

Time dependent creep response of ultra-high-performance concrete without fiber reinforcing

By

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A THESIS

Submitted in partial fulfillment of the requirements for the degree

MASTER OF SCIENCE

Department of Civil Engineering
Carl R. Ice College of Engineering

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2022

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Abstract

With increased usage among today's modern infrastructure, ultra-high-performance concrete (UHPC) and its mechanical properties have been the focus of many research projects and experiments. Understanding the advantages of this relatively new material can provide immense benefits in design of global infrastructure. The purpose of this study is to fill the gaps in understanding of long-term deformation behavior and structural significance of UHPC mixtures by accurately measuring and modeling the creep strain observed in UHPC specimens. For this study, a series of six, 2.5" by 2.5" by 36" column specimens were tested, three cast with normal strength concrete and three cast with a modified ultra-high-performance concrete without steel fibers. The specimens were loaded to varying stress levels defined as fractions of measured f'_c values for a duration of 28 days. Displacement measurements were taken at predetermined time intervals using a Whittemore gauge and embedded brass inserts. The data collected for each specimen was fitted using a Laplace Transform Elastic-Viscoelastic solution. The fitted data was then used to show and compare calculated values of creep compliance and creep coefficients for the various stress levels of each concrete mix. The creep compliance values after 28 days for the normal strength concrete ranged from $2.48\text{E-}07$ to $3.05\text{E-}07$ psi^{-1} and the 28-day creep coefficients ranged from 0.27 to 1.69. The creep compliance values after 28 days for the modified ultra-high-performance concrete ranged from $2.08\text{E-}07$ to $2.21\text{E-}07$ psi^{-1} and the 28-day creep coefficients ranged from 0.38 to 0.50. The best fit models for creep, shrinkage and recovery curves and their respective fit parameters are presented as well.

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Acknowledgements

I would like to thank my major professor, Dr. Christopher Jones, for his help and support on this project. I would also like to extend my thanks to Dr. Robert Peterman and Dr. Kimberly Kramer for serving on my advisory committee.

I would like to thank Josi Frigon for her help with the collection and recording of data as well as her assistance in experiment preparations. Finally, I would like to thank the Civil Engineering Research Technologists Andrew Schoenecke and Clifford Temple for their hand in placing material orders and help in the woodshop.

Chapter One – Introduction

Background

Since its inception in the 1980s ultra-high-performance concrete (UHPC) has been a popular topic among the infrastructure industry (Schmidt and Fehling, 2004). The materials superior properties have drawn engineers to its potential usage in modern construction. When compared to normal strength concrete (NCS), UHPC mixtures have shown greater strength and durability properties. Mainly characterized by high tensile strengths ranging from 1.2 to 2.2 ksi (Wille et al, 2011) and compressive strengths ranging from 17 to 22 ksi (Tadros et al., 2020) engineers quickly realized the advantages to using UHPC mixes in both traditional and “tensioned” concrete design. The first structure to use a UHPC mixture for structural members was a pedestrian bridge in Sherbrooke, Canada. This bridge, built in 1997 used an early form of UHPC called Reactive Powder Concrete (Azmeem and Shafiq, 2018). Since the completion of this project UHPC has been a heavy focus primarily in the transportation and bridge industry, however, with new information arising about this material, its potential for use in other facets of infrastructure is becoming even more probable.

UHPC mixtures gain their increased strength and durability behavior by applying four principle adjustments to the mix matrix of normal strength concrete. These include a reduction in the water-cement-ratio (w/c) to 0.25 or less, elimination of coarse aggregate to achieve greater packing density, the use of additional superplasticizers to maintain workability and the incorporation of fibrous materials to increase the tensile properties (Schmidt and Fehling, 2004).

While plenty of research has been done on ultra-high-performance concrete in the past thirty years there is still a need for more information to help validate and create safe code

provision for designers in the years to come. Among the available research, project parameters have included studying better material substitutes for cheaper and stronger mixtures, finding different curing methods for increase strength, or observing the effectiveness as structural members such as beams or columns. While in most of these projects the materials strength properties are normally well recorded, there is a lack in information about the time-dependent properties such as the creep and shrinkage seen with UHPC mixtures. These time-dependent properties are vital to designers and if neglected during the design process will lead to inadequate and unsafe structures.

For example, a major aspect of pretension or post-tension design is the importance of losses. Losses are a reduction in the tensioning forces applied to a member due to immediate and long-term deformations in both the concrete and steel strands (Nawy, 1996). A major component of losses are the creep strains that develop within the concrete member from the effect of the constant applied compressive force. If not taken into consideration during design, these losses will cause excess deflections which in turn create cracking and ultimately failure. Knowing the level of importance that these long-term deformation behaviors hold in design, it is necessary that for further advancements in structural design the creep properties of a UHPC material should be well known and documented.

Scope and Aim

The scope of this research is to fill in gaps in the understanding as well as reinforce previous research conclusions by presenting the time dependent deformation properties of normal strength concrete ($f'_c \sim 6\text{ksi}$) and a modified ultra-high-performance concrete ($f'_c \sim 21\text{ksi}$) without steel fibers. A series of three test specimens for each mix were loaded to selected stress levels and held at constant for a 28-day period in a temperature and humidity-controlled room.

The concrete deformations were measure at selected time intervals via external Whittemore strain gauge readings between embedded brass inserts on the side of the test specimens. The collected data was used to accurately model the time dependent deformation properties of both concrete mixes by determining fit parameters for a Laplace Transform Elastic-Viscoelastic solution. Creep and shrinkage strains were measured and along with the calculated creep compliance and creep correlation values were presented and compared to values found in the previous research studies mentioned in the literature review. After creep testing was performed, measurements for the recovery curve were also recorded and model to encapsulate a full range of visible creep strain behaviors seen in concrete members.

Thesis Outline

The outline for this thesis is broken up into seven chapters. The introduction presented in Chapter One, includes background information and the scope and aim of the project. Chapter Two reviews the mechanisms behind creep behavior in concrete as well as discussing the theory of a viscoelastic modeling solution for use in fitting creep and recovery data. A comprehensive literature review of the state of knowledge on creep behavior in both normal strength and ultra-high-performance concrete is presented in Chapter Three. Chapters Four and Five present the experimental materials and methodology. The experimental results are presented and discussed in Chapter Six. Finally, the report is concluded in Chapter Seven. All calculated data used in this study are included in the appendices.

Chapter Two - Theory

As the aim of this study is to determine the time-dependent properties of ultra-high-performance concrete, this section will review the theories and ideas for the prediction of creep, shrinkage, and recovery behavior of concrete.

Creep Behavior

Concrete is a viscoelastic material, meaning upon loading a linear stress-strain relation can be observed. However, after holding a load constant the material shows signs of viscous behavior with a reduction in the strain rate due to particle redistribution. This behavior, notably known as creep, is debated amongst material engineers today as many factors play into the creep behavior of a concrete mixture. By separating concrete into its two main components, the aggregates and cement paste, it has been agreed upon that creep is not a factor of the aggregates as they will tend to restrain movement (Mindess et al., 2003). Instead, creep is a behavior of the cement paste. A common consensus is that creep occurs as a product of the rearrangement of the cement paste nanostructure due to the presence of water in the Calcium-Silicate-Hydrate structure (Hailong Ye, 2015). Where the interaction between the water and the calcium silicate hydrate cause deformations due to either movement of free water between pores, redistribution of particles through sliding or transfer caused by the absorbed water, or translation of internal molecular structure due to the interlayer water.

To determine creep properties of concrete, a creep test is performed where specimens are loaded in compression to desired stress levels and held at constant for a predetermined time. It is common to load concrete test specimens to stress levels up to 50% of the measured f'_c value, as doing this ensures that the concrete will remain in a linear elastic behavior. Keeping the applied

stress below 0.50f_c allows for the simplification of calculations while still producing accurate data modeling using constitutive equations. Readings taken throughout the test measure deformations seen in the specimen. These deformations relate to total strain readings and at their most basic level, as seen in Equation 1, are a combination of initial elastic, creep, and shrinkage strains.

$$\varepsilon_{tot} = \varepsilon_{initial} + \varepsilon_{creep} + \varepsilon_{shrinkage} \quad (1)$$

Shrinkage strains are taken from measurements on identical unloaded concrete specimens that are allowed to dry in the same environment as the loaded specimens. As it is assumed that creep and shrinkage strains are interrelated (Mindess et al., 2003) the creep strain can be determined by subtracting the shrinkage strain from the total measured strain. Doing this allows for the reporting of the sole creep strain behavior seen within concrete mixtures.

Creep data is commonly presented in two ways, the first being the calculated creep coefficient, Equation 2, which shows the ratio of creep strain to initial strain. The second is the presentation of the calculation of a creep compliance, which is a measurement of the creep strain per unit stress shown in Equation 3 (ACI 209, 2008).

$$C = \frac{\varepsilon_{cr-t}}{\varepsilon_0} \quad (2)$$

$$J(t) = \frac{\varepsilon(t)_{cr}}{\sigma} \quad (3)$$

The creep coefficient can be helpful in determining the amount of creep loss seen in prestressed and post-tensioned members, it is also used in various creep strain prediction models to determine the creep compliance. The creep compliance is an important piece of creep strain

modeling as the compliance is the inverse of the relaxation modulus and multiplying the compliance by the applied stress will yield a strain model as a function of time.

Creep strains can be modeled by forming a viscoelastic solution. These solutions use the basic theories behind the behavior of springs and dashpots to replicate the elastic and viscous behaviors seen in concrete. In doing so, the springs will represent the elastic properties and the dashpots help to model the viscous behavior of concrete (Findley et al, 1976).

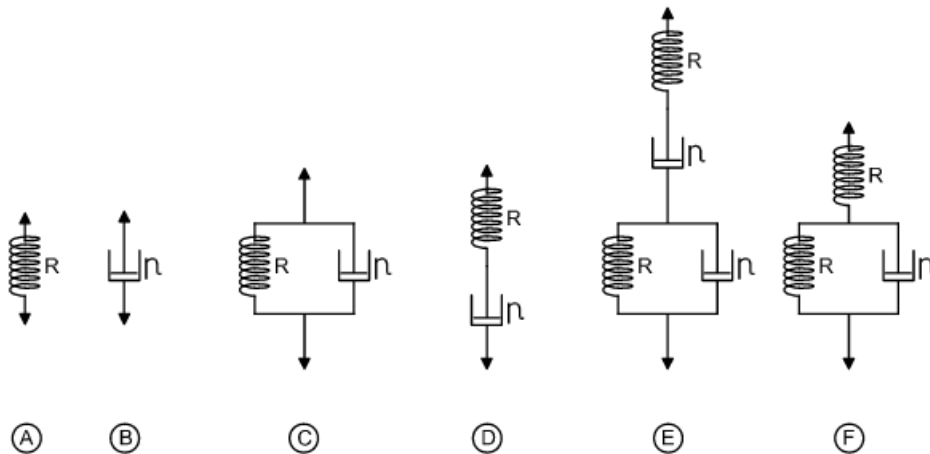


Figure 1. Creep model visualizations

Two basic models for viscoelastic solutions are the Maxwell and Kelvin models. The Maxwell model shown as Figure 1C consist of a spring and dashpot arranged in series. While adequate for determining the initial elastic strain behavior it falls short to accurately represent the creep strain behavior due to a lack of creep strain rate differentiation. The Kelvin model in Figure 1D consists of a spring and dashpot arranged in parallel. Unlike the Maxwell model, the Kelvin model more accurately depicts the creep strain rate behavior seen in time dependent tests

of concrete. However, the Kelvin model does not include an initial elastic strain component. Due to their differences the two models are commonly used together to form combined four or three element models seen in Figures 1E and 1F respectively that work together to capture the full time dependent observable creep strain behavior (Findley et al, 1976). Using the simple stress-strain relationship equations for both a spring and dashpot, total stress or total strain equations can be created and manipulated using Laplace Transforms to form a strain function with respect to time to be used in the fitting of recorded data.

The Elastic-Viscoelastic solution used in this experiment is presented in Equation 4 which includes fit parameters E_0 , E_1 , τ , β and P_{max} . Where E_0 represents the initial elastic stiffness, E_1 determines the viscous flow with time, τ is the total duration of the test, β controls the shape of the fit curve and P_{max} is the applied load. To obtain this function the time variable was removed using Laplace Transforms in a similar manor as done by Jones and Grasley in their research on short-term creep of cement paste during nanoindentation (Jones and Grasley, 2010).

$$\varepsilon(t) = \left(\frac{1}{E_0} + \frac{1 - e^{-\left(\frac{t}{\tau}\right)^\beta}}{\left(1 - \frac{1}{e}\right)E_1} \right) * \frac{P_{max}}{A} \quad (4)$$

As creep compliance and the relaxation modulus are both factors of viscoelastic properties in a material, they are mathematically related. Equation 5 shows their inverse relationship as the transformed relaxation modulus is a function of the transformed creep compliance. The transformed creep compliance function used in this model was derived from Equation 6, which shows the creep compliance function presented by Jones and Grasley.

$$\hat{E}(s) = \frac{1}{s^2 \hat{j}(s)} \quad (5)$$

$$J(t) = \frac{1}{E_0} + \frac{1}{E_1(1 - e^{-1})}(1 - e^{-\left(\frac{t}{\tau}\right)^\beta}) \quad (6)$$

Assuming the load is applied as a step load allows for the Laplace Transform of the step function to be taken as seen in Equation 7.

$$P(s) = \frac{P_{max}}{s} \quad (7)$$

To form the strain function in Equation 4, the inverse Laplace Transform of the transformed stress function divided by the transformed relaxation modulus, as shown in Equation 8, must be taken. In doing so the output function shows a strain-time relationship, influenced by creep compliance multiplied by the applied stress.

$$L^{-1}\left\{\frac{P(s)/A}{s\hat{E}(s)}\right\} \quad (8)$$

Shrinkage Behavior

Shrinkage behavior is similar to creep behavior as it is seen in concrete as a product of the cement paste and water. However, while creep pertains to the movement of water, shrinkage is a factor of the loss of water in the cement paste. Shrinkage strains are broken down into drying shrinkage, autogenous shrinkage, and carbonation shrinkage (Mindess et al., 2003). Drying shrinkage is caused by the removal of all evaporable water from the concrete. This includes water on the surface, internal pores, and in the C-S-H solid. Autogenous shrinkage comes from the loss of water due to the hydration process of the cement paste. This is commonly found during standard curing as the internal water begins to react with the cement. Finally, carbonation shrinkage is a factor of the reaction of the C-S-H with the carbon dioxide in the air.

To model shrinkage strains the ACI 209.2R-08 *Guide for Modeling and Calculating Shrinkage and Creep in Hardened Concrete* provides four applicable best fit models. These include the ACI 209R-92, Bažant-Baweja B3, CEB MC90-99, and GL2000 models. For the purpose of this paper, the concrete shrinkages were modeled using the ACI 209R-92 shrinkage strain equation as seen in Equation 9. Where ϕ is a function of the shape and size of the concrete specimen, ε_{shu} is the ultimate shrinkage strain, and α defines the shape of the curve. While the

$$\varepsilon(t)_{sh} = \frac{t^\alpha}{\phi + t^\alpha} \varepsilon_{shu} \quad (9)$$

other models mentioned may more closely predict the shrinkage behavior, the ACI 209R-92 model is most commonly used as it allows for simplicity in the prediction of shrinkage behavior.

Recovery Behavior

Recovery occurs after applied stress is removed. This behavior, like the creep behavior during the loaded period is a factor of the initial elastic strain as well a function of viscous behavior with time. Because of this, modeling can be accomplished using the same strain function from the creep strain model in Equation 4. Changing the applied stress from positive to negative will allow for the modeling of the inverse curve as the calculated strains will be deducted from the final 28-day creep strain measurement. Similar as to before, in Equation 10,

$$\varepsilon(t) = \left(\frac{1}{E_0} + \frac{1 - e^{-\left(\frac{t}{\tau}\right)^\beta}}{\left(1 - \frac{1}{e}\right)E_1} \right) * \frac{-P_{max}}{A} \quad (10)$$

the linear elastic stiffness E_0 will be related to the observed initial elastic strain, E_1 models the viscous flows and β determined shape of the recovery strain model. These will differ from the

parameters found with the creep strains due to the presence of an irreversible strain that is caused by the viscous deformation that occurred during the loaded period.

Chapter Three - Literature Review

In this literature review creep data from previous research projects using normal strength and ultra-high-performance concrete will be presented with the purpose of showing where the current state of knowledge is on creep aspects in both normal strength and ultra-high-performance concrete.

Normal Strength Creep Data

Since first being observed in the early 1900s, a wide range of data for creep behavior of normal strength concrete has been collected. Researchers at Northwestern University created a complete database for creep and shrinkage tests in 1978 and have continued to update it as more data is recorded (Hubler et al., 2015). This database originally known as RILEM includes data from the 1930s to present day with recordings for both creep and shrinkage test. The intent of this was to provide a comprehensive collection of creep and shrinkage data with varying sets of parameters including mix design, curing procedure, test environmental conditions, specimen sizes, test duration, and stress levels. The collection of data could be used to test and evaluate the effectiveness of creep and shrinkage prediction models.

A report published by the American Concrete Institution, the ACI 209.2R-08 *Guide for Modeling and Calculating Shrinkage and Creep in Hardened Concrete*, shows information from a study performed by Noel J. Gardner where the RILEM data was compared with four commonly used creep and shrinkage prediction models (Gardner, 2004; ACI 209, 2008). These include the ACI 209R-92 model, the Bažant-Baweja B3 model, the CEB MC90-99 model and the GL2000 model. The ACI 209R-92 model was introduced in the 1970s for the precast industry as an empirical based model which allows simplicity in usage due to the limited amount

of information needed. The Bažant-Baweja B3 model was also created in the 1970s and unlike the ACI model this requires a more in-depth knowledge of the mix design which may be available to the engineer at the time of usage. The CEB MC90-99 model came about in the 1990s and includes adjustments for usage of high-strength concrete as well as normal strength concrete. Finally, the GL2000 model which was formulated in 2001 was created to model creep and shrinkage with the intent that the only data required would be that which would be readily available to the design engineer (ACI 209, 2008).

In the study done by Gardner, data from the RILEM database for 107 shrinkage test and 166 creep compliance tests were used to compare the prediction models to experimental results with a range of parameters. These parameters included tests performed for greater than 500 days, 28-day compressive strengths ranging from 16 MPa to 82 MPa, curing duration of greater than 1 day, age of loading greater than 28 days, V/S ration greater than 19mm, relative humidity ranging from 20-100% for compliance and relative humidity below 80% for shrinkage. Gardner found that, the ACI 209R-92 tends to overestimate early shrinkage strain and underestimate late shrinkage strain, as well as underestimate the creep compliance, the CEB MC90-99 model underestimates shrinkage but adequately models creep compliance, the Bažant-Baweja B3 model is good at predicting shrinkage, and the GL2000 model produced the most accurate predictions of shrinkage and creep compliance when compared the to the RILEM data used (Gardner, 2004).

The continuation of testing and recording creep and shrinkage data to be added to the RILEM database can help to increase the understand of how different parameters affect the long-term deformation behavior of concrete and ultimately lead to revision in code equations to lead to increased accuracy with prediction models.

UHPC Creep Data

As mentioned before, the creep behavior of UHPC specimens has not been as well documented and researched as the normal strength concrete counterpart. The following tests are some of the available sources with relevant data pertaining to the behavior of UHPC specimens subjected to a small variety of different parameters. Each of these studies uses proprietary UHPC mixtures available to the commercial market and include the usage of steel fibers as part of their mix matrix.

Under the support of the Federal Highway Association, Benjamin A. Graybeal conducted a full material testing of Lafarge's patented UHPC mix, Ductal (Graybeal, 2006). At the time this was the only commercially available mixture in the United States and Graybeal's study would determine the feasibility of using the Ductal mix for bridge infrastructure. Through his research, data was collected for the strength properties and time-dependent behaviors of the Ductal mix. Among the experimental test were long-term creep and shrinkage tests.

The creep tests were performed on four sets of four 4" by 8" cylinder, each cured by differing methods, steam treated, delayed steam treated, tempered steam treated and untreated. The cylinders were loaded at differing times according to their curing treatment. Steam and tempered steam treated cylinders were loaded at 4 days, delayed steam treated cylinders were loaded at 21 days and untreated cylinders were loaded at 28 days. A hydraulically actuated load frame placed in an environmentally-controlled room was used to apply a load to each cylinder of 40% of the expected 28 ksi compressive strength which equates to 11.2 ksi. Readings were taken via Whittemore points with a gauge length of 6" attached to the cylinder at three locations around its circumference for a time of one year. Simultaneously with the creep test, shrinkage data was being collected on three unloaded samples for each curing method in accordance with

ASTM C157 and ASTM C490. The measurements were taken initially after demolding and then daily, weekly, and monthly for the duration of a year.

Shrinkage strains were fit by using a modified shrinkage strain equation presented in the ACI209R-92 model. The shrinkage strains were subtracted from the total recorded strains to determine creep strains, and the creep coefficients were found by dividing the creep strain by the initial elastic strain. Using the creep coefficients, Graybeal was able to compare his measures data to that of the manufacture Lafarge as well as to coefficients seen in normal strength concrete. The data showed that the Ductal mixture provided lower creep coefficients than that seen in normal strength concrete mixes. The coefficients of 0.29, 0.78, 0.66, 0.31 for steam treated, untreated, tempered steam treated, and delayed steam treated respectively, compared to the range of 1.5 to 3.0 for recorded data from normal strength concrete tests. Recorded data showed that the ultimate shrinkage strains ranges from 555 $\mu\epsilon$ to 766 $\mu\epsilon$, the initial elastic strains ranged from 1500 $\mu\epsilon$ to 2057 $\mu\epsilon$, and the final creep strain ranged from 440 $\mu\epsilon$ to 1600 $\mu\epsilon$. Graybeal was able to conclude that the UHPC specimen in his test did show improved creep behavior when compared to NSC and he determined that steam treating concrete is an effective way to mitigate strains behavior.

Jason C. Flietstra also researched creep and shrinkage effects of the Ductal premix for his master's thesis at Michigan Technological University (Flietstra, 2011). Suited towards determining creep behavior for prestress usage, the experimental matrix included testing five different curing treatments at two applied stress levels. A targeted 14 ksi 7-day compressive strength was determined for the specimens as this is a typical recommended release strength for prestressed design. The five curing treatments included ambient curing treatment (AMC), standard thermal curing treatment (SST), pre-steam then standard thermal curing treatment

(PST), pre-steam then delayed thermal curing treatment (PSD), and pre-steam then double delayed thermal curing treatment (PDD).

By conducting compression test study on 3” by 6” specimens for each curing treatment, Flietstra was able to determine when each treatment would yield the desired compressive strength of 14 ksi. Subsequently the specimen curing times and load levels were as follows for 0.60f_c and 0.20f_c respectively:

- AMC cured for 70 hours before loading to 51.8 kips and 17.25 kips
- SST cured for 70 hours before loading to 0.63 and 0.21 of measure 13.3 ksi f_c
- PST cured for 14 hours before loading to 58.6 kips and 19.5 kips
- PSD cured for 16 hours before loading to 57.8 kips and 19.3 kips
- PDD cured for 16 hours before loading to 56.9 kips and 19.0 kips

The creep tests were performed on 3” by 12” cylinders that were horizontally cast. The specimens were loaded in a custom hydraulic jack creep frame for 24 to 28 day. Measurements were taken on all creep and shrinkage specimens via imbedded brass inserts with an initial gauge length of 8” using a Whittemore strain gauge at hourly, daily then weekly intervals after initial loading. The recorded strains for each test are shown in Table 1. Subtracting the initial elastic and shrinkage strains from the total strains allowed for the calculations of the creep strains and creep coefficient.

Table 1. Recorded strain data from study performed by Flietstra (Flietstra, 2011)

	0.20f _c Initial	0.60f _c Initial	0.20f _c Total 28-day	0.60f _c Total 28-day	Shrinkage 28-day
AMC	579 $\mu\epsilon$	1269 $\mu\epsilon$	693 $\mu\epsilon$	1438 $\mu\epsilon$	380 $\mu\epsilon$
SST	466 $\mu\epsilon$	1403 $\mu\epsilon$	755 $\mu\epsilon$	1991 $\mu\epsilon$	313 $\mu\epsilon$
PST	573 $\mu\epsilon$	1502 $\mu\epsilon$	611 $\mu\epsilon$	1955 $\mu\epsilon$	303 $\mu\epsilon$
PSD	526 $\mu\epsilon$	1542 $\mu\epsilon$	785 $\mu\epsilon$	2034 $\mu\epsilon$	301 $\mu\epsilon$
PDD	557 $\mu\epsilon$	1451 $\mu\epsilon$	879 $\mu\epsilon$	2012 $\mu\epsilon$	475 $\mu\epsilon$

Table 2. Creep strains and creep coefficients recorded by Flietstra (Flietstra, 2011)

	0.20f _c Creep Strain	0.60f _c Creep Strain	0.20f _c Creep Coef.	0.60f _c Creep Coef.
AMC	313 $\mu\epsilon$	1058 $\mu\epsilon$	0.54	0.83
SST	442 $\mu\epsilon$	1678 $\mu\epsilon$	0.89	1.12
PST	309 $\mu\epsilon$	1653 $\mu\epsilon$	0.54	1.26
PSD	491 $\mu\epsilon$	1727 $\mu\epsilon$	0.93	1.12
PDD	404 $\mu\epsilon$	1537 $\mu\epsilon$	0.68	1.00

Flietstra found that thermal treatments are good at speeding up the creep behavior, but unlike Graybeal found that steaming did not have the same effect. His recordings of creep coefficient differed from those seen in the Graybeal report as higher values were calculated. However, his strain measurements were in the range of those seen recorded by Graybeal.

Zachary B. Haber, Igor De la Varga, Benjamin A. Graybeal, Brian Nakashoji, and Rafic El-Helou continued to research the properties and behaviors of UHPC mixtures as more variations became available under support of the FHWA (Haber et al., 2018). Through testing, data was collected on five different commercially available UHPC mixes in the United States and Europe including the Ductal mix previously mentioned in the Graybeal (2006) experiment. Unlike Graybeal's initial research where creep behavior was differentiated by adjusting curing treatments for specimens, the goal of this test was to observe the creep behavior due to varying

applied stress levels. In a similar approach as to before, tests were performed on 4" by 8" cylinders in a hydraulically actuated load frame placed in an environmentally-control room with relative humidity at 50% and a temperature of 23°C. Specimens were loaded to predetermined stresses of 0.40f_c and 0.65f_c. The specimens loaded to 0.40f_c were cured by standard treatment for a minimum of 56 days before loading whereas those loaded to 0.65f_c were cured for a maximum of 7 days before loading. To gain the desired stress levels a load of 115 kips was applied to all frames. Due to the difference in compressive strength seen from the varying cure times 115 kips provided the desired 0.40 and 0.65f_c stress levels.

Data measurements were collected using a micrometer via externally applied detachable mechanical strain gauge points with an initial gauge length of 6". Readings were taken before loading, initially after loading, two to six hours after loading, daily, weekly, and then monthly for over a year. Measurement for shrinkage strain were taken simultaneously with the creep readings. Combined with recorded data from Graybeal's 2006 tests the measured initial strains ranged from 1947 µε to 2998 µε for the 0.65f_c test and 1432 µε to 2076 µε for the 0.40f_c test. The corresponding calculated creep strains ranged from 1600 µε to 3719 µε for the 0.65f_c test and 1003 µε to 2425 µε for the 0.40f_c test. As done in the previous studies the creep coefficients were also calculated as follows, the 0.65f_c test ranged from 0.78 to 2.47 and the coefficients for the 0.40f_c test ranged from 0.70 to 1.17 (Haber et al.,2018).

Comparing these studies over UHPCs to the estimated normal strength creep coefficients of 1.5-3.0 for mature concrete, it is observed that the UHPC mixes still show lower values of creep strain. As seen through the research presented, much like with NSC there are many factors that affect the creep behavior in UHPC specimens. Continuing to test and record data can help to create accurate creep and shrinkage prediction models to be used in the design process.

Chapter Four - Materials

Normal Strength Concrete Mix Design

Following traditional concrete design procedures, a normal strength concrete mix was created. The mix used in this experiment had a desired f'_c of 6 ksi after 28 days of curing. The w/c ratio was kept to 0.45 and a water reducer was added to help obtain greater compressive strength. Type I Portland Cement was used to form the cement paste and oven dried crushed stone and oven dried river sand formed the aggregates. Table 3 shows the proportioning for the normal strength concrete mix used in testing.

Table 3. Normal strength concrete mix design

Material	Specific Gravity	per cubic yard
Type I Portland Cement	3.15	564 lbs
Fine Aggregate	2.6	2024 lbs
Coarse Aggregate	2.6	1120 lbs
Water	1.0	254 lbs
Water Reducer – ADVA 140M		25 fl. oz.

Ultra-High-Performance Concrete Mix Design

Over the years there have been several UHPC mixtures that have been available for commercial usage. While each have their differences, ultra-high-performance concrete mixtures can be characterized by having a low water-to-cement ratio, high packing density, and include the usage of superplasticizers and steel fibers. For this experiment a mixture was derived from a UHPC mix design provided by HiPer Fiber LLC. This mix was formed through a study done to create an “open-recipe” UHPC mix that would be used as an alternative to expensive proprietary mixtures currently on the market (El-Tawil et al., 2020). Having a non-proprietary mix formula

allowed for adjustments in the mix design to be made to better suit specific needed requirements. Two adjustments made for the mix used in this experiment were the elimination of the silica fume and steel fibers. The silica fume is originally included to act as a compressive strength booster for the mix as silica fume's pozzolanic properties and fine particles have shown to increase compressive strength when correctly dosed (Park et al., 2008). Yet, during the testing of the UHPC mixtures the compressive strengths seen in the mixture without silica fume had consistently shown greater compressive strengths when compared to the mixture with the silica fume. For this reason, it was decided to continue batching without the inclusion of silica fume and instead increase the cement and slag volumes in its absence to achieve the desired compressive strengths. Steel fibers were also called for in the original mix by the amount of 2% by volume, however, as a custom mold setup with a relatively small cross section and embedded inserts was used, the fibers were left out with concerns of creating an inhomogeneous distribution of fibers and cement paste due to low flowability and the confinement of the mold. The inhomogeneous cross section would allow for defects in the internal structure which could negatively affect the creep response. This effect has been previously seen to occur in fiber reinforced concretes with increased fiber percentages for both normal strength and UHPC mixtures (Zhao et al., 2016; Xu et al., 2018). While it may be argued that without the steel fibers this mixture is no longer considered a UHPC mixture, both the ACI and FHWA have acknowledged that while steel fibers are generally used to increase specific requirements, tests have been performed on UHPC mixtures without the inclusion of fibers.

The desired f'_c for the UHPC mixture was set at 21 ksi after 28 days of standard curing. The mix used had a w/c ratio of 0.18 and included a high range water reducer to maintain a high workability. Type I Portland Cement and Ground Granulated Blast Furnace Slag (GGBS) cement

were used for the paste and a kiln dried fine sand produced by Quikrete was used as the fine aggregate. Also, the addition of an accelerant helped to increase the 28-day compressive strength even further. Table 4 shows the used mix proportions for the UHPC test specimens.

Table 4. Ultra-high-performance concrete mix design

Material	Specific Gravity	per cubic yard
Type I Portland Cement	3.15	870 lbs
GGBS	2.81	870 lbs
Fine Aggregate	2.6	2100 lbs
Water	1.0	305 lbs
Water Reducer – Advacast 575		20 lbs
Accelerator – Daraset 400		348 fl. Oz.

Experimental Setup

The creep test was performed using a screw driven mechanical jack creep frame apparatus. This setup allowed for the ability to apply a constant stress without loss of load. Fitted to the top of the frame was a 100-kip load cell which fed direct real time voltage readings to a Keithley 2750 Multimeter/Switch System where the voltage readings were converted into applied load readings in a custom LabVIEW based software.



Figure 2. Screw driven loading jack



Figure 3. 100-kip load cell placed at top of creep frame



Figure 4. Keithley Multimeter / Switch System

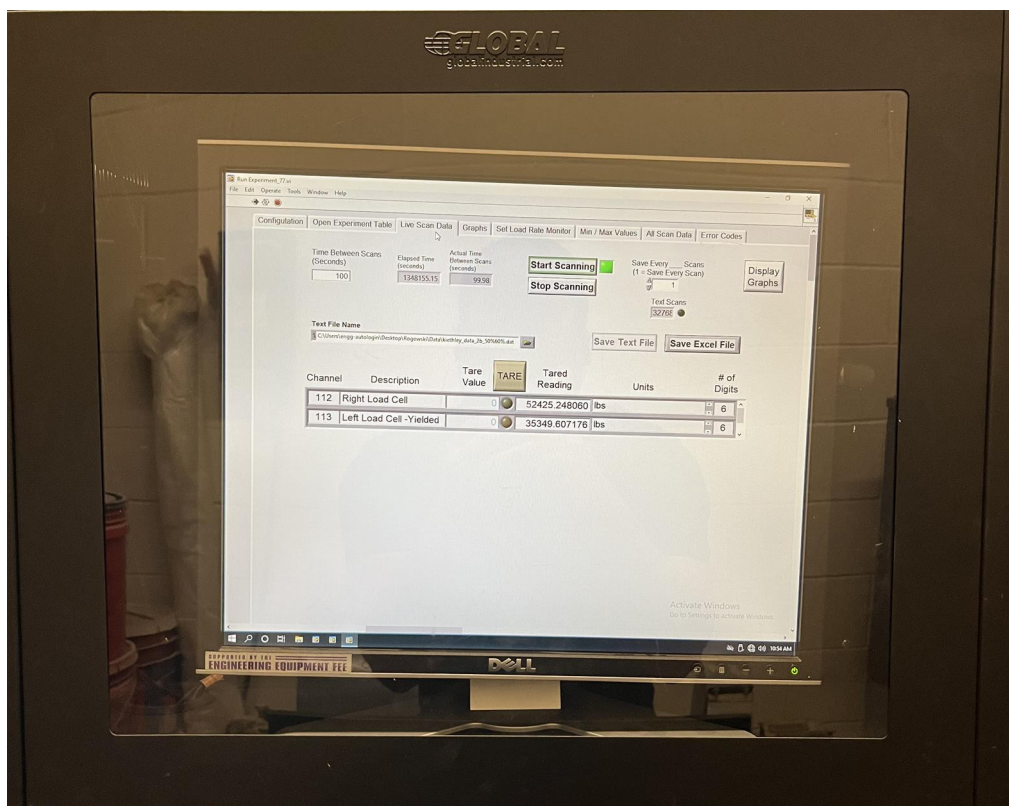


Figure 5. LabVIEW based software for real time load readouts

The load frames used for testing had a large 36" space between jack and load cell. To fit this, a custom mold was designed for casting of test specimens. Due to the load limitation of the 100-kip load cells, a 2.5" by 2.5" cross section was used to allow for the proper load to be applied in relation to the desired stress. With such a small column member buckling failure was checked using Euler's equation for buckling, the 36" unbraced length and 2.5" by 2.5" cross section of the test specimen was determined to be adequate for pure compression without bending. Additionally, during the tests the measured strain differences between opposite sides would confirm relatively zero bending.

To measure the strain, a Whittemore gauge, seen in Figure 6, with a gauge length of 8" was used to manually measure length changes between the embedded brass inserts shown in Figure 7. Experimental readings were recorded using a Mitutoyo ABS Digimatic indicator mounted to the Whittemore gauge which provided capabilities for an absolute zero setting and error of 0.0001 inches.



Figure 6. Whittemore strain gauge with Mitutoyo input tool

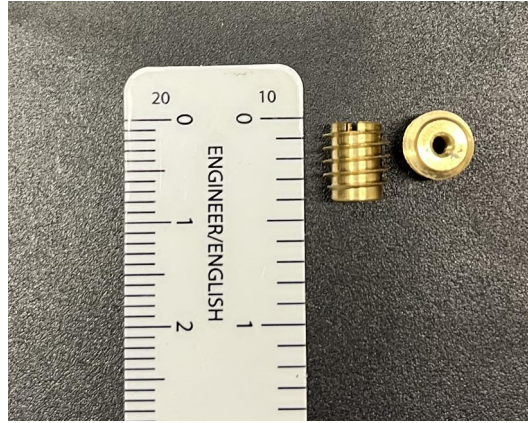


Figure 7. Brass inserts used for measurement points

Recorded readings were placed into a pre-set excel sheet via a Mitutoyo USB input tool, also shown in Figure 6, to help eliminate recording errors. The brass inserts were set in line down the center of each side of the test specimen. These inserts were spaced at approximately 1" spacings and totaled to 34 inserts per side leaving a 1.5" space between the top and bottom of the test specimen. As the Whittemore gauge had a gauge length of 8" this allowed for 26 individual collection points to be recorded per side of the test specimen.

Chapter Five - Methods

Mix Procedure

Due to the limitation of having only two creep frames, two separate batches of normal strength concrete and two separate batches of the UHPC were mixed on different days. Using the mix procedure provided by HiPer Fiber solutions for “Plant Mixing” the following steps were conducted to batch the UHPC mixtures after all ingredients were measured and proportioned for the desired batch size.

1. Silica Sand, Type I Cement and Slag were added to the mixer and dry-mixed for roughly 5 minutes
2. Water and HRWR were mixed separately before being added to the dry mixed materials
3. Accelerator added to the mix after the water and HRWR
4. Batch mix for approximately 30 minutes or until adequate mixture consistency was achieved

After mixing, the concrete was placed into the 2.5” by 2.5” by 36” molds seen in Figure 8 and prepared with the 2.5” by 2.5” by ¼” steel cap from Figure 10, which was placed at each end to help achieve a flat surface for load application. Temporary drilled steel spacers shown in Figure 9 were set in channels within the molds to hold the brass inserts in place during the first 24 hours of curing. In addition to the test specimen molds, six 4” by 8” cylinders were also prepared for the checking of 7- and 28-day compressive strength of each mix. All molds were vibrated on a small vibrating table to allow for even dispersion of the concrete and reduction of air voids. The molds were then placed into a curing room at 95% RH and 23°C and left for 24

hours before being demolded. After demolding, all specimens were then placed back into the curing room to undergo standard moist curing for the duration of the 28-day curing period. A total of eight specimens cast, six of which were used for loaded creep testing (three NSC and three UHPC) and two were used to determine shrinkage strains see in both the NSC and UHPC specimens.

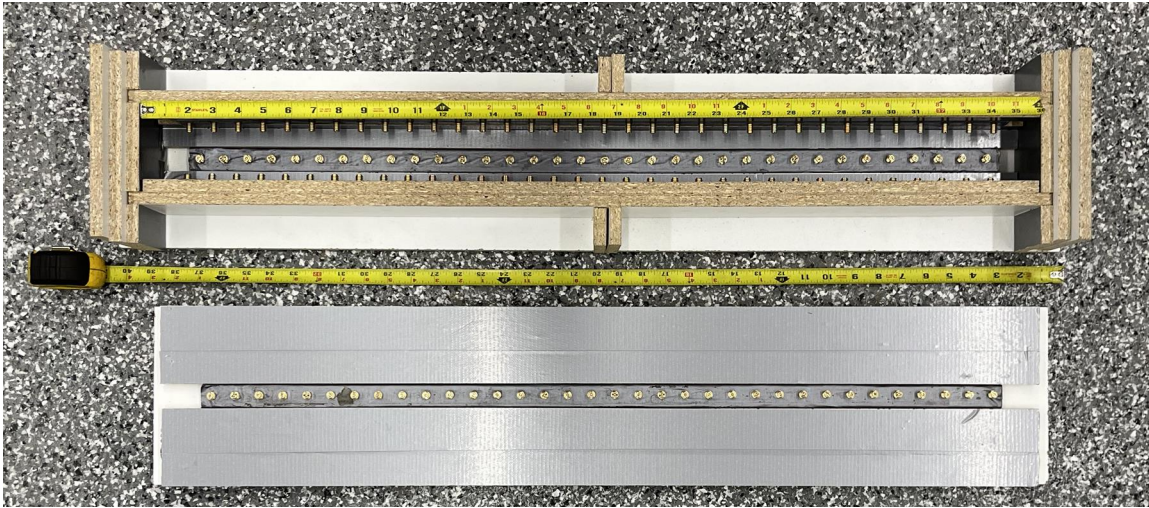


Figure 8. Custom 2.5" by 2.5" by 36" specimen mold



Figure 9. Pre-drilled steel spacer bar for brass inserts



Figure 10. 2.5" by 2.5" by 1/4" steel cap plate

Loading Procedure

On the day of loading, the 4" by 8" cylinders were pulled from curing to check for the 28-day compressive strength. After compressive testing the creep test specimens were then pulled from curing at which point they were transferred to the creep frame in Figure 11, where they then were adjusted before taking on load.



Figure 11. Test specimen loaded into creep frame

Each specimen would be loaded to a percentage of the normal strength concrete or UHPC's desired f'_c values. The normal strength concrete test specimens were loaded to stress

levels of 30, 40 and 50% of the desired 6 ksi f'_c value. This correlated to 35, 37, 58% respectively of the actual measured f'_c values of each batch. The UHPC concrete test specimens were loaded to stress levels of 27, 30 and 40% of the desired 21 ksi f'_c value. This correlated to 32, 34 and 47% respectively of the actual measured f'_c value of each batch. The loads applied to each specimen were held constant for the 28-day test and would be adjusted if seen to deviated more than 2% from the desired stress level. The two additional test specimens used for shrinkage strain measurements were kept unloaded and in the same environment-controlled room as the creep test specimens where RH was kept a 50% and the temperature remained at 23°C.



Figure 12. Testing room environment control panel

Measurement Procedure

Measurements were performed using the Whittemore gauge previously mentioned by taking the deformation readings between the brass insert points along all the sides of each test

specimen. Before taking a set of readings the Whittemore gauge was zeroed using a drilled metal gauge with a controlled gauge length of 7.965 inches. After zeroing, measurements were



Figure 13. Zero test performed before taking measurements

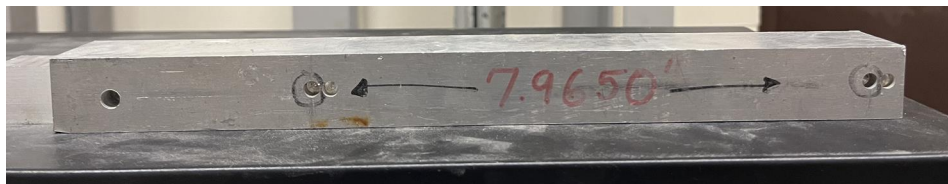


Figure 14. Pre-drilled metal "zero" gauge

taken starting at the top of the column and then moving down towards the base. This process was repeated for each side measured. These readings were taken before and after initial loading, then at times of 3 hours, 6 hours, 9 hours, 24 hours, 48 hours, 72 hours, 1 week, 2 weeks, 3 weeks and 4 weeks after loading. The UHPC specimens had additional readings at times of 30 minutes, 1 hour and 12 hours after loading. The shrinkage specimens were measured initially after the 28-day curing period, then daily for 21 days, and a final recording was taken on the 28th day.

Data Processing

After the 28-day creep tests had concluded, the collected data was then post processed to be set up for data modeling. The procedure of the post processing of the data was completed as follows. Beginning with the raw data readings the “zero” length of 7.965” was added to all recorded values to get the true distance between insert points. Next, using the strain equation, the measured strain at each time interval was calculated by dividing the change in length by the initial length. When determining the measured strain an “IF” statement was written into the strain equation to eliminate negative strain measurements as it can be assumed that under compressive load, increases in the specimen length are improbable. After the strain was calculated, the average strain per insert point was taken for all sides recorded. The same process was repeated for the unloaded test specimens to get the average shrinkage strain, as well as the recorded data for the recovery curves.

The averaged data would then be copied into a different excel file to be fitted. The fitting procedure included further separating the copied averages into their individual measurement points. Here, another sweep of the data was conducted to determine and eliminate outlying data points to help create smoother fittings. A best fit model for each measurement point was formed for creep, shrinkage, and recovery via their respective strain modeling equation mentioned in Chapter Two. After a best fit model and its corresponding equation parameters had been determined for each measurement point, the equation fitting parameters were then averaged to determine a best fit model for the entire test specimen. Using this best fit model, the standard deviation and corresponding 95% confidence levels were calculated to determine the adequacy of the created model.

Chapter Six – Results and Discussion

Compressive Strength

As previously mentioned, ASTM C39 compressive tests were performed on the 4” by 8” cylinders after 7- and 28-day curing periods to determine the actual f'_c value per mix batch. The recorded compressive strengths for both the NSC and UHPC can be seen below in Tables 5 and 6 respectively.

Table 5. 7 day and 28-day compressive strengths for NSC mixes

Mix Batch	Normal Strength # 1	Normal Strength # 2
7 Day Compressive Strength (psi)	2,600 \ 3,560 \ 2,900 Avg. = 3,020	5,366 \ 5,807 \ 5,684 Avg. = 5,619
28 Day Compressive Strength (psi)	6,903 \ 4,128 \ 4,503 Avg. = 5,178	6,950 \ 6,790 \ 5,878 Avg. = 6,539

Table 6. 7 day and 28-day compressive strengths for UHPC mixes

Mix Batch	UHPC # 1	UHPC # 2
7 Day Compressive Strength (psi)	16,434 \ 15,871 \ 15,786 Avg. = 16,030	15,484 \ 15,496 \ 14,407 Avg. = 15,129
28 Day Compressive Strength (psi)	19,028 \ 18,234 \ 18,780 Avg. = 18,681	17,837 \ 17,797 \ 17,963 Avg. = 17,866

While the compressive strength for the UHPC specimens did not reach the desired 21 ksi limit, the strengths shown in Table 6 are similar to those seen in both Graybeal’s and Haber’s experiments. The untreated concrete specimen in Graybeal’s experiment reached a 28-day compressive strength of roughly 16.5 ksi and two of the batches mixed in Haber’s test only reached compressive strengths of 17.2 and 19.7 ksi. As found by Graybeal and Flietstra,

performing additional treatments, whether steaming or heat treating can lead to higher compressive strengths.

Shrinkage Strain Data

Fitting for the shrinkage strain data was performed using the ACI 209R-92 shrinkage strain equation seen in Equation 9. To create the best fit curve for shrinkage a solver tool was used to determine the fit parameters of ε_{shu} and α for each individual insert point. After all fit parameters were determined for each of the insert point, the average of the fit parameters was taken and the best fit line was plotted. Figure 15 shows the calculated best fit line for both the normal strength concrete and the ultra-high-performance concrete. The modeled ultimate shrinkage strains at 28 days are 200 $\mu\epsilon$ for the NSC and 121 $\mu\epsilon$ for the UHPC.

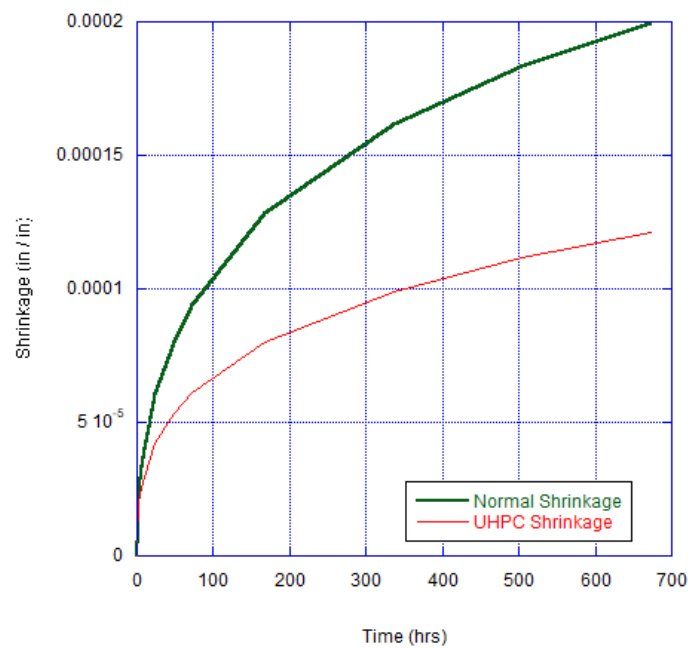


Figure 15. Modeled shrinkage strain curves for HSC and UHPC

When compared to the shrinkage strains seen in the three studies reviewed in the literature review, seen in Table 7, the shrinkage strain for the UHPC specimen used in this test was much lower than those of the other experimental tests.

Table 7. Comparison of experimental shrinkage strains

Rogowski (2022)	121 $\mu\epsilon$
Graybeal (2006)	555 - 766 $\mu\epsilon$
Flietstra (2011)	301 – 475 $\mu\epsilon$
Haber et al. (2018)	No direct shrinkage strains available

All tests were performed in relatively similar environments therefore the differences in shrinkage strain cannot be directly attributed to the relative humidity or temperature. A major difference between the shrinkage strains found is the time at which the ultimate shrinkage was recorded. The strains found in this test and Flietstra's were recorded at 28 days, whereas Graybeal's data is recorded at 200+ days. To directly compare to Graybeal's data, the ultimate shrinkage strains were calculated for a time of 365 days using the respective best fit strain model equations for both this test and Flietstra's. Where the shrinkage strain for this test was 230 $\mu\epsilon$ and Flietstra's was 460 $\mu\epsilon$. While both are still lower than the strains found in Graybeal's work, differences in reported values may be caused by the different best fit models used, or possibly a difference in the concrete mixtures. As both Graybeal and Flietstra used Ductal as their UHPC mixture, the contents of the mix are relatively unknown, however, Lafarge states that the w/c is around 0.20 which is slightly higher than the 0.18 recorded in this test. Though the w/c ratio may not be the sole cause of the visible differences it should be considered as a major factor.

Creep Strain Data

As done in the studies prior to this paper, the creep strain data would be acquired by subtracting the shrinkage strain from the measured total strain to see the sole creep strain behavior. This is allowed as it is assumed that creep and shrinkage strains are interrelated and by taking shrinkage strain measurements on test specimens with the exact proportions as the creep test specimens it can be inferred that the shrinkage strains seen measured from the shrinkage test will be the same as those seen in the creep test. With this, the creep strains in this experiment were found simply by subtracting the shrinkage strains calculated using the shrinkage best fit model from the total strain measurement of the individual insert points during the creep strain test. This process was done for both the NSC and UHPC specimen.

As mentioned in the methodology, fitting was performed by separating the recorded average creep strain readings for individual insert points. Once separated, one further filtering occurred after the insert points were isolated to eliminate outliers. Using the solver tool in excel with the viscoelastic solution presented in Equation 3, the fit parameters of E_0 , E_1 , τ , β and P_{max} were determined. Figure 16 serves as an example to show the fit curve for an individual insert point, this curve is from the UHPC 0.40f_c test specimen. To see all individual fit curves, see the Appendices.

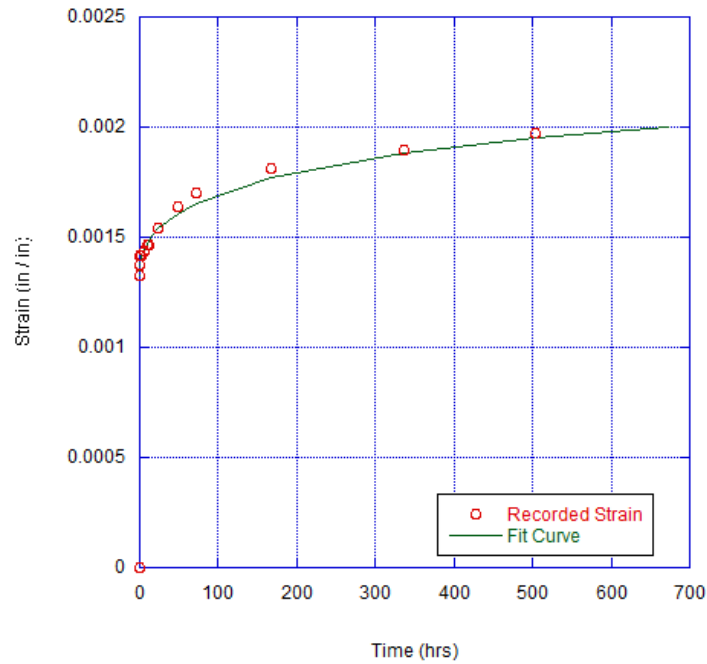


Figure 16. Individual fitting for single insert point of UHPC 0.40f'c test

After determining the fit parameters E_0 , E_I , τ , β and P_{max} for each insert point they were averaged and used to form the best fit models for each test. Comparing the calculated strain values to the averaged strain values allowed for the determination of the standard deviation and ultimately the 95% confidence intervals for each test. Figure 17 through Figure 22 show the individual best fit models for each of the six tests performed and Figure 23 shows the six curves combined on a single plot.

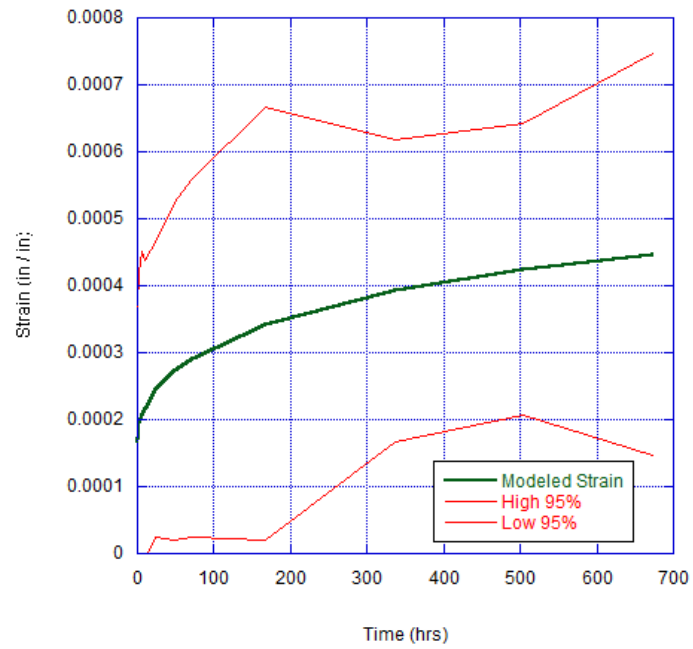


Figure 17. Modeled strain curve for 0.30f'c normal strength concrete test

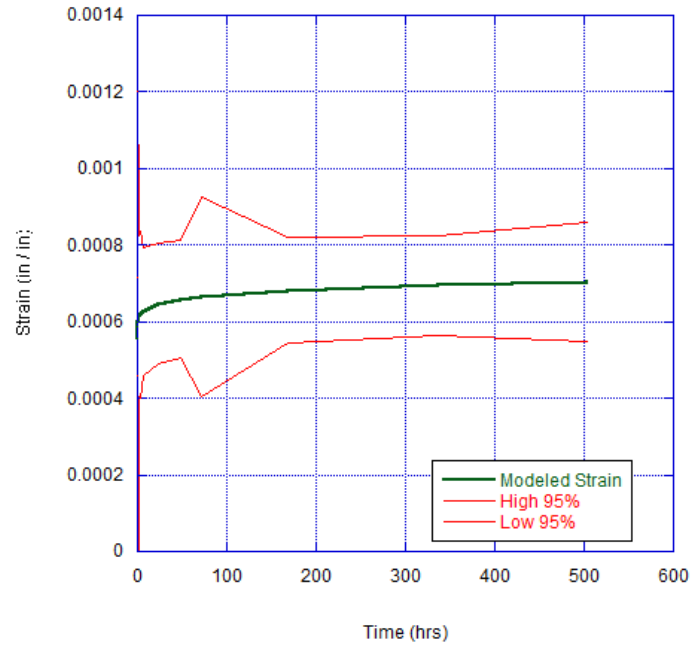


Figure 18. Modeled strain curve for 0.40f'c normal strength concrete test

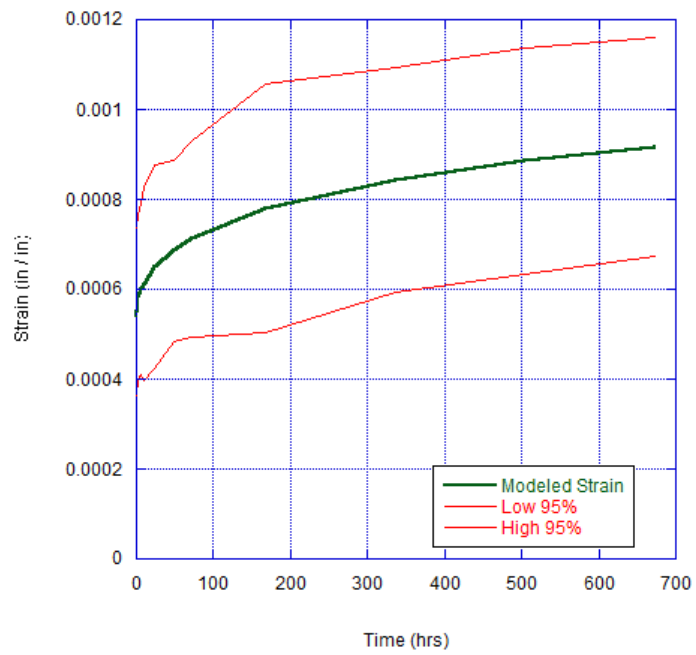


Figure 19. Modeled strain curve for 0.50f'c normal strength concrete test

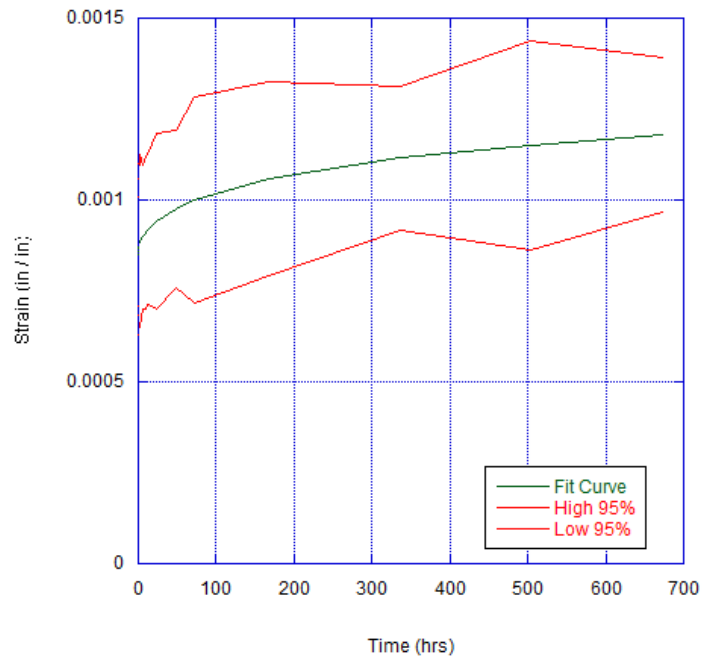


Figure 20. Modeled strain curve for 0.27f'c UHPC test

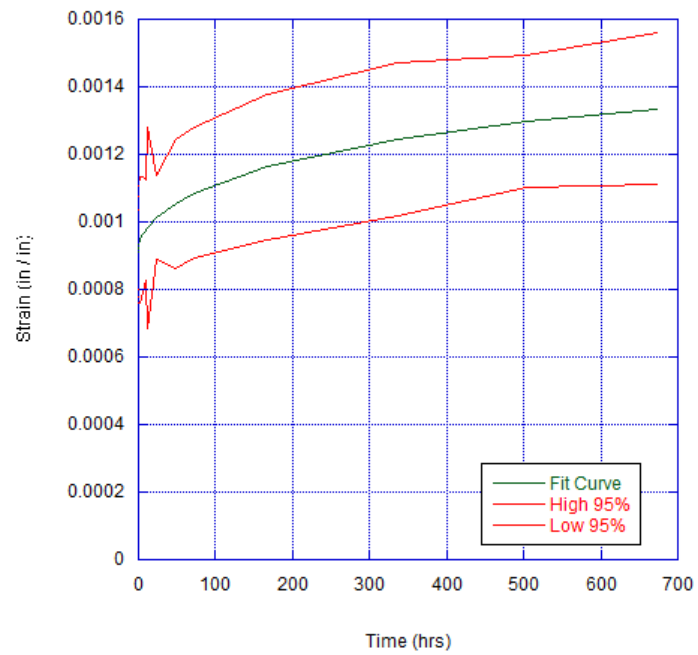


Figure 21. Modeled strain curve for $0.30f'_c$ UHPC test

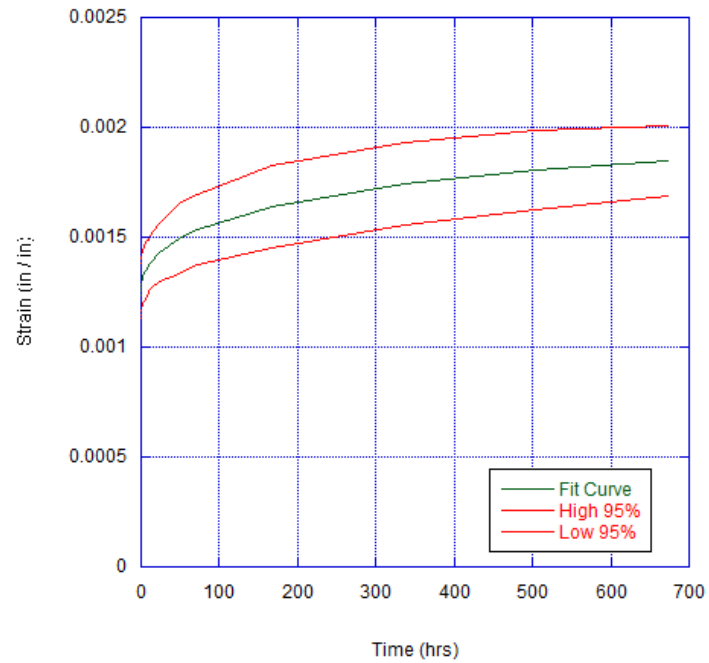


Figure 22. Modeled strain curve for $0.40f'_c$ UHPC test

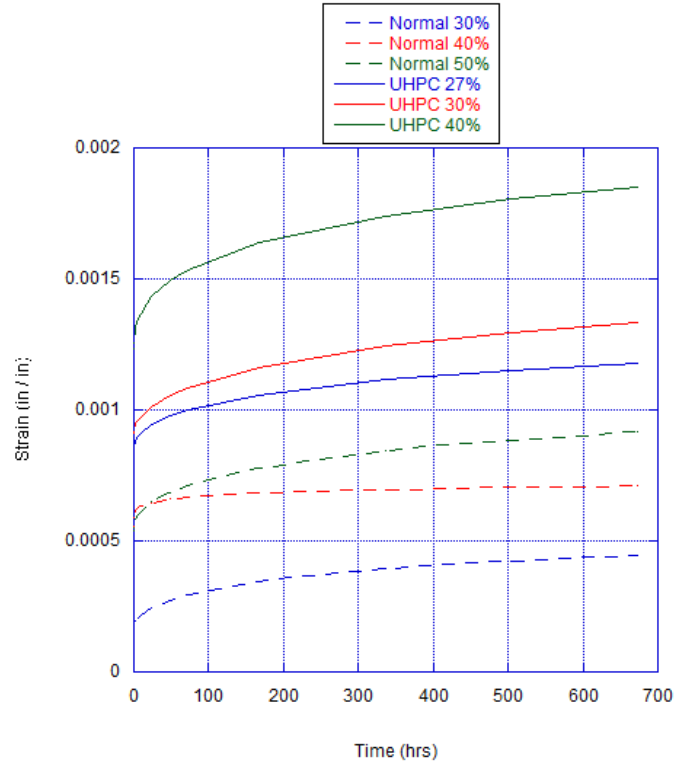


Figure 23. Combined plot of strain curves for 6 creep tests performed

The calculated 95% confidence intervals tend to grow tighter as the loads applied increased, with the UHPC 40% test showing the most accurate fitting. Figure 23 serves as a visual to see the linearity of the test specimens for each mix as the curves, excluding the Normal 40%, seem to show similar strain behavior that by the theory of linearity could be obtained simply by applying a multiplier to an individual strain measurement.

The fit parameters calculated with Equation 4 for each test are shown in Table 8. Here it is first evident the creep behavior differences between NSC and UHPC test specimens. Comparing the E_I values, it can determine that, except for the Normal 40% test, the NSC specimens will show a greater response to the viscous flow of the creep test as the fitted E_I values are significantly lower than those seen for the UHPC specimens.

Table 8. Strain vs time, Equation 3, fit parameters for individual test specimens

	E0	E1	β	τ	P
	(psi)	(psi)		(hrs)	(kips)
Normal 30%	1.08E+07	6.41E+06	4.92E-01	672	11.25
*Normal 40%	4.30E+06	1.64E+07	2.35E-01	504	15.00
Normal 50%	5.54E+06	8.02E+06	4.82E-01	672	18.75
*UHPC 27%	6.66E+06	1.73E+07	4.89E-01	672	35.44
UHPC 30%	6.90E+06	1.49E+07	5.43E-01	672	39.38
UHPC 40%	6.80E+06	1.37E+07	4.44E-01	672	52.50

Looking the elastic modulus calculated as E_0 in the table above, when compared to the modulus of elasticity calculated via ACI specification 19.2.2.1 (ACI 318-19, 2019) using Equation 11. The elastic moduli for the average 5.9 ksi and 18.3 ksi f'_c values seen in this test

$$E_c = 57,000\sqrt{f'_c(psi)} \quad (11)$$

are 4362.8 ksi and 7705.2 ksi respectively. As anticipated, this does not correctly calculate the elastic moduli found for the UHPC specimens. This error was also seen by Flietstra in his report, to correct this he used the elastic modulus equation presented in the ACI 363 provisions for high strength concrete shown in Equation 12 (Flietstra, 2011). In doing so Flietstra was able to

$$E_c = 40,000\sqrt{f'_c(psi)} + 1.0 * 10^6 \quad (12)$$

obtain an elastic modulus closer to the observed values, similarly, using this equation yields a calculated elastic modulus of 6407.2 ksi for this test, which is much closer to those seen in Table 8.

Using the fit parameters presented above the creep compliance, $J(t)$, verse time curve was plotted in Figure 24. Here it is seen that, as mentioned above, the UHPC shows a decreased response to the viscous behavior of creep as the UHPC curves are tending to an asymptotic maximum compliance much lower than those seen by the NSC. To better visualize this normalizing the compliance curves by eliminating the initial compliance, $J(0)$, allows for the plotting of the sole creep compliance as seen in Figure 25.

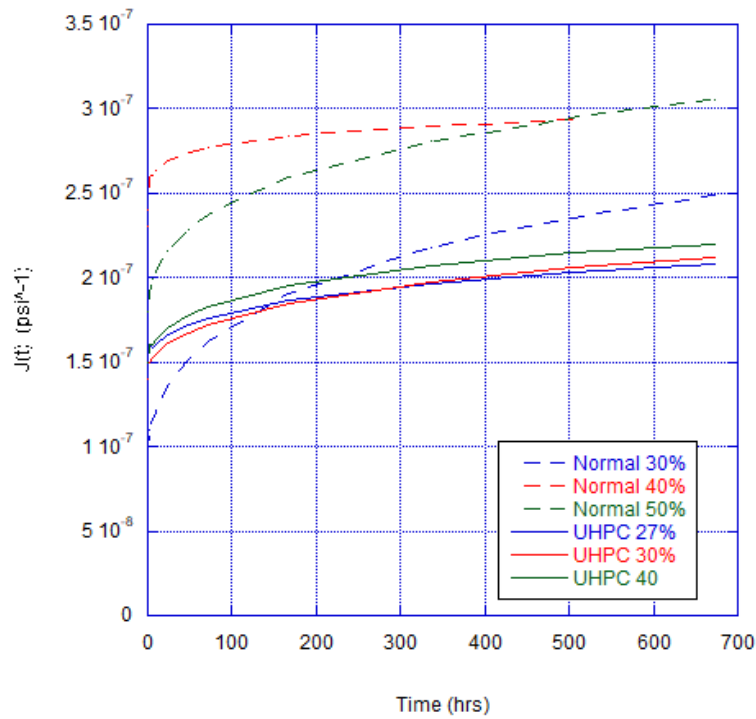


Figure 24. Creep compliance verse time curves for all six creep tests

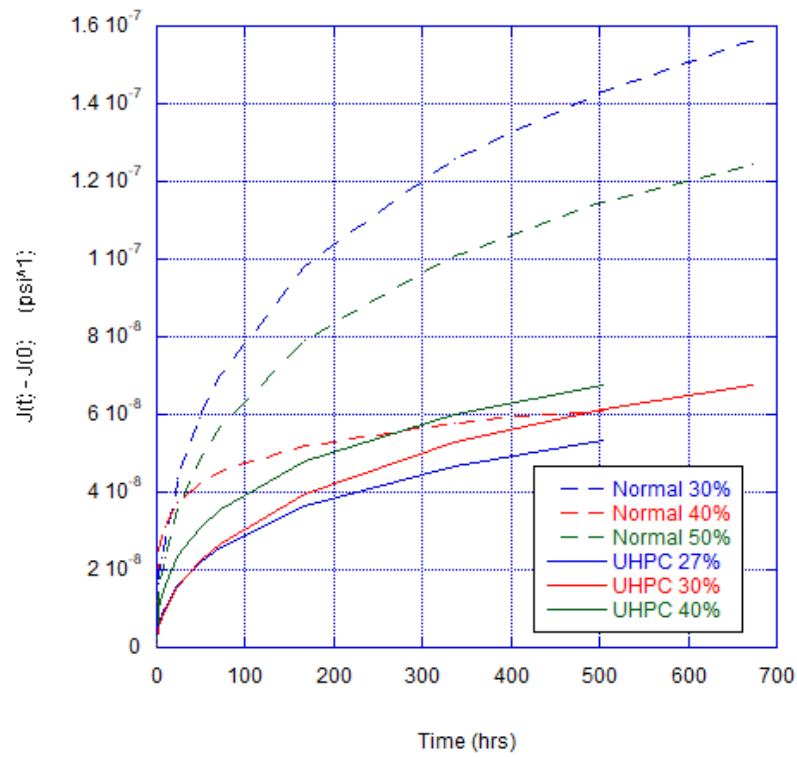


Figure 25. Normalized creep compliance curves for all six creep tests

Provided in Table 9 are the corresponding values for the initial creep compliance and the 28-day creep compliance shown in the plotted figures above.

Table 9. initial and 28-day creep compliance

	J(0)	J(t)28
	(psi ⁻¹)	(psi ⁻¹)
Normal 30%	9.24E-08	2.48E-07
*Normal 40%	2.32E-07	2.96E-07
Normal 50%	1.81E-07	3.05E-07
*UHPC 27%	1.50E-07	2.08E-07
UHPC 30%	1.45E-07	2.12E-07
UHPC 40%	1.48E-07	2.21E-07

Note that the two “asterisk” test show in Tables 8 and 9, the Normal 40% and UHPC 27%, are shown but should be considered defective as their testing procedure differed from the others. The test specimen for the Normal 40% test was allowed to dry before loading. While not intentional, the drying of the specimen before loading meant that shrinkage would not be as great of an influence on this test as it would for other. As expected with this specimen a larger stiffness value, E_I , was seen and lower creep compliance was recorded. The test specimen for the UHPC 27% test was damaged upon loading, as a crack formed from the bottom of the specimen and propagated up. Original a desired stress level of $0.50f'_c$ was set, but with the formation of the crack the test was to drop to a stress of $0.27f'_c$ where no further cracking was observed, and the load was held steady. Continuing to test this specimen highlighted the durability of UHPC mixtures as even when cracked the test specimen showed similar stiffness and creep compliance values as those recorded in the uncracked UHPC 30% and 50% tests.



Figure 26. Cracked test specimen used for UHPC 27% test

The table below shows the ultimate 28-day strain calculated using the best fit model parameters determined for each individual test, along with the initial elastic strain and the 28-day creep strain. As done in the studies presented before, these values were used to then calculate the creep coefficient for each test.

Table 10. Calculated strains and creep coefficient

	28-day ultimate strain ($\mu\epsilon$)	Initial elastic strain ($\mu\epsilon$)	28-day creep strain ($\mu\epsilon$)	Calculated creep coefficient
Normal 30%	447.26	166.27	281.0	1.69
Normal 40%	709.69	557.63	152.1	0.27
Normal 50%	915.38	541.53	373.9	0.69
UHPC 27%	1178.35	850.83	327.5	0.38
UHPC 30%	1335.22	913.16	422.1	0.46
UHPC 40%	1849.14	1235.80	613.3	0.50

By comparing the creep coefficients found from untreated specimens in Graybeal's data (creep coefficient of 0.78 at 0.67f'c), the ambient cured specimens from Flietstra's (creep coefficient of 0.83 at 0.60f'c and 0.54 at 0.20f'c), and the data from Haber's study (creep coefficients of 0.78-2.47 for 0.65f'c and 0.70-1.17 for 0.40f'c) it is evident that a similar creep behavior is being recorded between all specimens. The higher creep coefficients seen in Graybeal's and Haber's data can be attributed to the increased duration of testing as their specimens were loaded for up to a year under pressure. This would show greater ultimate creep strains and lead to higher creep coefficients. Flietstra's data was recorded for a duration of 24 to 28 days which is similar to the duration of loading in this study, here the coefficients reported by Flietstra, while still slightly higher, were closer to the coefficients calculated in this report.

Comparing the strains, with the applied stresses of 5.67 ksi, 6.3 ksi and 8.4 ksi the initial strains and creep strains recorded in this study tend to be lower than values recorded by Graybeal

and Haber and relate more to the values recorded by Fleitstra. However, this is to be expected as the stress loading recorded during the Graybeal and Haber studies was greater than the applied stress in this study. Haber's study shows that with an applied stress of 9.15 ksi for 0.40f^c the mixtures showed initial elastic strains ranging from 1432 to 2076 $\mu\epsilon$ which when compared to the 0.40f^c test in this study with applied stress of 8.4 ksi, the initial strains are relatively similar but the creep strains seen in Haber's study were significantly higher. In the same manner as the creep coefficients, the long-term creep strains reported by Graybeal and Haber are expected to be larger than this study's recorded data as the load durations were much longer.

Recovery Strain Data

After the 28-day creep tests were concluded the specimens were unloaded and measurements were taken to record the recovery behavior of two materials. The recorded data was then processed using the same procedure as the shrinkage and creep strain measurement and the fitting was performed in a similar manner as well. One key difference between the fitting procedures used for the creep strain and the recovery strain is the fitting of the E_0 value. While it is assumed that the recovery curve is a function of the initial elastic strain and a viscous behavior like the creep strain, during the fitting process for the recovery curve it was seen that for multiple measurement points the initial recovery was less than the strain seen from the initial loading. Because of this the E_0 values were manually adjusted to help in modeling as opposed to being a factor of the initial applied stress divided by the recorded strain.

Recovery data has been collected for each of the NSC test specimens and for one UHPC specimen. In a similar manner to the creep strain the model fit parameters are shown in Table 11 below. As mentioned in Chapter Two, to model the behavior of the recovery curve the applied

Table 11. Fit parameters for recovery curves

	E0 (psi)	E1 (psi)	β	τ (hrs)	P (kips)
Normal 30%	1.08E+07	8.77E+06	1.88E-1	1680	-11.25
Normal 40%	4.46E+06	2.89E+07	2.50E-1	672	-15.00
Normal 50%	6.05E+06	3.56E+07	3.88E-1	1680	-18.75
UHPC 30%	6.96E+06	4.72E+07	2.39E-1	672	-39.38

stress was negative as opposed to the positive value used in the creep model. Comparing the E_0 values to those calculated in the creep strain modeling, the values found in Table 11 tend to be higher than those found in Table 8. Again, this is due to the adjustments required to better fit the measured data. Presented in Table 12 is a direct comparison of the initial elastic strains taken from the creep model compared to the calculated initial recovery strains seen from the recovery model.

Table 12. Comparison of initial strains

	Initial elastic strain ($\mu\epsilon$)	Initial recovery strain ($\mu\epsilon$)
Normal 30%	172.1	215.1
Normal 40%	586.9	551.8
Normal 50%	549.9	498.6
UHPC 30%	918.7	929.1

Another major difference between the two is the fit values for β . As the recovery curve has a much sharper shape the β values found will tend to be much smaller. One noticeable problem with fitting using Equation 11 was that the model would tend to inaccurately represent the strain measurements recorded from the time initially after unloading to roughly a week later.

The creep strain curves, and their respective creep recovery curves can be seen in Figure 27 through Figure 30 and the combined four tests on Figure 31. Note that strain seen at the end of the creep strain curves do not necessarily match those seen as the beginning of the recovery strain curves. This is due to the fact that the last strain value plotted for the creep curve is a calculated value based upon the determined fit parameters, whereas the strain seen as the beginning of the recovery curve is an average of the measured strain at the time of 28 days. The differences seen range from 13 to 70 $\mu\epsilon$.

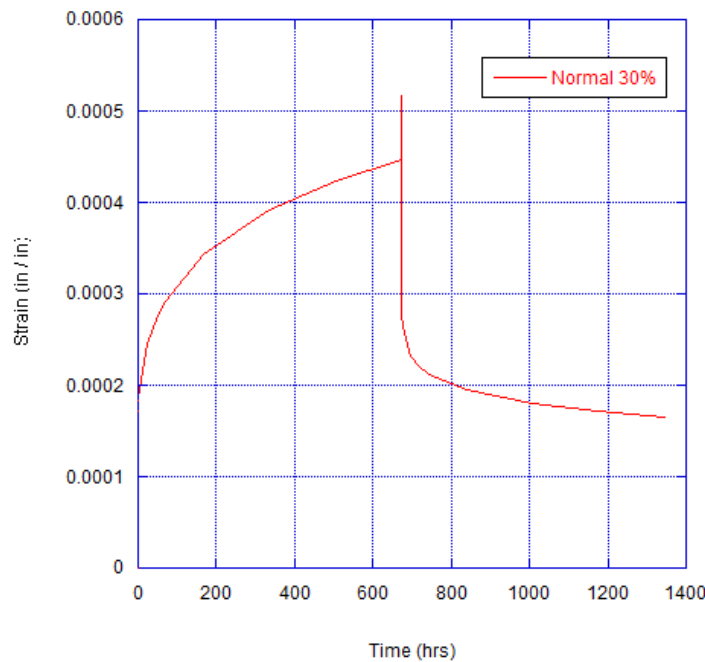


Figure 27. Modeled creep and recovery curve for normal strength concrete 0.30f'c test

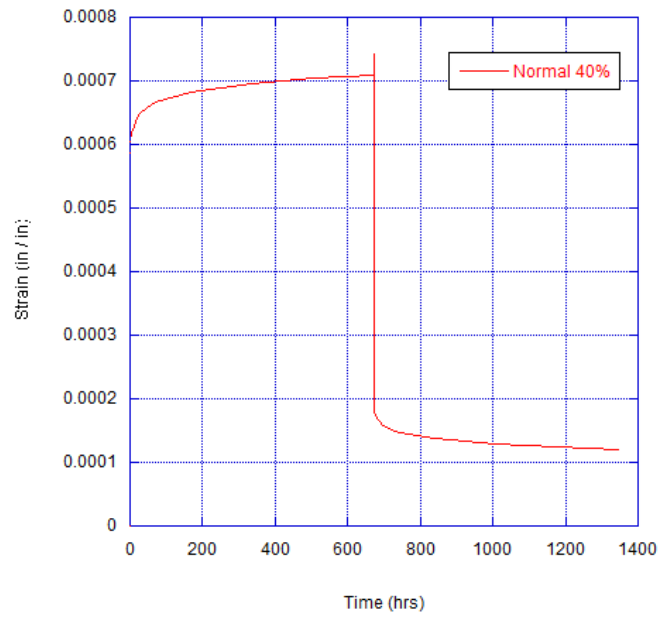


Figure 28. Modeled creep and recovery curve for normal strength concrete $0.40f'_c$ test

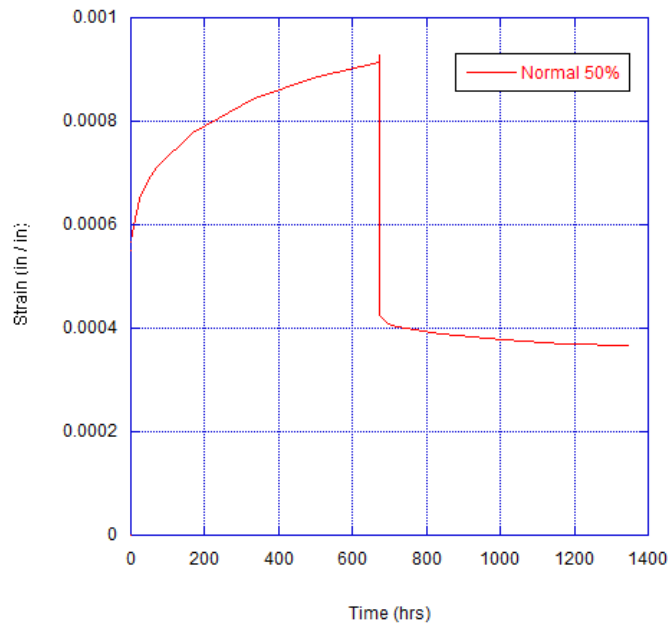


Figure 29. Modeled creep and recovery curve for normal strength concrete $0.50f'_c$ test

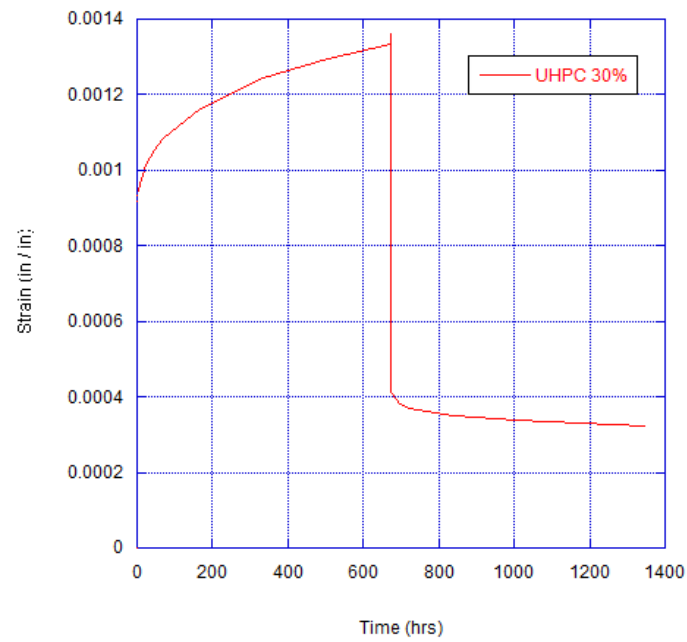


Figure 30. Modeled creep and recovery curve for UHPC 0.30f'c test

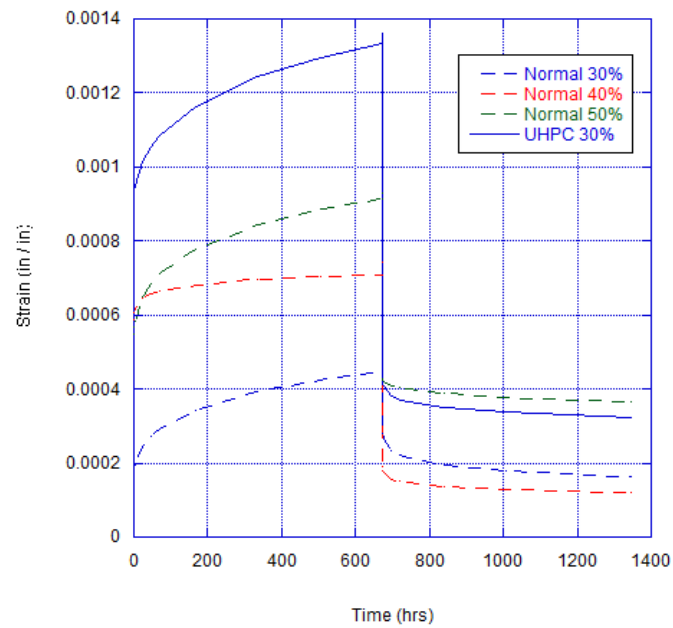


Figure 31. Combined plot of modeled creep and recovery curves

The recovery strain measurements recorded over the 28-day period begin to show the full recovery behavior seen as the strain measurements began to equalize close around the 14-day mark. From the modeled curves the strain measurements calculated at 28 days show a permanent strain seen in each specimen of 165 $\mu\epsilon$, 121 $\mu\epsilon$, 366 $\mu\epsilon$ and 324 $\mu\epsilon$ for the respective normal strength 30, 40, 50% tests and the UHPC 30% test. As would be expected the permanent strains seen in the tests subjected to higher loads would be greater. As the models used to fit the recovery data are exponential, they will continue to show a slight decrease in strain as time increase. This behavior may not fully represent what happens in concrete recovery as at some point in time recovery would be expected to halt.

Chapter Seven – Conclusion and Future Work

While the UHPC mixture used in this test was modified to not include the usage of steel fibers, the data in this research confirmed the results presented in previous projects by Graybeal, Flitstra and Haber et.al. with the comparison of creep and shrinkage strains as well as calculated creep coefficients and for UHPC mixtures. It also provided new data in the form of a calculated creep compliance for the UHPC mixtures which shows the long-term creep behavior can be accurately modeling using elastic-viscoelastic solutions.

The recorded data confirms that when compared to normal strength concrete, the UHPC mixtures are less susceptible to creep effects. The data presented in this experiment will help to create a full understanding of the creep and shrinkage behavior in ultra-high-performance concrete mixtures as the values shown in this paper will add to results of past, current, and future research projects, and aid in the development of future code provisions for UHPC structural members.

The inclusion of recovery curve data will also be beneficial to developments in new and existing code provisions. It was also seen that using a viscoelastic solution similar to those seen in creep curves can be promising to accurately model long-term recovery behavior, however adjustments may be required to more accurately represent the short-term recovery, as well as, the implementation of a limit state to represent the maximum possible recovery.

The tests performed in this study provided viable reasoning for the usage of a creep test specimen with multiple embedded measurement points for low stress level loading. If high stress levels may be required, this method is not suggested, for the embedded inserts provided a stress concentration for cracking to start. To avoid cracking, suggest applying measurement

points post curing to the external faces of the specimen. This test also shows the adequacy of using a large 36" column specimen for creep testing as minimal to no bending was seen. Also proven in this study is the viable use of a screw driven mechanical jack creep apparatus, as the frame was able to apply consistent loading without losses. This was beneficial in this study as a power outage was seen during test and due to the lack of electronic components the load remained constant, and the test was not disrupted.

One study not mentioned in the literature review due to a lack of conclusive data, is a test performed by Yi Xu, Jiaping Liu, Jianzhong Liu, Ping Zhang, Qianqian Zhang and Linhua Jiang, where they investigated the effects of steel fibers on creep behavior (Xu et al., 2018). Their test was conducted using specimens of 0, 1, and 2 percent steel fibers by volume with a 0.16 water-binder-ratio loaded to 0.40f_c for a period of 180 day. They found that the creep coefficients were ~0.40 for 2% fibers, ~0.55 for 1% fibers, and ~0.65 for 0% fibers. When compared with the data from the 0.40f_c test in this experiment, even though there are no fibers used, the creep coefficients relate more to those seen in test with steel fibers.

While overall the creep data obtained in this study comparatively matches the data presented by Graybeal, Flietstra, Haber et al., and Xu et al. For future work, extending this test to include a mixture with steel fibers using the same set up and molds presented in this paper will help aid in the determination of the relationship between the steel fibers and their effect on creep behavior.

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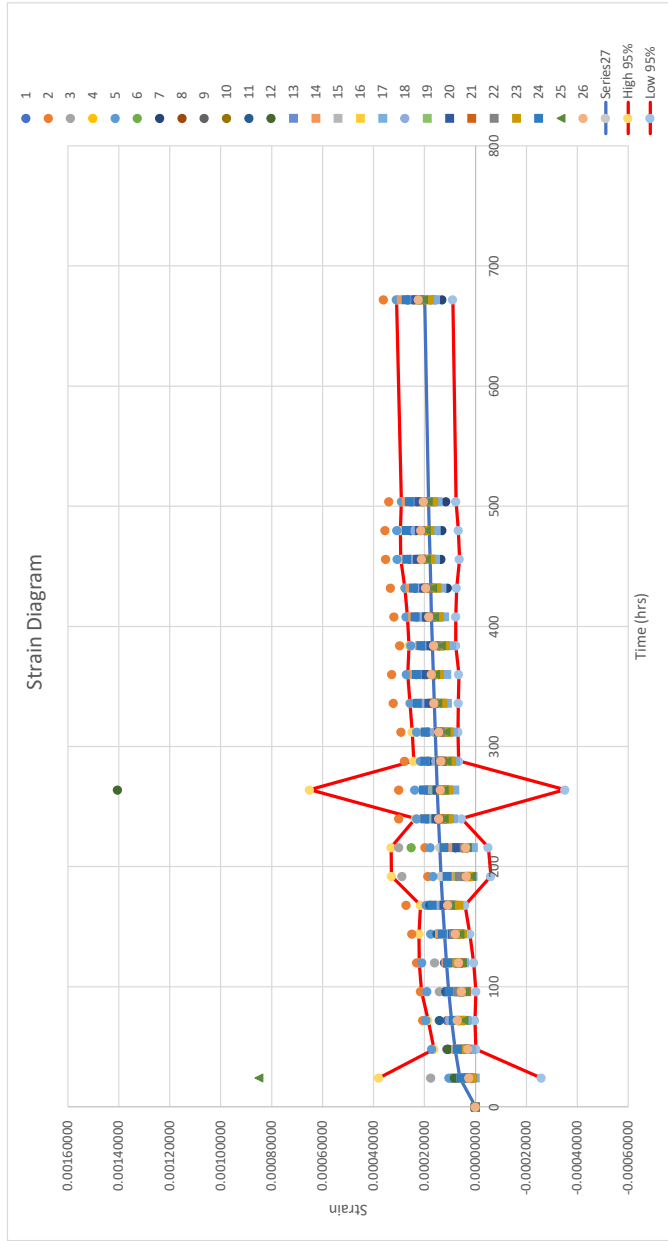
APPENDIX A – Shrinkage Models

Test Sample: Normal Strength - DRY
Load Applied: 0%

Date	2/21/2022				2/22/2022				2/23/2022				2/24/2022				2/25/2022				2/26/2022				2/27/2022				2/28/2022				3/1/2022				3/2/2022				3/3/2022				3/4/2022				3/5/2022				3/6/2022				3/7/2022				3/8/2022				3/9/2022				3/10/2022				3/11/2022				3/12/2022				3/13/2022				3/14/2022				3/15/2022				3/16/2022				3/17/2022				3/18/2022				3/19/2022				3/20/2022				3/21/2022				3/22/2022				3/23/2022				3/24/2022				3/25/2022				3/26/2022				3/27/2022				3/28/2022				3/29/2022				3/30/2022				3/31/2022				4/1/2022				4/2/2022				4/3/2022				4/4/2022				4/5/2022				4/6/2022				4/7/2022				4/8/2022				4/9/2022				4/10/2022				4/11/2022				4/12/2022				4/13/2022				4/14/2022				4/15/2022				4/16/2022				4/17/2022				4/18/2022				4/19/2022				4/20/2022				4/21/2022				4/22/2022				4/23/2022				4/24/2022				4/25/2022				4/26/2022				4/27/2022				4/28/2022				4/29/2022				4/30/2022				5/1/2022				5/2/2022				5/3/2022				5/4/2022				5/5/2022				5/6/2022				5/7/2022				5/8/2022				5/9/2022				5/10/2022				5/11/2022				5/12/2022				5/13/2022				5/14/2022				5/15/2022				5/16/2022				5/17/2022				5/18/2022				5/19/2022				5/20/2022				5/21/2022				5/22/2022				5/23/2022				5/24/2022				5/25/2022				5/26/2022				5/27/2022				5/28/2022				5/29/2022				5/30/2022				5/31/2022				6/1/2022				6/2/2022				6/3/2022				6/4/2022				6/5/2022				6/6/2022				6/7/2022				6/8/2022				6/9/2022				6/10/2022				6/11/2022				6/12/2022				6/13/2022				6/14/2022				6/15/2022				6/16/2022				6/17/2022				6/18/2022				6/19/2022				6/20/2022				6/21/2022				6/22/2022				6/23/2022				6/24/2022				6/25/2022				6/26/2022				6/27/2022				6/28/2022				6/29/2022				6/30/2022				7/1/2022				7/2/2022				7/3/2022				7/4/2022				7/5/2022				7/6/2022				7/7/2022				7/8/2022				7/9/2022				7/10/2022				7/11/2022				7/12/2022				7/13/2022				7/14/2022				7/15/2022				7/16/2022				7/17/2022				7/18/2022				7/19/2022				7/20/2022				7/21/2022				7/22/2022				7/23/2022				7/24/2022				7/25/2022				7/26/2022				7/27/2022				7/28/2022				7/29/2022				7/30/2022				7/31/2022				8/1/2022				8/2/2022				8/3/2022				8/4/2022				8/5/2022				8/6/2022				8/7/2022				8/8/2022				8/9/2022				8/10/2022				8/11/2022				8/12/2022				8/13/2022				8/14/2022				8/15/2022				8/16/2022				8/17/2022				8/18/2022				8/19/2022				8/20/2022				8/21/2022				8/22/2022				8/23/2022				8/24/2022				8/25/2022				8/26/2022				8/27/2022				8/28/2022				8/29/2022				8/30/2022				8/31/2022				9/1/2022				9/2/2022				9/3/2022				9/4/2022				9/5/2022				9/6/2022				9/7/2022				9/8/2022				9/9/2022				9/10/2022				9/11/2022				9/12/2022				9/13/2022				9/14/2022				9/15/2022				9/16/2022				9/17/2022				9/18/2022				9/19/2022				9/20/2022				9/21/2022				9/22/2022				9/23/2022				9/24/2022				9/25/2022				9/26/2022				9/27/2022				9/28/2022				9/29/2022				9/30/2022				10/1/2022				10/2/2022				10/3/2022				10/4/2022				10/5/2022				10/6/2022				10/7/2022				10/8/2022				10/9/2022				10/10/2022				10/11/2022				10/12/2022				10/13/2022				10/14/2022				10/15/2022				10/16/2022				10/17/2022				10/18/2022				10/19/2022				10/20/2022				10/21/2022				10/22/2022				10/23/2022				10/24/2022				10/25/2022				10/26/2022				10/27/2022				10/28/2022				10/29/2022				10/30/2022				10/31/2022				11/1/2022				11/2/2022				11/3/2022				11/4/2022				11/5/2022				11/6/2022				11/7/2022				11/8/2022				11/9/2022				11/10/2022				11/11/2022				11/12/2022				11/13/2022				11/14/2022				11/15/2022				11/16/2022				11/17/2022				11/18/2022				11/19/2022				11/20/2022				11/21/2022				11/22/2022				11/23/2022				11/24/2022				11/25/2022				11/26/2022				11/27/2022				11/28/2022				11/29/2022				11/30/2022				12/1/2022				12/2/2022				12/3/2022				12/4/2022				12/5/2022				12/6/2022				12/7/2022				12/8/2022				12/9/2022				12/10/2022				12/11/2022				12/12/2022				12/13/2022				12/14/2022				12/15/2022				12/16/2022				12/17/2022				12/18/2022				12/19/2022				12/20/2022				12/21/2022				12/22/2022				12/23/2022				12/24/2022				12/25/2022				12/26/2022				12/27/2022				12/28/2022				12/29/2022				12/30/2022				12/31/2022			
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time (hr)	strain μ
0	0
24	6.06415E-05
48	8.03028E-05
72	9.40332E-05
96	0.000104828
120	0.000113811
144	0.000121546
168	0.000128359
192	0.00013446
216	0.000139992
240	0.000145058
264	0.000149733
288	0.000154075
312	0.000158131
336	0.000161938
360	0.000165524
384	0.000168915
408	0.000172132
432	0.000175191
456	0.000178108
480	0.000180895
504	0.000183564
672	0.000199619

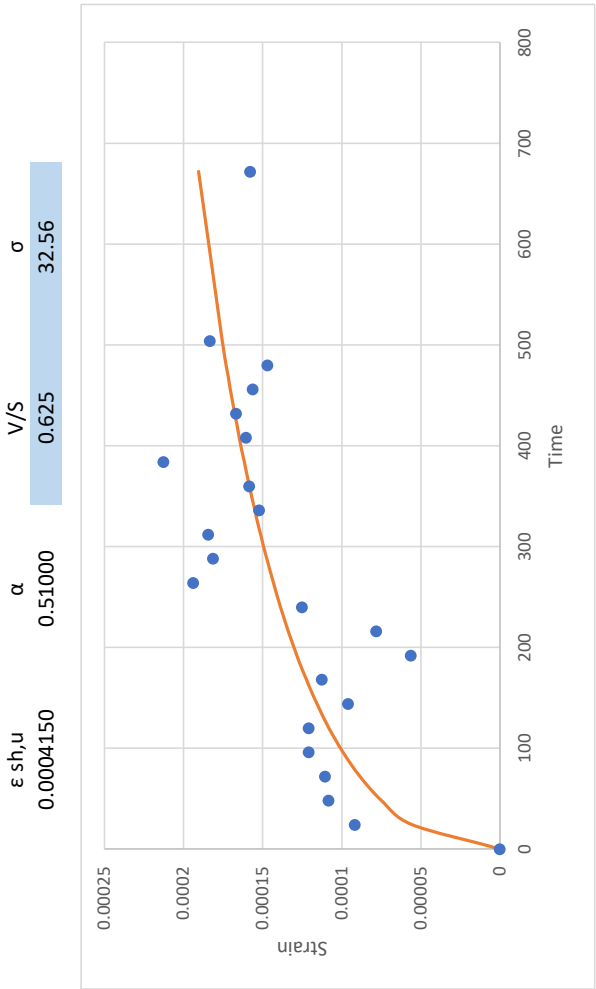
$\epsilon_{sh,u}$ 0.0005030 α 0.4707407 V/S 0.625 σ 32.56



Data Set # 1

time (hr)	strain μ	
0	0	0.00000000
24	9.17108E-05	0.00005579
48	0.000108382	0.00007516
72	0.000110462	0.00008874
96	0.000120883	0.00009940
120	0.000120882	0.00010826
144	9.58642E-05	0.00011586
168	0.000112535	0.00012254
192	5.62643E-05	0.00012850
216	7.81444E-05	0.00013389
240	0.000125033	0.00013881
264	0.000193801	0.00014334
288	0.000181297	0.00014753
312	0.000184422	0.00015143
336	0.000152123	0.00015509
360	0.000158378	0.00015852
384	0.000212556	0.00016176
408	0.000160461	0.00016482
432	0.000166712	0.00016772
456	0.000156294	0.00017049
480	0.000146917	0.00017312
504	0.000183386	0.00017563
672	0.00015786	0.00019064

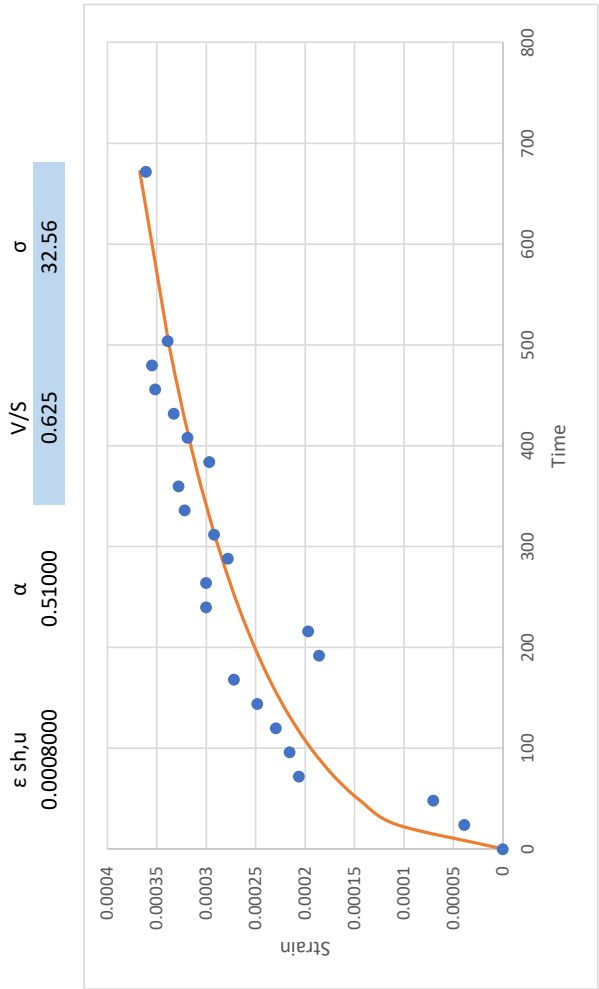
sum R^2 = 2.19E-08



Data Set # 2

time (hr)	strain μ	
0	0	0.00000000
24	3.90687E-05	0.00010755
48	7.03195E-05	0.00014490
72	0.000206213	0.00017106
96	0.000215586	0.00019162
120	0.000229647	0.00020869
144	0.0002484	0.00022335
168	0.000271842	0.00023622
192	0.000185903	0.00024772
216	0.000196842	0.00025811
240	0.000299974	0.00026759
264	0.000299974	0.00027631
288	0.000278102	0.00028439
312	0.000292162	0.00029192
336	0.000321853	0.00029896
360	0.000328103	0.00030558
384	0.00029685	0.00031182
408	0.000318728	0.00031772
432	0.00033279	0.00032332
456	0.000351542	0.00032865
480	0.000354668	0.00033372
504	0.00033904	0.00033857
672	0.000360915	0.00036750

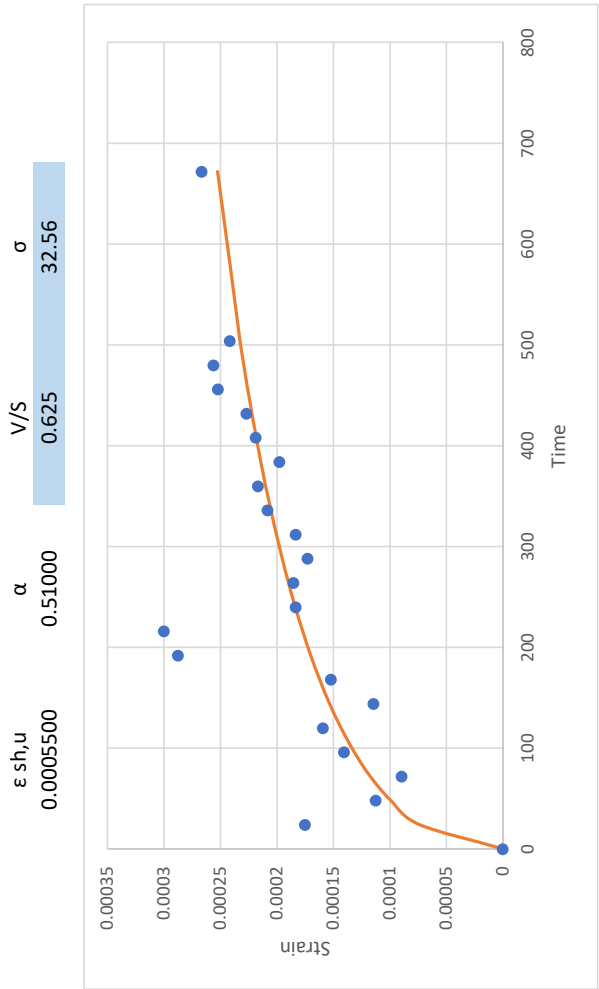
sum R^2 = 2.60E-08



Data Set # 3

time (hr)	strain μ	
0	0	0.00000000
24	0.00017499	0.00007394
48	0.000112492	0.00009962
72	8.95768E-05	0.00011761
96	0.000140616	0.00013174
120	0.000159364	0.00014348
144	0.000114574	0.00015355
168	0.000152069	0.00016240
192	0.000287484	0.00017031
216	0.000299983	0.00017745
240	0.000183316	0.00018397
264	0.000185399	0.00018996
288	0.000172901	0.00019552
312	0.000183316	0.00020069
336	0.000208313	0.00020554
360	0.000216645	0.00021008
384	0.000197897	0.00021437
408	0.000218728	0.00021843
432	0.00022706	0.00022228
456	0.000252057	0.00022594
480	0.000256223	0.00022943
504	0.000241642	0.00023277
672	0.000266638	0.00025266

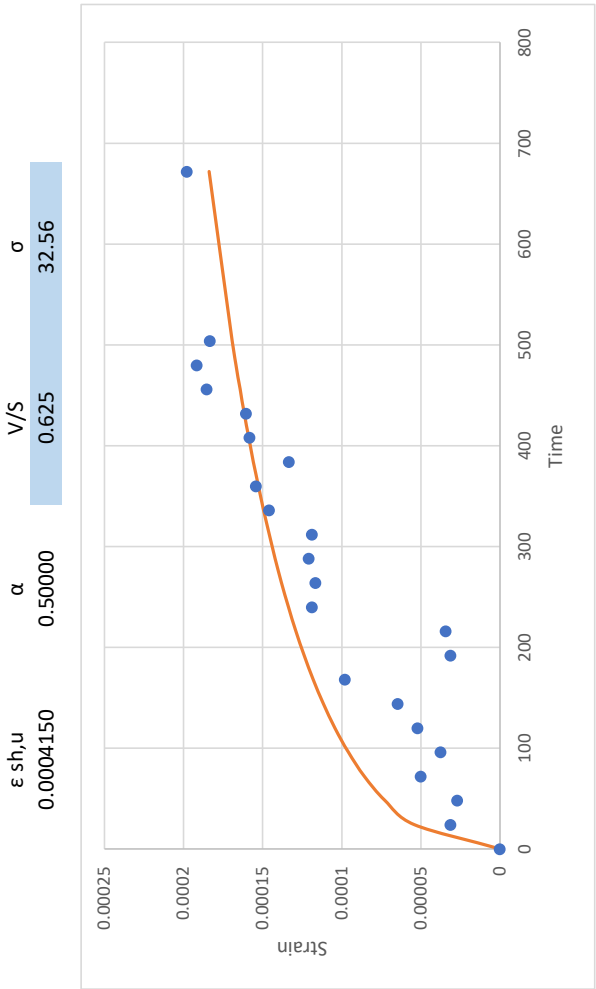
sum R^2 = 4.47E-08



Data Set # 4

time (hr)	strain μ	
0	0	0.00000000
24	3.12471E-05	0.00005427
48	2.70801E-05	0.00007281
72	4.9994E-05	0.00008579
96	3.74957E-05	0.00009599
120	5.20774E-05	0.00010447
144	6.45756E-05	0.00011176
168	9.79045E-05	0.00011816
192	3.12461E-05	0.00012389
216	3.4371E-05	0.00012906
240	0.000118735	0.00013379
264	0.000116652	0.00013815
288	0.000120817	0.00014219
312	0.000118735	0.00014595
336	0.000145814	0.00014948
360	0.000154146	0.00015279
384	0.000133316	0.00015592
408	0.000158313	0.00015888
432	0.000160396	0.00016169
456	0.000185392	0.00016437
480	0.000191642	0.00016692
504	0.00018331	0.00016936
672	0.000197891	0.00018395

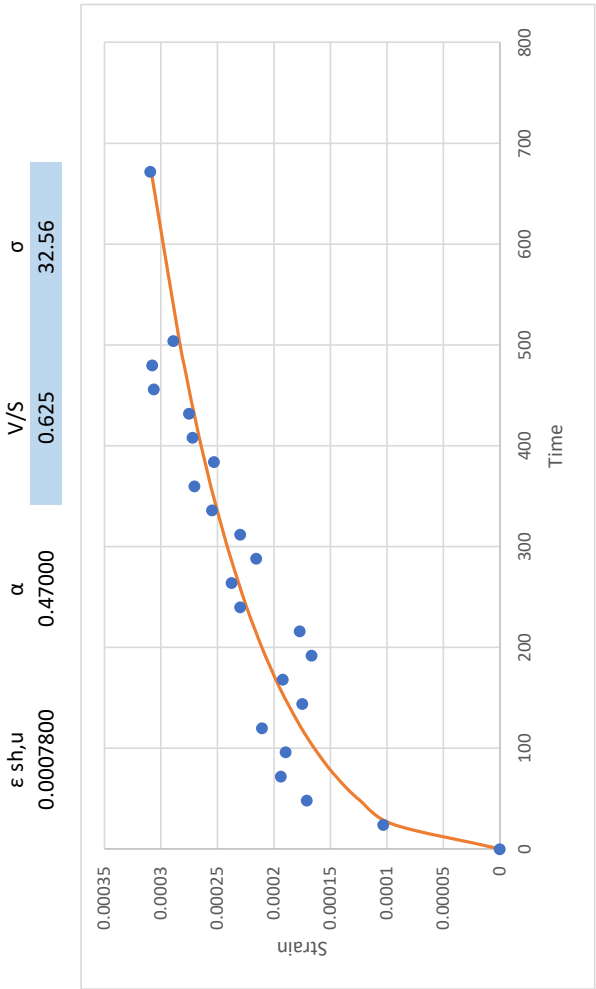
sum R^2 = 3.41E-08



Data Set # 5

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	0.000103109	0.00009385				
48	0.000170804	0.00012423				
72	0.000193716	0.00014545				
96	0.00018955	0.00016213				
120	0.000210379	0.00017602				
144	0.000174969	0.00018797				
168	0.000192153	0.00019850				
192	0.000166639	0.00020793				
216	0.000177055	0.00021648				
240	0.000229646	0.00022431				
264	0.000237458	0.00023153				
288	0.000215587	0.00023825				
312	0.000229646	0.00024452				
336	0.000254641	0.00025040				
360	0.000270264	0.00025595				
384	0.000253079	0.00026119				
408	0.000271826	0.00026616				
432	0.00027495	0.00027089				
456	0.000306193	0.00027540				
480	0.000307756	0.00027971				
504	0.000289009	0.00028384				
672	0.000309318	0.00030867				

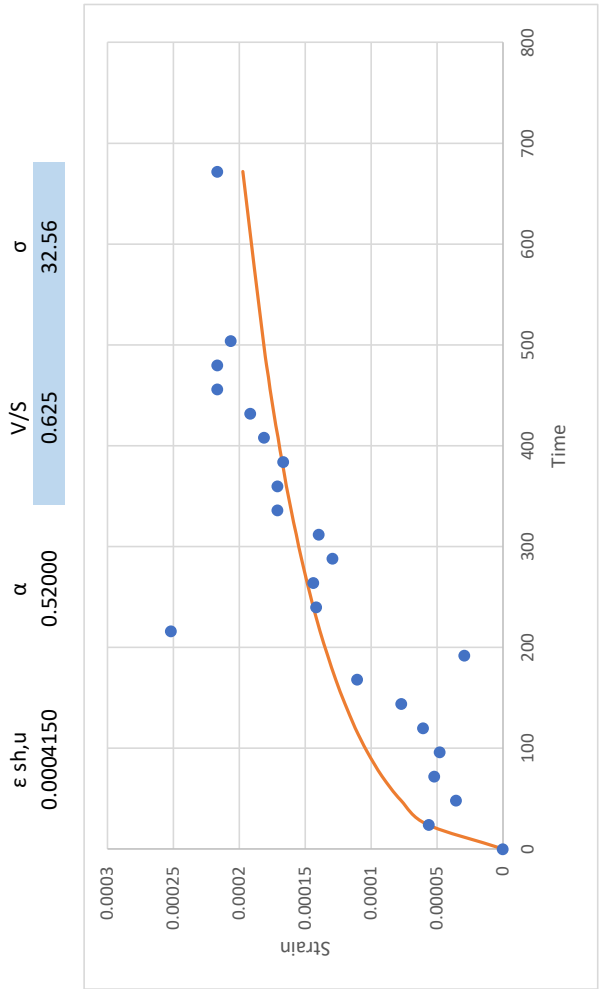
sum R^2 = 1.29E-08



Data Set # 6

time (hr)	strain μ	
0	0	0.00000000
24	5.62743E-05	0.00005734
48	3.5429E-05	0.00007758
72	5.21014E-05	0.00009176
96	4.79322E-05	0.00010289
120	6.0433E-05	0.00011213
144	7.71039E-05	0.00012006
168	0.00011044	0.00012701
192	2.91771E-05	0.00013321
216	0.000251665	0.00013881
240	0.000141691	0.00014392
264	0.000143775	0.00014861
288	0.00012919	0.00015296
312	0.000139608	0.00015700
336	0.000170861	0.00016078
360	0.000170861	0.00016432
384	0.000166696	0.00016767
408	0.00018128	0.00017083
432	0.000191698	0.00017382
456	0.000216699	0.00017667
480	0.0002167	0.00017938
504	0.000206283	0.00018197
672	0.0002167	0.00019737

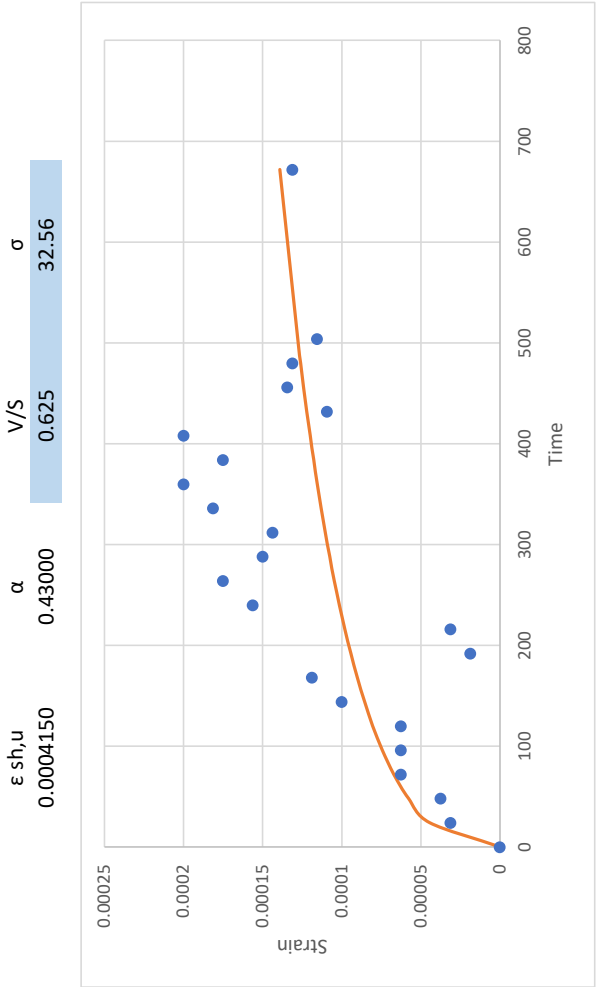
sum R^2 = 4.02E-08



Data Set # 7

time (hr)	strain μ	
0	0	0.00000000
24	3.12443E-05	0.00004461
48	3.74932E-05	0.00005794
72	6.24887E-05	0.00006719
96	6.24887E-05	0.00007445
120	6.24887E-05	0.00008049
144	9.99819E-05	0.00008570
168	0.000118728	0.00009030
192	1.87466E-05	0.00009442
216	3.12443E-05	0.00009817
240	0.000156222	0.00010160
264	0.000174968	0.00010478
288	0.000149973	0.00010774
312	0.000143724	0.00011050
336	0.000181217	0.00011311
360	0.000199964	0.00011556
384	0.000174968	0.00011789
408	0.000199964	0.00012011
432	0.000109355	0.00012221
456	0.000134352	0.00012423
480	0.000131227	0.00012616
504	0.000115604	0.00012801
672	0.000131227	0.00013921

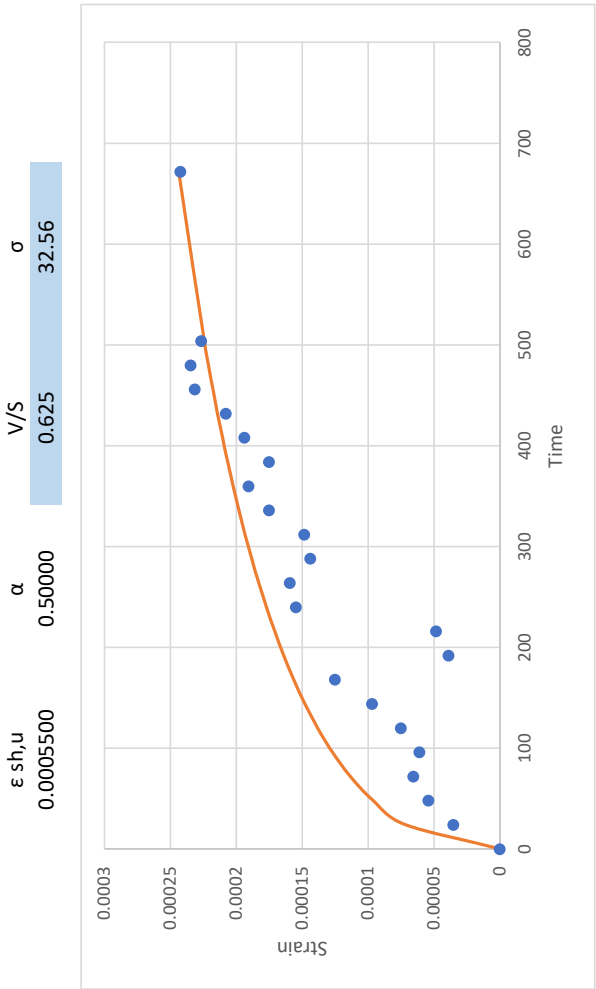
sum R^2 = 4.50E-08



Data Set # 8

time (hr)	strain μ	
0	0	0.00000000
24	3.5424E-05	0.00007193
48	5.4171E-05	0.00009650
72	6.56347E-05	0.00011370
96	6.09485E-05	0.00012722
120	7.50162E-05	0.00013846
144	9.69007E-05	0.00014811
168	0.000125036	0.00015660
192	3.90677E-05	0.00016419
216	4.84468E-05	0.00017105
240	0.00015474	0.00017732
264	0.000159428	0.00018309
288	0.000143793	0.00018844
312	0.000148484	0.00019343
336	0.000175057	0.00019810
360	0.000190687	0.00020250
384	0.000175056	0.00020664
408	0.000193813	0.00021057
432	0.000207881	0.00021429
456	0.000231325	0.00021784
480	0.000234456	0.00022122
504	0.00022664	0.00022446
672	0.000242268	0.00024379

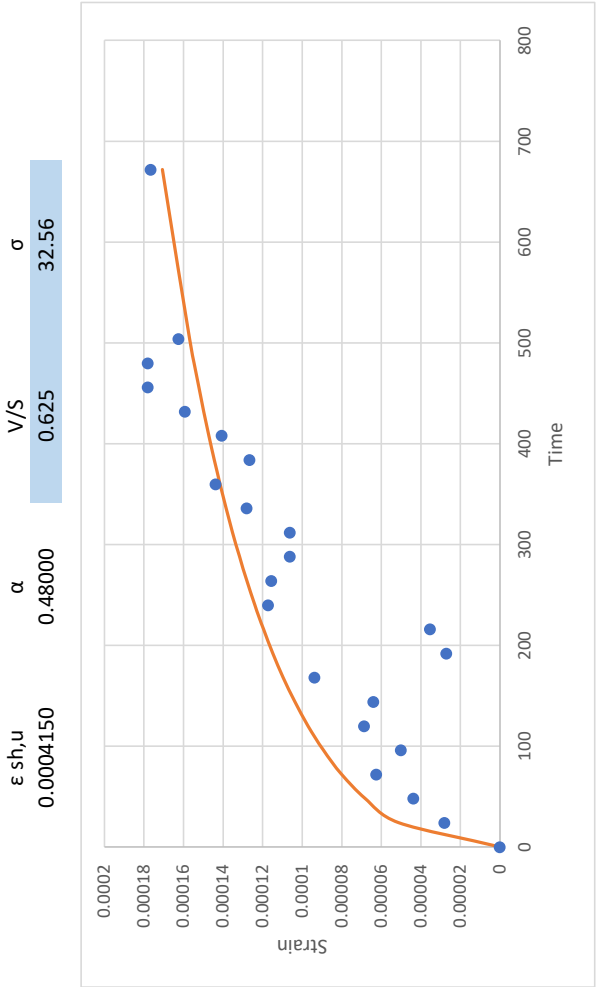
sum R^2 = 5.56E-08



Data Set # 9

time (hr)	strain μ	
0	0	0.00000000
24	2.81191E-05	0.00005135
48	4.37436E-05	0.00006828
72	6.249E-05	0.00008012
96	4.99937E-05	0.00008942
120	6.87394E-05	0.00009717
144	6.4054E-05	0.00010383
168	9.37394E-05	0.00010970
192	2.7082E-05	0.00011495
216	3.54132E-05	0.00011970
240	0.000117175	0.00012406
264	0.000115613	0.00012807
288	0.000106238	0.00013180
312	0.000106238	0.00013528
336	0.000128111	0.00013854
360	0.000143736	0.00014162
384	0.000126549	0.00014452
408	0.000140611	0.00014727
432	0.000159359	0.00014989
456	0.000178108	0.00015238
480	0.000178107	0.00015476
504	0.000162484	0.00015704
672	0.000176545	0.00017073

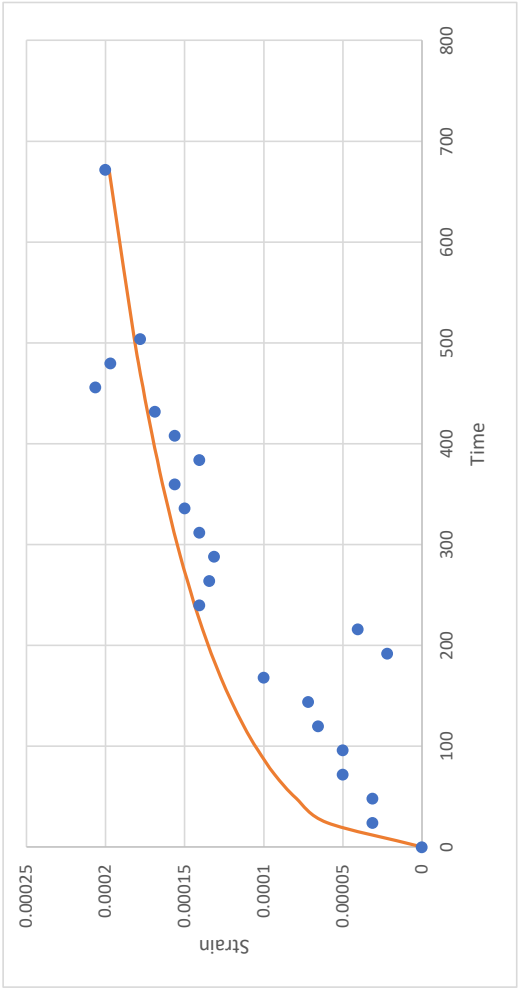
sum R^2 = 2.40E-08



Data Set # 10

time (hr)	strain μ	$\epsilon_{sh,u}$	α	V/S	σ
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	3.1241E-05	0.00006016	0.00000000	0.00000000	0.00000000
48	3.12436E-05	0.00007964	0.00000000	0.00000000	0.00000000
72	4.99961E-05	0.00009324	0.00000000	0.00000000	0.00000000
96	5.0004E-05	0.00010393	0.00000000	0.00000000	0.00000000
120	6.56323E-05	0.00011283	0.00000000	0.00000000	0.00000000
144	7.18805E-05	0.00012049	0.00000000	0.00000000	0.00000000
168	0.000100008	0.00012724	0.00000000	0.00000000	0.00000000
192	2.18739E-05	0.00013329	0.00000001	0.00000000	0.00000000
216	4.06395E-05	0.00013877	0.00000001	0.00000000	0.00000000
240	0.00014065	0.00014379	0.00000000	0.00000000	0.00000000
264	0.000134402	0.00014842	0.00000000	0.00000000	0.00000000
288	0.000131278	0.00015272	0.00000000	0.00000000	0.00000000
312	0.00014065	0.00015674	0.00000000	0.00000000	0.00000000
336	0.000150025	0.00016051	0.00000000	0.00000000	0.00000000
360	0.000156278	0.00016407	0.00000000	0.00000000	0.00000000
384	0.00014065	0.00016743	0.00000000	0.00000000	0.00000000
408	0.000156276	0.00017062	0.00000000	0.00000000	0.00000000
432	0.000168777	0.00017365	0.00000000	0.00000000	0.00000000
456	0.00020629	0.00017654	0.00000000	0.00000000	0.00000000
480	0.00019691	0.00017930	0.00000000	0.00000000	0.00000000
504	0.000178158	0.00018195	0.00000000	0.00000000	0.00000000
672	0.000200042	0.00019787	0.00000000	0.00000000	0.00000000

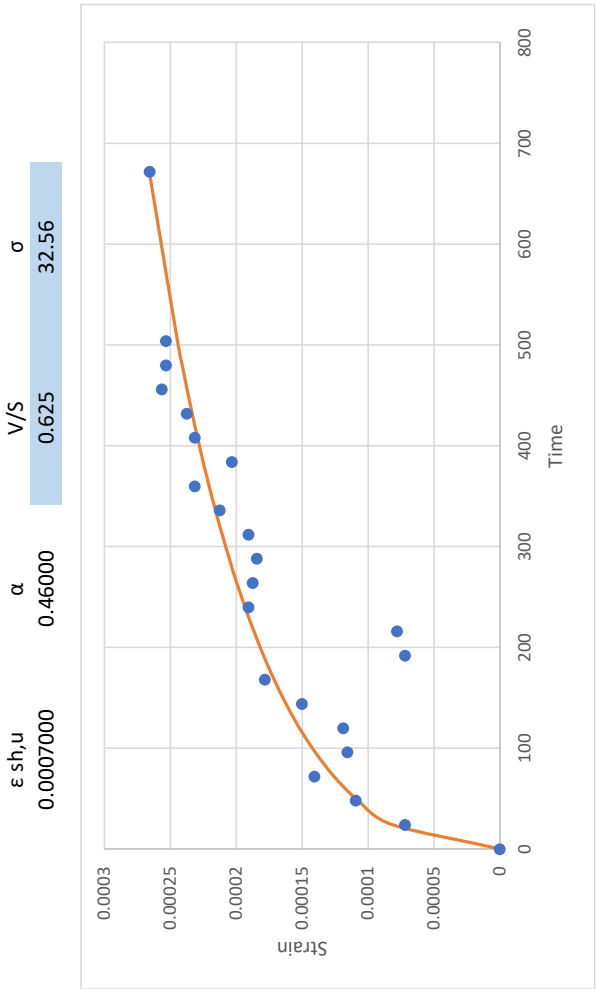
sum R^2 = 3.86E-08



Data Set # 11

time (hr)	strain μ				
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	7.18888E-05	0.00008190	0.00000000	0.00000000	0.00000000
48	0.000109396	0.00010791	0.00000000	0.00000000	0.00000000
72	0.000140651	0.00012605	0.00000000	0.00000000	0.00000000
96	0.000115647	0.00014031	0.00000000	0.00000000	0.00000000
120	0.000118772	0.00015218	0.00000000	0.00000000	0.00000000
144	0.000150028	0.00016241	0.00000000	0.00000000	0.00000000
168	0.000178158	0.00017142	0.00000000	0.00000000	0.00000000
192	7.18885E-05	0.00017950	0.00000001	0.00000000	0.00000001
216	7.81395E-05	0.00018682	0.00000001	0.00000000	0.00000001
240	0.00019066	0.00019353	0.00000000	0.00000000	0.00000000
264	0.000187535	0.00019973	0.00000000	0.00000000	0.00000000
288	0.000184409	0.00020550	0.00000000	0.00000000	0.00000000
312	0.00019066	0.00021088	0.00000000	0.00000000	0.00000000
336	0.000212539	0.00021594	0.00000000	0.00000000	0.00000000
360	0.000231293	0.00022071	0.00000000	0.00000000	0.00000000
384	0.000203163	0.00022522	0.00000000	0.00000000	0.00000000
408	0.000231293	0.00022950	0.00000000	0.00000000	0.00000000
432	0.000237544	0.00023357	0.00000000	0.00000000	0.00000000
456	0.000256297	0.00023746	0.00000000	0.00000000	0.00000000
480	0.000253172	0.00024117	0.00000000	0.00000000	0.00000000
504	0.000253172	0.00024473	0.00000000	0.00000000	0.00000000
672	0.000265674	0.00026619	0.00000000	0.00000000	0.00000000

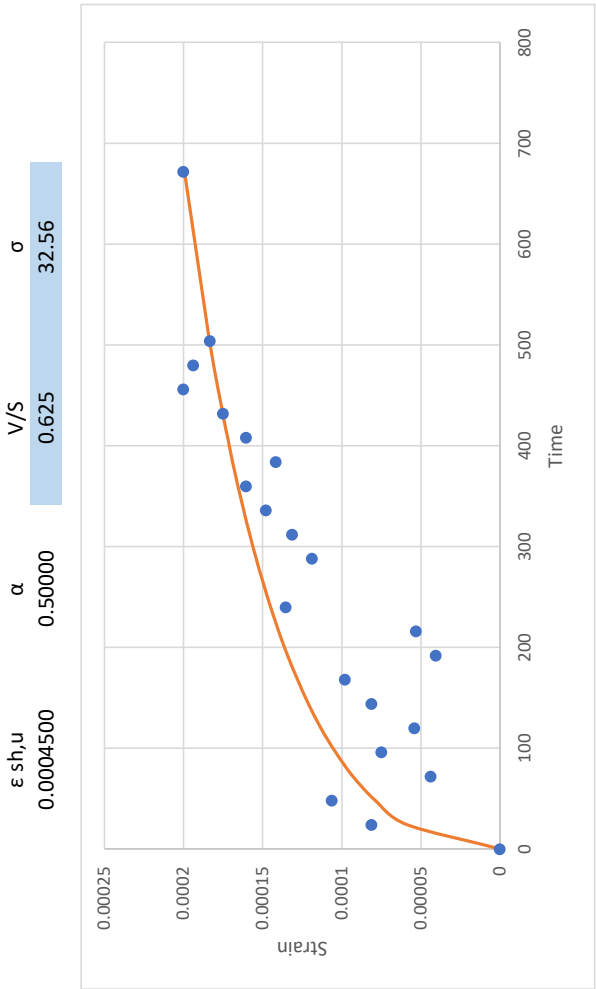
sum R^2 = 2.78E-08



Data Set # 12

time (hr)	strain μ	$\epsilon_{sh,u}$	α	V/S	σ
0	0	0.00000000	0.00000000	0.625	32.56
24	8.12642E-05	0.00005885			
48	0.000106269	0.00007895			
72	4.37577E-05	0.00009303			
96	7.50103E-05	0.00010409			
120	5.41743E-05	0.00011328			
144	8.12599E-05	0.00012118			
168	9.79277E-05	0.00012813			
192	4.06321E-05	0.00013433			
216	5.31324E-05	0.00013995			
240	0.000135431	0.00014508			
264		0.00014980			
288	0.000118762	0.00015418			
312	0.000131264	0.00015826			
336	0.000147931	0.00016209			
360	0.000160432	0.00016568			
384	0.000141681	0.00016907			
408	0.000160432	0.00017228			
432	0.000175018	0.00017533			
456	0.00020002	0.00017823			
480	0.000193769	0.00018100			
504	0.000183351	0.00018365			
672	0.000200018	0.00019946			

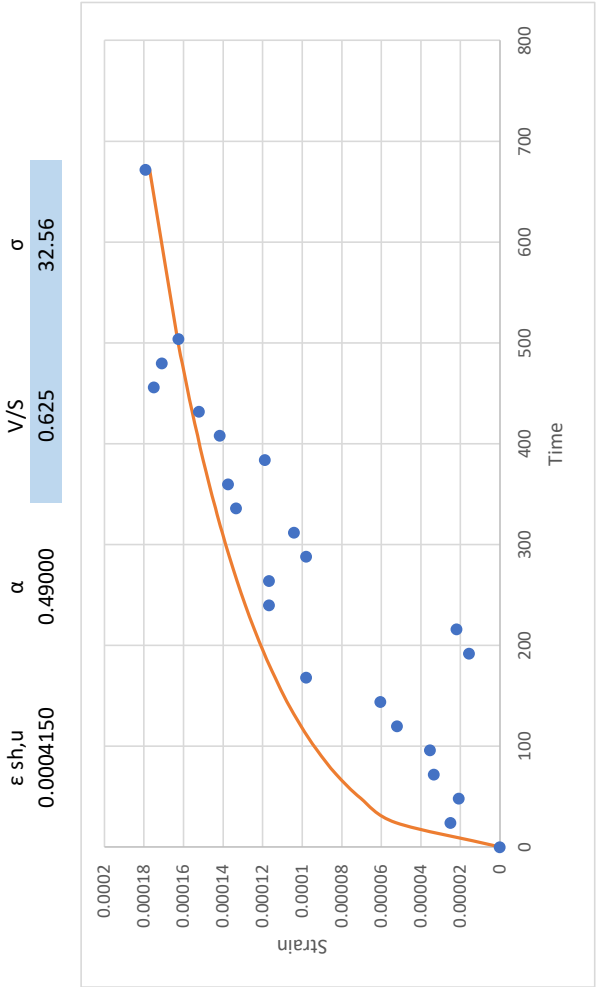
sum R^2 = 3.07E-08



Data Set # 13

time (hr)	strain μ	
0	0	0.00000000
24	2.50002E-05	0.00005279
48	2.08342E-05	0.00007052
72	3.33358E-05	0.00008292
96	3.54192E-05	0.00009267
120	5.20875E-05	0.00010077
144	6.04223E-05	0.00010775
168	9.79275E-05	0.00011388
192	1.56251E-05	0.00011937
216	2.18751E-05	0.00012433
240	0.00011668	0.00012888
264	0.00011668	0.00013306
288	9.79275E-05	0.00013694
312	0.000104178	0.00014057
336	0.000133348	0.00014396
360	0.000137515	0.00014716
384	0.000118763	0.00015017
408	0.000141682	0.00015303
432	0.000152101	0.00015575
456	0.00017502	0.00015833
480	0.000170852	0.00016080
504	0.000162518	0.00016316
672	0.000179187	0.00017731

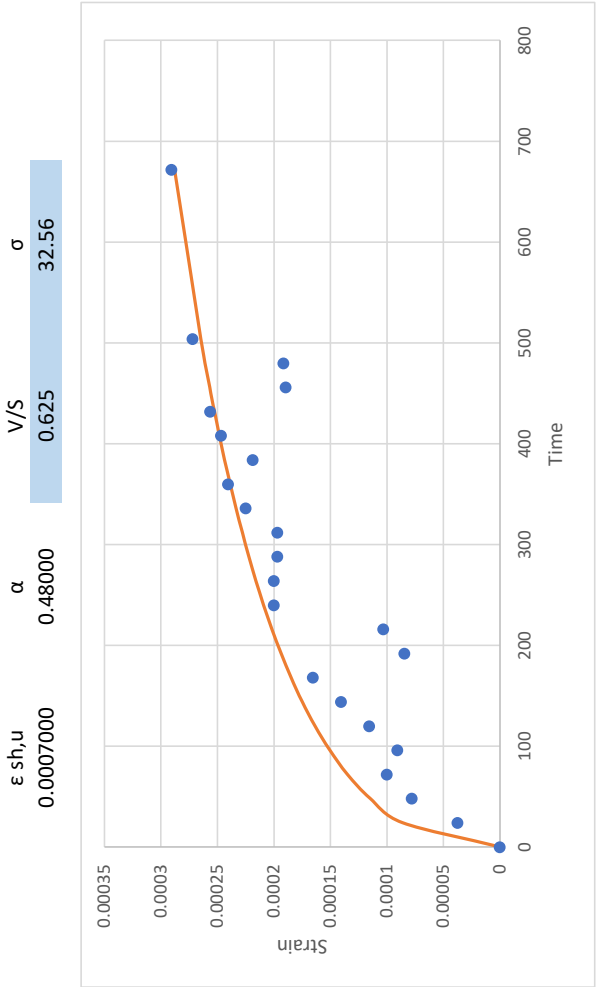
sum R^2 = 4.01E-08



Data Set # 14

time (hr)	strain μ	
0	0	0.00000000
24	3.75055E-05	0.00008661
48	7.81277E-05	0.00011517
72	0.000100003	0.00013514
96	9.06248E-05	0.00015084
120	0.000115624	0.00016390
144	0.000140622	0.00017513
168	0.00016562	0.00018503
192	8.43718E-05	0.00019388
216	0.00010312	0.00020191
240	0.000199993	0.00020925
264	0.000199993	0.00021602
288	0.000196869	0.00022231
312	0.000196869	0.00022818
336	0.00022499	0.00023369
360	0.000240615	0.00023887
384	0.000218741	0.00024377
408	0.000246864	0.00024841
432	0.000256239	0.00025283
456	0.000189574	0.00025703
480	0.000191656	0.00026105
504	0.000271862	0.00026489
672	0.00029061	0.00028798

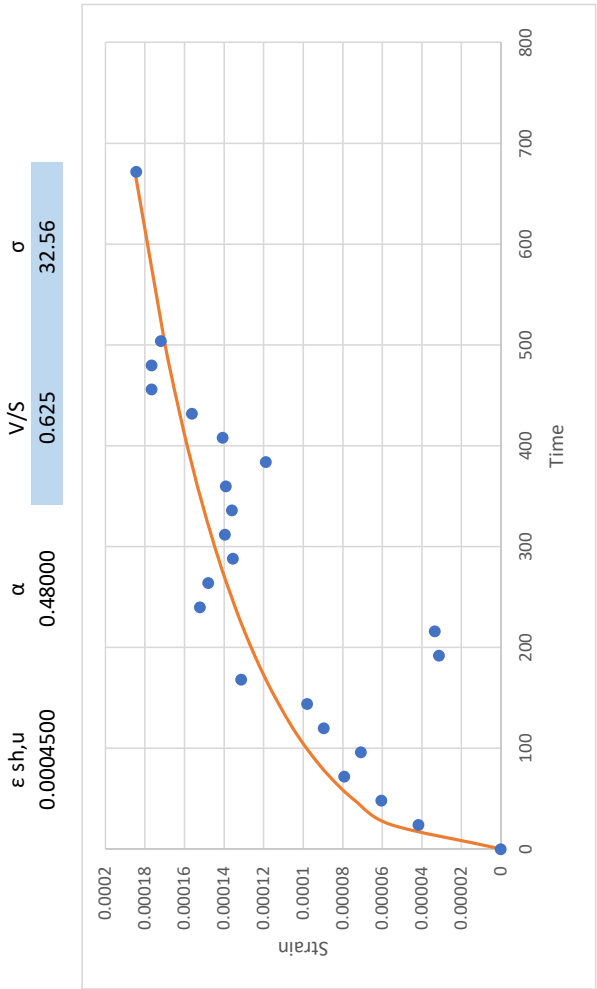
sum R^2 = 4.64E-08



Data Set # 15

time (hr)	strain μ	
0	0	0.00000000
24	4.16699E-05	0.00005568
48	6.04206E-05	0.00007404
72	7.91754E-05	0.00008687
96	7.08416E-05	0.00009697
120	8.95922E-05	0.00010536
144	9.7926E-05	0.00011259
168	0.000131264	0.00011895
192	3.12474E-05	0.00012464
216	3.33303E-05	0.00012980
240	0.000152098	0.00013452
264	0.000147932	0.00013887
288	0.000135426	0.00014291
312	0.000139593	0.00014669
336	0.00013595	0.00015023
360	0.000139075	0.00015356
384	0.00011876	0.00015671
408	0.000140637	0.00015969
432	0.000156262	0.00016253
456	0.000176578	0.00016523
480	0.000176578	0.00016782
504	0.000171889	0.00017029
672	0.000184391	0.00018513

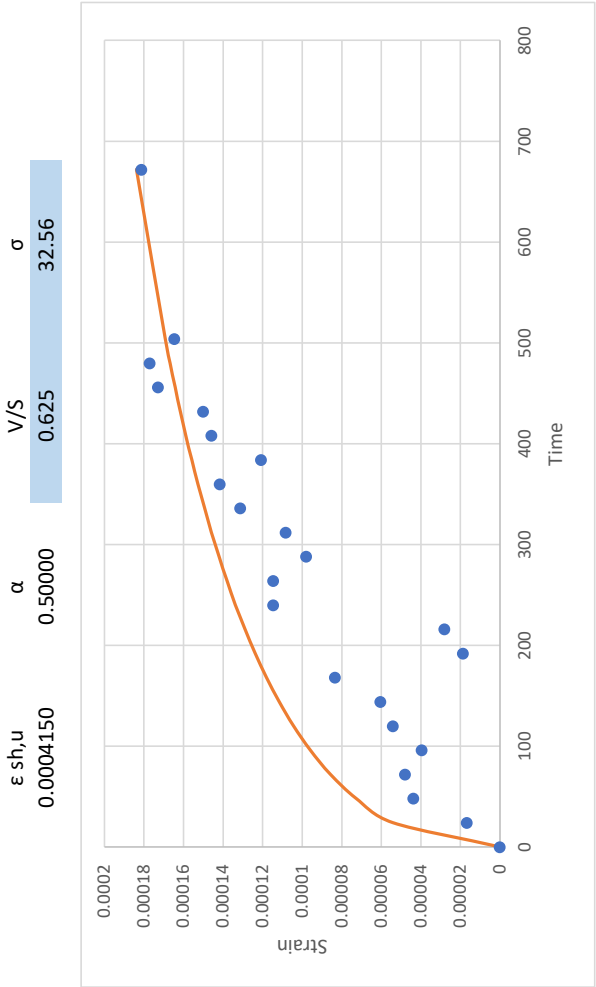
sum R^2 = 2.27E-08



Data Set # 16

time (hr)	strain μ	
0	0	0.00000000
24	1.66719E-05	0.00005427
48	4.3763E-05	0.00007281
72	4.79315E-05	0.00008579
96	3.95965E-05	0.00009599
120	5.41807E-05	0.00010447
144	6.04315E-05	0.00011176
168	8.33506E-05	0.00011816
192	1.87546E-05	0.00012389
216	2.81342E-05	0.00012906
240	0.000114607	0.00013379
264	0.000114605	0.00013815
288	9.79356E-05	0.00014219
312	0.000108354	0.00014595
336	0.000131272	0.00014948
360	0.00014169	0.00015279
384	0.000120855	0.00015592
408	0.000145857	0.00015888
432	0.000150026	0.00016169
456	0.000172946	0.00016437
480	0.00017711	0.00016692
504	0.00016461	0.00016936
672	0.000181278	0.00018395

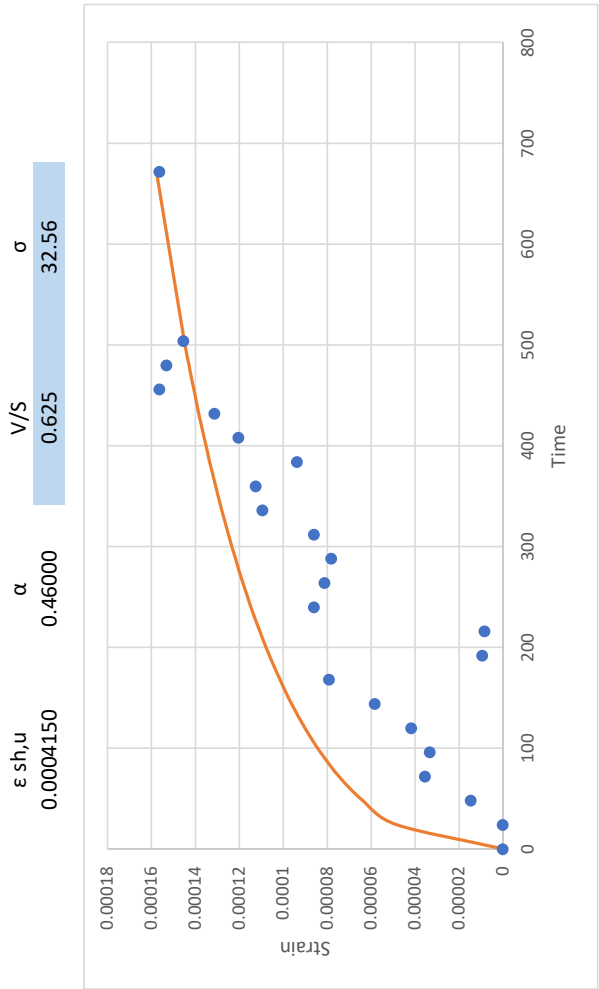
sum R^2 = 4.10E-08



Data Set # 17

time (hr)	strain μ				
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	0	0.00004855	0.00004855	0.00000000	0.00000000
48	1.45819E-05	0.00006398	0.00006398	0.00000000	0.00000000
72	3.54151E-05	0.00007473	0.00007473	0.00000000	0.00000000
96	3.33325E-05	0.00008319	0.00008319	0.00000000	0.00000000
120	4.16664E-05	0.00009022	0.00009022	0.00000000	0.00000000
144	5.83319E-05	0.00009629	0.00009629	0.00000000	0.00000000
168	7.91637E-05	0.00010163	0.00010163	0.00000000	0.00000000
192	9.37359E-06	0.00010642	0.00010642	0.00000001	0.00000001
216	8.33273E-06	0.00011076	0.00011076	0.00000001	0.00000001
240	8.59347E-05	0.00011474	0.00011474	0.00000000	0.00000000
264	8.12472E-05	0.00011841	0.00011841	0.00000000	0.00000000
288	7.81222E-05	0.00012183	0.00012183	0.00000000	0.00000000
312	8.59365E-05	0.00012502	0.00012502	0.00000000	0.00000000
336	0.000109377	0.00012802	0.00012802	0.00000000	0.00000000
360	0.000112501	0.00013085	0.00013085	0.00000000	0.00000000
384	9.37492E-05	0.00013352	0.00013352	0.00000000	0.00000000
408	0.000120314	0.00013606	0.00013606	0.00000000	0.00000000
432	0.000131255	0.00013847	0.00013847	0.00000000	0.00000000
456	0.000156257	0.00014078	0.00014078	0.00000000	0.00000000
480	0.000153134	0.00014298	0.00014298	0.00000000	0.00000000
504	0.00014532	0.00014509	0.00014509	0.00000000	0.00000000
672	0.000156259	0.00015781	0.00015781	0.00000000	0.00000000

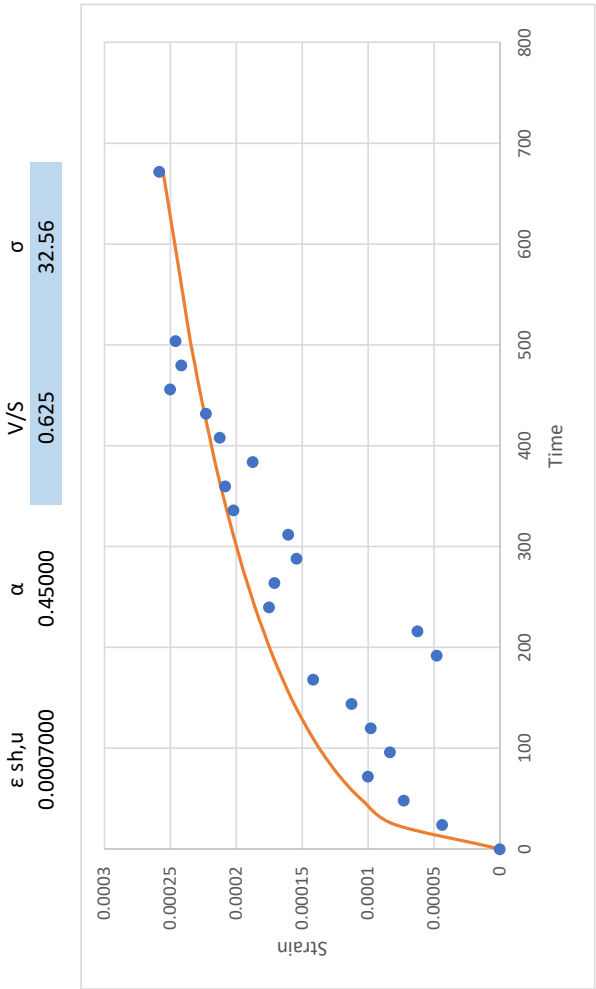
sum R^2 = 4.16E-08



Data Set # 18

time (hr)	strain μ				
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	4.37582E-05	0.00007963			
48	7.29301E-05	0.00010443			
72	0.000100018	0.00012169			
96	8.33485E-05	0.00013526			
120	9.7934E-05	0.00014656			
144	0.00011252	0.00015629			
168	0.000141691	0.00016488			
192	4.79258E-05	0.00017257			
216	6.25122E-05	0.00017955			
240	0.00017503	0.00018595			
264	0.000170863	0.00019187			
288	0.000154193	0.00019737			
312	0.000160444	0.00020252			
336	0.000202118	0.00020735			
360	0.000208369	0.00021191			
384	0.000187532	0.00021622			
408	0.000212536	0.00022032			
432	0.000222954	0.00022422			
456	0.000250041	0.00022795			
480	0.000241707	0.00023151			
504	0.000245875	0.00023492			
672	0.000258376	0.00025554			

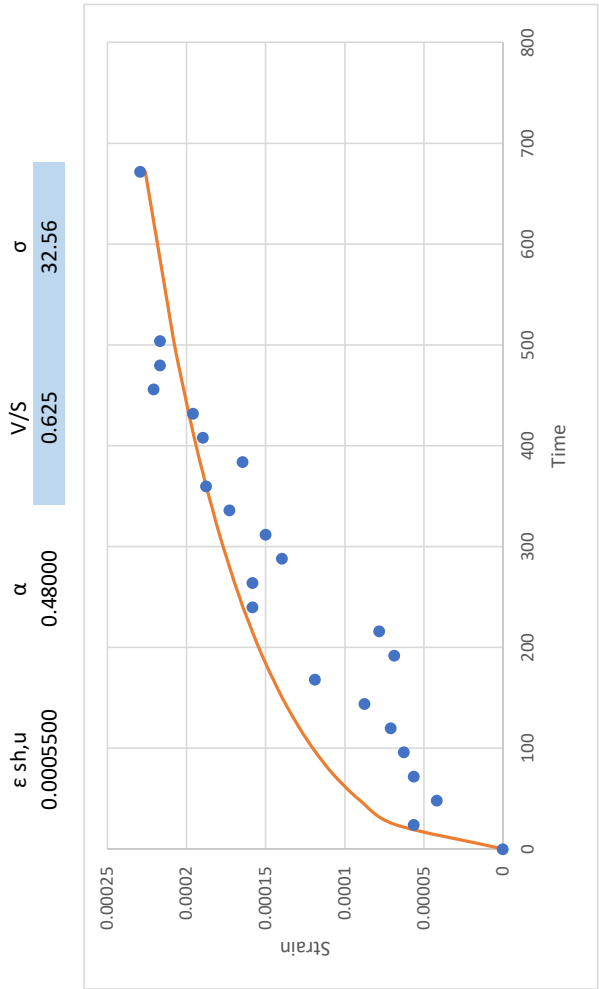
sum R^2 = 4.53E-08



Data Set # 19

time (hr)	strain μ	
0	0	0.00000000
24	5.62532E-05	0.00006805
48	4.1665E-05	0.00009049
72	5.62486E-05	0.00010618
96	6.24976E-05	0.00011851
120	7.08306E-05	0.00012877
144	8.74946E-05	0.00013761
168	0.000118742	0.00014538
192	6.87469E-05	0.00015234
216	7.81214E-05	0.00015864
240	0.000158323	0.00016441
264	0.000158323	0.00016973
288	0.000139575	0.00017467
312	0.00014999	0.00017929
336	0.000172907	0.00018361
360	0.000187489	0.00018768
384	0.000164574	0.00019153
408	0.000189572	0.00019518
432	0.000195821	0.00019865
456	0.000220819	0.00020195
480	0.000216654	0.00020511
504	0.000216653	0.00020813
672	0.000229152	0.00022627

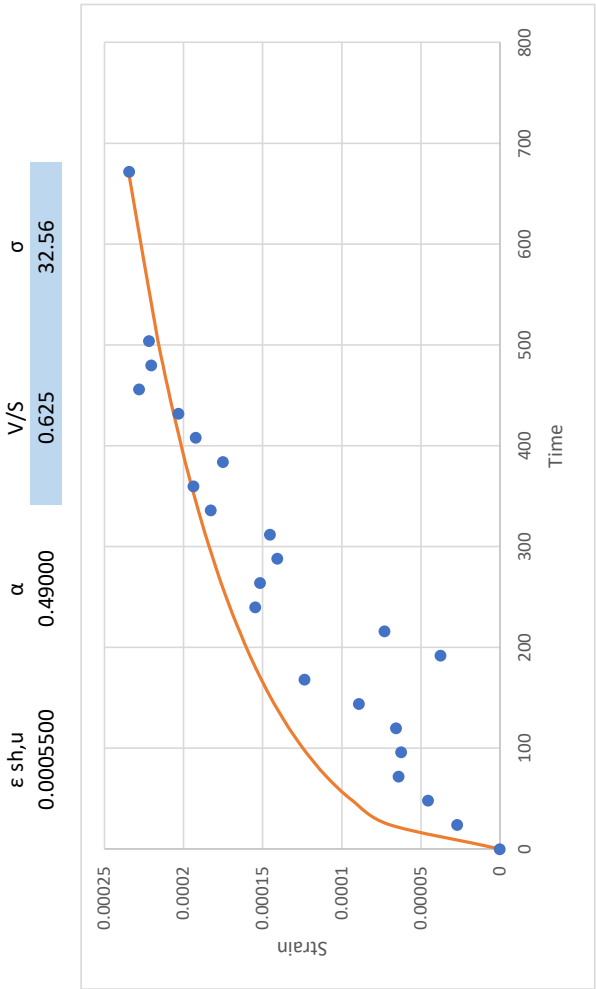
sum R^2 = 3.19E-08



Data Set # 20

time (hr)	strain μ	
0	0	0.00000000
24	2.70777E-05	0.00006997
48	4.53027E-05	0.00009345
72	6.40496E-05	0.00010989
96	6.24872E-05	0.00012281
120	6.56116E-05	0.00013356
144	8.90451E-05	0.00014280
168	0.000123416	0.00015093
192	3.74916E-05	0.00015820
216	7.29003E-05	0.00016478
240	0.00015466	0.00017080
264	0.000151536	0.00017635
288	0.0001406	0.00018149
312	0.000145286	0.00018629
336	0.000182781	0.00019079
360	0.000193717	0.00019503
384	0.000174971	0.00019903
408	0.000192155	0.00020281
432	0.000203091	0.00020641
456	0.000228087	0.00020984
480	0.000220275	0.00021311
504	0.000221838	0.00021624
672	0.000234336	0.00023499

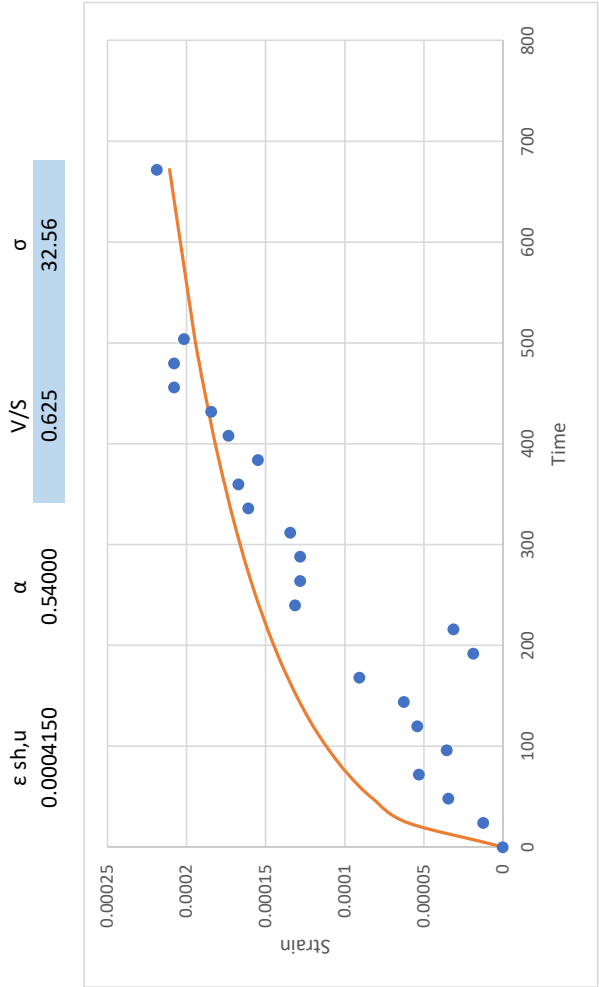
sum R^2 = 4.66E-08



Data Set # 21

time (hr)	strain μ	
0	0	0.00000000
24	1.25027E-05	0.00006056
48	3.43825E-05	0.00008258
72	5.31367E-05	0.00009802
96	3.54245E-05	0.00011012
120	5.41761E-05	0.00012014
144	6.25086E-05	0.00012871
168	9.06393E-05	0.00013622
192	1.87525E-05	0.00014290
216	3.1253E-05	0.00014891
240	0.000131271	0.00015439
264	0.000128146	0.00015941
288	0.000128145	0.00016405
312	0.000134396	0.00016836
336	0.000160964	0.00017237
360	0.000167215	0.00017614
384	0.000154712	0.00017968
408	0.000173465	0.00018302
432	0.000184405	0.00018619
456	0.000207847	0.00018919
480	0.000207846	0.00019204
504	0.000201596	0.00019476
672	0.000218786	0.00021087

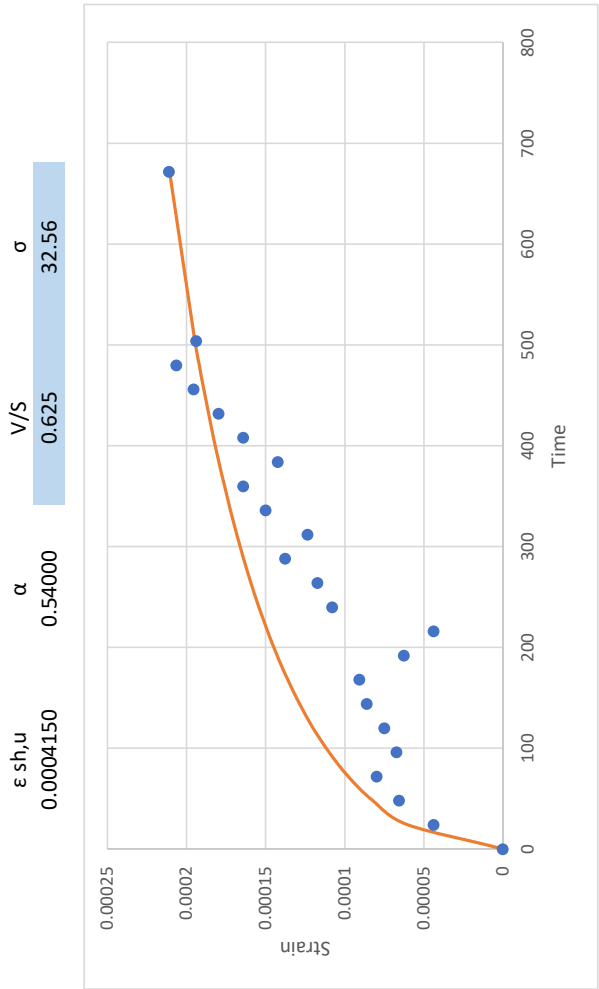
sum R^2 = 5.79E-08



Data Set # 22

time (hr)	strain μ	
0	0	0.00000000
24	4.37606E-05	0.00006056
48	6.56422E-05	0.00008258
72	7.97115E-05	0.00009802
96	6.72097E-05	0.00011012
120	7.50227E-05	0.00012014
144	8.59665E-05	0.00012871
168	9.06687E-05	0.00013622
192	6.25068E-05	0.00014290
216	4.3772E-05	0.00014891
240	0.000107864	0.00015439
264	0.000117241	0.00015941
288	0.000137566	0.00016405
312	0.000123482	0.00016836
336	0.000150055	0.00017237
360	0.000164119	0.00017614
384	0.000142238	0.00017968
408	0.000164119	0.00018302
432	0.00017975	0.00018619
456	0.00019538	0.00018919
480	0.000206322	0.00019204
504	0.00019382	0.00019476
672	0.000211012	0.00021087

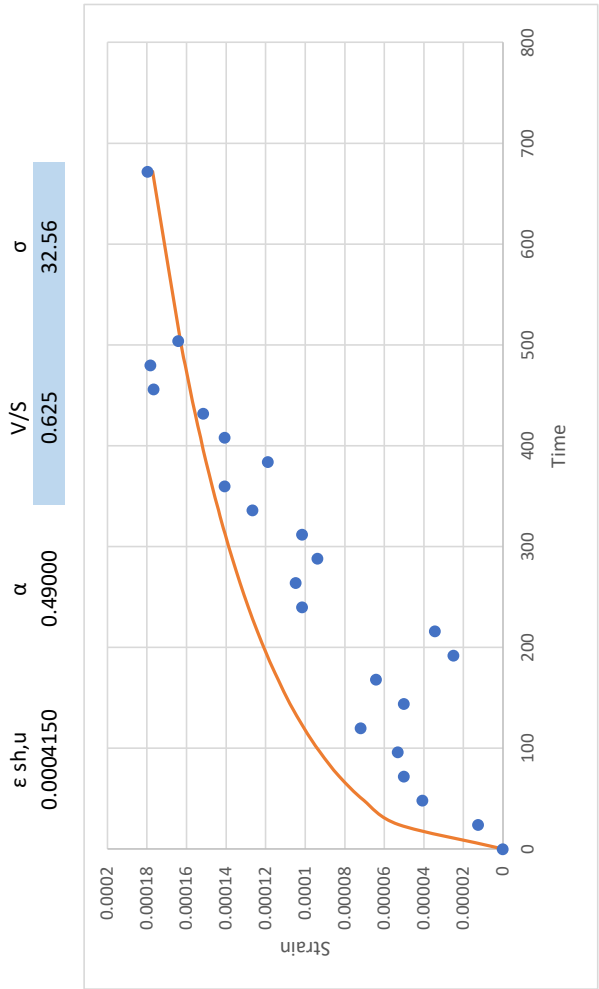
sum R^2 = 3.55E-08



Data Set # 23

time (hr)	strain μ	
0	0	0.00000000
24	1.2507E-05	0.00005279
48	4.06395E-05	0.00007052
72	5.0017E-05	0.00008292
96	5.31437E-05	0.00009267
120	7.18987E-05	0.00010077
144	5.00109E-05	0.00010775
168	6.40764E-05	0.00011388
192	2.50031E-05	0.00011937
216	3.43751E-05	0.00012433
240	0.00010158	0.00012888
264	0.000104705	0.00013306
288	9.3767E-05	0.00013694
312	0.000101579	0.00014057
336	0.000126583	0.00014396
360	0.000140648	0.00014716
384	0.000118768	0.00015017
408	0.000140647	0.00015303
432	0.000151585	0.00015575
456	0.000176591	0.00015833
480	0.000178154	0.00016080
504	0.000164086	0.00016316
672	0.000179715	0.00017731

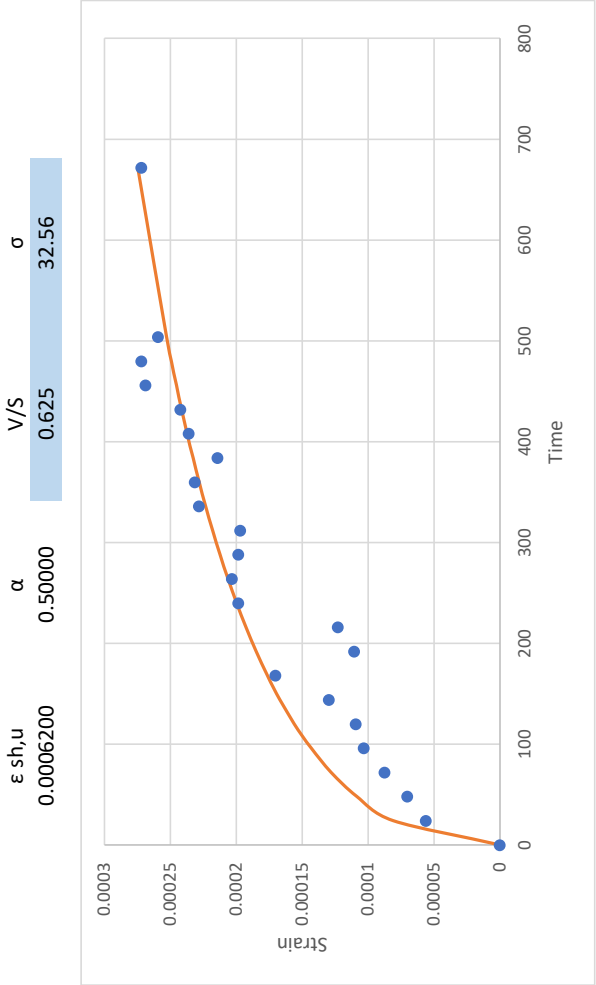
sum R^2 = 3.59E-08



Data Set # 24

time (hr)	strain μ				
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	5.62602E-05	0.00008108	0.00008108	0.00000000	0.00000000
48	7.03275E-05	0.00010878	0.00010878	0.00000000	0.00000000
72	8.75222E-05	0.00012817	0.00012817	0.00000000	0.00000000
96	0.000103149	0.00014341	0.00014341	0.00000000	0.00000000
120	0.000109405	0.00015608	0.00015608	0.00000000	0.00000000
144	0.000129722	0.00016696	0.00016696	0.00000000	0.00000000
168	0.000170353	0.00017653	0.00017653	0.00000000	0.00000000
192	0.000110446	0.00018508	0.00018508	0.00000001	0.00000000
216	0.000122951	0.00019282	0.00019282	0.00000000	0.00000000
240	0.000198482	0.00019989	0.00019989	0.00000000	0.00000000
264	0.00020317	0.00020639	0.00020639	0.00000000	0.00000000
288	0.000198482	0.00021243	0.00021243	0.00000000	0.00000000
312	0.000196921	0.00021805	0.00021805	0.00000000	0.00000000
336	0.000228175	0.00022332	0.00022332	0.00000000	0.00000000
360	0.000231299	0.00022827	0.00022827	0.00000000	0.00000000
384	0.000214111	0.00023294	0.00023294	0.00000000	0.00000000
408	0.000235986	0.00023737	0.00023737	0.00000000	0.00000000
432	0.000242238	0.00024157	0.00024157	0.00000000	0.00000000
456	0.000268805	0.00024557	0.00024557	0.00000000	0.00000000
480	0.000271928	0.00024938	0.00024938	0.00000000	0.00000000
504	0.000259428	0.00025302	0.00025302	0.00000000	0.00000000
672	0.00027193	0.00027482	0.00027482	0.00000000	0.00000000

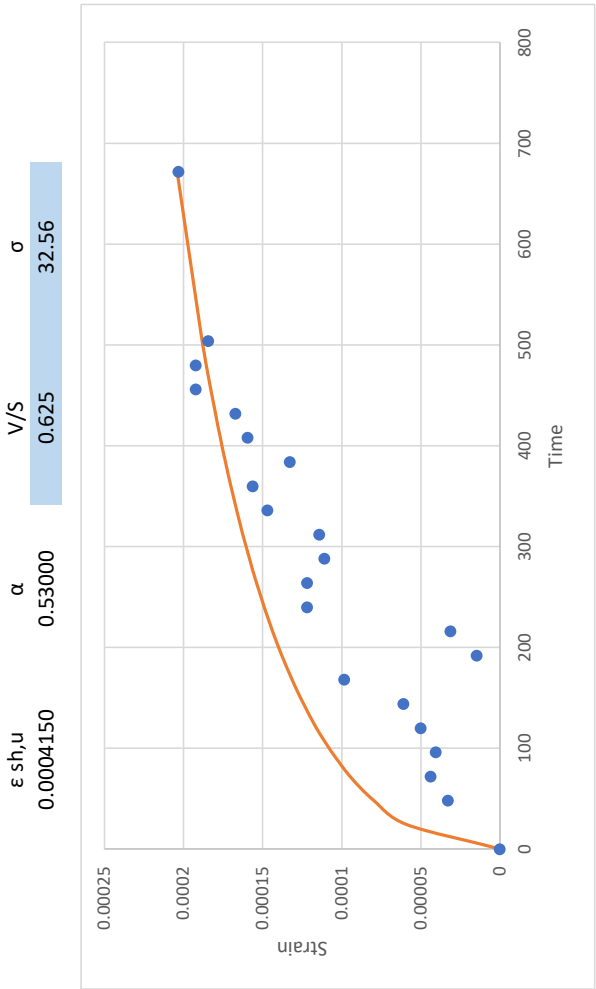
sum R^2 = 2.16E-08



Data Set # 25

time (hr)	strain μ	$\epsilon_{sh,u}$	α	V/S	σ
0	0	0.00000000	0.00000000		
24	3.28211E-05	0.00005893			
48	4.37618E-05	0.00008005			
72	4.06353E-05	0.00009485			
96	4.06353E-05	0.00010647			
120	5.00123E-05	0.00011609			
144	6.09526E-05	0.00012434			
168	9.84598E-05	0.00013157			
192	1.45873E-05	0.00013801			
216	3.12568E-05	0.00014382			
240	0.000121902	0.00014911			
264	0.000121902	0.00015397			
288	0.000110962	0.00015847			
312	0.000114087	0.00016264			
336	0.000146906	0.00016654			
360	0.000156284	0.00017020			
384	0.000132841	0.00017364			
408	0.000159409	0.00017690			
432	0.000167224	0.00017998			
456	0.000192229	0.00018291			
480	0.000192229	0.00018569			
504	0.000184415	0.00018835			
672	0.000203168	0.00020411			

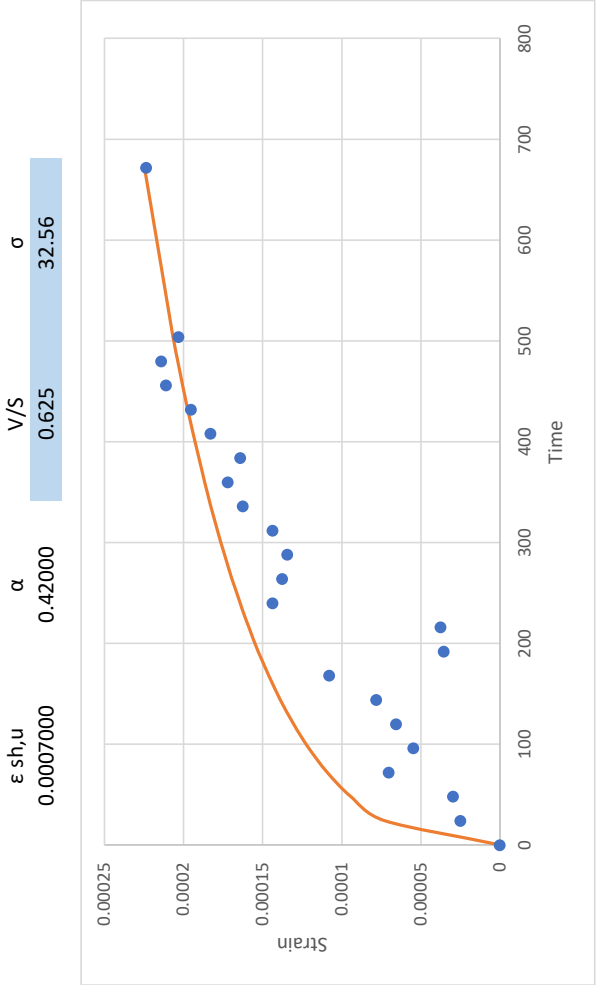
sum R^2 = 5.58E-08



Data Set # 26

time (hr)	strain μ				
0	0	0.00000000	0.00000000	0.00000000	0.00000000
24	2.50053E-05	0.00007314			
48	2.96951E-05	0.00009452			
72	7.03253E-05	0.00010933			
96	5.46983E-05	0.00012094			
120	6.5637E-05	0.00013061			
144	7.81397E-05	0.00013894			
168	0.000107833	0.00014629			
192	3.54243E-05	0.00015289			
216	3.75077E-05	0.00015888			
240	0.000143775	0.00016438			
264	0.000137525	0.00016947			
288	0.0001344	0.00017421			
312	0.000143776	0.00017864			
336	0.00016253	0.00018282			
360	0.000171906	0.00018676			
384	0.00016409	0.00019049			
408	0.000182844	0.00019404			
432	0.000195347	0.00019743			
456	0.000210975	0.00020066			
480	0.0002141	0.00020376			
504	0.00020316	0.00020673			
672	0.000223476	0.00022476			

sum R^2 = 5.40E-08

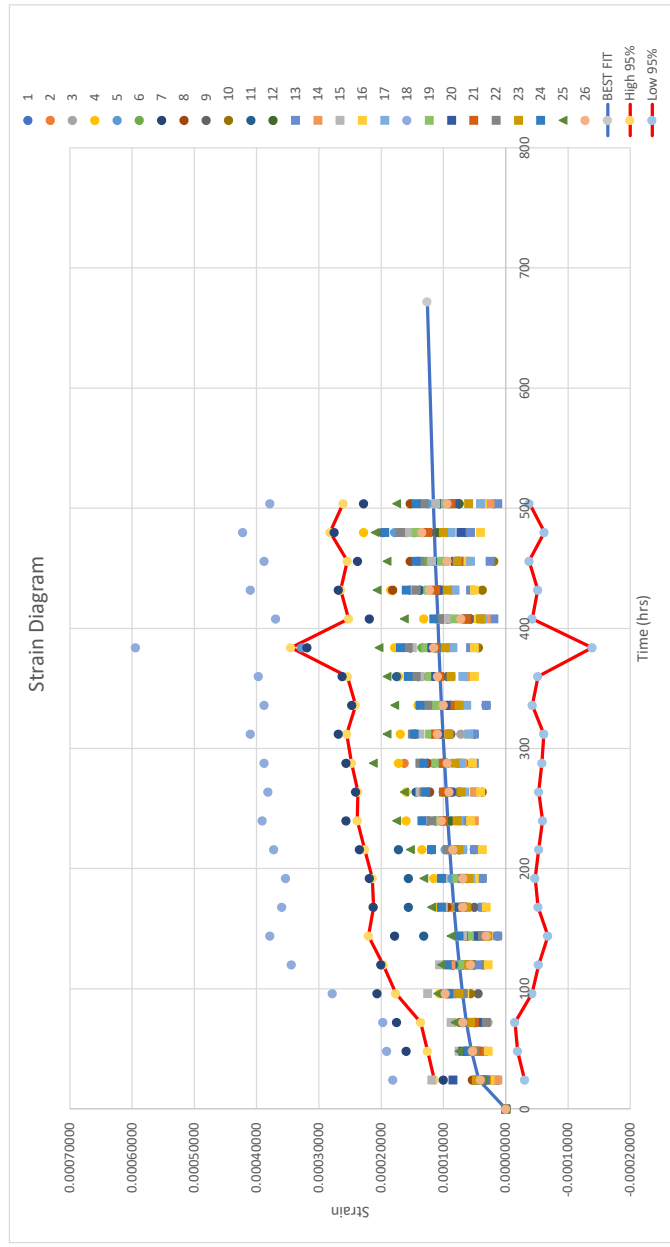


Test Sample: Normal Strength - DRY
Load Applied: 0%

AVERAGE STRAINS – UHPC SHRINKAGE TEST																						
Date	3/22/2022	3/23/2022	3/24/2022	3/25/2022	3/26/2022	3/27/2022	3/28/2022	3/29/2022	3/30/2022	3/31/2022	4/1/2022	4/2/2022	4/3/2022	4/4/2022	4/5/2022	4/6/2022	4/7/2022	4/8/2022	4/9/2022	4/10/2022	4/11/2022	4/12/2022
Time	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM	1:00-OPM
Relative Humidity	50.0	49.9	50.0	50.0	49.9	49.9	50.1	50.1	49.9	49.9	49.6	49.6	49.9	49.7	50.1	49.9	49.9	49.9	49.9	50.1	49.7	50.0
Air Temp	23.0	23.0	23.0	23.0	23.0	23.0	22.9	22.9	22.9	22.9	22.9	22.9	23.0	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Notes	0	24	48	72	96	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504
Point of Measure	1	0.0000000	0.0003430	0.0005400	0.0005000	0.0006877	0.0006476	0.0006877	0.0006877	0.0007502	0.0010003	0.0007502	0.0009378	0.0009378	0.0009873	0.0010629	0.0009873	0.0010629	0.0010629	0.0010629	0.0011254	0.0009750
	2	0.0000000	0.0003440	0.0005400	0.0005000	0.0006877	0.0006476	0.0006877	0.0006877	0.0007502	0.0010003	0.0007502	0.0009378	0.0009378	0.0009873	0.0010629	0.0009873	0.0010629	0.0010629	0.0010629	0.0011254	0.0009750
	3	0.0000000	0.0003440	0.0005400	0.0005000	0.0006877	0.0006476	0.0006877	0.0006877	0.0007502	0.0010003	0.0007502	0.0009378	0.0009378	0.0009873	0.0010629	0.0009873	0.0010629	0.0010629	0.0010629	0.0011254	0.0009750
	4	0.0000000	0.0003440	0.0005400	0.0005000	0.0006877	0.0006476	0.0006877	0.0006877	0.0007502	0.0010003	0.0007502	0.0009378	0.0009378	0.0009873	0.0010629	0.0009873	0.0010629	0.0010629	0.0010629	0.0011254	0.0009750
	5	0.0000000	0.0003440	0.0005400	0.0005000	0.0006877	0.0006476	0.0006877	0.0006877	0.0007502	0.0010003	0.0007502	0.0009378	0.0009378	0.0009873	0.0010629	0.0009873	0.0010629	0.0010629	0.0010629	0.0011254	0.0009750
	6	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	7	0.0000000	0.0001002	0.0001594	0.0001504	0.0002157	0.0002189	0.0002189	0.0002189	0.0002189	0.0002343	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563	0.0002563
	8	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	9	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	10	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	11	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	12	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	13	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	14	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	15	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	16	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	17	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	18	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	19	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	20	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	21	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	22	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	23	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	24	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
	25	0.0000000	0.0003438	0.0005631	0.0005000	0.0006876	0.0007189	0.0006876	0.0006876	0.0007848	0.0010000	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0010000	0.0010000	0.0010000	0.0010000	0.0011564	0.0009750
	26	0.0000000	0.0001875	0.0003123	0.0003349	0.0003562	0.0003749	0.0003562	0.0003562	0.0003749	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000	0.0004000
FIT DATA																						
Standard Deviation	0	4.1940E-05	5.3298E-05	6.0967E-05	7.2012E-05	6.6998E-05	7.7301E-05	8.143E-05	8.3583E-05	8.9891E-05	9.2167E-05	9.6472E-05	9.6949E-05	9.91E-05	0.0001015	0.0001031	0.0001045	0.0001067	0.0001081	0.0001103	0.0001119	0.0001207
Low Deviation	0	6.0201E-05	3.6116E-05	3.7838E-05	4.6275E-05	4.6376E-05	5.6247E-05	6.143E-05	6.5371E-05	6.8861E-05	7.4413E-05	7.6735E-05	7.9122E-05	7.9627E-05	7.6448E-05	0.0001093	0.0001099	0.0001293	0.0001376	0.0001405	8.6055E-05	7.4706E-05
High Deviation	0	0.0001144	0.0001292	0.0001413	0.0001664	0.0001763	0.0002033	0.0002136	0.0002269	0.0002384	0.0002374	0.0002457	0.0002551	0.0002605	0.0002540	0.0002416	0.0002405	0.0002496	0.0002594	0.0002694	0.0002824	0.0003026
	-3.0408E-05	-1.8992E-05	-1.4713E-05	-5.2347E-06	-5.2863E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-5.2868E-06	-3.7838E-05

time (hr)	strain μ
0	0
24	4.3035E-05
48	5.48053E-05
72	6.29059E-05
96	6.92429E-05
120	7.45098E-05
144	7.90472E-05
168	8.30505E-05
192	8.66432E-05
216	8.99092E-05
240	9.2908E-05
264	9.56838E-05
288	9.82701E-05
312	0.000100693
336	0.000102974
360	0.00010513
384	0.000107175
408	0.000109121
432	0.000110977
456	0.000112752
480	0.000114453
504	0.000116087
672	0.000126022

$\epsilon_{sh,u}$ 0.0004469 α 0.3914815 V/S 0.625 σ 32.56

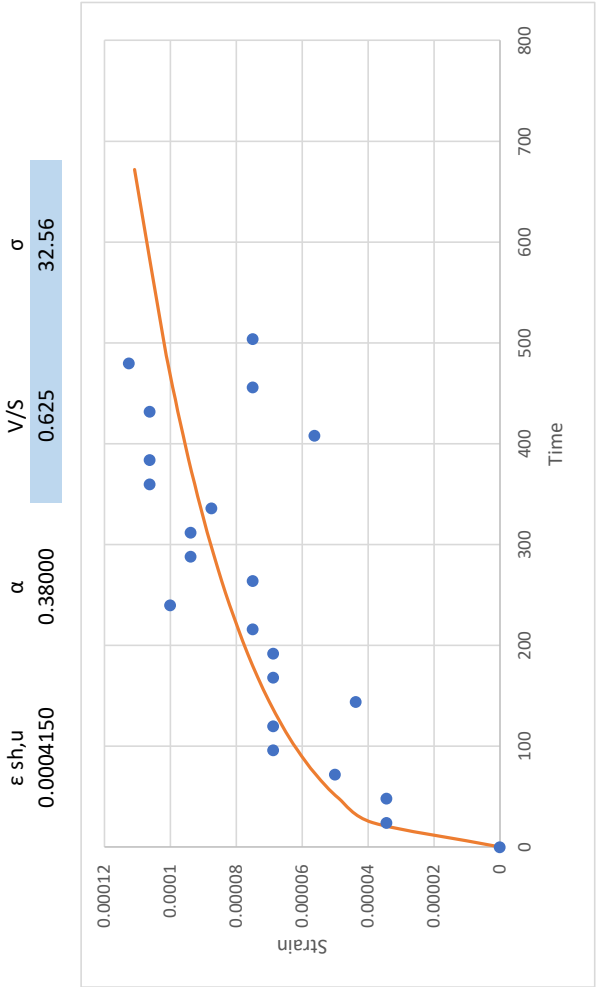


Move and Transpose Data

Data Set # 1

time (hr)	strain μ	
0	0	0.00000000
24	3.4396E-05	0.00003867
48	3.43919E-05	0.00004895
72	5.00166E-05	0.00005600
96	6.87728E-05	0.00006151
120	6.87728E-05	0.00006609
144	4.37645E-05	0.00007003
168	6.87728E-05	0.00007350
192	6.87728E-05	0.00007662
216	7.50249E-05	0.00007946
240	0.000100033	0.00008206
264	7.50249E-05	0.00008447
288	9.37811E-05	0.00008672
312	9.37811E-05	0.00008883
336	8.7529E-05	0.00009081
360	0.000106285	0.00009268
384	0.000106285	0.00009446
408	5.62686E-05	0.00009615
432	0.000106285	0.00009776
456	7.50249E-05	0.00009931
480	0.000112537	0.00010079
504	7.50249E-05	0.00010221
672		0.00011086

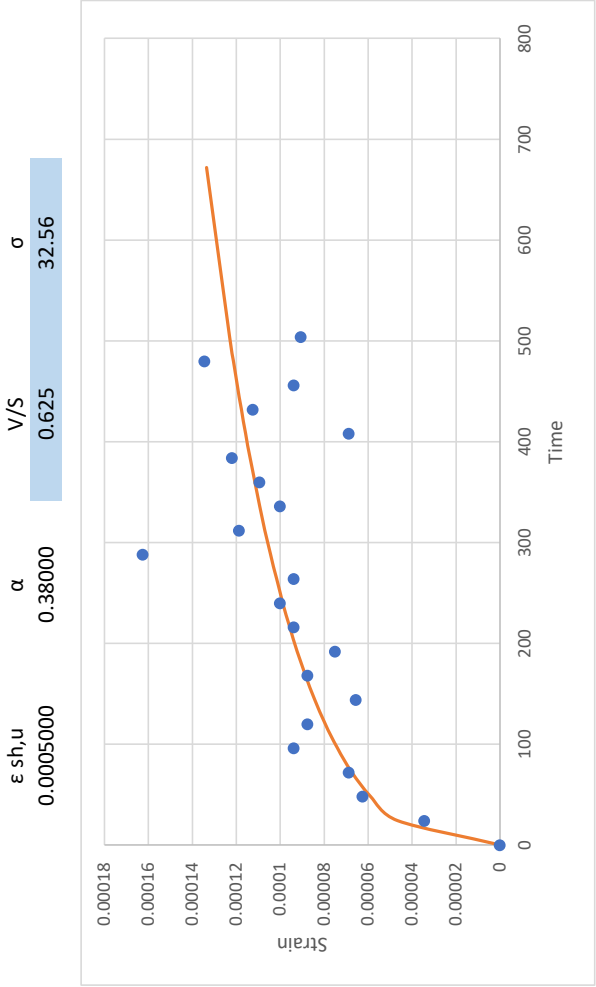
sum R^2 = 1.74E-08



Data Set # 2

time (hr)	strain μ	
0	0	0.00000000
24	3.43908E-05	0.00004659
48	6.25293E-05	0.00005897
72	6.8782E-05	0.00006747
96	9.37934E-05	0.00007411
120	8.75407E-05	0.00007962
144	6.5659E-05	0.00008437
168	8.75408E-05	0.00008856
192	7.50349E-05	0.00009232
216	9.37937E-05	0.00009573
240	0.000100047	0.00009887
264	9.37938E-05	0.00010178
288	0.000162577	0.00010448
312	0.000118806	0.00010702
336	0.000100047	0.00010941
360	0.000109426	0.00011166
384	0.000121932	0.00011381
408	6.87825E-05	0.00011584
432	0.000112553	0.00011779
456	9.37941E-05	0.00011965
480	0.000134438	0.00012143
504	9.06677E-05	0.00012314
672		0.00013357

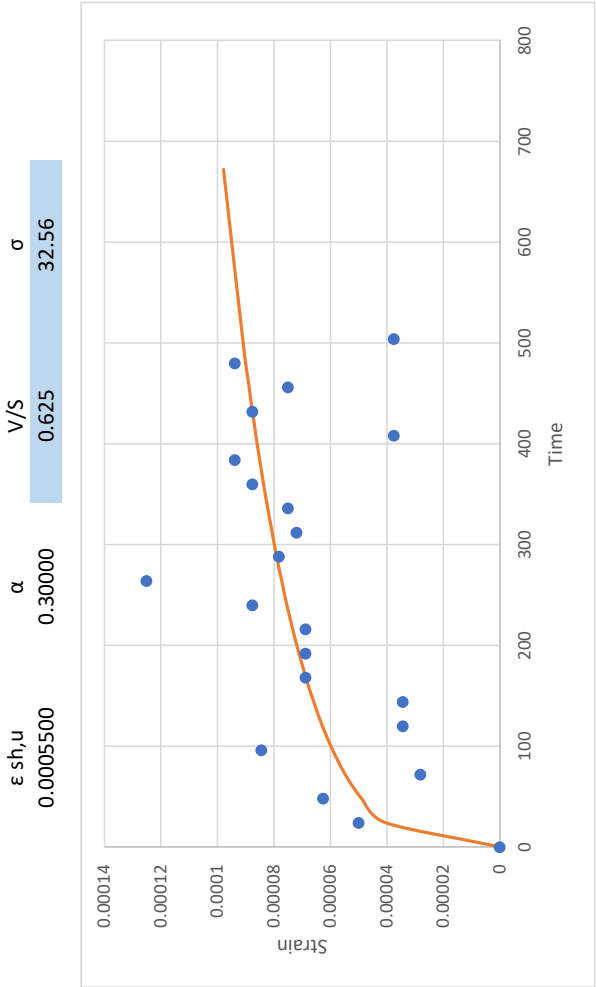
sum R^2 = 2.70E-08



Data Set # 3

time (hr)	strain μ	
0	0	0.00000000
24	5.00325E-05	0.00004059
48	6.25407E-05	0.00004914
72	2.81433E-05	0.00005486
96	8.44299E-05	0.00005927
120	3.43974E-05	0.00006290
144	3.43974E-05	0.00006602
168	6.87947E-05	0.00006875
192	6.87947E-05	0.00007120
216	6.87947E-05	0.00007342
240	8.75569E-05	0.00007545
264	0.000125081	0.00007733
288	7.81758E-05	0.00007908
312	7.19217E-05	0.00008072
336	7.50488E-05	0.00008226
360	8.75569E-05	0.00008372
384	9.3811E-05	0.00008511
408	3.75244E-05	0.00008642
432	8.75569E-05	0.00008768
456	7.50488E-05	0.00008888
480	9.3811E-05	0.00009003
504	3.75244E-05	0.00009114
672		0.00009789

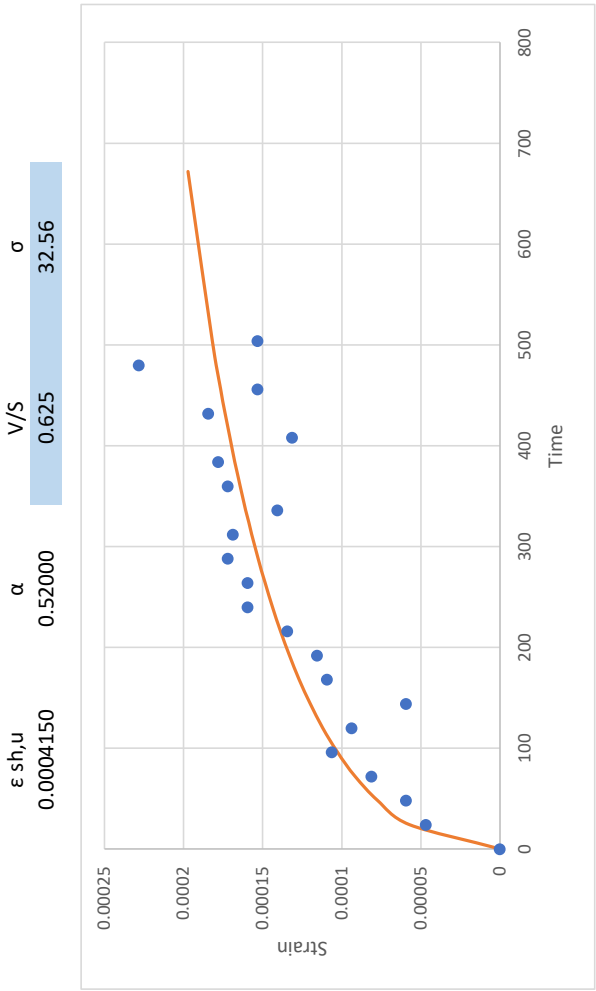
sum R^2 = 2.12E-08



Data Set # 4

time (hr)	strain μ	
0	0	0.00000000
24	4.68875E-05	0.00005734
48	5.9389E-05	0.00007758
72	8.12702E-05	0.00009176
96	0.000106275	0.00010289
120	9.37733E-05	0.00011213
144	5.93898E-05	0.00012006
168	0.000109401	0.00012701
192	0.000115653	0.00013321
216	0.000134406	0.00013881
240	0.000159411	0.00014392
264	0.000159412	0.00014861
288	0.000171914	0.00015296
312	0.000168791	0.00015700
336	0.000140659	0.00016078
360	0.000171917	0.00016432
384	0.000178168	0.00016767
408	0.000131284	0.00017083
432	0.00018442	0.00017382
456	0.000153163	0.00017667
480	0.000228173	0.00017938
504	0.000153163	0.00018197
672		0.00019737

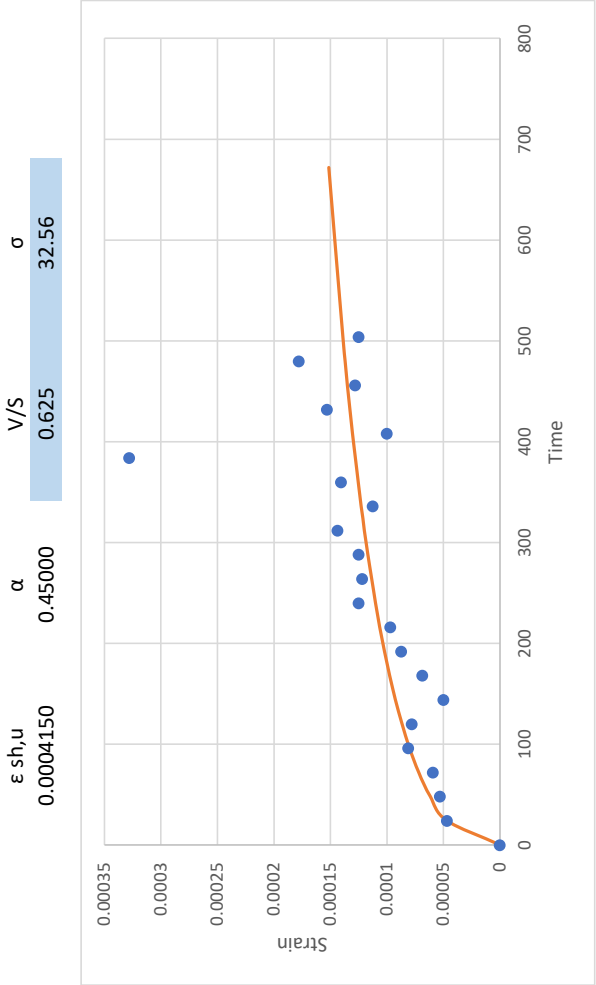
sum R^2 = 5.10E-08



Data Set # 5

time (hr)	strain μ	
0	0	0.00000000
24	4.68544E-05	0.00004721
48	5.30979E-05	0.00006191
72	5.93413E-05	0.00007215
96	8.12172E-05	0.00008019
120	7.80954E-05	0.00008689
144	4.99809E-05	0.00009266
168	6.87303E-05	0.00009775
192	8.74606E-05	0.00010231
216	9.68401E-05	0.00010645
240	0.000124955	0.00011024
264	0.000121828	0.00011375
288	0.000124955	0.00011701
312	0.000143699	0.00012006
336	0.000112468	0.00012293
360	0.000140578	0.00012563
384	0.000327886	0.00012819
408	9.9957E-05	0.00013062
432	0.000153069	0.00013293
456	0.000128076	0.00013514
480	0.000178057	0.00013725
504	0.000124955	0.00013928
672		0.00015150

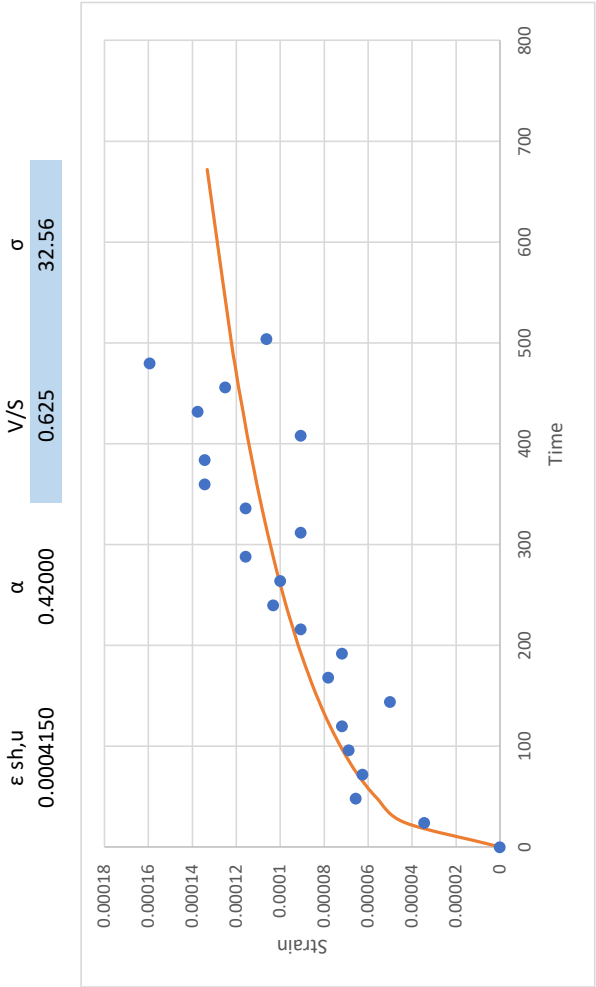
sum R^2 = 7.06E-08



Data Set # 6

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	3.43802E-05	0.00004336				
48	6.56362E-05	0.00005604				
72	6.25096E-05	0.00006482				
96	6.87612E-05	0.00007170				
120	7.18861E-05	0.00007743				
144	5.0009E-05	0.00008237				
168	7.81368E-05	0.00008673				
192	7.18861E-05	0.00009064				
216	9.06383E-05	0.00009419				
240	0.000103138	0.00009746				
264	0.000100012	0.00010047				
288	0.000115639	0.00010328				
312	9.06399E-05	0.00010591				
336	0.000115642	0.00010838				
360	0.000134391	0.00011072				
384	0.000134395	0.00011294				
408	9.06367E-05	0.00011504				
432	0.000137516	0.00011705				
456	0.000125016	0.00011896				
480	0.000159395	0.00012080				
504	0.000106263	0.00012256				
672		0.00013325				0.00000002

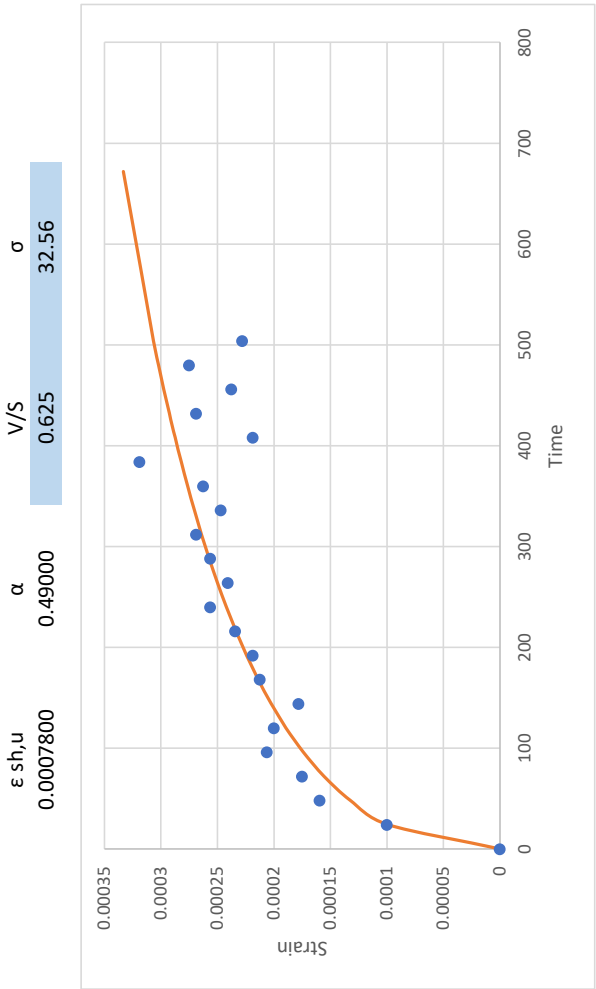
sum R^2 = 2.38E-08



Data Set # 7

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	0.000100024	0.00009922	0.00009922	0.00000000	0.00000000	0.00000000
48	0.000159412	0.00013254	0.00013254	0.00000000	0.00000000	0.00000000
72	0.000175041	0.00015585	0.00015585	0.00000000	0.00000000	0.00000000
96	0.000206297	0.00017417	0.00017417	0.00000000	0.00000000	0.00000000
120	0.000200047	0.00018941	0.00018941	0.00000000	0.00000000	0.00000000
144	0.000178168	0.00020251	0.00020251	0.00000000	0.00000000	0.00000000
168	0.00021255	0.00021404	0.00021404	0.00000000	0.00000000	0.00000000
192	0.000218802	0.00022435	0.00022435	0.00000000	0.00000000	0.00000000
216	0.000234429	0.00023369	0.00023369	0.00000000	0.00000000	0.00000000
240	0.000256308	0.00024222	0.00024222	0.00000000	0.00000000	0.00000000
264	0.00024068	0.00025009	0.00025009	0.00000000	0.00000000	0.00000000
288	0.000256308	0.00025739	0.00025739	0.00000000	0.00000000	0.00000000
312	0.000268811	0.00026420	0.00026420	0.00000000	0.00000000	0.00000000
336	0.000246932	0.00027058	0.00027058	0.00000000	0.00000000	0.00000000
360	0.000262559	0.00027658	0.00027658	0.00000000	0.00000000	0.00000000
384	0.000318815	0.00028225	0.00028225	0.00000000	0.00000000	0.00000000
408	0.000218801	0.00028763	0.00028763	0.00000000	0.00000000	0.00000000
432	0.00026881	0.00029273	0.00029273	0.00000000	0.00000000	0.00000000
456	0.000237555	0.00029759	0.00029759	0.00000000	0.00000000	0.00000000
480	0.000275061	0.00030223	0.00030223	0.00000000	0.00000000	0.00000000
504	0.000228178	0.00030667	0.00030667	0.00000001	0.00000001	0.00000001
672		0.00033326	0.00033326	0.00000011	0.00000011	0.00000011

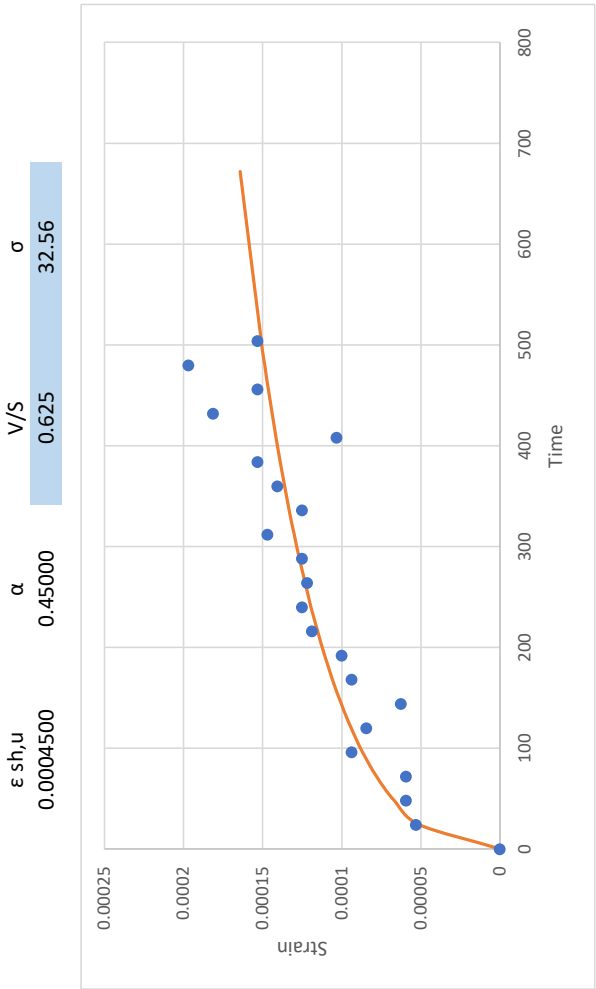
sum R^2 = 1.32E-07



Data Set # 8

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	5.31451E-05	0.00005119	0.00005119	0.00000000	0.00000000	0.00000000
48	5.9398E-05	0.00006713	0.00006713	0.00000000	0.00000000	0.00000000
72	5.93988E-05	0.00007823	0.00007823	0.00000000	0.00000000	0.00000000
96	9.37871E-05	0.00008695	0.00008695	0.00000000	0.00000000	0.00000000
120	8.44088E-05	0.00009422	0.00009422	0.00000000	0.00000000	0.00000000
144	6.25256E-05	0.00010047	0.00010047	0.00000000	0.00000000	0.00000000
168	9.37882E-05	0.00010599	0.00010599	0.00000000	0.00000000	0.00000000
192	0.000100041	0.00011094	0.00011094	0.00000000	0.00000000	0.00000000
216	0.000118799	0.00011543	0.00011543	0.00000000	0.00000000	0.00000000
240	0.000125052	0.00011954	0.00011954	0.00000000	0.00000000	0.00000000
264	0.000121925	0.00012334	0.00012334	0.00000000	0.00000000	0.00000000
288	0.000125052	0.00012688	0.00012688	0.00000000	0.00000000	0.00000000
312	0.000146935	0.00013019	0.00013019	0.00000000	0.00000000	0.00000000
336	0.000125052	0.00013330	0.00013330	0.00000000	0.00000000	0.00000000
360	0.000140683	0.00013623	0.00013623	0.00000000	0.00000000	0.00000000
384	0.000153188	0.00013900	0.00013900	0.00000000	0.00000000	0.00000000
408	0.000103168	0.00014164	0.00014164	0.00000000	0.00000000	0.00000000
432	0.000181323	0.00014414	0.00014414	0.00000000	0.00000000	0.00000000
456	0.000153188	0.00014654	0.00014654	0.00000000	0.00000000	0.00000000
480	0.000196956	0.00014883	0.00014883	0.00000000	0.00000000	0.00000000
504	0.000153188	0.00015102	0.00015102	0.00000000	0.00000000	0.00000000
672	0.000153188	0.00016428	0.00016428	0.00000003	0.00000000	0.00000000

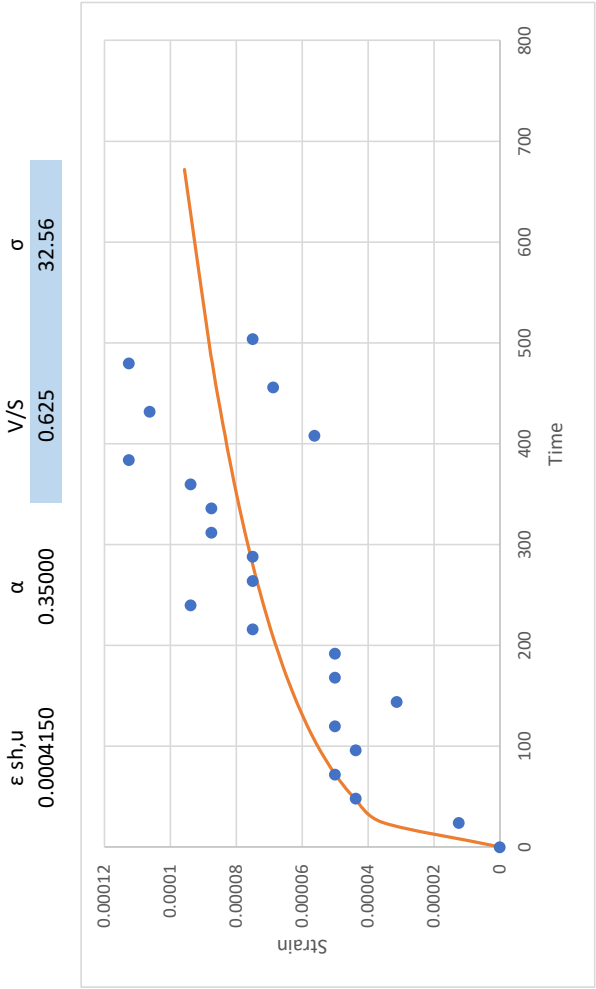
sum R^2 = 3.51E-08



Data Set # 9

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	1.25045E-05	0.00003545				
48	4.37656E-05	0.00004415				
72	5.00178E-05	0.00005007				
96	4.37656E-05	0.00005468				
120	5.00178E-05	0.00005849				
144	3.12611E-05	0.00006177				
168	5.00178E-05	0.00006466				
192	5.00178E-05	0.00006726				
216	7.50267E-05	0.00006961				
240	9.37834E-05	0.00007177				
264	7.50267E-05	0.00007378				
288	7.50267E-05	0.00007564				
312	8.75312E-05	0.00007739				
336	8.75312E-05	0.00007904				
360	9.37834E-05	0.00008059				
384	0.00011254	0.00008207				
408	5.627E-05	0.00008348				
432	0.000106288	0.00008482				
456	6.87745E-05	0.00008610				
480	0.00011254	0.00008733				
504	7.50267E-05	0.00008852				
672		0.00009573				

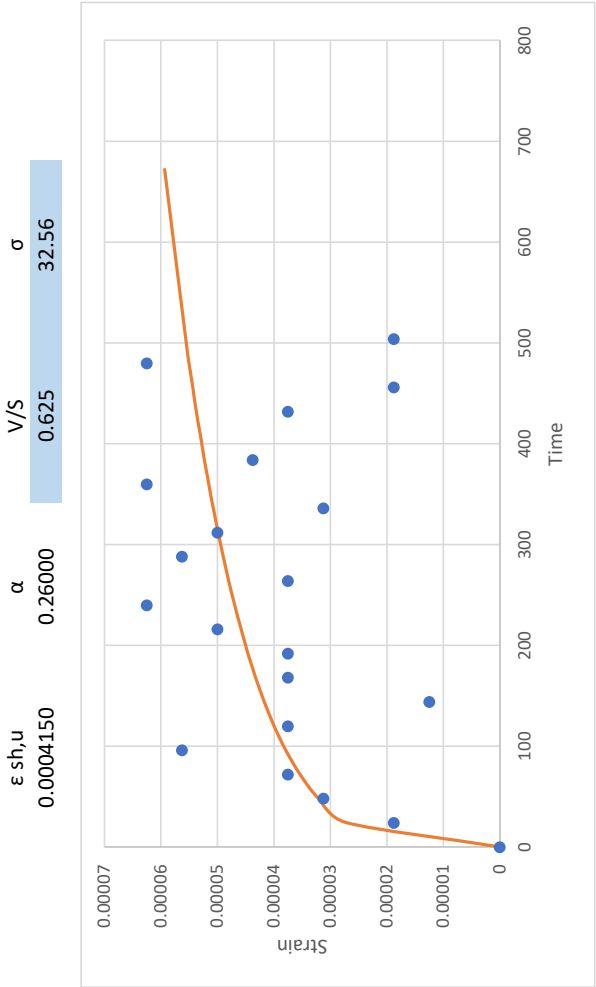
sum R^2 = 1.54E-08



Data Set # 10

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	1.87473E-05	0.00002721				
48	3.12455E-05	0.00003217				
72	3.74946E-05	0.00003544				
96	5.62419E-05	0.00003794				
120	3.74946E-05	0.00003999				
144	1.24982E-05	0.00004174				
168	3.74946E-05	0.00004326				
192	3.74946E-05	0.00004463				
216	4.99928E-05	0.00004586				
240	6.2491E-05	0.00004699				
264	3.74946E-05	0.00004803				
288	5.62419E-05	0.00004900				
312	4.99928E-05	0.00004991				
336	3.12455E-05	0.00005076				
360	6.2491E-05	0.00005157				
384	4.37437E-05	0.00005233				
408		0.00005305				
432	3.74946E-05	0.00005375				
456	1.87473E-05	0.00005441				
480	6.2491E-05	0.00005504				
504	1.87473E-05	0.00005565				
672		0.00005935				

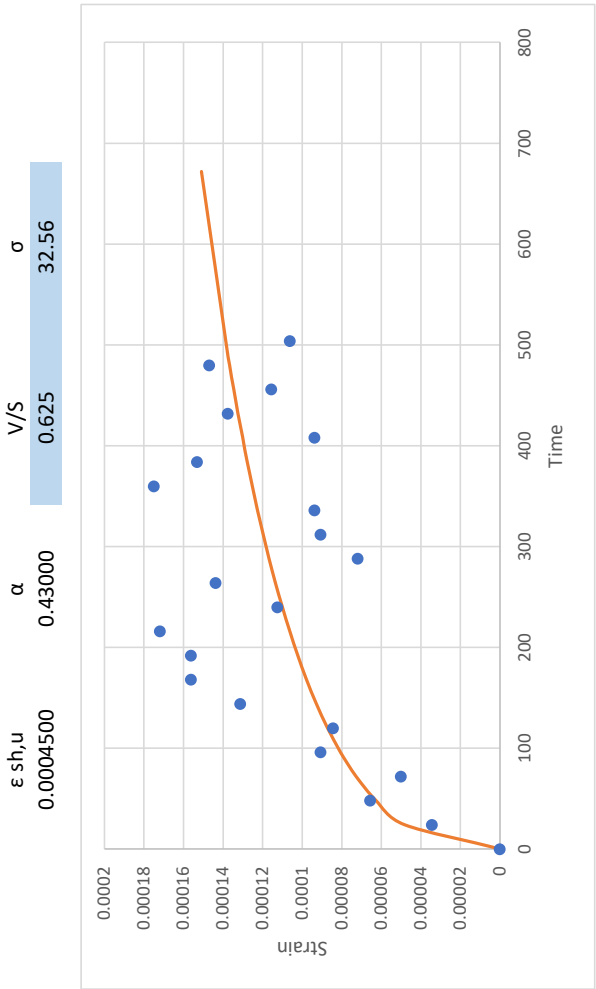
sum R^2 = 1.16E-08



Data Set # 11

time (hr)	strain μ	
0	0	0.00000000
24	3.43804E-05	0.00004838
48	6.5639E-05	0.00006283
72	5.00157E-05	0.00007286
96	9.06456E-05	0.00008073
120	8.43935E-05	0.00008728
144	0.000131268	0.00009293
168	0.000156273	0.00009791
192	0.000156273	0.00010238
216	0.000171903	0.00010644
240	0.000112526	0.00011017
264	0.000143798	0.00011362
288	7.1898E-05	0.00011682
312	9.06507E-05	0.00011982
336	9.37725E-05	0.00012265
360	0.00017503	0.00012531
384	0.000153153	0.00012784
408	9.3769E-05	0.00013023
432	0.000137528	0.00013252
456	0.000115649	0.00013470
480	0.000146906	0.00013680
504	0.000106272	0.00013880
672		0.00015095

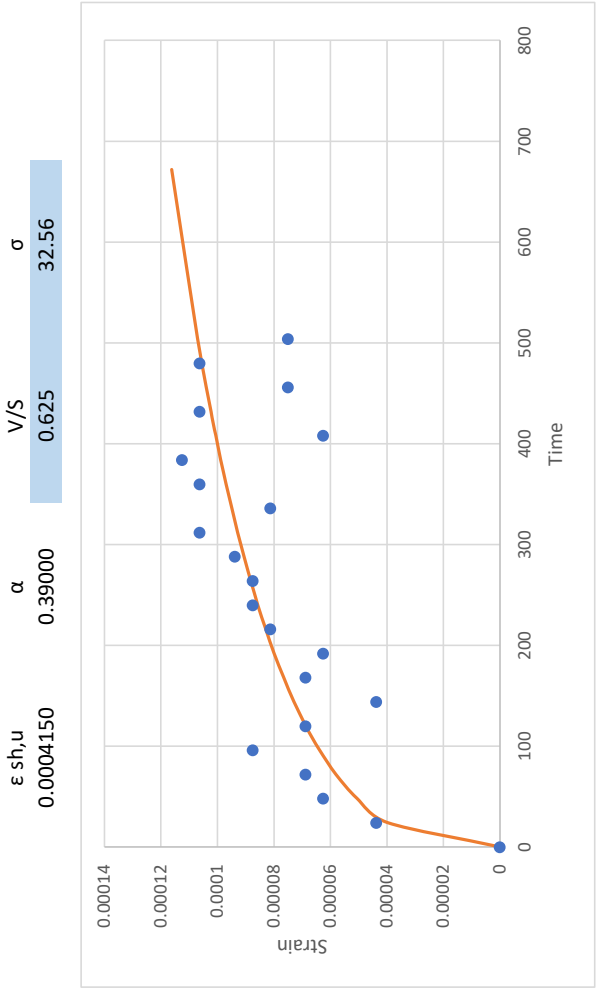
sum R^2 = 4.63E-08



Data Set # 12

time (hr)	strain μ	
0	0	0.00000000
24	4.37E-05	0.00003980
48	6.25285E-05	0.00005064
72	6.87814E-05	0.00005810
96	8.75399E-05	0.00006394
120	6.87814E-05	0.00006879
144	4.37E-05	0.00007297
168	6.87814E-05	0.00007666
192	6.25285E-05	0.00007996
216	8.12871E-05	0.00008297
240	8.75399E-05	0.00008573
264	8.75399E-05	0.00008829
288	9.37928E-05	0.00009067
312	0.000106298	0.00009290
336	8.12871E-05	0.00009500
360	0.000106298	0.00009699
384	0.000112551	0.00009887
408	6.25285E-05	0.00010066
432	0.000106298	0.00010237
456	7.50342E-05	0.00010401
480	0.000106298	0.00010557
504	7.50342E-05	0.00010708
672		0.00011623

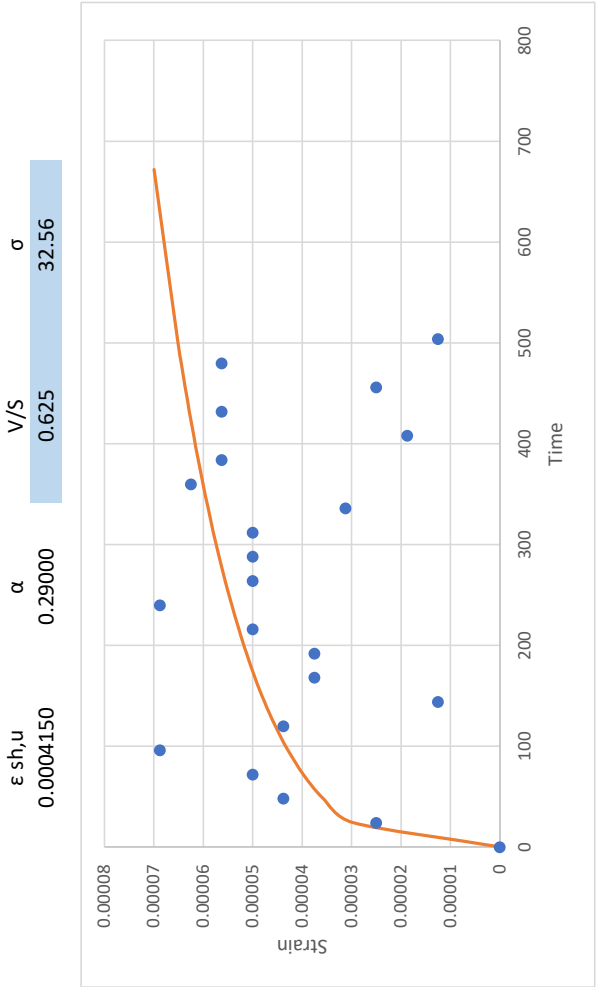
sum R^2 = 1.95E-08



Data Set # 13

time (hr)	strain μ	
0	0	0.00000000
24	2.50041E-05	0.00002974
48	4.37571E-05	0.00003579
72	5.00081E-05	0.00003983
96	6.87612E-05	0.00004293
120	4.37571E-05	0.00004549
144	1.2502E-05	0.00004767
168	3.75061E-05	0.00004959
192	3.75061E-05	0.00005131
216	5.00081E-05	0.00005287
240	6.87612E-05	0.00005429
264	5.00081E-05	0.00005561
288	5.00081E-05	0.00005684
312	5.00081E-05	0.00005798
336	3.12551E-05	0.00005906
360	6.25102E-05	0.00006008
384	5.62591E-05	0.00006105
408	1.8753E-05	0.00006197
432	5.62591E-05	0.00006285
456	2.50041E-05	0.00006369
480	5.62591E-05	0.00006450
504	1.2502E-05	0.00006527
672		0.00007000

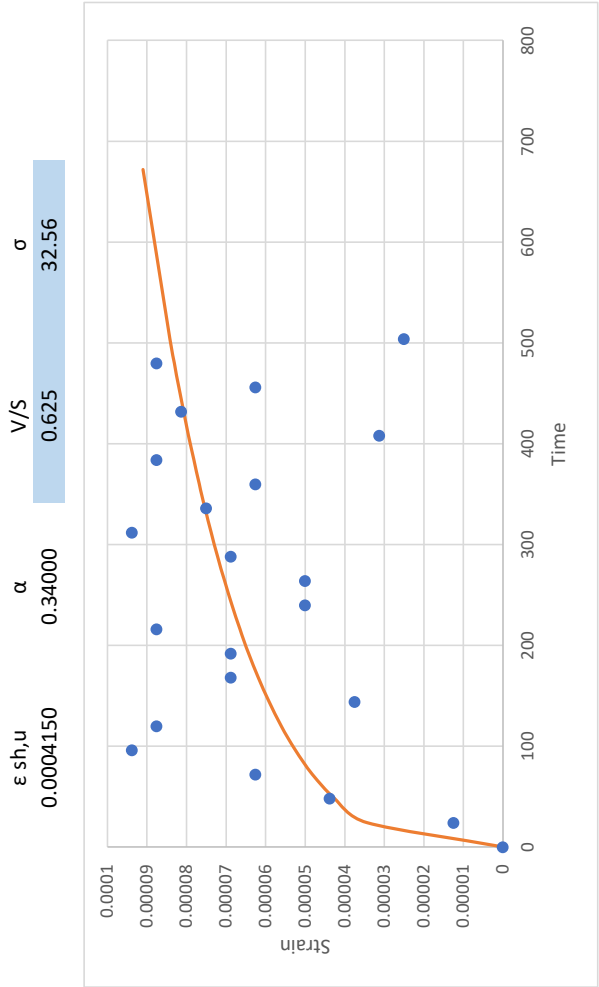
sum R^2 = 1.48E-08



Data Set # 14

time (hr)	strain μ	
0	0	0.00000000
24	1.25083E-05	0.00003444
48	4.3779E-05	0.00004265
72	6.25414E-05	0.00004822
96	9.38122E-05	0.00005255
120	8.7558E-05	0.00005613
144	3.75249E-05	0.00005920
168	6.87956E-05	0.00006191
192	6.87956E-05	0.00006434
216	8.7558E-05	0.00006655
240	5.00331E-05	0.00006858
264	5.00331E-05	0.00007045
288	6.87956E-05	0.00007220
312	9.38122E-05	0.00007384
336	7.50497E-05	0.00007538
360	6.25414E-05	0.00007684
384	8.7558E-05	0.00007822
408	3.12707E-05	0.00007954
432	8.13039E-05	0.00008080
456	6.25414E-05	0.00008200
480	8.7558E-05	0.00008315
504	2.50166E-05	0.00008426
672		0.00009102

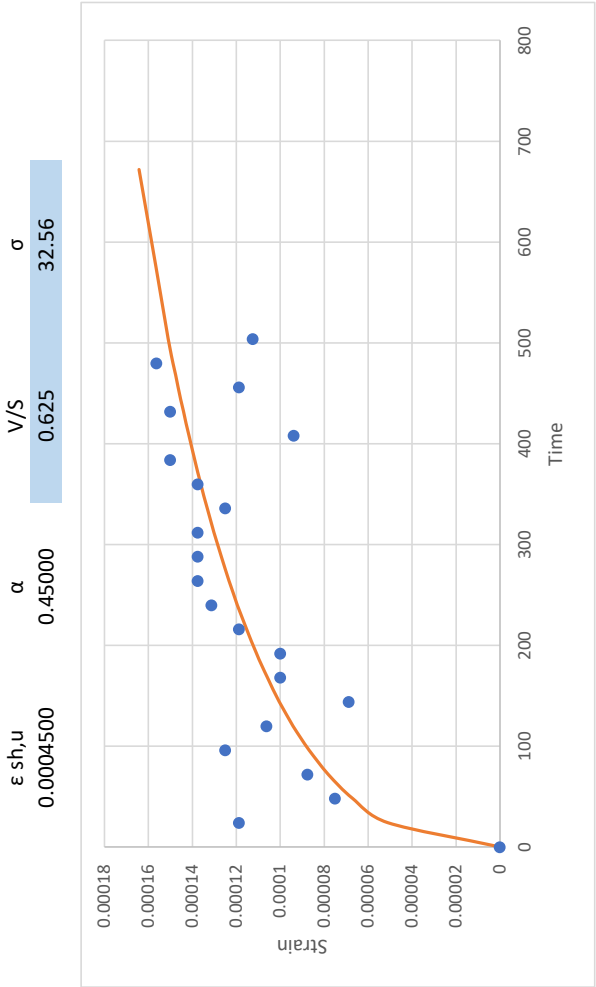
sum R^2 = 2.03E-08



Data Set # 15

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	0.000118779	0.00005119	0.00005119	0.00000000	0.00000000	0.00000000
48	7.50202E-05	0.00006713	0.00006713	0.00000000	0.00000000	0.00000000
72	8.75235E-05	0.00007823	0.00007823	0.00000000	0.00000000	0.00000000
96	0.000125034	0.00008695	0.00008695	0.00000000	0.00000000	0.00000000
120	0.000106279	0.00009422	0.00009422	0.00000000	0.00000000	0.00000000
144	6.87685E-05	0.00010047	0.00010047	0.00000000	0.00000000	0.00000000
168	0.000100027	0.00010599	0.00010599	0.00000000	0.00000000	0.00000000
192	0.000100027	0.00011094	0.00011094	0.00000000	0.00000000	0.00000000
216	0.000118782	0.00011543	0.00011543	0.00000000	0.00000000	0.00000000
240	0.000131285	0.00011954	0.00011954	0.00000000	0.00000000	0.00000000
264	0.000137537	0.00012334	0.00012334	0.00000000	0.00000000	0.00000000
288	0.000137537	0.00012688	0.00012688	0.00000000	0.00000000	0.00000000
312	0.000137537	0.00013019	0.00013019	0.00000000	0.00000000	0.00000000
336	0.000125034	0.00013330	0.00013330	0.00000000	0.00000000	0.00000000
360	0.000137537	0.00013623	0.00013623	0.00000000	0.00000000	0.00000000
384	0.00015004	0.00013900	0.00013900	0.00000000	0.00000000	0.00000000
408	9.37752E-05	0.00014164	0.00014164	0.00000000	0.00000000	0.00000000
432	0.00015004	0.00014414	0.00014414	0.00000000	0.00000000	0.00000000
456	0.000118782	0.00014654	0.00014654	0.00000000	0.00000000	0.00000000
480	0.000156292	0.00014883	0.00014883	0.00000000	0.00000000	0.00000000
504	0.00011253	0.00015102	0.00015102	0.00000000	0.00000000	0.00000000
672		0.00016428	0.00016428	0.00000003	0.00000000	0.00000003

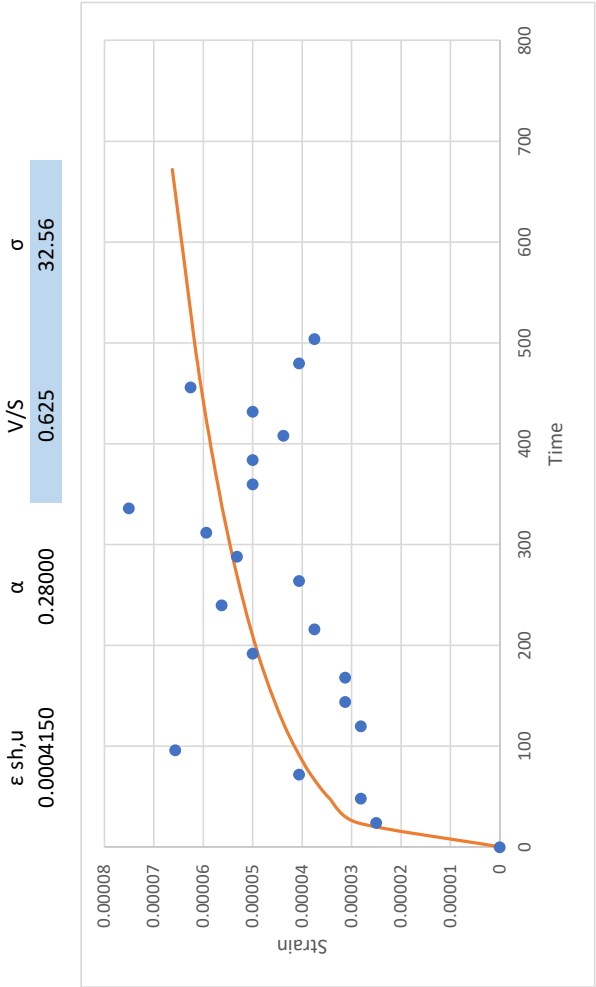
sum R^2 = 3.98E-08



Data Set # 16

time (hr)	strain μ	
0	0	0.00000000
24	2.50094E-05	0.00002887
48	2.81352E-05	0.00003454
72	4.06398E-05	0.00003831
96	6.56481E-05	0.00004121
120	2.81359E-05	0.00004359
144	3.12621E-05	0.00004562
168	3.12621E-05	0.00004740
192	5.00194E-05	0.00004899
216	3.75142E-05	0.00005044
240	5.62708E-05	0.00005176
264	4.06404E-05	0.00005298
288	5.31449E-05	0.00005411
312	5.93974E-05	0.00005518
336	7.50291E-05	0.00005618
360	5.00187E-05	0.00005712
384	5.00187E-05	0.00005802
408	4.3767E-05	0.00005887
432	5.00194E-05	0.00005968
456	6.25242E-05	0.00006046
480	4.06404E-05	0.00006121
504	3.75145E-05	0.00006192
672		0.00006629

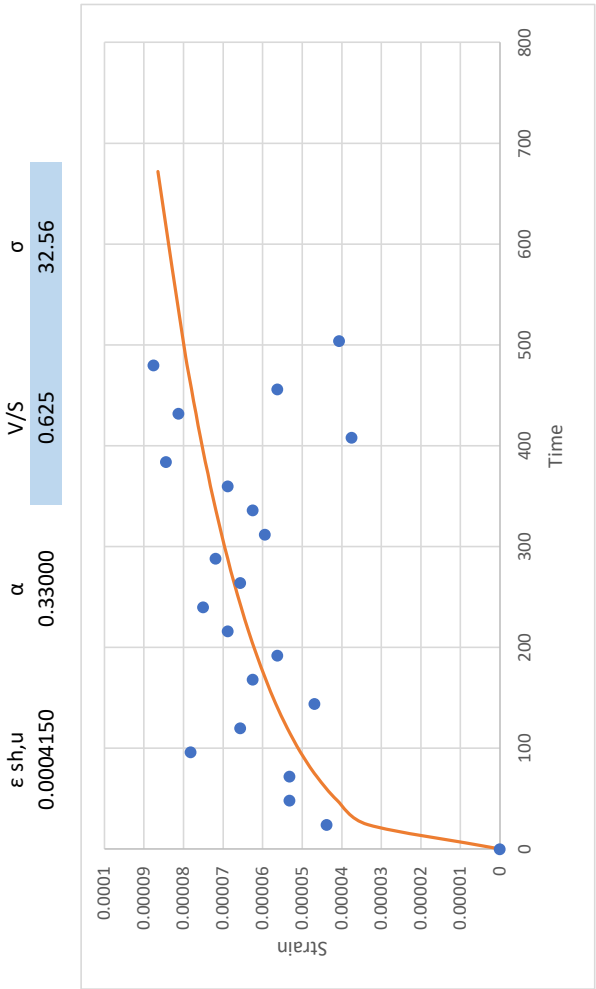
sum R^2 = 7.93E-09



Data Set # 17

time (hr)	strain μ	
0	0	0.00000000
24	4.37715E-05	0.00003345
48	5.31508E-05	0.00004119
72	5.31506E-05	0.00004643
96	7.8163E-05	0.00005049
120	6.56571E-05	0.00005384
144	4.68982E-05	0.00005673
168	6.25307E-05	0.00005926
192	5.62776E-05	0.00006154
216	6.87837E-05	0.00006360
240	7.5037E-05	0.00006550
264	6.56573E-05	0.00006725
288	7.19103E-05	0.00006889
312	5.9405E-05	0.00007042
336	6.25311E-05	0.00007186
360	6.87843E-05	0.00007322
384	8.44168E-05	0.00007451
408	3.75191E-05	0.00007575
432	8.12902E-05	0.00007692
456	5.6278E-05	0.00007804
480	8.75437E-05	0.00007912
504	4.06457E-05	0.00008016
672		0.00008648

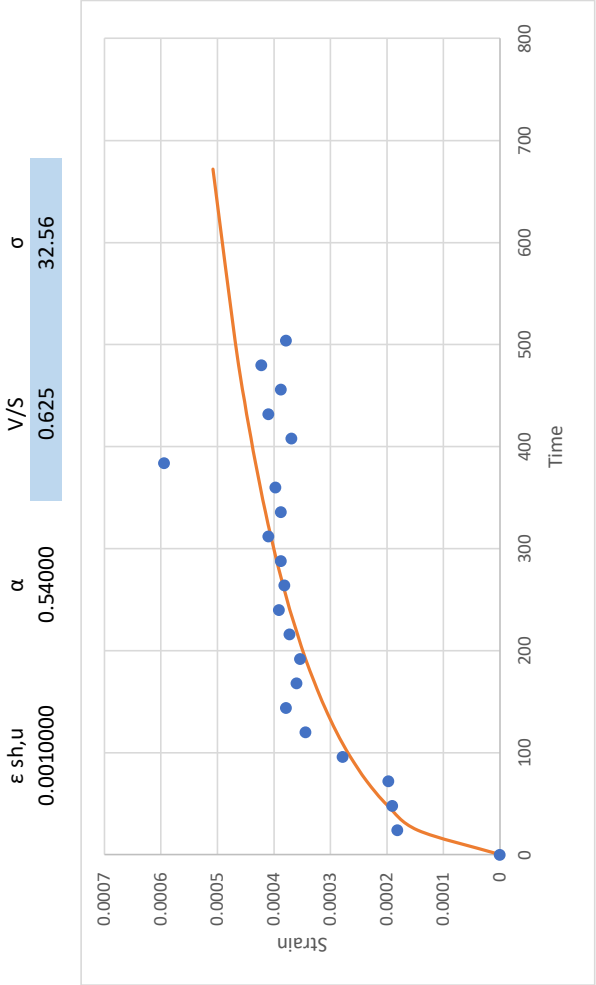
sum R^2 = 1.29E-08



Data Set # 18

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	0.000181414	0.00014592	0.00014592	0.00000000	0.00000000	0.00000000
48	0.000190798	0.00019899	0.00019899	0.00000000	0.00000000	0.00000000
72	0.000197053	0.00023619	0.00023619	0.00000000	0.00000000	0.00000000
96	0.000278376	0.00026535	0.00026535	0.00000000	0.00000000	0.00000000
120	0.000344062	0.00028949	0.00028949	0.00000000	0.00000000	0.00000000
144	0.000378466	0.00031015	0.00031015	0.00000000	0.00000000	0.00000000
168	0.000359701	0.00032824	0.00032824	0.00000000	0.00000000	0.00000000
192	0.000353445	0.00034433	0.00034433	0.00000000	0.00000000	0.00000000
216	0.000372212	0.00035883	0.00035883	0.00000000	0.00000000	0.00000000
240	0.000390978	0.00037202	0.00037202	0.00000000	0.00000000	0.00000000
264	0.000381595	0.00038412	0.00038412	0.00000000	0.00000000	0.00000000
288	0.00038785	0.00039530	0.00039530	0.00000000	0.00000000	0.00000000
312	0.000409744	0.00040567	0.00040567	0.00000000	0.00000000	0.00000000
336	0.00038785	0.00041536	0.00041536	0.00000000	0.00000000	0.00000000
360	0.000397233	0.00042443	0.00042443	0.00000000	0.00000000	0.00000000
384	0.000594274	0.00043297	0.00043297	0.00000003	0.00000000	0.00000000
408	0.000369084	0.00044102	0.00044102	0.00000001	0.00000000	0.00000000
432	0.000409744	0.00044865	0.00044865	0.00000000	0.00000000	0.00000000
456	0.00038785	0.00045588	0.00045588	0.00000000	0.00000000	0.00000000
480	0.000422256	0.00046276	0.00046276	0.00000000	0.00000000	0.00000000
504	0.000378467	0.00046931	0.00046931	0.00000001	0.00000000	0.00000000
672		0.00050811	0.00050811	0.00000026	0.00000000	0.00000026

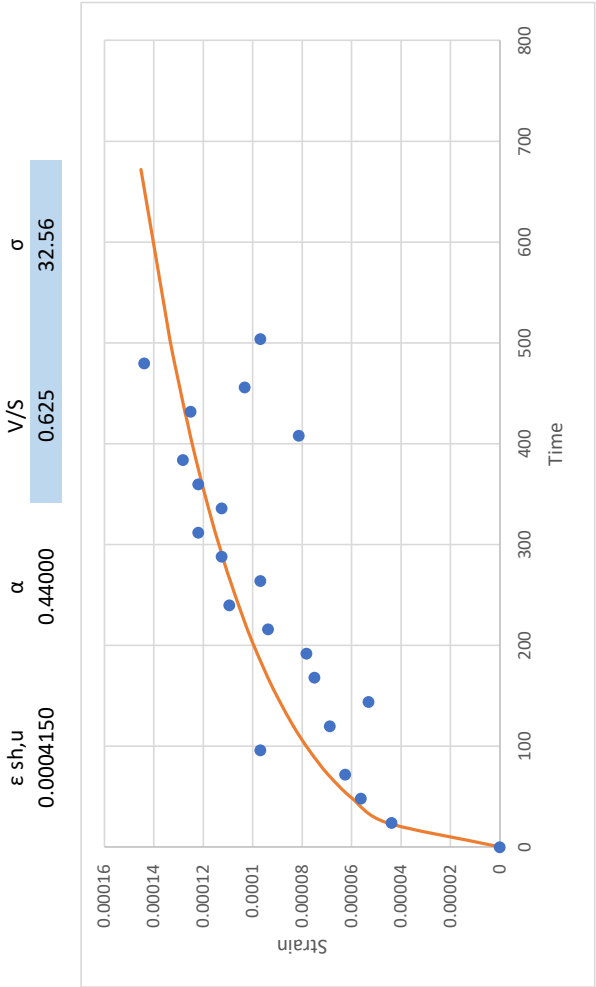
sum R^2 = 3.19E-07



Data Set # 19

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	4.37814E-05	0.00004589				
48	5.62894E-05	0.00005990				
72	6.25431E-05	0.00006963				
96	9.69425E-05	0.00007728				
120	6.87975E-05	0.00008365				
144	5.31626E-05	0.00008913				
168	7.50525E-05	0.00009397				
192	7.81801E-05	0.00009831				
216	9.38157E-05	0.00010225				
240	0.000109451	0.00010586				
264	9.69432E-05	0.00010921				
288	0.00011258	0.00011231				
312	0.000121961	0.00011522				
336	0.00011258	0.00011796				
360	0.000121961	0.00012054				
384	0.000128214	0.00012298				
408	8.13069E-05	0.00012530				
432	0.000125088	0.00012751				
456	0.000103198	0.00012962				
480	0.000143851	0.00013164				
504	9.69432E-05	0.00013358				
672		0.00014529				0.00000002

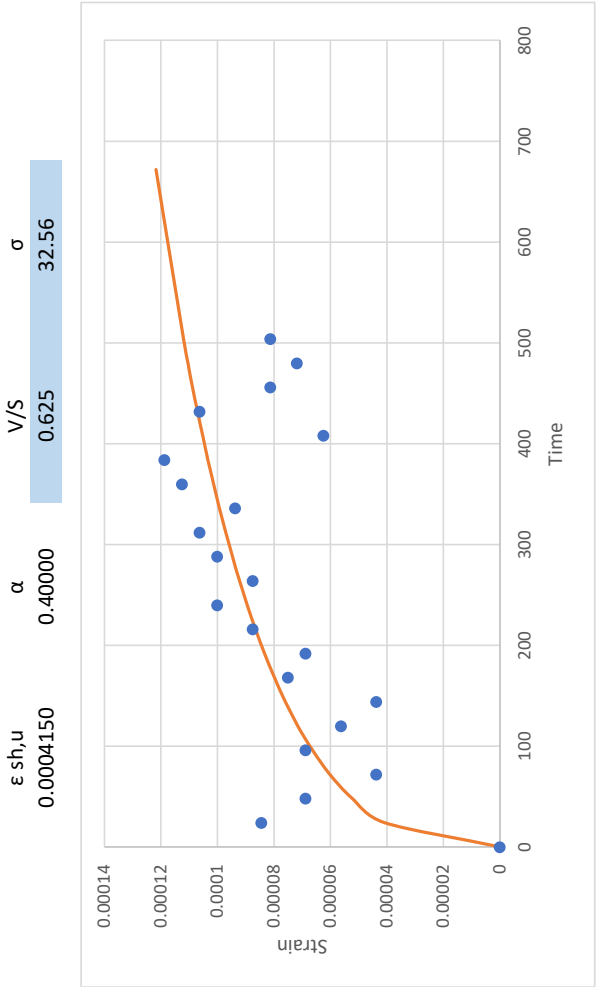
sum R^2 = 2.83E-08



Data Set # 20

time (hr)	strain μ	
0	0	0.00000000
24	8.44001E-05	0.00004096
48	6.87679E-05	0.00005239
72	4.37541E-05	0.00006027
96	6.87564E-05	0.00006645
120	5.62553E-05	0.00007158
144	4.37541E-05	0.00007601
168	7.5007E-05	0.00007991
192	6.87564E-05	0.00008341
216	8.75082E-05	0.00008660
240	0.000100009	0.00008952
264	8.75082E-05	0.00009223
288	0.000100009	0.00009475
312	0.00010626	0.00009711
336	9.37588E-05	0.00009933
360	0.000112511	0.00010143
384	0.000118761	0.00010342
408	6.25059E-05	0.00010532
432	0.00010626	0.00010712
456	8.12576E-05	0.00010885
480	7.18842E-05	0.00011051
504	8.12576E-05	0.00011210
672		0.00012176

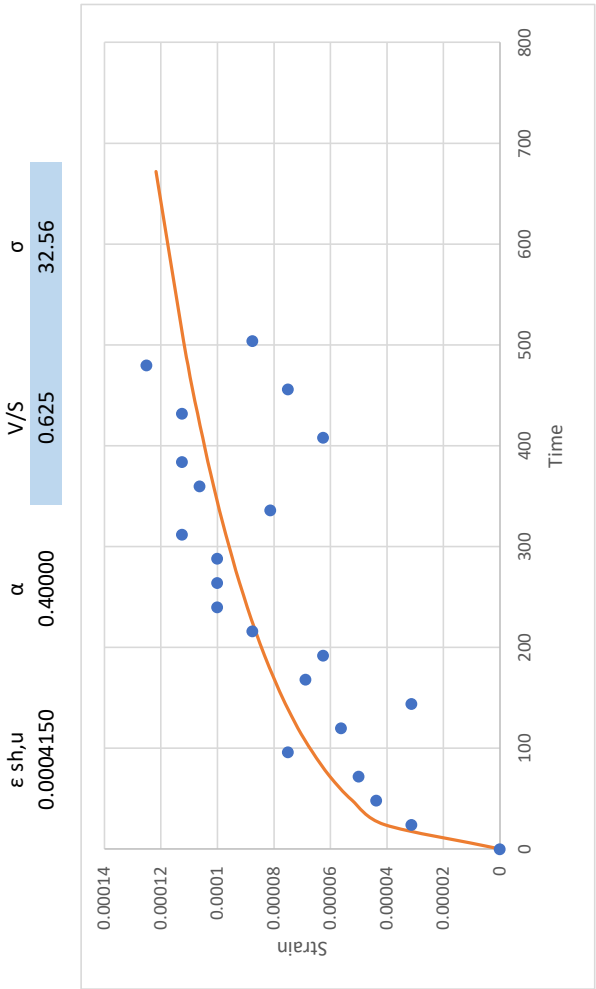
sum R^2 = 2.44E-08



Data Set # 21

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	3.1266E-05	0.00004096	0.00004096	0.00000000	0.00000000	0.00000000
48	4.37724E-05	0.00005239	0.00005239	0.00000000	0.00000000	0.00000000
72	5.00256E-05	0.00006027	0.00006027	0.00000000	0.00000000	0.00000000
96	7.50385E-05	0.00006645	0.00006645	0.00000000	0.00000000	0.00000000
120	5.62788E-05	0.00007158	0.00007158	0.00000000	0.00000000	0.00000000
144	3.1266E-05	0.00007601	0.00007601	0.00000000	0.00000000	0.00000000
168	6.87853E-05	0.00007991	0.00007991	0.00000000	0.00000000	0.00000000
192	6.2532E-05	0.00008341	0.00008341	0.00000000	0.00000000	0.00000000
216	8.75449E-05	0.00008660	0.00008660	0.00000000	0.00000000	0.00000000
240	0.000100051	0.00008952	0.00008952	0.00000000	0.00000000	0.00000000
264	0.000100051	0.00009223	0.00009223	0.00000000	0.00000000	0.00000000
288	0.000100051	0.00009475	0.00009475	0.00000000	0.00000000	0.00000000
312	0.000112558	0.00009711	0.00009711	0.00000000	0.00000000	0.00000000
336	8.12917E-05	0.00009933	0.00009933	0.00000000	0.00000000	0.00000000
360	0.000106304	0.00010143	0.00010143	0.00000000	0.00000000	0.00000000
384	0.000112558	0.00010342	0.00010342	0.00000000	0.00000000	0.00000000
408	6.2532E-05	0.00010532	0.00010532	0.00000000	0.00000000	0.00000000
432	0.000112558	0.00010712	0.00010712	0.00000000	0.00000000	0.00000000
456	7.50385E-05	0.00010885	0.00010885	0.00000000	0.00000000	0.00000000
480	0.000125064	0.00011051	0.00011051	0.00000000	0.00000000	0.00000000
504	8.75449E-05	0.00011210	0.00011210	0.00000000	0.00000000	0.00000000
672		0.00012176	0.00012176	0.00000001	0.00000000	0.00000001

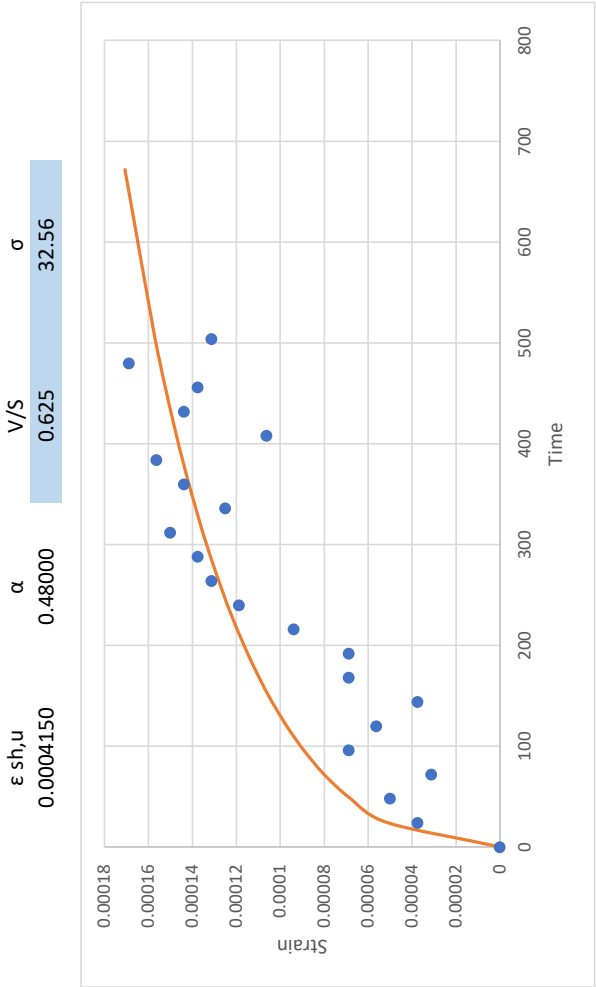
sum R^2 = 2.27E-08



Data Set # 22

time (hr)	strain μ	
0	0	0.00000000
24	3.75117E-05	0.00005135
48	5.00156E-05	0.00006828
72	3.12598E-05	0.00008012
96	6.87715E-05	0.00008942
120	5.62676E-05	0.00009717
144	3.75117E-05	0.00010383
168	6.87715E-05	0.00010970
192	6.87715E-05	0.00011495
216	9.37793E-05	0.00011970
240	0.000118787	0.00012406
264	0.000131291	0.00012807
288	0.000137543	0.00013180
312	0.000150047	0.00013528
336	0.000125039	0.00013854
360	0.000143795	0.00014162
384	0.000156299	0.00014452
408	0.000106283	0.00014727
432	0.000143795	0.00014989
456	0.000137543	0.00015238
480	0.000168803	0.00015476
504	0.000131291	0.00015704
672		0.00017073

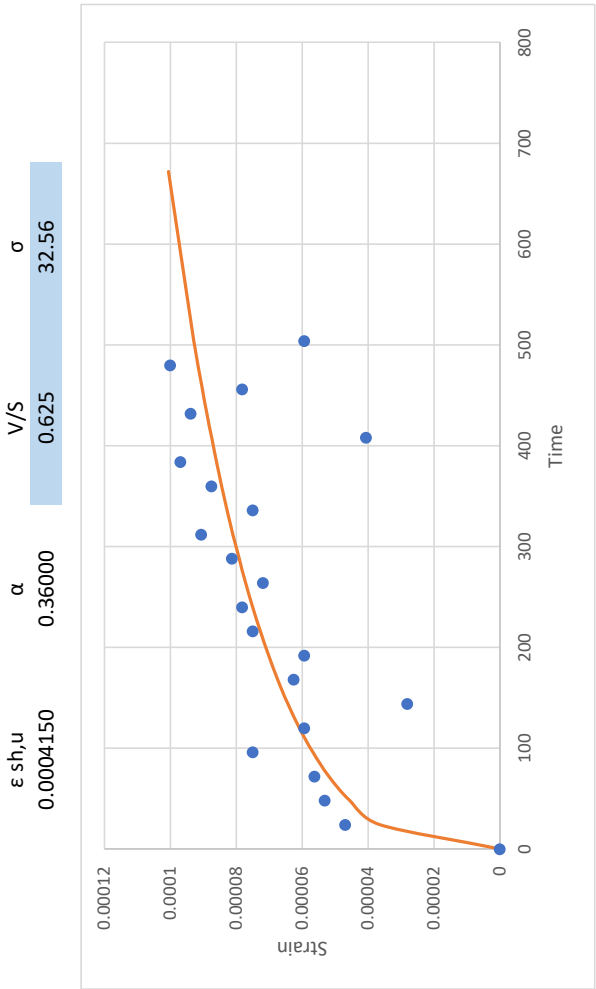
sum R^2 = 4.65E-08



Data Set # 23

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	4.68934E-05	0.00003650				
48	5.31395E-05	0.00004570				
72	5.62704E-05	0.00005198				
96	7.50266E-05	0.00005688				
120	5.93994E-05	0.00006094				
144	2.81411E-05	0.00006443				
168	6.25264E-05	0.00006751				
192	5.94014E-05	0.00007027				
216	7.50286E-05	0.00007278				
240	7.81576E-05	0.00007509				
264	7.19055E-05	0.00007722				
288	8.12826E-05	0.00007921				
312	9.06617E-05	0.00008107				
336	7.50305E-05	0.00008282				
360	8.75347E-05	0.00008448				
384	9.69137E-05	0.00008606				
408	4.06472E-05	0.00008756				
432	9.37887E-05	0.00008899				
456	7.81556E-05	0.00009035				
480	0.000100039	0.00009167				
504	5.94034E-05	0.00009293				
672		0.00010061				0.00000001

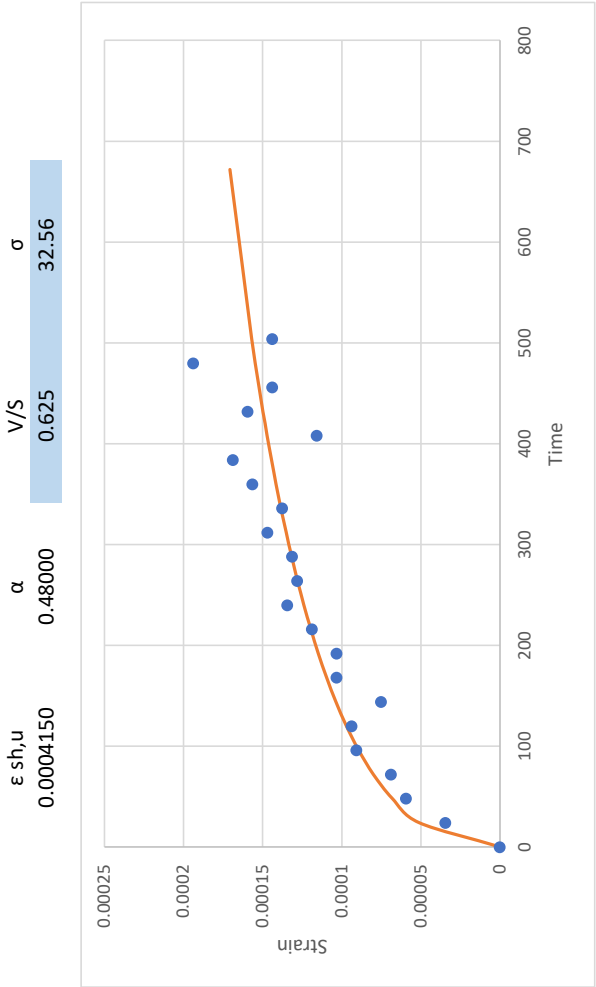
sum R^2 = 1.60E-08



Data Set # 24

time (hr)	strain μ	
0	0	0.00000000
24	3.43966E-05	0.00005135
48	5.94121E-05	0.00006828
72	6.87926E-05	0.00008012
96	9.06808E-05	0.00008942
120	9.38087E-05	0.00009717
144	7.50471E-05	0.00010383
168	0.000103189	0.00010970
192	0.000103188	0.00011495
216	0.000118822	0.00011970
240	0.000134457	0.00012406
264	0.000128203	0.00012807
288	0.000131329	0.00013180
312	0.000146965	0.00013528
336	0.000137584	0.00013854
360	0.000156345	0.00014162
384	0.000168853	0.00014452
408	0.00015695	0.00014727
432	0.000159471	0.00014989
456	0.000143837	0.00015238
480	0.00019387	0.00015476
504	0.000143837	0.00015704
672		0.00017073

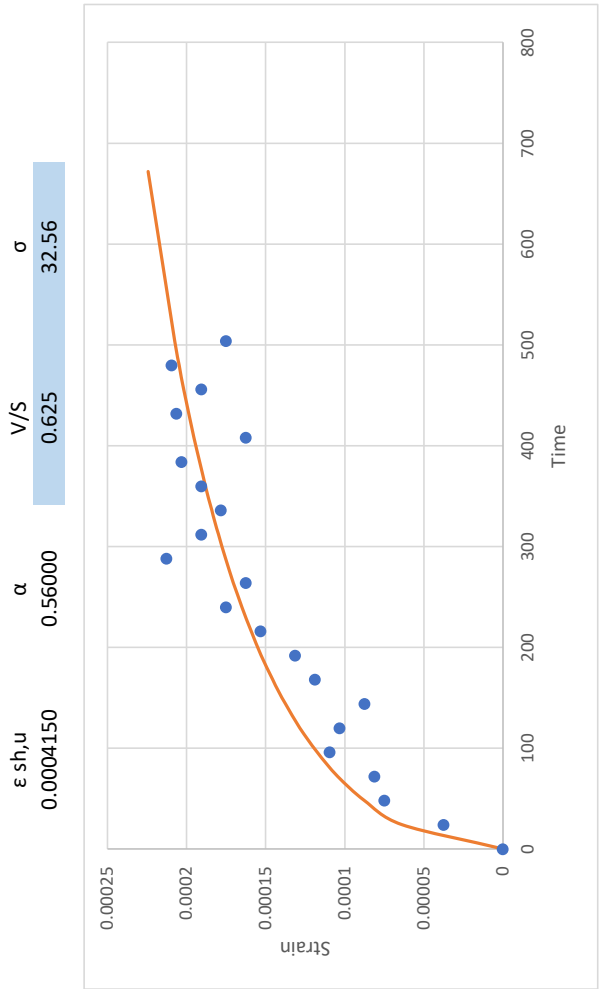
sum R^2 = 3.46E-08



Data Set # 25

time (hr)	strain μ	
0	0	0.00000000
24	3.7512E-05	0.00006392
48	7.50239E-05	0.00008782
72	8.12768E-05	0.00010457
96	0.000109413	0.00011766
120	0.00010316	0.00012847
144	8.75298E-05	0.00013770
168	0.000118792	0.00014576
192	0.000131295	0.00015290
216	0.000153177	0.00015933
240	0.000175059	0.00016516
264	0.000162557	0.00017049
288	0.000212575	0.00017541
312	0.000190693	0.00017996
336	0.000178187	0.00018420
360	0.000190693	0.00018817
384	0.000203195	0.00019189
408	0.000162557	0.00019540
432	0.000206321	0.00019871
456	0.000190694	0.00020185
480	0.00020945	0.00020483
504	0.000175063	0.00020766
672		0.00022434

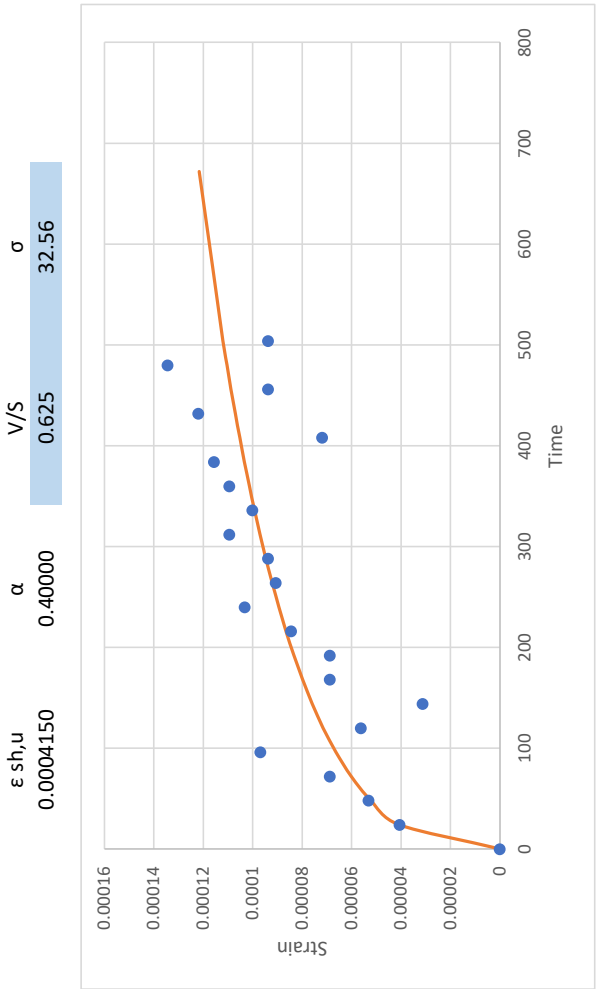
sum R^2 = 5.97E-08



Data Set # 26

time (hr)	strain μ					
0	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
24	4.06377E-05	0.00004096				
48	5.3147E-05	0.00005239				
72	6.8771E-05	0.00006027				
96	9.69187E-05	0.00006645				
120	5.62855E-05	0.00007158				
144	3.12712E-05	0.00007601				
168	6.8786E-05	0.00007991				
192	6.8786E-05	0.00008341				
216	8.44205E-05	0.00008660				
240	0.000103178	0.00008952				
264	9.06707E-05	0.00009223				
288	9.37981E-05	0.00009475				
312	0.00010943	0.00009711				
336	0.000100055	0.00009933				
360	0.00010943	0.00010143				
384	0.000115681	0.00010342				
408	7.19133E-05	0.00010532				
432	0.000121935	0.00010712				
456	9.37959E-05	0.00010885				
480	0.00013444	0.00011051				
504	9.38003E-05	0.00011210				
672		0.00012176				

sum R^2 = 2.14E-08



APPENDIX B – Creep Models

Test Sample: Normal Strength f_c desired: 6 ksi Load Applied: 11250 lbs

Load Applied: 30% f_c measured: 5.178 ksi

Date	AVERAGE STRAINS - NSC 0.30f _c CREEP TEST																									
	12/20/2021 11:30:00 AM	12/20/2021 12:15:00 PM	12/20/2021 12:45:00 PM	12/20/2021 3:30:00 PM	12/20/2021 6:30:00 PM	12/20/2021 9:30:00 PM	12/21/2021 12:30:00 PM	12/21/2021 12:30:00 PM	12/22/2021 12:30:00 PM	12/23/2021 12:30:00 PM	12/23/2021 12:30:00 PM	12/27/2021 12:30:00 PM	1/3/2022 12:30:00 PM	1/10/2022 12:30:00 PM	1/17/2022 12:30:00 PM											
Relative Humidity	49.3	49.3	50.3	50.3	49.9	49.9	50.1	50.1	50.1	50	50	50	50.2	50	50.1											
Air Temp	23.2	23.2	23.0	23.0	23.0	23.0	22.9	22.9	23.0	22.9	22.9	23.0	22.9	22.9	22.9											
Time (hrs)	0	0.1	3	6	9	9	24	48	72	168	504	672														
Point of Measure	1	0.00000000	0.00018432	0.00019682	0.00044363	0.00041864	0.00048737	0.00036552	0.00045300	0.00052798	0.00059983	0.00067335	0.00074723	0.00082111	0.00089519											
	2	0.00000000	0.00008132	0.00008444	0.00014072	0.00014698	0.00017199	0.00026892	0.00027517	0.00041901	0.00051281	0.00063778	0.00074723	0.00085614	0.00096506											
	3	0.00000000	0.00007815	0.00010627	0.00011564	0.00010001	0.00014691	0.00019693	0.00022194	0.00025283	0.00032507	0.00041883	0.00052798	0.00063778	0.00074723											
	4	0.00000000	0.00013754	0.00021882	0.00018130	0.00020006	0.00024382	0.00018445	0.00038452	0.00038143	0.00042833	0.00047233	0.00052798	0.00058132	0.00063579											
	5	0.00000000	0.00026949	0.00022562				0.00031315	0.00025036	0.00058540	0.00063150	0.00067760	0.00072370	0.00076980	0.00081590											
	6	0.00000000	0.00019696	0.00027510	0.00026261	0.00026886	0.00031576	0.00043143	0.00042517	0.00063150	0.00067760	0.00072370	0.00076980	0.00081590	0.00086200											
	7	0.00000000	0.00005940	0.00011568	0.00019695	0.00015945	0.00023447	0.00034700	0.00064093	0.00090665	0.00117237	0.00143809	0.00170381	0.00196953	0.00223525											
	8	0.00000000	0.00020943	0.00027821	0.00031568	0.00024381	0.00038136	0.00054070	0.00069081	0.00084092	0.00099103	0.00114114	0.00129125	0.00144136	0.00159147											
	9	0.00000000	0.00016574	0.00025330	0.00024705	0.00026581	0.00034397	0.00043467	0.00051597	0.00059727	0.00067857	0.00075987	0.00084117	0.00092247	0.00100377											
	10	0.00000000	0.00007815	0.00018448	0.00013757	0.00012506	0.00015319	0.00032204	0.00043148	0.00044709	0.00046270	0.00047831	0.00049392	0.00050953	0.00052514											
	11	0.00000000	0.00017191	0.00031567	0.00020942	0.00020942	0.00027506	0.00044385	0.00045010	0.00046571	0.00048132	0.00049693	0.00051254	0.00052815	0.00054376											
	12	0.00000000	0.00023123	0.00030622	0.00021873	0.00027185	0.00028762	0.00036871	0.00045952	0.00049078	0.00052207	0.00055330	0.00058456	0.00061582	0.00064708											
	13	0.00000000	0.00025008	0.00029384	0.00031572	0.00031885	0.00038762	0.00045952	0.00049078	0.00052207	0.00055330	0.00058456	0.00061582	0.00064708	0.00067834											
	14	0.00000000	0.00016252	0.00021565	0.00023753	0.00024378	0.00030941	0.00043130	0.00041880	0.00045620	0.00049360	0.00053100	0.00056840	0.00060580	0.00064320											
	15	0.00000000	0.00030326	0.00033139	0.00037517	0.00037830	0.00041269	0.00051587	0.00050336	0.00054076	0.00057816	0.00061556	0.00065296	0.00069036	0.00072776											
	16	0.00000000	0.00033754	0.00039380	0.00041568	0.00038131	0.00041257	0.00055321	0.00052196	0.00055936	0.00059676	0.00063416	0.00067156	0.00070896	0.00074636											
	17	0.00000000	0.00025626	0.00035313	0.00033751	0.00033751	0.00036566	0.00050627	0.00050940	0.00054680	0.00058420	0.00062160	0.00065900	0.00069640	0.00073380											
	18	0.00000000	0.00030617	0.00036866	0.00038428	0.00040303	0.00044052	0.00050615	0.00052489	0.00056151	0.00059802	0.00063453	0.00067104	0.00070755	0.00074406											
	19	0.00000000	0.00028761	0.00038452	0.00038139	0.00037827	0.00040015	0.00048143	0.00051894	0.00055645	0.00059396	0.00063147	0.00066898	0.00070649	0.00074400											
	20	0.00000000	0.00031871	0.00037183	0.00042182	0.00039057	0.00044682	0.00052806	0.00055305	0.00058845	0.00062385	0.00065925	0.00069465	0.00073005	0.00076545											
	21	0.00000000	0.00030309	0.00040622	0.00039996	0.00037809	0.00041871	0.00051870	0.00055308	0.00058746	0.00062184	0.00065622	0.00069060	0.00072498	0.00075936											
	22	0.00000000	0.00031569	0.00039070	0.00040320	0.00041258	0.00045321	0.00057823	0.00055011	0.00058451	0.00061891	0.00065331	0.00068771	0.00072211	0.00075651											
	23	0.00000000	0.00030004	0.00032192	0.00034692	0.00036255	0.00038755	0.00044694	0.00048444	0.00052194	0.00055944	0.00059694	0.00063444	0.00067194	0.00070944											
	24	0.00000000	0.00018742	0.00022804	0.00024366	0.00029368	0.00032180	0.00039366	0.00045305	0.00049054	0.00052803	0.00056552	0.00060301	0.00064050	0.00067799											
	25	0.00000000	0.00033122	0.00037496	0.00038746	0.00035621	0.00038746	0.00046870	0.00049370	0.00052810	0.00056250	0.00059690	0.00063130	0.00066570	0.00070010											
	26	0.00000000	0.00032184	0.00038120	0.00041558	0.00037496	0.00040308	0.00046558	0.00049682	0.00052806	0.00055930	0.00059054	0.00062178	0.00065302	0.00068426											

Test Sample: Normal Strength
Load Applied: 30%

f'c desired:
f'c measured:

6 ksi
5.2

Load Applied:

11250 lbs

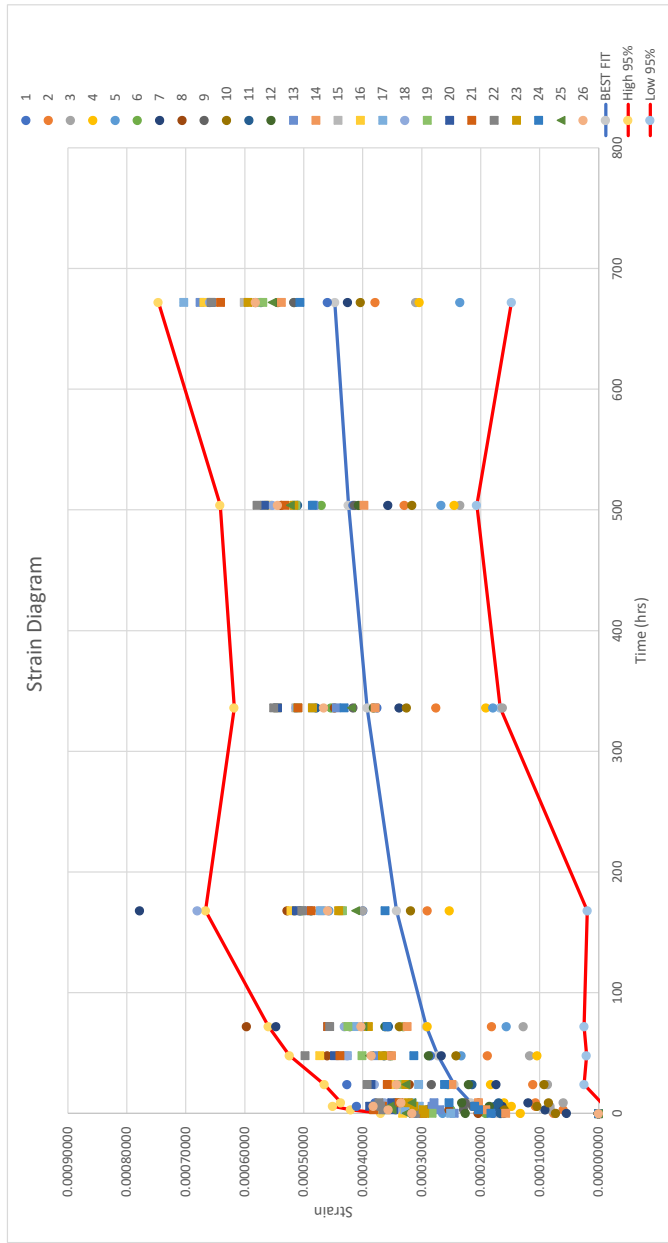
		TOTAL STRAINS MINUS SHRINKAGE STRAINS															
Date	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021
Time	11:30:00 AM	12:15:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM	12:30:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM	12:30:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM	12:30:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM
Relative Humidity	49.3	49.3	50.3	49.9	49.9	50.1	50.1	49.9	49.9	50.1	50.1	50.1	50.1	50.2	50	50.1	50.1
Air Temp	23.2	23.2	23.0	23.0	23.0	22.9	22.9	23.0	23.0	22.9	23.0	23.0	22.9	22.9	22.9	22.9	22.9
Notes	0	0.1	3	6	9	24	48	72	336	504	672						
Point of Measure	1	0.00000000	0.00017915	0.00017218	0.00041012	0.00037864	0.00042673	0.00028522	0.00035897	0.00039962	0.00037541	0.00041627	0.00045957				
	2	0.00000000	0.00007615	0.00005980	0.00010721	0.00010698	0.00011135	0.00018862	0.00018114	0.00029066	0.00027585	0.00032924	0.00037886				
	3	0.00000000	0.00007297	0.00008163	0.00008212	0.00006001	0.00008627	0.00011663	0.00012791	0.00039995	0.00016313	0.00023526	0.00030986				
	4	0.00000000	0.00013237	0.00019418	0.00014779	0.00016006	0.00018318	0.00010414	0.00029049	0.00025307	0.00019135	0.00024477	0.00030375				
	5	0.00000000	0.00026431	0.00020098				0.00023285	0.00015632	0.00045704	0.00017930	0.00026700	0.00023533				
	6	0.00000000	0.00019179	0.00025046	0.00022909	0.00022886	0.00025512	0.00035113	0.00033114	0.00050314	0.00045394	0.00046984	0.00051630				
	7	0.00000000	0.00005422	0.00009104	0.00016343	0.00011945	0.00017383	0.00026669	0.00054690	0.00077829	0.00033827	0.00035727	0.00042562				
	8	0.00000000	0.00020426	0.00025357	0.00028217	0.00020381	0.00032072	0.00046040	0.00059677	0.00052799	0.00044754	0.00053839	0.00058172				
	9	0.00000000	0.00016057	0.00022866	0.00021354	0.00022581	0.00028333	0.00035436	0.00042193	0.00051584	0.00041657	0.00041371	0.00051648				
	10	0.00000000	0.00007298	0.00015984	0.00010406	0.00008506	0.00009255	0.00024174	0.00033745	0.00031873	0.00032579	0.00031665	0.00040377				
	11	0.00000000	0.00016674	0.00029103	0.00017590	0.00016942	0.00021442	0.00036355	0.00035607	0.00050616	0.00047883	0.00051035	0.00057243				
	12	0.00000000	0.00022605	0.00028158	0.00018521	0.00023185	0.00022058	0.00028841	0.00036217	0.00048720	0.00038175	0.00040699	0.00054405				
	13	0.00000000	0.00024491	0.00026920	0.00028221	0.00027885	0.00032698	0.00037922	0.00039675	0.00049371	0.00044451	0.00048227	0.00067565				
	14	0.00000000	0.00015735	0.00019101	0.00020401	0.00020378	0.00024877	0.00035100	0.00032476	0.00043733	0.00037875	0.00039775	0.00053797				
	15	0.00000000	0.00029809	0.00030675	0.00034166	0.00033830	0.00035205	0.00043557	0.00040932	0.00046878	0.00051338	0.00056367	0.00060076				
	16	0.00000000	0.00033237	0.00036916	0.00038217	0.00034131	0.00035193	0.00047291	0.00042793	0.00052174	0.00054443	0.00056032	0.00066927				
	17	0.00000000	0.00025109	0.00032849	0.00030400	0.00031627	0.00030502	0.00042597	0.00041537	0.00047167	0.00048499	0.00051336	0.00070352				
	18	0.00000000	0.00030100	0.00034402	0.00035076	0.00036303	0.00037988	0.00042584	0.00043085	0.00068076	0.00051293	0.00053378	0.00065954				
	19	0.00000000	0.00028244	0.00035988	0.00034788	0.00033827	0.00033951	0.00040113	0.00042491	0.00043435	0.00051019	0.00051357	0.00056942				
	20	0.00000000	0.00031354	0.00034719	0.00038831	0.00035057	0.00038618	0.00044775	0.00045902	0.00051219	0.00054423	0.00056634	0.00065652				
	21	0.00000000	0.00029792	0.00038158	0.00036645	0.00033809	0.00035807	0.00043840	0.00045905	0.00048721	0.00050988	0.00053201	0.00064094				
	22	0.00000000	0.000331051	0.00036606	0.00036969	0.00037258	0.00039257	0.00049793	0.00045608	0.00050302	0.00055070	0.00057909	0.00065680				
	23	0.00000000	0.00029487	0.00029728	0.00031341	0.00032255	0.00032691	0.00036663	0.00039041	0.00044047	0.00048503	0.00051653	0.00059424				
	24	0.00000000	0.00018225	0.00020340	0.00021015	0.00025368	0.00026116	0.00031336	0.00035902	0.00036219	0.00043174	0.00048514	0.00050658				
	25	0.00000000	0.00032605	0.00035033	0.00035395	0.00031621	0.00032682	0.00038840	0.00039967	0.00041221	0.00041925	0.00052261	0.00055343				
	26	0.00000000	0.00031666	0.00035656	0.00038207	0.00033496	0.00034244	0.00038528	0.00040279	0.00045908	0.00046614	0.00054450	0.00058156				
FIT DATA	0.00016627	0.00017207	0.00019628	0.00020787	0.00021652	0.00020787	0.00024476	0.00027253	0.00029232	0.00034273	0.0003925	0.0004242	0.00044726				
Standard Deviation	0.00016627	9.8903E-05	0.00011222	0.00012149	0.00011038	0.00011014	0.00011014	0.00012598	0.00013378	0.00016181	0.0001272	0.00010878	0.00014972				
High Deviation		0.00036988	0.00042072	0.00045085	0.00043728	0.00046505	0.00046505	0.0005245	0.00055987	0.00066635	0.00061794	0.00064177	0.00074669				
Low Deviation		-2.5737E-05	-2.8164E-05	-3.5103E-05	-4.2482E-06	2.4477E-05	2.4765E-05	2.0563E-05	2.4765E-05	1.9107E-05	0.00016707	0.00020664	0.00014783				

ϵ sh,u	α	V/S	σ
0.0005030	0.4707407	0.625	32.56

	0	0.1	3	6	9	24	48	72	168	336	504	672
Shrinkage Strain	0	5.1715E-06	2.464E-05	3.3513E-05	4E-05	6.0642E-05	8.0303E-05	9.4033E-05	0.00012836	0.00016194	0.00018356	0.00019962

time (hr)	strain μ
0	0.00016627
0.1	0.00017207
3	0.00019628
6	0.00020787
9	0.00021652
24	0.00024476
48	0.00027253
72	0.00029232
168	0.00034273
336	0.00039250
504	0.00042420
672	0.00044726

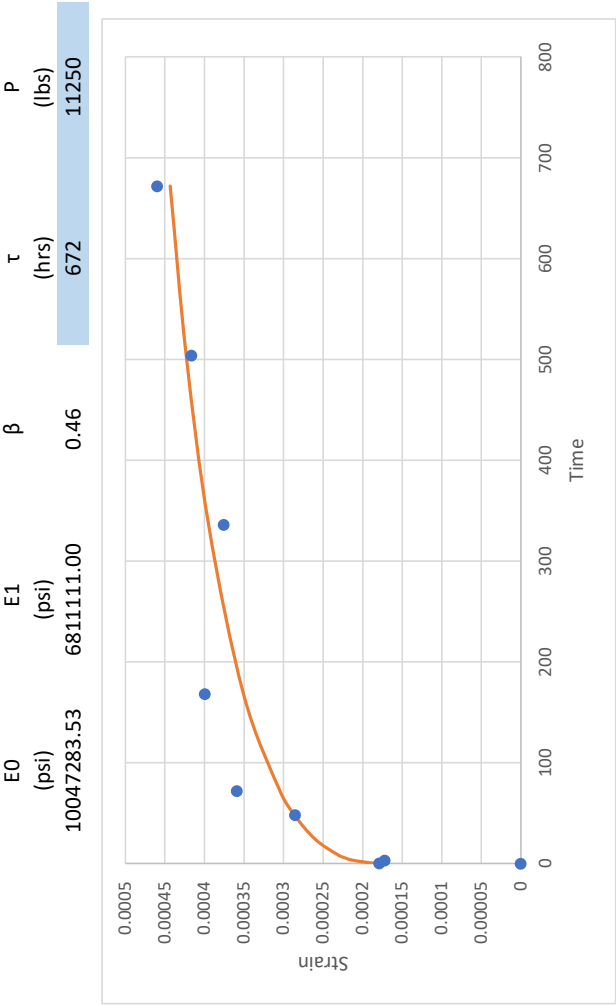
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
10825500.62	6405999.082	0.491710392	672	11250



Data Set # 1

time (hr)	strain μ				
0	0	0.00017915	0.00000003		
0.1	0.000179153	0.00018635	0.00000000		
3	0.000172182	0.00021244	0.00000000		
6	0.00022424	0.00022424	0.00000000		
9		0.00023287			
24		0.00026035			
48	0.00028522	0.00028659	0.00000000		
72	0.000358966	0.00030494	0.00000000		
168	0.000399618	0.00035078	0.00000000		
336	0.000375412	0.00039515	0.00000000		
504	0.000416266	0.00042313	0.00000000		
672	0.000459569	0.00044343	0.00000000		

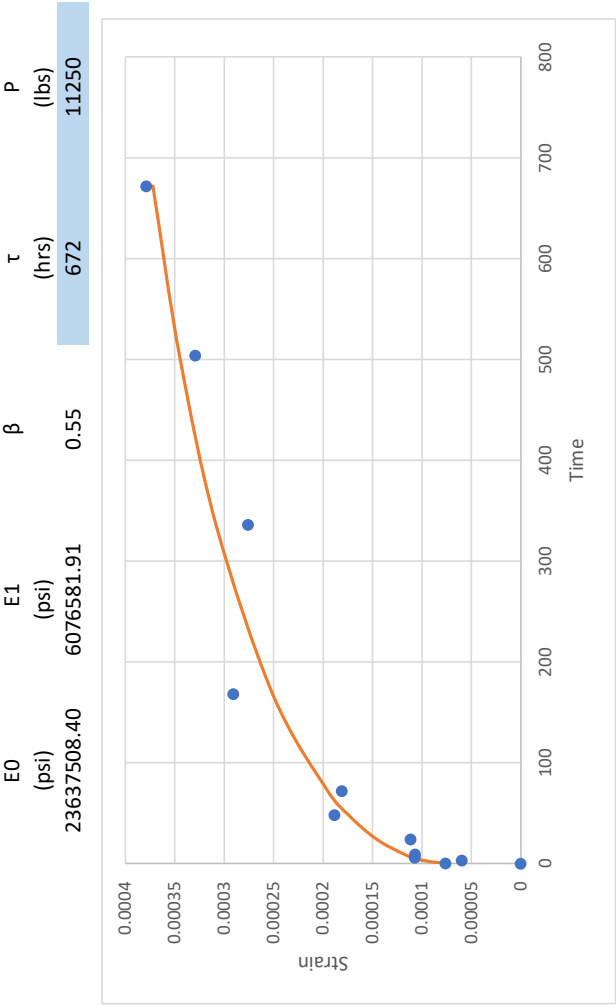
sum R^2 = 3.97711E-08



Data Set # 2

time (hr)	strain μ	
0	0	0.00000001
0.1	7.61502E-05	0.00000000
3	5.98041E-05	0.00000000
6	0.000107211	0.00000000
9	0.000106982	0.00000000
24	0.00011135	0.00000000
48	0.000188618	0.00000000
72	0.000181136	0.00000000
168	0.000290656	0.00000000
336	0.000275846	0.00000000
504	0.000329243	0.00000000
672	0.000378862	0.00000000

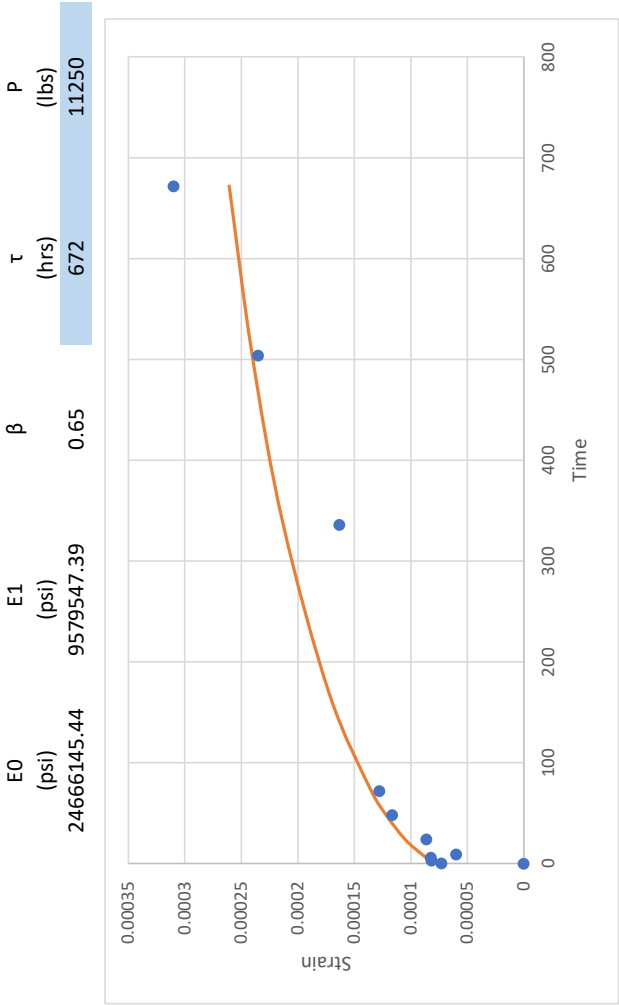
sum R^2 = 1.20637E-08



Data Set # 3

time (hr)	strain μ	
0	0	0.00000001
0.1	7.29745E-05	0.00000000
3	8.16281E-05	0.00007395
6	8.21236E-05	0.00008174
9	6.00136E-05	0.00008660
24	8.62659E-05	0.00009058
48	0.000116626	0.00010534
72	0.000127909	0.00012211
168		0.00013523
336	0.000163132	0.00017238
504	0.000235262	0.00021318
672	0.000309858	0.00024059
		0.00026087

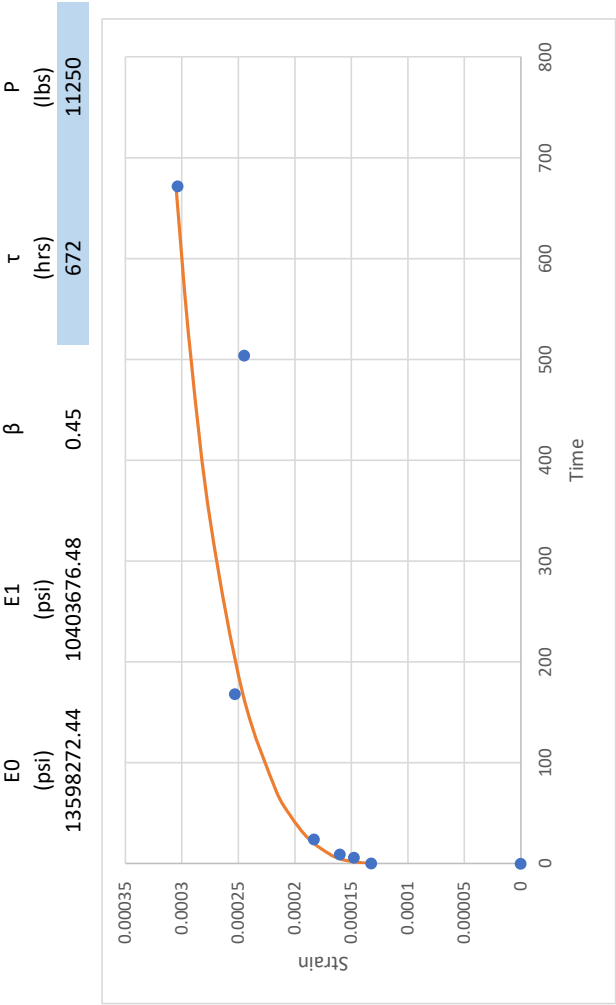
$\text{sum } R^2 = 1.16607\text{E-}08$



Data Set # 4

time (hr)	strain μ				
0	0	0.00013237	0.00000002		
0.1	0.00013237	0.00013761	0.00000000		
3		0.00015558			
6	0.000147792	0.00016353	0.00000000		
9	0.00016006	0.00016929	0.00000000		
24	0.000183182	0.00018748	0.00000000		
48		0.00020466			
72		0.00021660			
168	0.000253071	0.00024617	0.00000000		
336		0.00027459			
504	0.000244769	0.00029245	0.00000000		
672	0.000303752	0.00030539	0.00000000		

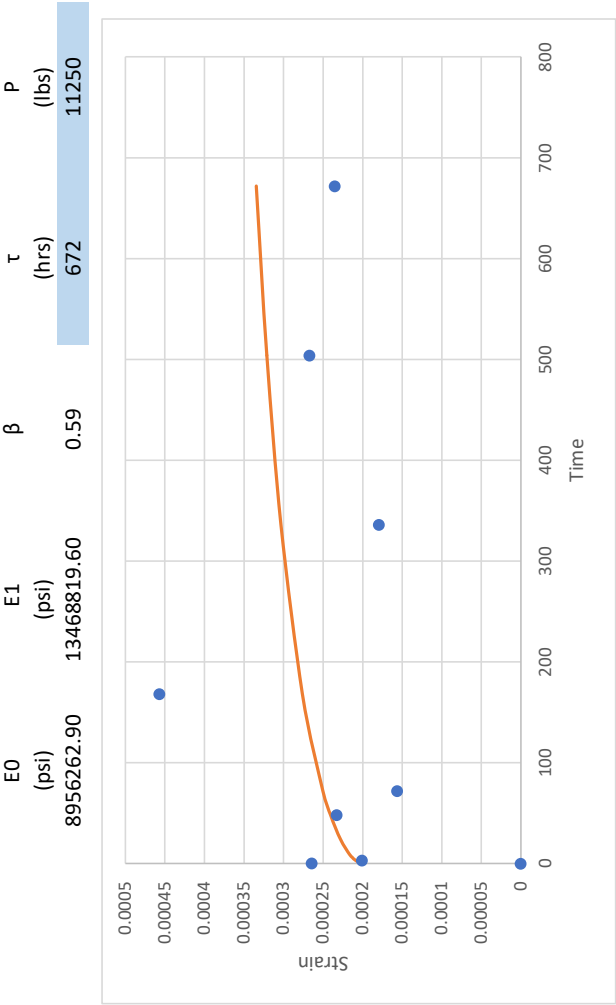
sum R^2 = 2.0224E-08



Data Set # 5

time (hr)	strain μ				
0	0	0.00020098	0.00000004		
0.1	0.000264315	0.00020212	0.00000000		
3	0.000200977	0.00020939	0.00000000		
6		0.00021353			
9		0.00021680			
24		0.00022843			
48	0.000232847	0.00024096	0.00000000		
72	0.000156325	0.00025044	0.00000001		
168	0.00045704	0.00027625	0.00000003		
336	0.000179302	0.00030349	0.00000002		
504	0.000266998	0.00032143	0.00000000		
672	0.000235335	0.00033462	0.00000001		

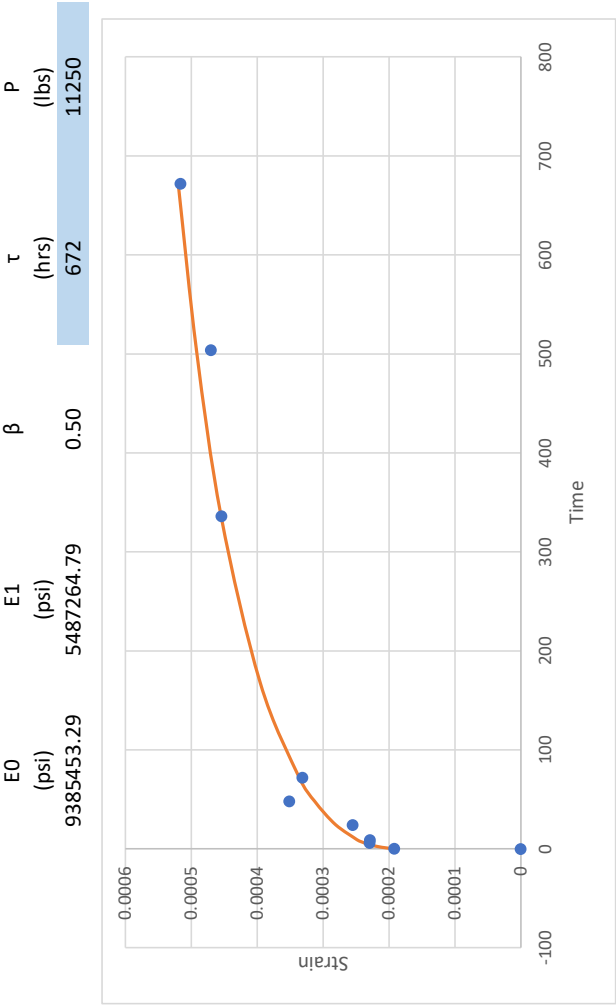
sum R^2 = 1.14184E-07



Data Set # 6

time (hr)	strain μ	
0	0	0.000000004
0.1	0.000191786	0.000000000
3		0.00019808
6	0.000229092	0.00022532
9	0.000228859	0.00023857
24	0.00025512	0.00024849
48	0.000351132	0.00028114
72	0.00033114	0.00031348
168		0.00033664
336	0.000453938	0.00039597
504	0.00046984	0.00045485
672	0.000516301	0.00049245
		0.00051982

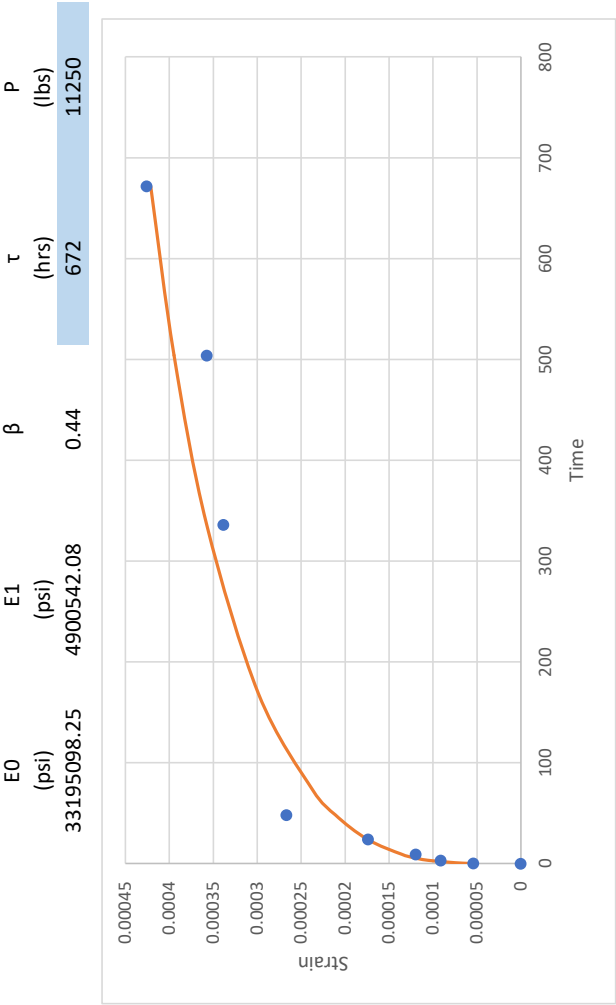
sum R^2 = 3.99457E-08



Data Set # 7

time (hr)	strain μ				
0	0	0.00005422	0.00000000	0.00000000	0.00000000
0.1	5.42249E-05	0.00006642	0.00000000	0.00000000	0.00000000
3	9.10357E-05	0.00010626	0.00000000	0.00000000	0.00000000
6		0.00012355			
9	0.000119452	0.00013600	0.00000000	0.00000000	0.00000000
24	0.000173828	0.00017496	0.00000000	0.00000000	0.00000000
48	0.000266693	0.00021140	0.00000000	0.00000000	0.00000000
72		0.00023655			
168		0.00029851			
336	0.000338266	0.00035765	0.00000000	0.00000000	0.00000000
504	0.000357266	0.00039471	0.00000000	0.00000000	0.00000000
672	0.000425615	0.00042153	0.00000000	0.00000000	0.00000000

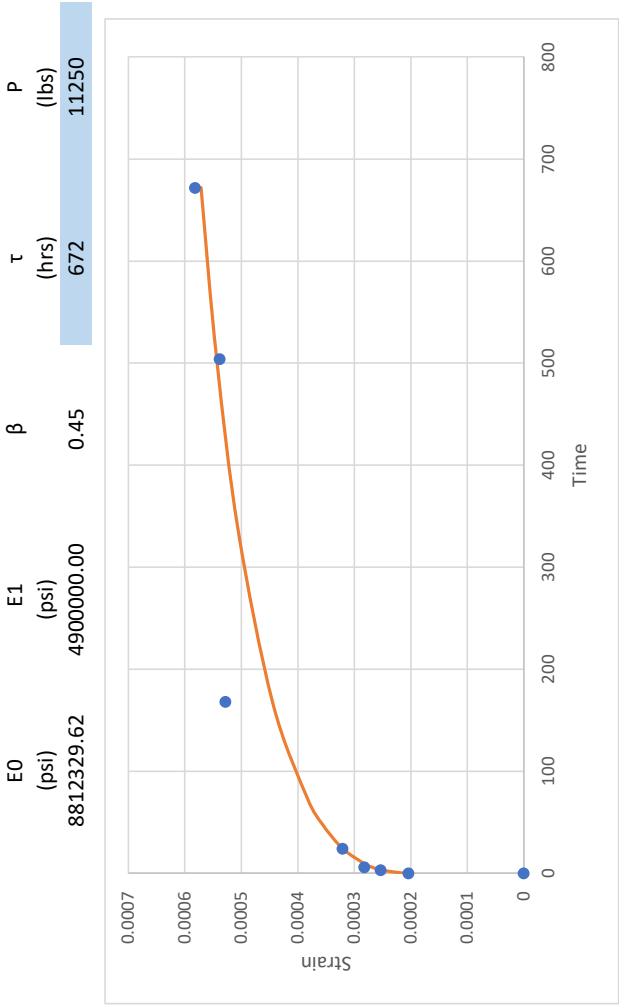
sum R^2 = 8.44814E-09



Data Set # 8

time (hr)	strain μ					
0	0	0.00020426	0.00000004			
0.1	0.000204259	0.00021517	0.00000000			
3	0.000253573	0.00025299	0.00000000			
6	0.000282171	0.00026978	0.00000000			
9		0.00028198				
24	0.000320716	0.00032053	0.00000000			
48		0.00035701				
72		0.00038238				
168	0.000527989	0.00044534	0.00000001			
336		0.00050591				
504	0.000538386	0.00054400	0.00000000			
672	0.000581722	0.00057161	0.00000000			

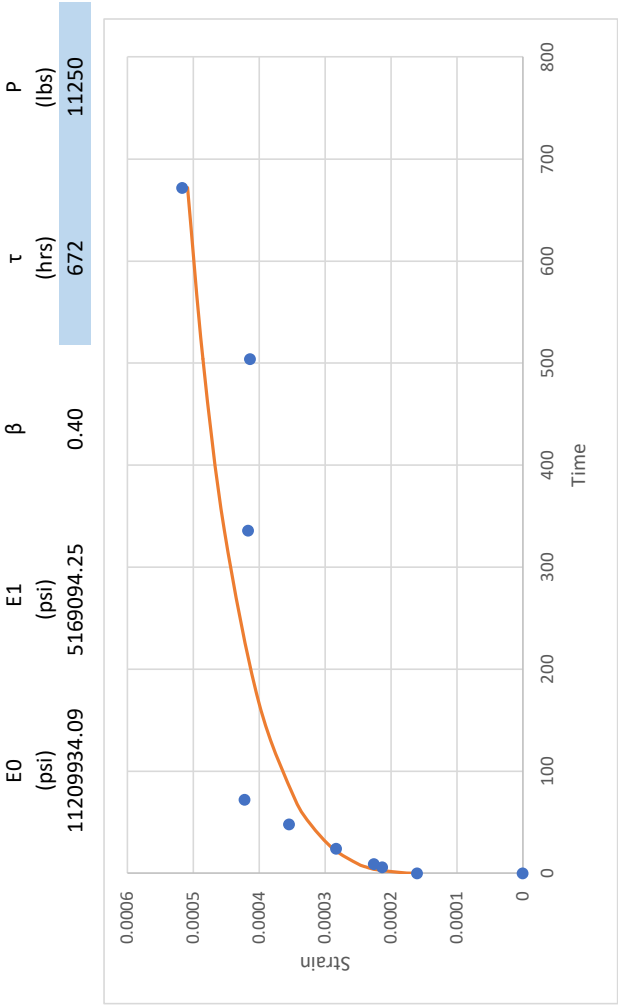
sum R^2 = 4.8959E-08



Data Set # 9

time (hr)	strain μ	
0	0	0.00000003
0.1	0.000160572	0.00000000
3		0.00017656
6	0.000213536	0.00022031
9	0.000225809	0.00023800
24	0.000283333	0.00025046
48	0.000354363	0.00028827
72	0.000421935	0.00032247
168		0.00034559
336	0.000416569	0.00040127
504	0.000413712	0.00045327
672	0.000516477	0.00048552
		0.00050880

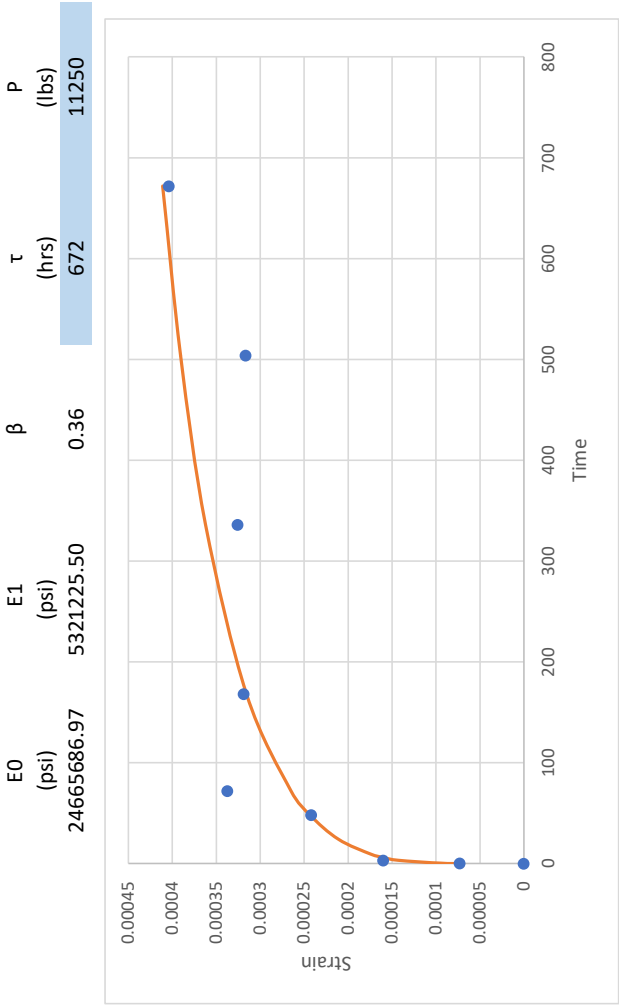
$\text{sum } R^2 = 4.06791\text{E-}08$



Data Set # 10

time (hr)	strain μ					
0	0	0.00007298	0.000000001			
0.1	7.29759E-05	0.00009446	0.000000000			
3	0.000159843	0.00014316	0.000000000			
6	0.000159843	0.00016147	0.000000000			
9		0.00017407				
24		0.00021119				
48	0.000241735	0.00024367	0.000000000			
72	0.000337451	0.00026517	0.000000001			
168	0.000318731	0.00031588	0.000000000			
336	0.000325787	0.00036226	0.000000000			
504	0.000316652	0.00039075	0.000000001			
672	0.000403768	0.00041124	0.000000000			

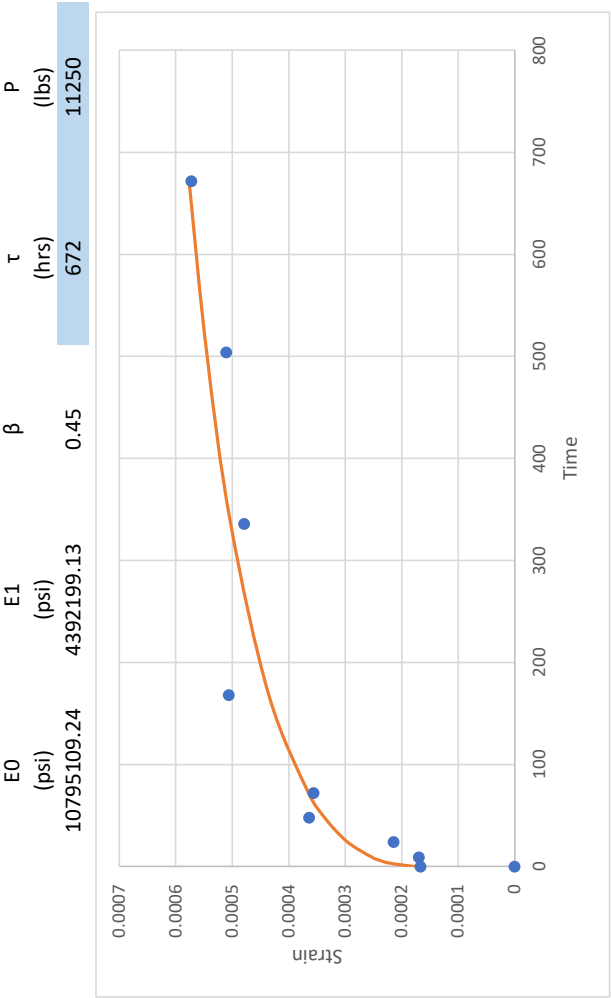
sum R^2 = 1.81774E-08



Data Set # 11

time (hr)	strain μ				
0	0	0.00016674	0.00000003		
0.1	0.000166742	0.00017891	0.00000000		
3		0.00022110			
6		0.00023984			
9	0.000169416	0.00025345	0.00000001		
24	0.000214416	0.00029646	0.00000001		
48	0.000363545	0.00033715	0.00000000		
72	0.000356068	0.00036545	0.00000000		
168	0.000506163	0.00043570	0.00000000		
336	0.000478831	0.00050327	0.00000000		
504	0.000510349	0.00054577	0.00000000		
672	0.000572433	0.00057656	0.00000000		

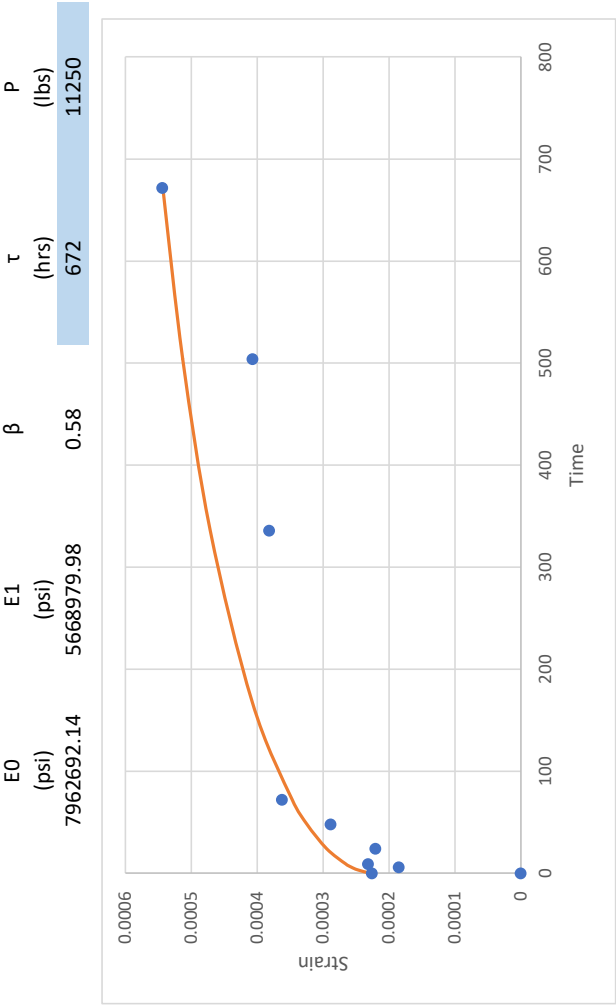
sum R^2 = 4.93632E-08



Data Set # 12

time (hr)	strain μ				
0	0	0.00022605	0.00000005		
0.1	0.000226054	0.00022919	0.00000000		
3		0.00024785			
6	0.000185215	0.00025820	0.00000001		
9	0.000231847	0.00026630	0.00000000		
24	0.000220578	0.00029467	0.00000001		
48	0.000288406	0.00032480	0.00000000		
72	0.00036217	0.00034737	0.00000000		
168		0.00040815			
336	0.000381753	0.00047158	0.00000001		
504	0.000406993	0.00051310	0.00000001		
672	0.000544051	0.00054357	0.00000000		

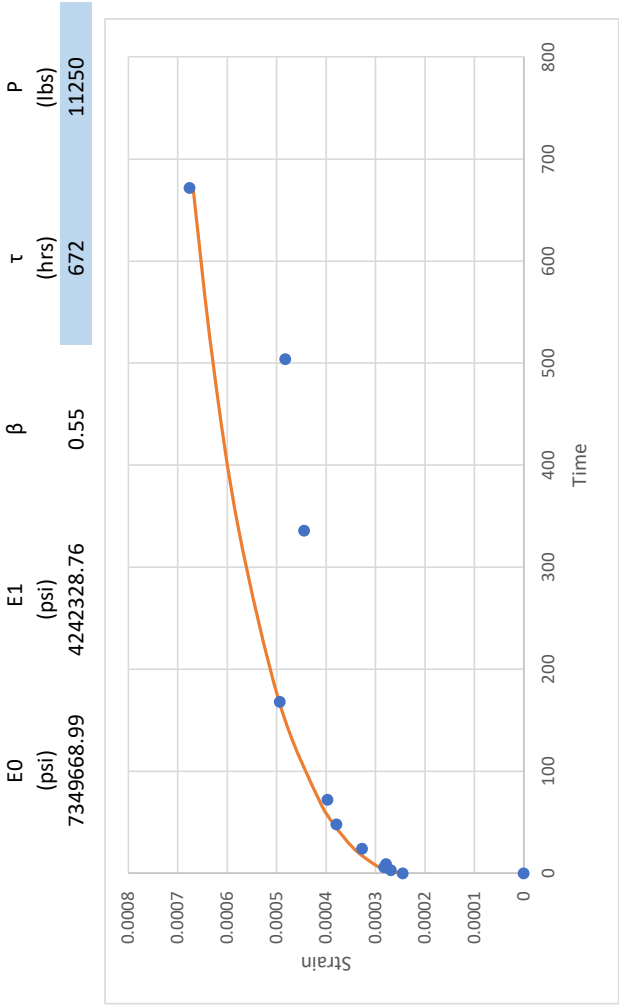
sum R^2 = 8.3985E-08



Data Set # 13

time (hr)	strain μ					
0	0	0.00024491	0.00000006			
0.1	0.000244909	0.00025016	0.00000000			
3	0.000269202	0.00027827	0.00000000			
6	0.000282212	0.00029318	0.00000000			
9	0.000278851	0.00030469	0.00000000			
24	0.000326982	0.00034414	0.00000000			
48	0.00037922	0.00038507	0.00000000			
72	0.000396746	0.00041525	0.00000000			
168	0.000493715	0.00049515	0.00000000			
336	0.000444506	0.00057711	0.00000002			
504	0.000482273	0.00063029	0.00000002			
672	0.000675651	0.00066920	0.00000000			

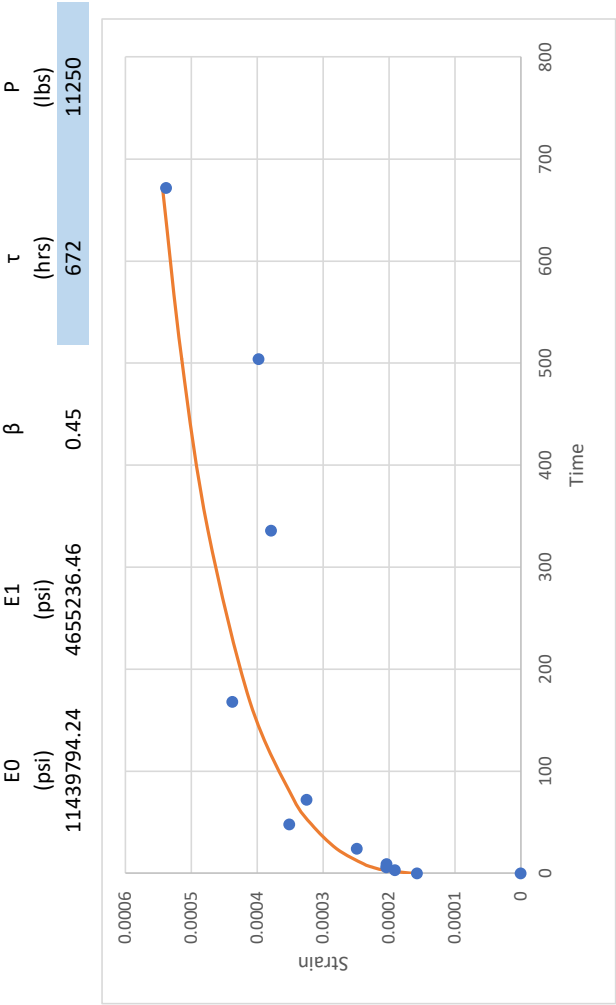
sum R^2 = 1.01085E-07



Data Set # 14

time (hr)	strain μ				
0	0	0.00015735	0.00000002		
0.1	0.000157345	0.00016883	0.00000000		
3	0.00019101	0.00020864	0.00000000		
6	0.000204014	0.00022632	0.00000000		
9	0.000203777	0.00023916	0.00000000		
24	0.00024877	0.00027973	0.00000000		
48	0.000350999	0.00031813	0.00000000		
72	0.000324764	0.00034483	0.00000000		
168	0.000437331	0.00041110	0.00000000		
336	0.000378751	0.00047486	0.00000001		
504	0.000397755	0.00051495	0.00000001		
672	0.000537967	0.00054401	0.00000000		

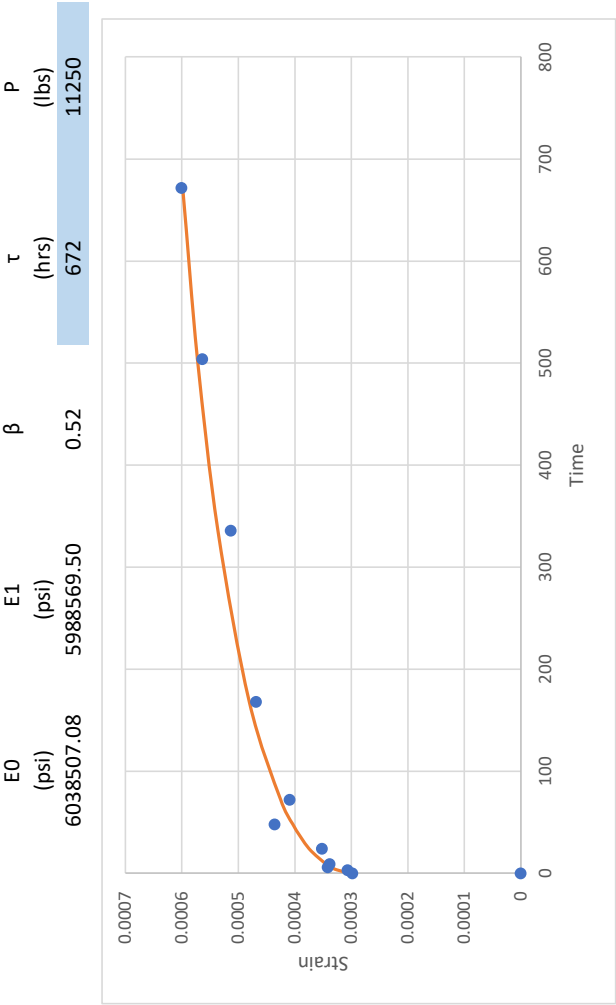
sum R^2 = 5.30878E-08



Data Set # 15

time (hr)	strain μ										
0	0	0.00029809	0.00000009								
0.1	0.000298087	0.00030288	0.00000000								
3	0.000306751	0.00032559	0.00000000								
6	0.000341657	0.00033706	0.00000000								
9	0.000338298	0.00034575	0.00000000								
24	0.000352049	0.00037487	0.00000000								
48	0.00043557	0.00040428	0.00000000								
72	0.000409323	0.00042560	0.00000000								
168	0.000468779	0.00048098	0.00000000								
336	0.000513383	0.00053671	0.00000000								
504	0.00056367	0.00057253	0.00000000								
672	0.000600761	0.00059866	0.00000000								

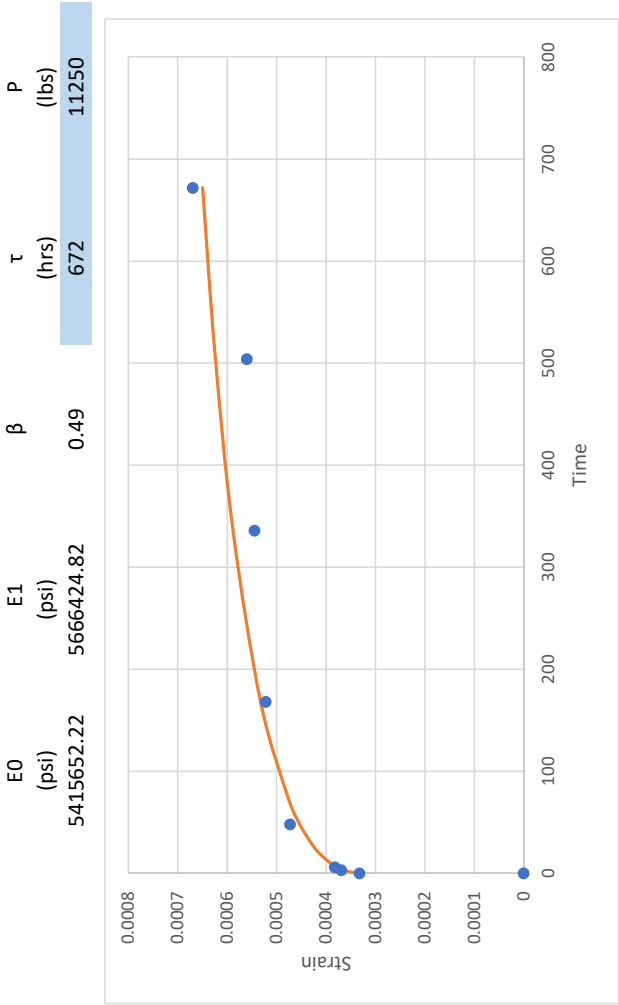
sum R^2 = 9.1851E-08



Data Set # 16

time (hr)	strain μ	
0	0	0.00000011
0.1	0.00033237	0.00000000
3	0.00036916	0.00000000
6	0.000382168	0.00000000
9	0.00039014	0.00000000
24	0.00042223	
48	0.00045365	0.00000000
72	0.00047599	
168	0.00052174	0.00000000
336	0.000544432	0.00000000
504	0.000560323	0.00000000
672	0.000669273	0.00000000

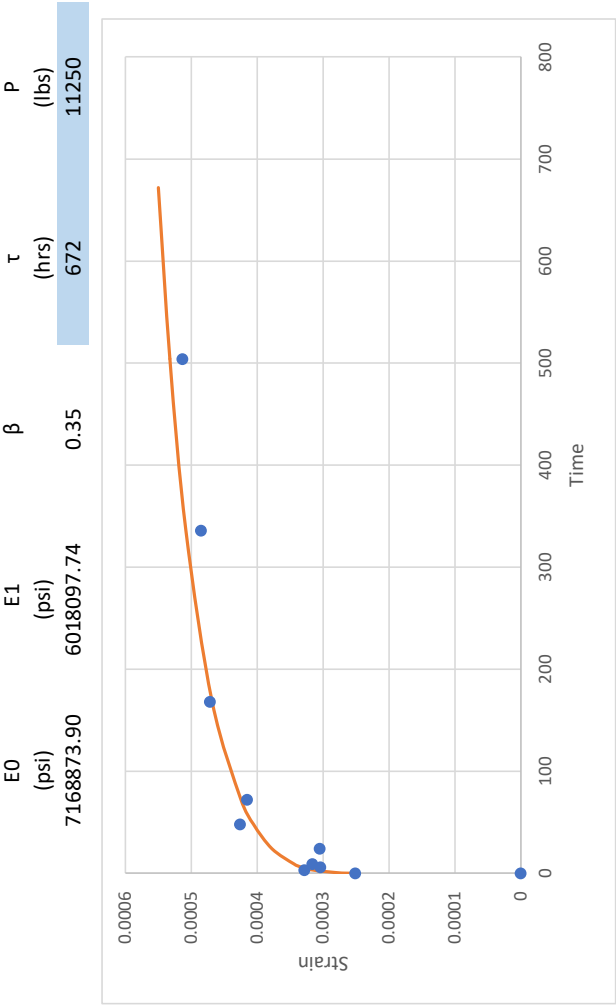
sum R^2 = 1.17418E-07



Data Set # 17

time (hr)	strain μ	
0	0	0.00000006
0.1	0.000251085	0.00000000
3	0.000328494	0.00000000
6	0.000303999	0.00000000
9	0.000316269	0.00000000
24	0.000305019	0.00000001
48	0.000425972	0.00000000
72	0.000415368	0.00000000
168	0.000471672	0.00000000
336	0.000484985	0.00000000
504	0.000513361	0.00000000
672		0.00055018

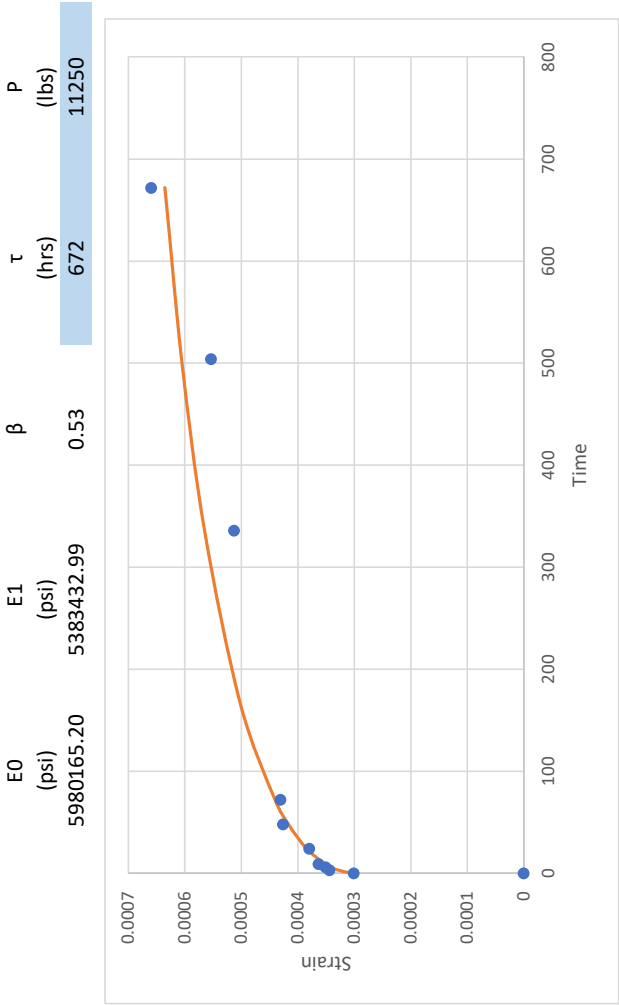
sum R^2 = 7.20186E-08



Data Set # 18

time (hr)	strain μ										
0	0	0.00030100	0.00000009								
0.1	0.000300995	0.00030601	0.00000000								
3	0.000344016	0.00033050	0.00000000								
6	0.000350763	0.00034302	0.00000000								
9	0.00036303	0.00035254	0.00000000								
24	0.000379878	0.00038463	0.00000000								
48	0.000425844	0.00041725	0.00000000								
72	0.000430853	0.00044099	0.00000000								
168		0.00050294									
336	0.000512929	0.00056556	0.00000000								
504	0.000553785	0.00060590	0.00000000								
672	0.000659544	0.00063535	0.00000000								

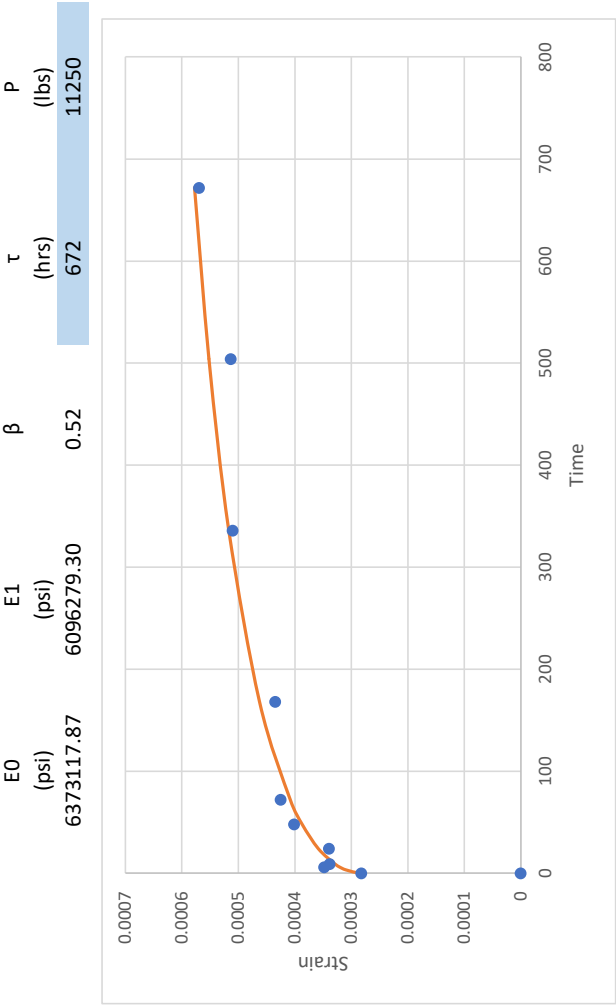
sum R^2 = 9.72464E-08



Data Set # 19

time (hr)	strain μ	
0	0	0.00028244
0.1	0.000282436	0.00028726
3		0.00030987
6	0.00034788	0.00032123
9	0.000338267	0.00032982
24	0.000339508	0.00035854
48	0.000401127	0.00038747
72	0.00042491	0.00040840
168	0.000434351	0.00046267
336	0.000510188	0.00051717
504	0.000513571	0.00055217
672	0.000569417	0.00057770

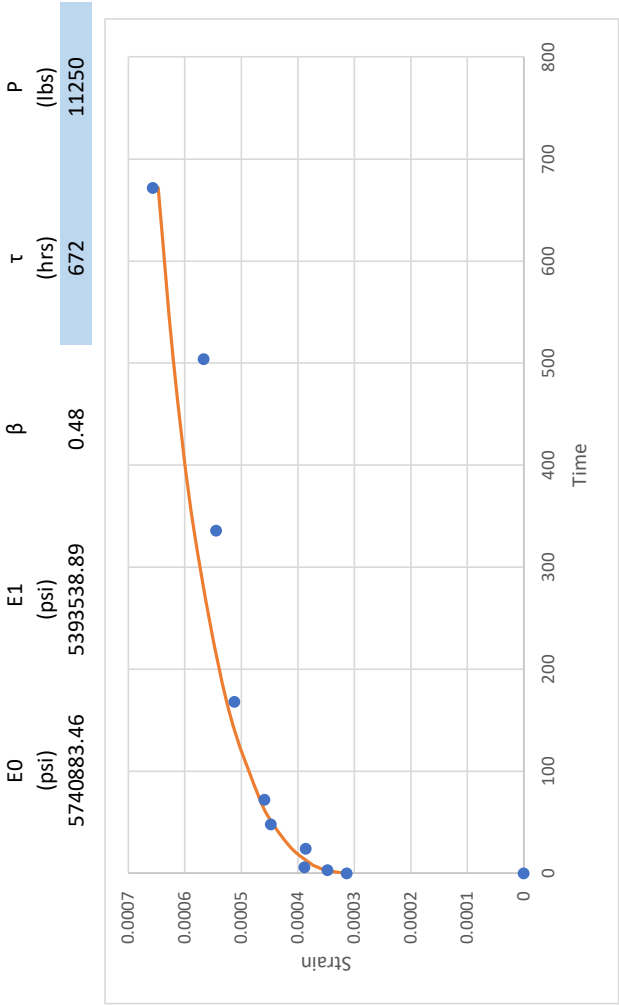
sum R^2 = 8.38056E-08



Data Set # 20

time (hr)	strain μ					
0	0	0.00031354	0.00000010			
0.1	0.000313541	0.00032137	0.00000000			
3	0.000347191	0.00035203	0.00000000			
6	0.00038831	0.00036633	0.00000000			
9		0.00037689				
24	0.000386177	0.00041100	0.00000000			
48	0.000447753	0.00044408	0.00000000			
72	0.00045902	0.00046745	0.00000000			
168	0.000512186	0.00052644	0.00000000			
336	0.000544225	0.00058413	0.00000000			
504	0.000566342	0.00062071	0.00000000			
672	0.000656522	0.00064727	0.00000000			

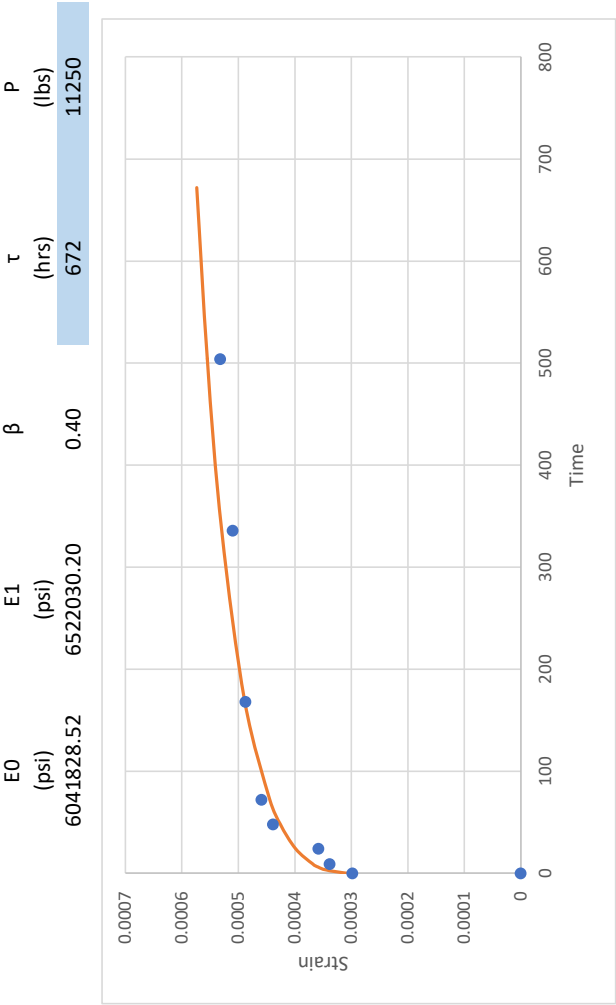
sum R^2 = 1.04412E-07



Data Set # 21

time (hr)	strain μ	
0	0	0.00029792
0.1	0.000297923	0.00031059
3		0.00034527
6		0.00035929
9	0.00033809	0.00036916
24	0.000358073	0.00039913
48	0.000438402	0.00042623
72	0.000459046	0.00044456
168	0.000487212	0.00048869
336	0.000509885	0.00052991
504	0.000532005	0.00055547
672		0.00057391

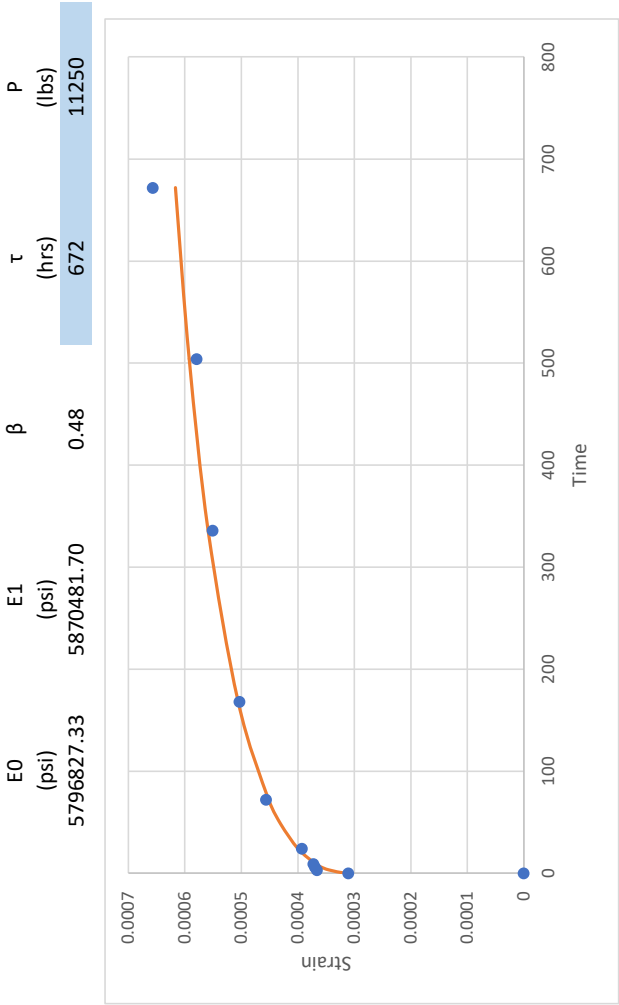
$\text{sum } R^2 = 9.28816\text{E-}08$



Data Set # 22

time (hr)	strain μ				
0	0	0.00031051	0.00000010		
0.1	0.000310515	0.00031770	0.00000000		
3	0.000366063	0.00034585	0.00000000		
6	0.000369691	0.00035899	0.00000000		
9	0.000372582	0.00036869	0.00000000		
24	0.000392573	0.00040002	0.00000000		
48		0.00043041			
72	0.000456076	0.00045188	0.00000000		
168	0.000503015	0.00050609	0.00000000		
336	0.000550704	0.00055910	0.00000000		
504	0.000579087	0.00059272	0.00000000		
672	0.000656797	0.00061713	0.00000000		

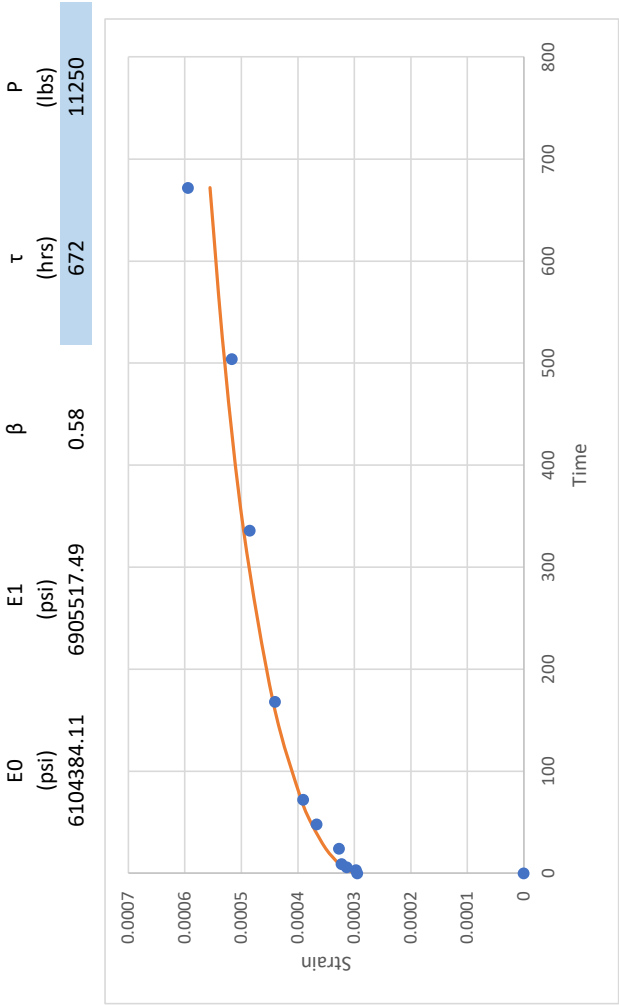
sum R^2 = 9.89211E-08



Data Set # 23

time (hr)	strain μ	
0	0	0.00029487
0.1	0.00029487	0.00029741
3	0.00029728	0.00031261
6	0.00031341	0.00032106
9	0.00032255	0.00032768
24	0.000326912	0.00035091
48	0.000366634	0.00037562
72	0.000390409	0.00039415
168	0.00044047	0.00044409
336	0.000485028	0.00049627
504	0.000516533	0.00053045
672	0.000594242	0.00055553

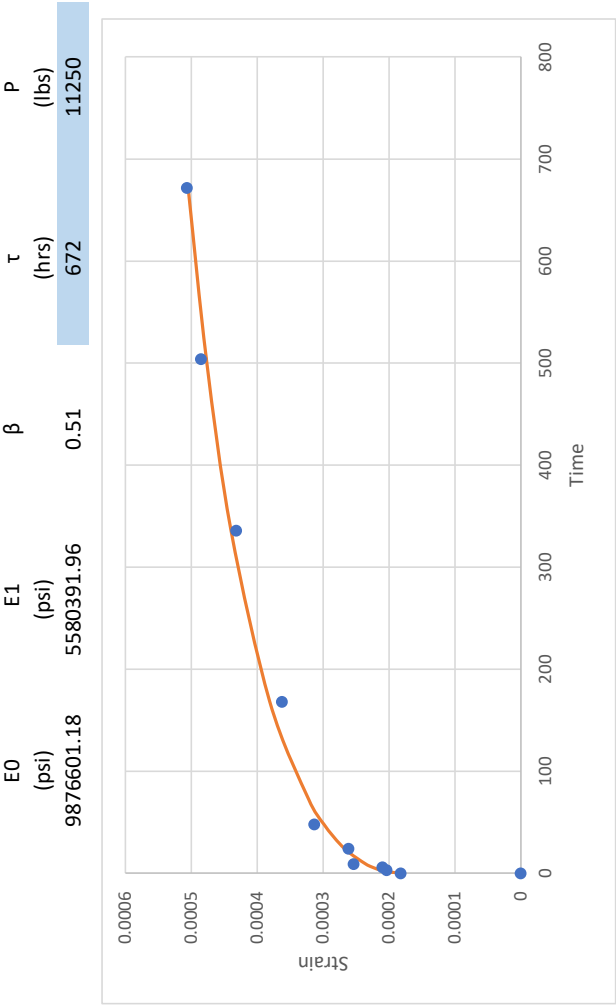
$\text{sum } R^2 = 8.97771\text{E-}08$



Data Set # 24

time (hr)	strain μ					
0	0	0.00018225	0.000000003			
0.1	0.000182249	0.00018795	0.00000000			
3	0.000203396	0.00021366	0.00000000			
6	0.000210146	0.00022637	0.00000000			
9	0.000253677	0.00023594	0.00000000			
24	0.000261159	0.00026768	0.00000000			
48	0.00031336	0.00029939	0.00000000			
72		0.00032221				
168	0.000362186	0.00038104	0.00000000			
336	0.00043174	0.00043978	0.00000000			
504	0.000485144	0.00047740	0.00000000			
672	0.000506584	0.00050481	0.00000000			

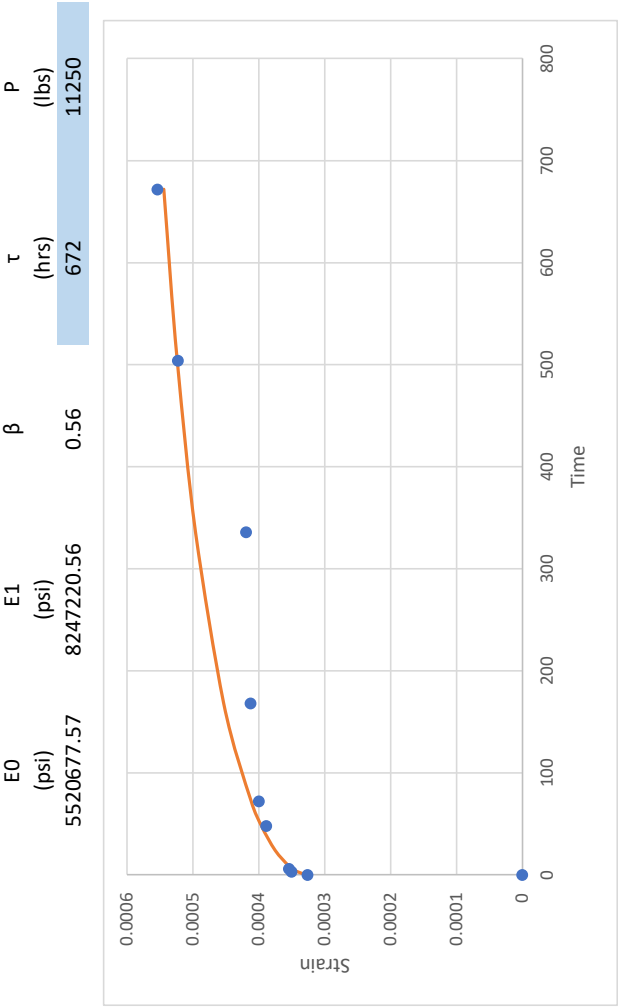
sum R^2 = 3.46515E-08



Data Set # 25

time (hr)	strain μ					
0	0	0.00032605	0.00000011			
0.1	0.000326047	0.00032852	0.00000000			
3	0.000350325	0.00034230	0.00000000			
6	0.00035395	0.00034975	0.00000000			
9		0.00035553				
24		0.00037551				
48	0.000388399	0.00039644	0.00000000			
72	0.000399666	0.00041196	0.00000000			
168	0.000412209	0.00045334	0.00000000			
336	0.000419247	0.00049608	0.00000001			
504	0.000522613	0.00052392	0.00000000			
672	0.000553428	0.00054430	0.00000000			

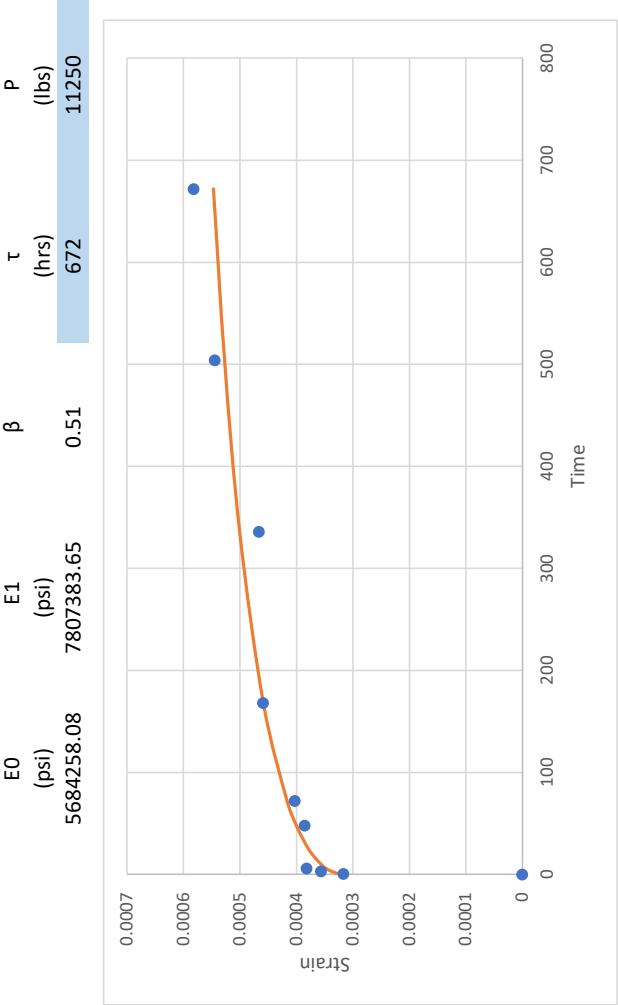
sum R^2 = 1.14291E-07



Data Set # 26

time (hr)	strain μ	
0	0	0.00000010
0.5	0.000316664	0.00031666
3	0.000356558	0.00032594
6	0.000382068	0.00033929
9		0.00034841
24		0.00035527
48	0.00038528	0.00037799
72	0.000402791	0.00040067
168	0.000459082	0.00041698
336	0.000466138	0.00045897
504	0.000544499	0.00050086
672	0.000581561	0.00052768
		0.00054722

sum R^2 = 1.049E-07



Test Sample: Normal Strength f'c desired: 6 ksi Load Applied: 15000 lbs
Load Applied: 40% f'c measured: 6.5 ksi

AVERAGE STRAINS - NSC 0.40f'c CREEP TEST																	
Date	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/16/2022	2/17/2022	2/18/2022	2/22/2022	3/1/2022	3/8/2022			
Time	4:00:00 AM	4:00:00 AM	4:30:00 PM	5:00:00 PM	6:00:00 PM	7:00:00 PM	10:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	12:00:00 PM	10:00:00 PM			
Relative Humidity	49.7	50	50	49.9	49.2	49.6	49.6	49.6	50.4	50	49.9	49.9	50.2	50.3			
Air Temp	23.0	23.0	23.0	23.0	22.9	22.9	22.9	22.9	23.0	22.9	23.0	22.9	23.0	22.9			
Time (hrs)	0	0.1	0.5	1	2	3	6	24	48	72	168	336	504				
Point of Measure	1	0.00000000	0.00074078	0.00071576	0.00073922	0.00066417	0.00085018	0.00085175	0.00089550	0.00090019	0.00090801	0.00094394	0.00093772	0.00099086			
	2	0.00000000	0.00057072	0.00056916	0.00057698	0.00053162	0.00062076	0.00060981	0.00063171	0.00066922	0.00069584	0.00068800	0.00070363	0.00070051			
	3	0.00000000	0.00048556	0.00043554	0.00050849	0.00045638	0.00067315	0.00057726	0.00058976	0.00057517	0.00064187	0.00071483	0.00067522	0.00067938			
	4	0.00000000	0.00054414	0.00051287	0.00052381	0.00045502	0.00057697	0.00056133	0.00064734	0.00061137	0.00058323	0.00064108	0.00063169	0.00065201			
	5	0.00000000	0.00057053	0.00058460	0.00063620	0.00054552	0.00067527	0.00064087	0.00068778	0.00067995	0.00071906	0.00070185	0.00072998	0.00074718			
	6	0.00000000	0.00053485	0.00052546	0.00055673	0.00048012	0.00062242	0.00060521	0.00065056	0.00066621	0.00063179	0.00065838	0.00067558	0.00070373			
	7	0.00000000	0.00050189	0.00049095	0.00053317	0.00046437	0.00058164	0.00056444	0.00058164	0.00060040	0.00069891	0.00061604	0.00067858	0.00068484			
	8	0.00000000	0.00052066	0.00049252	0.00054255	0.00047219	0.00060040	0.00060353	0.00059883	0.00071766	0.00077866	0.00065512	0.00067232	0.00071142			
	9	0.00000000	0.00050968	0.00054564	0.00057535	0.00045809	0.00061913	0.00057691	0.00066292	0.00070983	0.00067073	0.00063632	0.00066291	0.00063008			
	10	0.00000000	0.00052066	0.00049565	0.00053943	0.00073028	0.00060979	0.00062857	0.00059572	0.00062856	0.00098033	0.00066607	0.00068015	0.00065670			
	11	0.00000000	0.00051440	0.00052534	0.00056912	0.00046750	0.00065974	0.00065821	0.00061599	0.00066289	0.00082537	0.00066603	0.00070667	0.00072543			
	12	0.00000000	0.00053616	0.00054553	0.00057992	0.00047206	0.00062681	0.00062213	0.00060337	0.00062369	0.00067373	0.00064871	0.00064401	0.00066903			
	13	0.00000000	0.00053312	0.00051749	0.00059252	0.00067225	0.00075500	0.00061127	0.00065347	0.00062534	0.00061908	0.00061596	0.00061439	0.00065973			
	14	0.00000000	0.00057829	0.00057048	0.00062205	0.00052203	0.00080491	0.00066611	0.00068926	0.00072208	0.00090491	0.00068614	0.00074709	0.00071427			
	15	0.00000000	0.00052368	0.00054245	0.00060029	0.00052838	0.00083162	0.00074565	0.00076130	0.00079258	0.00070346	0.00068784	0.00073786	0.00079414			
	16	0.00000000	0.00048557	0.00049600	0.00056894	0.00044807	0.00061896	0.00063354	0.00069815	0.00066898	0.00089398	0.00063563	0.00067731	0.00076066			
	17	0.00000000	0.00058456	0.00055017	0.00062831	0.00053610	0.00083774	0.00068771	0.00069083	0.00069396	0.00075648	0.00070334	0.00072991	0.00080649			
	18	0.00000000	0.00060324	0.00057823	0.00062668	0.00054385	0.00067826	0.00068607	0.00072674	0.00068138	0.00076894	0.00070640	0.00071890	0.00083460			
	19	0.00000000	0.00058139	0.00054387	0.00056888	0.00049698	0.00069234	0.00069862	0.00067827	0.00070329	0.00074082	0.00070956	0.00068922	0.00071110			
	20	0.00000000	0.00059092	0.00066594	0.00065813	0.00059560	0.00079255	0.00076443	0.00077381	0.00081760	0.00091759	0.00080351	0.00076132	0.00082382			
	21	0.00000000	0.00058750	0.00057969	0.00062343	0.00054687	0.00069688	0.00070313	0.00073438	0.00072656	0.00074843	0.00075469	0.00075468	0.00081406			
	22	0.00000000	0.00057054	0.00058149	0.00063306	0.00053928	0.00065807	0.00070964	0.00067994	0.00068621	0.00075805	0.00068778	0.00067996	0.00072995			
	23	0.00000000	0.00059546	0.00208537	0.00069236	0.00060953	0.00068924	0.00067829	0.00072050	0.00071267	0.00075171	0.00073455	0.00073924	0.00073768			
	24	0.00000000	0.00051681	0.00067730	0.00064395	0.00060435	0.00065853	0.00069189	0.00069605	0.00070021	0.00070646	0.00070438	0.00073147	0.00073356			
	25	0.00000000	0.00069408	0.00073318	0.00137902	0.00067378	0.00078945	0.00079572	0.00078633	0.00079571	0.00082854	0.00079883	0.00083167	0.00083948			
	26	0.00000000	0.00065191	0.00069102	0.00072384	0.00061908	0.00073635	0.00075824	0.00073635	0.00071130	0.00075041	0.00076135	0.00077698	0.00078011			

Test Sample: Normal Strength f'c desired: 6 ksi Load Applied: 15000 lbs
Load Applied: 40% f'c measured: 6.5 ksi

TOTAL STRAINS MINUS SHRINKAGE STRAINS

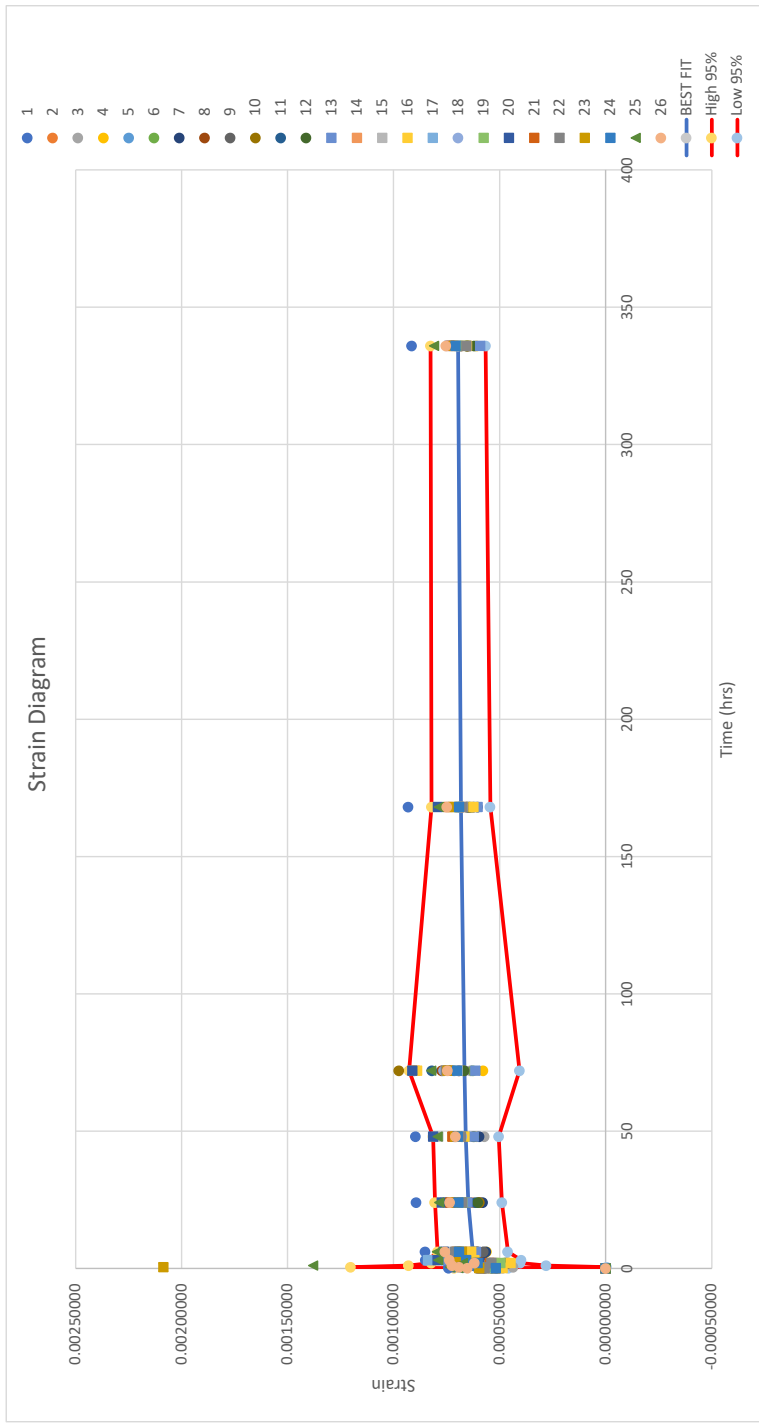
Date	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/15/2022	2/16/2022	2/17/2022	2/18/2022	2/22/2022	3/1/2022	3/8/2022
Time	4:00:00 AM	4:00:00 AM	4:30:00 PM	5:00:00 PM	6:00:00 PM	7:00:00 PM	10:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	4:00:00 PM	12:00:00 PM	10:00:00 PM
Relative Humidity	49.7	50	50	49.9	49.2	49.6	49.6	49.6	50.4	50	49.9	49.9	50.2	50.3
Air Temp	23.0	23.0	23.0	23.0	22.9	22.9	22.9	22.9	23.0	22.9	23.0	22.9	23.0	22.9
Notes	0	0.1	0.5	1	2	3	6	24	24	48	72	168	336	504
Point of Measure	1	0.00000000	0.00074077	0.00071572	0.00073913	0.00066401	0.00084992	0.00085124	0.00089351	0.00089627	0.00090221	0.00093117	0.00091435	0.00095845
	2	0.00000000	0.00057071	0.00056911	0.00057689	0.00053146	0.00062051	0.00060931	0.00062972	0.00066530	0.00069004	0.00067523	0.00068026	0.00066810
	3	0.00000000	0.00048555	0.00043550	0.00050841	0.00045621	0.00067290	0.00057676	0.00058777	0.00057125	0.00063607	0.00070206	0.00065185	0.00064697
	4	0.00000000	0.00054413	0.00051283	0.00052372	0.00045485	0.00057671	0.00056083	0.00064534	0.00060745	0.00057743	0.00062830	0.00060832	0.00061960
	5	0.00000000	0.00057052	0.00058456	0.00063612	0.00054535	0.00067502	0.00064037	0.00068578	0.00067603	0.00071326	0.00068907	0.00070662	0.00071477
	6	0.00000000	0.00053484	0.00052542	0.00055665	0.00047995	0.00062217	0.00060471	0.00064857	0.00066229	0.00062600	0.00064560	0.00065222	0.00067132
	7	0.00000000	0.00050188	0.00049091	0.00053308	0.00046420	0.00058138	0.00056393	0.00057964	0.00059648	0.00069312	0.00060326	0.00065521	0.00065244
	8	0.00000000	0.00052065	0.00049247	0.00054247	0.00047202	0.00060015	0.00060302	0.00059684	0.00071374	0.00077286	0.00064235	0.00064895	0.00067901
	9	0.00000000	0.00050967	0.00054560	0.00057527	0.00045792	0.00061888	0.00057641	0.00066093	0.00070591	0.00066494	0.00062355	0.00063954	0.00059767
	10	0.00000000	0.00052065	0.00049561	0.00053935	0.00073011	0.00060954	0.00062807	0.00059373	0.00062464	0.00097454	0.00065330	0.00065678	0.00062429
	11	0.00000000	0.00051439	0.00052530	0.00056904	0.00046733	0.00065949	0.00065770	0.00061400	0.00065896	0.00081958	0.00065326	0.00068330	0.00069302
	12	0.00000000	0.00053615	0.00054549	0.00057984	0.00047189	0.00062656	0.00062163	0.00060138	0.00061977	0.00066793	0.00063593	0.00062064	0.00063662
	13	0.00000000	0.00053311	0.00051744	0.00059244	0.00067208	0.00075475	0.00061077	0.00065148	0.00062142	0.00061328	0.00060318	0.00059102	0.00062732
	14	0.00000000	0.00057829	0.00057044	0.00062197	0.00052186	0.00080466	0.00066062	0.00068727	0.00071816	0.00089912	0.00067337	0.00072372	0.00068186
	15	0.00000000	0.00052367	0.00054241	0.00060021	0.00052822	0.00083137	0.00074515	0.00075931	0.00078866	0.00069767	0.00067507	0.00071449	0.00076173
	16	0.00000000	0.00048557	0.00049596	0.00056886	0.00044790	0.00061870	0.00063304	0.00069616	0.00066505	0.00088818	0.00062286	0.00065395	0.00072826
	17	0.00000000	0.00058455	0.00055013	0.00062823	0.00053593	0.00083749	0.00068720	0.00068884	0.00069004	0.00075068	0.00069057	0.00070654	0.00077408
	18	0.00000000	0.00060323	0.00057819	0.00062660	0.00054368	0.00067801	0.00068557	0.00072475	0.00067746	0.00076315	0.00069362	0.00069553	0.00080219
	19	0.00000000	0.00058138	0.00054383	0.00056880	0.00049681	0.00069209	0.00069811	0.00067628	0.00069937	0.00073502	0.00069679	0.00066585	0.00067870
	20	0.00000000	0.00059091	0.00066589	0.00065805	0.00059543	0.00079230	0.00076393	0.00077182	0.00081367	0.00091180	0.00079074	0.00073795	0.00079141
	21	0.00000000	0.00058749	0.00057964	0.00062335	0.00054670	0.00069663	0.00070263	0.00073239	0.00072263	0.00074264	0.00074191	0.00073131	0.00078165
	22	0.00000000	0.00057053	0.00058145	0.00063298	0.00053911	0.00065782	0.00067795	0.00067795	0.00068229	0.00075226	0.00067500	0.00065659	0.00069755
	23	0.00000000	0.00059545	0.000208533	0.00069228	0.00060936	0.00068898	0.00067779	0.00071850	0.00070875	0.00074591	0.00072178	0.00071587	0.00070527
	24	0.00000000	0.00051680	0.00067726	0.00064386	0.00060419	0.00065828	0.00069138	0.00069405	0.00069629	0.00070067	0.00069161	0.00070811	0.00070115
	25	0.00000000	0.00069407	0.00073314	0.00137894	0.00067361	0.00078919	0.00079522	0.00078434	0.00079178	0.00082274	0.00078606	0.00080830	0.00080707
	26	0.00000000	0.00065190	0.00069097	0.00072376	0.00061892	0.00073609	0.00075773	0.00073435	0.00070738	0.00074461	0.00074857	0.00075362	0.00074771
	FIT DATA													
Standard Deviation	0.00055763	0.00058685	0.00059902	0.00060552	0.0006129	0.00061764	0.0006265	0.00064716	0.0006716	0.00065892	0.0006662	0.00068219	0.00069584	0.00070394
High Deviation	0.00055763	6.4236E-05	0.00030212	0.00016216	0.0001049	0.00010938	8.2768E-05	7.8939E-05	7.8939E-05	7.7459E-05	0.00013008	6.9156E-05	6.5029E-05	7.72E-05
Low Deviation		0.00071533	0.00120326	0.00092985	0.0008227	0.0008364	0.00079203	0.00080504	0.00080504	0.00081384	0.00092636	0.00082051	0.0008259	0.00085834
		0.00045838	-5.2256E-06	0.00028119	0.00040309	0.00039887	0.00046096	0.00046096	0.00048929	0.00050401	0.00040604	0.00054388	0.00056579	0.00054954

$\epsilon_{sh,u}$	α	V/S	σ
0.0005030	0.4707407	0.625	32.56

Shrinkage Strain	672	672.1	672.5	673	674	675	678	696	720	744	840	1008	1176
	0	8.4331E-09	4.2154E-08	8.428E-08	1.6845E-07	2.525E-07	5.0399E-07	1.9921E-06	3.9229E-06	5.796E-06	1.2773E-05	2.3368E-05	3.2409E-05

time (hr)	strain μ
0	0.0005763
0.1	0.00058685
0.5	0.00059902
1	0.00060552
2	0.00061290
3	0.00061764
6	0.00062650
24	0.00064716
48	0.00065892
72	0.00066620
168	0.00068219
336	0.00069584
504	0.00070394

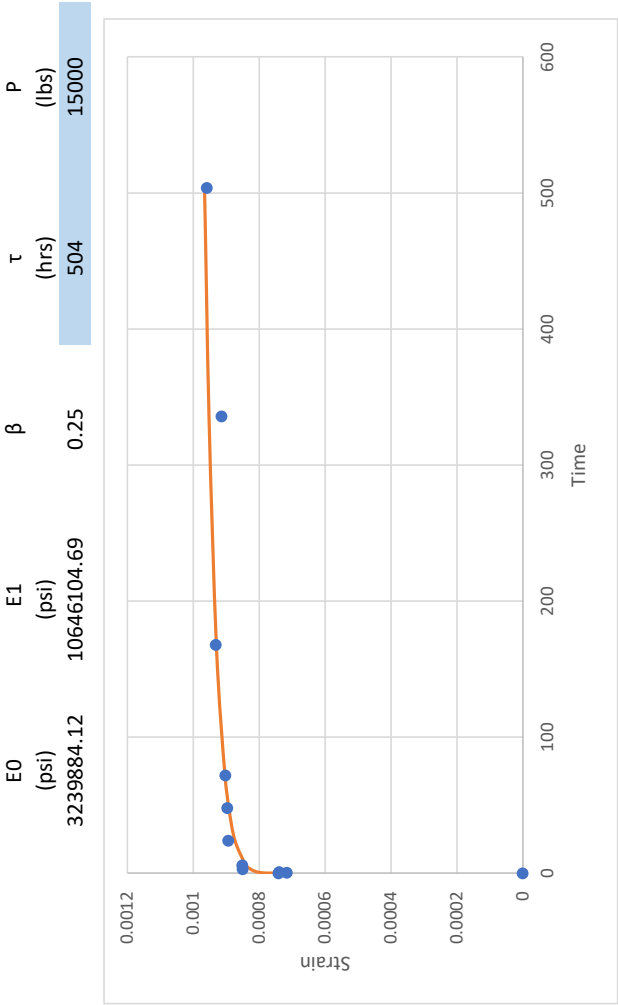
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
4303937.40	16403090.48	0.234913686	504	15000



Data Set # 1

time (hr)	strain μ	
0	0	0.00074077
0.1	0.000740767	0.00078068
0.5	0.000715716	0.00079876
1	0.000739135	0.00080862
2		0.00081993
3	0.000849924	0.00082726
6	0.000851241	0.00084109
24	0.00089351	0.00087386
48	0.000896269	0.00089277
72	0.000902215	0.00090455
168	0.000931172	0.00093059
336	0.000914349	0.00095292
504	0.000958448	0.00096620

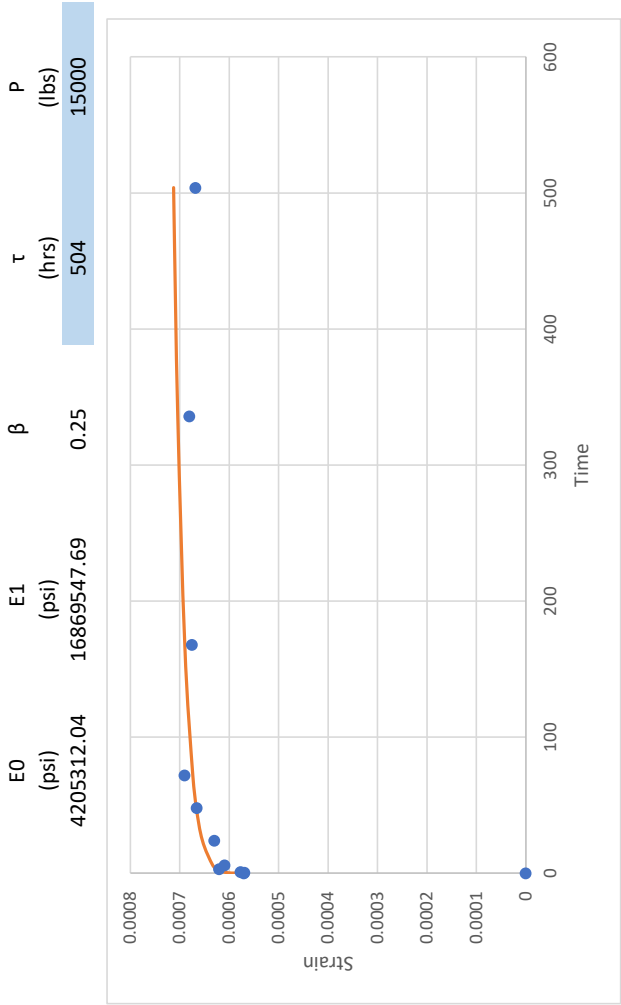
sum R^2 = 5.65E-07



Data Set # 2

time (hr)	strain μ					
0	0	0.00057071	0.00000033			
0.1	0.000570707	0.00059589	0.00000000			
0.5	0.000569114	0.00060731	0.00000000			
1	0.000576891	0.00061353	0.00000000			
2		0.00062066				
3	0.000620511	0.00062529	0.00000000			
6	0.00060931	0.00063402	0.00000000			
24	0.000629723	0.00065470	0.00000000			
48	0.000665299	0.00066664	0.00000000			
72	0.000690045	0.00067407	0.00000000			
168	0.00067523	0.00069050	0.00000000			
336	0.000680263	0.00070460	0.00000000			
504	0.000668101	0.00071297	0.00000000			

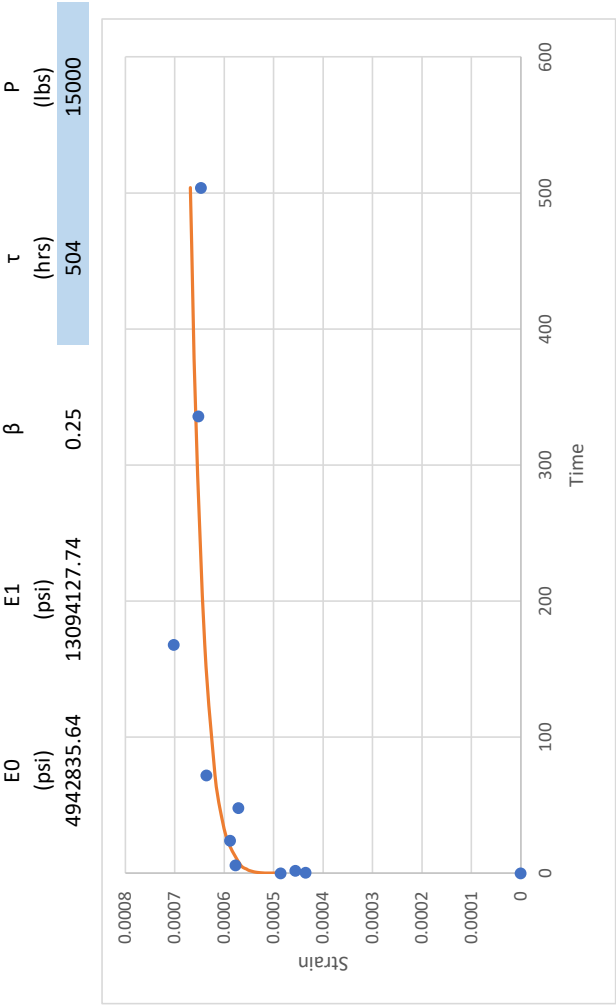
sum R^2 = 3.33E-07



Data Set # 3

time (hr)	strain μ	
0	0	0.00048555
0.1	0.000485551	0.00051800
0.5	0.000435499	0.00053270
1		0.00054072
2	0.000456214	0.00054991
3		0.00055587
6	0.000576759	0.00056712
24	0.000587769	0.00059377
48	0.000571248	0.00060914
72	0.000636071	0.00061871
168	0.000702057	0.00063988
336	0.000651851	0.00065804
504	0.000646968	0.00066884

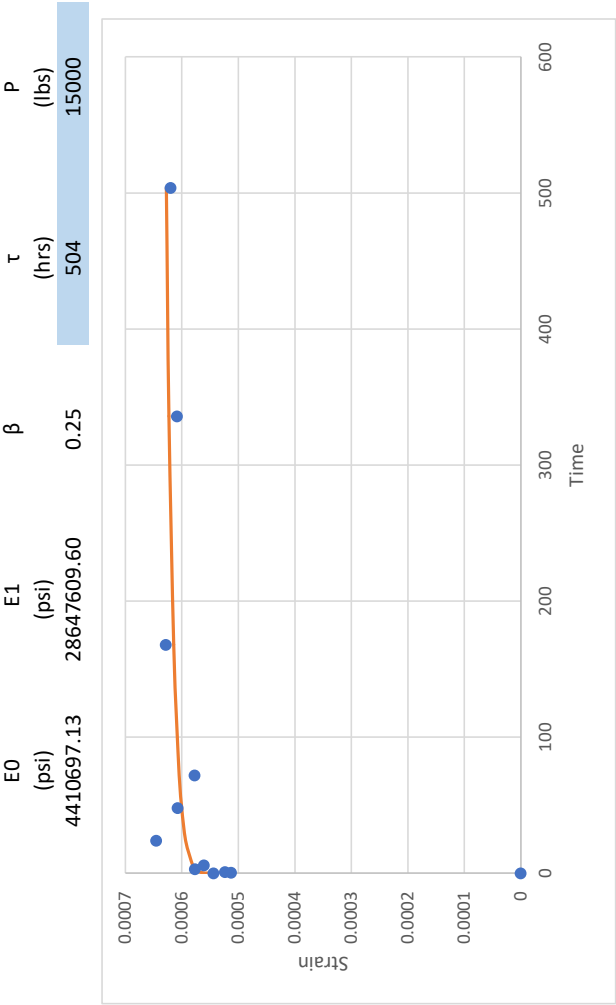
sum R^2 = 2.61E-07



Data Set # 4

time (hr)	strain μ										
0	0	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413	0.00054413
0.1	0.000544132	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896	0.00055896
0.5	0.000512828	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568	0.00056568
1	0.000523724	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935	0.00056935
2		0.00057355	0.00057355	0.00057355	0.00057355	0.00057355	0.00057355	0.00057355	0.00057355	0.00057355	0.00057355
3	0.000576715	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627	0.00057627
6	0.00056083	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141	0.00058141
24	0.000645345	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359	0.00059359
48	0.000607451	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062	0.00060062
72	0.000577429	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500	0.00060500
168	0.000628304	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467	0.00061467
336	0.000608323	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297	0.00062297
504	0.000619605	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791	0.00062791

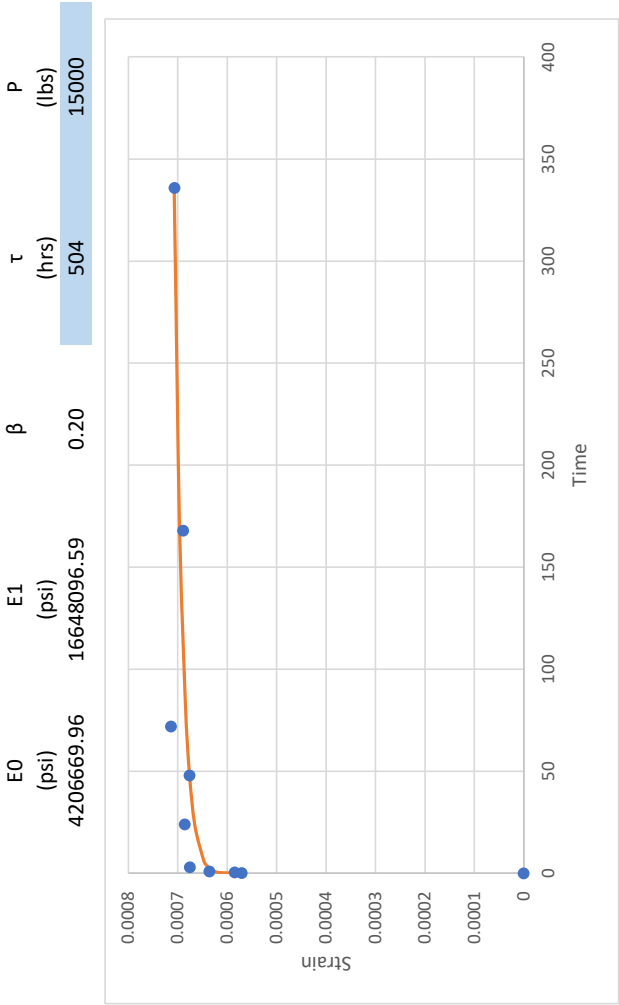
sum R^2 = 3.06E-07



Data Set # 5

time (hr)	strain μ					
0	0	0.00057052	0.00000033			
0.1	0.000570523	0.00060843	0.00000000			
0.5	0.000584556	0.00062111	0.00000000			
1	0.000636115	0.00062761	0.00000000			
2	0.000675022	0.00063477	0.00000000			
3		0.00063929				
6		0.00064757				
24	0.000685785	0.00066620	0.00000000			
48	0.000676032	0.00067649	0.00000000			
72	0.000713264	0.00068277	0.00000000			
168	0.000689074	0.00069639	0.00000000			
336	0.000706615	0.00070789	0.00000000			
504	0.000714774	0.00071468	0.00000000			

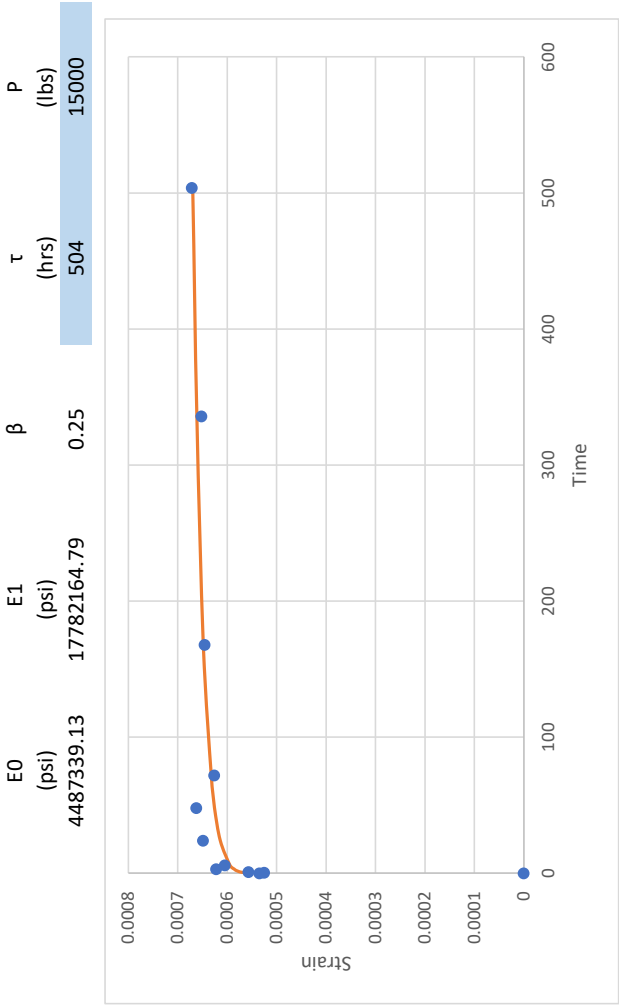
sum R^2 = 3.31E-07



Data Set # 6

time (hr)	strain μ	
0	0	0.00053484
0.1	0.000534838	0.00055873
0.5	0.000525419	0.00056956
1	0.000556649	0.00057546
2		0.00058223
3	0.000622166	0.00058662
6	0.000604708	0.00059490
24	0.000648566	0.00061452
48	0.000662287	0.00062584
72	0.000625995	0.00063289
168	0.000645603	0.00064848
336	0.000652216	0.00066186
504	0.000671325	0.00066980

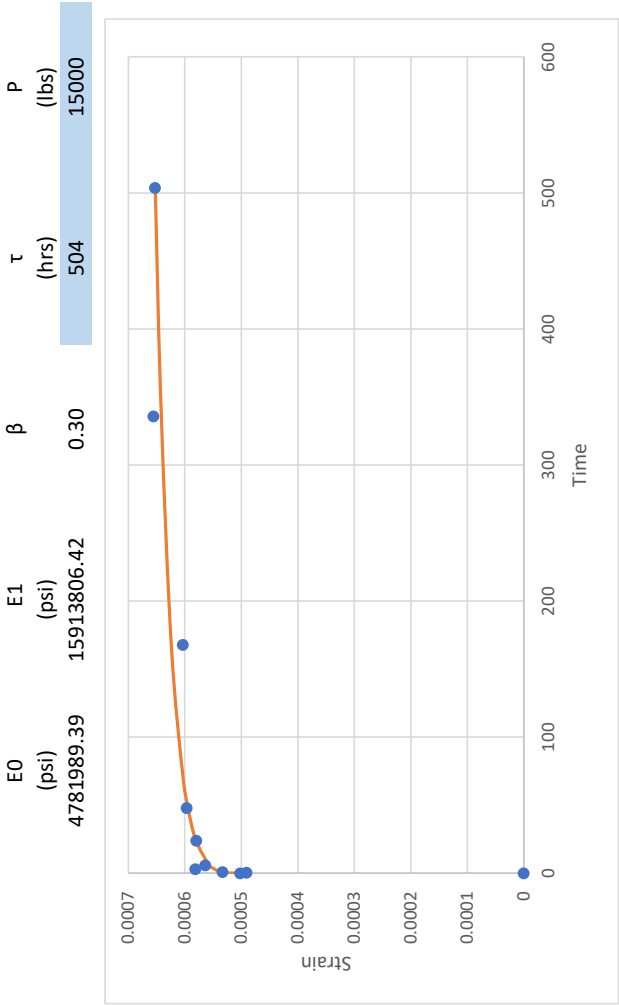
sum R^2 = 2.93E-07



Data Set # 7

time (hr)	strain μ										
0	0	0.00050188	0.00050188	0.00000025							
0.1	0.000501883	0.00051967	0.00051967	0.00000000							
0.5	0.000490906	0.00053004	0.00053004	0.00000000							
1	0.000533082	0.00053606	0.00053606	0.00000000							
2		0.00054324	0.00054324								
3	0.000581383	0.00054804	0.00054804	0.00000000							
6	0.000563932	0.00055736	0.00055736	0.00000000							
24	0.000579644	0.00058073	0.00058073	0.00000000							
48	0.000596477	0.00059487	0.00059487	0.00000000							
72		0.00060388	0.00060388								
168	0.000603263	0.00062424	0.00062424	0.00000000							
336	0.000655212	0.00064204	0.00064204	0.00000000							
504	0.000652435	0.00065270	0.00065270	0.00000000							

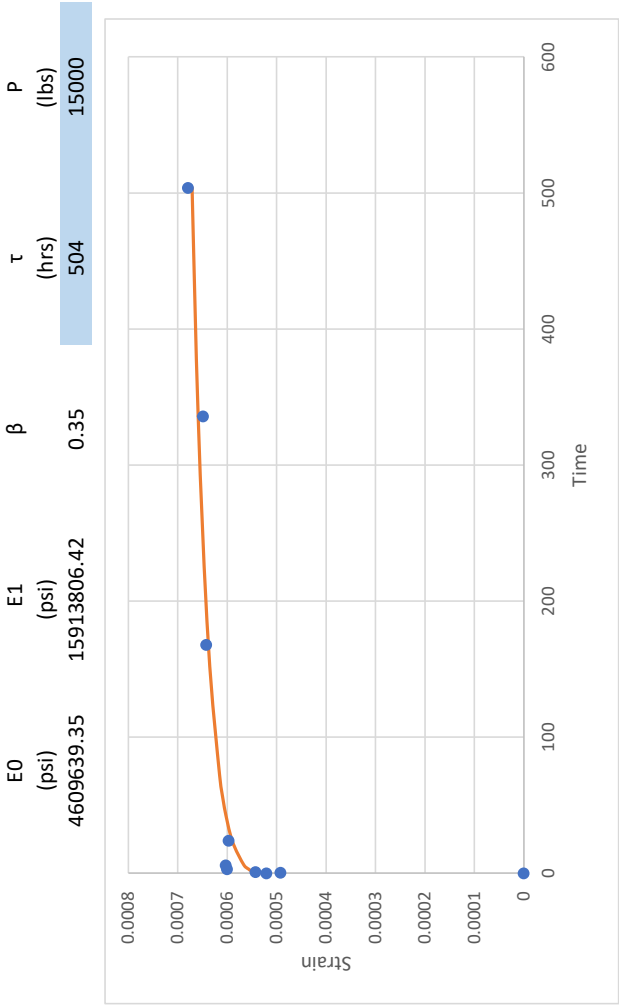
sum R^2 = 2.56E-07



Data Set # 8

time (hr)	strain μ					
0	0	0.00052065	0.00000027			
0.1	0.000520648	0.00053262	0.00000000			
0.5	0.000492473	0.00054122	0.00000000			
1	0.000542468	0.00054651	0.00000000			
2		0.00055307				
3	0.000600146	0.00055758	0.00000000			
6	0.000603022	0.00056662	0.00000000			
24	0.000596841	0.00059055	0.00000000			
48		0.00060577				
72		0.00061569				
168	0.000642351	0.00063864	0.00000000			
336	0.000648953	0.00065912	0.00000000			
504	0.00067901	0.00067146	0.00000000			

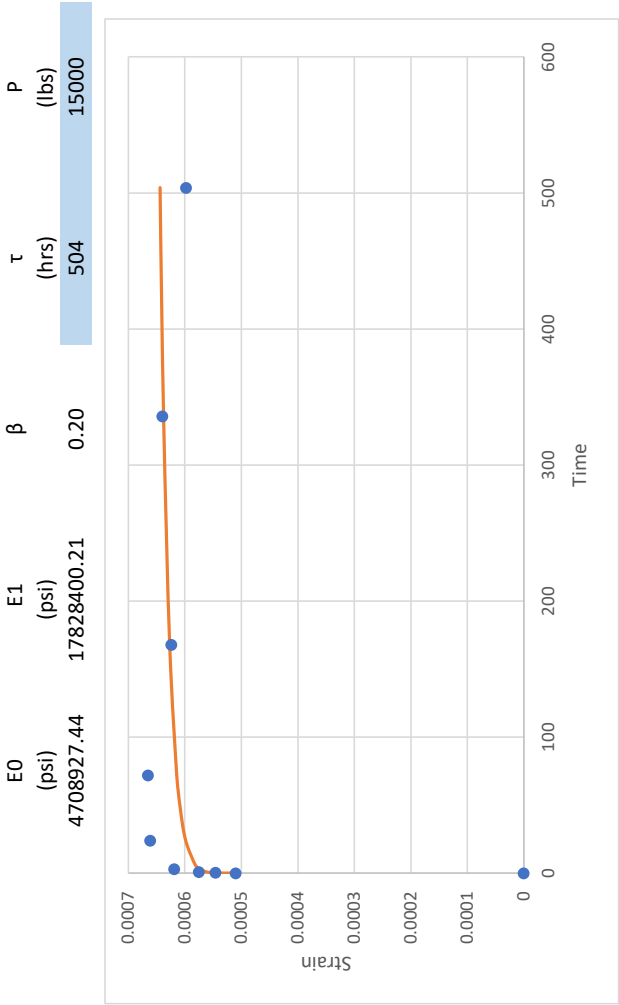
sum R^2 = 2.77E-07



Data Set # 9

time (hr)	strain μ				
0	0	0.00050967	0.00000026		
0.1	0.00050967	0.00054507	0.00000000		
0.5	0.000545601	0.00055691	0.00000000		
1	0.000575268	0.00056297	0.00000000		
2		0.00056967			
3	0.000618879	0.00057389	0.00000000		
6		0.00058161			
24	0.000660928	0.00059902	0.00000000		
48		0.00060862			
72	0.000664939	0.00061448	0.00000000		
168	0.000623549	0.00062720	0.00000000		
336	0.000639544	0.00063794	0.00000000		
504	0.000597666	0.00064429	0.00000000		

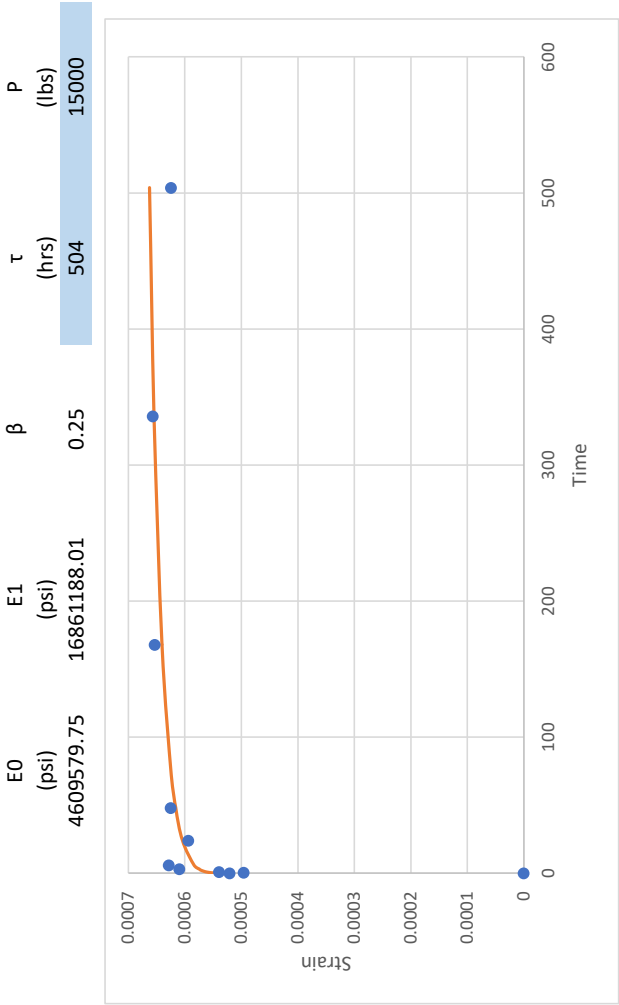
sum R^2 = 2.72E-07



Data Set # 10

time (hr)	strain μ					
0	0	0.00052065	0.00052065	0.00000027		
0.1	0.000520655	0.00054585	0.00054585	0.00000000		
0.5	0.000495605	0.00055727	0.00055727	0.00000000		
1	0.000539345	0.00056350	0.00056350	0.00000000		
2		0.00057064				
3	0.000609536	0.00057527	0.00057527	0.00000000		
6	0.000628069	0.00058400	0.00058400	0.00000000		
24	0.000593731	0.00060469	0.00060469	0.00000000		
48	0.000624636	0.00061663	0.00061663	0.00000000		
72		0.00062407				
168	0.000653302	0.00064051	0.00064051	0.00000000		
336	0.000656781	0.00065461	0.00065461	0.00000000		
504	0.000624294	0.00066299	0.00066299	0.00000000		

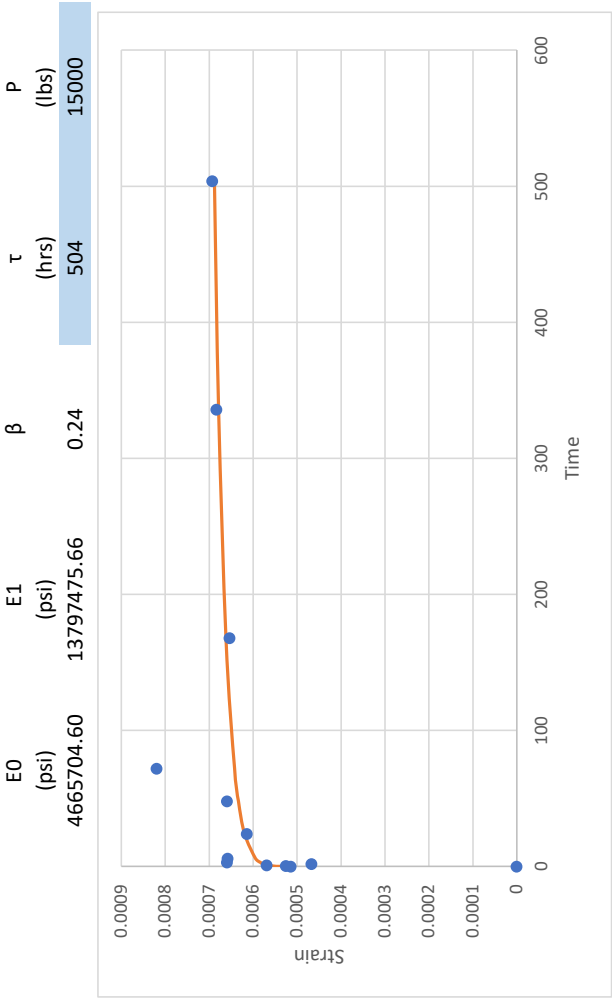
sum R^2 = 2.81E-07



Data Set # 11

time (hr)	strain μ	
0	0	0.00051439
0.1	0.000514392	0.00054811
0.5	0.000525303	0.00056245
1	0.000569038	0.00057016
2	0.000467333	0.00057892
3	0.00059491	0.00058456
6	0.00057702	0.00059513
24	0.000613998	0.00061989
48	0.000658964	0.00063403
72	0.000819578	0.00064279
168	0.000653258	0.00066207
336	0.000683301	0.00067855
504	0.000693018	0.00068834

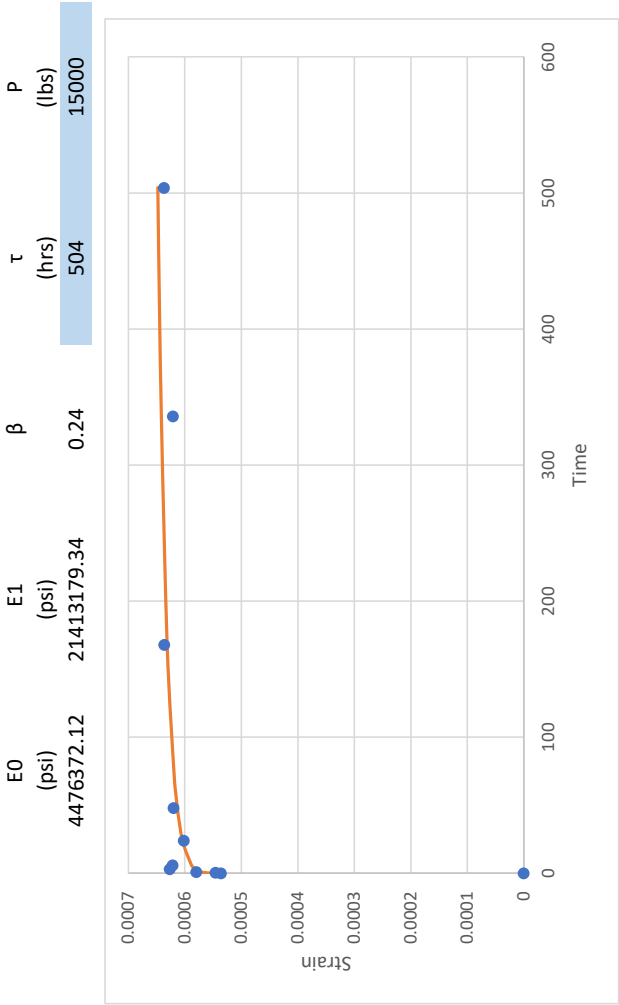
sum R^2 = 2.77E-07



Data Set # 12

time (hr)	strain μ				
0	0	0.00053615	0.00000029		
0.1	0.000536148	0.00055815	0.00000000		
0.5	0.000545493	0.00056743	0.00000000		
1	0.000579838	0.00057240	0.00000000		
2		0.00057805			
3	0.000626562	0.00058168	0.00000000		
6	0.000621625	0.00058848	0.00000000		
24	0.000601376	0.00060439	0.00000000		
48	0.000619771	0.00061345	0.00000000		
72		0.00061907			
168	0.000635933	0.00063142	0.00000000		
336	0.000620642	0.00064197	0.00000000		
504	0.000636616	0.00064823	0.00000000		

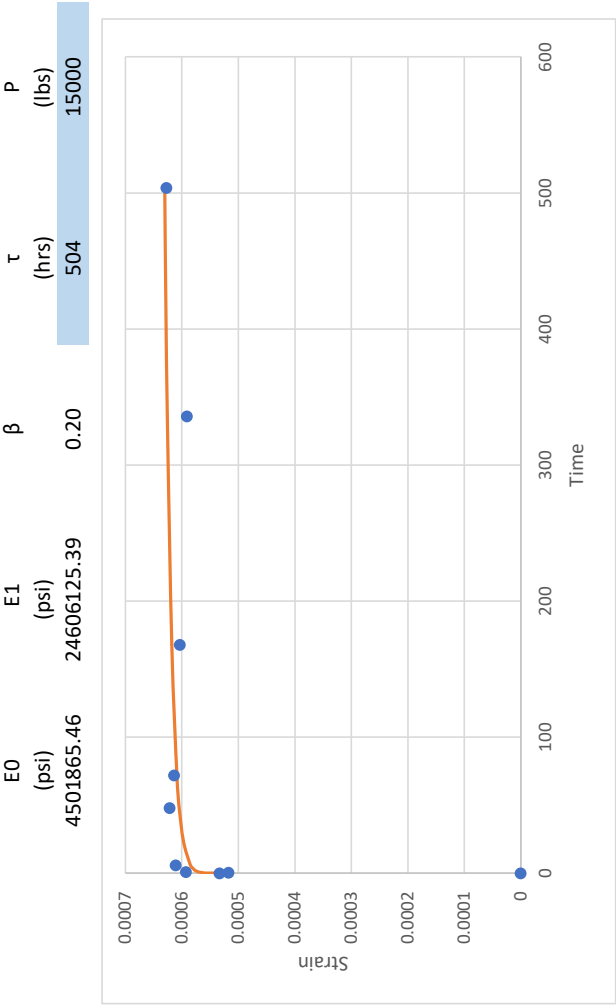
sum R^2 = 2.92E-07



Data Set # 13

time (hr)	strain μ				
0	0	0.00053311	0.00000028		
0.1	0.000533112	0.00055876	0.00000000		
0.5	0.000517444	0.00056734	0.00000000		
1	0.000592439	0.00057173	0.00000000		
2		0.00057658			
3		0.00057964			
6		0.00058524	0.00000000		
24	0.000610769	0.00059785			
48	0.000621417	0.00060481	0.00000000		
72	0.000613281	0.00060905	0.00000000		
168	0.000603182	0.00061827	0.00000000		
336	0.000591021	0.00062605	0.00000000		
504	0.000627316	0.00063065	0.00000000		

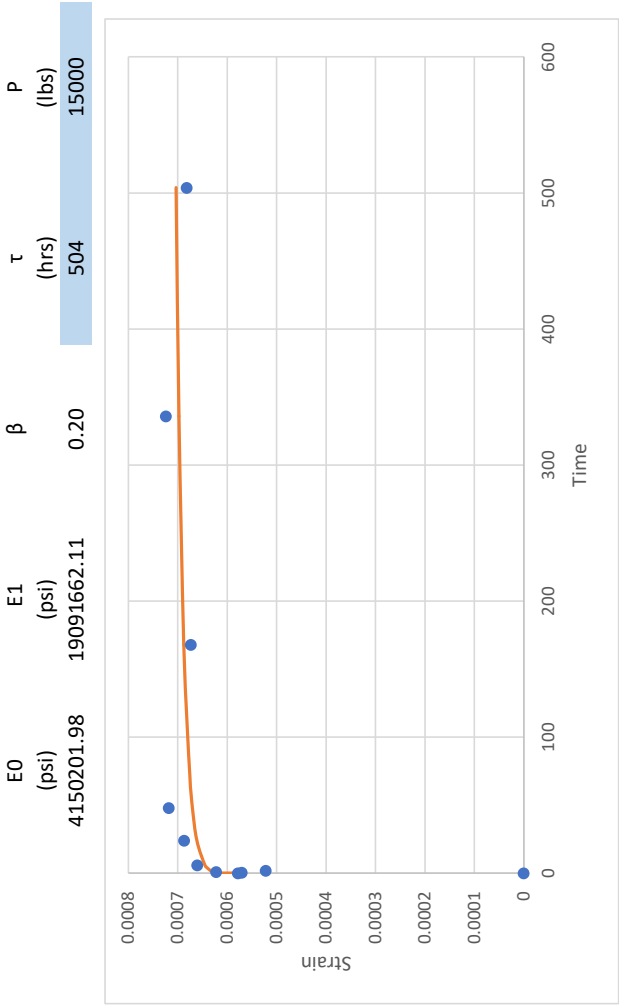
sum R^2 = 2.90E-07



Data Set # 14

time (hr)	strain μ				
0	0	0.00057829	0.00000033		
0.1	0.000578285	0.00061134	0.00000000		
0.5	0.000570438	0.00062240	0.00000000		
1	0.000621971	0.00062806	0.00000000		
2	0.000521862	0.00063431	0.00000001		
3		0.00063825			
6	0.000660621	0.00064547	0.00000000		
24	0.000687271	0.00066172	0.00000000		
48	0.000718159	0.00067069	0.00000000		
72		0.00067616			
168	0.000673366	0.00068804	0.00000000		
336	0.000723724	0.00069807	0.00000000		
504	0.000681861	0.00070399	0.00000000		

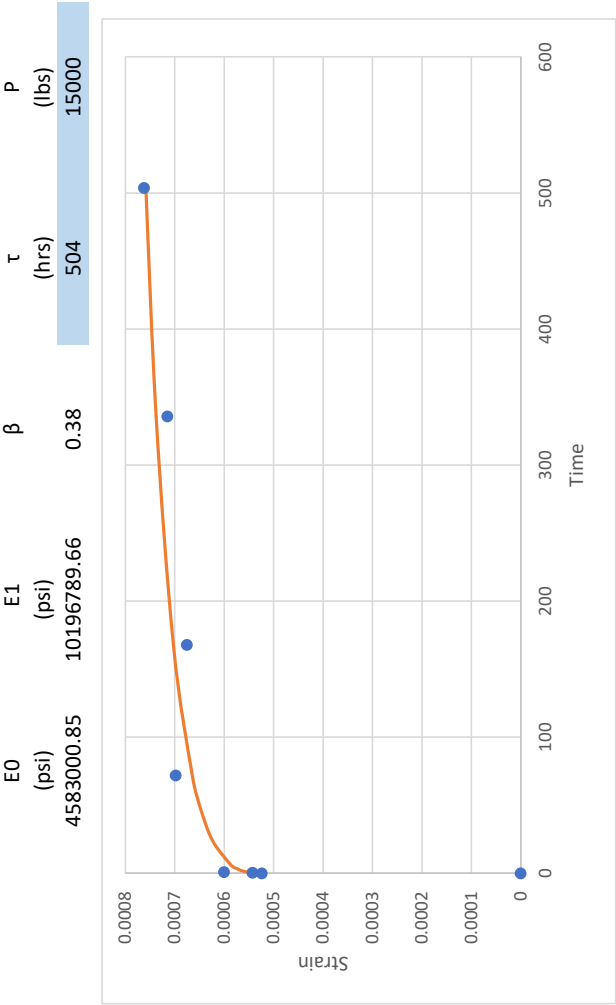
sum R^2 = 3.55E-07



Data Set # 15

time (hr)	strain μ				
0	0	0.00052367	0.00000027		
0.1	0.000523674	0.00053798	0.00000000		
0.5	0.000542407	0.00054962	0.00000000		
1	0.000600209	0.00055708	0.00000000		
2		0.00056654			
3		0.00057319			
6		0.00058677			
24		0.00062414			
48		0.00064872			
72		0.00066501			
168		0.00070332			
336		0.000714491			
504	0.000761728	0.00075904	0.00000000		

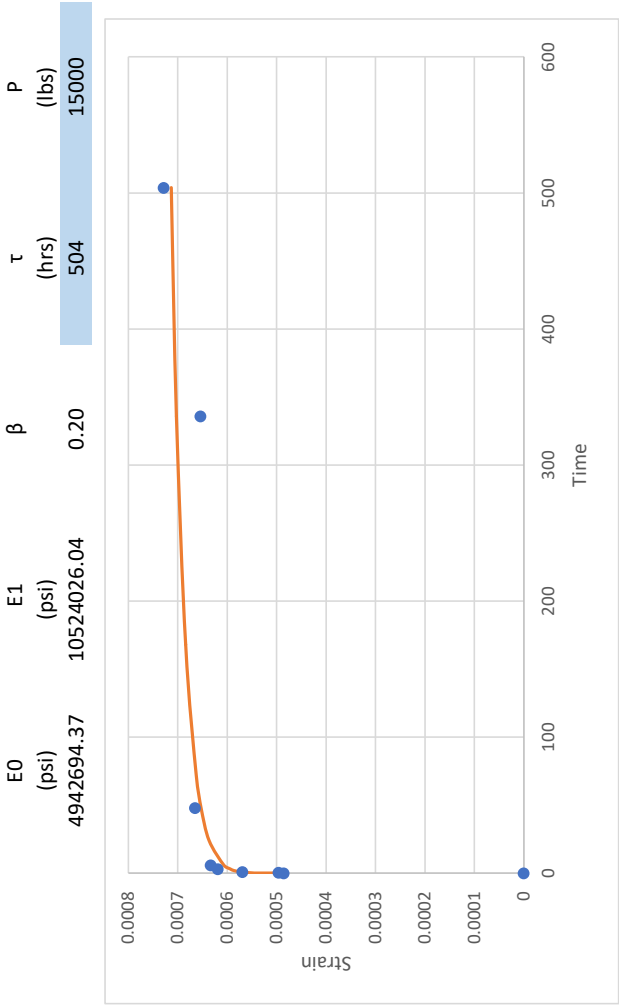
sum R^2 = 2.79E-07



Data Set # 16

time (hr)	strain μ	
0	0	0.00048557
0.1	0.000485565	0.00054553
0.5	0.000495956	0.00056559
1	0.000568856	0.00057587
2		0.00058721
3	0.000618704	0.00059435
6	0.000633038	0.00060744
24		0.00063692
48	0.000665052	0.00065320
72		0.00066313
168		0.00068467
336	0.000653946	0.00070286
504	0.000728255	0.00071361

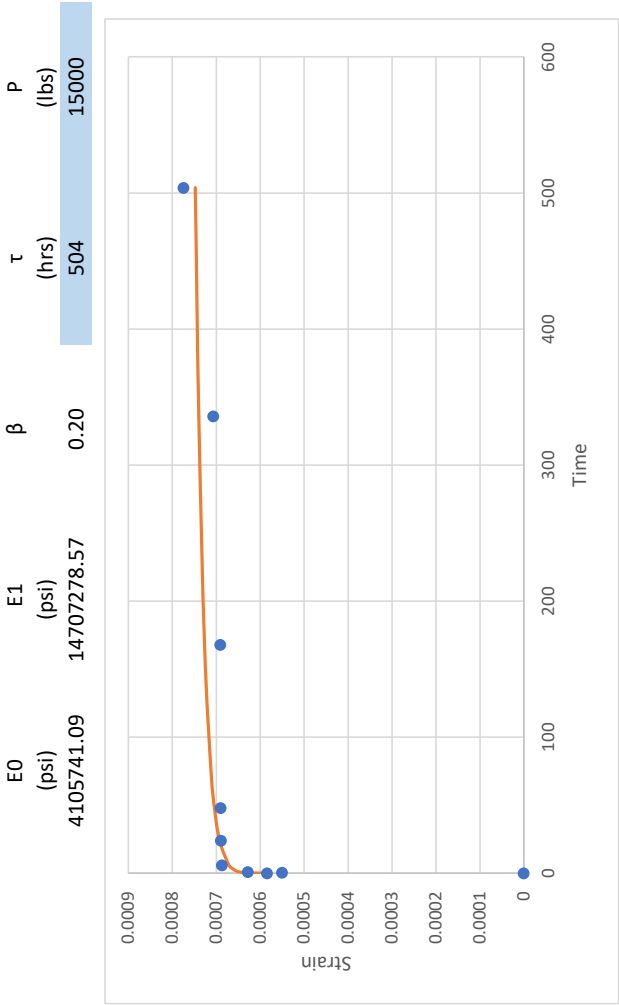
sum R^2 = 2.48E-07



Data Set # 17

time (hr)	strain μ				
0	0	0.00058455	0.00000034		
0.1	0.000584547	0.00062745	0.00000000		
0.5	0.000550126	0.00064181	0.00000001		
1	0.000628228	0.00064916	0.00000000		
2		0.00065728			
3		0.00066239			
6	0.000687203	0.00067176	0.00000000		
24	0.000688843	0.00069286	0.00000000		
48	0.000690036	0.00070450	0.00000000		
72		0.00071160			
168	0.000690565	0.00072702	0.00000000		
336	0.000706543	0.00074004	0.00000000		
504	0.000774084	0.00074773	0.00000000		

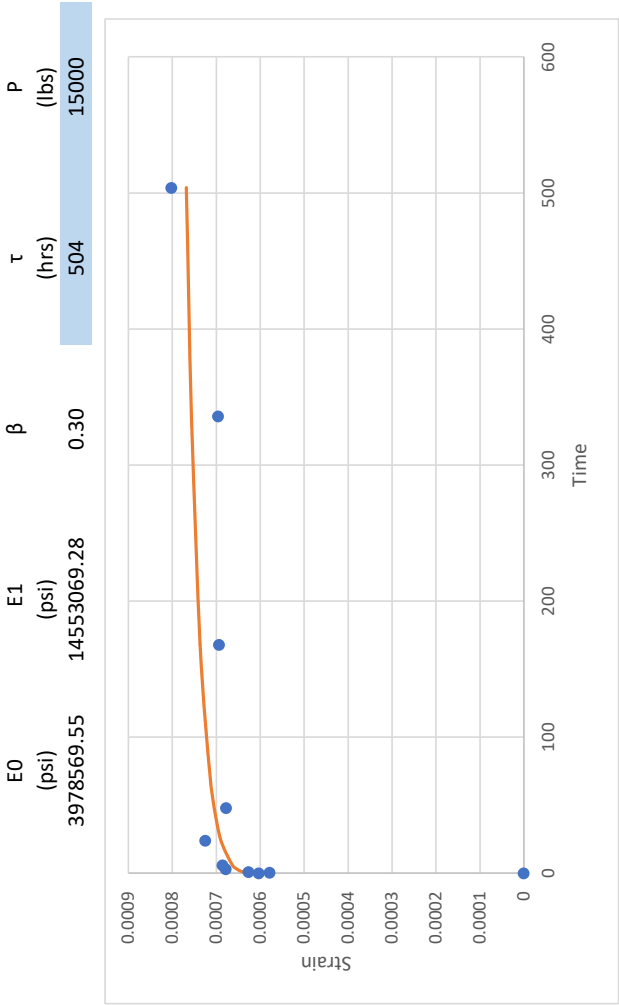
sum R^2 = 3.56E-07



Data Set # 18

time (hr)	strain μ	
0	0	0.00060323
0.1	0.000603232	0.00062269
0.5	0.000578189	0.00063402
1	0.000626599	0.00064061
2		0.00064845
3	0.000678005	0.00065370
6	0.000685566	0.00066390
24	0.000724747	0.00068945
48	0.000677459	0.00070492
72		0.00071477
168	0.000693624	0.00073703
336	0.000695532	0.00075650
504	0.000802195	0.00076815

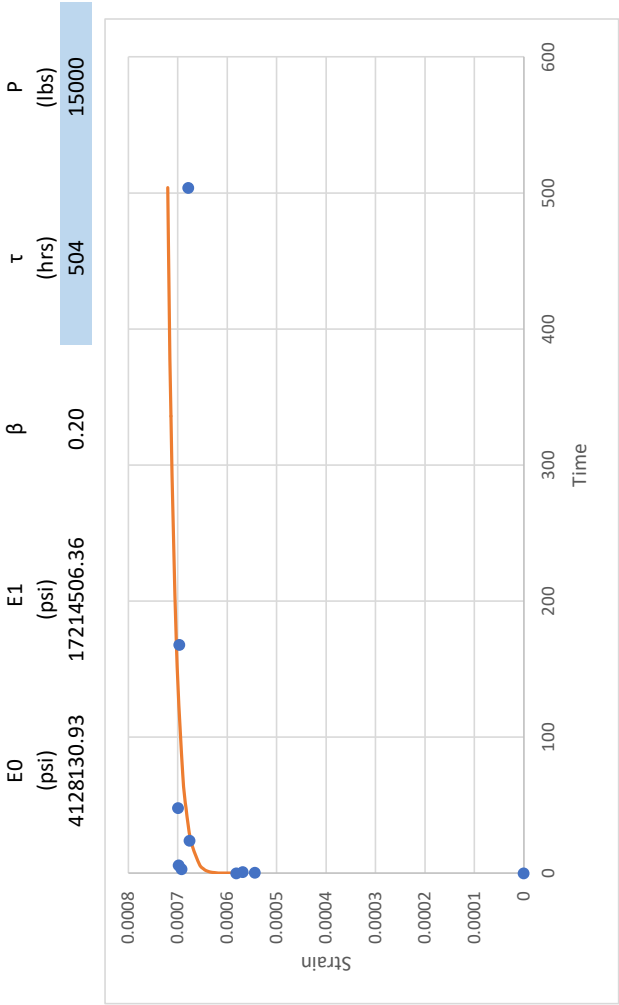
sum R^2 = 3.77E-07



Data Set # 19

time (hr)	strain μ				
0	0	0.00058138	0.00000034		
0.1	0.000581377	0.00061803	0.00000000		
0.5	0.000543828	0.00063030	0.00000001		
1	0.000568796	0.00063658	0.00000000		
2		0.00064352			
3	0.000692089	0.00064788	0.00000000		
6	0.000698113	0.00065589	0.00000000		
24	0.00067628	0.00067391	0.00000000		
48	0.000699368	0.00068386	0.00000000		
72		0.00068993			
168	0.000696786	0.00070310	0.00000000		
336		0.00071422			
504	0.000678695	0.00072079	0.00000000		

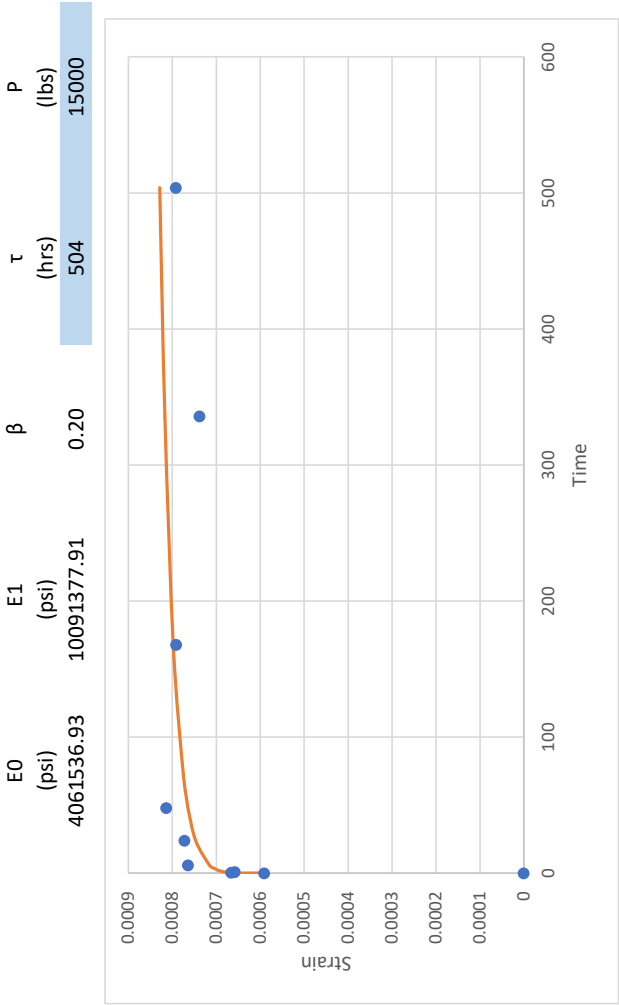
sum R^2 = 3.57E-07



Data Set # 20

time (hr)	strain μ				
0	0	0.00059091	0.00000035		
0.1	0.000590909	0.00065149	0.00000000		
0.5	0.000665894	0.00067232	0.00000000		
1	0.000658049	0.00068304	0.00000000		
2		0.00069491			
3		0.00070241			
6	0.000763928	0.00071617	0.00000000		
24	0.000771823	0.00074729	0.00000000		
48	0.000813673	0.00076453	0.00000000		
72		0.00077506			
168	0.000790736	0.00079795	0.00000000		
336	0.000737947	0.00081730	0.00000001		
504	0.000791413	0.00082874	0.00000000		

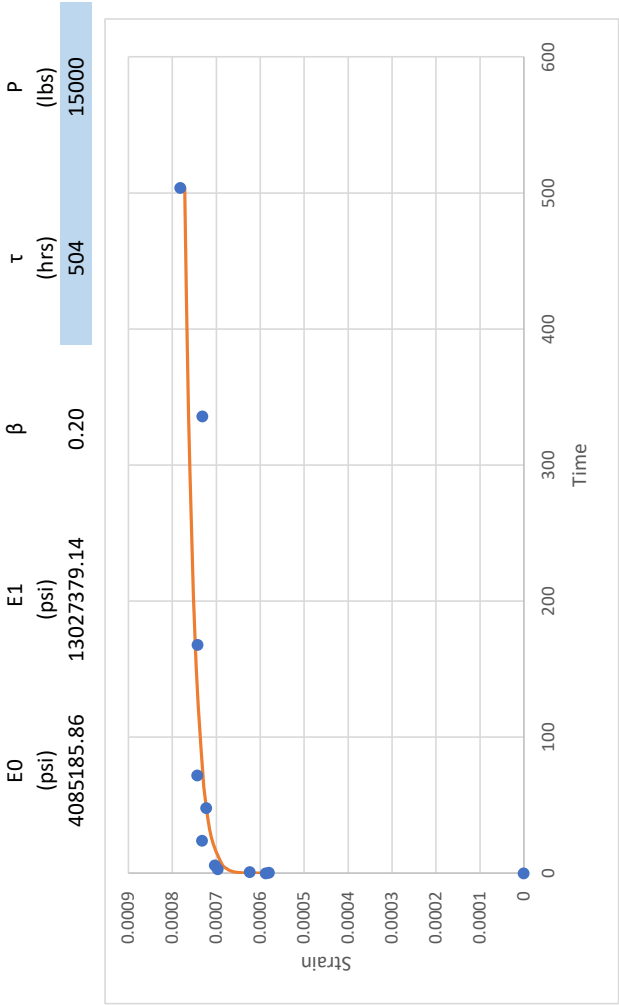
sum R^2 = 3.67E-07



Data Set # 21

time (hr)	strain μ	
0	0	0.00058749
0.1	0.000587489	0.00063593
0.5	0.000579643	0.00065213
1	0.00062335	0.00066044
2		0.00066960
3	0.000696626	0.00067537
6	0.000702626	0.00068595
24	0.000732391	0.00070976
48	0.000722635	0.00072291
72	0.000742638	0.00073093
168	0.000741912	0.00074834
336	0.00073131	0.00076303
504	0.000781649	0.00077172

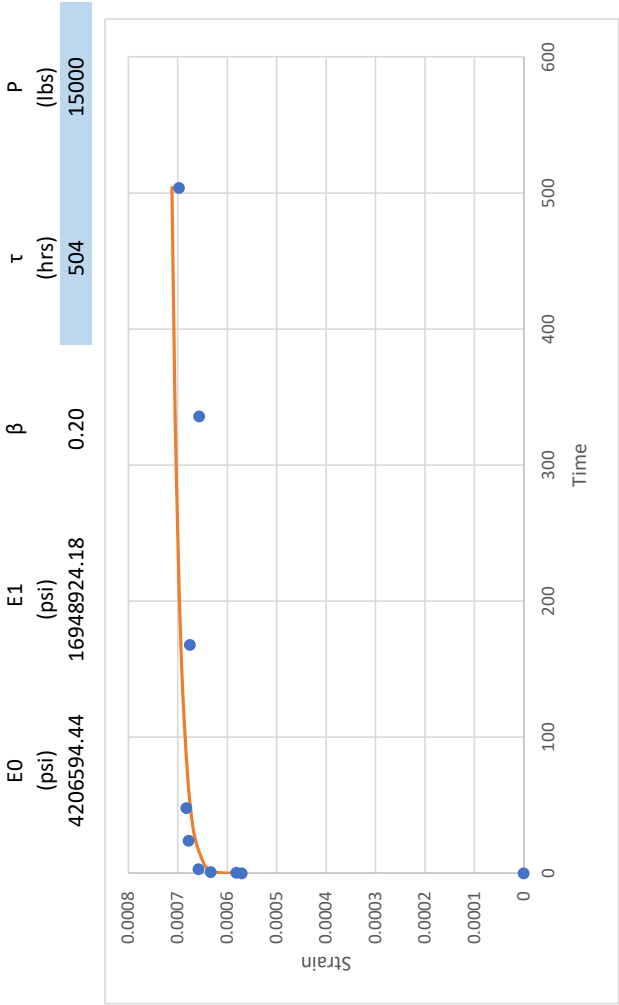
sum R^2 = 3.57E-07



Data Set # 22

time (hr)	strain μ	
0	0	0.00057053
0.1	0.000570533	0.00060776
0.5	0.000581445	0.00062022
1	0.000632978	0.00062660
2		0.00063364
3	0.000657816	0.00063808
6		0.00064621
24	0.000677951	0.00066452
48	0.000682289	0.00067462
72		0.00068078
168	0.000675002	0.00069416
336	0.000656594	0.00070546
504	0.000697545	0.00071213

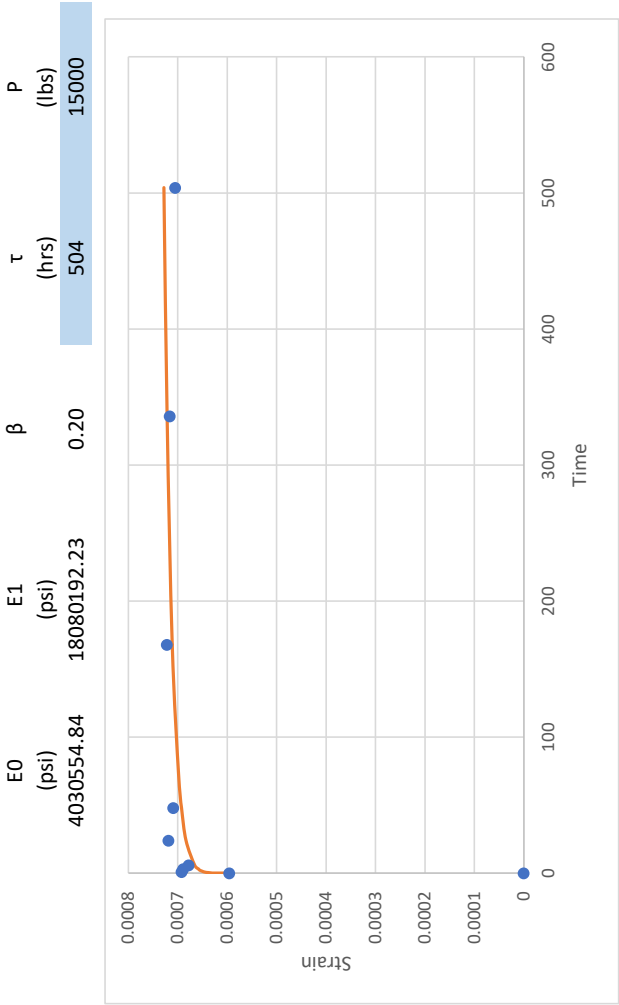
sum R^2 = 3.32E-07



Data Set # 23

time (hr)	strain μ				
0	0	0.00059545	0.00000035		
0.1	0.000595452	0.00063035	0.00000000		
0.5		0.00064203			
1	0.000692277	0.00064801	0.00000000		
2		0.00065461			
3	0.000688984	0.00065877	0.00000000		
6	0.000677786	0.00066639	0.00000000		
24	0.000718503	0.00068355	0.00000000		
48	0.000708749	0.00069303	0.00000000		
72		0.00069880			
168	0.000721782	0.00071135	0.00000000		
336	0.000715871	0.00072194	0.00000000		
504	0.000705267	0.00072819	0.00000000		

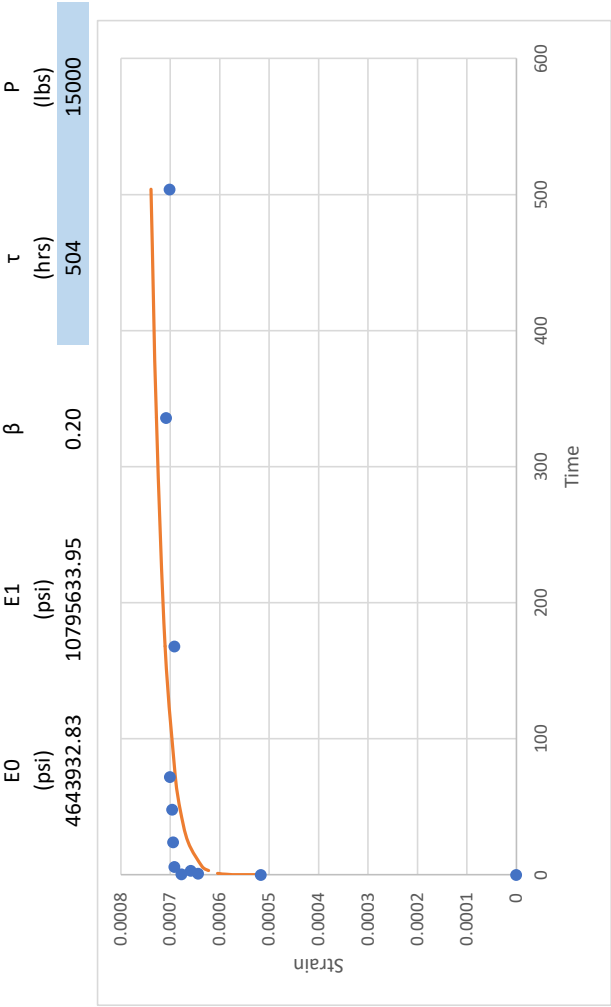
sum R^2 = 3.61E-07



Data Set # 24

time (hr)	strain μ					
0	0	0.00051680	0.00000027			
0.1	0.000516803	0.00057526	0.00000000			
0.5	0.000677259	0.00059481	0.00000001			
1	0.000643861	0.00060483	0.00000000			
2						
3	0.00058282	0.00062285	0.00000000			
6	0.000691382	0.00063562	0.00000000			
24	0.000694054	0.00066435	0.00000000			
48	0.000696291	0.00068022	0.00000000			
72	0.000700667	0.00068990	0.00000000			
168	0.000691608	0.00071090	0.00000000			
336	0.000708105	0.00072863	0.00000000			
504	0.000701149	0.00073912	0.00000000			

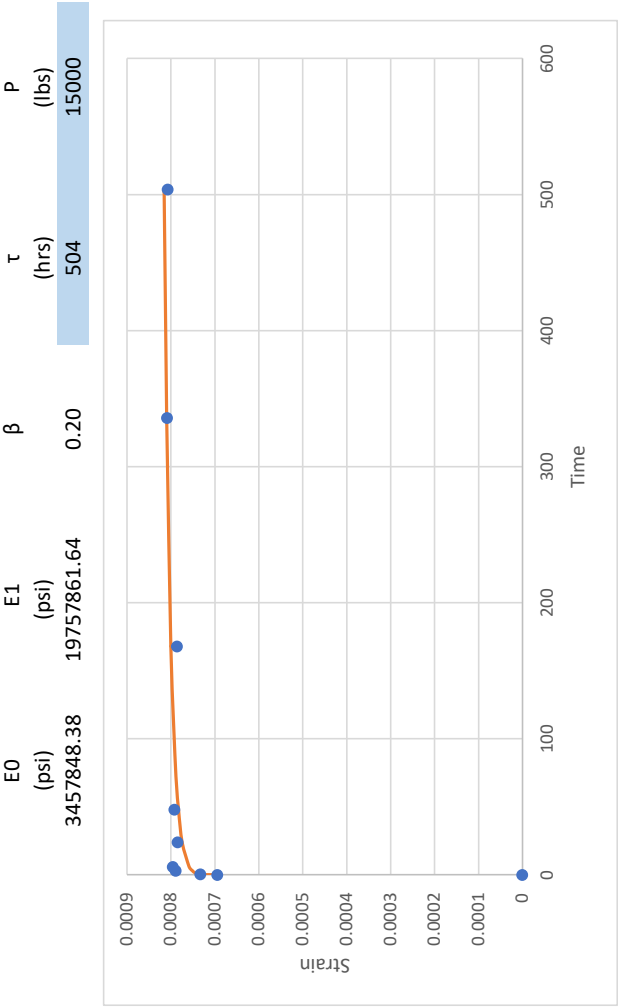
sum R^2 = 2.87E-07



Data Set # 25

time (hr)	strain μ				
0	0	0.00069407	0.00000048		
0.1	0.000694073	0.00072601	0.00000000		
0.5	0.000733137	0.00073670	0.00000000		
1	0	0.00074217	0.00000000		
2		0.00074821			
3		0.00075202			
6	0.000789194	0.00075899	0.00000000		
24	0.000795216	0.00077469	0.00000000		
48	0.000784337	0.00078336	0.00000000		
72	0.000791784	0.00078865	0.00000000		
168	0.000786062	0.00080013			
336	0.000808299	0.00080982			
504	0.000807072	0.00081554	0.00000000		

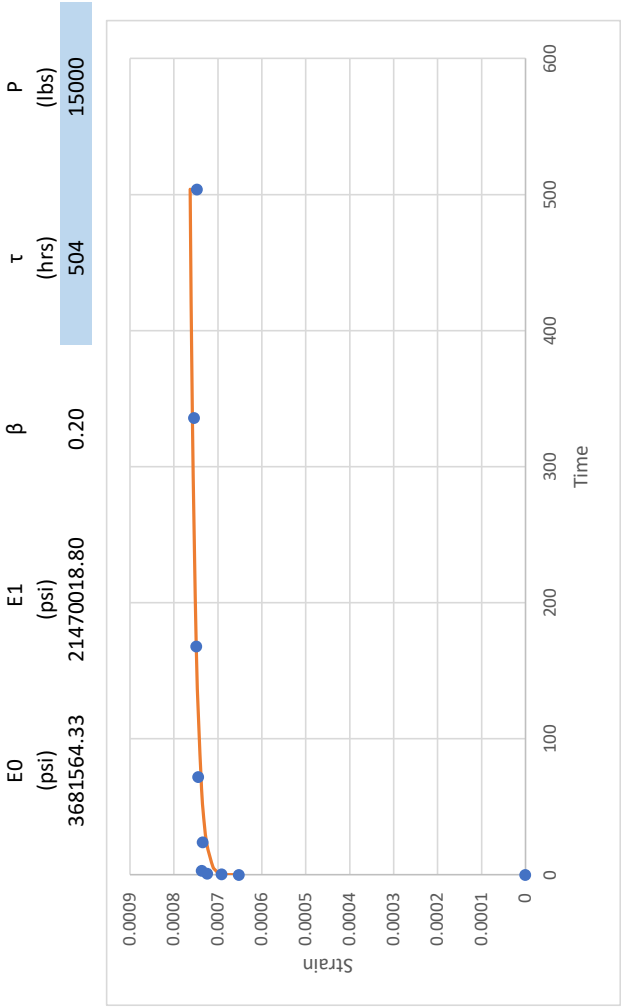
sum R^2 = 4.86E-07



Data Set # 26

time (hr)	strain μ	
0	0	0.00000042
0.1	0.000651897	0.00000000
0.5	0.000690974	0.00000000
1	0.000723759	0.00000000
2		0.00069616
3	0.000736093	0.00070172
6		0.00070522
24	0.000734354	0.00071164
48		0.00072609
72	0.00074461	0.00073406
168	0.000748574	0.00073893
336	0.000753616	0.00074949
504	0.000747706	0.00075841
		0.00076368

sum R^2 = 4.28E-07



Test Sample: Normal Strength f_c desired: 6 ksi lbs
Load Applied: 50% f_c measured: 5.2 ksi

		AVERAGE STRAINS - NSC 0.50f _c CREEP TEST															
Date	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021
Time	11:30:00 AM	12:15:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM
Relative Humidity	49.3	49.3	50.3	23.0	23.0	23.0	49.9	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Air Temp	23.2	23.2	23.0	23.0	23.0	23.0	23.0	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9
Time (hrs)	0	0.1	3	6	9	24	48	72	168	336	504	672					
Point of Measure	1	0.00000000	0.00075962	0.00077838	0.00088778	0.00059185	0.00060644	0.00075441	0.00078775	0.00084407	0.00078466	0.00082999	0.00094883				
	2	0.00000000	0.00056436	0.00048620	0.00057687	0.00052685	0.00060032	0.00069880	0.00073007	0.00107709	0.00093172	0.00098330	0.00107240				
	3	0.00000000	0.00049249	0.00061705	0.00071294	0.00067749	0.00058315	0.00066600	0.00068477	0.00095679	0.00089893	0.00093958	0.00102400				
	4	0.00000000	0.00058783	0.00064828	0.00067328	0.00070871	0.00076083	0.00082961	0.00086828	0.00107396	0.00093639	0.00091606	0.00099109				
	5	0.00000000	0.00053114	0.00058738	0.00063737	0.00063943	0.00069774	0.00076231	0.00084146	0.00098520	0.00101430	0.00106014	0.00111844				
	6	0.00000000	0.00050636	0.00049231	0.00053294	0.00054701	0.00065169	0.00070170	0.00079232	0.00100795	0.00099079	0.00100954	0.00107674				
	7	0.00000000	0.00050325	0.00055012	0.00062356	0.00057514	0.00067044	0.00077200	0.00100161	0.00108135	0.00097672	0.00102359	0.00110330				
	8	0.00000000	0.00056251	0.00059219	0.00060781	0.00062656	0.00069061	0.00077968	0.00087810	0.00106091	0.00101251	0.00107814	0.00115470				
	9	0.00000000	0.00047804	0.00047806	0.00056085	0.00053742	0.00061709	0.00070456	0.00081703	0.00089358	0.00094512	0.00098574	0.00107165				
	10	0.00000000	0.00050470	0.00056720	0.00059841	0.00055939	0.00064532	0.00076092	0.00082501	0.00099222	0.00115151	0.00107658	0.00112969				
	11	0.00000000	0.00049220	0.00068337	0.00075004	0.00076877	0.00083335	0.00069690	0.00079849	0.00096256	0.00107194	0.00106725	0.00113602				
	12	0.00000000	0.00056408	0.00058128	0.00065315	0.00063283	0.00071253	0.00076097	0.00082034	0.00100160	0.00107974	0.00109692	0.00116255				
	13	0.00000000	0.00065629	0.00063283	0.00066408	0.00064855	0.00071408	0.00076878	0.00091410	0.00112506	0.00113129	0.00120317	0.00126724				
	14	0.00000000	0.00057509	0.00059698	0.00064855	0.00065635	0.00071262	0.00077044	0.00081419	0.00095483	0.00103609	0.001111267	0.00116892				
	15	0.00000000	0.00066567	0.00066878	0.00072503	0.00075003	0.00082816	0.00087348	0.00095318	0.00108288	0.00116100	0.00125008	0.00129696				
	16	0.00000000	0.00055156	0.00060624	0.00063436	0.00067654	0.00069685	0.00074841	0.00080466	0.00095468	0.00103435	0.00108123	0.00114999				
	17	0.00000000	0.00058135	0.00061573	0.00064699	0.00067199	0.00072200	0.00078920	0.00083139	0.00100486	0.00113145	0.00111894	0.00118458				
	18	0.00000000	0.00032931	0.00034600	0.00040645	0.00037308	0.00041897	0.00048776	0.00053362	0.00066284	0.00071913	0.00080460	0.00088380				
	19	0.00000000	0.00057498	0.00062655	0.00066405	0.00068748	0.00073123	0.00080623	0.00083749	0.00099061	0.00105310	0.00112967	0.00118124				
	20	0.00000000	0.00077170	0.00082794	0.00084669	0.00085451	0.00094043	0.00102010	0.00103573	0.00114041	0.00125132	0.00130444	0.00135443				
	21	0.00000000	0.00054690	0.00058285	0.00064692	0.00064222	0.00070004	0.00077505	0.00080630	0.00096565	0.00098599	0.00109538	0.00114850				
	22	0.00000000	0.00058913	0.00060944	0.00065164	0.00067664	0.00075942	0.00078758	0.00082508	0.00097197	0.00105322	0.00112823	0.00118761				
	23	0.00000000	0.00059204	0.00064044	0.00065451	0.00070136	0.00080136	0.00081228	0.00086383	0.00095443	0.00107162	0.00112161	0.00119504				
	24	0.00000000	0.00074034	0.00068881	0.00071849	0.00092311	0.00099653	0.00099651	0.00100901	0.00115584	0.00127456	0.00130268	0.00137454				
	25	0.00000000	0.00053131	0.00058131	0.00070476	0.00075164	0.00079539	0.00086103	0.00090010	0.00103293	0.00110481	0.00117669	0.00123764				
	26	0.00000000	0.00051858	0.00054774	0.00056648	0.00062272	0.00076848	0.00084347	0.00092885	0.00111418	0.00107469	0.00125999	0.00133290				

Test Sample: Normal Strength f'c desired: 6 ksi Load Applied: 18750 lbs
Load Applied: 50% f'c measured 5.2 ksi

TOTAL STRAINS MINUS SHRINKAGE STRAINS

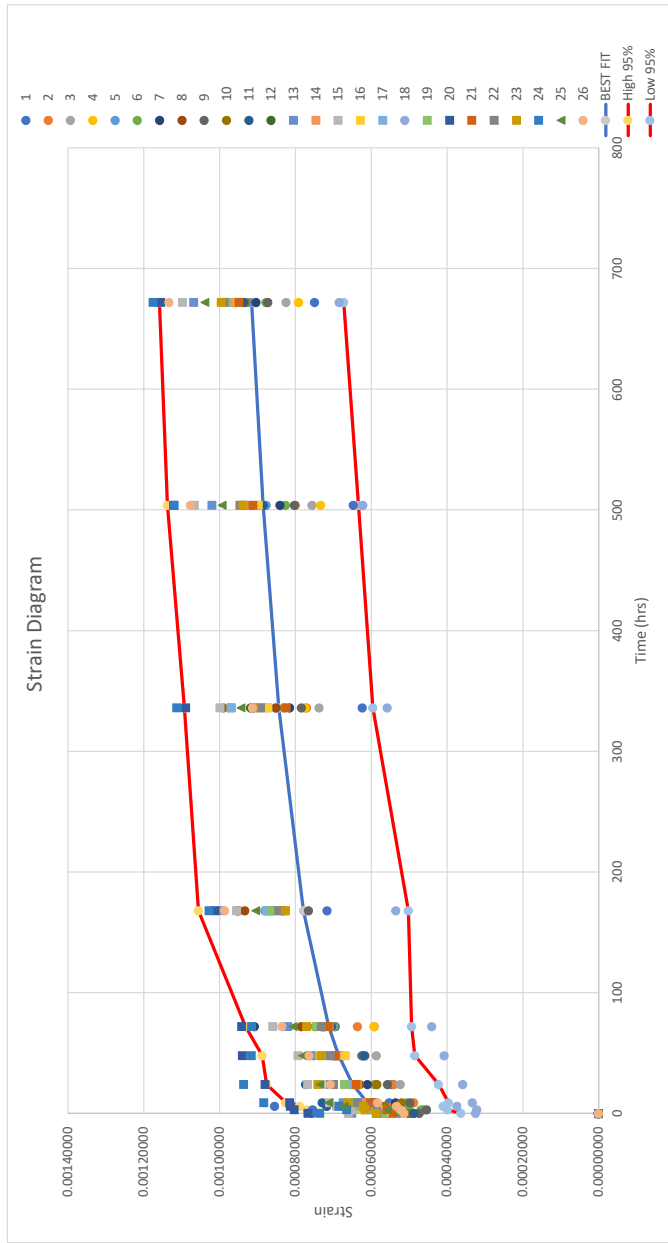
Date	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/21/2021	12/22/2021	12/23/2021	12/27/2021	1/3/2022	1/10/2022	1/17/2022
Time	11:30:00 AM	12:15:00 PM	3:30:00 PM	6:30:00 PM	9:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM	12:30:00 PM
Relative Humidity	49.3	49.3	50.3	49.9	49.9	50.1	50.1	50.1	50	50	50.2	50	50.1
Air Temp	23.2	23.2	23.0	23.0	23.0	23.0	22.9	23.0	22.9	23.0	22.9	22.9	22.9
Notes	0	0.1	3	6	9	24	48	72	336	168	336	504	672
Point of Measure	1	0.00000000	0.00075445	0.00075374	0.00085426	0.00055185	0.00054580	0.00067411	0.00069372	0.00071571	0.00062272	0.00064642	0.00074921
	2	0.00000000	0.00055919	0.00046156	0.00054336	0.00048685	0.00053968	0.00061849	0.00063603	0.00094873	0.00076978	0.00079974	0.00087279
	3	0.00000000	0.00048732	0.00059241	0.00067943	0.00063749	0.00052251	0.00058570	0.00059073	0.00082843	0.00073699	0.00075602	0.00082438
	4	0.00000000	0.00058266	0.00062364	0.00063977	0.00066871	0.00070018	0.00074930	0.00059224	0.00094560	0.00077445	0.00073250	0.00079147
	5	0.00000000	0.00052597	0.00056274	0.00060385	0.00059943	0.00063710	0.00068201	0.00074743	0.00085684	0.00085236	0.00087657	0.00091882
	6	0.00000000	0.00050119	0.00046767	0.00049943	0.00050701	0.00059105	0.00062140	0.00069829	0.00087959	0.00082885	0.00082598	0.00087112
	7	0.00000000	0.00049808	0.00052548	0.00059005	0.00053514	0.00060980	0.00069170	0.00090758	0.00095299	0.00081478	0.00084003	0.00090368
	8	0.00000000	0.00055734	0.00056755	0.00057430	0.00058656	0.00062997	0.00069938	0.00078407	0.00093255	0.00085057	0.00089457	0.00095508
	9	0.00000000	0.00047287	0.00045342	0.00052734	0.00049742	0.00055645	0.00062426	0.00072299	0.00076523	0.00078319	0.00080217	0.00087203
	10	0.00000000	0.00049953	0.00054256	0.00056490	0.00051939	0.00058468	0.00068062	0.00073098	0.00086386	0.00098957	0.00089301	0.00093007
	11	0.00000000	0.00048703	0.00065873	0.00071653	0.00072877	0.00077271	0.00061660	0.00070445	0.00083420	0.00091000	0.00088368	0.00093640
	12	0.00000000	0.00055891	0.00055664	0.00061964	0.00059283	0.00065188	0.00068066	0.00072631	0.00087324	0.00091780	0.00091336	0.00096293
	13	0.00000000	0.00065112	0.00060819	0.00063056	0.00067408	0.00070813	0.00075877	0.00082006	0.00099670	0.00096935	0.00101960	0.00106762
	14	0.00000000	0.00056992	0.00057234	0.00061504	0.00061635	0.00065197	0.00069014	0.00072016	0.00082647	0.00087415	0.00092910	0.00096930
	15	0.00000000	0.00066050	0.00064414	0.00069152	0.00071003	0.00076752	0.00079318	0.00085914	0.00095452	0.00099906	0.00106651	0.00109734
	16	0.00000000	0.00054638	0.00058160	0.00060085	0.00063654	0.00063621	0.00066811	0.00071063	0.00082633	0.00087241	0.00089767	0.00095037
	17	0.00000000	0.00057617	0.00059109	0.00061347	0.00063199	0.00066136	0.00070890	0.00073736	0.00087650	0.00096951	0.00093538	0.00098496
	18	0.00000000	0.00032414	0.00032136	0.00037293	0.00033308	0.00035833	0.00040746	0.00043959	0.00053448	0.00055719	0.00062104	0.00068419
	19	0.00000000	0.00056981	0.00060191	0.00063051	0.00064748	0.00067059	0.00072593	0.00074345	0.00086225	0.00089117	0.00094611	0.00098162
	20	0.00000000	0.00076653	0.00080330	0.00081318	0.00081451	0.00087978	0.00093980	0.00094170	0.00101205	0.00108938	0.00112088	0.00115481
	21	0.00000000	0.00054173	0.00055821	0.00061341	0.00060222	0.00063940	0.00069474	0.00071227	0.00083729	0.00082405	0.00091181	0.00094888
	22	0.00000000	0.00058396	0.00058480	0.00061812	0.00063664	0.00069878	0.00070727	0.00073105	0.00084361	0.00089128	0.00094467	0.00098799
	23	0.00000000	0.00058687	0.00061580	0.00062100	0.00066136	0.00074072	0.00073197	0.00076980	0.00082607	0.00090968	0.00093804	0.00099542
	24	0.00000000	0.00073517	0.00066417	0.00068498	0.00088311	0.00093589	0.00091620	0.00091498	0.00102748	0.00111262	0.00111912	0.00117492
	25	0.00000000	0.00052614	0.00055668	0.00067125	0.00071164	0.00073475	0.00078072	0.00080606	0.00090457	0.00094287	0.00099313	0.00103802
	26	0.00000000	0.00051340	0.00052310	0.00053297	0.00058272	0.00070784	0.00076316	0.00083482	0.00098582	0.00091275	0.00107643	0.00113328
FIT DATA	0.00054153	0.00054989	0.00058342	0.00059922	0.00061093	0.00064891	0.00064891	0.00068593	0.00071216	0.00077862	0.00084385	0.00085528	0.00091538
Standard Deviation	0.00054153	9.3191E-05	9.2478E-05	9.4734E-05	0.00010722	0.00011349	0.000110071	0.00010943	0.00010943	0.00013833	0.00012441	0.00012592	0.00012155
High Deviation		0.00073627	0.00076838	0.00078869	0.00082537	0.00087588	0.00087588	0.00088735	0.00093103	0.00105529	0.00109266	0.00113712	0.00115849
Low Deviation		0.00036351	0.00039847	0.00040976	0.00039649	0.00042193	0.00042193	0.00048451	0.0004933	0.00050196	0.00055904	0.00063343	0.00067227

ϵ sh,u	α	V/S	σ
0.0005030	0.4707407	0.625	32.56

	0	0.1	3	6	9	24	48	72	168	336	504	672
Shrinkage Strain	0	5.1715E-06	2.464E-05	3.3513E-05	4E-05	6.0642E-05	8.0303E-05	9.4033E-05	0.00012836	0.00016194	0.00018356	0.00019962

time (hr)	strain μ
0	0.00054153
0.1	0.00054989
3	0.00058342
6	0.00059922
9	0.00061093
24	0.00064891
48	0.00068593
72	0.00071216
168	0.00077862
336	0.00084385
504	0.00088528
672	0.00091538

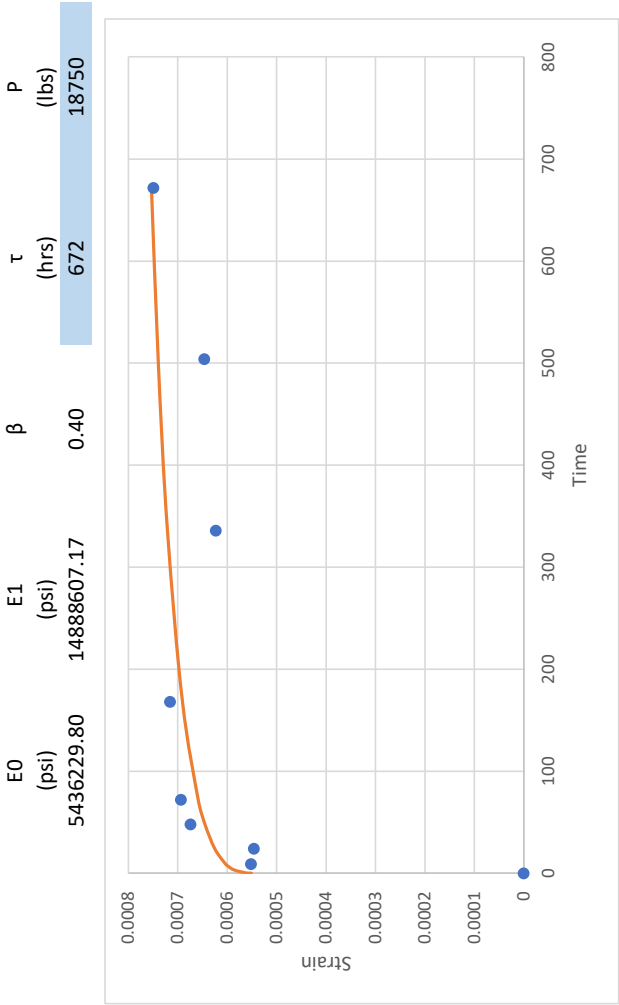
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
5539856.45	8024596.945	0.482468804	672	18750



Data Set # 1

time (hr)	strain μ				
0	0	0.00055185	0.00000030		
0.1		0.00056110			
3		0.00058642			
6		0.00059666			
9	0.000551853	0.00060387	0.00000000		
24	0.000545798	0.00062574	0.00000001		
48	0.000674107	0.00064553	0.00000000		
72	0.000693719	0.00065891	0.00000000		
168	0.000715709	0.00069113	0.00000000		
336	0.000622719	0.00072122	0.00000001		
504	0.000646424	0.00073988	0.00000001		
672	0.000749211	0.00075335	0.00000000		

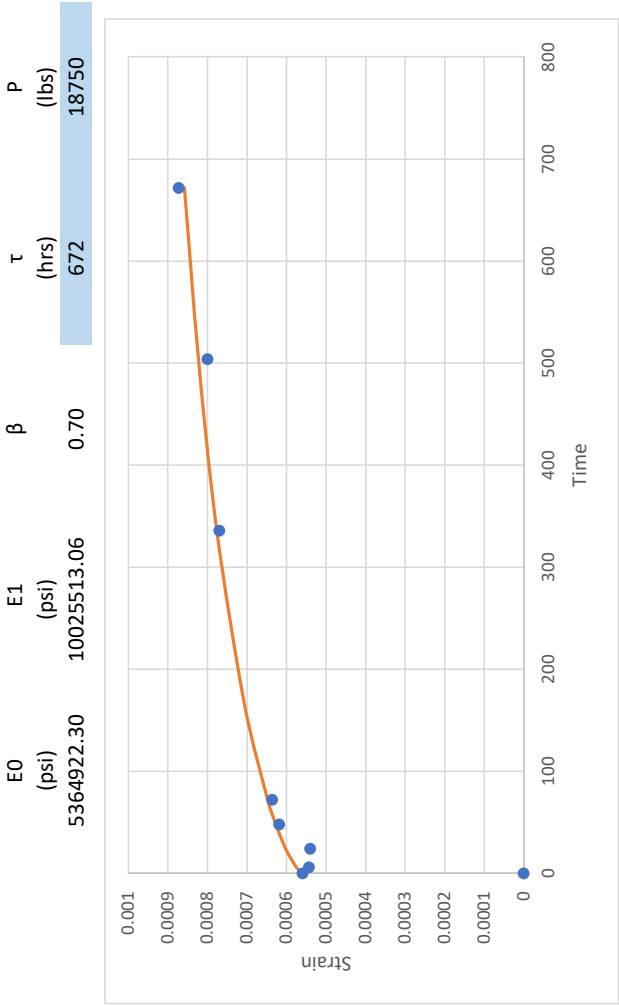
sum R^2 = 3.34726E-07



Data Set # 2

time (hr)	strain μ					
0	0	0.00055919	0.00000031			
0.1	0.000559188	0.00056016	0.00000000			
3		0.00056967				
6	0.00054336	0.00057612	0.00000000			
9		0.00058156				
24	0.000539678	0.00060269	0.00000000			
48	0.000618494	0.00062789	0.00000000			
72	0.000636032	0.00064826	0.00000000			
168		0.00070815				
336	0.000769781	0.00077657	0.00000000			
504	0.000799739	0.00082348	0.00000000			
672	0.000872785	0.00085842	0.00000000			

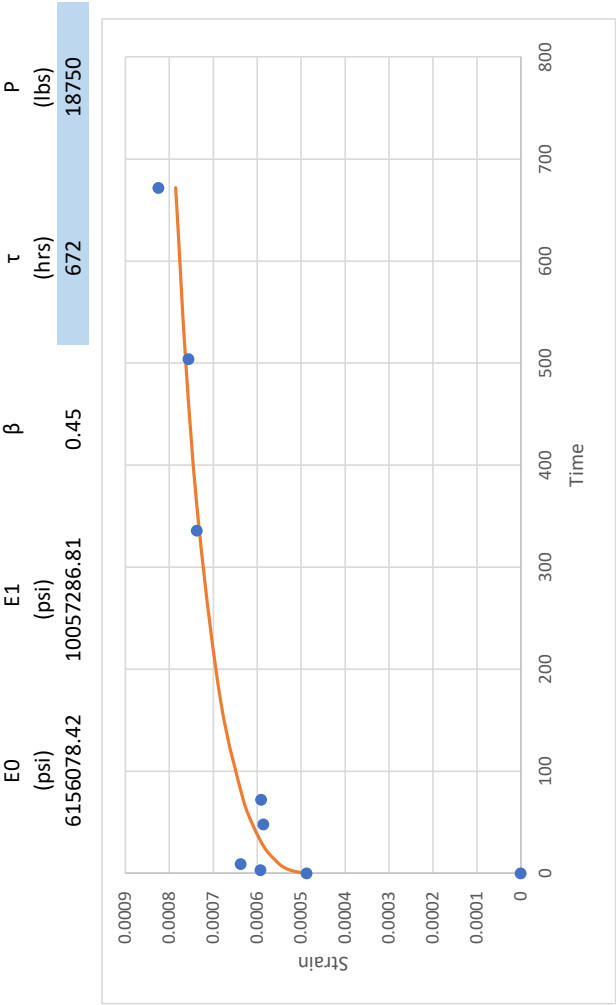
sum R^2 = 3.18789E-07



Data Set # 3

time (hr)	strain μ	
0	0	0.00000024
0.1	0.000487323	0.00000000
3	0.000592412	0.00000000
6		0.00000000
9	0.000637485	0.00000001
24		
48	0.0005857	0.00000000
72	0.000590734	0.00000000
168		
336	0.000736994	0.00000000
504	0.000756017	0.00000000
672	0.000824379	0.00000000

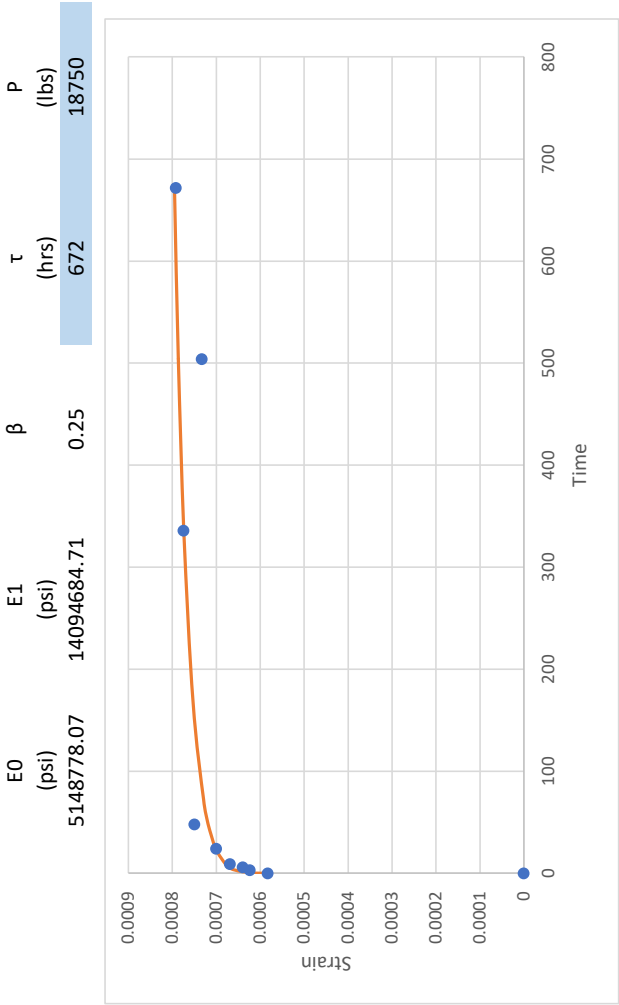
sum R^2 = 2.53E-07



Data Set # 4

time (hr)	strain μ	
0	0	0.00058266
0.1	0.000582663	0.00061787
3	0.000623636	0.00065936
6	0.000639768	0.00067177
9	0.000668715	0.00067976
24	0.000700184	0.00070137
48	0.000749304	0.00071859
72		0.00072936
168		0.00075336
336	0.000774451	0.00077415
504	0.000732497	0.00078661
672	0.000791472	0.00079551

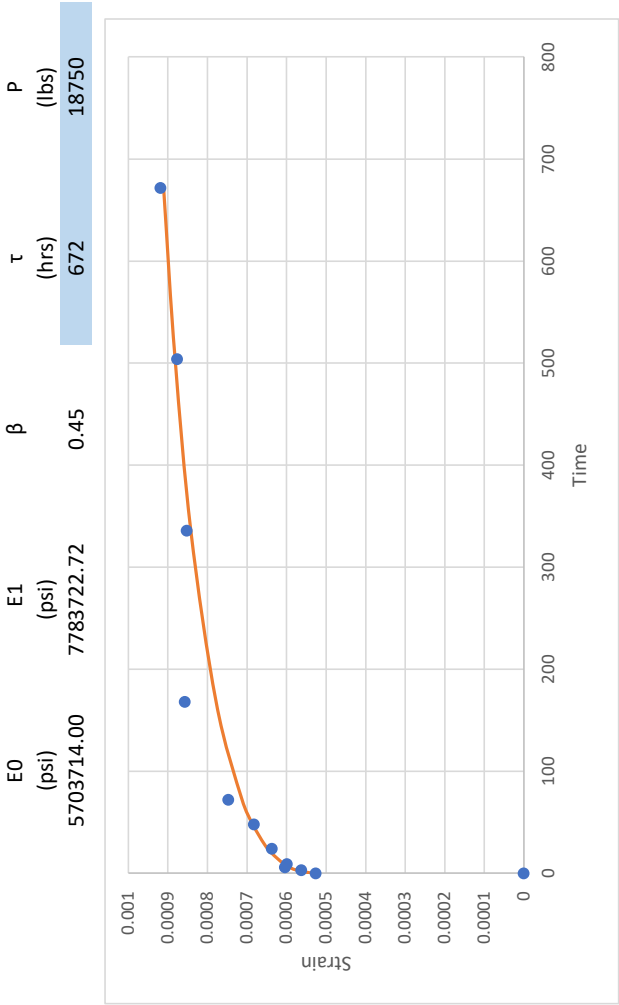
sum R^2 = 3.47047E-07



Data Set # 5

time (hr)	strain μ	
0	0	0.00052597
0.1	0.000525973	0.00053742
3	0.00056274	0.00057710
6	0.000603854	0.00059472
9	0.000599426	0.00060752
24	0.000637102	0.00064797
48	0.000682009	0.00068624
72	0.00074743	0.00071285
168	0.000856844	0.00077892
336	0.00085236	0.00084247
504	0.000876572	0.00088243
672	0.000918819	0.00091139

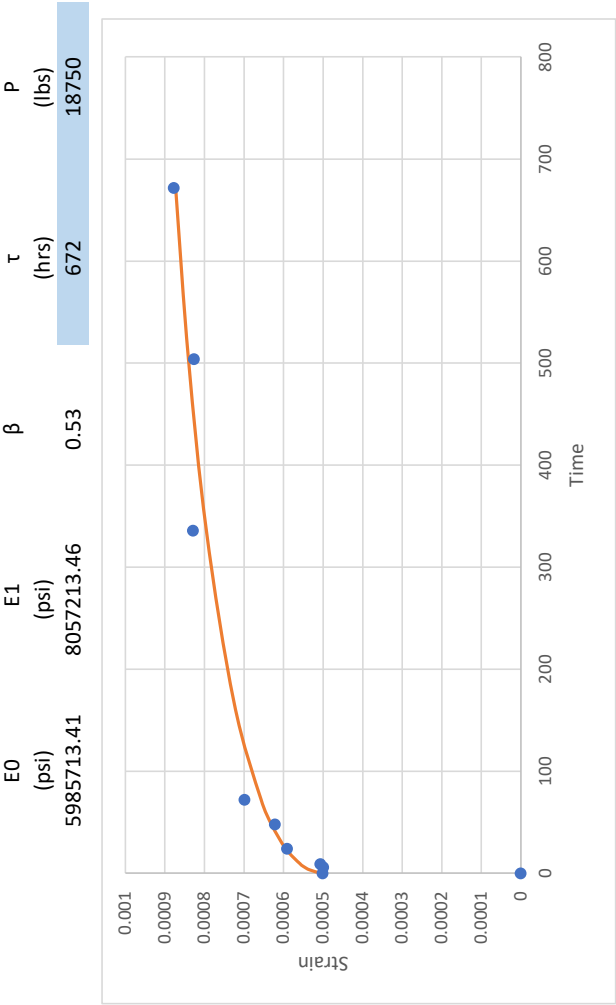
$\text{sum } R^2 = 2.85E-07$



Data Set # 6

time (hr)	strain μ	
0	0	0.00000025
0.1	0.000501193	0.00000000
3		0.00050684
6	0.000499431	0.00053426
9	0.000507007	0.00054824
24	0.000591052	0.00055888
48	0.000621401	0.00059466
72	0.000698291	0.00063101
168		0.00065745
336	0.000828849	0.00072636
504	0.000825977	0.00079597
672	0.000877121	0.00084081
		0.00087353

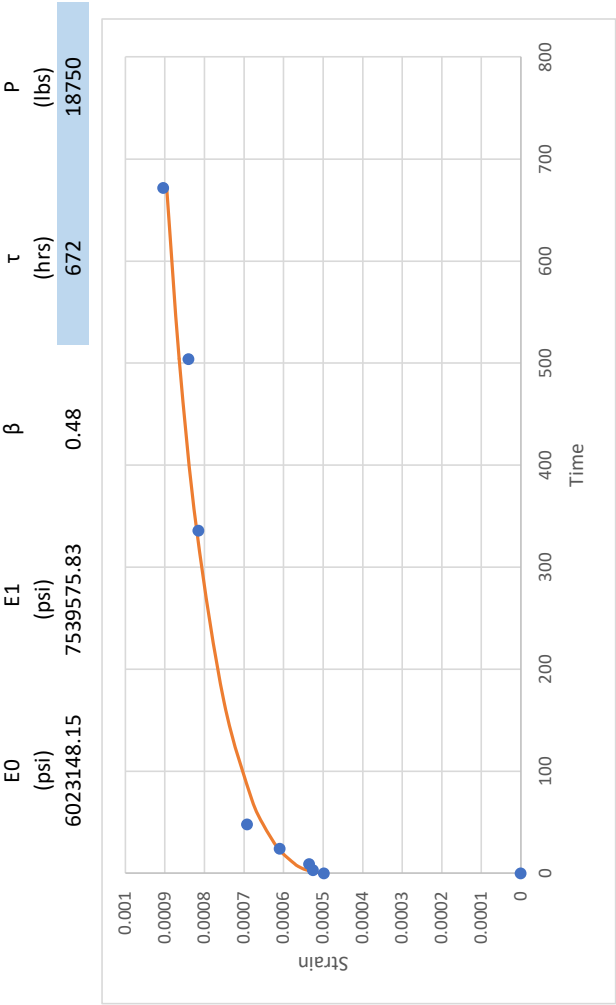
sum R^2 = 2.59386E-07



Data Set # 7

time (hr)	strain μ	
0	0	0.00049808
0.1	0.000498078	0.00050717
3	0.000525484	0.00054324
6		0.00056016
9	0.000535137	0.00057268
24	0.000609801	0.00061321
48	0.000691697	0.00065264
72		0.00068053
168		0.00075108
336	0.000814778	0.00082022
504	0.000840031	0.00086410
672	0.000903681	0.00089598

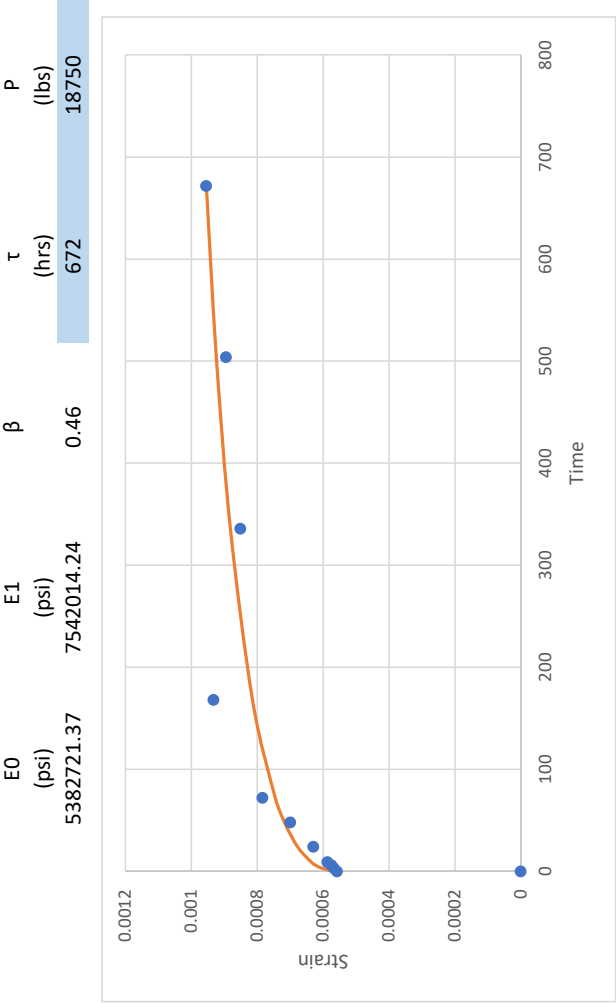
sum R^2 = 2.52096E-07



Data Set # 8

time (hr)	strain μ										
0	0	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734	0.00055734
0.1	0.000557339	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789	0.00056789
3	0.000567553	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668	0.00060668
6	0.000574296	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432	0.00062432
9	0.000586559	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723	0.00063723
24	0.000629971	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847	0.00067847
48	0.000699375	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796	0.00071796
72	0.000784068	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563	0.00074563
168	0.000932551	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486	0.00081486
336	0.00085057	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199	0.00088199
504	0.000894573	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437	0.00092437
672	0.000955078	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511	0.00095511

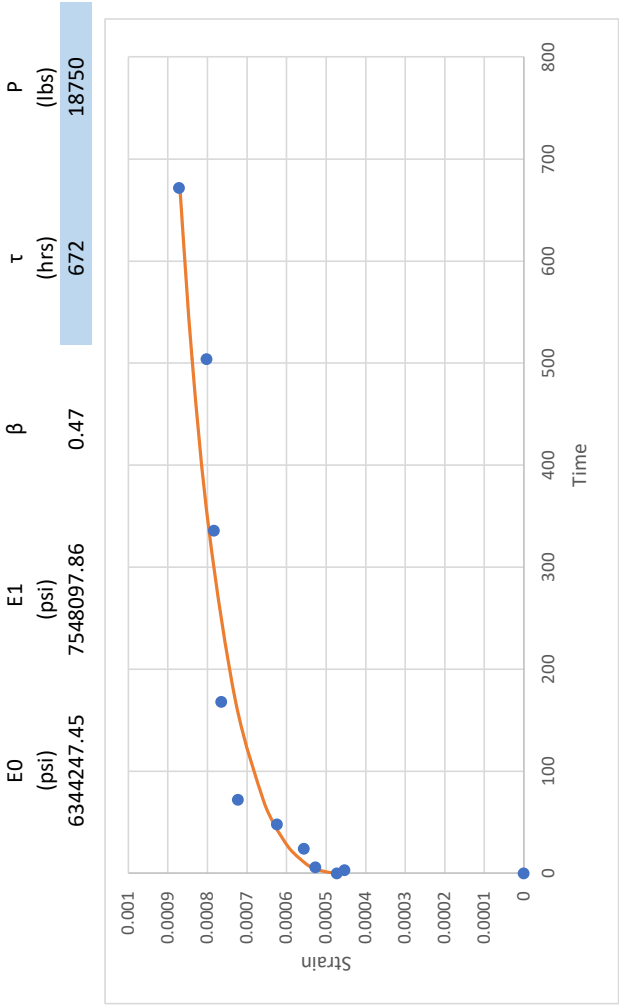
sum R^2 = 3.37239E-07



Data Set # 9

time (hr)	strain μ				
0	0	0.00047287	0.00000022		
0.1	0.000472869	0.00048302	0.00000000		
3	0.000453416	0.00052106	0.00000000		
6	0.000527339	0.00053850	0.00000000		
9		0.00055130			
24	0.000556446	0.00059233	0.00000000		
48	0.00062426	0.00063177	0.00000000		
72	0.000722993	0.00065948	0.00000000		
168	0.000765226	0.00072900	0.00000000		
336	0.000783187	0.00079659	0.00000000		
504	0.000802174	0.00083931	0.00000000		
672	0.000872032	0.00087032	0.00000000		

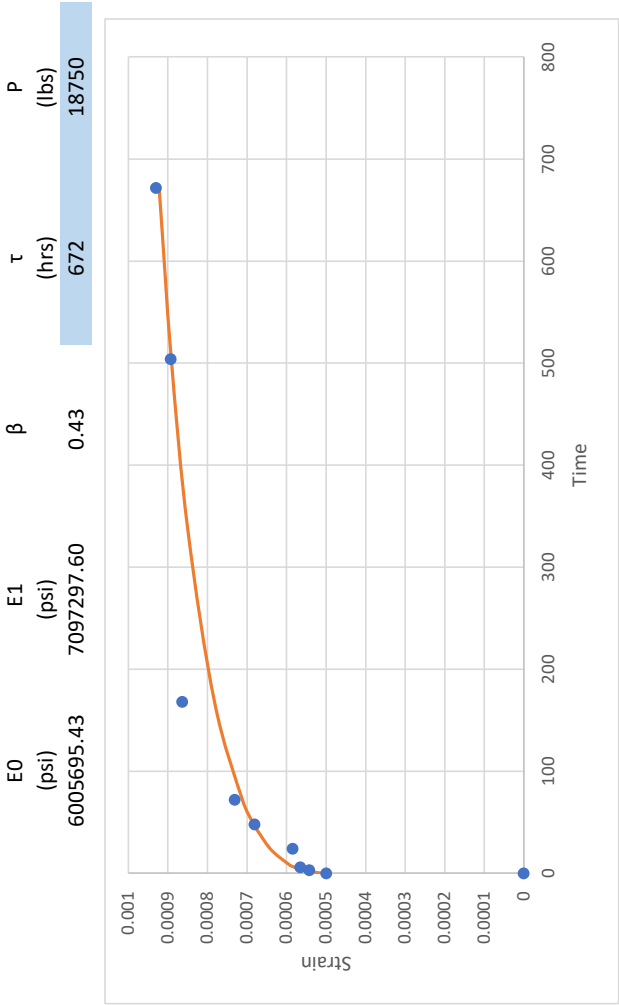
sum R^2 = 2.36661E-07



Data Set # 10

time (hr)	strain μ				
0	0	0.00049953	0.00000025		
0.1	0.000499526	0.00051447	0.00000000		
3	0.00054256	0.00056170	0.00000000		
6	0.000564897	0.00058191	0.00000000		
9		0.00059641			
24	0.000584677	0.00064148	0.00000000		
48	0.000680617	0.00068337	0.00000000		
72	0.000730977	0.00071217	0.00000000		
168	0.000863859	0.00078278	0.00000001		
336		0.00084990			
504	0.000893012	0.00089187	0.00000000		
672	0.000930067	0.00092222	0.00000000		

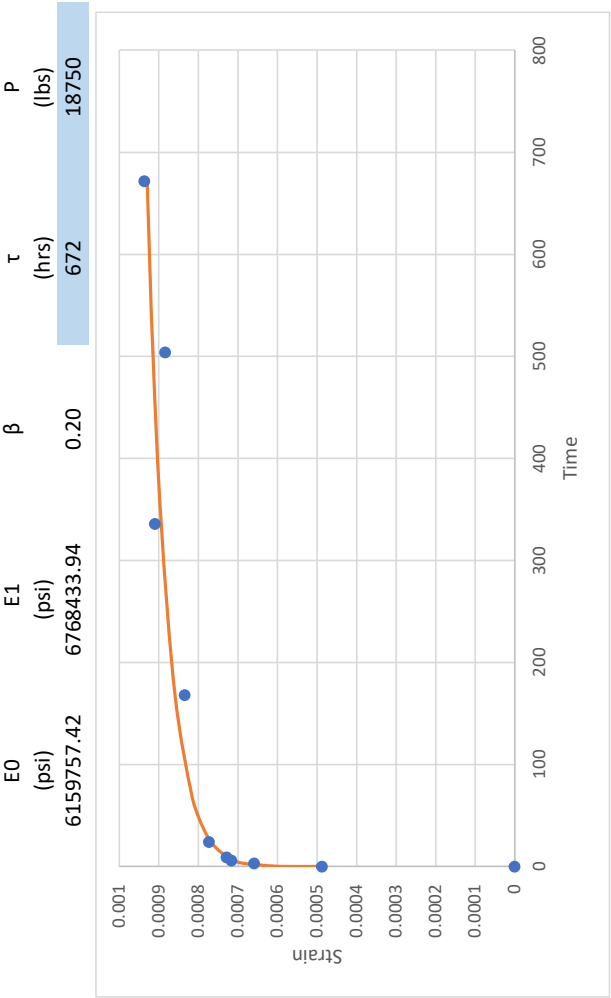
$\text{sum } R^2 = 2.60629\text{E-}07$



Data Set # 11

time (hr)	strain μ				
0	0	0.00048703	0.00000024		
0.1	0.000487032	0.00059760	0.00000001		
3	0.000658725	0.00068854	0.00000000		
6	0.000716526	0.00071309	0.00000000		
9	0.000728771	0.00072845	0.00000000		
24	0.000772705	0.00076864	0.00000000		
48		0.00079949			
72		0.00081839			
168	0.0008342	0.00085959	0.00000000		
336	0.000910003	0.00089462	0.00000000		
504	0.000883682	0.00091543	0.00000000		
672	0.000936398	0.00093027	0.00000000		

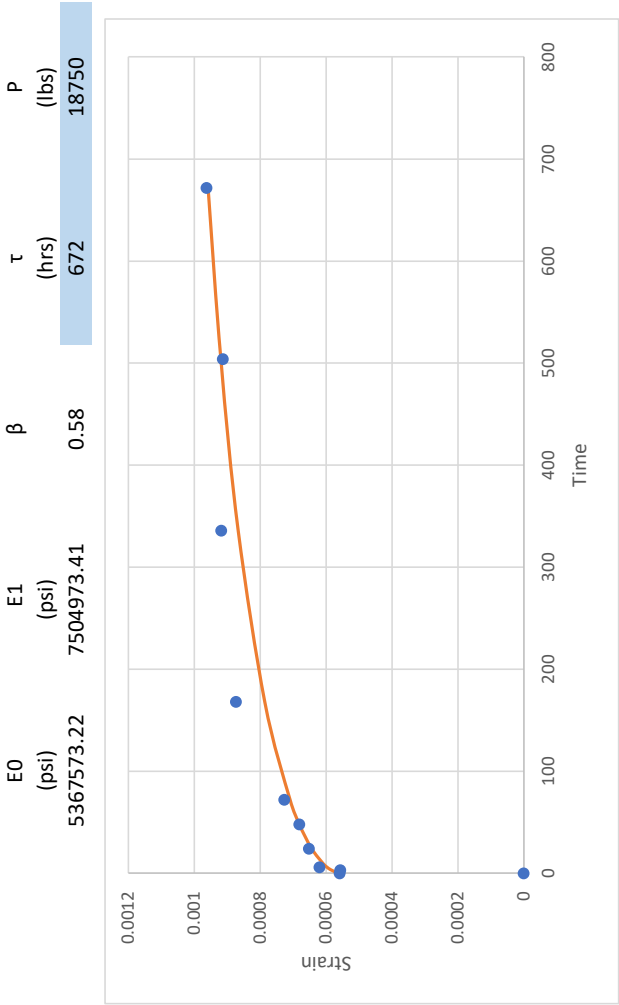
sum R^2 = 2.5227E-07



Data Set # 12

time (hr)	strain μ					
0	0	0.00055891	0.00000031			
0.1	0.000558912	0.00056272	0.00000000			
3	0.000556636	0.00058576	0.00000000			
6	0.000619637	0.00059862	0.00000000			
9		0.00060872				
24	0.000651885	0.00064419	0.00000000			
48	0.000680663	0.00068202	0.00000000			
72	0.000726306	0.00071042	0.00000000			
168	0.000873241	0.00078712	0.00000001			
336	0.000917803	0.00086739	0.00000000			
504	0.000913356	0.00092002	0.00000000			
672	0.00096293	0.00095865	0.00000000			

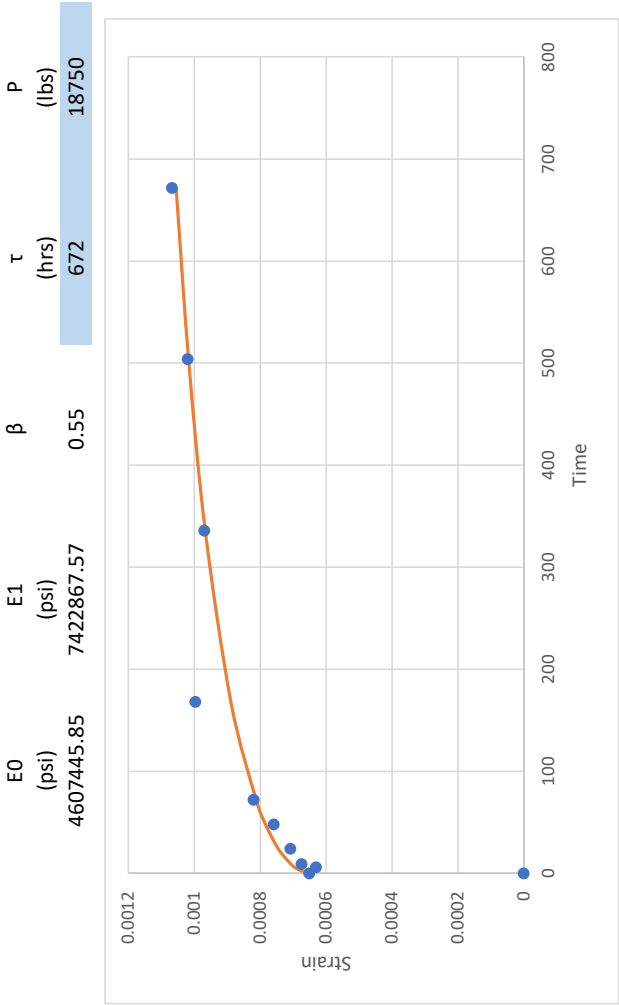
sum R^2 = 3.24022E-07



Data Set # 13

time (hr)	strain μ	
0	0	0.000000042
0.1	0.00065112	0.000000000
3		0.00065612
6	0.000630565	0.00068290
9	0.000674084	0.00069710
24	0.000708134	0.00070806
48	0.000758774	0.00074564
72	0.000820063	0.00078463
168	0.000996699	0.00081338
336	0.00096935	0.00088949
504	0.001019602	0.00096755
672	0.001067616	0.00101821
		0.00105528

$\text{sum } R^2 = 4.43\text{E-}07$

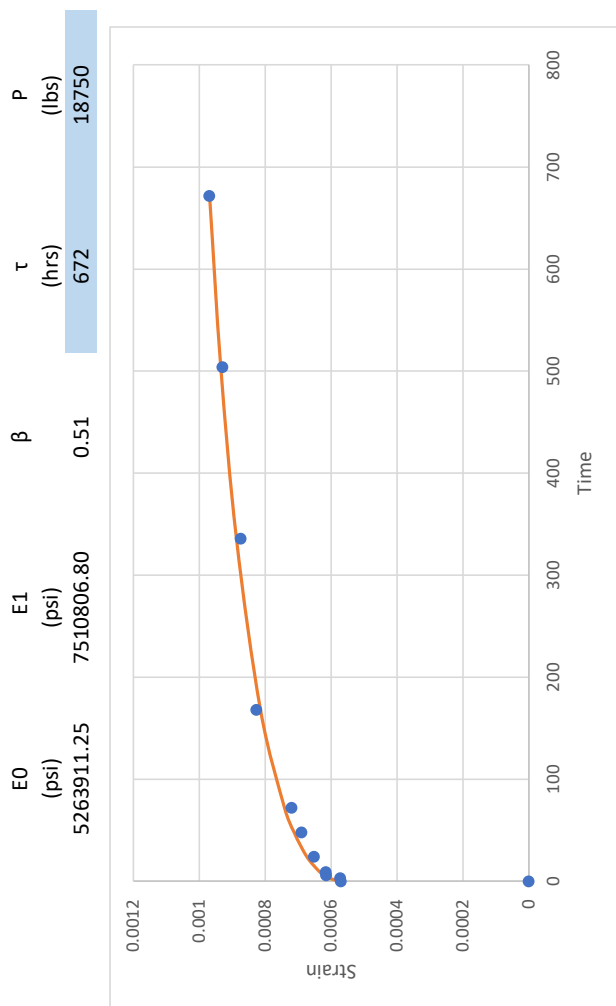


E0 (psi)	4607445.85
E1 (psi)	7422867.57
β	0.55
τ (hrs)	672
P (lbs)	18750

Data Set # 14

0	0	0.00056992	0.00000032
0.1	0.000569918	0.00057669	0.00000000
3	0.000572336	0.00060784	0.00000000
6	0.000615039	0.00062338	0.00000000
9	0.000616352	0.00063511	0.00000000
24	0.000651974	0.00067416	0.00000000
48	0.000690138	0.00071336	0.00000000
72	0.000720159	0.00074165	0.00000000
168	0.000826467	0.00081481	0.00000000
336	0.000874152	0.00088808	0.00000000
504	0.000929104	0.00093508	0.00000000
672	0.000969297	0.00096934	0.00000000

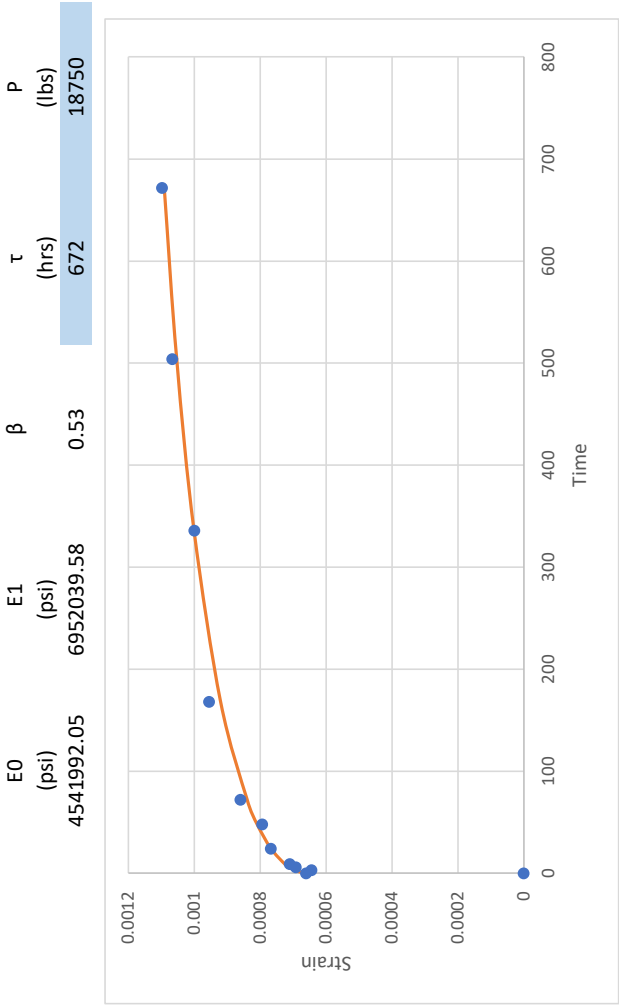
sum R^2 = 3.28394E-07



Data Set # 15

time (hr)	strain μ										
0	0	0.000660503	0.00066050	0.000000044							
0.1	0.000660503	0.00066687	0.00066687	0.000000000							
3	0.000644138	0.00069820	0.00069820	0.000000000							
6	0.000691518	0.00071426	0.00071426	0.000000000							
9	0.000710027	0.00072651	0.00072651	0.000000000							
24	0.000767518	0.00076781	0.00076781	0.000000000							
48	0.000793176	0.00080987	0.00080987	0.000000000							
72	0.000859143	0.00084052	0.00084052	0.000000000							
168	0.00095452	0.00092059	0.00092059	0.000000000							
336	0.000999065	0.00100163	0.00100163	0.000000000							
504	0.001066513	0.00105388	0.00105388	0.000000000							
672	0.001097337	0.00109203	0.00109203	0.000000000							

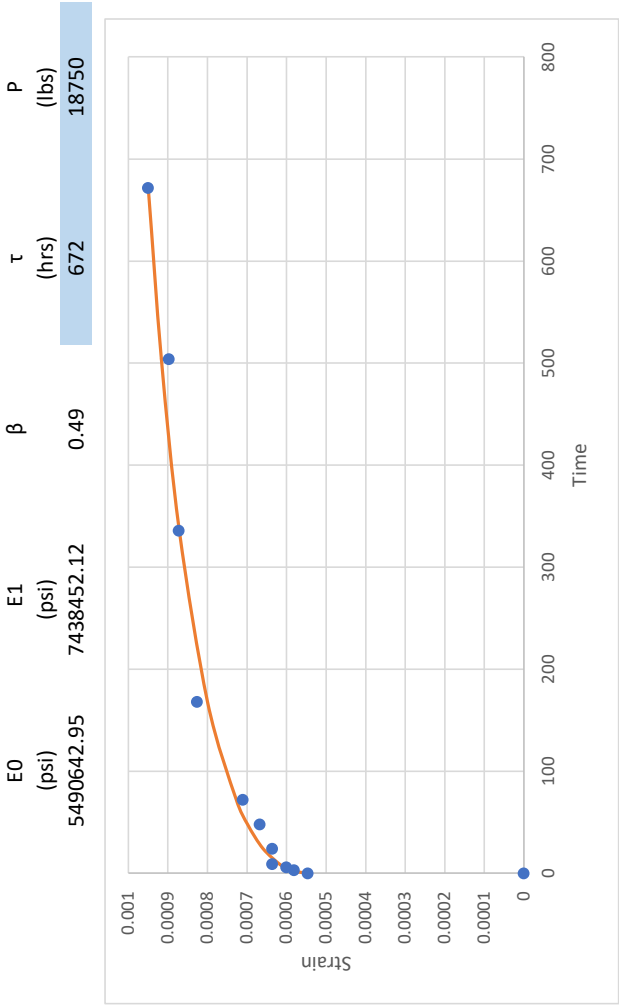
sum R^2 = 4.41987E-07



Data Set # 16

time (hr)	strain μ										
0	0	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638	0.00054638
0.1	0.000546384	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483	0.00055483
3	0.000581598	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983	0.00058983
6	0.000600845	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656	0.00060656
9	0.000636544	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900	0.00061900
24	0.000636212	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962	0.00065962
48	0.000668109	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950	0.00069950
72	0.000710627	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788	0.00072788
168	0.000826326	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012	0.00080012
336	0.000872412	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136	0.00087136
504	0.000897665	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671	0.00091671
672	0.000950366	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969	0.00094969

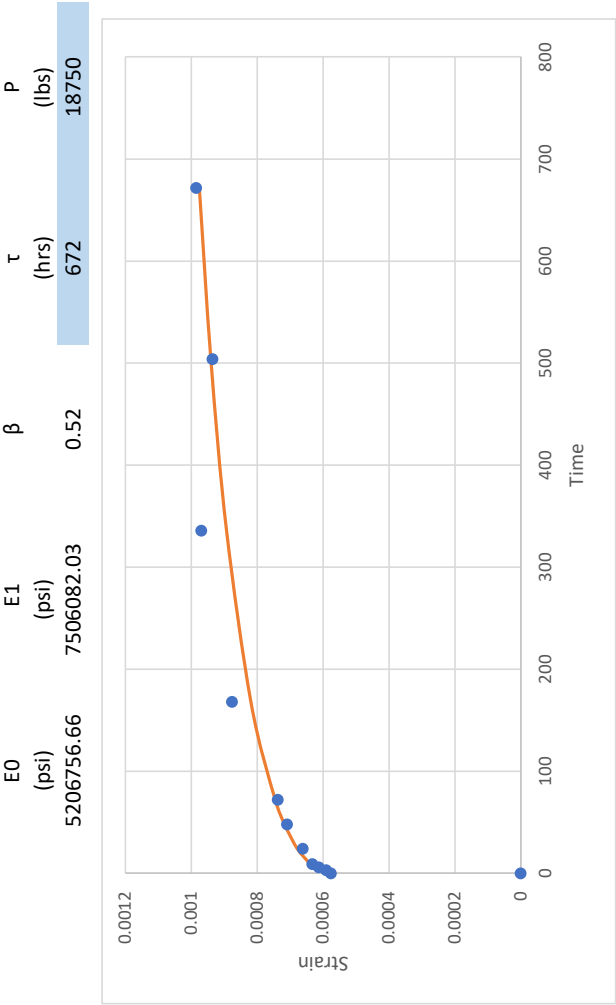
sum R^2 = 3.01897E-07



Data Set # 17

time (hr)	strain μ										
0	0	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617	0.00057617
0.1	0.000576174	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261	0.00058261
3	0.000591091	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297	0.00061297
6	0.000613474	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827	0.00062827
9	0.00063199	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986	0.00063986
24	0.000661357	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864	0.00067864
48	0.000708896	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776	0.00071776
72	0.000737359	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611	0.00074611
168	0.000876498	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968	0.00081968
336	0.00096951	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365	0.00089365
504	0.000935378	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118	0.00094118
672	0.000984958	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585	0.00097585

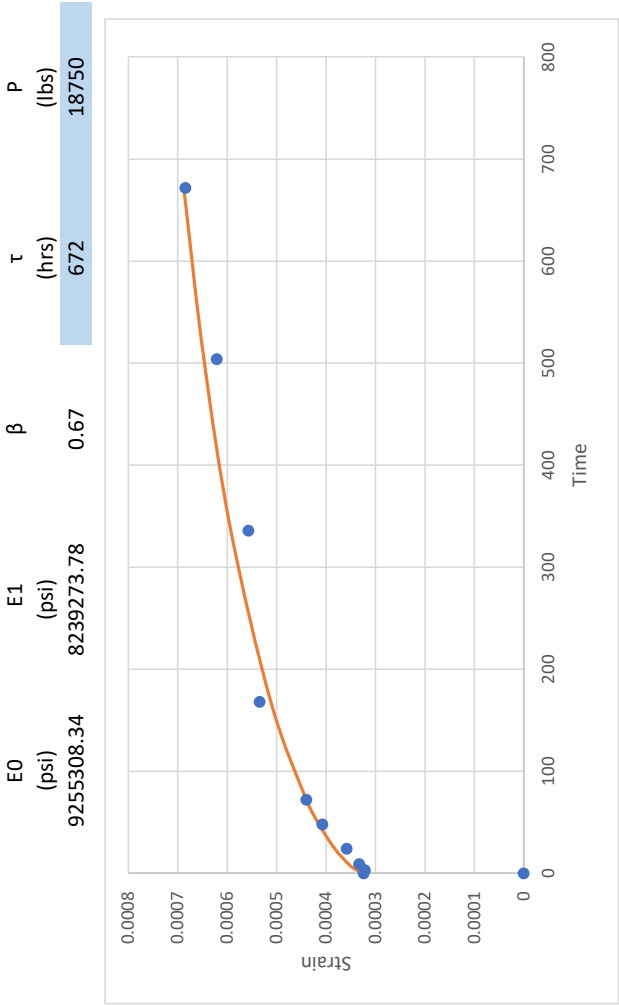
sum R^2 = 3.42332E-07



Data Set # 18

time (hr)	strain μ				
0	0	0.00032414	0.00000011		
0.1	0.000324138	0.00032573	0.00000000		
3	0.000321359	0.00033942	0.00000000		
6		0.00034823			
9	0.000333085	0.00035552	0.00000000		
24	0.000358329	0.00038306	0.00000000		
48	0.000407461	0.00041490	0.00000000		
72	0.000439588	0.00044011	0.00000000		
168	0.000534479	0.00051250	0.00000000		
336	0.000557195	0.00059316	0.00000000		
504	0.000621037	0.00064775	0.00000000		
672	0.000684185	0.00068825	0.00000000		

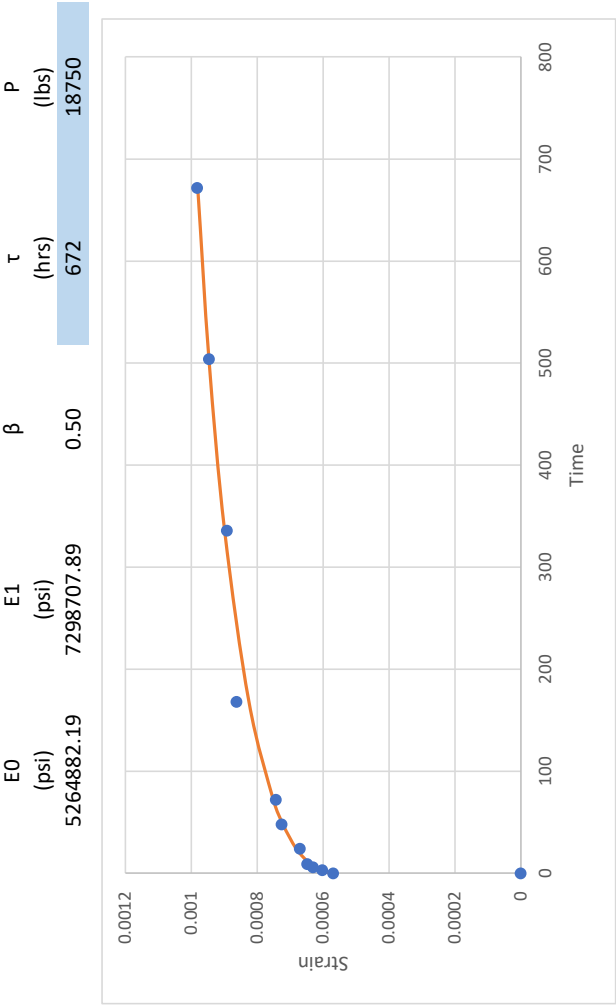
sum R^2 = 1.09072E-07



Data Set # 19

time (hr)	strain μ					
0	0	0.00056981	0.00000032			
0.1	0.000569813	0.00057773	0.00000000			
3	0.000601906	0.00061194	0.00000000			
6	0.000630534	0.00062856	0.00000000			
9	0.000647481	0.00064100	0.00000000			
24	0.000670589	0.00068193	0.00000000			
48	0.000725931	0.00072247	0.00000000			
72	0.000743452	0.00075148	0.00000000			
168	0.000862253	0.00082578	0.00000000			
336	0.000891166	0.00089951	0.00000000			
504	0.000946111	0.00094658	0.00000000			
672	0.000981617	0.00098084	0.00000000			

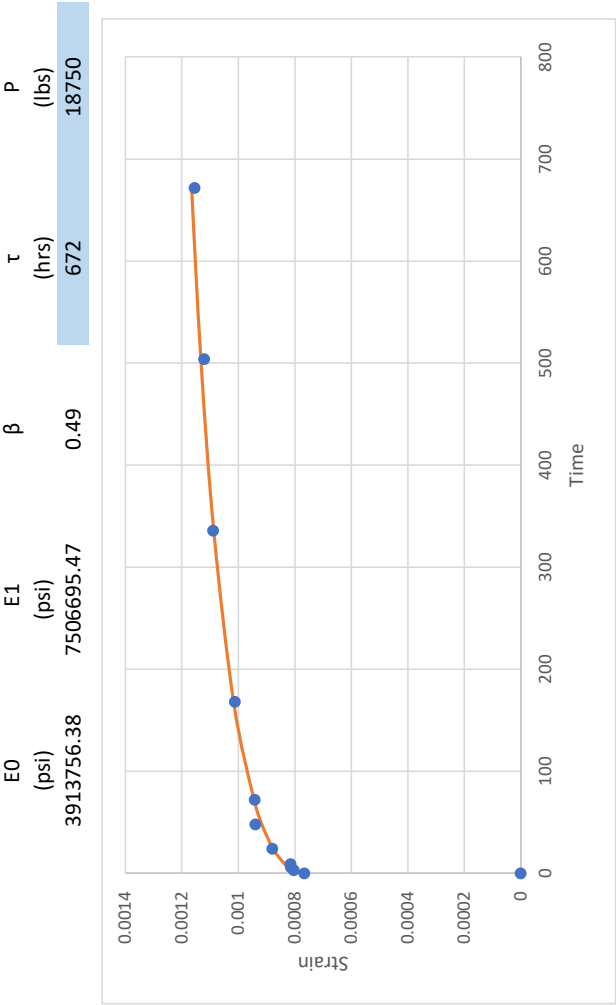
sum R^2 = 3.26502E-07



Data Set # 20

time (hr)	strain μ	
0	0	0.000000059
0.1	0.000766527	0.000000000
3	0.000803298	0.000000000
6	0.000813178	0.000000000
9	0.000814512	0.000000000
24	0.000879785	0.000000000
48	0.000939799	0.000000000
72	0.000941696	0.000000000
168	0.001012051	0.000000000
336	0.001089385	0.000000000
504	0.001120878	0.000000000
672	0.001154813	0.000000000

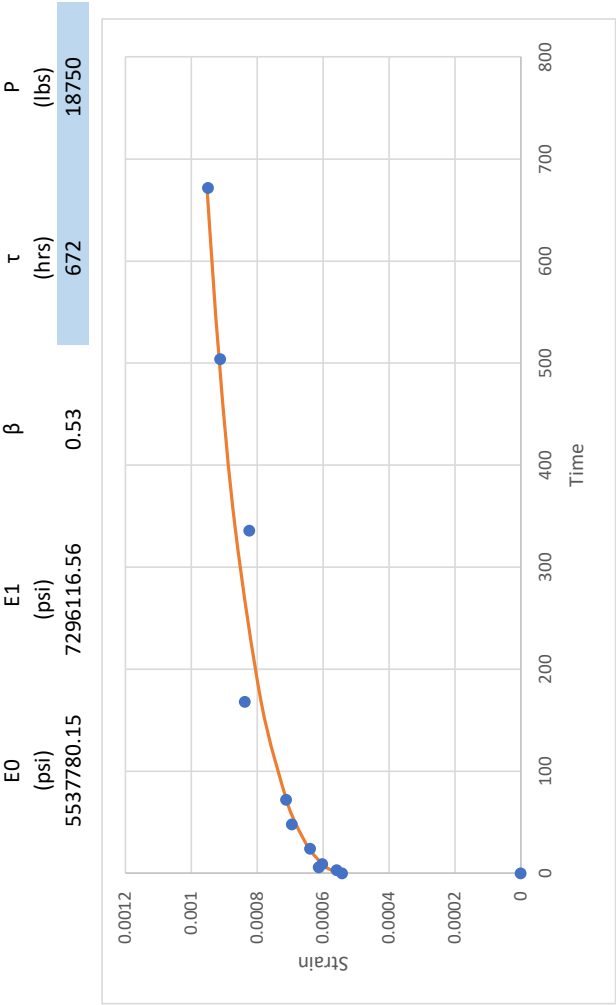
sum R^2 = 5.89E-07



Data Set # 21

time (hr)	strain μ										
0	0	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173	0.00054173
0.1	0.000541733	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761	0.00054761
3	0.000558208	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699	0.00057699
6	0.000613407	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214	0.00059214
9	0.000602225	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372	0.00060372
24	0.000639403	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287	0.00064287
48	0.000694743	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288	0.00068288
72	0.000712265	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210	0.00071210
168	0.000837294	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861	0.00078861
336	0.000824051	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622	0.00086622
504	0.000911811	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632	0.00091632
672	0.000948883	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291	0.00095291

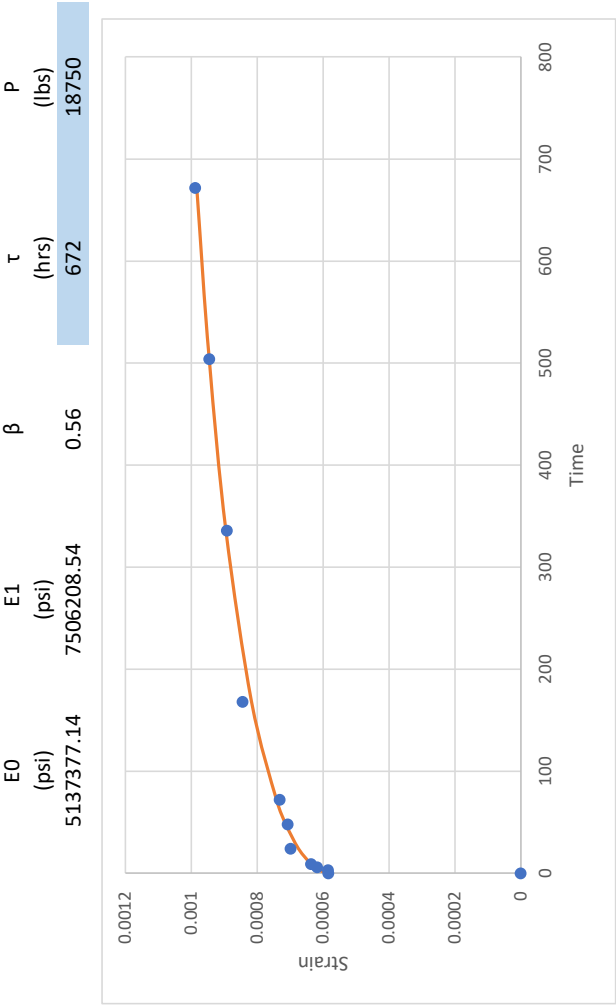
$\text{sum } R^2 = 2.99\text{E-}07$



Data Set # 22

time (hr)	strain μ					
0	0	0.00058396	0.00058396	0.00000034		
0.1	0.000583956	0.00058856	0.00058856	0.00000000		
3	0.000584803	0.00061405	0.00061405	0.00000000		
6	0.000618123	0.00062776	0.00062776	0.00000000		
9	0.000636636	0.00063840	0.00063840	0.00000000		
24	0.000698783	0.00067510	0.00067510	0.00000000		
48	0.000707274	0.00071347	0.00071347	0.00000000		
72	0.000731049	0.00074191	0.00074191	0.00000000		
168	0.000843611	0.00081758	0.00081758	0.00000000		
336	0.000891282	0.00089564	0.00089564	0.00000000		
504	0.000944669	0.00094643	0.00094643	0.00000000		
672	0.000987992	0.00098362	0.00098362	0.00000000		

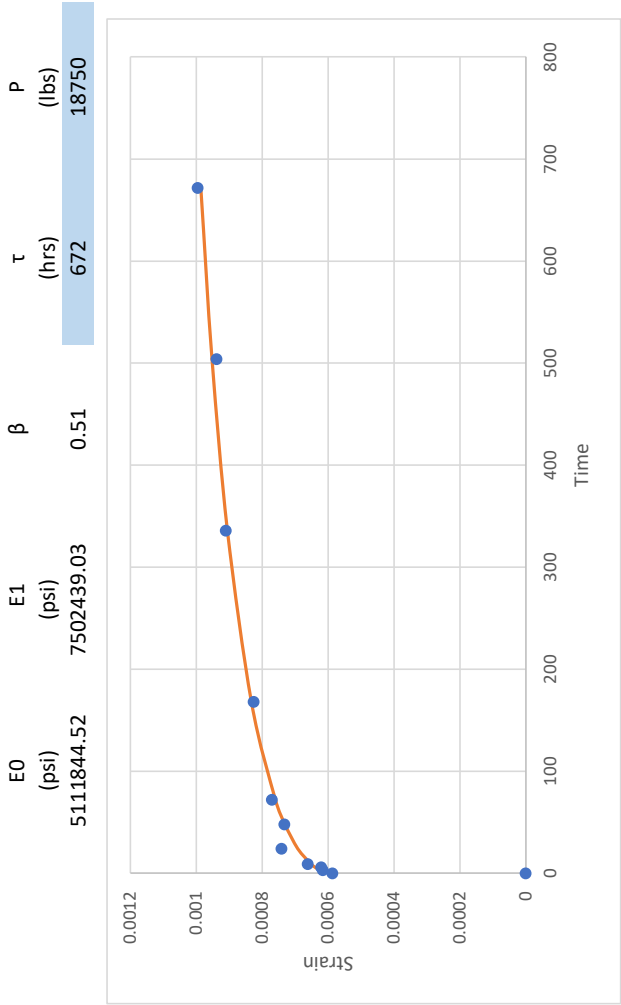
sum R^2 = 3.43412E-07



Data Set # 23

time (hr)	strain μ										
0	0	0.00058687	0.00000034								
0.1	0.000586872	0.00059390	0.00000000								
3	0.000615798	0.00062567	0.00000000								
6	0.000620996	0.00064140	0.00000000								
9	0.000661357	0.00065324	0.00000000								
24	0.000740718	0.00069255	0.00000000								
48	0.000731973	0.00073185	0.00000000								
72	0.0007698	0.00076015	0.00000000								
168	0.000826074	0.00083312	0.00000000								
336	0.000909682	0.00090602	0.00000000								
504	0.000938044	0.00095272	0.00000000								
672	0.000995421	0.00098674	0.00000000								

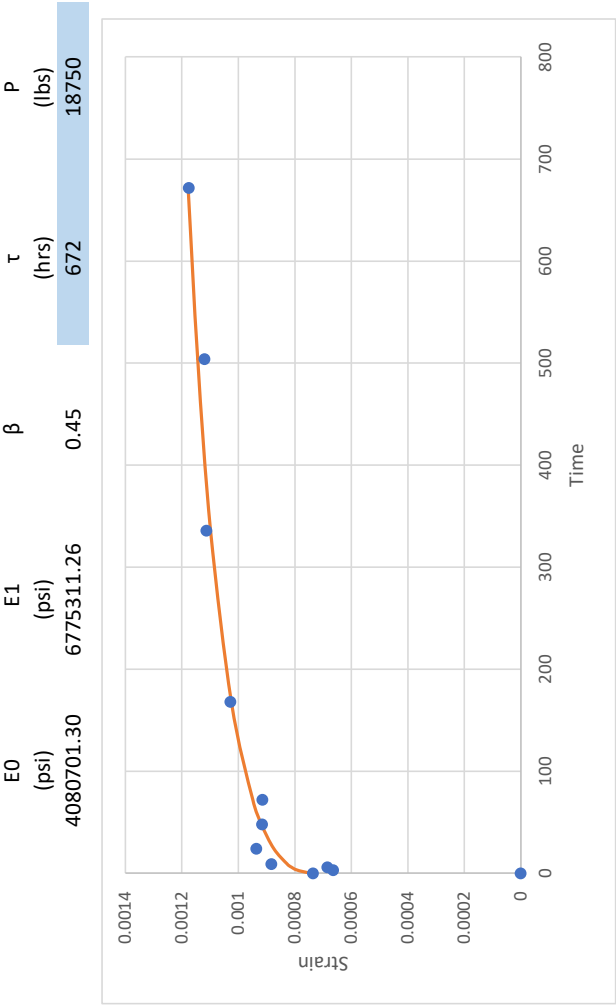
sum R^2 = 3.47815E-07



Data Set # 24

time (hr)	strain μ	
0	0	0.00073517
0.1	0.000735168	0.00074832
3	0.000664168	0.00079390
6	0.000684978	0.00081415
9	0.000883108	0.00082885
24	0.000935888	0.00087532
48	0.000916204	0.00091929
72	0.000914975	0.00094986
168	0.00102748	0.00102576
336	0.001112619	0.00109877
504	0.001119118	0.00114468
672	0.001174922	0.00117795

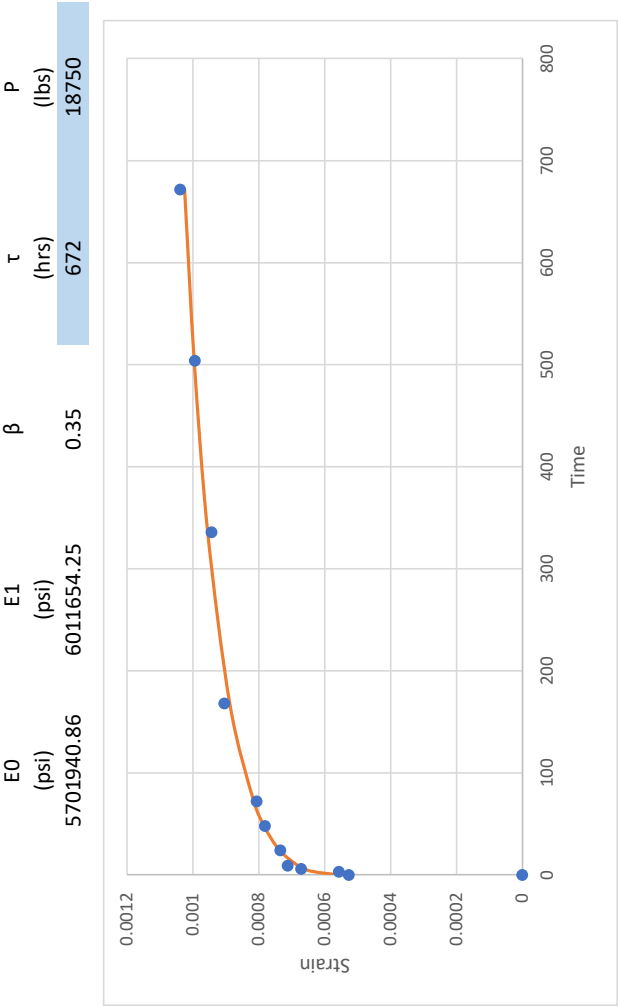
sum R^2 = 5.82857E-07



Data Set # 25

time (hr)	strain μ										
0	0	0.00052614	0.00000028								
0.1	0.000526137	0.00056144	0.00000000								
3	0.000556675	0.00063641	0.00000001								
6	0.000671247	0.00066390	0.00000000								
9	0.000711639	0.00068268	0.00000000								
24	0.000734752	0.00073745	0.00000000								
48	0.000780725	0.00078485	0.00000000								
72	0.000806062	0.00081602	0.00000000								
168	0.000904568	0.00088902	0.00000000								
336	0.000942871	0.00095536	0.00000000								
504	0.000993129	0.00099597	0.00000000								
672	0.001038019	0.00102517	0.00000000								

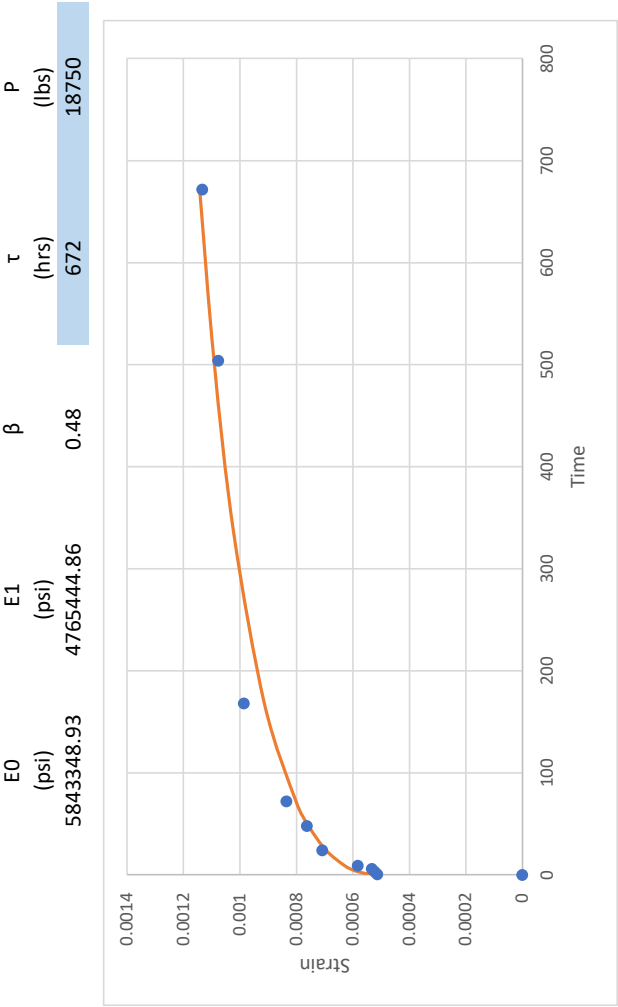
sum R^2 = 2.86011E-07



Data Set # 26

time (hr)	strain μ	
0	0	0.000000026
0.5	0.000513404	0.00051340
3	0.000523099	0.00054444
6	0.000532965	0.00058512
9	0.000582718	0.00061194
24	0.000707841	0.00063177
48	0.000763163	0.00069594
72	0.000834819	0.00075832
168	0.000985821	0.00080244
336		0.00091399
504	0.001076427	0.00102325
672	0.001133283	0.00109257
		0.00114294

$\text{sum } R^2 = 2.83763\text{E-}07$



21 ksi
17.9 ksi

AVERAGE STRAINS - UHPC 0.27f_c CREEP TEST

Date	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/9/2022	3/10/2022	3/11/2022	3/15/2022	3/22/2022	3/29/2022	4/5/2022
Time	1:00-00PM	5:03	50.3	22.9	22.9	49.4	49.1	49.7	1:00-00AM	1:00-00PM	1:00-00PM	1:00-00PM	1:00-00PM	1:00-00PM	50	50.1
Relative Humidity	22.9	0	0.1	0.5	1	3	6	9	22.9	22.9	50.1	50.1	50.1	23.0	23.0	22.9
Air Temp	22.9	0	0.1	0.5	1	3	6	9	22.9	22.9	50.1	50.1	50.1	23.0	23.0	22.9
Notes	1	0.00000000	0.00083347	0.00096793	0.00089914	0.00088351	0.00094918	0.00093979	0.00098826	0.00098514	0.00100859	0.00108990	0.00115401	0.00121968	0.00127910	0.00131193
Point of Measure	2	0.00000000	0.00079251	0.00083472	0.00081283	0.00081596	0.00085192	0.00084723	0.00089099	0.00089880	0.00092694	0.00099728	0.00119267	0.00114265	0.00118798	0.00122081
	3	0.00000000	0.00095953	0.00095327	0.00093608	0.00109232	0.00110013	0.00109700	0.00115326	0.00119234	0.00121517	0.00127518	0.00120019	0.00141583	0.00144552	0.00150178
	4	0.00000000	0.00087538	0.00092695	0.00088632	0.00095196	0.00091601	0.00089882	0.00093653	0.00098166	0.001099730	0.00111922	0.00114736	0.00122239	0.00125365	0.00132868
	5	0.00000000	0.00107331	0.00124916	0.00116469	0.00123034	0.00111575	0.00117876	0.001116938	0.00128977	0.00127878	0.00140702	0.00150076	0.00143666	0.00143820	0.00155235
	6	0.00000000	0.00088004	0.00080659	0.00080345	0.00088161	0.00086599	0.00090976	0.00090192	0.00090335	0.00093318	0.00095507	0.00115825	0.00112858	0.00114421	0.00118641
	7	0.00000000	0.00083940	0.00101290	0.00093162	0.00095976	0.00092693	0.00091912	0.00093788	0.00096758	0.00100353	0.00107699	0.00110989	0.00125830	0.00124268	0.00132083
	8	0.00000000	0.00081424	0.00089708	0.00083612	0.00087989	0.00089395	0.00092678	0.00093928	0.000910805	0.00100805	0.00105024	0.00113462	0.00117684	0.00121748	0.00127843
	9	0.00000000	0.00086716	0.00088747	0.00095781	0.00095780	0.00094217	0.00094842	0.00099842	0.00094060	0.00100310	0.00105467	0.00114686	0.00123905	0.00123905	0.00140625
	10	0.00000000	0.00088791	0.00102246	0.00090823	0.00098786	0.00095825	0.00095826	0.00099890	0.00103173	0.00106457	0.00110889	0.00103787	0.00122401	0.00128185	0.00135063
	11	0.00000000	0.00094411	0.00095038	0.00092380	0.00092389	0.00101446	0.00095351	0.00116649	0.00107231	0.00110825	0.00120987	0.00133962	0.00132083	0.00136617	0.00140525
	12	0.00000000	0.00092196	0.00085789	0.00096728	0.00096728	0.00097353	0.00097979	0.00103136	0.00102979	0.00111010	0.00119698	0.00132357	0.00127980	0.00135325	0.00144700
	13	0.00000000	0.00086660	0.00078938	0.00084562	0.00084562	0.00079406	0.00081437	0.00083470	0.00082531	0.00100197	0.00137993	0.00100821	0.00113484	0.00114734	0.00124896
	14	0.00000000	0.00095504	0.00097067	0.00091909	0.00092221	0.00101757	0.00100193	0.00099599	0.00096754	0.00103477	0.00113795	0.00120827	0.00124578	0.00126923	0.00132328
	15	0.00000000	0.00084876	0.00084876	0.00084876	0.00090972	0.00094411	0.00091128	0.00094880	0.00095349	0.00102226	0.00109572	0.00108634	0.00121230	0.00133083	0.00133957
	16	0.00000000	0.00084728	0.00087073	0.00086135	0.00088480	0.00098953	0.00090351	0.00094889	0.00094889	0.00101767	0.00117677	0.00114899	0.00122872	0.00127130	0.00134596
	17	0.00000000	0.00069396	0.00072365	0.00072053	0.00070801	0.00077459	0.00081274	0.00080649	0.00086425	0.00090653	0.00090653	0.00114848	0.00106598	0.00111151	0.00118009
	18	0.00000000	0.00091856	0.00095761	0.00095761	0.00094200	0.00096542	0.00097483	0.00098419	0.00107637	0.00105292	0.00110448	0.00124664	0.00127322	0.00134040	0.00139040
	19	0.00000000	0.00085882	0.00082361	0.00082361	0.00082518	0.00084080	0.00087831	0.00085018	0.00084860	0.00090799	0.00096426	0.00098303	0.00115337	0.00119243	0.00124400
	20	0.00000000	0.00096921	0.00086300	0.00077863	0.00070657	0.00069719	0.00072064	0.00075233	0.00077347	0.00076441	0.00081131	0.00087853	0.00087072	0.00103017	0.00107550
	21	0.00000000	0.00096921	0.00086300	0.00077863	0.00070657	0.00069719	0.00072064	0.00075233	0.00077347	0.00076441	0.00081131	0.00087853	0.00087072	0.00103017	0.00107550

Test Sample: UHPC f'c desired: 21 ksi Load Applied: 35437.5 lbs
Load Applied: 27% f'c measured: 17.9 ksi

TOTAL STRAIN MINUS SHRINKAGE STRAIN

Date	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/10/2022	3/11/2022	3/15/2022	3/22/2022	3/29/2022	4/5/2022
Time	12:00:00PM	1:00:00PM	2:00:00PM	4:00:00PM	7:00:00PM	10:00:00PM	1:00:00PM	1:00:00AM	1:00:00PM	1:00:00PM	1:00:00PM	1:00:00PM	1:00:00PM	1:00:00PM	1:00:00PM	1:00:00PM
Relative Humidity	50.3	50.3	50.3	49.4	49.1	49.9	49.9	49.4	50	50.1	50.1	50.1	50.1	50	50	50.1
Air Temp	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0	22.9
Notes	0	0.1	0.5	1	3	6	9	12	24	48	72	168	336	504	672	
Point of Measure	1	0.00000000	0.00082796	0.00095771	0.00088582	0.00093312	0.00090955	0.00095469	0.00094217	0.00095379	0.00095379	0.00102699	0.00107096	0.00111670	0.00125169	0.00118591
	2	0.00000000	0.00078701	0.00082449	0.00079592	0.00079582	0.00082586	0.00085742	0.00085579	0.00087214	0.00087214	0.00093438	0.00110562	0.00103968	0.00123237	0.00109478
	3	0.00000000	0.00095402	0.00094304	0.00092277	0.00107217	0.00107407	0.00111968	0.00114931	0.00117036	0.00117036	0.00121227	0.00111714	0.00131285	0.00125088	0.00137576
	4	0.00000000	0.00086987	0.00091673	0.00087300	0.00093182	0.00088995	0.00090276	0.00093863	0.00094249	0.00105631	0.00106431	0.00111941	0.00111941	0.00121986	0.00120265
	5	0.00000000	0.00102781	0.00123894	0.00115138	0.00127693	0.00114852	0.00113580	0.00124673	0.00122397	0.00134412	0.00141771	0.00133368	0.00133368	0.00135359	0.00142633
	6	0.00000000	0.00087454	0.00079637	0.00079014	0.00086146	0.00083993	0.00087952	0.00086835	0.00085732	0.00087838	0.00107520	0.00102560	0.00102560	0.00102616	0.00106039
	7	0.00000000	0.00083390	0.00100267	0.00091830	0.00093961	0.00090087	0.00088888	0.00090430	0.00092454	0.00094872	0.00101408	0.00102676	0.00115533	0.00118653	0.00119481
	8	0.00000000	0.00080874	0.00088685	0.00082281	0.00085974	0.00086789	0.00086527	0.00089320	0.00089624	0.00095324	0.00098734	0.00105159	0.00107387	0.00114666	0.00115241
	9	0.00000000	0.00086166	0.00096789	0.00087416	0.00093765	0.00091610	0.00091818	0.00096484	0.00089756	0.00094830	0.00099176	0.00106381	0.00110170	0.00116293	0.00128023
	10	0.00000000	0.00088241	0.00101223	0.00089491	0.00096782	0.00093218	0.00092802	0.00096533	0.00098870	0.00100977	0.00104698	0.00095482	0.00112104	0.00119054	0.00122461
	11	0.00000000	0.00093861	0.00094016	0.00091048	0.00096775	0.00098840	0.00092327	0.00103091	0.00102928	0.00105345	0.00114696	0.00125657	0.00121786	0.00128434	0.00127922
	12	0.00000000	0.00091646	0.00084767	0.00095396	0.00094747	0.00097058	0.00094955	0.00099778	0.00098675	0.00104529	0.00113407	0.00124052	0.00117683	0.00126311	0.00132098
	13	0.00000000	0.00080110	0.00077916	0.00083231	0.00077391	0.00078831	0.00076381	0.00080112	0.00082728	0.00094716	0.00131102	0.00092515	0.00103187	0.00121558	0.00112294
	14	0.00000000	0.00094953	0.00096045	0.00090577	0.00090206	0.00091501	0.00097169	0.00095741	0.00092451	0.00097996	0.00107504	0.00112522	0.00114281	0.00113652	0.00119636
	15	0.00000000	0.00084325	0.00083853	0.00085264	0.00088957	0.00091804	0.00088104	0.00091522	0.00091045	0.00096746	0.00103282	0.00105943	0.00112093	0.00115518	0.00121355
	16	0.00000000	0.00084177	0.00086051	0.00084803	0.00086465	0.00096346	0.00087331	0.00089812	0.00090586	0.00096287	0.00101418	0.00106594	0.00112574	0.00109704	0.00121994
	17	0.00000000	0.00068846	0.00071342	0.00070722	0.00068787	0.00075853	0.00077917	0.00079171	0.00076345	0.0008764	0.00084363	0.00105943	0.00096300	0.00084282	0.00105406
	18	0.00000000	0.00091306	0.00094739	0.00092868	0.00094528	0.00094875	0.00095394	0.00095686	0.00098333	0.00099812	0.00104158	0.00116359	0.00117025	0.00099869	0.00126438
	19	0.00000000	0.00086032	0.00081339	0.00081186	0.00082065	0.00085225	0.00081994	0.00081503	0.00082745	0.00085319	0.00090135	0.00089998	0.00105039	0.00094260	0.00111798
	20	0.00000000	0.00096371	0.00077608	0.00069326	0.00067705	0.00069458	0.00069509	0.00070114	0.00072138	0.00075651	0.00081563	0.00078767	0.00092719	0.00080105	0.00101357
FIT DATA	0.00085083	0.00085775	0.0008659	0.00087186	0.0008863	0.00089991	0.00091004	0.00091838	0.00091838	0.00094307	0.00097546	0.00099855	0.00105711	0.00111487	0.00115162	0.00117835
Standard Deviation	0.00085083	7.5214E-05	0.00011778	9.3715E-05	0.00011869	9.909E-05	0.00010476	0.00010348	0.00012058	0.00012058	0.00010845	0.0001417	0.00013332	9.7988E-05	0.00014373	0.0001063
High Deviation		0.00100817	0.00110146	0.00105929	0.00112367	0.00109809	0.00111955	0.00112534	0.00118424	0.00119235	0.00112819	0.00132375	0.00131084	0.00131084	0.00143908	0.00139095
Low Deviation		0.00070732	0.00063035	0.00068443	0.00064892	0.00070173	0.00070053	0.00071141	0.0007019	0.00075857	0.00071509	0.00079046	0.00091889	0.00086417	0.00096575	

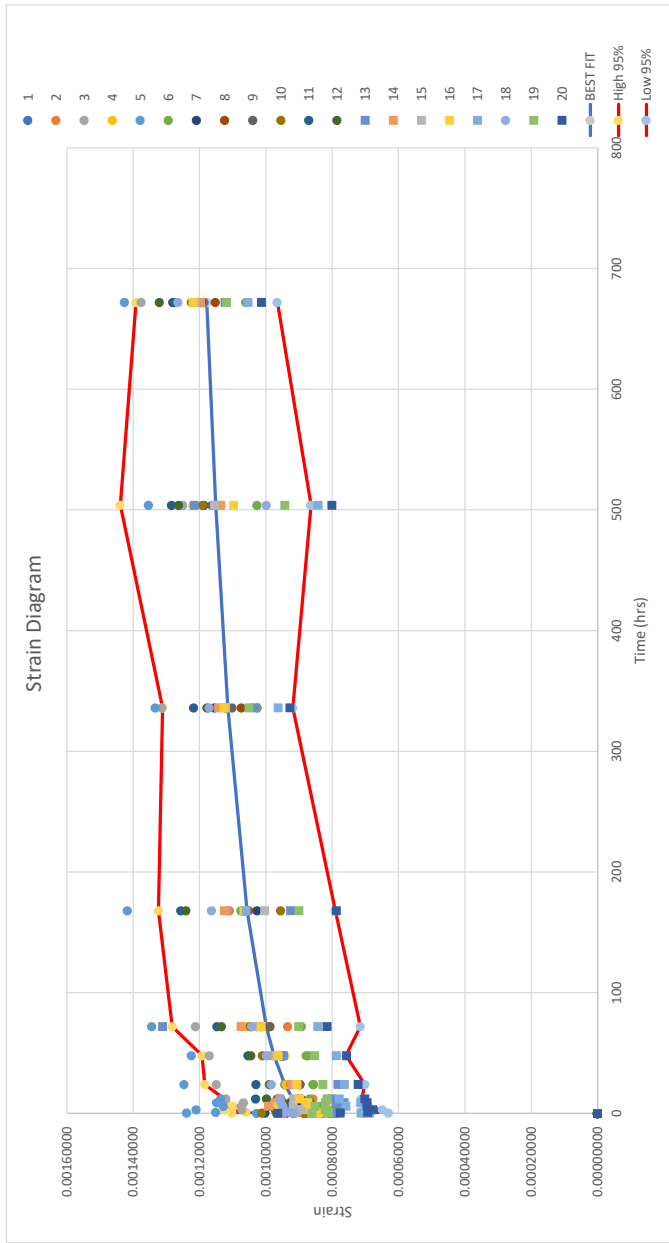
ϵ sh,u	α	V/S	σ
0.0004469	0.3914815	0.625	32.56

Shrinkage Strain	0	0.1	0.5	1	3	6	9	12	24	48	72	168	336	504	672
	0	5.5031E-06	1.0223E-05	1.3315E-05	2.0148E-05	2.6062E-05	3.0242E-05	3.3576E-05	4.3035E-05	5.4805E-05	6.2906E-05	8.305E-05	0.00010297	0.00011609	0.00012602

time (hr)	strain μ
0	0.00085083
0.1	0.00085775
0.5	0.00086590
1	0.00087186
3	0.00088630
6	0.00089991
9	0.00091004
12	0.00091838
24	0.00094307
48	0.00097546
72	0.00099850
168	0.00105711
336	0.00111487
504	0.00115162
672	0.00117835

Copy and Transpose Data

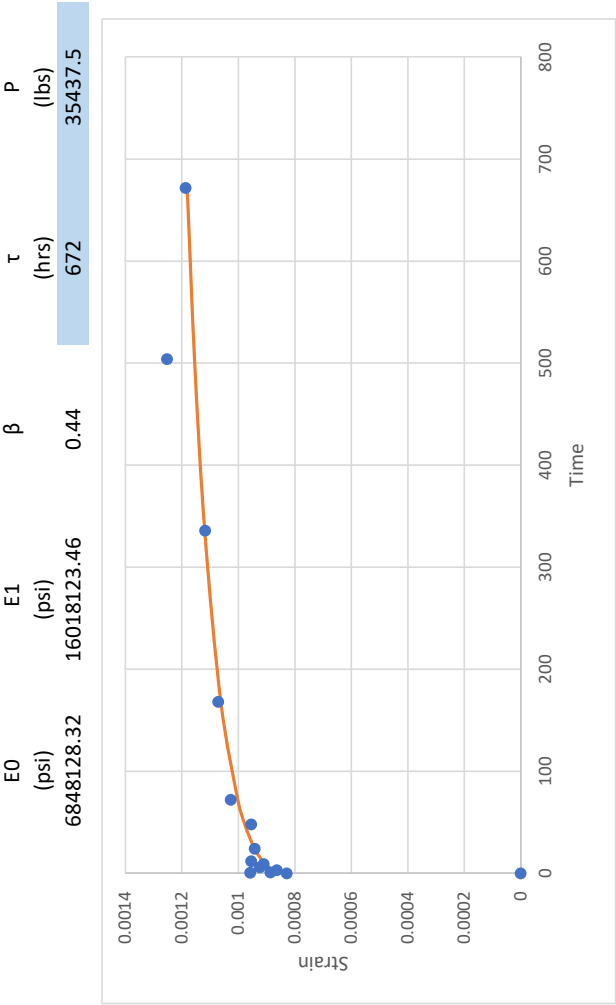
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6664094.90	17311599.25	0.49	672	35437.5



Data Set # 1

time (hr)	strain μ	
0	0	0.00082796
0.1	0.000827963	0.00083936
0.5	0.000957712	0.00085088
1	0.000885823	0.00085885
3	0.000863359	0.00087722
6	0.000923118	0.00089374
9	0.000909552	0.00090568
12	0.000954688	0.00091533
24	0.000942104	0.00094312
48	0.000953789	0.00097825
72	0.001026991	0.00100255
168	0.001070955	0.00106253
336	0.001116703	0.00111990
504	0.001251692	0.00115588
672	0.001185905	0.00118194

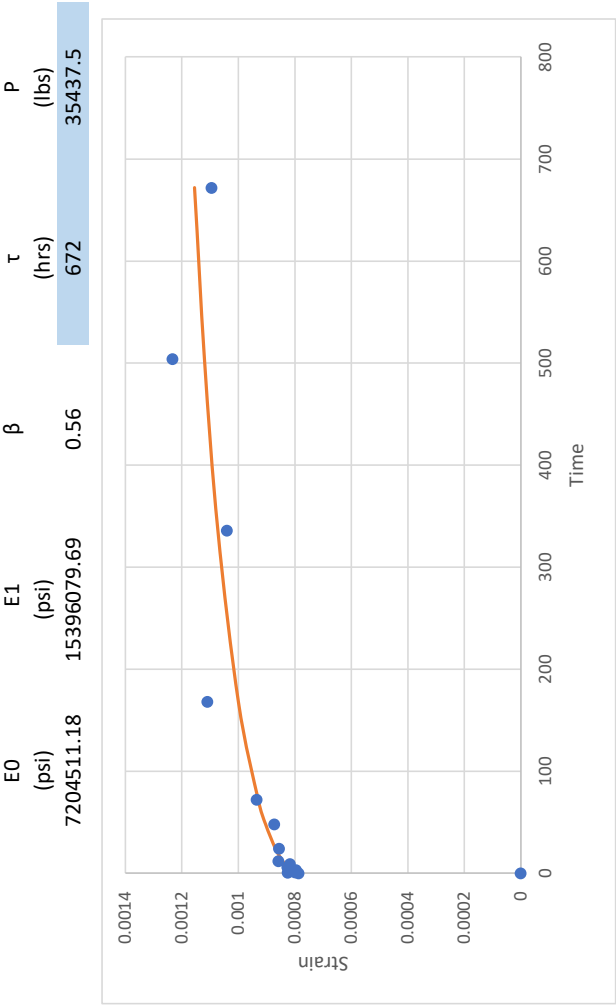
sum R^2 = 7.11E-07



Data Set # 2

time (hr)	strain μ	
0	0	0.00078701
0.1	0.000787007	0.00079101
0.5	0.000824493	0.00079688
1	0.00079952	0.00080156
3	0.000795816	0.00081378
6	0.000825856	0.00082617
9	0.000816985	0.00083581
12	0.000857416	0.00084399
24	0.000855769	0.00086929
48	0.00087214	0.00090449
72	0.000934376	0.00093069
168	0.001109623	0.00100072
336	0.001039676	0.00107328
504	0.001232374	0.00112060
672	0.001094783	0.00115528

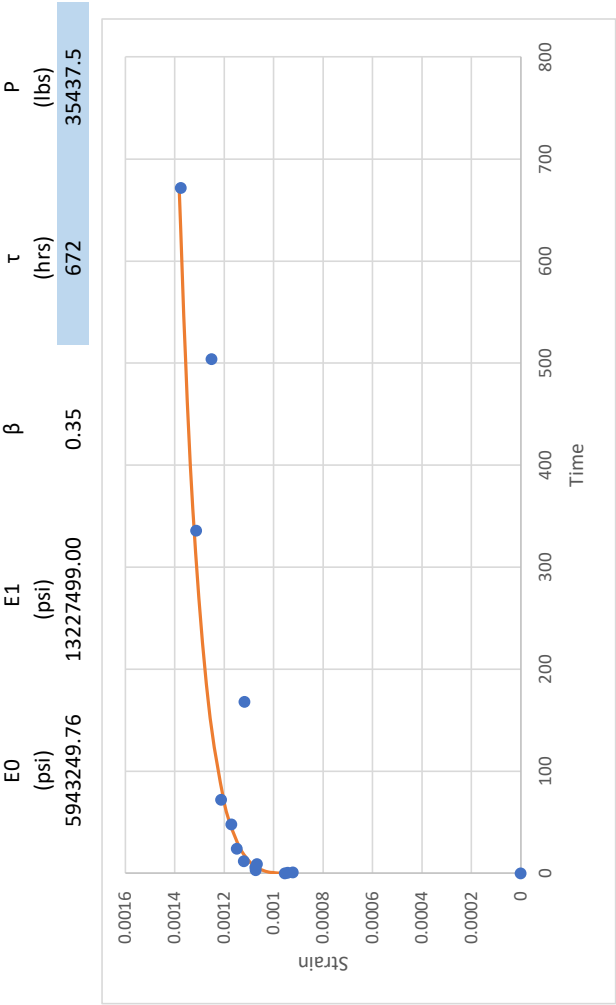
sum R^2 = 6.51E-07



Data Set # 3

time (hr)	strain μ	
0	0	0.00000091
0.1	0.000954024	0.00000000
0.5	0.000943044	0.00000000
1	0.000922767	0.00000000
3	0.00107217	0.00000000
6	0.001074068	0.00000000
9	0.001066761	0.00000000
12	0.001119682	0.00000000
24	0.001149308	0.00000000
48	0.001170361	0.00000000
72	0.001212274	0.00000000
168	0.001117138	0.00000002
336	0.001312853	0.00000000
504	0.001250882	0.00000001
672	0.001375758	0.00000000

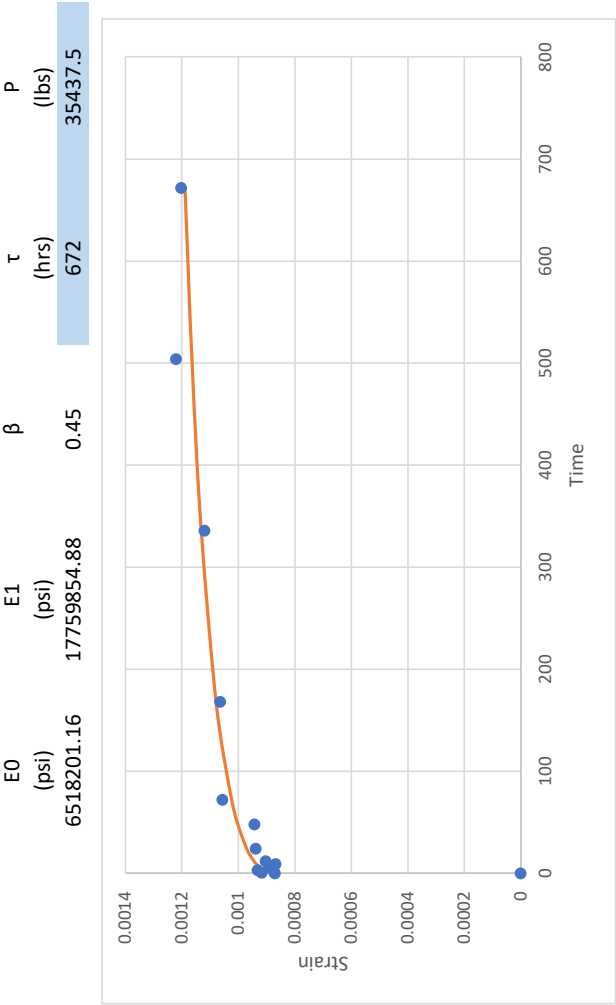
sum R^2 = 9.50E-07



Data Set # 4

time (hr)	strain μ	
0	0	0.00086987
0.1	0.000869872	0.00087935
0.5	0.000916728	0.00088924
1	0.000873004	0.00089614
3	0.000931816	0.00091222
6	0.000889952	0.00092682
9	0.000868577	0.00093742
12	0.000902758	0.00094602
24	0.000938628	0.00097092
48	0.000942493	0.00100263
72	0.001056313	0.00102467
168	0.001064309	0.00107940
336	0.001119412	0.00113204
504	0.001219863	0.00116514
672	0.001202654	0.00118913

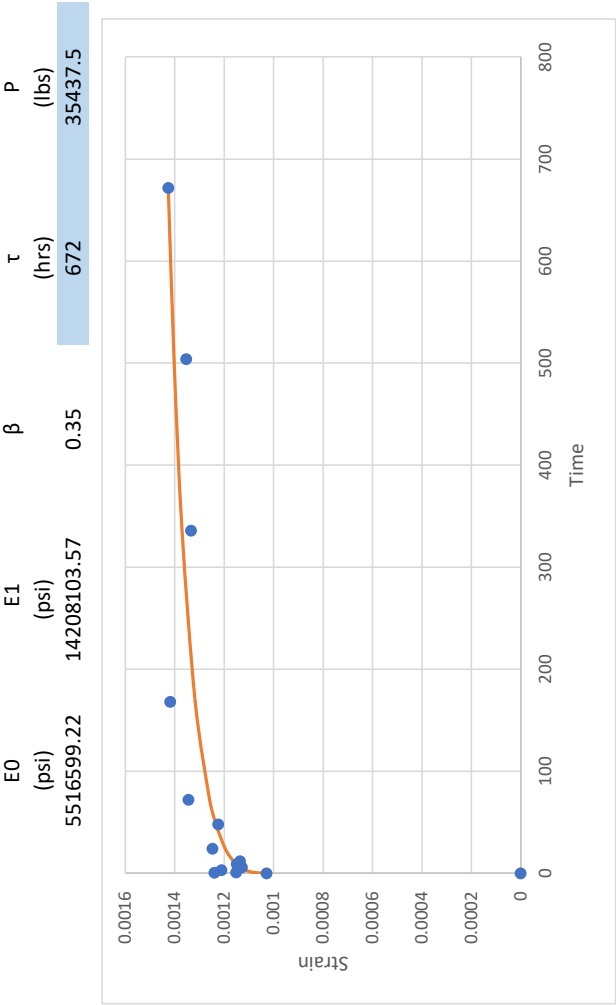
sum R^2 = 7.70E-07



Data Set # 6

time (hr)	strain μ	
0	0	0.00102781
0.1	0.001027807	0.00105604
0.5	0.001238937	0.00107656
1	0.001151379	0.00108927
3	0.001210197	0.00111599
6	0.001127693	0.00113797
9	0.001148517	0.00115299
12	0.0011358	0.00116470
24	0.001246733	0.00119679
48	0.001223973	0.00123469
72	0.001344118	0.00125963
168	0.001417711	0.00131800
336	0.001333683	0.00137105
504	0.001353594	0.00140353
672	0.001426328	0.00142688

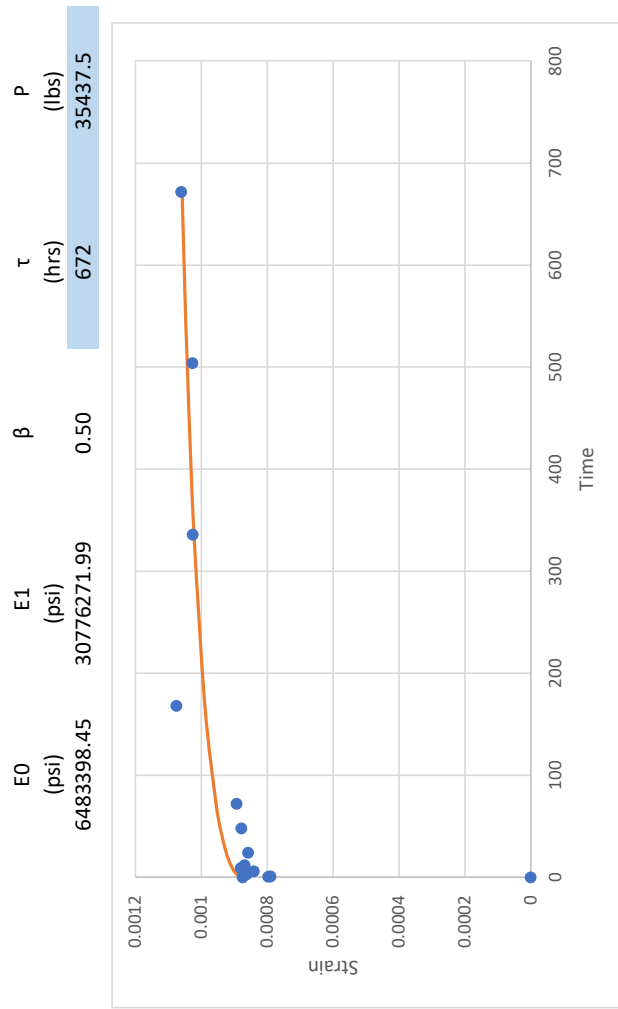
sum R^2 = 1.09E-06



Data Set # 5

0	0	0.00087454	0.00000076
0.1	0.000874541	0.00087808	0.00000000
0.5	0.000796367	0.00088238	
1	0.000790139	0.00088557	
3	0.000861465	0.00089338	0.00000000
6	0.000839926	0.00090082	
9	0.000879516	0.00090639	0.00000000
12	0.000868346	0.00091100	0.00000000
24	0.000857319	0.00092473	0.00000000
48	0.000878377	0.00094289	0.00000000
72	0.000892163	0.00095590	0.00000000
168	0.001075195	0.00098922	0.00000001
336	0.001025603	0.00102229	0.00000000
504	0.001026157	0.00104340	0.00000000
672	0.001060389	0.00105877	0.00000000

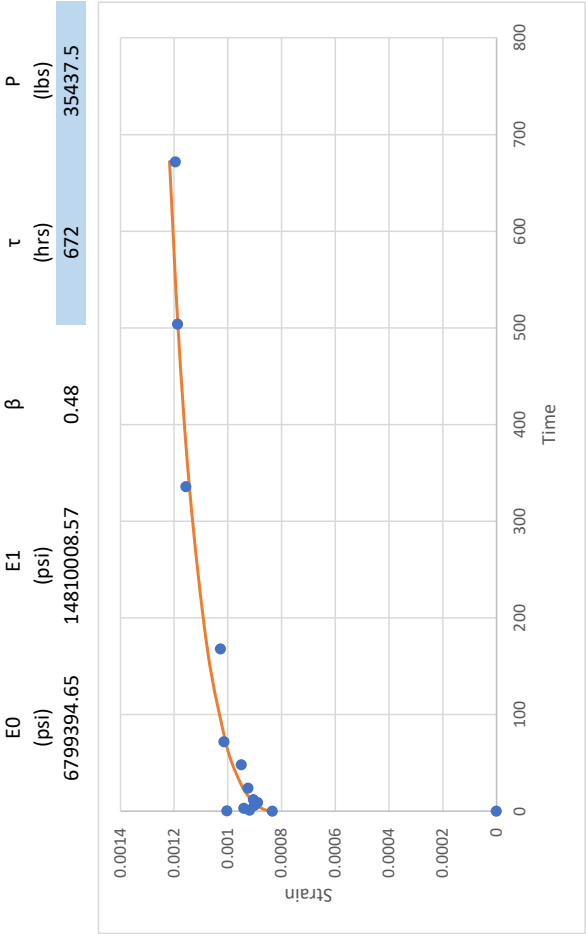
sum R^2 = 7.89E-07



Data Set # 7

time (hr)	strain μ		
0	0	0.00083390	0.00000070
0.1	0.000833898	0.00084254	0.00000000
0.5	0.001002674	0.00085250	
1	0.000918304	0.00085970	0.00000000
3	0.000939609	0.00087704	0.00000000
6	0.000900873	0.00089326	0.00000000
9	0.000888877	0.00090527	0.00000000
12	0.000904301	0.00091513	0.00000000
24	0.00092454	0.00094421	0.00000000
48	0.000948722	0.00098213	0.00000000
72	0.001014083	0.00100899	0.00000000
168	0.001026765	0.00107697	0.00000000
336	0.001155325	0.00114365	0.00000000
504	0.001186533	0.00118598	0.00000000
672	0.001194806	0.00121675	0.00000000

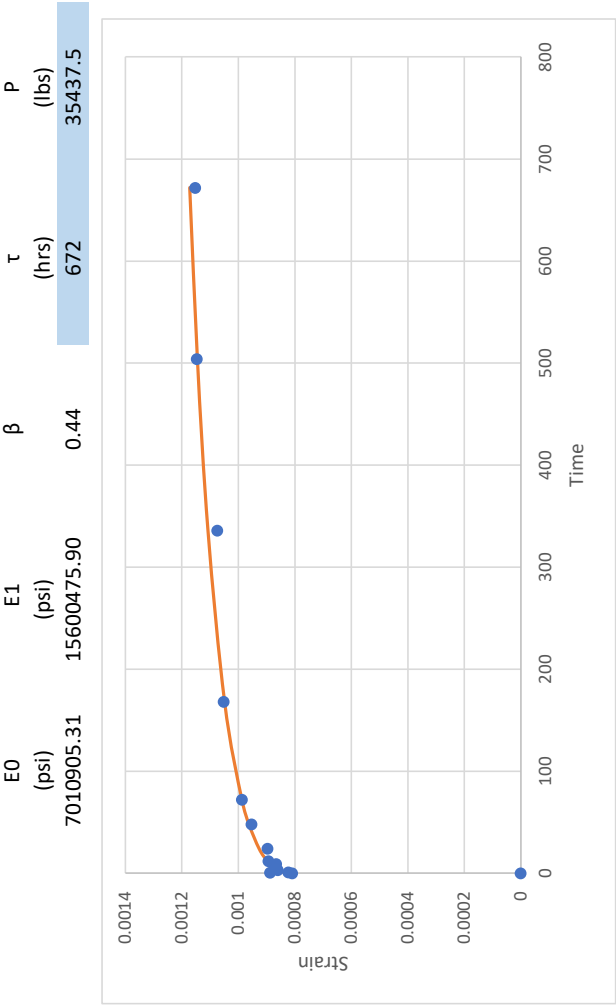
sum R^2 = 7.08E-07



Data Set # 8

time (hr)	strain μ	
0	0	0.00080874
0.1	0.00080874	0.00082052
0.5	0.000886855	0.00083240
1	0.000822808	0.00084060
3	0.00085974	0.00085951
6	0.00086789	0.00087651
9	0.000865272	0.00088878
12	0.000893199	0.00089869
24	0.000896241	0.00092725
48	0.000953241	0.00096331
72	0.000987336	0.00098825
168	0.001051591	0.00104977
336	0.001073868	0.00110860
504	0.001146664	0.00114549
672	0.001152409	0.00117219

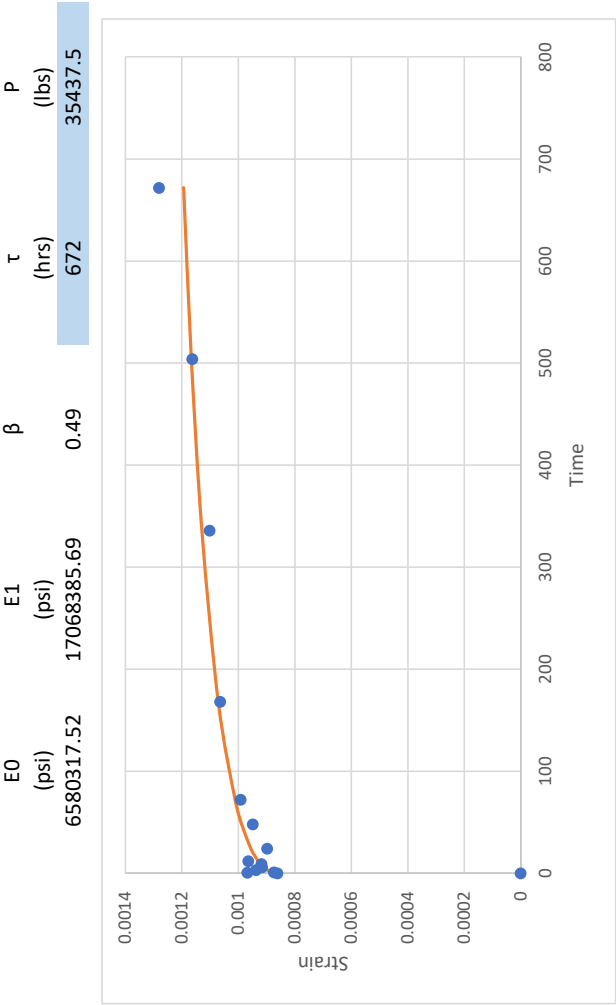
sum R^2 = 6.61E-07



Data Set # 9

time (hr)	strain μ	
0	0	0.00086166
0.1	0.000861661	0.00086886
0.5	0.000967891	0.00087728
1	0.000874157	0.00088341
3	0.000937649	0.00089821
6	0.000916103	0.00091212
9	0.000918178	0.00092245
12	0.000964841	0.00093095
24	0.000897564	0.00095607
48	0.000948297	0.00098894
72	0.00099176	0.00101228
168	0.001063806	0.00107155
336	0.001101697	0.00112985
504	0.001162925	0.00116691
672	0.001280231	0.00119385

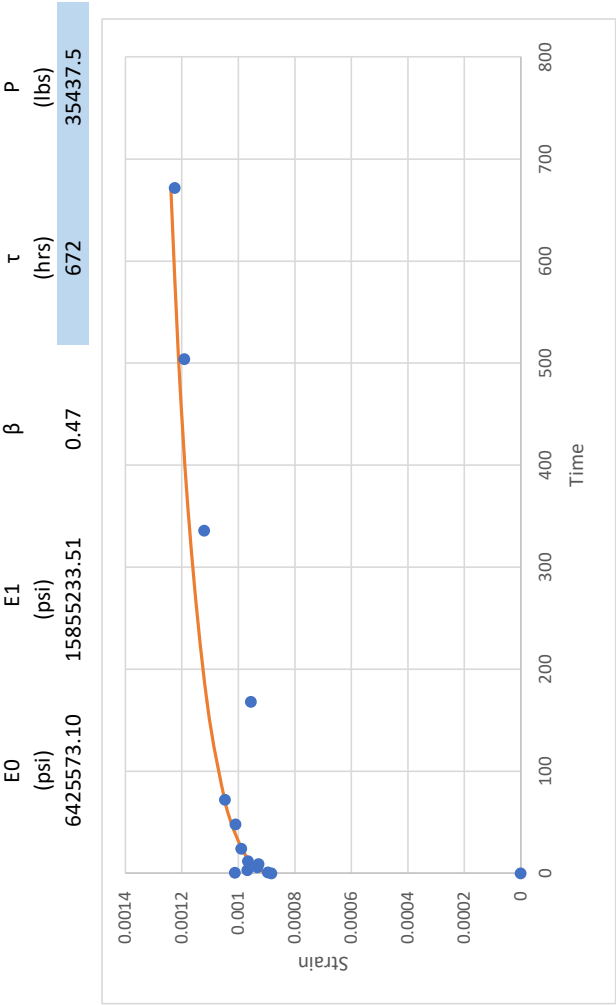
sum R^2 = 7.67E-07



Data Set # 10

time (hr)	strain μ	
0	0	0.00088241
0.1	0.000882412	0.00089123
0.5	0.001012235	0.00090107
1	0.000894912	0.00090811
3	0.000967815	0.00092488
6	0.000932184	0.00094042
9	0.000928019	0.00095185
12	0.000965327	0.00096120
24	0.000988696	0.00098862
48	0.001009767	0.00102409
72	0.001046982	0.00104907
168	0.000954823	0.00111190
336	0.001121037	0.00117313
504	0.001190539	0.00121189
672	0.001224606	0.00124002

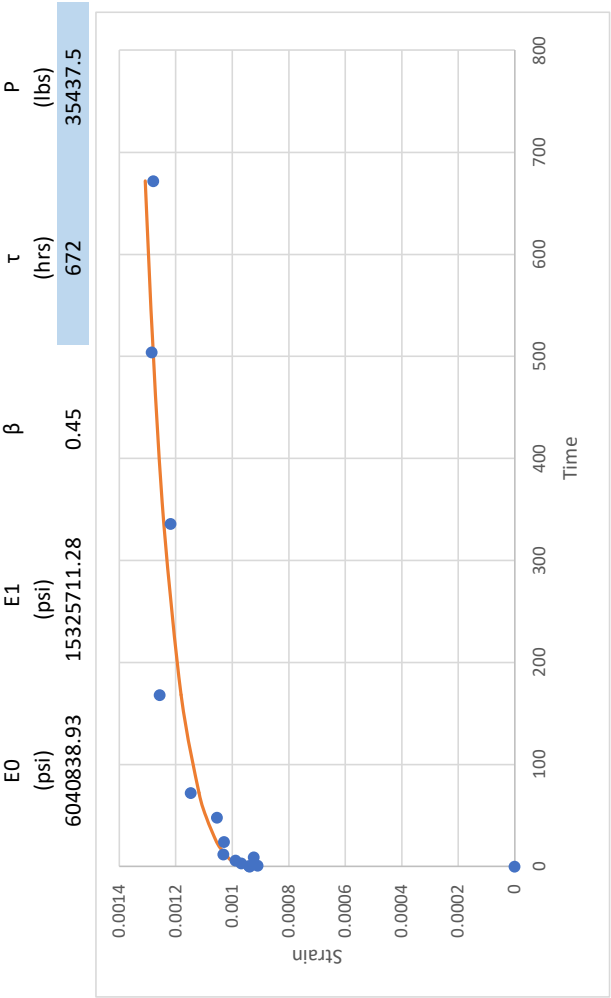
sum R^2 = 7.83E-07



Data Set # 11

time (hr)	strain μ	
0	0	0.00093861
0.1	0.000938611	0.00094960
0.5	0.000940156	0.00096106
1	0.000910484	0.00096906
3	0.000967746	0.00098769
6	0.0009884	0.00100460
9	0.000923272	0.00101689
12	0.001030913	0.00102685
24	0.001029276	0.00105571
48	0.001053448	0.00109245
72	0.001146959	0.00111800
168	0.001256574	0.00118141
336	0.001217855	0.00124241
504	0.00128434	0.00128078
672	0.001279224	0.00130858

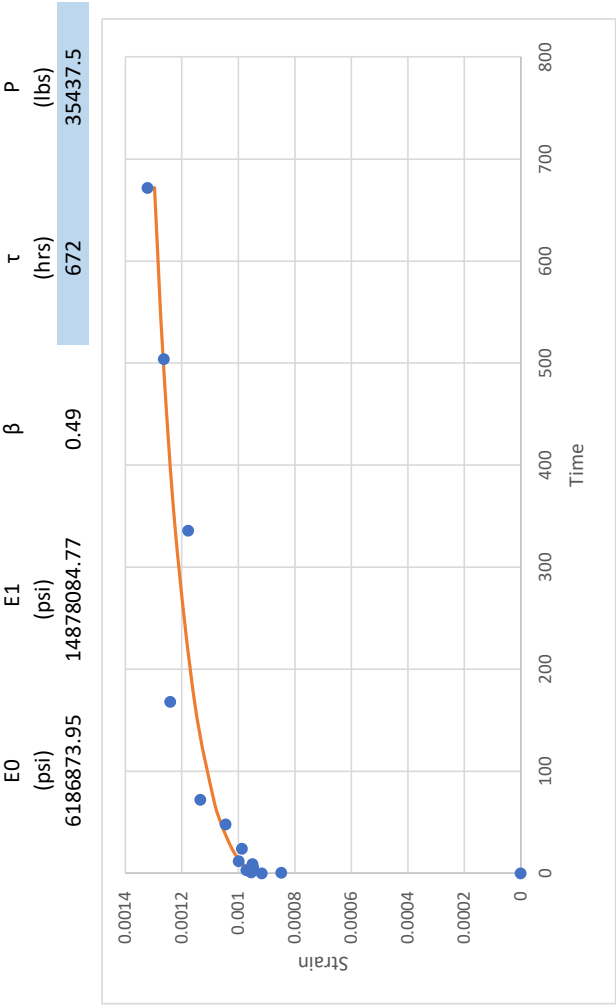
sum R^2 = 8.92E-07



Data Set # 12

time (hr)	strain μ	
0	0	0.00091646
0.1	0.000916456	0.00092444
0.5	0.000847669	0.00093387
1	0.000953965	0.00094077
3	0.000970582	0.00095751
6	0.000947471	0.00097331
9	0.000949549	0.00098507
12	0.000997781	0.00099476
24	0.000986753	0.00102346
48	0.001045294	0.00106114
72	0.00113407	0.00108795
168	0.001240524	0.00115622
336	0.00117683	0.00122354
504	0.001263111	0.00126639
672	0.001320977	0.00129755

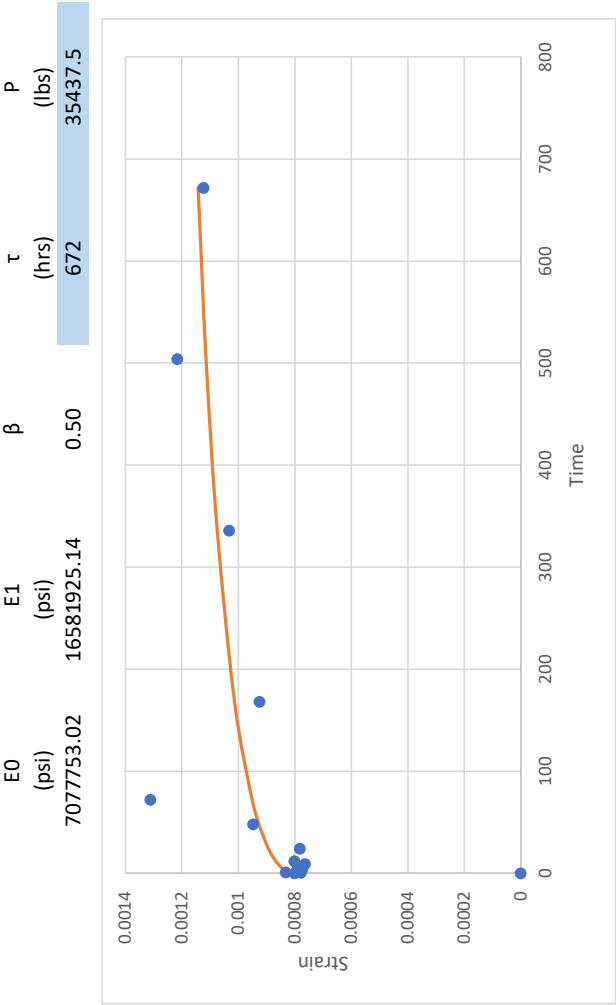
sum R^2 = 8.56E-07



Data Set # 13

time (hr)	strain μ	
0	0	0.00080110
0.1	0.000801102	0.00080766
0.5	0.000779161	0.00081566
1	0.000832305	0.00082157
3	0.000773909	0.00083606
6	0.000788309	0.00084988
9	0.000763806	0.00086022
12	0.000801119	0.00086877
24	0.000782278	0.00089425
48	0.000947161	0.00092797
72	0.001311025	0.00095211
168	0.000925155	0.00101394
336	0.00103187	0.00107532
504	0.00121558	0.00111451
672	0.001122941	0.00114304
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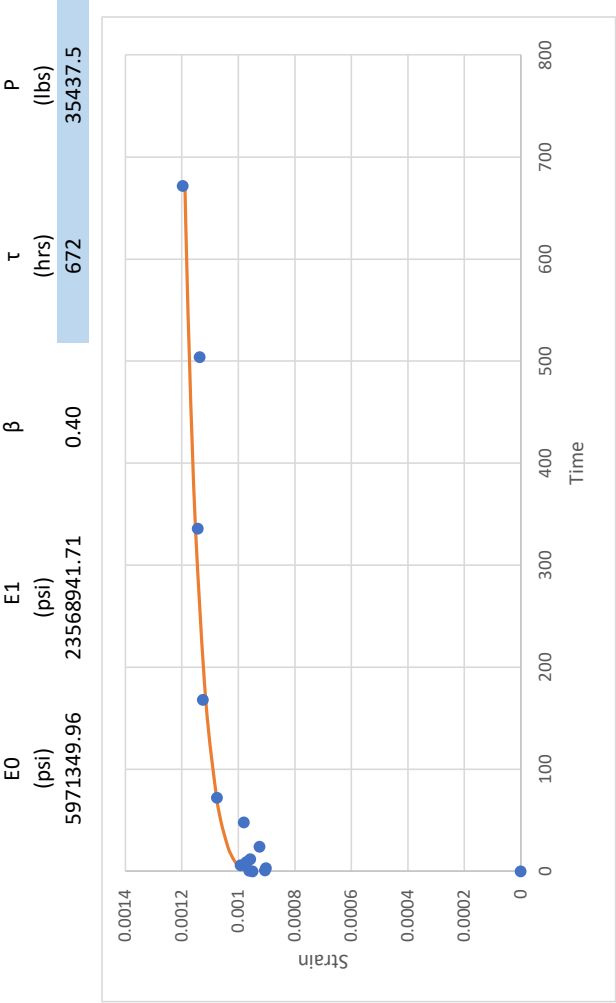
sum R^2 = 6.98E-07



Data Set # 14

time (hr)	strain μ	
0	0	0.00094953
0.1	0.000949534	0.00096058
0.5	0.000960446	0.00097028
1	0.000905771	0.00097667
3	0.000902065	0.00099081
6	0.000991503	0.00100303
9	0.000971691	0.00101163
12	0.000957415	0.00101848
24	0.00092451	0.00103776
48	0.000979963	0.00106138
72	0.00107504	0.00107735
168	0.001125216	0.00111582
336	0.001142806	0.00115175
504	0.001136516	0.00117403
672	0.001196358	0.00119010

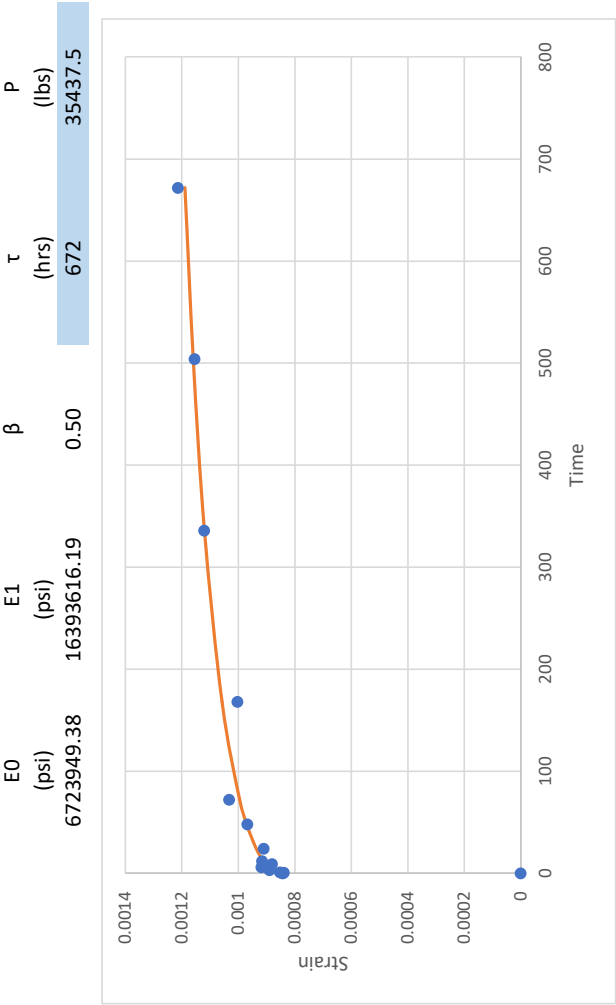
sum R^2 = 9.09E-07



Data Set # 15

time (hr)	strain μ	
0	0	0.00000071
0.1	0.000843254	0.00000000
0.5	0.000838534	0.00000000
1	0.000852636	0.00000000
3	0.000889568	0.00000000
6	0.000918044	0.00000000
9	0.000881039	0.00000000
12	0.00091522	0.00000000
24	0.00091045	0.00000000
48	0.000967456	0.00000000
72	0.001032818	0.00000000
168	0.001003291	0.00000000
336	0.001120926	0.00000000
504	0.001155175	0.00000000
672	0.001213547	0.00000000

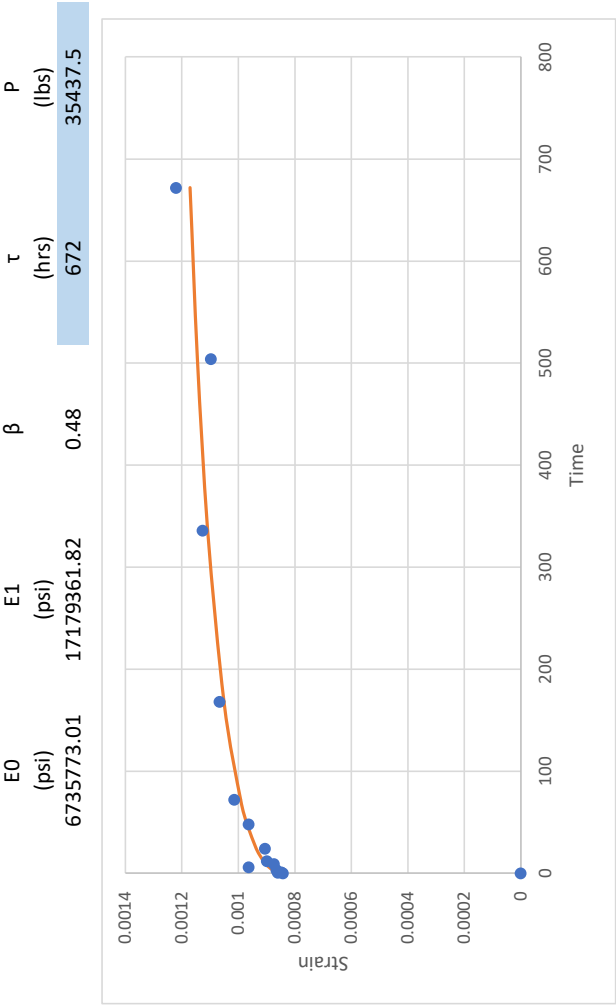
sum R^2 = 7.19E-07



Data Set # 16

time (hr)	strain μ	
0	0	0.00084177
0.1	0.000841774	0.00084923
0.5	0.000860506	0.00085782
1	0.000848033	0.00086404
3	0.000864649	0.00087899
6	0.000963464	0.00089298
9	0.000873311	0.00090334
12	0.00089812	0.00091184
24	0.000905856	0.00093691
48	0.000962869	0.00096960
72	0.001014179	0.00099275
168	0.001065937	0.00105135
336	0.001125744	0.00110882
504	0.001097044	0.00114531
672	0.001219941	0.00117182

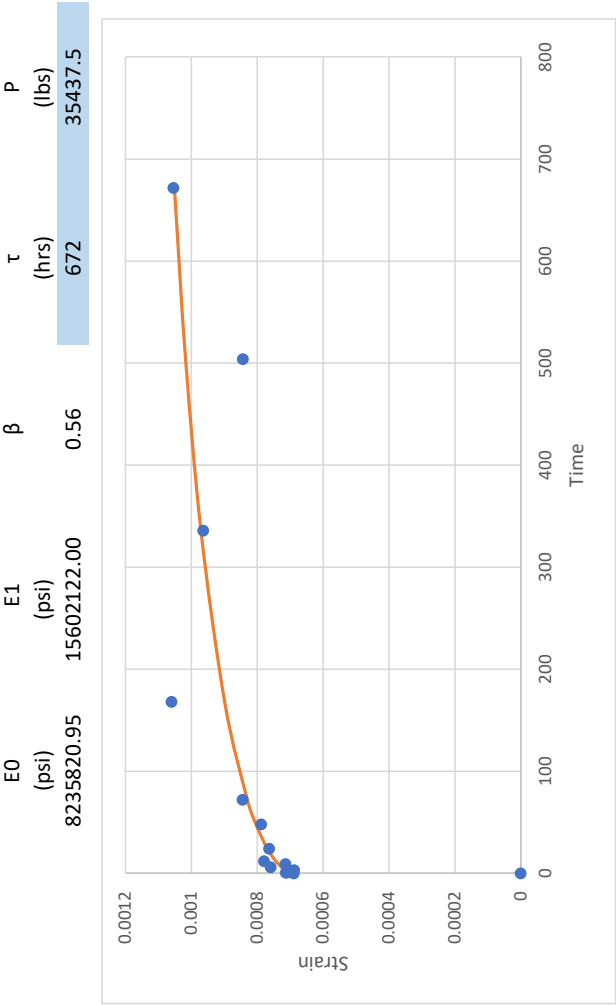
sum R^2 = 7.14E-07



Data Set # 17

time (hr)	strain μ	
0	0	0.00068846
0.1	0.000688456	0.00069242
0.5	0.000713424	0.00069824
1	0.000707216	0.00070286
3	0.000687866	0.00071495
6	0.000758526	0.00072720
9	0.000713735	0.00073673
12	0.000779167	0.00074481
24	0.000763455	0.00076979
48	0.000787641	0.00080454
72	0.000843629	0.00083039
168	0.001059428	0.00089948
336	0.000963005	0.00097102
504	0.000842825	0.00101768
672	0.001054064	0.00105187

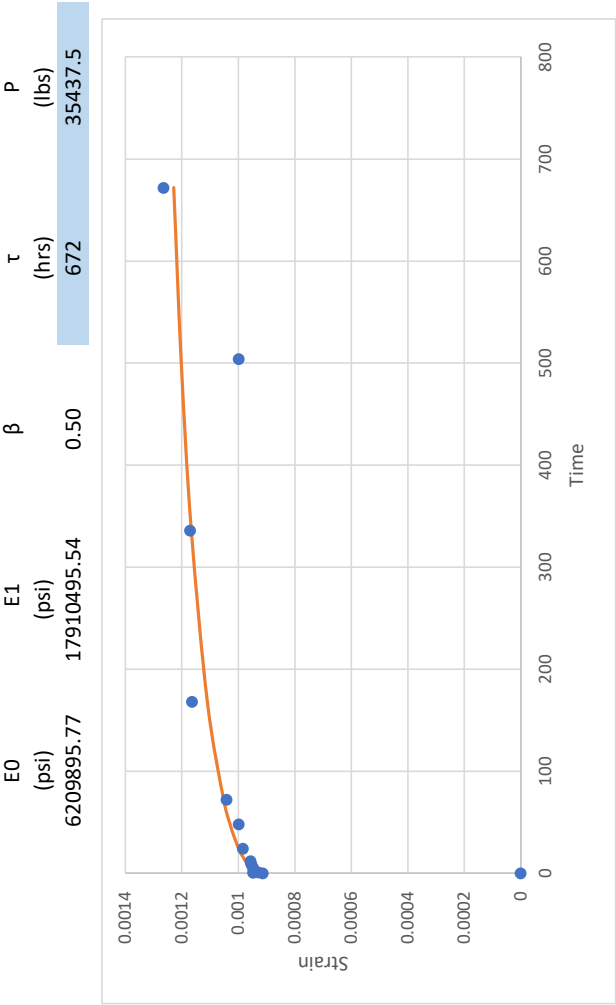
$\text{sum } R^2 = 4.78\text{E-}07$



Data Set # 18

time (hr)	strain μ										
0	0	0.00091306	0.00000083								
0.1	0.000913059	0.00091913	0.00000000								
0.5	0.000947392	0.00092653	0.00000000								
1	0.000928681	0.00093201	0.00000000								
3	0.000945277	0.00094543	0.00000000								
6	0.000948747	0.00095821	0.00000000								
9	0.000953944	0.00096779	0.00000000								
12	0.000956856	0.00097570	0.00000000								
24	0.000983331	0.00099930	0.00000000								
48	0.000998117	0.00103051	0.00000000								
72	0.001041577	0.00105286	0.00000000								
168	0.001163585	0.00111011	0.00000000								
336	0.001170249	0.00116694	0.00000000								
504	0.000998685	0.00120322	0.00000000								
672	0.001264381	0.00122963	0.00000000								

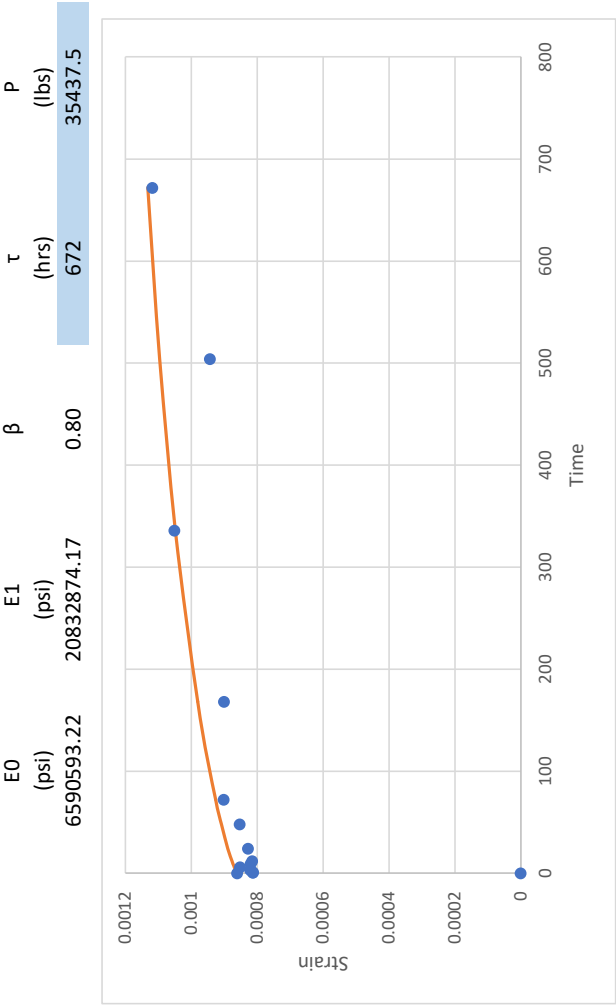
sum R^2 = 8.40E-07



Data Set # 19

time (hr)	strain μ				
0	0	0.00086032	0.00000074		
0.1	0.000860317	0.00086069	0.00000000		
0.5	0.000813388	0.00086167			
1	0.000811863	0.00086267			
3	0.000820654	0.00086595			
6	0.000852249	0.00087008	0.00000000		
9	0.000819943	0.00087377	0.00000000		
12	0.000815026	0.00087718	0.00000000		
24	0.000827453	0.00088924	0.00000000		
48	0.000853189	0.00090942	0.00000000		
72	0.000901349	0.00092671	0.00000000		
168	0.000899978	0.00098130	0.00000001		
336	0.001050393	0.00104844	0.00000000		
504	0.000942605	0.00109633	0.00000000		
672	0.001117982	0.00113248			

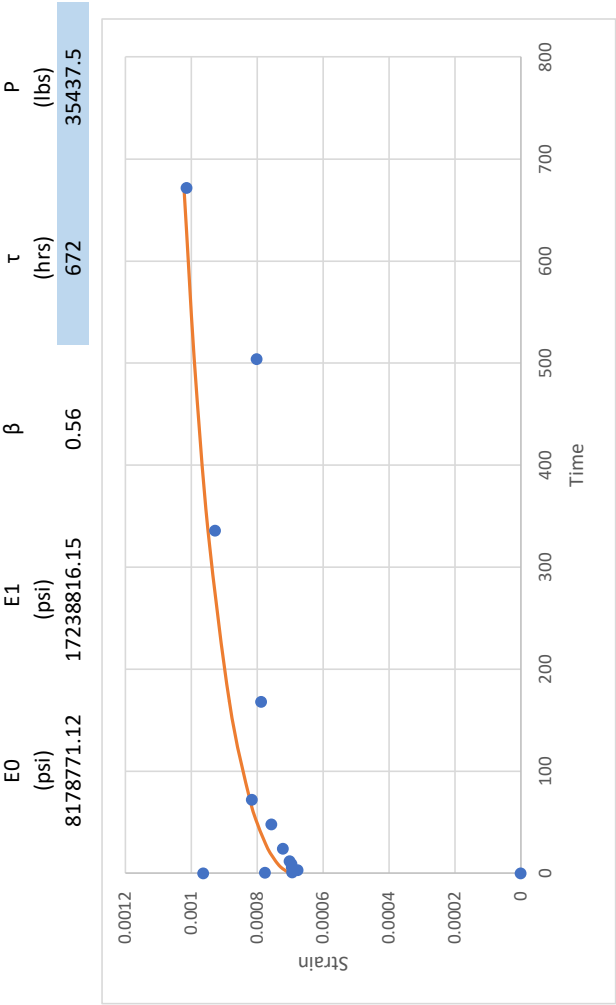
sum R^2 = 7.61E-07



Data Set # 20

time (hr)	strain μ					
0	0	0.00069326	0.00000048			
0.1	0.00096371	0.00069699				
0.5	0.000776079	0.00070239				
1	0.000693258	0.00070666	0.00000000			
3	0.000677047	0.00071779	0.00000000			
6	0.000694582	0.00072901	0.00000000			
9	0.000695092	0.00073773	0.00000000			
12	0.000701136	0.00074510	0.00000000			
24	0.000721379	0.00076785	0.00000000			
48	0.000756506	0.00079939	0.00000000			
72	0.000815625	0.00082279	0.00000000			
168	0.000787672	0.00088514	0.00000001			
336	0.000927191	0.00094953	0.00000000			
504	0.000801047	0.00099146	0.00000000			
672	0.00101357	0.00102217	0.00000000			

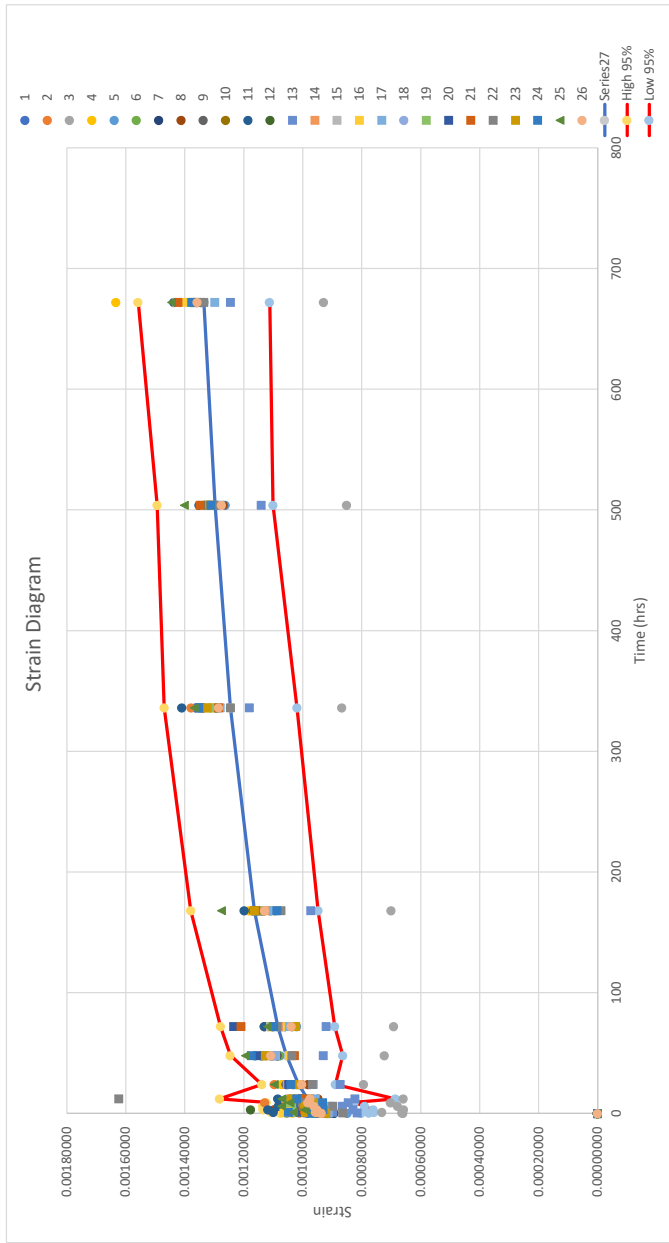
sum R^2 = 5.02E-07



time (hr)	strain μ
0	0.00091316
0.1	0.00091871
0.5	0.00092638
1	0.00093233
3	0.00094757
6	0.00096270
9	0.00097433
12	0.00098410
24	0.00101397
48	0.00105484
72	0.00108486
168	0.00116395
336	0.00124471
504	0.00129699
672	0.00133522

Copy and Transpose Data

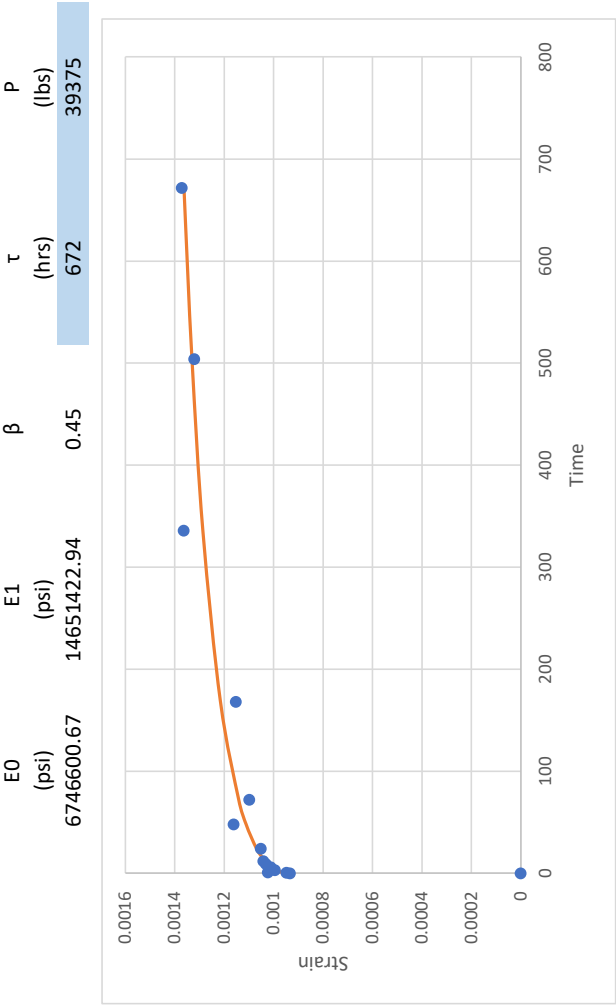
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6899109.42	14926713.57	0.543135776	672	39375



Data Set # 1

time (hr)	strain μ	
0	0	0.00093380
0.1	0.000933804	0.00094657
0.5	0.000947845	0.00095989
1	0.001022892	0.00096919
3	0.000994189	0.00099084
6	0.001011714	0.00101050
9	0.00103097	0.00102478
12	0.001041709	0.00103636
24	0.001051009	0.00106991
48	0.001161128	0.00111260
72	0.001098339	0.00114230
168	0.001153208	0.00121600
336	0.001363027	0.00128690
504	0.001320213	0.00133149
672	0.001371233	0.00136380

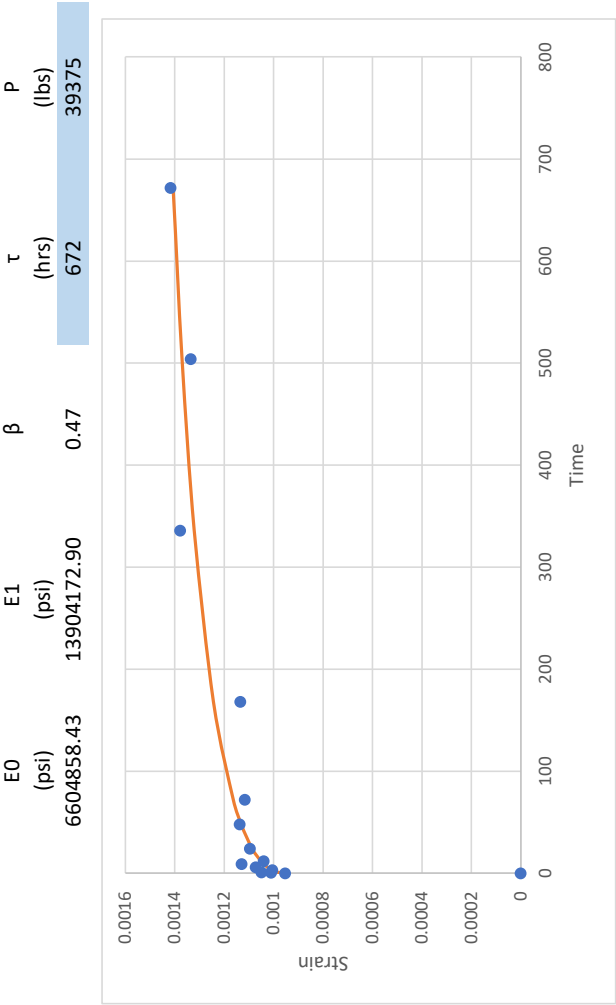
$\text{sum } R^2 = 8.90\text{E-}07$



Data Set # 2

time (hr)	strain μ	
0	0	0.00095384
0.1	0.000953843	0.00096479
0.5	0.00101005	0.00097709
1	0.001049166	0.00098592
3	0.001004814	0.00100699
6	0.001072305	0.00102657
9	0.001129017	0.00104100
12	0.00103983	0.00105280
24	0.001096012	0.00108746
48	0.001137356	0.00113240
72	0.001116749	0.00116408
168	0.0011341	0.00124388
336	0.001378285	0.00132178
504	0.001335466	0.00137112
672	0.001416158	0.00140694

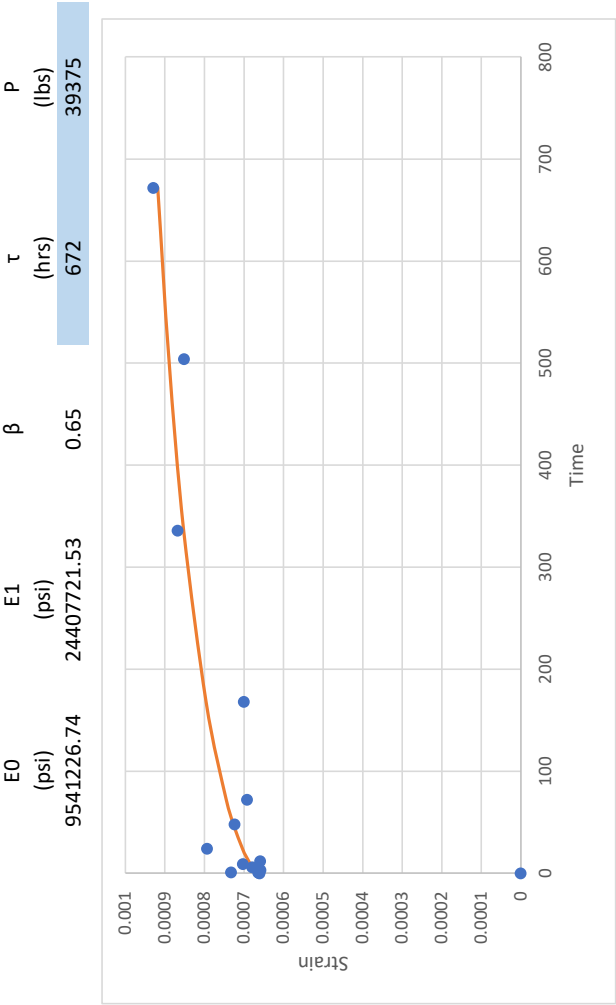
sum R^2 = 9.44E-07



Data Set # 3

time (hr)	strain μ	
0	0	0.00066029
0.1	0.000660292	0.00066162
0.5	0.000663393	0.00066406
1	0.000732154	0.00066618
3	0.00058163	0.00067223
6	0.000678791	0.00067887
9	0.000702774	0.00068430
12	0.00058808	0.00068906
24	0.00079311	0.00070452
48	0.000723495	0.00072752
72	0.000691982	0.00074553
168	0.000699959	0.00079658
336	0.000867552	0.00085273
504	0.000851337	0.00089047
672	0.00092891	0.00091841

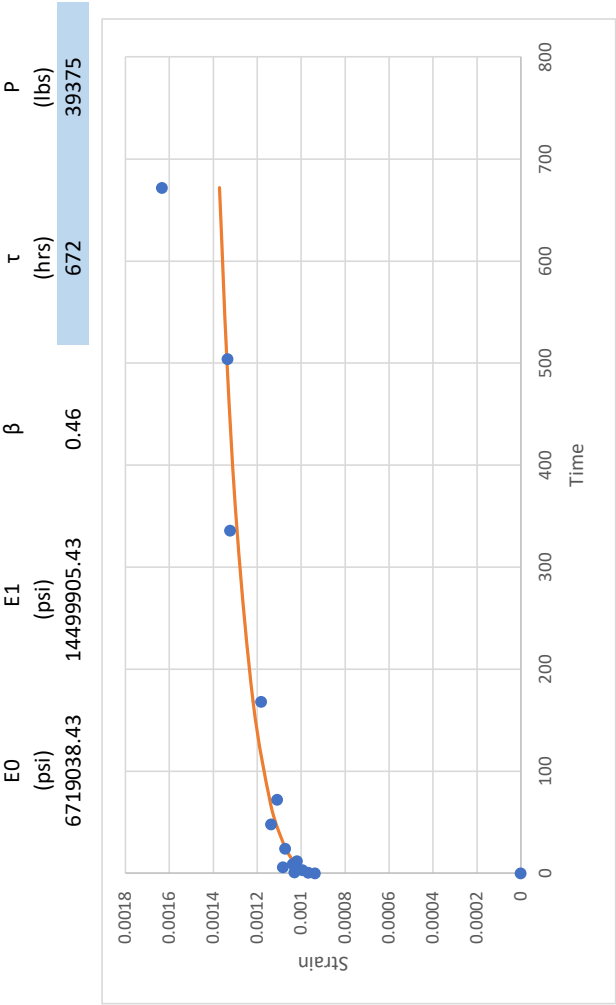
$\text{sum } R^2 = 4.64E-07$



Data Set # 4

time (hr)	strain μ	
0	0	0.00093763
0.1	0.000937634	0.00094946
0.5	0.000967263	0.00096219
1	0.001029779	0.00097119
3	0.000993232	0.00099236
6	0.001082463	0.00101176
9	0.001037822	0.00102595
12	0.001018857	0.00103749
24	0.001071865	0.00107112
48	0.001136623	0.00111426
72	0.001108201	0.00114444
168	0.001181694	0.00121980
336	0.00132274	0.00129274
504	0.001334616	0.00133875
672	0.001633334	0.00137212

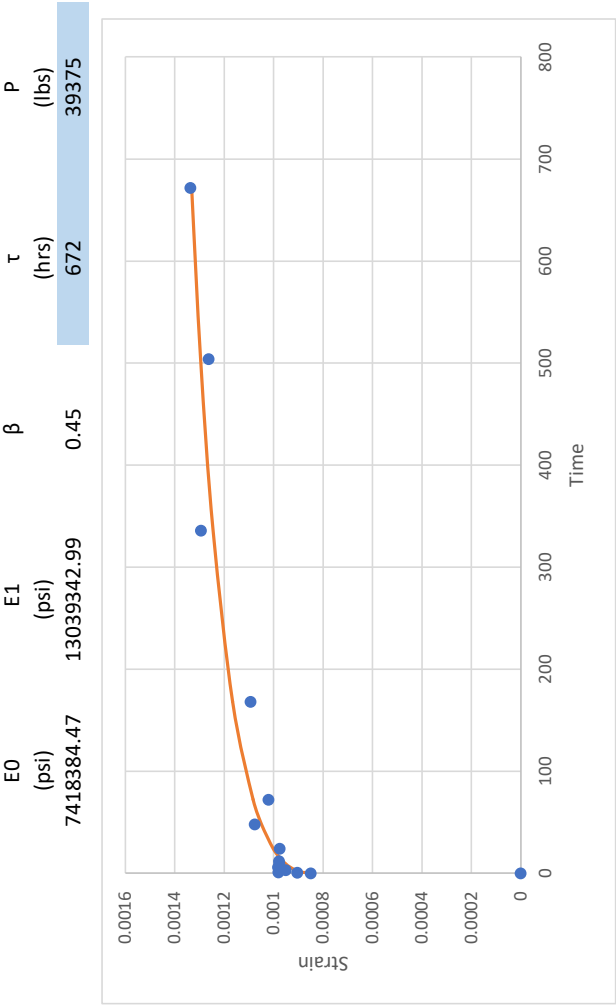
sum R^2 = 8.92E-07



Data Set # 5

time (hr)	strain μ	
0	0	0.00084924
0.1	0.000849242	0.00086359
0.5	0.000903899	0.00087855
1	0.000980514	0.00088900
3	0.000950229	0.00091333
6	0.000981815	0.00093542
9	0.000976076	0.00095147
12	0.000977423	0.00096448
24	0.000975776	0.00100217
48	0.001076511	0.00105015
72	0.001019977	0.00108351
168	0.00109359	0.00116633
336	0.001293983	0.00124599
504	0.001262122	0.00129609
672	0.001336565	0.00133239

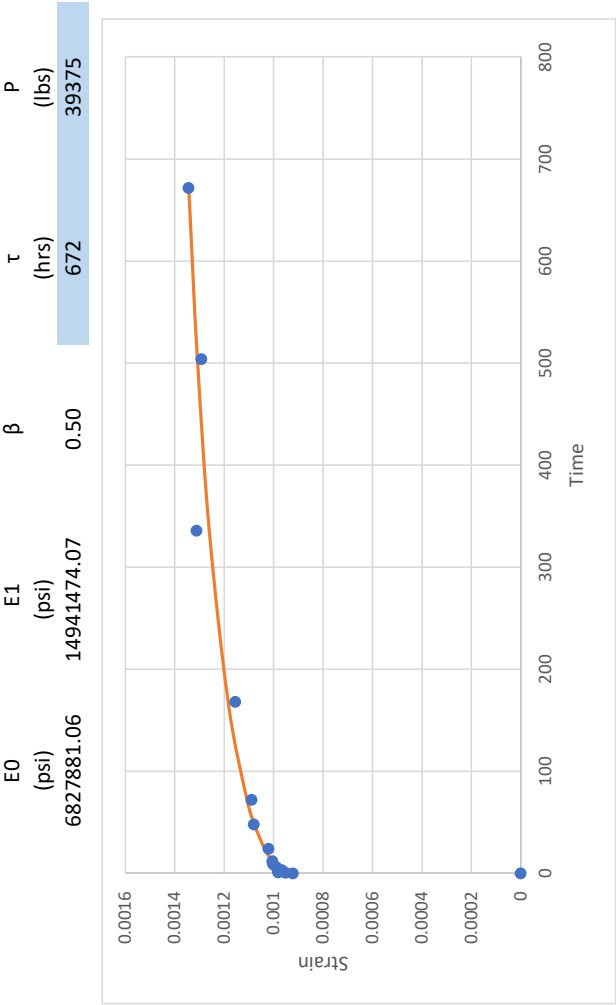
$\text{sum } R^2 = 7.49\text{E-}07$



Data Set # 6

time (hr)	strain μ	
0	0	0.00092269
0.1	0.000922687	0.00000085
0.5	0.000952352	0.00000000
1	0.000982082	0.00000000
3	0.000965877	0.00000000
6	0.000988088	0.00000000
9	0.001002647	0.00000000
12	0.001005583	0.00000000
24	0.001021118	0.00000000
48	0.001079668	0.00000000
72	0.00108876	0.00000000
168	0.001154555	0.00000000
336	0.001311206	0.00000000
504	0.001291843	0.00000000
672	0.001344407	0.00000000

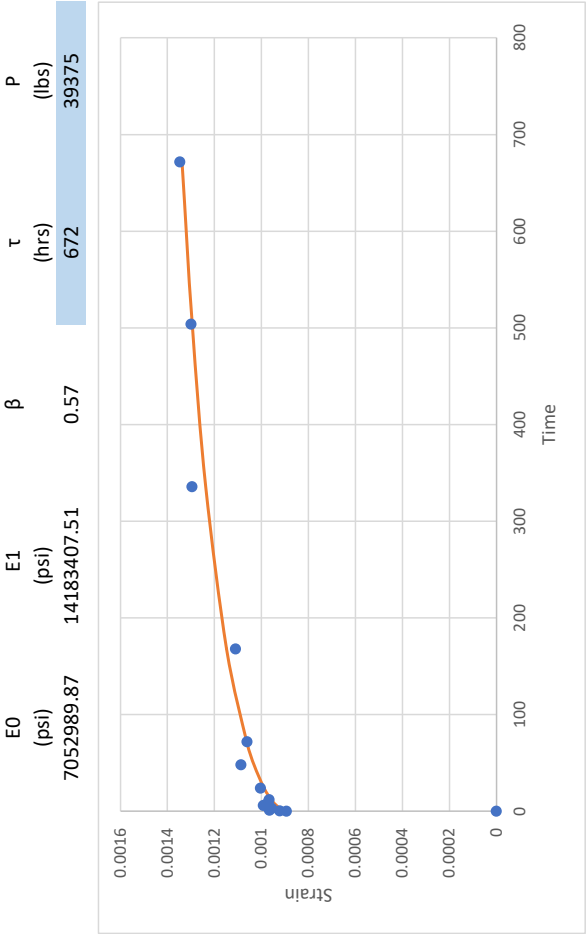
sum R^2 = 8.57E-07



Data Set # 7

time (hr)	strain μ		
0	0	0.00089324	0.00000080
0.1	0.000893238	0.00089767	0.00000000
0.5	0.000921356	0.00090435	0.00000000
1	0.000965143	0.00090973	0.00000000
3	0.00095519	0.00092391	0.00000000
6	0.000991464	0.00093843	0.00000000
9	0.000970089	0.00094980	0.00000000
12	0.000966759	0.00095947	0.00000000
24	0.001002625	0.00098955	0.00000000
48	0.001086185	0.00103174	0.00000000
72	0.001060894	0.00106332	0.00000000
168	0.001109522	0.00114828	0.00000000
336	0.001294332	0.00123689	0.00000000
504	0.001298413	0.00129488	0.00000000
672	0.00134632	0.00133742	0.00000000

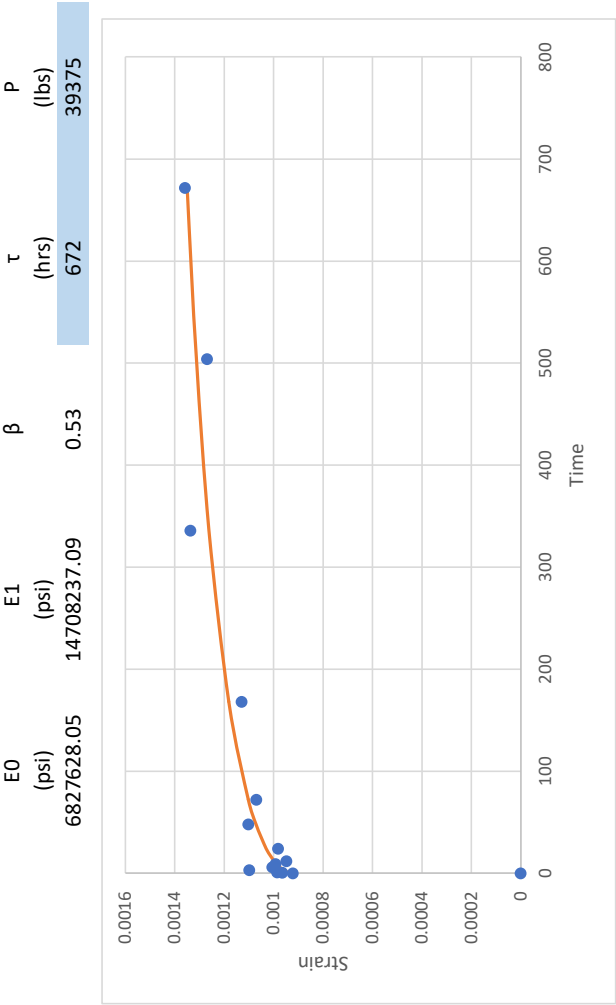
sum R^2 = 8.14E-07



Data Set # 8

time (hr)	strain μ	
0	0	0.00092272
0.1	0.000922722	0.00000085
0.5	0.000964893	0.00000000
1	0.000985232	0.00000000
3	0.001098744	0.00000000
6	0.001005306	
9	0.000991744	0.00000000
12	0.000947786	0.00000000
24	0.000982088	0.00000000
48	0.001101573	0.00000000
72	0.001070038	0.00000000
168	0.001129582	0.00000000
336	0.001336249	0.00000001
504	0.001268459	0.00000000
672	0.001358518	0.00000000

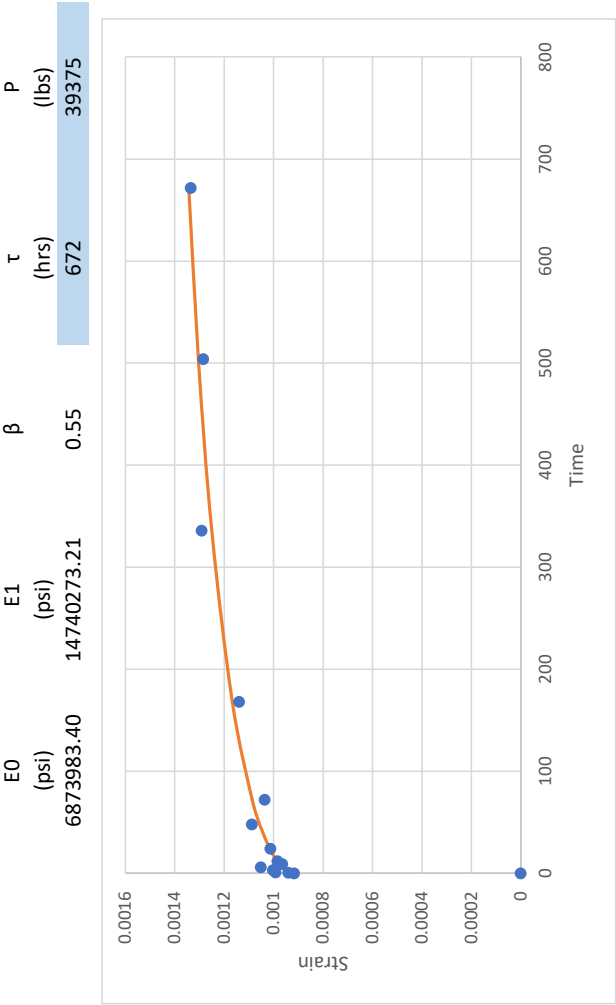
sum R^2 = 8.72E-07



Data Set # 9

time (hr)	strain μ	
0	0	0.00091650
0.1	0.000916499	0.000000084
0.5	0.000939903	0.000000000
1	0.000991508	0.000000000
3	0.001001863	0.000000000
6	0.001052199	0.000000000
9	0.000965199	0.000000000
12	0.000983744	0.000000000
24	0.001013358	0.000000000
48	0.001087544	0.000000000
72	0.001035679	0.000000000
168	0.001138999	0.000000000
336	0.001290982	0.000000000
504	0.001284118	0.000000000
672	0.001335163	0.000000000

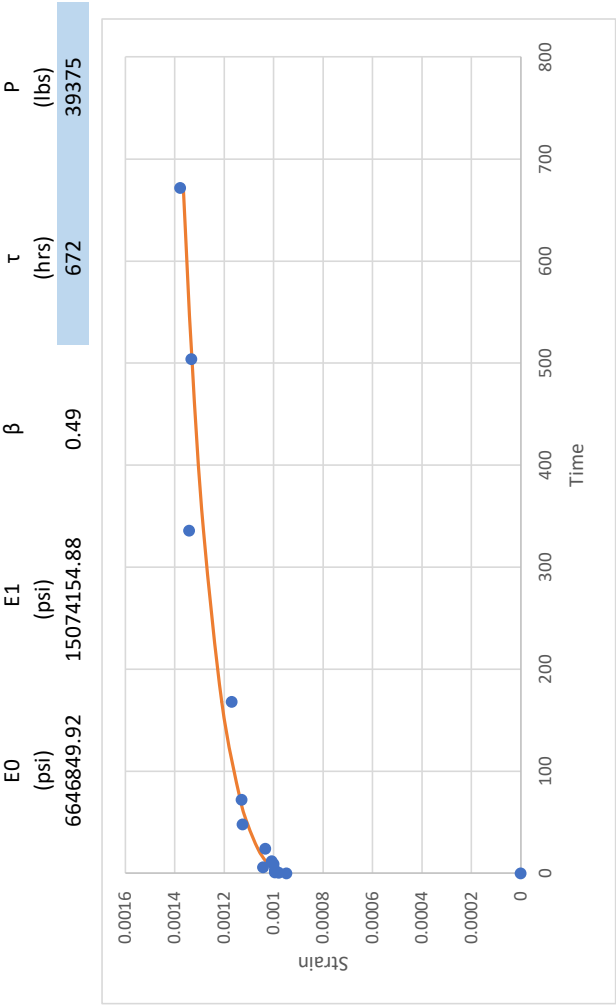
sum R^2 = 8.53E-07



Data Set # 10

time (hr)	strain μ	
0	0	0.00094782
0.1	0.000947817	0.00095657
0.5	0.00097904	0.00096692
1	0.000994704	0.00097449
3	0.000994119	0.00099284
6	0.001042898	0.00101017
9	0.000999662	0.00102307
12	0.001007266	0.00103369
24	0.001033748	0.00106516
48	0.00112513	0.00110648
72	0.001129541	0.00113589
168	0.001168781	0.00121075
336	0.001341071	0.00128458
504	0.001332655	0.00133157
672	0.001377407	0.00136575

sum R^2 = 9.08E-07



Data Set # 11

time (hr)	strain μ	
0	0	0.00098382
0.1	0.000983816	0.00099086
0.5	0.001054108	0.00100009
1	0.001099474	0.00100711
3	0.00111764	0.00102472
6	0.00108204	0.00104191
9	0.001032539	0.00105497
12	0.001083903	0.00106587
24	0.001055692	0.00109881
48	0.001139263	0.00114323
72	0.001129599	0.00117549
168	0.00119854	0.00125945
336	0.001409936	0.00134411
504	0.001351495	0.00139858
672	0.001436897	0.00143834

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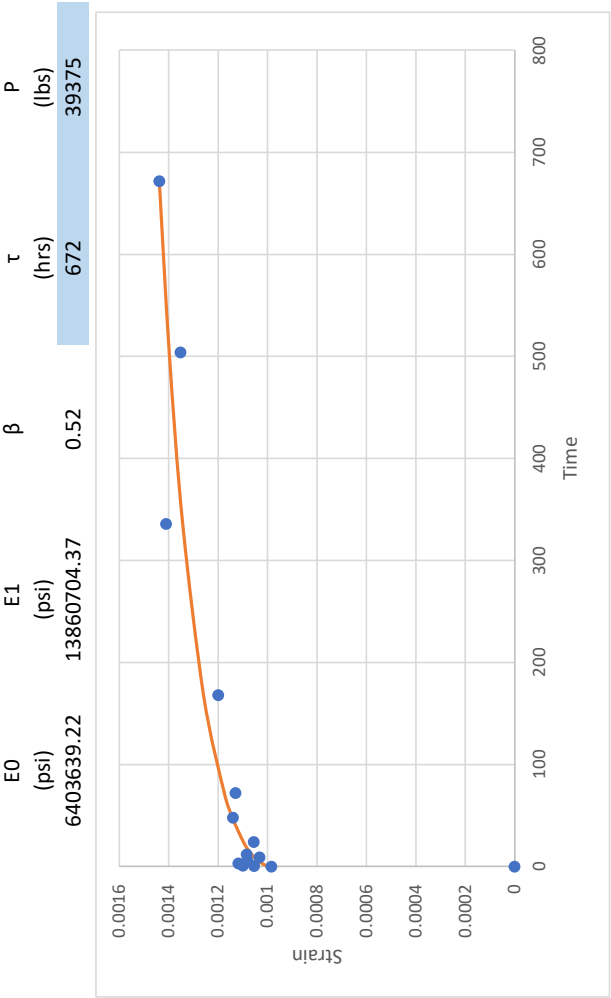
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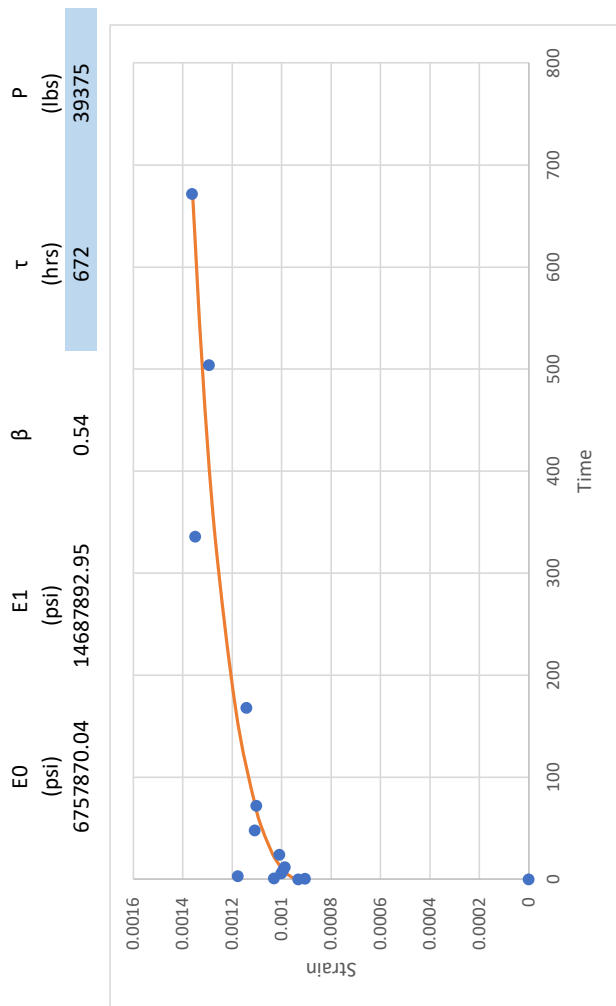
sum R^2 = 9.88E-07



Data Set # 12

0	0	0.000932246	0.00093225	0.00000087
0.1	0.1	0.000932246	0.00093804	0.00000000
0.5	0.5	0.00090565	0.00094598	0.00000000
1	1	0.001030722	0.00095212	
3	3	0.001177077	0.00096779	
6	6	0.001000775	0.00098331	0.00000000
9	9	0.000993469	0.00099521	0.00000000
12	12	0.000987008	0.00100521	0.00000000
24	24	0.001008809	0.00103569	0.00000000
48	48	0.001108003	0.00107729	0.00000000
72	72	0.00110146	0.00110779	0.00000000
168	168	0.001142276	0.00118798	0.00000000
336	336	0.001348962	0.00126969	0.00000001
504	504	0.00129366	0.00132254	0.00000000
672	672	0.001361869	0.00136117	0.00000000

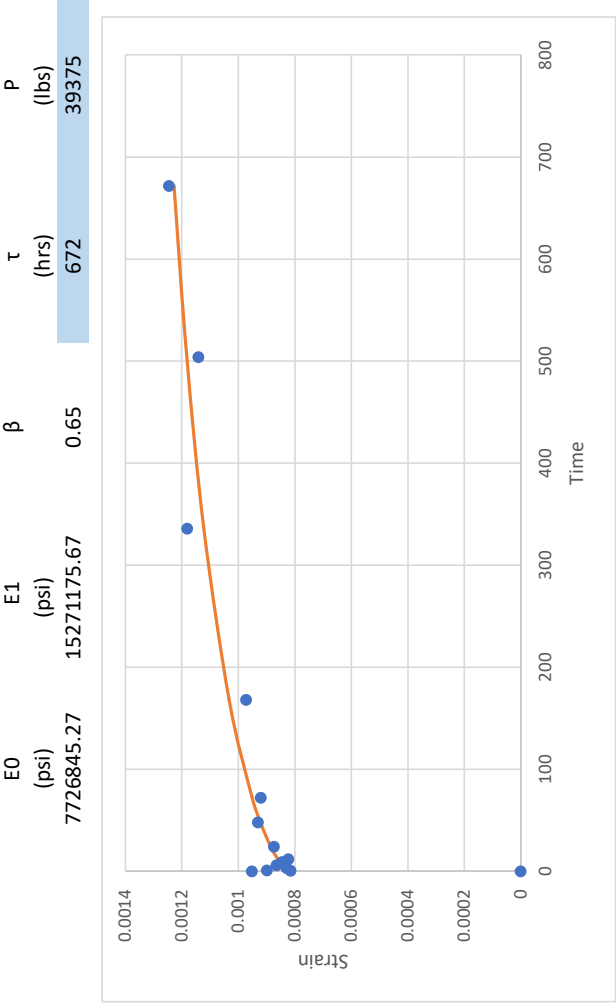
sum R^2 = 8.82E-07



Data Set # 13

time (hr)	strain μ	
0	0	0.00081534
0.1	0.000951433	0.00081746
0.5	0.000815339	0.00082135
1	0.000898254	0.00082475
3	0.00082887	0.00083442
6	0.000865177	0.00084503
9	0.00084535	0.00085371
12	0.000823261	0.00086132
24	0.00087322	0.00088603
48	0.000930245	0.00092279
72	0.000920581	0.00095158
168	0.000972367	0.00103317
336	0.001180727	0.00112291
504	0.001141035	0.00118323
672	0.001245253	0.00122788

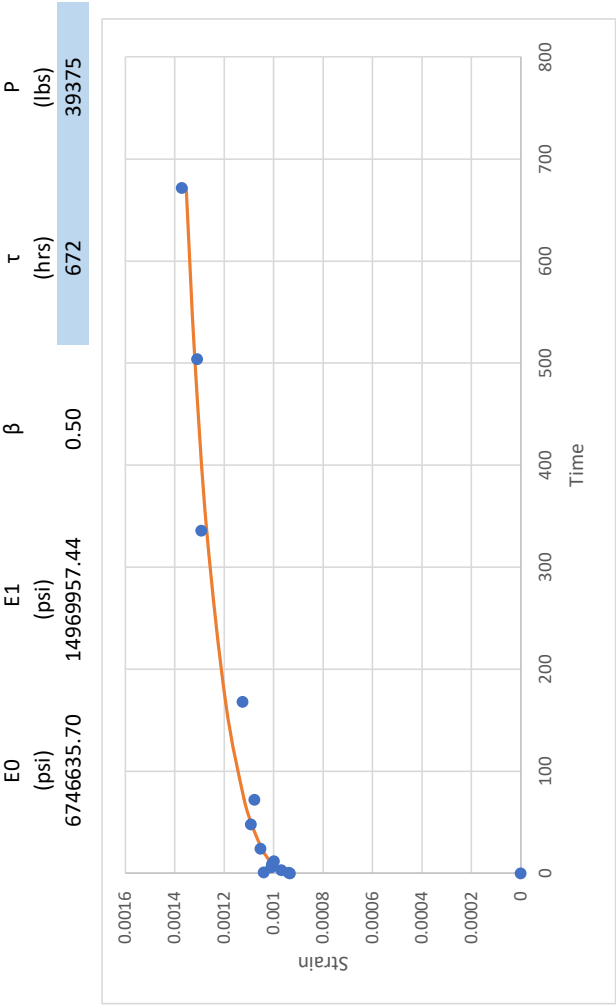
$\text{sum } R^2 = 6.82E-07$



Data Set # 14

time (hr)	strain μ					
0	0	0.00093380	0.00000087			
0.1	0.000933799	0.00094187	0.00000000			
0.5	0.00093846	0.00095171	0.00000000			
1	0.001040072	0.00095899	0.00000001			
3	0.000969168	0.00097683	0.00000000			
6	0.001008575	0.00099383	0.00000000			
9	0.001005962	0.00100655	0.00000000			
12	0.000997945	0.00101708	0.00000000			
24	0.001052543	0.00104844	0.00000000			
48	0.001092371	0.00108994	0.00000000			
72	0.001078019	0.00111965	0.00000000			
168	0.001125079	0.00119576	0.00000000			
336	0.0012927	0.00127130	0.00000000			
504	0.00130929	0.00131953	0.00000000			
672	0.00137124	0.00135464	0.00000000			

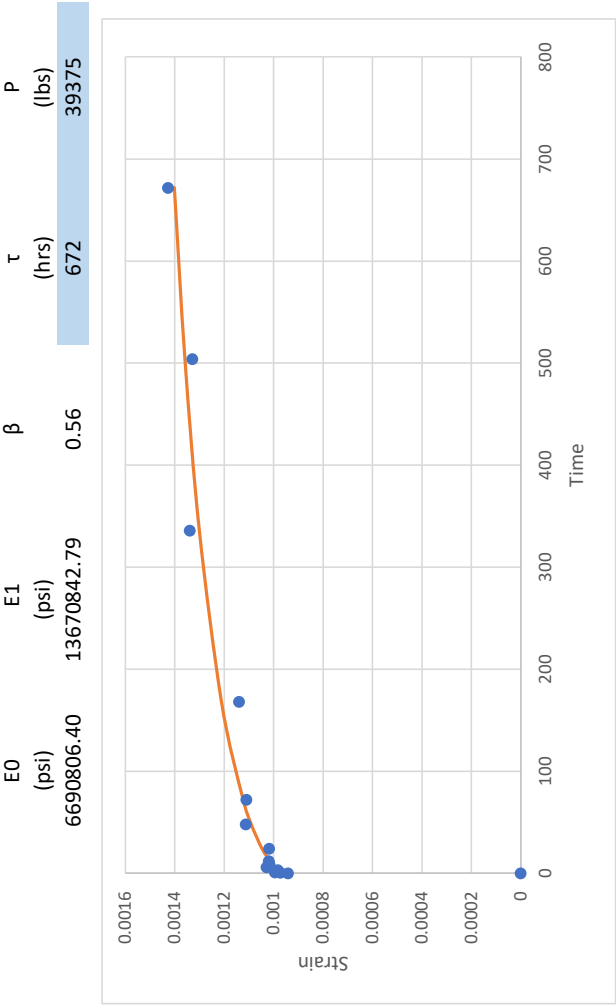
$\text{sum } R^2 = 8.87\text{E-}07$



Data Set # 15

time (hr)	strain μ	
0	0	0.00094159
0.1	0.000941591	0.00094699
0.5	0.000972814	0.00095473
1	0.000994735	0.00096083
3	0.000983214	0.00097664
6	0.00102887	0.00099254
9	0.001016888	0.00100486
12	0.0010198	0.00101526
24	0.001018153	0.00104730
48	0.001112665	0.00109159
72	0.001109247	0.00112438
168	0.001139119	0.00121153
336	0.001339559	0.00130130
504	0.001328013	0.00135968
672	0.001427473	0.00140243

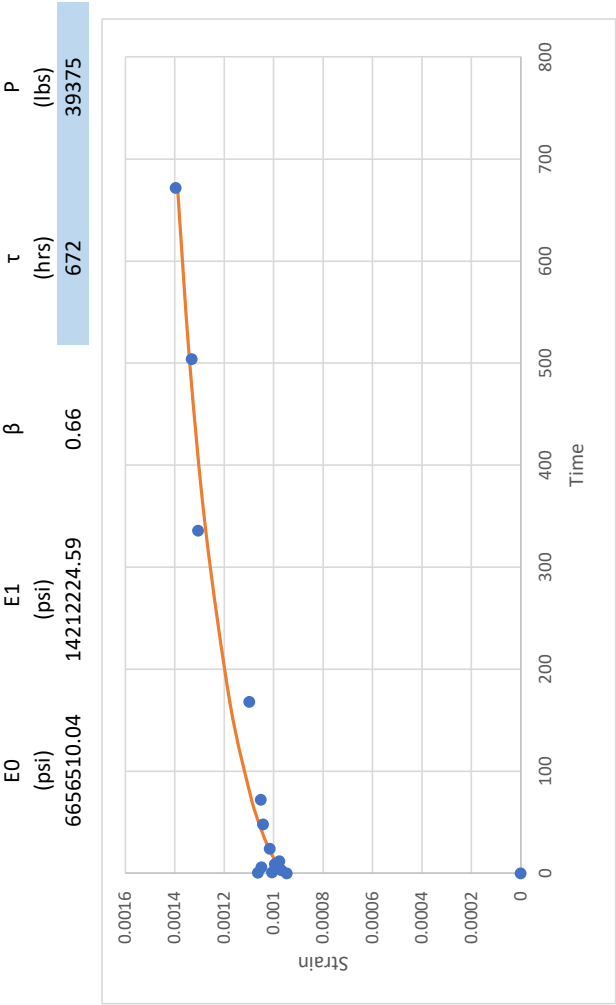
sum R^2 = 8.99E-07



Data Set # 16

time (hr)	strain μ	
0	0	0.00094644
0.1	0.000946442	0.00094853
0.5	0.001063647	0.00095246
1	0.001005848	0.00095592
3	0.000969312	0.00096588
6	0.001049372	0.00097691
9	0.000995161	0.00098599
12	0.000976198	0.00099397
24	0.001015196	0.00102005
48	0.001042515	0.00105915
72	0.001051604	0.00108995
168	0.001098665	0.00117788
336	0.0013054	0.00127529
504	0.001331362	0.00134102
672	0.001396458	0.00138972

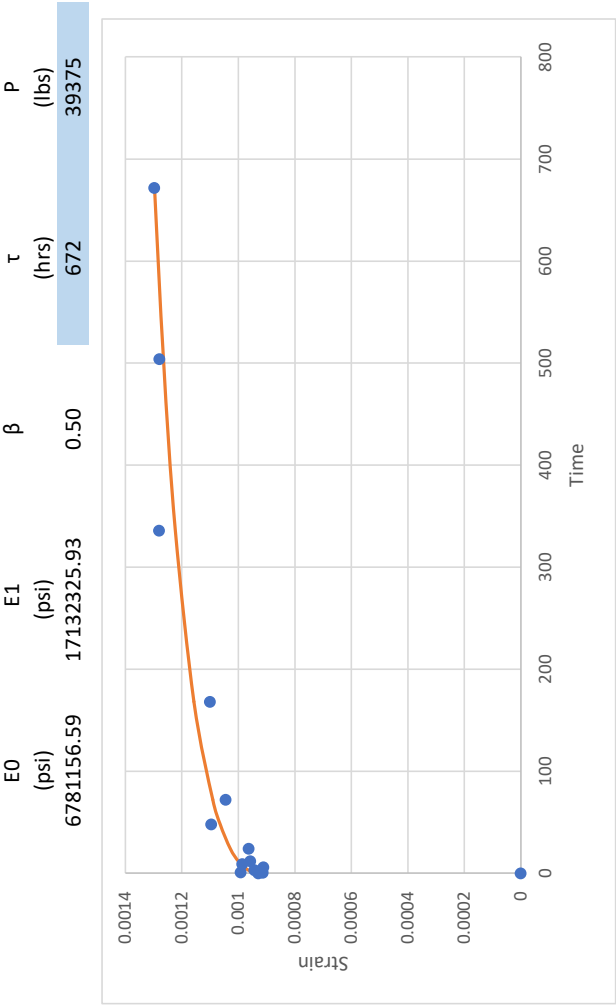
$\text{sum } R^2 = 9.25\text{E-}07$



Data Set # 17

time (hr)	strain μ	
0	0	0.00092905
0.1	0.000929045	0.000000086
0.5	0.000913411	0.000000000
1	0.000991574	0.000000000
3	0.000942541	0.000000000
6	0.000911659	0.000000000
9	0.000985543	0.000000000
12	0.000957222	0.000000000
24	0.000963399	0.000000000
48	0.001095378	0.000000000
72	0.001045107	0.000000000
168	0.001099974	0.000000000
336	0.001280022	0.000000000
504	0.001279437	0.000000000
672	0.001297636	0.000000000

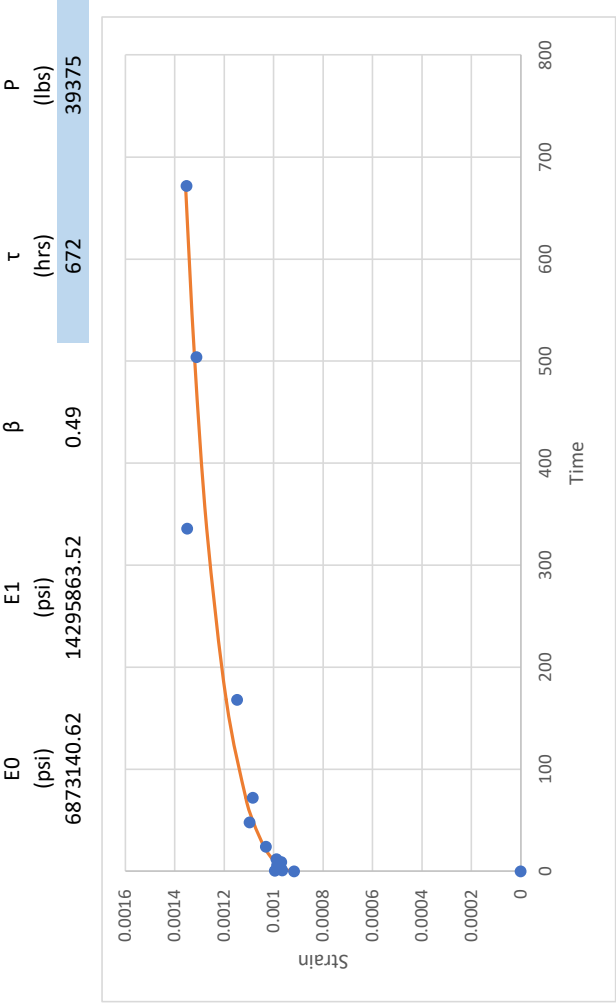
sum R^2 = 8.87E-07



Data Set # 18

time (hr)	strain μ	
0	0	0.00091661
0.1	0.000916612	0.00092564
0.5	0.000994724	0.00093640
1	0.000965059	0.00094429
3	0.000970726	0.00096348
6	0.000985123	0.00098163
9	0.00096844	0.00099516
12	0.000988556	0.00100632
24	0.00103067	0.00103942
48	0.001097047	0.00108297
72	0.001084254	0.00111400
168	0.001146947	0.00119313
336	0.001348987	0.00127129
504	0.001312405	0.00132108
672	0.001352478	0.00135730

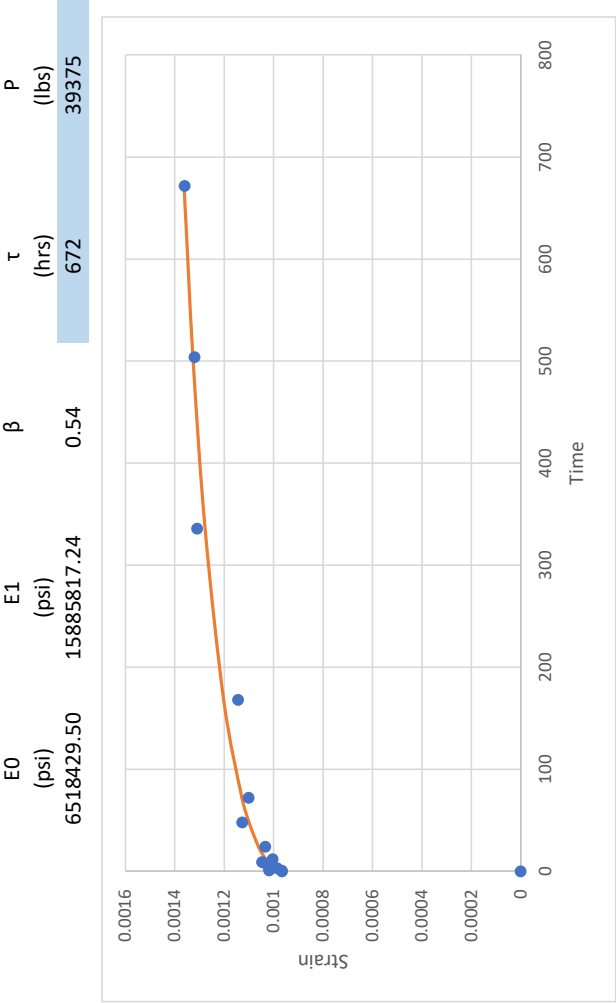
sum R^2 = 8.55E-07



Data Set # 19

time (hr)	strain μ	
0	0	0.00096649
0.1	0.00096649	0.00097185
0.5	0.000966445	0.00097919
1	0.001018055	0.00098487
3	0.000986211	0.00099936
6	0.00102405	0.00101370
9	0.001046441	0.00102471
12	0.001004039	0.00103395
24	0.001033651	0.00106213
48	0.001126597	0.00110060
72	0.001101292	0.00112879
168	0.001143654	0.00120294
336	0.001309718	0.00127849
504	0.001320043	0.00132735
672	0.001360112	0.00136307

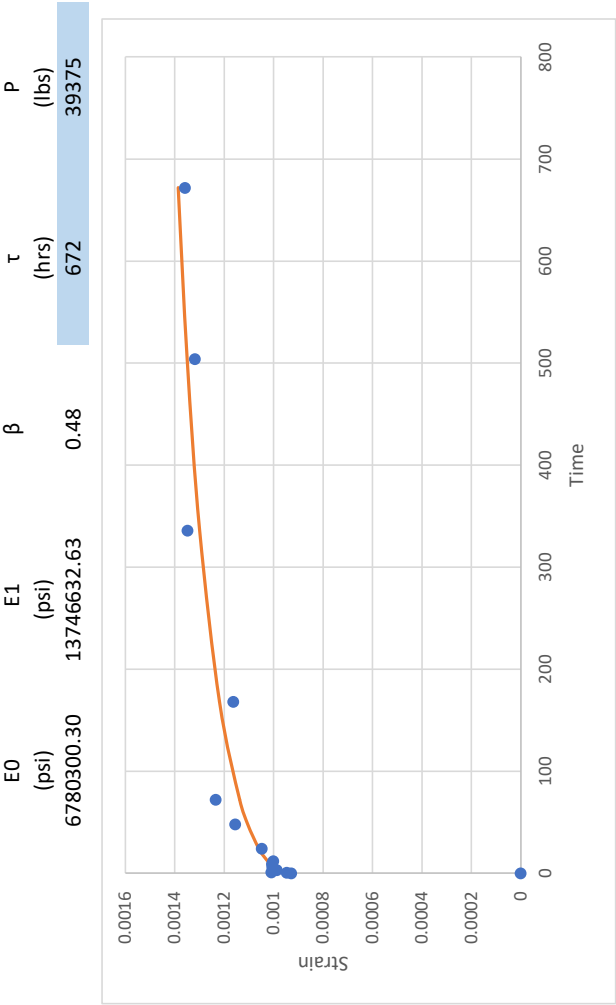
sum R^2 = 9.44E-07



Data Set # 20

time (hr)	strain μ	
0	0	0.00092916
0.1	0.000929162	0.00093937
0.5	0.000946328	0.00095118
1	0.001008879	0.00095975
3	0.000986423	0.00098039
6	0.001005515	0.00099973
9	0.001006027	0.00101407
12	0.001001132	0.00102584
24	0.001047934	0.00106060
48	0.001154948	0.00110598
72	0.001234402	0.00113815
168	0.001162655	0.00121966
336	0.001347461	0.00129969
504	0.001318724	0.00135051
672	0.001358809	0.00138746

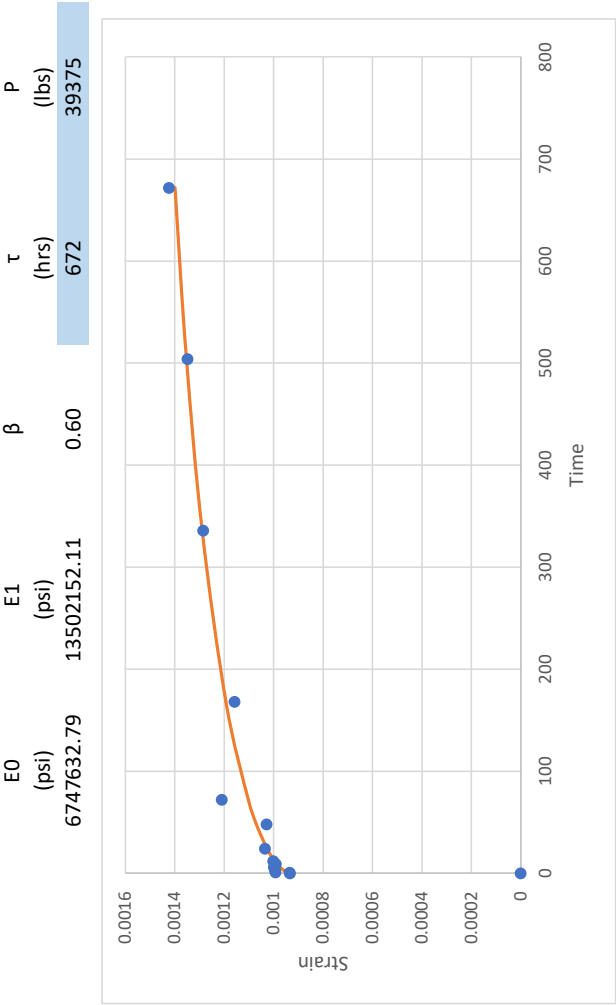
sum R^2 = 8.77E-07



Data Set # 21

time (hr)	strain μ	
0	0	0.00000087
0.1	0.000933661	0.00000000
0.5	0.000935187	0.00000000
1	0.000991474	0.00000000
3	0.00099402	0.00000000
6	0.000999043	0.00000000
9	0.000990177	0.00000000
12	0.001000906	0.00000000
24	0.001035199	0.00000000
48	0.001028116	0.00000000
72	0.001209107	0.00000000
168	0.001157702	0.00000000
336	0.001284669	0.00000000
504	0.001348132	0.00000000
672	0.001422578	0.00000000

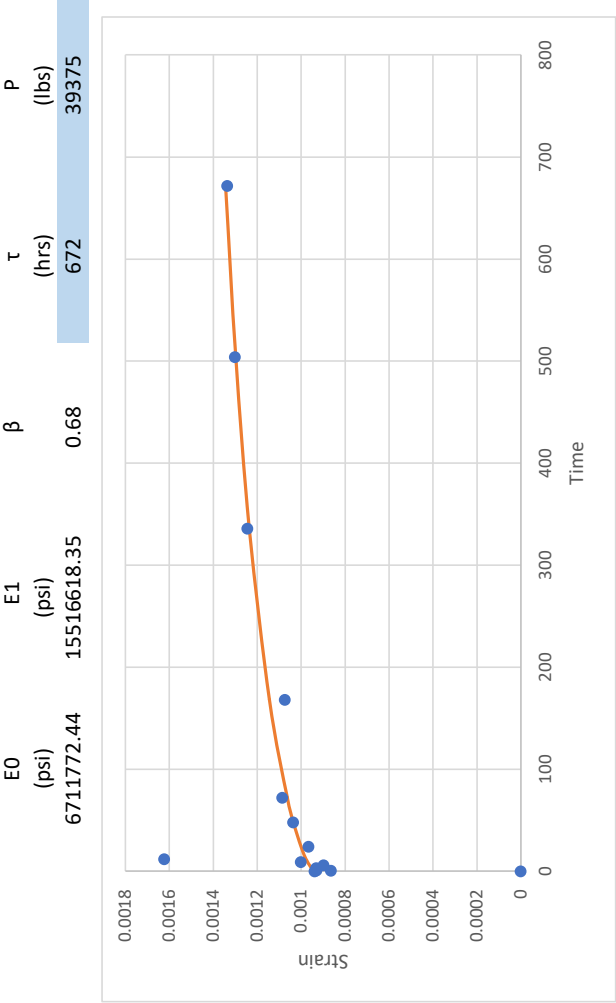
sum R^2 = 8.79E-07



Data Set # 22

time (hr)	strain μ	
0	0	0.00093865
0.1	0.000938649	0.00094021
0.5	0.000863627	0.00094333
1	0.000929303	0.00094615
3	0.00093184	0.00095442
6	0.00089782	0.00096378
9	0.001001452	0.00097158
12	0.001623424	0.00097850
24	0.000966814	0.00100141
48	0.00103632	0.00103637
72	0.001086028	0.00106429
168	0.001073728	0.00114527
336	0.00124452	0.00123647
504	0.001301725	0.00129854
672	0.001335543	0.00134467

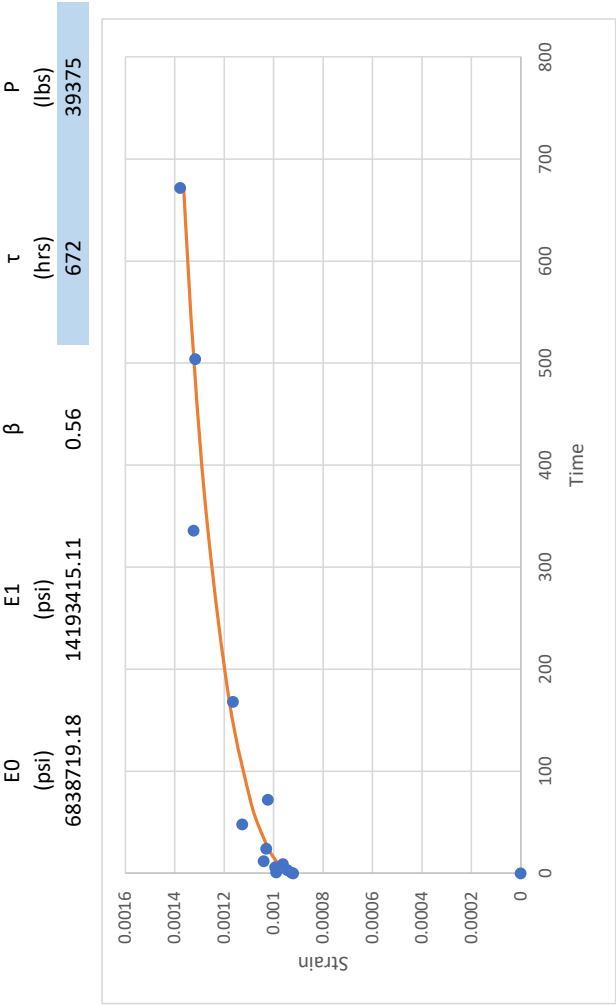
$\text{sum } R^2 = 8.94\text{E-}07$



Data Set # 23

time (hr)	strain μ	
0	0	0.00092123
0.1	0.000921225	0.00092626
0.5	0.000927448	0.00093355
1	0.000989989	0.00093932
3	0.000944089	0.00095433
6	0.00099287	0.00096948
9	0.000962122	0.00098124
12	0.001040053	0.00099119
24	0.001029032	0.00102189
48	0.001126656	0.00106445
72	0.001023213	0.00109603
168	0.001164046	0.00118018
336	0.001323845	0.00126707
504	0.00131698	0.00132365
672	0.001377369	0.00136509

sum R^2 = 8.68E-07

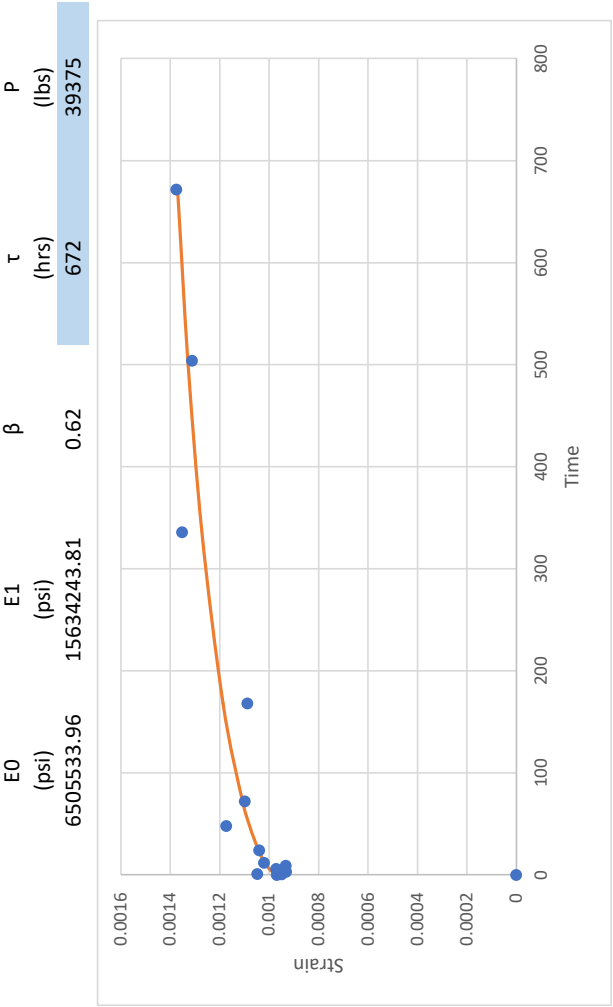


E0 (psi)	6838719.18	E1 (psi)	14193415.11	β	0.56	τ (hrs)	672	P (lbs)	39375

Data Set # 24

time (hr)	strain μ	
0	0	0.00096841
0.1	0.000968406	0.00000000
0.5	0.000949617	0.00000000
1	0.001048138	0.00097937
3	0.000931873	0.00098996
6	0.000971296	0.00100129
9	0.000932722	0.00101042
12	0.001020061	0.00101833
24	0.001040304	0.00104363
48	0.001173919	0.00108047
72	0.001098594	0.00110885
168	0.001087829	0.00118778
336	0.001352423	0.00127291
504	0.001311171	0.00132957
672	0.001374708	0.00137137

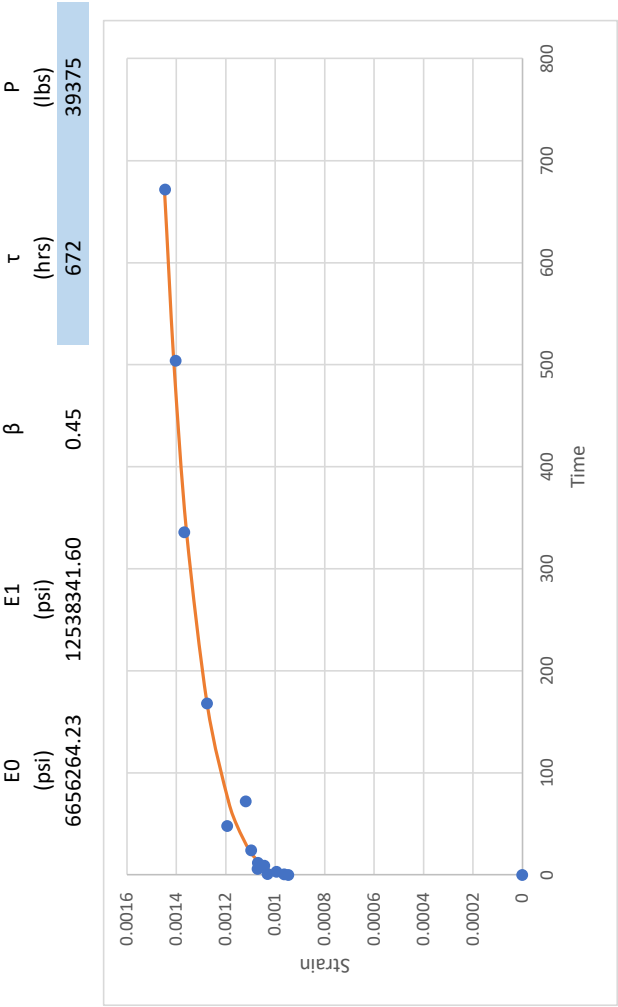
sum R^2 = 9.70E-07



Data Set # 25

time (hr)	strain μ	
0	0	0.00094648
0.1	0.000946477	0.00000000
0.5	0.000963633	0.00000000
1	0.001030895	0.00000000
3	0.000994355	0.00000000
6	0.001071291	0.00000000
9	0.001043662	0.00000000
12	0.001070041	0.00000000
24	0.001096536	0.00000000
48	0.001194199	0.00000000
72	0.001118871	0.00000000
168	0.00127531	0.00000000
336	0.001367981	0.00000000
504	0.001401782	0.00000000
672	0.001444987	0.00000000

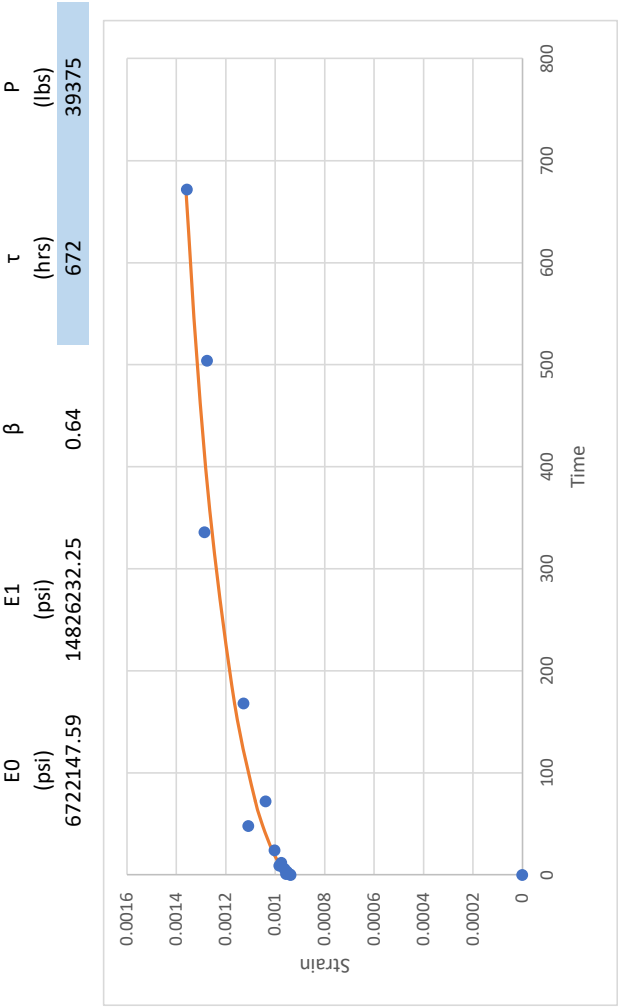
sum R^2 = 9.02E-07



Data Set # 26

time (hr)	strain μ	
0	0	0.00093720
0.1	0.0009372	0.00093967
0.5	0.000940299	0.00094405
1	0.000955962	0.00094781
3	0.000952256	0.00095837
6	0.000961979	0.00096981
9	0.000982806	0.00097910
12	0.000974787	0.00098719
24	0.001002841	0.00101327
48	0.001108315	0.00105165
72	0.00103925	0.00108145
168	0.001128545	0.00116511
336	0.001285274	0.00125619
504	0.001275291	0.00131711
672	0.001357576	0.00136212

sum R^2 = 8.88E-07



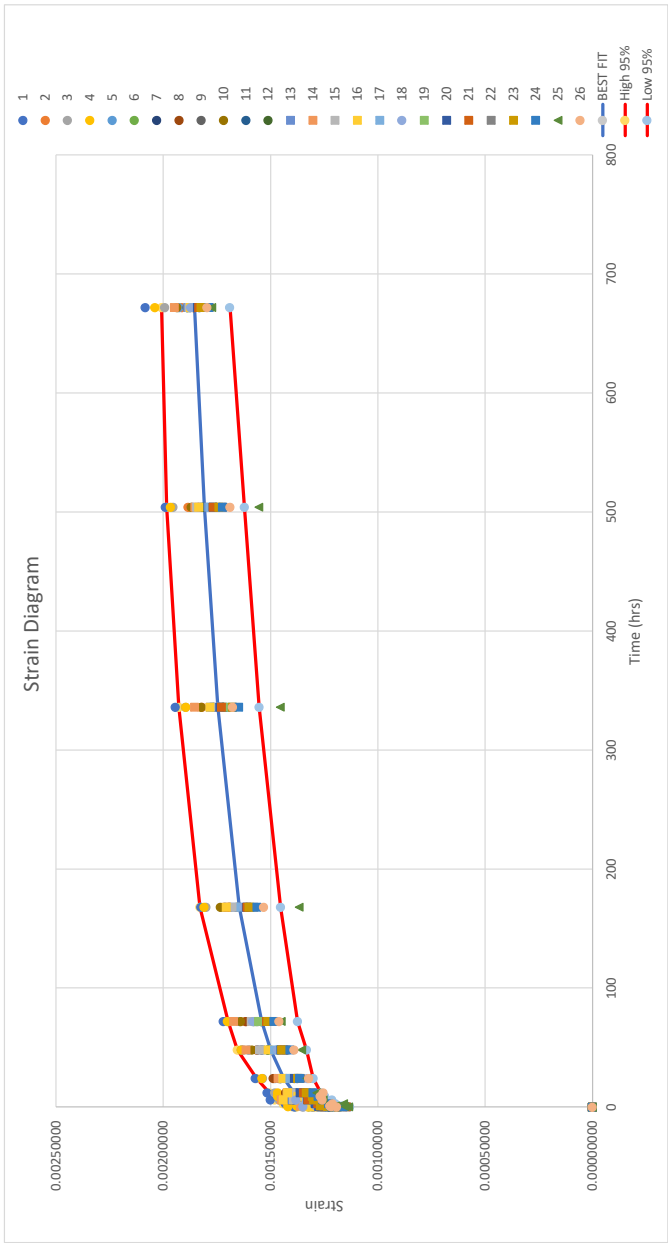
^{13}C desired:

Point of Measure

time (hr)	strain μ
0	0.00124106
0.1	0.00126018
0.5	0.00127976
1	0.00129334
3	0.00132480
6	0.00135321
9	0.00137377
12	0.00139040
24	0.00143844
48	0.00149932
72	0.00154153
168	0.00164594
336	0.00174603
504	0.00180887
672	0.00185439

Copy and Transpose Data

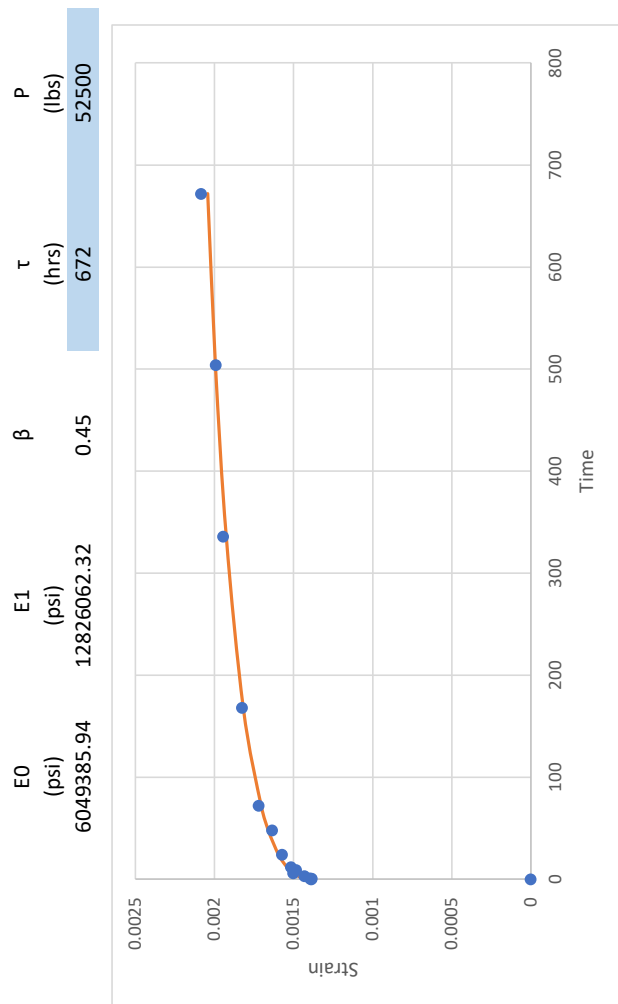
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6768432.71	13695621.66	0.444412938	672	52500



Data Set # 1

0	0	0.00138857	0.00000193
0.1	0.001388571	0.00140802	0.00000000
0.5	0.001383838	0.00142830	0.00000000
1	0.00139638	0.00144246	0.00000000
3	0.001430184	0.00147545	0.00000000
6	0.001500856	0.00150539	0.00000000
9	0.001484172	0.00152714	0.00000000
12	0.001515216	0.00154478	0.00000000
24	0.001571403	0.00159587	0.00000000
48	0.00163465	0.00166090	0.00000000
72	0.001720334	0.00170612	0.00000000
168	0.001825223	0.00181838	0.00000000
336	0.001944407	0.00192636	0.00000000
504	0.00199069	0.00199428	0.00000000
672	0.002083906	0.00204349	0.00000000

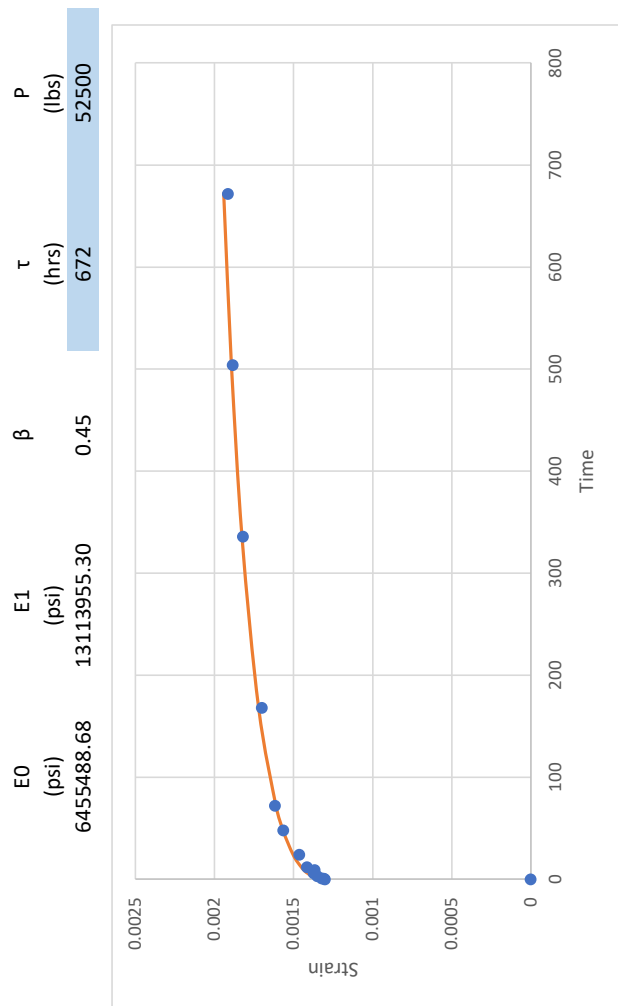
sum R^2 = 1.94E-06



Data Set # 2

0	0	0.001301218	0.00130122	0.00000169
0.1		0.001301218	0.00132024	0.00000000
0.5		0.00130744	0.00134008	0.00000000
1		0.00132154	0.00135393	0.00000000
3		0.001349094	0.00138619	0.00000000
6		0.001371315	0.00141547	0.00000000
9		0.001365572	0.00143675	0.00000001
12		0.001415381	0.00145400	0.00000000
24		0.001462191	0.00150396	0.00000000
48		0.001564525	0.00156757	0.00000000
72		0.001617381	0.00161180	0.00000000
168		0.001698835	0.00172159	0.00000000
336		0.001819586	0.00182721	0.00000000
504		0.001884623	0.00189363	0.00000000
672		0.001913766	0.00194176	0.00000000

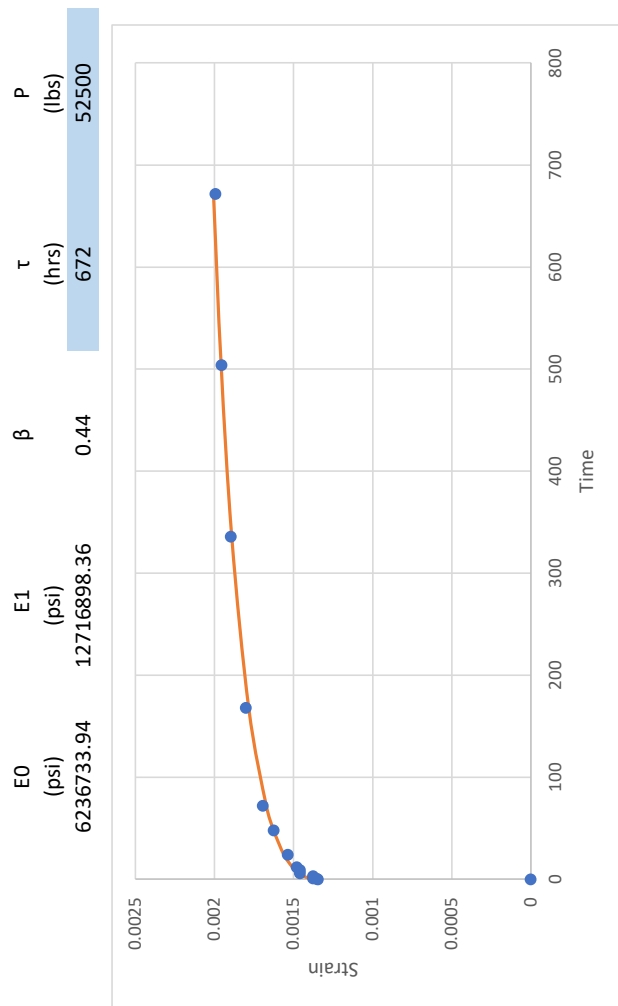
sum R^2 = 1.71E-06



Data Set # 3

0	0	0	0.001346859	0.00134686	0.00000181
0.1			0.001346859	0.00136827	0.00000000
0.5			0.001354651	0.00138986	0.00000000
1			0.001376589	0.00140477	0.00000000
3			0.001376003	0.00143913	0.00000000
6			0.001459204	0.00147003	0.00000000
9			0.001458149	0.00149233	0.00000000
12			0.001479831	0.00151034	0.00000000
24			0.001536034	0.00156223	0.00000000
48			0.001625889	0.00162778	0.00000000
72			0.001694391	0.00167310	0.00000000
168			0.001800888	0.00178492	0.00000000
336			0.001896656	0.00189182	0.00000000
504			0.001953901	0.00195886	0.00000000
672			0.001992428	0.00200740	0.00000000

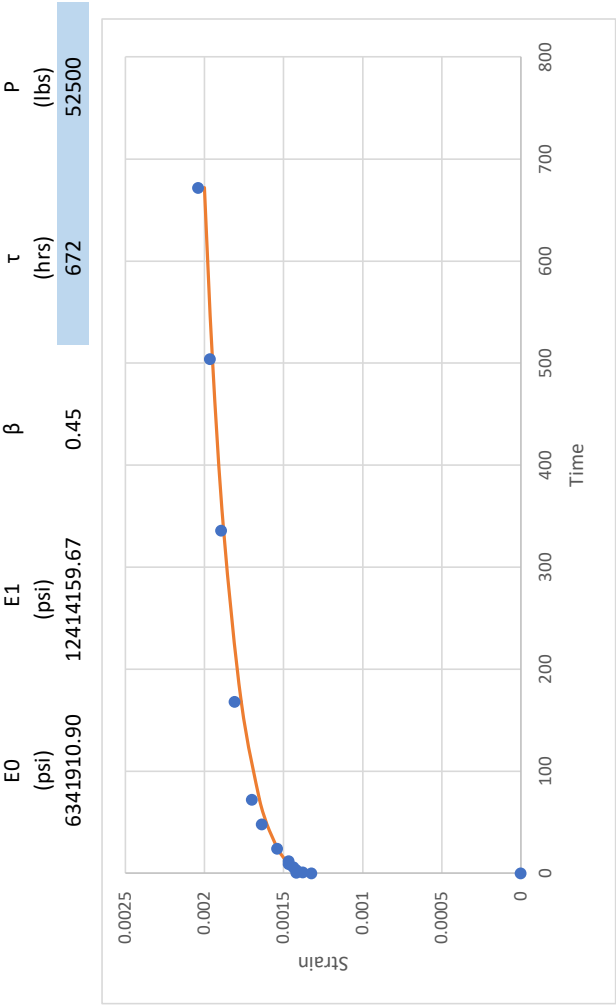
sum R^2 = 1.82E-06



Data Set # 4

time (hr)	strain μ	
0	0	0.00132452
0.1	0.001324522	0.00134462
0.5	0.001418274	0.00136557
1	0.00137768	0.00138020
3	0.001419286	0.00141428
6	0.00143682	0.00144522
9	0.001467017	0.00146769
12	0.001466809	0.00148591
24	0.001540186	0.00153870
48	0.001636261	0.00160588
72	0.001700051	0.00165261
168	0.001809633	0.00176859
336	0.001894426	0.00188016
504	0.00196571	0.00195033
672	0.002038611	0.00200117

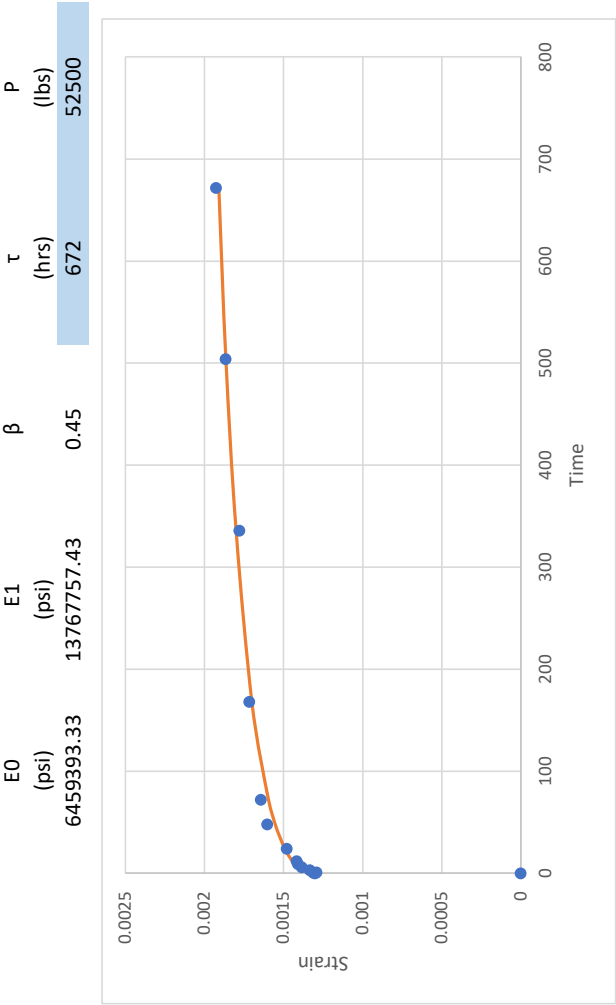
sum R^2 = 1.76E-06



Data Set # 5

time (hr)	strain μ	
0	0	0.00130043
0.1	0.001300432	0.00131855
0.5	0.001311321	0.00133745
1	0.001291055	0.00135064
3	0.0013342	0.00138136
6	0.001384542	0.00140926
9	0.001408472	0.00142953
12	0.001417648	0.00144595
24	0.001478495	0.00149355
48	0.00160263	0.00155413
72	0.001642979	0.00159626
168	0.001714996	0.00170084
336	0.00177787	0.00180144
504	0.001864734	0.00186471
672	0.001926676	0.00191055

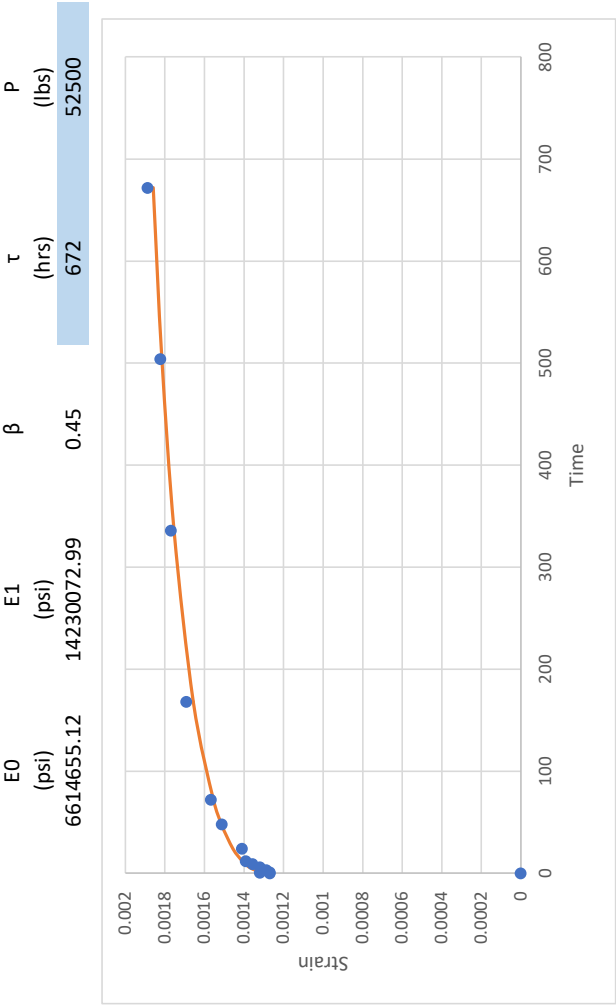
sum R^2 = 1.71E-06



Data Set # 6

time (hr)	strain μ	
0	0	0.00000161
0.1	0.001269907	0.00000000
0.5	0.001319906	0.00000000
1	0.001269924	0.00000000
3	0.001286522	0.00000000
6	0.001319686	0.00000000
9	0.00135615	0.00000000
12	0.001390328	0.00000000
24	0.001410553	0.00000000
48	0.001511324	0.00000000
72	0.001567305	0.00000000
168	0.001690955	0.00000000
336	0.001769502	0.00000000
504	0.001822022	0.00000000
672	0.001887113	0.00000000

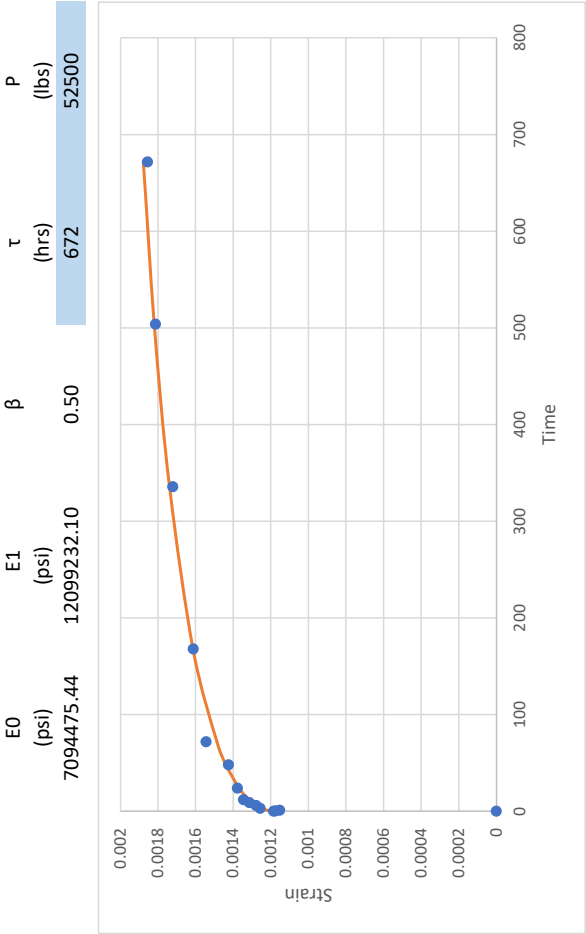
sum R^2 = 1.63E-06



Data Set # 7

time (hr)	strain μ				
0	0	0.00118402	0.00000140		
0.1	0.00118402	0.00119679	0.00000000		
0.5	0.001174629	0.00121259	0.00000000		
1	0.001151218	0.00122434	0.00000001		
3	0.001255346	0.00125326	0.00000000		
6	0.001277576	0.00128095	0.00000000		
9	0.001314022	0.00130174	0.00000000		
12	0.001343509	0.00131896	0.00000000		
24	0.001376261	0.00137044	0.00000000		
48	0.001423869	0.00143879	0.00000000		
72	0.001543933	0.00148787	0.00000000		
168	0.001611318	0.00161397	0.00000000		
336	0.001719558	0.00173952	0.00000000		
504	0.001812715	0.00181981	0.00000000		
672	0.001854362	0.00187828	0.00000000		

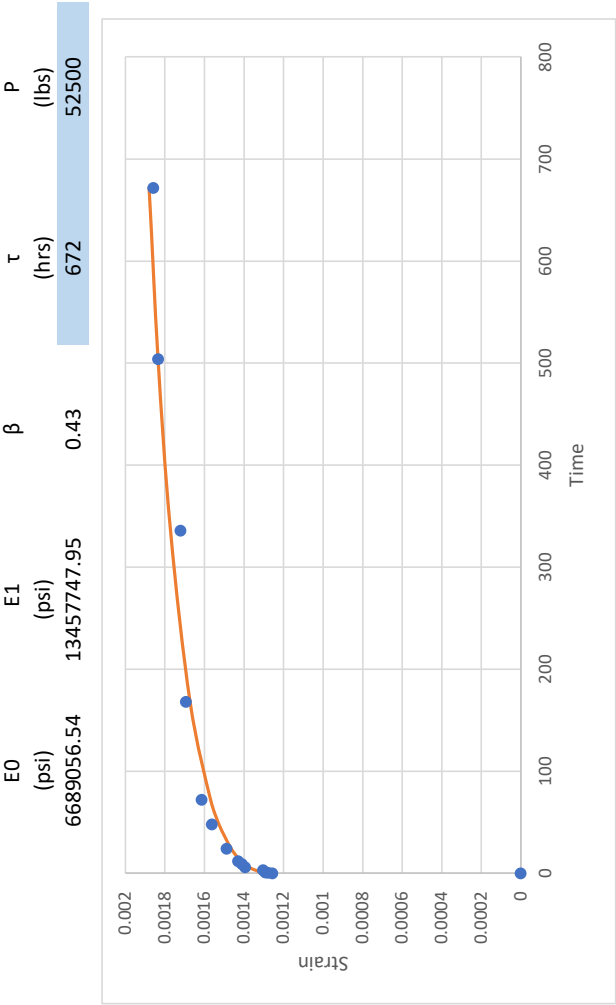
sum R^2 = 1.41E-06



Data Set # 8

time (hr)	strain μ	
0	0	0.00000158
0.1	0.001255782	0.00000000
0.5	0.001279183	0.00000000
1	0.00129174	0.00000000
3	0.001303663	0.00000000
6	0.001393103	0.00000000
9	0.001409237	0.00000000
12	0.001429351	0.00000000
24	0.001487103	0.00000000
48	0.00156129	0.00000000
72	0.001614144	0.00000000
168	0.001692459	0.00000000
336	0.001720978	0.00000000
504	0.001834481	0.00000000
672	0.001858924	0.00000000

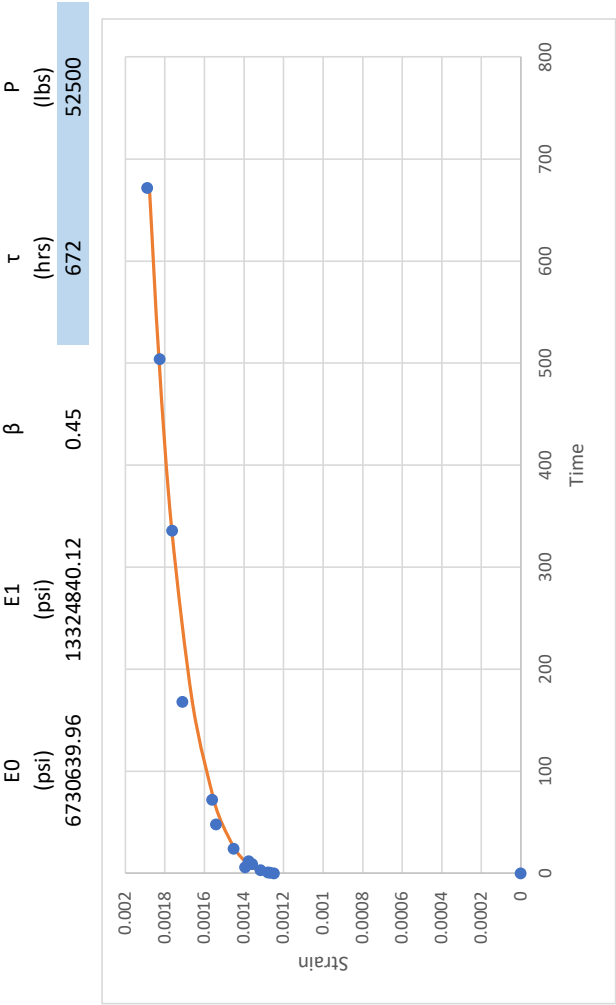
sum R^2 = 1.59E-06



Data Set # 9

time (hr)	strain μ	
0	0	0.00124802
0.1	0.001248024	0.00126675
0.5	0.001268306	0.00128627
1	0.001279284	0.00129990
3	0.001316215	0.00133165
6	0.001393144	0.00136047
9	0.001357704	0.00138141
12	0.001376252	0.00139838
24	0.001452758	0.00144756
48	0.001541022	0.00151016
72	0.00156106	0.00155369
168	0.001711281	0.00166175
336	0.001763261	0.00176569
504	0.001825177	0.00183106
672	0.001888703	0.00187843

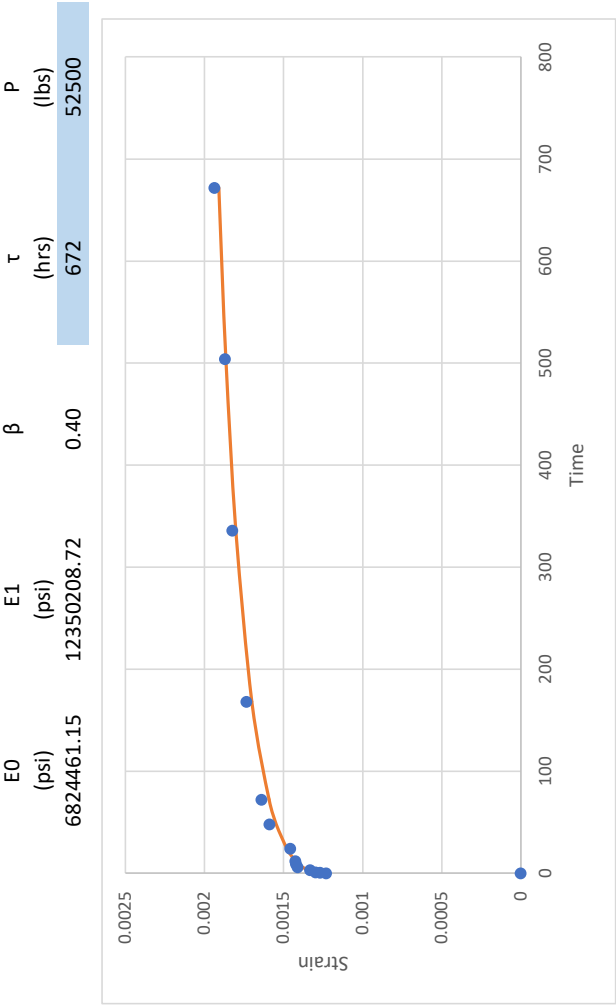
sum R^2 = 1.56E-06



Data Set # 10

time (hr)	strain μ	
0	0	0.00123087
0.1	0.001230866	0.000000152
0.5	0.001268348	0.000000000
1	0.001298085	0.000000000
3	0.001331892	0.000000000
6	0.001410382	0.000000000
9	0.00142027	0.000000000
12	0.001424753	0.000000000
24	0.0014575	0.000000000
48	0.001587973	0.000000000
72	0.001639267	0.000000000
168	0.001733225	0.000000000
336	0.001822716	0.000000000
504	0.001869003	0.000000000
672	0.001935653	0.000000000

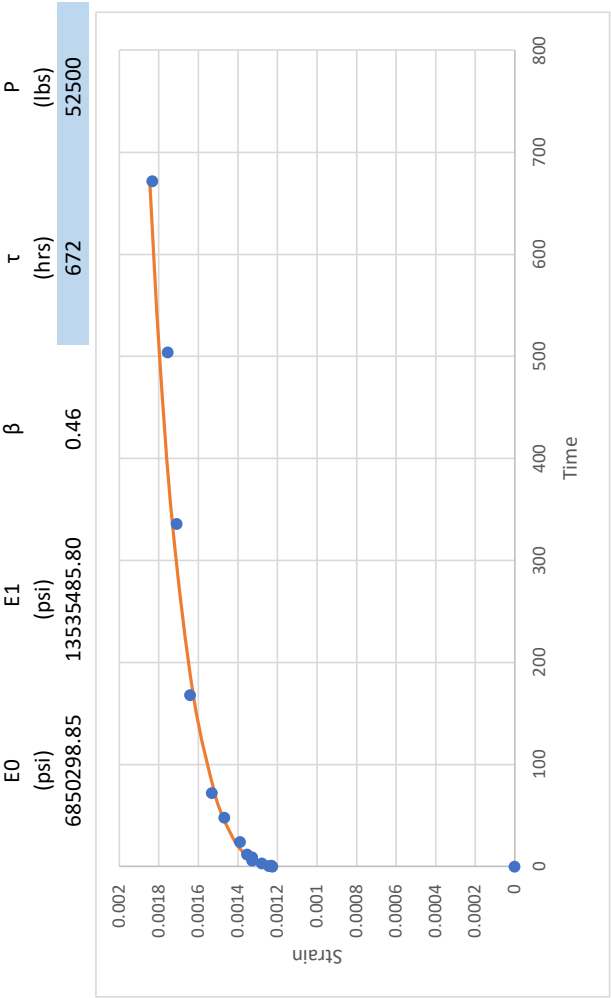
sum R^2 = 1.52E-06



Data Set # 11

time (hr)	strain μ	
0	0	0.00000150
0.1	0.001226224	0.00000000
0.5	0.001243359	0.00000000
1	0.001230894	0.00000000
3	0.001278778	0.00000000
6	0.001327562	0.00000000
9	0.001328098	0.00000000
12	0.001352894	0.00000000
24	0.001388767	0.00000000
48	0.001467666	0.00000000
72	0.001531478	0.00000000
168	0.001641076	0.00000000
336	0.001708705	0.00000000
504	0.001755001	0.00000000
672	0.001832601	0.00000000

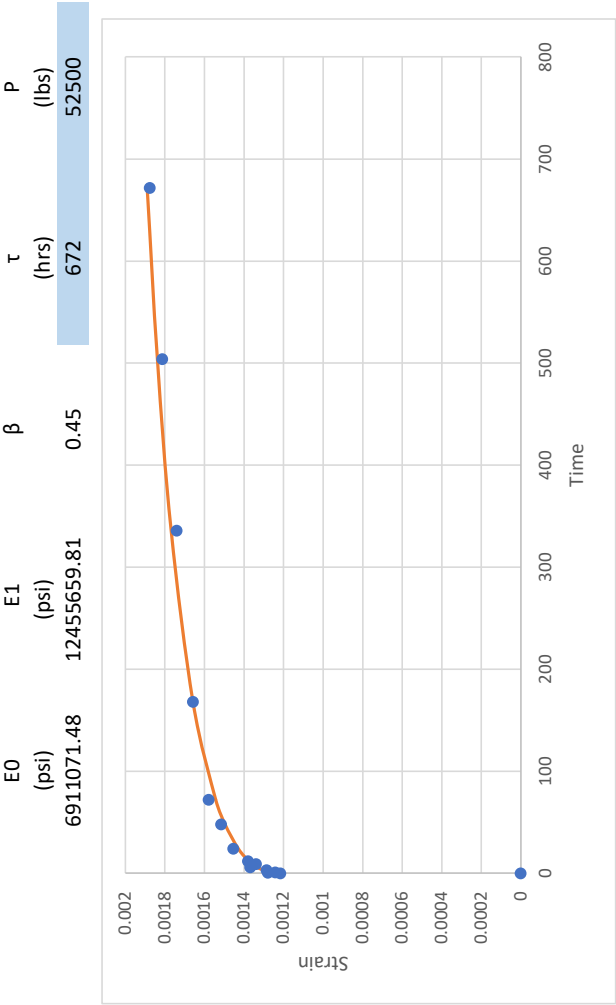
sum R^2 = 1.51E-06



Data Set # 12

time (hr)	strain μ	
0	0	0.00000148
0.1	0.001215441	0.00000000
0.5	0.001279508	0.00000000
1	0.001242022	0.00000000
3	0.001285216	0.00000000
6	0.001368406	0.00000000
9	0.001339217	0.00000000
12	0.001379655	0.00000000
24	0.001453049	0.00000000
48	0.00151476	0.00000000
72	0.001578568	0.00000000
168	0.001656914	0.00000000
336	0.001740171	0.00000000
504	0.001813041	0.00000000
672	0.001876582	0.00000000

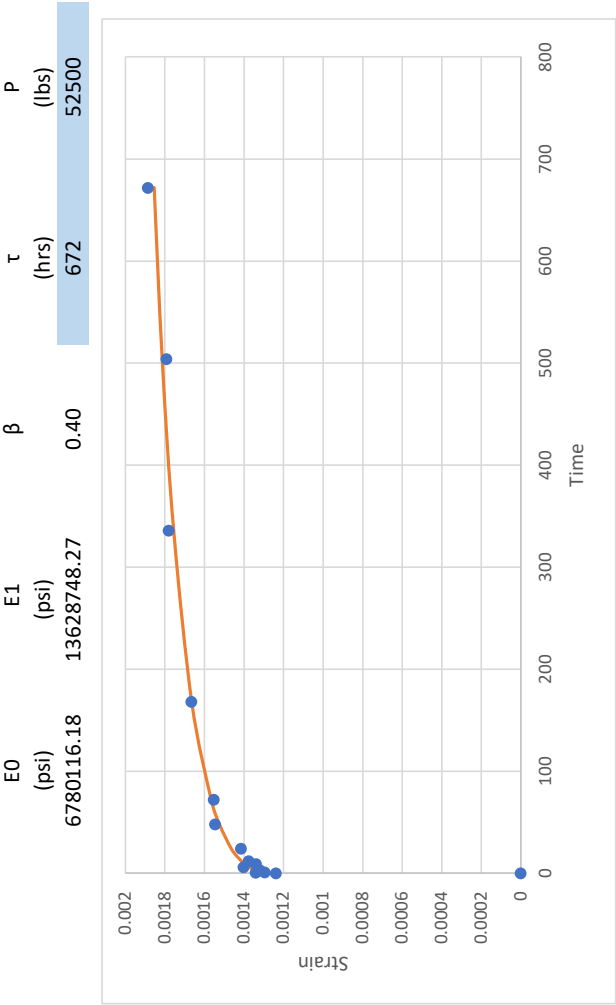
$\text{sum } R^2 = 1.48\text{E-}06$



Data Set # 13

time (hr)	strain μ	
0	0	0.00000153
0.1	0.001238917	0.00000000
0.5	0.001340499	0.00000000
1	0.001295187	0.00000000
3	0.001321182	0.00000000
6	0.001401281	0.00000000
9	0.001339244	0.00000000
12	0.001376546	0.00000000
24	0.001415569	0.00000000
48	0.001546041	0.00000000
72	0.001552014	0.00000000
168	0.001666332	0.00000000
336	0.001780856	0.00000000
504	0.001791178	0.00000000
672	0.001886003	0.00000000

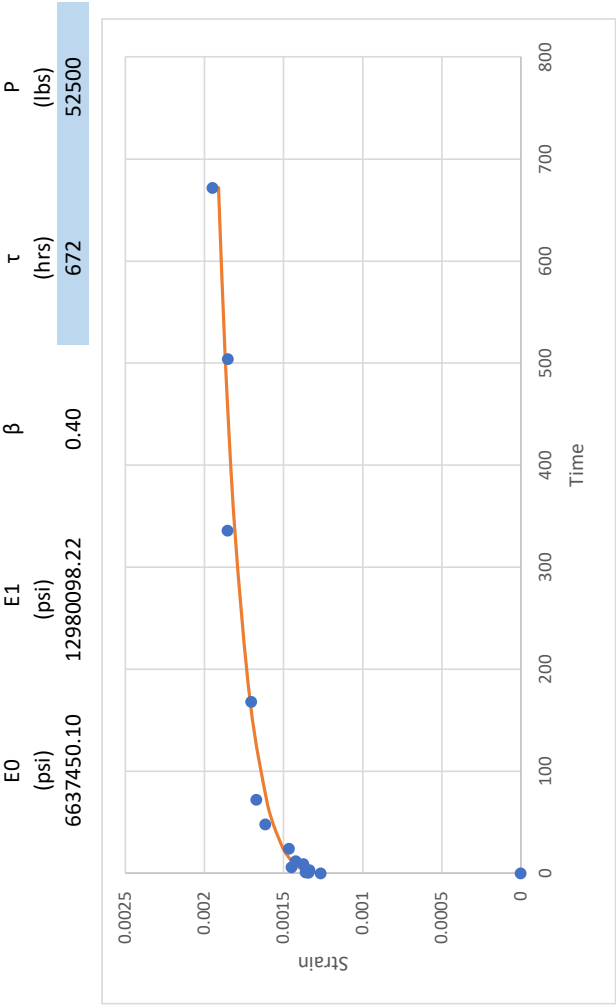
sum R^2 = 1.55E-06



Data Set # 14

time (hr)	strain μ	
0	0	0.00126555
0.1	0.001265546	0.00000000
0.5	0.001342118	0.00000000
1	0.001360922	0.00000000
3	0.001335323	0.00000000
6	0.001449796	0.00000000
9	0.001373696	0.00000000
12	0.001423516	0.00000000
24	0.001465646	0.00000000
48	0.001614909	0.00000000
72	0.001672465	0.00000000
168	0.001703913	0.00000000
336	0.001854403	0.00000000
504	0.001852231	0.00000000
672	0.001948606	0.00000000

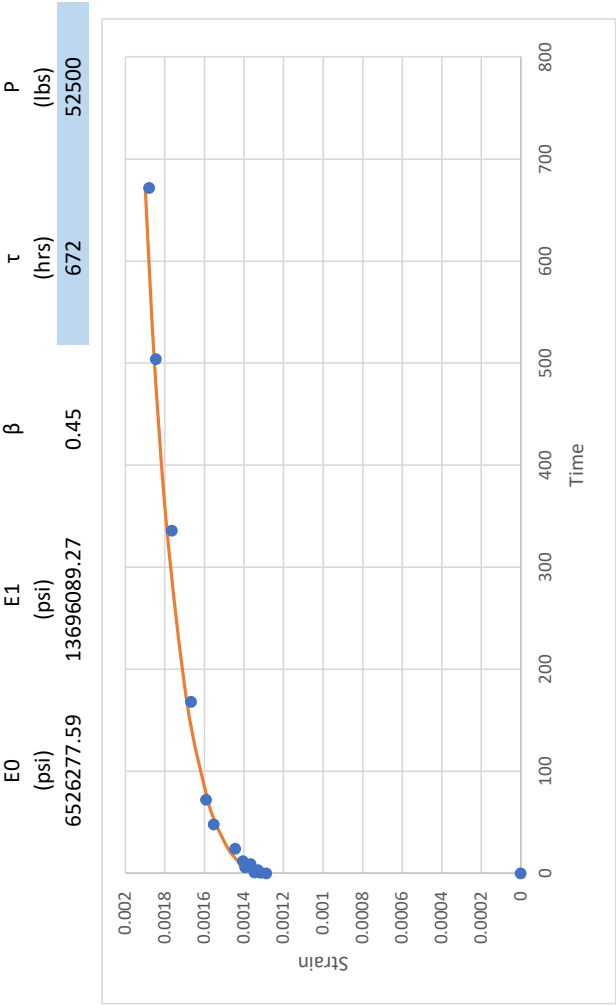
sum R^2 = 1.62E-06



Data Set # 15

time (hr)	strain μ	
0	0	0.00000166
0.1	0.001287104	0.00000000
0.5	0.001316767	0.00000000
1	0.00134652	0.00000000
3	0.001328739	0.00000000
6	0.001393167	0.00000000
9	0.001365537	0.00000000
12	0.001404405	0.00000000
24	0.001443401	0.00000000
48	0.001551978	0.00000000
72	0.001590769	0.00000000
168	0.001667534	0.00000000
336	0.001764844	0.00000000
504	0.001845515	0.00000000
672	0.001879345	0.00000000

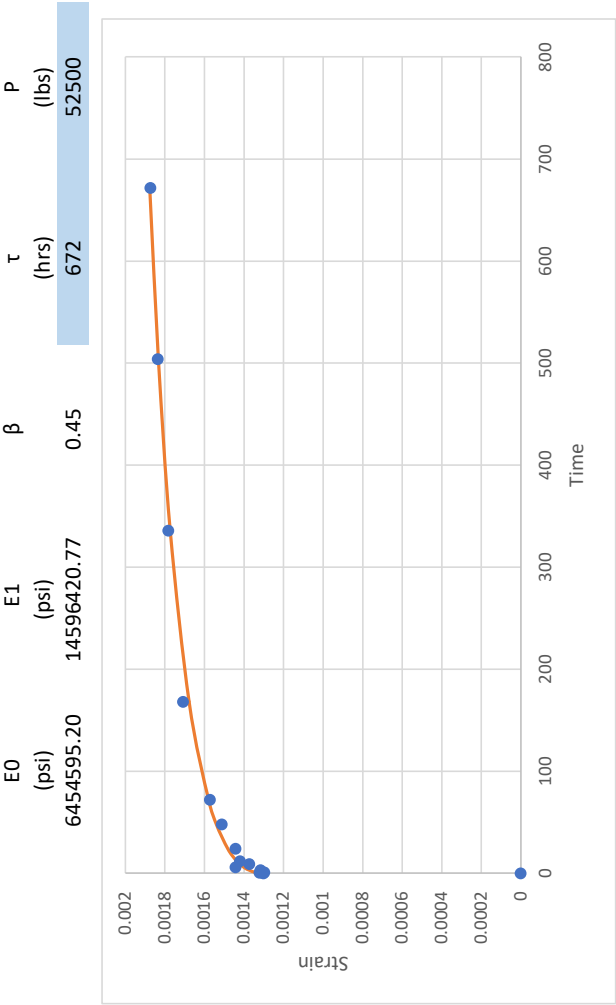
sum R^2 = 1.67E-06



Data Set # 16

time (hr)	strain μ	
0	0	0.00000169
0.1	0.001301398	0.00000000
0.5	0.001321683	0.00000000
1	0.001296711	0.00000000
3	0.001316454	0.00000000
6	0.001441855	0.00000000
9	0.00137202	0.00000000
12	0.001420273	0.00000000
24	0.001442081	0.00000000
48	0.001511606	0.00000000
72	0.001572293	0.00000000
168	0.001706913	0.00000000
336	0.001782353	0.00000000
504	0.001834903	0.00000000
672	0.001873428	0.00000000

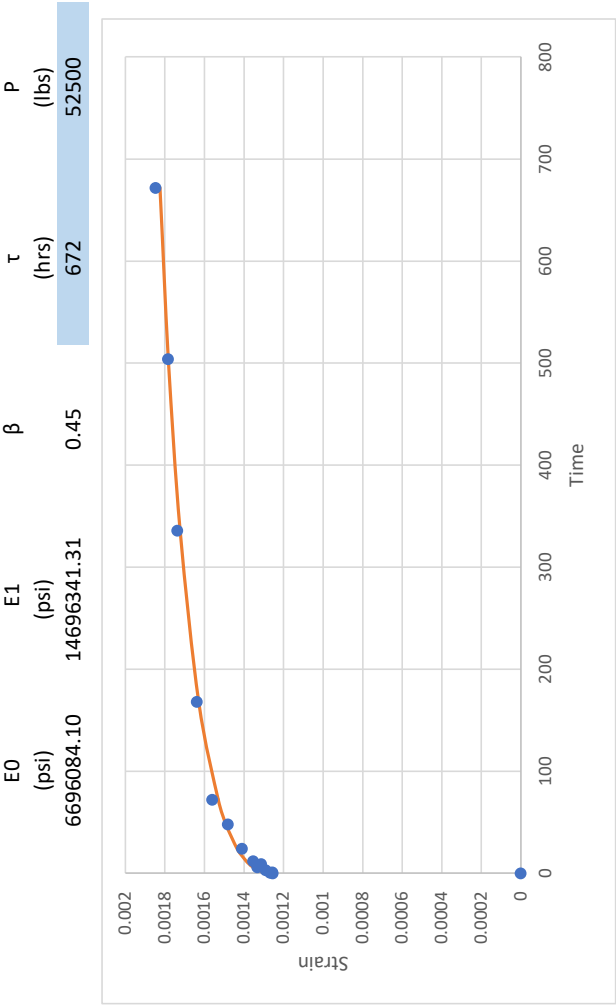
sum R^2 = 1.71E-06



Data Set # 17

time (hr)	strain μ	
0	0	0.00000157
0.1	0.001254465	0.00000000
0.5	0.001266951	0.00000000
1	0.001256039	0.00000000
3	0.001289847	0.00000000
6	0.001332394	0.00000000
9	0.001312578	0.00000000
12	0.001353013	0.00000000
24	0.001409215	0.00000000
48	0.001481852	0.00000000
72	0.001559731	0.00000000
168	0.001638054	0.00000000
336	0.00173694	0.00000000
504	0.001783218	0.00000000
672	0.00184676	0.00000000

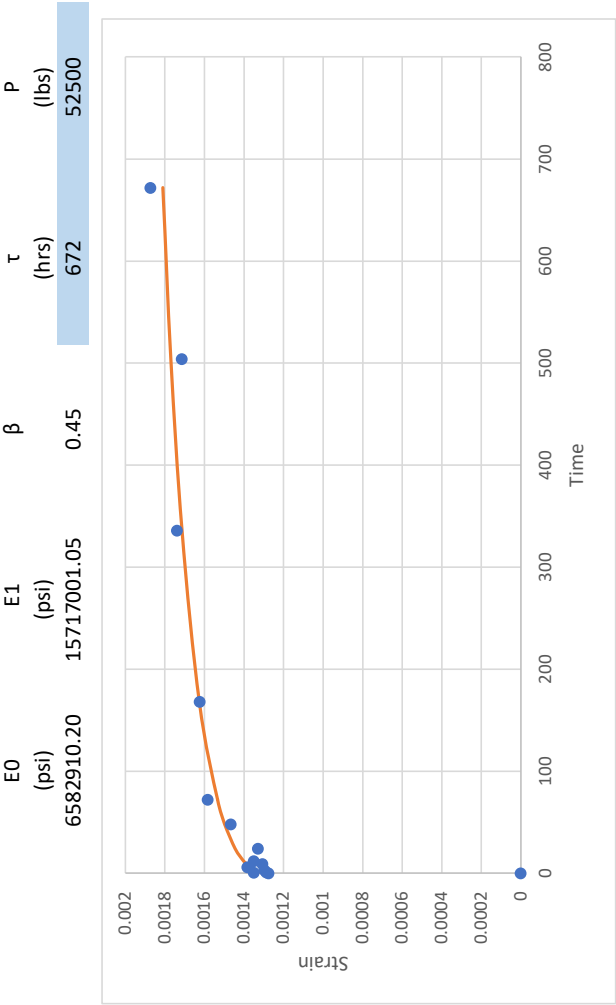
sum R^2 = 1.59E-06



Data Set # 18

time (hr)	strain μ	
0	0	0.00000163
0.1	0.001276031	0.00000000
0.5	0.001349467	0.00000000
1	0.001286981	0.00000000
3	0.001297335	0.00000000
6	0.00138207	0.00000000
9	0.001306004	0.00000000
12	0.001349552	0.00000000
24	0.001329172	0.00000001
48	0.001465856	0.00000000
72	0.001582789	0.00000000
168	0.001623586	0.00000000
336	0.001738075	0.00000000
504	0.00171405	0.00000000
672	0.001872884	0.00000000

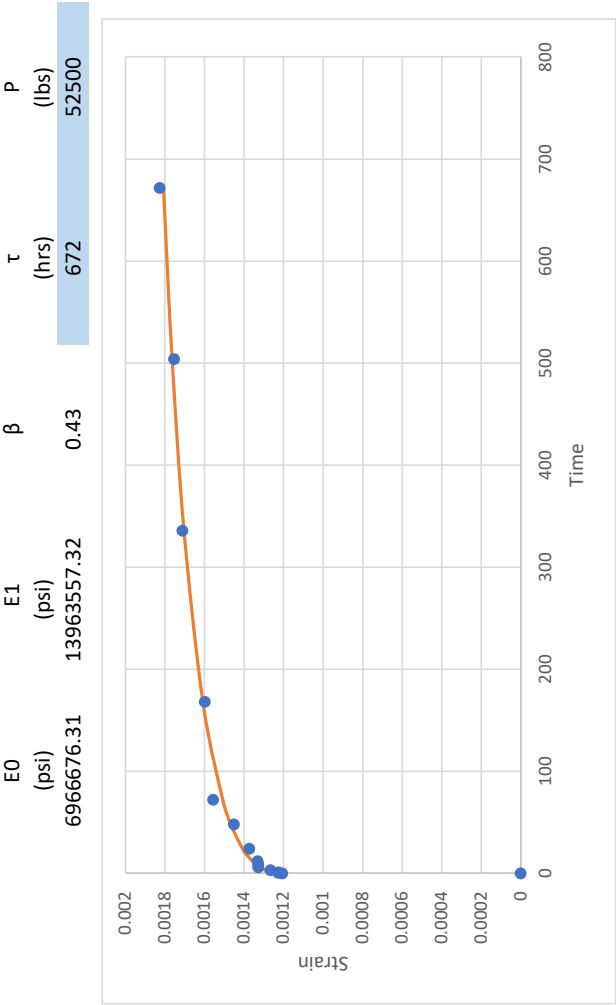
sum R^2 = 1.67E-06



Data Set # 19

time (hr)	strain μ	
0	0	0.00000145
0.1	0.00120574	0.00000000
0.5	0.001227591	0.00000000
1	0.001224504	0.00000000
3	0.001266121	0.00000000
6	0.001327415	0.00000000
9	0.001327919	0.00000000
12	0.001330836	0.00000000
24	0.00137295	0.00000000
48	0.001450264	0.00000000
72	0.001556258	0.00000000
168	0.001597058	0.00000000
336	0.001711545	0.00000000
504	0.001753128	0.00000000
672	0.001826028	0.00000000

sum R^2 = 1.46E-06

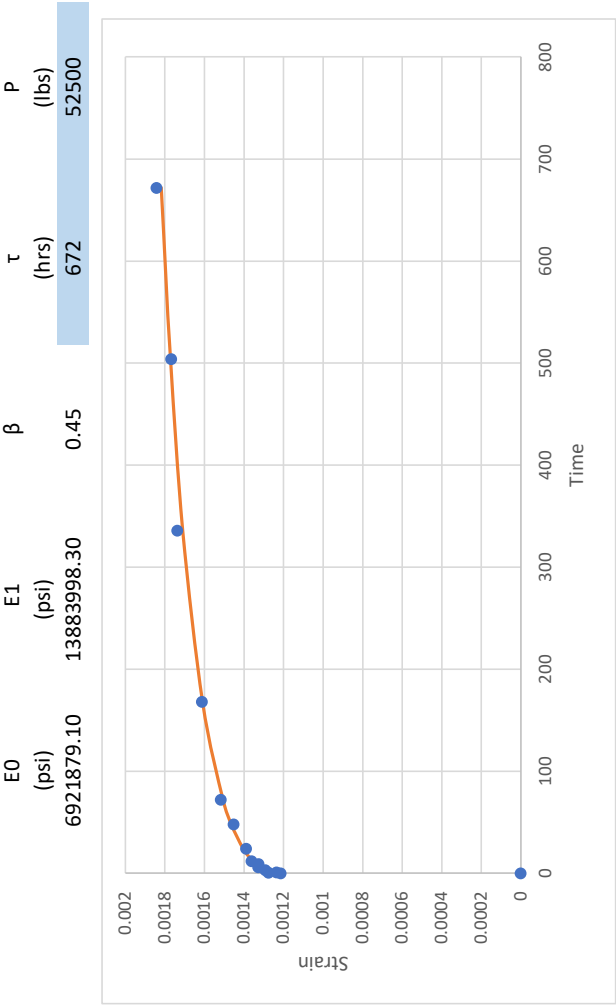


E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6966676.31	13963557.32	0.43	672	52500

Data Set # 20

time (hr)	strain μ	
0	0	0.00000147
0.1	0.001213543	0.00000000
0.5	0.001276038	0.00000000
1	0.00123543	0.00000000
3	0.001292677	0.00000000
6	0.00132739	0.00000000
9	0.001326345	0.00000000
12	0.00136208	0.00000000
24	0.001388572	0.00000000
48	0.001451818	0.00000000
72	0.00151717	0.00000000
168	0.001612678	0.00000000
336	0.001736546	0.00000000
504	0.001767189	0.00000000
672	0.00184164	0.00000000

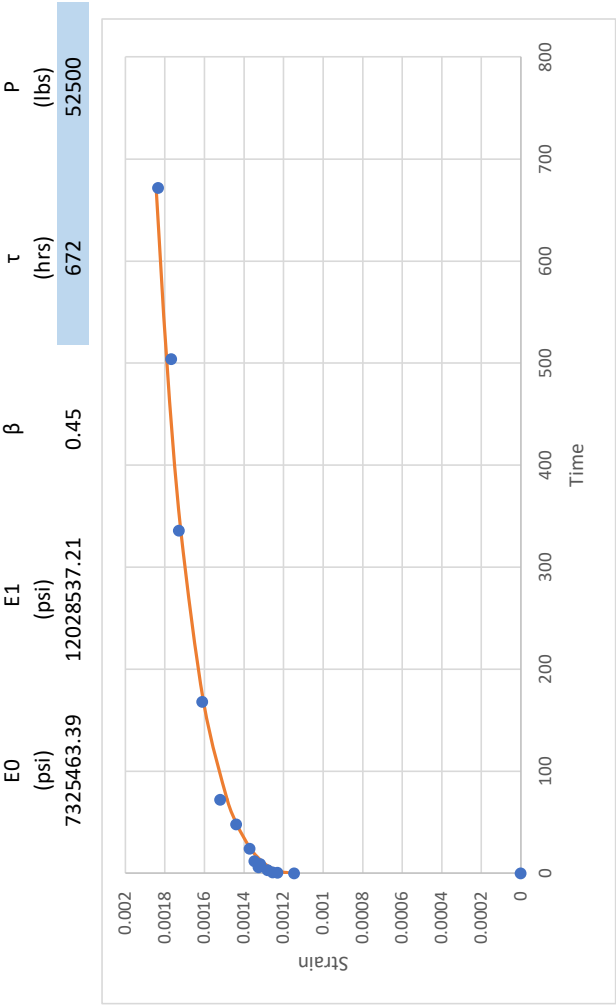
sum R^2 = 1.48E-06



Data Set # 21

time (hr)	strain μ	
0	0	0.00114669
0.1	0.001146685	0.00116743
0.5	0.001231081	0.00118905
1	0.001254572	0.00120415
3	0.001280565	0.00123932
6	0.001326245	0.00127125
9	0.001317373	0.00129444
12	0.001346868	0.00131325
24	0.001371801	0.00136772
48	0.001439762	0.00143707
72	0.001519205	0.00148529
168	0.001610062	0.00160499
336	0.001729276	0.00172014
504	0.001767753	0.00179255
672	0.001834428	0.00184502

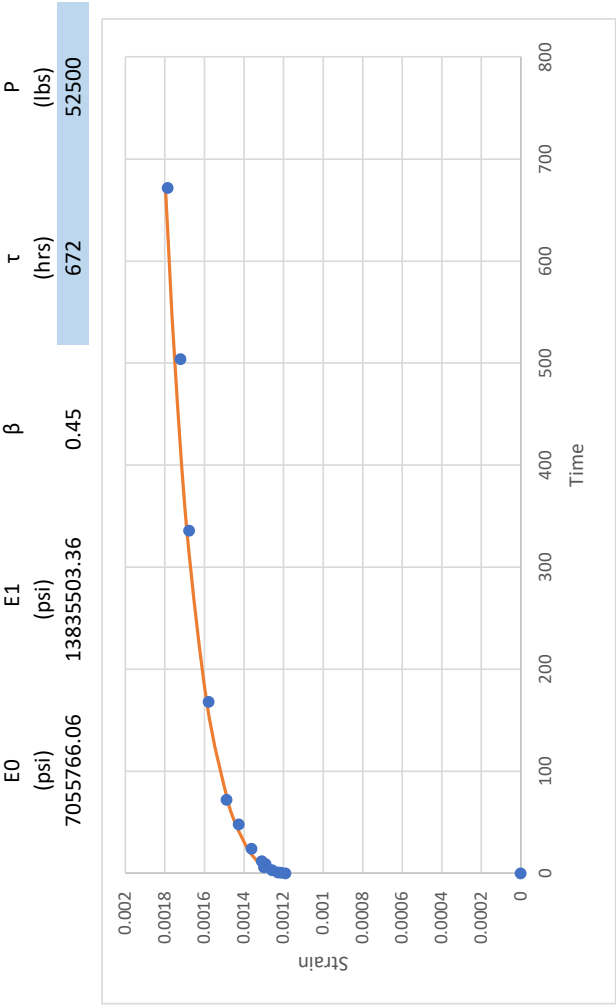
sum R^2 = 1.33E-06



Data Set # 22

time (hr)	strain μ	
0	0	0.00000142
0.1	0.001190516	0.00000000
0.5	0.001212375	0.00000000
1	0.001228044	0.00000000
3	0.00125717	0.00000000
6	0.001298159	0.00000000
9	0.001290847	0.00000000
12	0.001309403	0.00000000
24	0.001360916	0.00000000
48	0.001425752	0.00000000
72	0.001488007	0.00000000
168	0.001578861	0.00000000
336	0.00167776	0.00000000
504	0.001720927	0.00000000
672	0.001786036	0.00000000

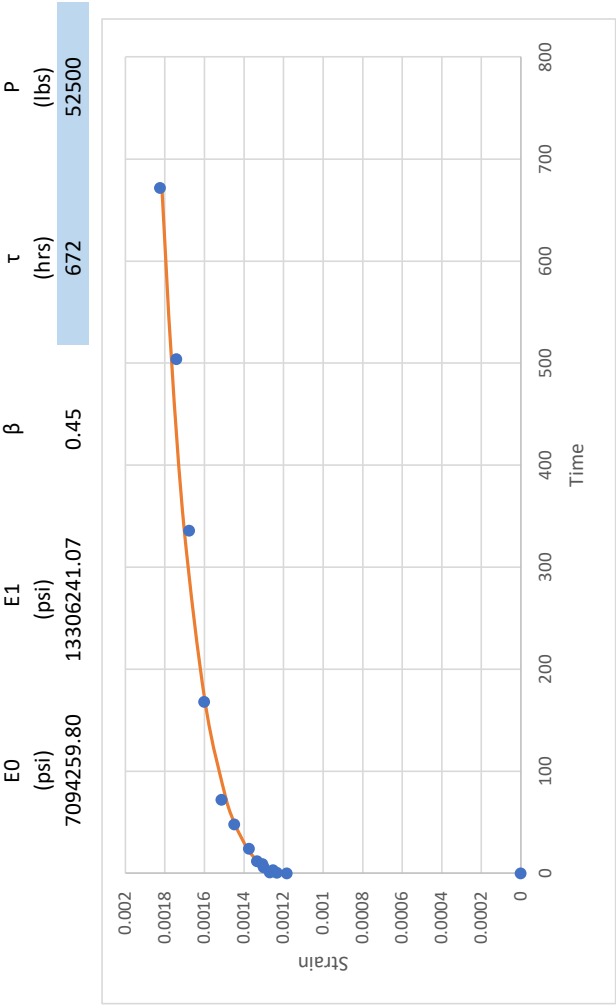
$\text{sum } R^2 = 1.42\text{E-}06$



Data Set # 23

time (hr)	strain μ	
0	0	0.00000140
0.1	0.001184056	0.00000000
0.5	0.001234053	0.00000000
1	0.00126848	0.00000000
3	0.001252264	0.00000000
6	0.001299493	0.00000000
9	0.001306257	0.00000000
12	0.001334188	0.00000000
24	0.00137475	0.00000000
48	0.001448955	0.00000000
72	0.001512764	0.00000000
168	0.001600475	0.00000000
336	0.001677467	0.00000000
504	0.001740949	0.00000000
672	0.001824805	0.00000000

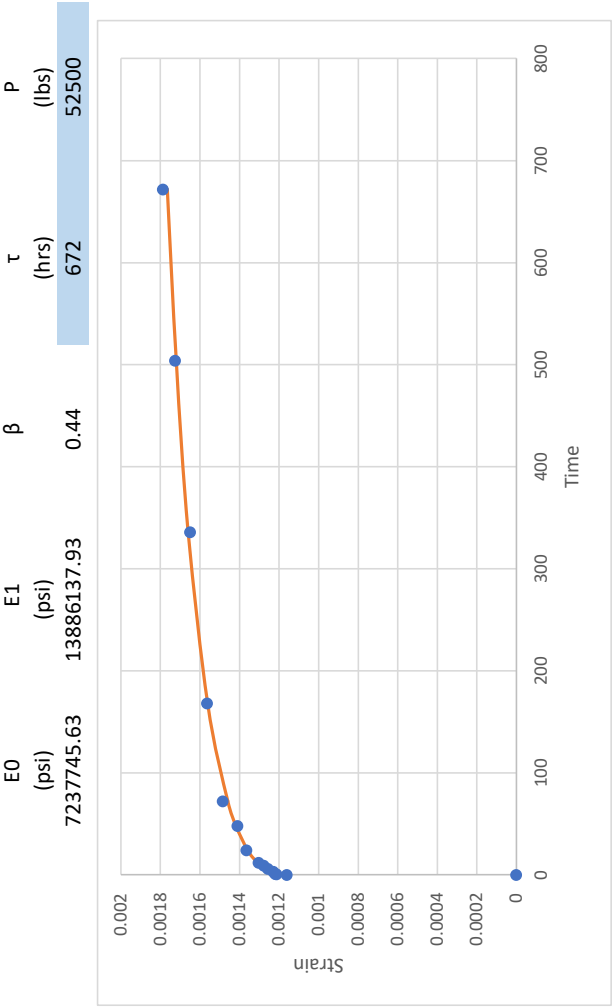
sum R^2 = 1.41E-06



Data Set # 24

time (hr)	strain μ	
0	0	0.00000135
0.1	0.001160582	0.00000000
0.5	0.001212137	0.00000000
1	0.001218424	0.00000000
3	0.001228783	0.00000000
6	0.001255692	0.00000000
9	0.00127809	0.00000000
12	0.00130289	0.00000000
24	0.001365336	0.00000000
48	0.001409833	0.00000000
72	0.001484573	0.00000000
168	0.001562902	0.00000000
336	0.001649271	0.00000000
504	0.001725256	0.00000000
672	0.001787218	0.00000000

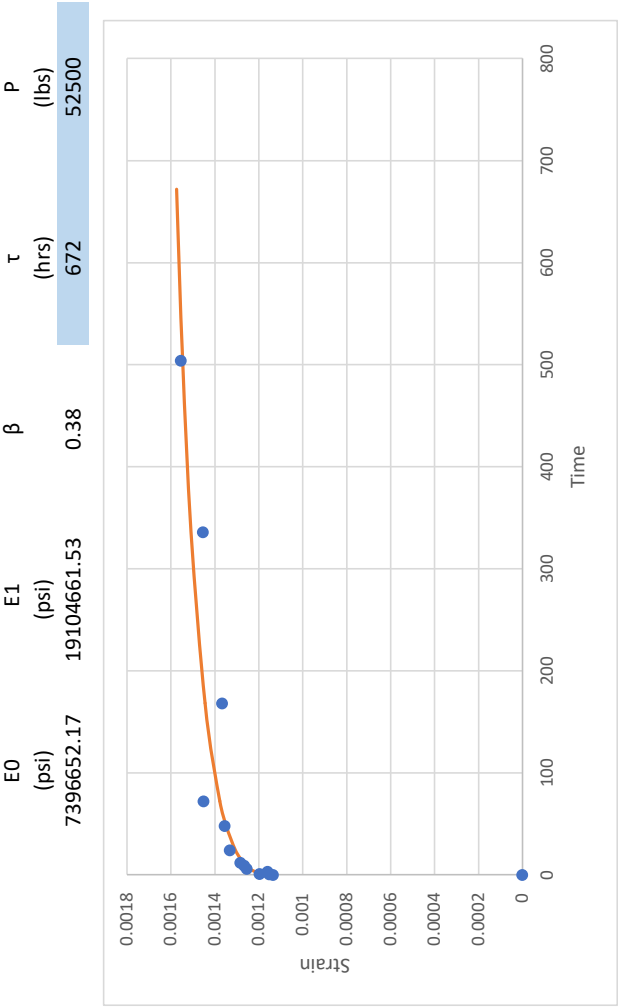
sum R^2 = 1.35E-06



Data Set # 25

time (hr)	strain μ	
0	0	0.00113565
0.1	0.001135649	0.00115966
0.5	0.001152817	0.00117926
1	0.001196619	0.00119185
3	0.00116008	0.00121916
6	0.001254214	0.00124231
9	0.001265668	0.00125841
12	0.001284218	0.00127112
24	0.001331037	0.00130651
48	0.00135522	0.00134924
72	0.001450292	0.00137781
168	0.001366023	0.00144584
336	0.001453962	0.00150866
504	0.001554974	0.00154741
672		0.00157533

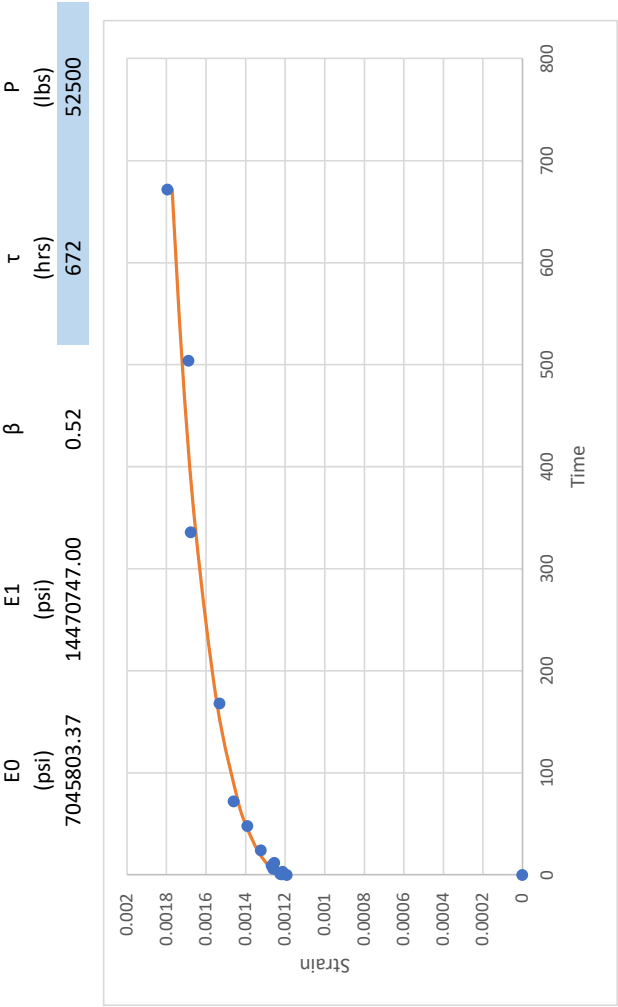
sum R^2 = 1.31E-06



Data Set # 26

time (hr)	strain μ	
0	0	0.00000142
0.1	0.001192199	0.00000000
0.5	0.001217197	0.00000000
1	0.001223489	0.00000000
3	0.001211956	0.00000000
6	0.001259199	0.00000000
9	0.001267527	0.00000000
12	0.001254809	0.00000000
24	0.001321968	0.00000000
48	0.001389933	0.00000000
72	0.001460016	0.00000000
168	0.001532115	0.00000000
336	0.001676372	0.00000000
504	0.001688271	0.00000000
672	0.001795603	0.00000000

sum R^2 = 1.43E-06



APPENDIX C – Recovery Models

Test Sample:	Normal Strength	f'c desired:
Load Applied:	30%	f'c measured

Date Time	Relative Humidity	Air Temp	Notes	AVERAGED STRAINS - NSC 0.30% RECOVERY TEST																								3/9/2022	3/10/2022	3/11/2022	3/12/2022	3/13/2022	3/14/2022	3/15/2022	3/16/2022	3/17/2022	3/18/2022	3/19/2022	3/20/2022	3/21/2022	3/22/2022	3/23/2022	3/24/2022	3/25/2022	3/26/2022	3/27/2022	3/28/2022	3/29/2022	3/30/2022	3/31/2022																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
				12/20/2021	12/21/2021	12/22/2021	12/23/2021	12/24/2021	12/25/2021	12/26/2021	12/27/2021	12/28/2021	12/29/2021	12/30/2021	12/31/2021	1/1/2022	1/2/2022	1/3/2022	1/4/2022	1/5/2022	1/6/2022	1/7/2022	1/8/2022	1/9/2022	1/10/2022	1/11/2022	1/12/2022																								1/13/2022	1/14/2022	1/15/2022	1/16/2022	1/17/2022	1/18/2022	1/19/2022	1/20/2022	1/21/2022	1/22/2022	1/23/2022	1/24/2022	1/25/2022	1/26/2022	1/27/2022	1/28/2022	1/29/2022	1/30/2022	1/31/2022	2/1/2022	2/2/2022	2/3/2022	2/4/2022	2/5/2022	2/6/2022	2/7/2022	2/8/2022	2/9/2022	2/10/2022	2/11/2022	2/12/2022	2/13/2022	2/14/2022	2/15/2022	2/16/2022	2/17/2022	2/18/2022	2/19/2022	2/20/2022	2/21/2022	2/22/2022	2/23/2022	2/24/2022	2/25/2022	2/26/2022	2/27/2022	2/28/2022	2/29/2022	2/30/2022	3/1/2022	3/2/2022	3/3/2022	3/4/2022	3/5/2022	3/6/2022	3/7/2022	3/8/2022	3/9/2022	3/10/2022	3/11/2022	3/12/2022	3/13/2022	3/14/2022	3/15/2022	3/16/2022	3/17/2022	3/18/2022	3/19/2022	3/20/2022	3/21/2022	3/22/2022	3/23/2022	3/24/2022	3/25/2022	3/26/2022	3/27/2022	3/28/2022	3/29/2022	3/30/2022	3/31/2022																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Before Loading	Initial Loading	23.2	23.2	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.

Test Sample: Normal Strength f_c desired: 6 ksi lbs
Load Applied: 30% f_c measured: 5.2 ksi

		TOTAL STRAIN MINUS SHRINKAGE STRAIN																	
Date	12/20/2021	12/20/2021	1/17/2022	1/18/2022	1/19/2022	1/20/2022	1/21/2022	1/25/2022	2/3/2022	2/8/2022	2/10/2022	2/15/2022	2/22/2022	3/1/2022	3/8/2022	3/15/2022	3/22/2022	3/29/2022	
Time	11:30:00 AM	12:15:00 PM	12:30:00 PM	12:30:00 PM	3:00:00 PM	3:00:00 PM	3:00:00 PM	11:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	7:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	
Relative Humidity	49.3	49.3	50.1	50.9	49.9	49.9	52	50	49.9	49.9	49.2	49.7	49.8	49.8	49.1	50.1	50	50	
Air Temp	23.2	23.2	22.9	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.9	22.9	22.9	23.0	23.0	23.0	
Notes	Before Loading	Initial Loading	0	0.1	24	48	72	168	384	504	552	672	840	1008	1176	1344	1512	1680	
1	0.00000000	0.0007915	0.0004354	0.00024797	0.00009487	0.00009382	0.00013558	0.00004698	0.00002962	0.00004554	0.00011394	0.00005892	0.00001948	0.00014218	0.00011139	0.00008739	0.00007631	0.00004996	
2	0.00000000	0.00007615	0.00038290	0.00015769	-0.00004458	0.00009969	0.00002958	-0.00007161	-0.00006561	-0.00007036	0.00001734	-0.00001638	-0.00001365	-0.00002060	-0.00001959	-0.00001735	0.00001697	-0.00000599	
3	0.00000000	0.00007297	0.00031389	0.00005819	-0.00011344	0.00003735	-0.00004557	-0.00012485	-0.00014698	-0.00011923	-0.00017905	-0.00006094	-0.00010403	-0.00008787	-0.00006034	-0.00010314	0.00010798	-0.00008143	
4	0.00000000	0.00013237	0.000030771	0.00001696	-0.00008838	-0.00001849	-0.00003849	-0.00009933	-0.00010628	-0.00009853	-0.00011088	-0.00008589	-0.00005075	-0.00006698	-0.00009153	-0.00006239	-0.00008399	-0.00002166	
5	0.00000000	0.00026431	0.00023935	0.00002640	-0.00019382	-0.00019382	-0.00017671	-0.00019695	-0.00020657	-0.00020508	-0.00022683	-0.00022683	-0.00022683	-0.00022683	-0.00022683	-0.00022683	-0.00019557	-0.00016557	
6	0.00000000	0.00019179	0.00023935	0.00018897	0.00008788	0.00008788	0.00008788	0.00008483	0.00009594	0.00007670	0.00004272	0.00002058	0.00008999	0.00009054	0.00008365	0.00010340	0.00011735	-0.00012537	
7	0.00000000	0.00005422	0.00042965	0.00031706	-0.00000396	0.00003776	0.00004828	-0.00005938	-0.00002812	-0.00005163	0.00004181	0.00002353	0.00002422	0.00002695	0.00004867	0.00002824	0.00001716	0.00003146	
8	0.00000000	0.00020436	0.00058575	0.00025129	0.00011477	0.00013772	0.00013573	0.00014401	0.00010506	0.00010506	0.00012036	0.00013355	0.00014878	0.00010172	0.00011469	0.00013755	0.00014863	0.00016265	
9	0.00000000	0.00016057	0.00052056	0.00022342	0.00011496	0.00015983	0.00016401	0.00012546	0.00010957	0.00009543	0.00009793	0.00015186	0.00015622	0.00015529	0.00012744	0.00014720	0.00014863	0.00018551	
10	0.00000000	0.00007298	0.00040779	0.00004505	-0.00005399	0.00000025	0.00032466	-0.00004975	-0.00004375	-0.00007351	0.00007932	0.00007073	-0.00000793	0.00006000	0.00000194	0.00000949	0.00000160	-0.00009396	
11	0.00000000	0.00016674	0.00057653	0.00029206	0.00008669	0.00009712	0.00012640	0.00011908	0.00007816	-0.00006717	0.00006731	0.00005509	0.00001211	0.00013323	0.00013307	0.00011790	0.00011718	0.00009396	
12	0.00000000	0.00022605	0.00054814	0.00014183	0.00008846	0.00004704	0.00012006	0.00009620	0.0001708	-0.00000466	0.00000749	0.00008603	0.00005591	0.00006123	0.00007090	0.00005939	0.00004519	0.00004385	
13	0.00000000	0.00024491	0.00057980	0.00018766	0.00010552	0.00013159	0.00015464	0.00013165	0.00011575	0.00013915	0.00010519	0.0001057	0.00004608	0.00015207	0.00012754	0.00015336	0.00016104	0.00012845	
14	0.00000000	0.00015735	0.00064207	0.00017943	0.00002415	0.00007111	0.00011077	0.00011588	0.0001562	0.0000462	-0.00000461	-0.0001057	0.00004973	0.00005443	0.00004910	0.00006572	0.00004938	0.00009081	
15	0.00000000	0.00029809	0.00060497	0.00030157	0.00019031	0.00021546	0.00027667	0.00024130	0.00023154	0.00022994	0.00021331	0.00019866	0.00022065	0.00024538	0.00023379	0.00025533	0.00026520	0.00021933	
16	0.00000000	0.00033237	0.00067350	0.00024830	0.00019931	0.00031601	0.00032656	0.00020043	0.00019078	0.00017353	0.00017992	0.00017984	0.00027993	0.00024273	0.00028605	0.00024502	0.00025866	0.00025033	
17	0.00000000	0.00025109	0.00070771	0.00027014	0.00014501	0.00024096	0.00026088	0.00010971	0.00012509	0.00011722	0.00011112	0.00009890	0.00017744	0.00018640	0.00021124	0.00017706	0.00017833	0.00021591	
18	0.00000000	0.00030100	0.00066374	0.00028662	0.00022726	0.00029083	0.00029825	0.00021900	0.00021559	0.00026087	0.00020163	0.00021756	0.00024847	0.0002596	0.00024693	0.00024693	0.00022344	0.00024392	
19	0.00000000	0.00028244	0.00057862	0.00025462	0.00016495	0.00025584	0.00028460	0.00026099	0.00015042	0.00011516	0.00012709	0.00020565	0.00011778	0.00020213	0.00021837	0.00020493	0.00018296	0.00019415	
20	0.00000000	0.00031354	0.00066071	0.00029500	0.00023037	0.00028460	0.00031075	0.00024399	0.00022335	0.00022335	0.00021127	0.00025160	0.00027471	0.00025173	0.00023657	0.00027505	0.00025772	0.00022515	
21	0.00000000	0.00029792	0.00064512	0.00028564	0.00019990	0.00025962	0.00027639	0.00018775	0.00017499	0.00016399	0.00014254	0.00021412	0.00023194	0.00022691	0.00022021	0.00022820	0.00021087	0.00021267	
22	0.00000000	0.00031051	0.00066103	0.00031393	0.00026492	0.00032854	0.00026942	0.00025977	0.00026264	0.00025477	0.00024895	0.00026116	0.00029311	0.00029584	0.00028630	0.00030651	0.00028605	0.00027535	
23	0.00000000	0.00029487	0.00059851	0.00028893	0.00018366	0.00023791	0.00026094	0.00019103	0.00018764	0.00017352	0.00017367	0.00021742	0.00022123	0.00022709	0.00022863	0.00023776	0.00021730	0.00021597	
24	0.00000000	0.00018225	0.00051067	0.00023859	0.00014587	0.00020011	0.00020127	0.00021037	0.00013422	0.00013260	0.00012650	0.00011799	0.00017718	0.00017678	0.00016143	0.00018745	0.00017321	0.00016552	
25	0.00000000	0.00032605	0.00055762	0.00022937	0.00022728	0.00025648	0.00028575	0.00023151	0.00021561	0.00022338	0.00018942	0.00022035	0.00020853	0.00023721	0.00023002	0.00021254	0.00022333	0.00021264	
26	0.00000000	0.00031666	0.00058590	0.00031075	0.00022424	0.000228159	0.00023116	0.00023160	0.00022197	0.00020784	0.00020487	0.00019890	0.00028300	0.00029360	0.00027108	0.00027206	0.00027974	0.00027842	
FIT DATA																			
Standard Deviation																			
High Deviation																			
Low Deviation																			

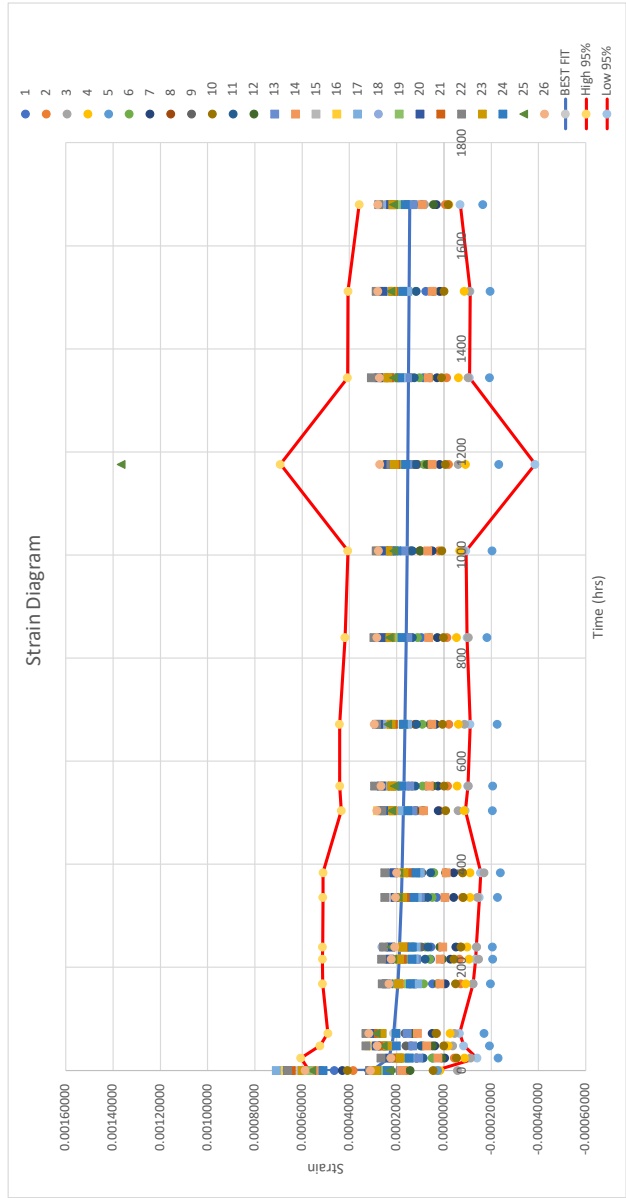
ε shu α V/S α
0.00050296 0.47074074 0.625 32.5603906

Shrinkage Strain	0	0.1	627	627.1	651	675	699	795	963	1011	1131	1179	1299	1467	1635	1803	1971	2307
	0	5.1715E-06	0.0001957	0.00019571	0.00019782	0.00019987	0.00020186	0.00020922	0.00022032	0.00022316	0.00022973	0.0003218	0.00032789	0.00042508	0.00052149	0.00062738	0.00073255	0.00083802

time (hr)	strain μ
0	0.00051708
0.1	0.00030199
24	0.00023250
48	0.00021991
72	0.00021216
168	0.00019512
216	0.00018986
240	0.00018763
336	0.00018043
384	0.00017754
504	0.00017160
552	0.00016959
672	0.00016524
840	0.00016027
1008	0.00015620
1176	0.00015274
1344	0.00014974
1512	0.00014709
1680	0.00014471

Copy and Transpose Data

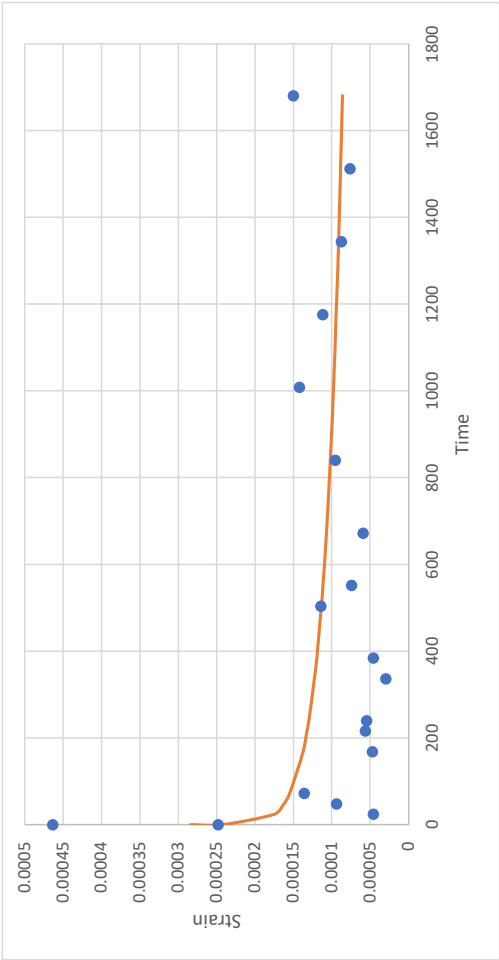
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
-10769877.75	8770460.00	0.19	1680.00	-11250.00



Data Set # 1

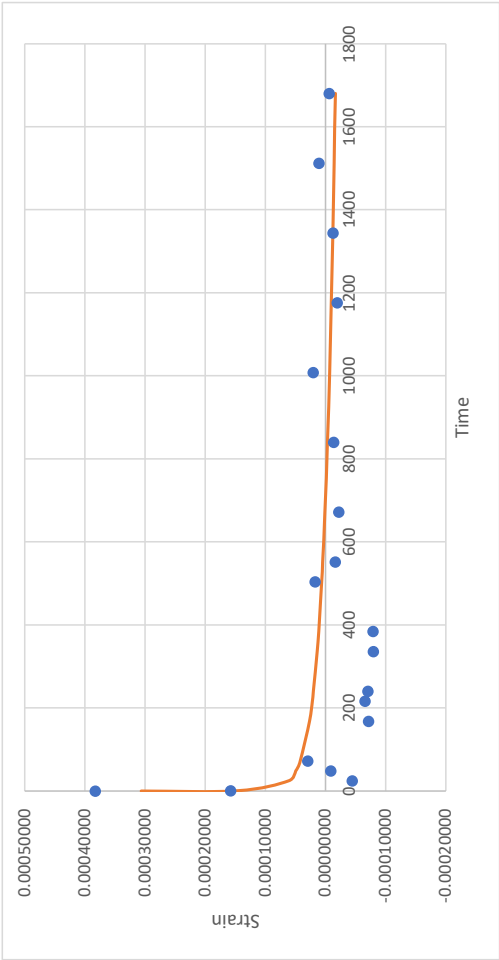
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000179153		10047283.53	9075460.00	0.20	1680	-11250
0	0.000463542	0.00028439	0.00000003				
0.1	0.000247974	0.00024262	0.00000000				
24	4.58732E-05	0.00017523	0.00000002				
48	9.38179E-05	0.00016263	0.00000000				
72	0.00013558	0.00015483	0.00000000				
168	4.69759E-05	0.00013757	0.00000001				
216	5.60964E-05	0.00013223	0.00000001				
240	5.44738E-05	0.00012996	0.00000001				
336	2.96246E-05	0.00012262	0.00000001				
384	4.55352E-05	0.00011967	0.00000001				
504	0.000113945	0.00011360	0.00000000				
552	7.40111E-05	0.00011155	0.00000000				
672	5.89234E-05	0.00010709	0.00000000				
840	9.54843E-05	0.00010200	0.00000000				
1008	0.000142176	0.00009783	0.00000000				
1176	0.000111392	0.00009428	0.00000000				
1344	8.73867E-05	0.00009120	0.00000000				
1512	7.63053E-05	0.00008848	0.00000000				
1680	0.000149957	0.00008605	0.00000000				

sum R^2 = 8.92209E-08



Data Set # 2

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	7.61502E-05		23637508.40	5575460.00	0.10	1680	-11250
0	0.00038290	0.00030675	0.00000001				
0.1	0.00015769	0.00014599	0.00000000				
24	-0.00004458	0.00006161	0.00000001				
48	-0.00000909	0.00004944	0.00000000				
72	0.00002958	0.00004219	0.00000000				
168	-0.00007161	0.00002681	0.00000001				
216	-0.00006561	0.00002219	0.00000001				
240	-0.00007036	0.00002025	0.00000001				
336	-0.00007959	0.00001402	0.00000001				
384	-0.00007930	0.00001154	0.00000001				
504	0.00001734	0.00000647	0.00000000				
552	-0.00001638	0.00000478	0.00000000				
672	-0.00002210	0.00000110	0.00000000				
840	-0.00001365	-0.00000308	0.00000000				
1008	0.00002060	-0.00000650	0.00000000				
1176	-0.00001959	-0.00000939	0.00000000				
1344	-0.00001235	-0.00001190	0.00000000				
1512	0.00001097	-0.00001411	0.00000000				
1680	-0.00000599	-0.00001609	0.00000000				
		sum R^2 =	6.39834E-08				

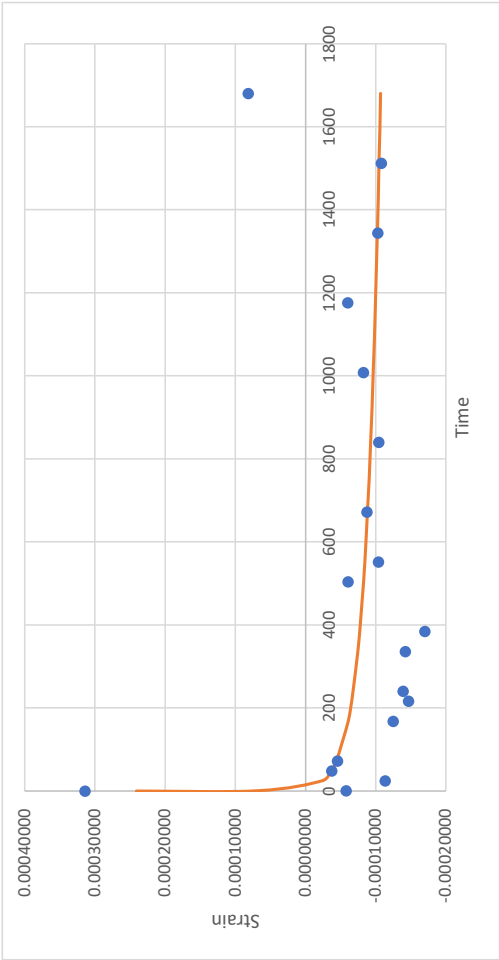


Data Set # 3

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	7.29745E-05		24666145.44	5175460.00	0.10	1680	-11250
0	0.00031389	0.00024091	0.00000001				
0.1	-0.00005819	0.00006773	0.00000002				
24	-0.00011344	-0.00002317	0.00000001				
48	-0.00003735	-0.00003629	0.00000000				
72	-0.00004557	-0.00004409	0.00000000				
168	-0.00012485	-0.00006066	0.00000000				
216	-0.00014698	-0.00006564	0.00000001				
240	-0.00013923	-0.00006773	0.00000001				
336	-0.00014220	-0.00007444	0.00000000				
384	-0.00017005	-0.00007712	0.00000001				
504	-0.00006094	-0.00008257	0.00000000				
552	-0.00010403	-0.00008440	0.00000000				
672	-0.00008787	-0.00008836	0.00000000				
840	-0.00010443	-0.00009287	0.00000000				
1008	-0.00008270	-0.00009655	0.00000000				
1176	-0.00006034	-0.00009967	0.00000000				
1344	-0.00010314	-0.00010237	0.00000000				
1512	-0.00010798	-0.00010475	0.00000000				
1680	0.00008143	-0.00010688	0.00000004				

sum R^2 =

5.92616E-08

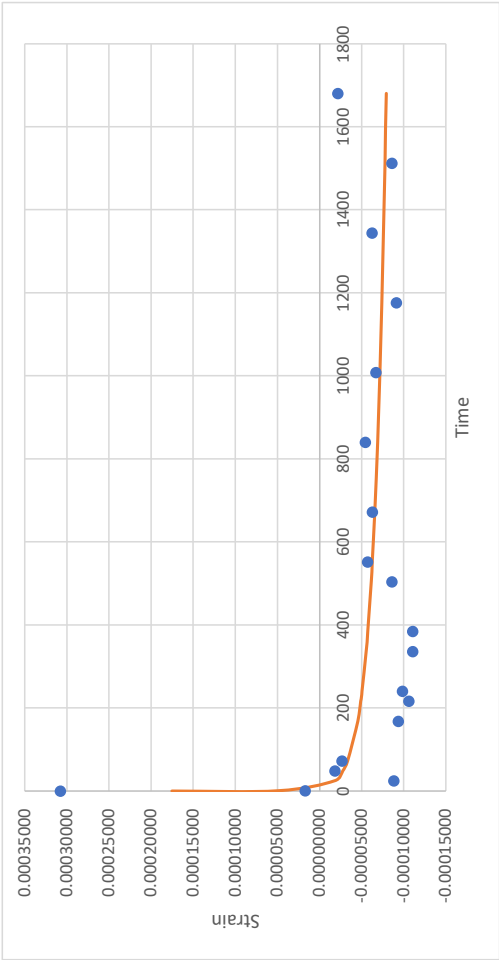


Data Set # 4

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.00013237		13598272.44	7075460.00	0.10	1680	-11250
0	0.00030771	0.00017534	0.00000002				
0.1	0.00001696	0.00004867	0.00000000				
24	-0.00008838	-0.00001782	0.00000000				
48	-0.00001849	-0.00002742	0.00000000				
72	-0.00002672	-0.00003313	0.00000000				
168	-0.00009353	-0.00004525	0.00000000				
216	-0.00010628	-0.00004889	0.00000000				
240	-0.00009853	-0.00005042	0.00000000				
336	-0.00011088	-0.00005533	0.00000000				
384	-0.00011060	-0.00005728	0.00000000				
504	-0.00008589	-0.00006127	0.00000000				
552	-0.00005704	-0.00006261	0.00000000				
672	-0.00006275	-0.00006551	0.00000000				
840	-0.00005431	-0.00006880	0.00000000				
1008	-0.00006698	-0.00007150	0.00000000				
1176	-0.00009153	-0.00007378	0.00000000				
1344	-0.00006239	-0.00007575	0.00000000				
1512	-0.00008599	-0.00007750	0.00000000				
1680	-0.00002166	-0.00007906	0.00000000				

sum R^2 =

3.81303E-08

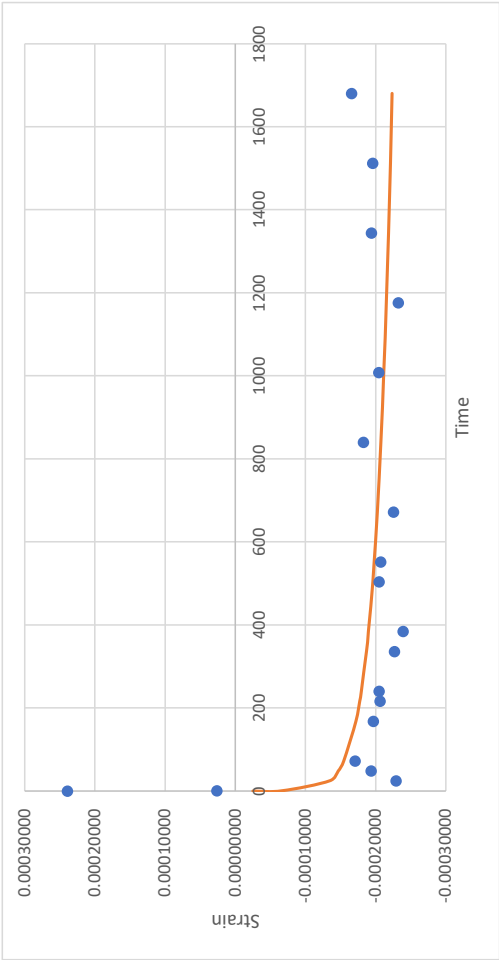


Data Set # 5

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000264315		6810068.37	9075460.00	0.20	1680	-11250
0	0.00023935	-0.00002497	0.00000007				
0.1	0.00002640	-0.00006674	0.00000001				
24	-0.00022932	-0.00013412	0.00000001				
48	-0.00019382	-0.00014673	0.00000000				
72	-0.00017077	-0.00015453	0.00000000				
168	-0.00019695	-0.00017178	0.00000000				
216	-0.00020657	-0.00017713	0.00000000				
240	-0.00020508	-0.00017939	0.00000000				
336	-0.00022683	-0.00018673	0.00000000				
384	-0.00023904	-0.00018969	0.00000000				
504	-0.00020495	-0.00019576	0.00000000				
552	-0.00020738	-0.00019781	0.00000000				
672	-0.00022560	-0.00020226	0.00000000				
840	-0.00018272	-0.00020735	0.00000000				
1008	-0.00020475	-0.00021153	0.00000000				
1176	-0.00023248	-0.00021508	0.00000000				
1344	-0.00019394	-0.00021815	0.00000000				
1512	-0.00019567	-0.00022087	0.00000000				
1680	-0.00016557	-0.00022330	0.00000000				

sum R^2 =

9.6462E-08

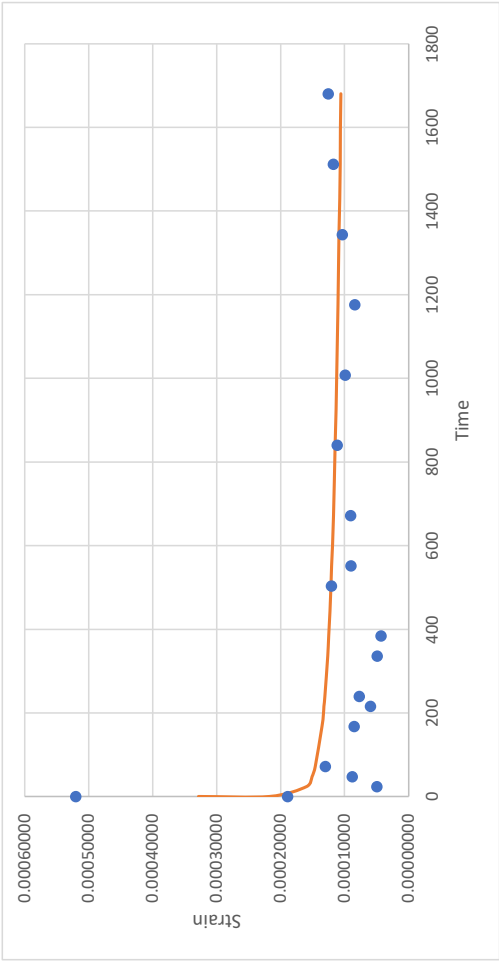


Data Set # 6

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000191786		9385453.29	8075460.00	0.10	1680	-11250
0	0.00052042	0.00032863	0.00000004				
0.1	0.00018897	0.00021764	0.00000000				
24	0.00004929	0.00015939	0.00000001				
48	0.00008788	0.00015098	0.00000000				
72	0.00012968	0.00014598	0.00000000				
168	0.00008483	0.00013536	0.00000000				
216	0.00005954	0.00013217	0.00000001				
240	0.00007670	0.00013083	0.00000000				
336	0.00004869	0.00012653	0.00000001				
384	0.00004272	0.00012481	0.00000001				
504	0.00012058	0.00012132	0.00000000				
552	0.00008999	0.00012014	0.00000000				
672	0.00009054	0.00011761	0.00000000				
840	0.00011150	0.00011472	0.00000000				
1008	0.00009882	0.00011236	0.00000000				
1176	0.00008365	0.00011036	0.00000000				
1344	0.00010340	0.00010863	0.00000000				
1512	0.00011735	0.00010710	0.00000000				
1680	0.00012537	0.00010574	0.00000000				

sum R^2 =

7.84391E-08

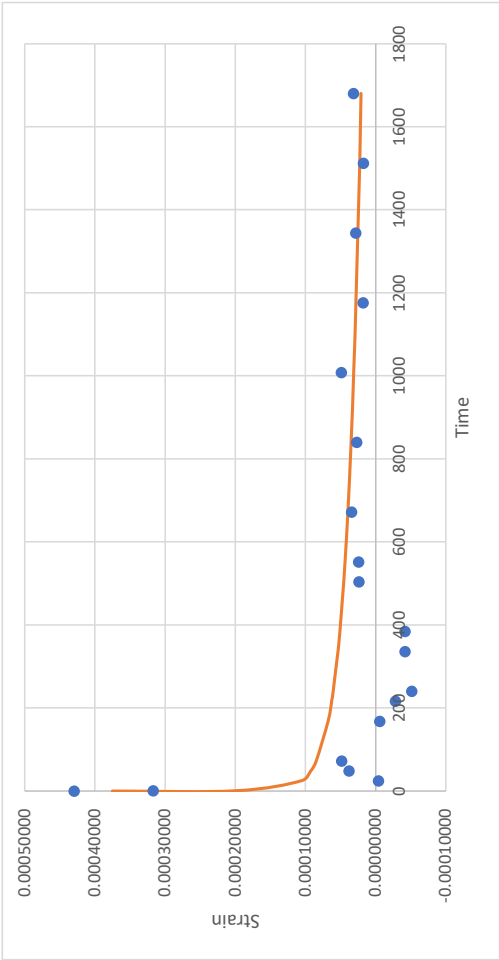


Data Set # 7

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	5.42249E-05		33195098.25	5075460.00	0.10	1680	-11250
0	0.00042965	0.00037543	0.00000000				
0.1	0.00031706	0.00019884	0.00000001				
24	-0.00000396	0.00010614	0.00000001				
48	0.00003776	0.00009277	0.00000000				
72	0.00004828	0.00008481	0.00000000				
168	-0.00000598	0.00006791	0.00000001				
216	-0.00002812	0.00006284	0.00000001				
240	-0.00005163	0.00006070	0.00000001				
336	-0.00004210	0.00005386	0.00000001				
384	-0.00004181	0.00005114	0.00000001				
504	0.00002353	0.00004557	0.00000000				
552	0.00002422	0.00004371	0.00000000				
672	0.00003414	0.00003967	0.00000000				
840	0.00002695	0.00003507	0.00000000				
1008	0.00004867	0.00003132	0.00000000				
1176	0.00001787	0.00002814	0.00000000				
1344	0.00002824	0.00002538	0.00000000				
1512	0.00001716	0.00002295	0.00000000				
1680	0.00003146	0.00002078	0.00000000				

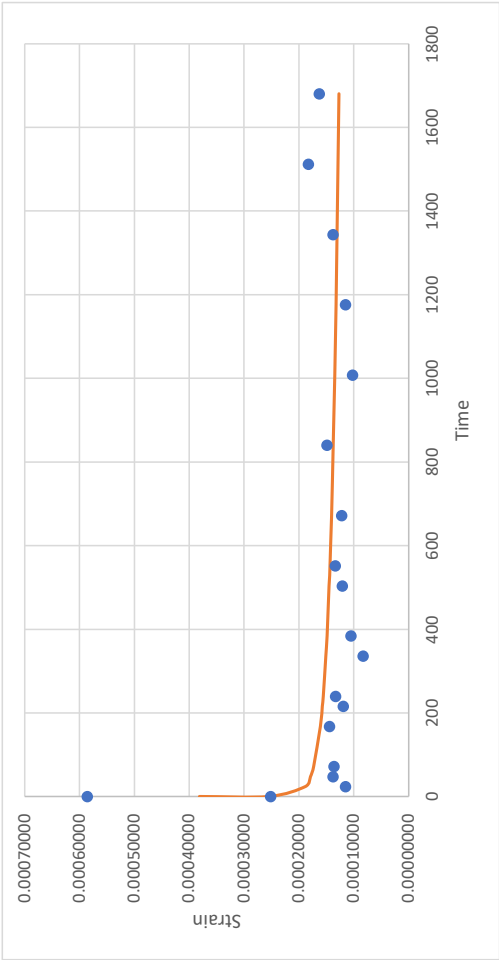
sum R^2 =

7.84646E-08



Data Set # 8

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000204259		8812329.62	7075460.00	0.10	1680	-11250
0	0.00058575	0.00038149	0.00000004				
0.1	0.00025129	0.00025482	0.00000000				
24	0.00011477	0.00018833	0.00000001				
48	0.00013772	0.00017873	0.00000000				
72	0.00013573	0.00017302	0.00000000				
168	0.00014400	0.00016090	0.00000000				
216	0.00011875	0.00015726	0.00000000				
240	0.00013275	0.00015573	0.00000000				
336	0.00008289	0.00015082	0.00000000				
384	0.00010506	0.00014887	0.00000000				
504	0.00012036	0.00014488	0.00000000				
552	0.00013355	0.00014354	0.00000000				
672	0.00012158	0.00014064	0.00000000				
840	0.00014878	0.00013735	0.00000000				
1008	0.00010172	0.00013465	0.00000000				
1176	0.00011469	0.00013237	0.00000000				
1344	0.00013755	0.00013040	0.00000000				
1512	0.00018274	0.00012865	0.00000000				
1680	0.00016265	0.00012709	0.00000000				
		sum R^2 =	5.97496E-08				



Data Set # 9

time (hr)	strain μ	Ei	11209934.09
Elastic Strain	0.000160572		
0	0.00052056	0.00035999	0.000000003
0.1	0.00022342	0.00024900	0.000000000
24	0.00011496	0.00019074	0.000000001
48	0.00015983	0.00018234	0.000000000
72	0.00016410	0.00017733	0.000000000
168	0.00012546	0.00016671	0.000000000
216	0.00010957	0.00016352	0.000000000
240	0.00009543	0.00016218	0.000000000
336	0.00008933	0.00015788	0.000000000
384	0.00009275	0.00015617	0.000000000
504	0.00015186	0.00015267	0.000000000
552	0.00014942	0.00015150	0.000000000
672	0.00015622	0.00014896	0.000000000
840	0.00015529	0.00014608	0.000000000
1008	0.00013636	0.00014371	0.000000000
1176	0.00012744	0.00014172	0.000000000
1344	0.00014720	0.00013999	0.000000000
1512	0.00014863	0.00013846	0.000000000
1680	0.00012854	0.00013709	0.000000000
sum R^2 =			5.06585E-08

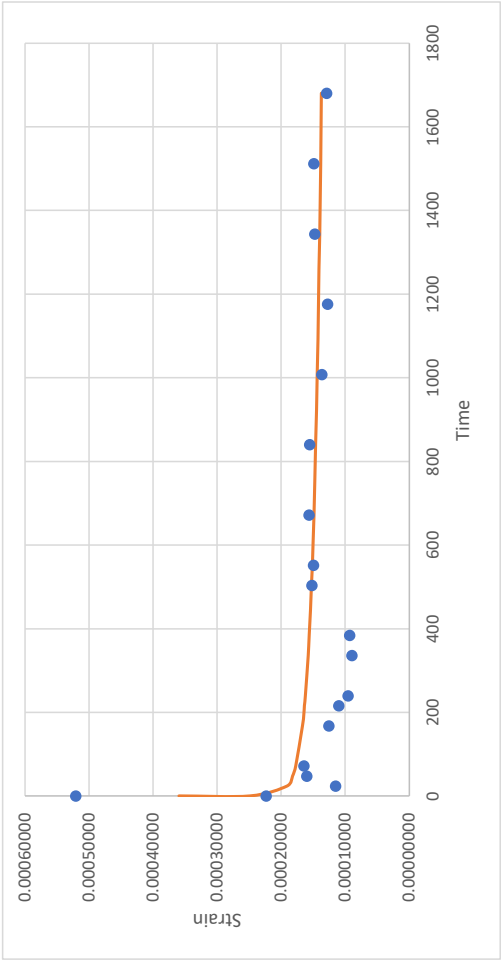
E0
(psi)
11209934.09

E1
(psi)
8075460.00

β
0.10

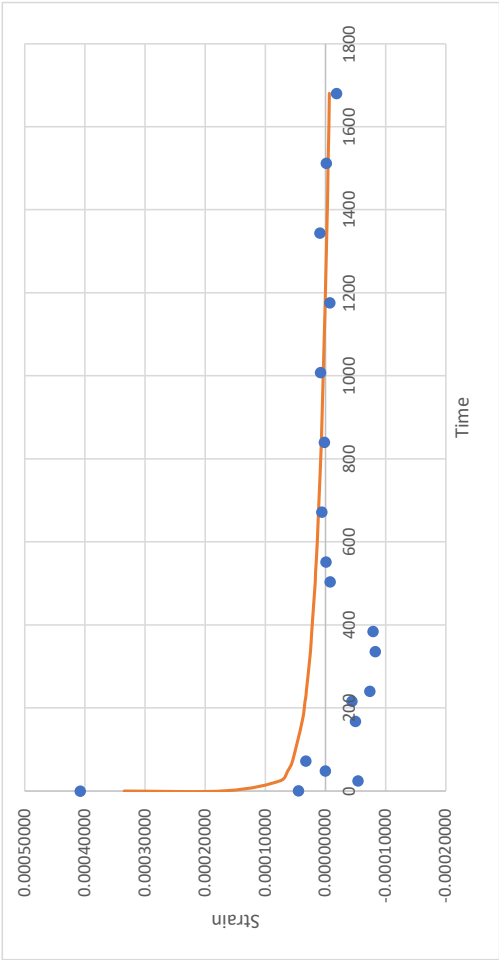
τ
(hrs)
1680

P
(lbs)
-11250



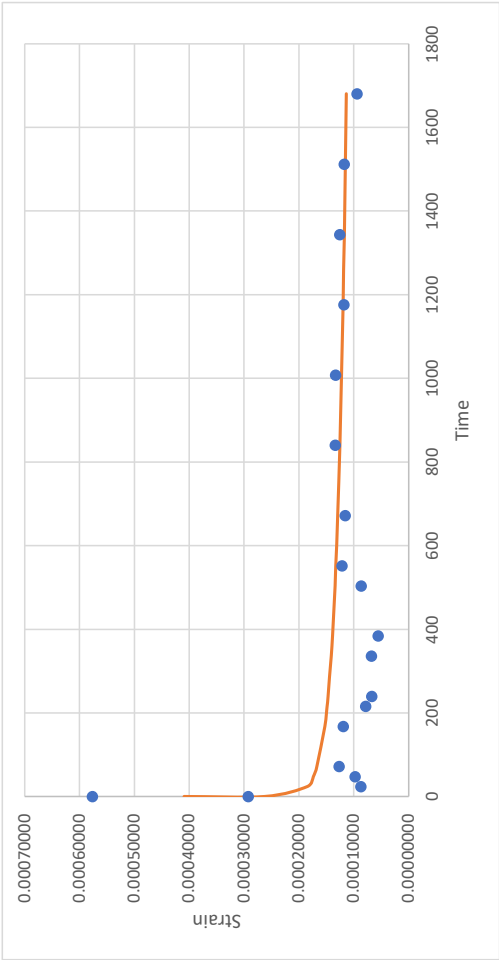
Data Set # 10

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	7.29759E-05		24665686.97	5275460.00	0.10	1680	-11250
0	0.00040779	0.00033481	0.00000001				
0.1	0.00004505	0.00016491	0.00000001				
24	-0.00005399	0.00007574	0.00000002				
48	0.00000025	0.00006287	0.00000000				
72	0.00003266	0.00005521	0.00000000				
168	-0.00004975	0.00003895	0.00000001				
216	-0.00004375	0.00003407	0.00000001				
240	-0.00007351	0.00003202	0.00000001				
336	-0.00008274	0.00002544	0.00000001				
384	-0.00007932	0.00002281	0.00000001				
504	-0.00000773	0.00001746	0.00000000				
552	-0.00000079	0.00001566	0.00000000				
672	0.00000600	0.00001178	0.00000000				
840	0.00000194	0.00000736	0.00000000				
1008	0.00000804	0.00000375	0.00000000				
1176	-0.00000714	0.00000069	0.00000000				
1344	0.00000949	-0.00000196	0.00000000				
1512	-0.00000160	-0.00000430	0.00000000				
1680	-0.00001855	-0.00000639	0.00000000				
		sum R^2 =	8.90472E-08				



Data Set # 11

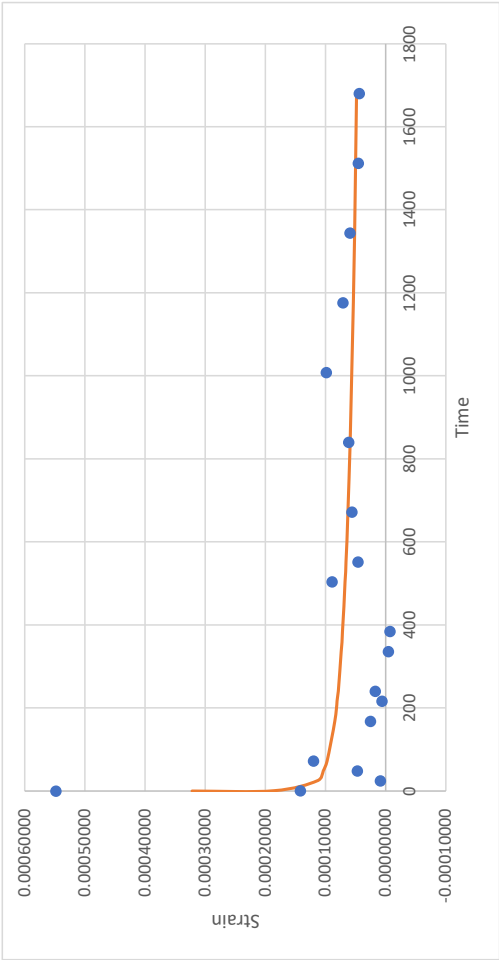
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000166742		10795109.24	6075460.00	0.10	1680	-11250
0	0.00057653	0.00040979	0.00000003				
0.1	0.00029206	0.00026226	0.00000000				
24	0.00008669	0.00018482	0.00000001				
48	0.00009712	0.00017365	0.00000001				
72	0.00012640	0.00016700	0.00000000				
168	0.00011908	0.00015289	0.00000000				
216	0.00007816	0.00014865	0.00000000				
240	0.00006717	0.00014686	0.00000001				
336	0.00006731	0.00014115	0.00000001				
384	0.00005509	0.00013887	0.00000001				
504	0.00008603	0.00013422	0.00000000				
552	0.00012111	0.00013266	0.00000000				
672	0.00011541	0.00012929	0.00000000				
840	0.00013323	0.00012545	0.00000000				
1008	0.00013307	0.00012232	0.00000000				
1176	0.00011790	0.00011966	0.00000000				
1344	0.00012514	0.00011736	0.00000000				
1512	0.00011718	0.00011533	0.00000000				
1680	0.00009396	0.00011351	0.00000000				
		sum R^2 =	7.32163E-08				



Data Set # 12

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000226054		7962692.14	6575460.00	0.10	1680	-11250
0	0.00054814	0.00032209	0.000000005				
0.1	0.00014183	0.00018578	0.000000000				
24	0.00000846	0.00011423	0.000000001				
48	0.00004704	0.00010391	0.000000000				
72	0.00012006	0.00009777	0.000000000				
168	0.0002521	0.00008472	0.000000000				
216	0.0000620	0.00008081	0.000000001				
240	0.00001708	0.00007916	0.000000000				
336	-0.00000466	0.00007388	0.000000001				
384	-0.00000749	0.00007177	0.000000001				
504	0.00008905	0.00006748	0.000000000				
552	0.00004600	0.00006604	0.000000000				
672	0.00005591	0.00006292	0.000000000				
840	0.00006123	0.00005938	0.000000000				
1008	0.00009856	0.00005648	0.000000000				
1176	0.00007090	0.00005402	0.000000000				
1344	0.00005939	0.00005190	0.000000000				
1512	0.00004519	0.00005002	0.000000000				
1680	0.00004385	0.00004834	0.000000000				

sum R^2 = 9.42298E-08

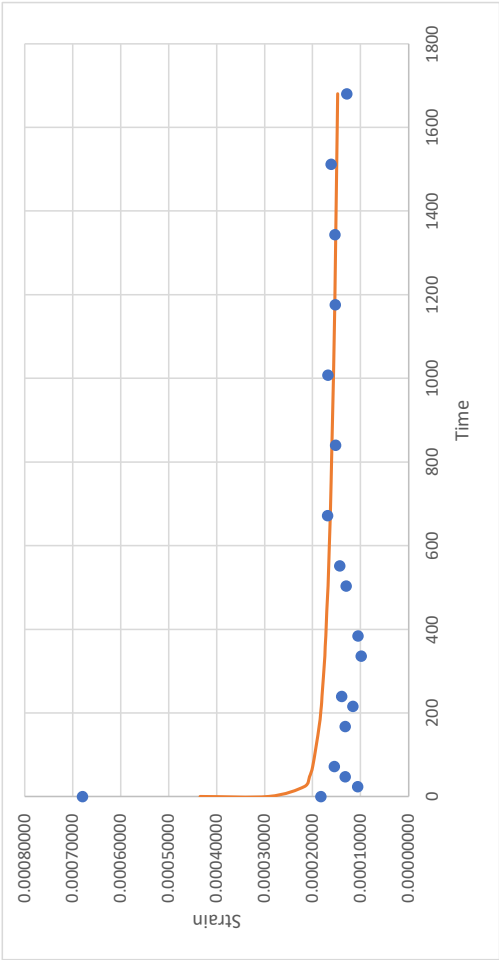


Data Set # 13

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000244909		7349668.99	6275460.00	0.10	1680	-11250
0	0.00067980	0.00043489	0.00000006				
0.1	0.00018266	0.00029207	0.00000001				
24	0.00010552	0.00021710	0.00000001				
48	0.00013159	0.00020628	0.00000001				
72	0.00015464	0.00019985	0.00000000				
168	0.00013165	0.00018618	0.00000000				
216	0.00011575	0.00018208	0.00000000				
240	0.00013915	0.00018035	0.00000000				
336	0.00009865	0.00017482	0.00000001				
384	0.00010519	0.00017261	0.00000000				
504	0.00012990	0.00016811	0.00000000				
552	0.00014308	0.00016660	0.00000000				
672	0.00016864	0.00016334	0.00000000				
840	0.00015207	0.00015962	0.00000000				
1008	0.00016754	0.00015659	0.00000000				
1176	0.00015237	0.00015401	0.00000000				
1344	0.00015336	0.00015179	0.00000000				
1512	0.00016104	0.00014982	0.00000000				
1680	0.00012845	0.00014806	0.00000000				

sum R^2 =

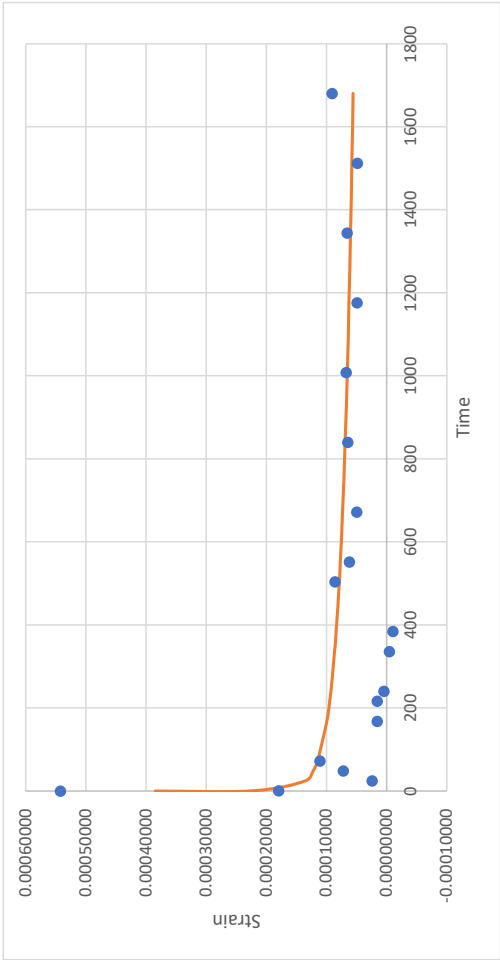
1.13455E-07



Data Set # 14

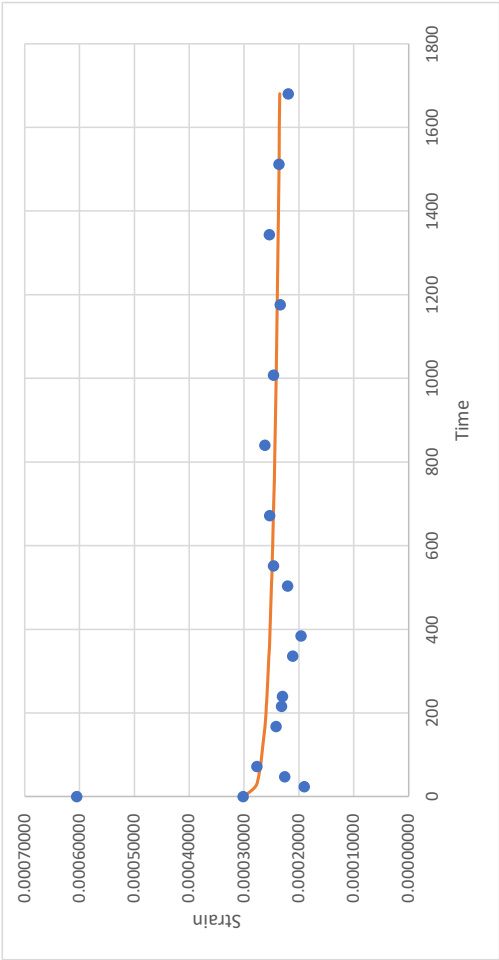
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000157345		11439794.24	5475460.00	0.10	1680	-11250
0	0.00054207	0.00038472	0.00000002				
0.1	0.00017943	0.00022103	0.00000000				
24	0.00002415	0.00013511	0.00000001				
48	0.00007211	0.00012271	0.00000000				
72	0.00011077	0.00011533	0.00000000				
168	0.00001588	0.00009967	0.00000001				
216	0.00001562	0.00009496	0.00000001				
240	0.00000462	0.00009299	0.00000001				
336	-0.00000461	0.00008664	0.00000001				
384	-0.00001057	0.00008412	0.00000001				
504	0.00008601	0.00007896	0.00000000				
552	0.00006170	0.00007723	0.00000000				
672	0.00004973	0.00007349	0.00000000				
840	0.00006443	0.00006923	0.00000000				
1008	0.00006739	0.00006575	0.00000000				
1176	0.00004910	0.00006280	0.00000000				
1344	0.00006572	0.00006025	0.00000000				
1512	0.00004838	0.00005800	0.00000000				
1680	0.00009081	0.00005598	0.00000000				

sum R^2 = 8.0091E-08



Data Set # 15

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Elastic Strain	0.000298087		6038507.08	25075460.00	0.30	1680	-11250
0	0.00060497	0.00030688	0.000000009				
0.1	0.00030157	0.00030091	0.000000000				
24	0.00019002	0.00027919	0.000000001				
48	0.00022546	0.00027381	0.000000000				
72	0.00027667	0.00027031	0.000000000				
168	0.00024120	0.00026212	0.000000000				
216	0.00023154	0.00025947	0.000000000				
240	0.00022994	0.00025833	0.000000000				
336	0.00021131	0.00025459	0.000000000				
384	0.00019596	0.00025306	0.000000000				
504	0.00022065	0.00024989	0.000000000				
552	0.00024636	0.00024881	0.000000000				
672	0.00025318	0.00024645	0.000000000				
840	0.00026162	0.00024372	0.000000000				
1008	0.00024583	0.00024147	0.000000000				
1176	0.00023379	0.00023956	0.000000000				
1344	0.00025353	0.00023789	0.000000000				
1512	0.00023620	0.00023642	0.000000000				
1680	0.00021923	0.00023510	0.000000000				
		sum R^2 =	1.07203E-07				



Data Set # 16

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.00033237		5415652.22				
0	0.00067350	0.00034113	0.00000011				
0.1	0.00024830	0.00034004	0.00000001				
24	0.00019931	0.00032515	0.00000002				
48	0.00031601	0.00031907	0.00000000				
72	0.00032656	0.00031460	0.00000000				
168	0.00020043	0.00030267	0.00000001				
216	0.00019078	0.00029839	0.00000001				
240	0.00017353	0.00029648	0.00000002				
336	0.00017992	0.00028998	0.00000001				
384	0.00017084	0.00028722	0.00000001				
504	0.00027993	0.00028131	0.00000000				
552	0.00024937	0.00027924	0.00000000				
672	0.00024054	0.00027464	0.00000000				
840	0.00024273	0.00026922	0.00000000				
1008	0.00028005	0.00026466	0.00000000				
1176	0.00024302	0.00026073	0.00000000				
1344	0.00025027	0.00025728	0.00000000				
1512	0.00026106	0.00025421	0.00000000				
1680	0.00025033	0.00025147	0.00000000				
		sum R^2 =	1.98581E-07				

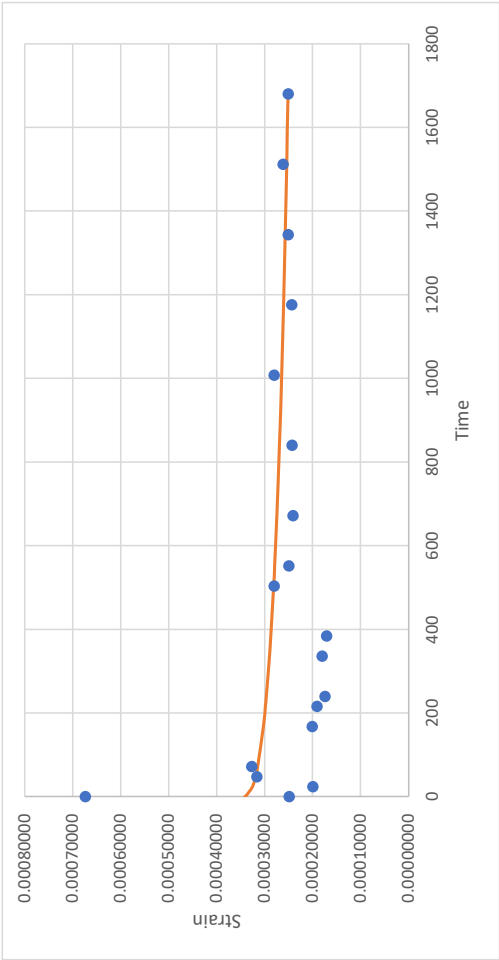
E0
(psi)
5415652.22

E1
(psi)
20075460.00

β
0.50

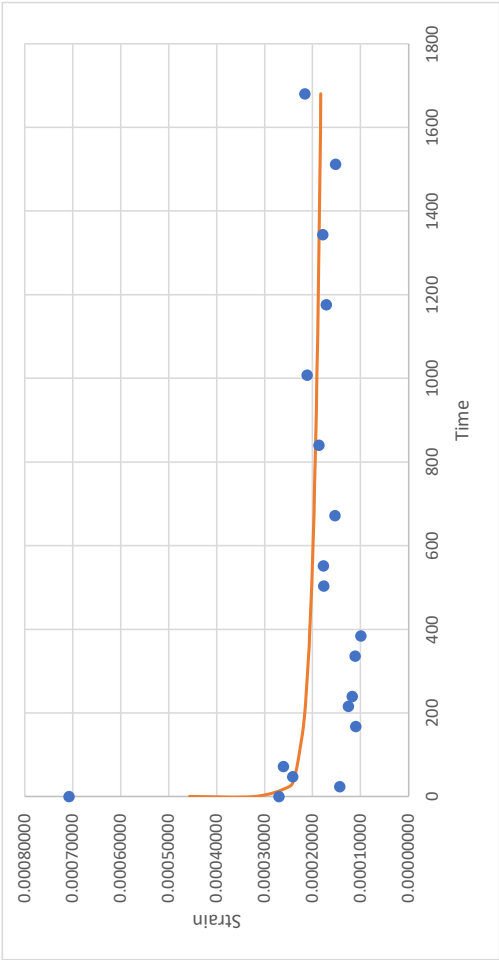
τ
(hrs)
1680

P
(lbs)
-11250



Data Set # 17

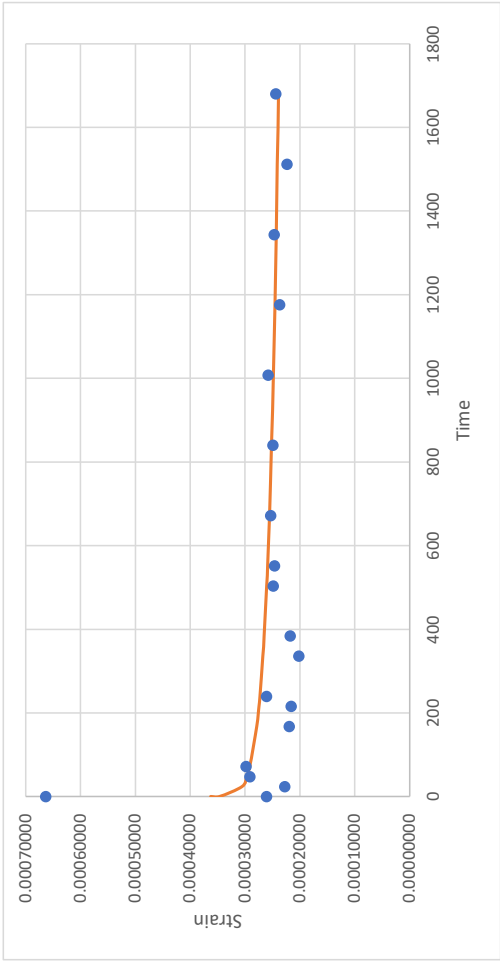
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000251085		7168873.90	6575460.00	0.10	1680	-11250
0	0.00070771	0.00045662					
0.1	0.00027014	0.00032032					
24	0.00014301	0.00024877					
48	0.00024096	0.00023844					
72	0.00026088	0.00023230					
168	0.00010971	0.00021926					
216	0.00012509	0.00021534					
240	0.00011722	0.00021369					
336	0.00011112	0.00020841					
384	0.00009890	0.00020631					
504	0.00017671	0.00020201					
552	0.00017744	0.00020057					
672	0.00015295	0.00019746					
840	0.00018640	0.00019391					
1008	0.00021124	0.00019101					
1176	0.00017106	0.00018856					
1344	0.00017833	0.00018643					
1512	0.00015162	0.00018456					
1680	0.00021591	0.00018288					
		sum R^2 =	1.29202E-07				



Data Set # 18

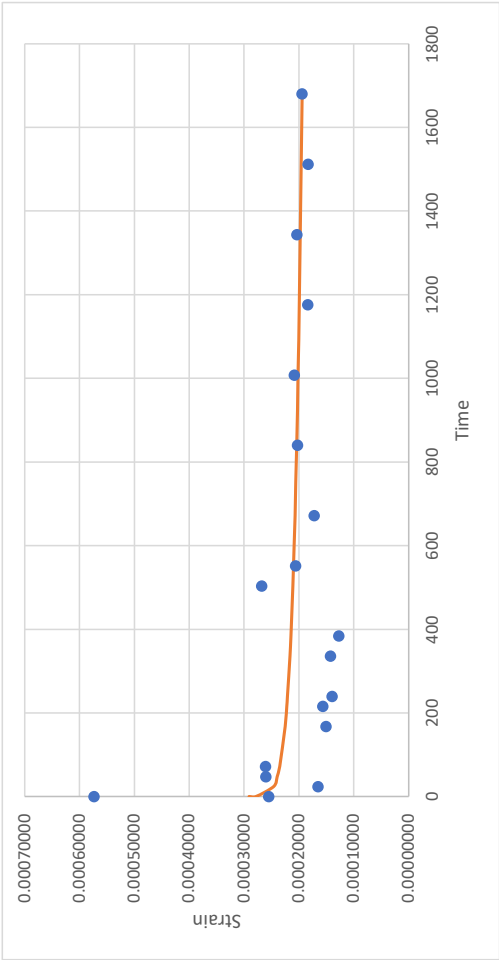
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000300995		5980165.20	14575460.00	0.25	1680	-11250
0	0.00066374	0.00036275	0.00000009				
0.1	0.00026062	0.00034632	0.00000001				
24	0.0002726	0.00030565	0.00000001				
48	0.00029083	0.00029689	0.00000000				
72	0.00029825	0.00029133	0.00000000				
168	0.00021900	0.00027872	0.00000000				
216	0.00021559	0.00027473	0.00000000				
240	0.00026087	0.00027303	0.00000000				
336	0.00020163	0.00026748	0.00000000				
384	0.00021756	0.00026523	0.00000000				
504	0.00024847	0.00026059	0.00000000				
552	0.00024605	0.00025901	0.00000000				
672	0.00025284	0.00025558	0.00000000				
840	0.00024878	0.00025165	0.00000000				
1008	0.00025796	0.00024841	0.00000000				
1176	0.00023654	0.00024565	0.00000000				
1344	0.00024693	0.00024326	0.00000000				
1512	0.00022334	0.00024115	0.00000000				
1680	0.00024392	0.00023925	0.00000000				

sum R^2 = 1.18308E-07



Data Set # 19

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000282436		6373117.87				
0	0.00057362	0.00029118					
0.1	0.00025462	0.00027829					
24	0.00016495	0.00024637					
48	0.00025984	0.00023950					
72	0.00026099	0.00023514					
168	0.00015042	0.00022524					
216	0.00015642	0.00022212					
240	0.00013916	0.00022078					
336	0.00014244	0.00021643					
384	0.00012709	0.00021466					
504	0.00026749	0.00021102					
552	0.00020565	0.00020978					
672	0.00017178	0.00020709					
840	0.00020213	0.00020401					
1008	0.00020822	0.00020146					
1176	0.00018367	0.00019930					
1344	0.00020343	0.00019742					
1512	0.00018296	0.00019576					
1680	0.00019415	0.00019428					
		sum R^2 =	1.20965E-07				



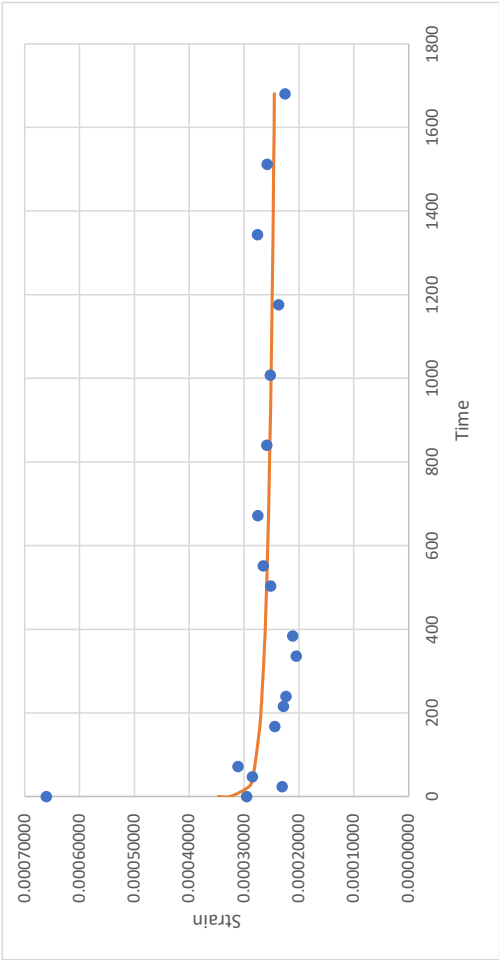
E0 (psi) 6373117.87
E1 (psi) 18575460.00
 β 0.25
 τ (hrs) 1680
P (lbs) -11250

Data Set # 20

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000313541		5740883.46	17575460.00	0.20	1680	-11250
0	0.00066071	0.00034717	0.00000010				
0.1	0.00029500	0.00032560	0.00000000				
24	0.00023037	0.00029080	0.00000000				
48	0.00028460	0.00028430	0.00000000				
72	0.00031075	0.00028027	0.00000000				
168	0.00024399	0.00027136	0.00000000				
216	0.00022809	0.00026860	0.00000000				
240	0.00022335	0.00026743	0.00000000				
336	0.00020475	0.00026364	0.00000000				
384	0.00021127	0.00026211	0.00000000				
504	0.00025160	0.00025898	0.00000000				
552	0.00026479	0.00025792	0.00000000				
672	0.00027471	0.00025562	0.00000000				
840	0.00025814	0.00025299	0.00000000				
1008	0.00025173	0.00025083	0.00000000				
1176	0.00023657	0.00024900	0.00000000				
1344	0.00027505	0.00024741	0.00000000				
1512	0.00025772	0.00024601	0.00000000				
1680	0.00022515	0.00024475	0.00000000				

sum R^2 =

1.14312E-07



Data Set # 21

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000297923		6041828.52				
0	0.00064512	0.00034720					
0.1	0.00028564	0.00031927					
24	0.00019290	0.00027423					
48	0.00025962	0.00026580					
72	0.00027639	0.00026058					
168	0.00018775	0.00024905					
216	0.00017499	0.00024548					
240	0.00016399	0.00024396					
336	0.00015476	0.00023905					
384	0.00014254	0.00023708					
504	0.00021412	0.00023302					
552	0.00021794	0.00023165					
672	0.00021222	0.00022867					
840	0.00022691	0.00022527					
1008	0.00022050	0.00022248					
1176	0.00020221	0.00022011					
1344	0.00022820	0.00021805					
1512	0.00021087	0.00021623					
1680	0.00021267	0.00021461					

sum R^2 =

1.28501E-07

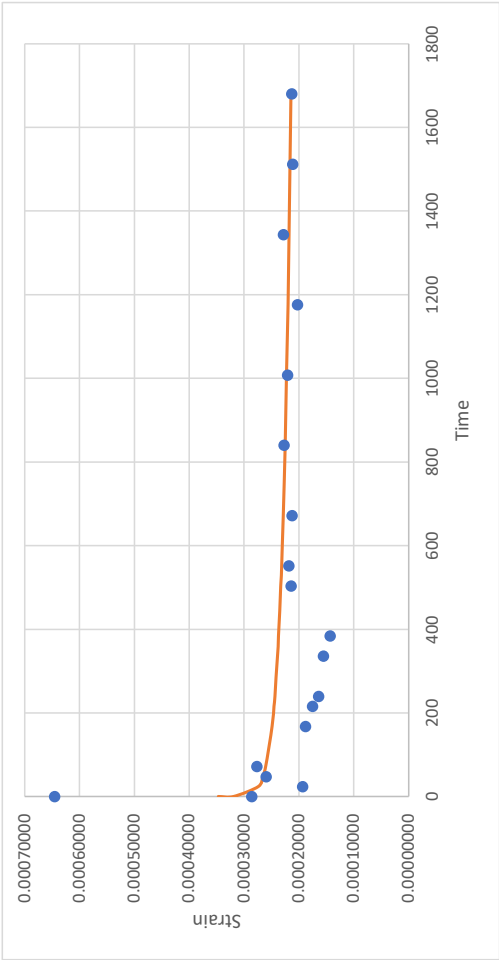
E0
(psi)
6041828.52

E1
(psi)
13575460.00

β
0.20

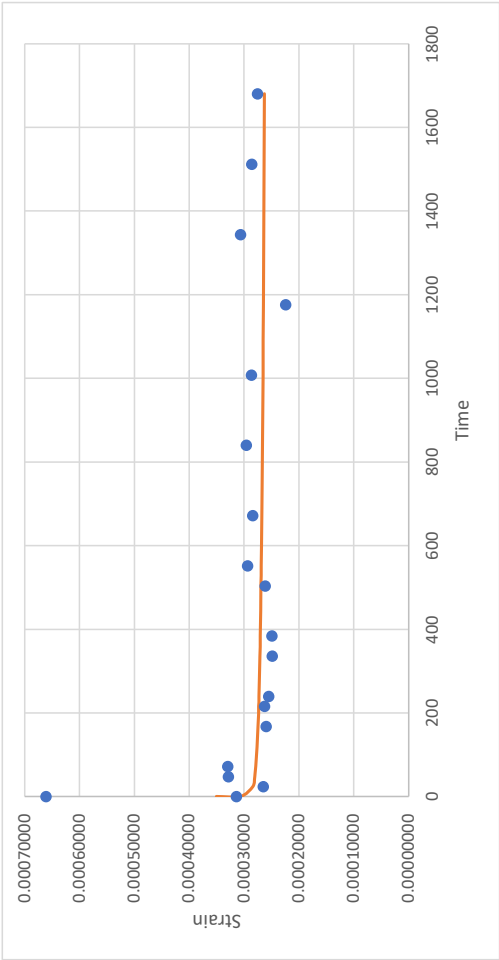
τ
(hrs)
1680

P
(lbs)
-11250



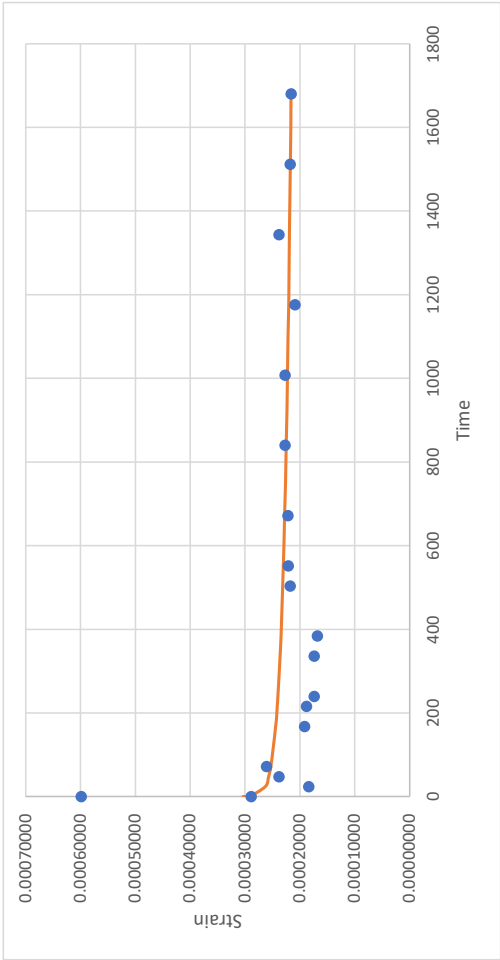
Data Set # 22

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000310515		5796827.33	20575460.00	0.10	1680	-11250
0	0.00066103	0.00035052	0.00000010				
0.1	0.00031393	0.00030696	0.00000000				
24	0.00026492	0.00028409	0.00000000				
48	0.00032854	0.00028079	0.00000000				
72	0.00032969	0.00027883	0.00000000				
168	0.00025977	0.00027466	0.00000000				
216	0.00026264	0.00027341	0.00000000				
240	0.00025477	0.00027288	0.00000000				
336	0.00024867	0.00027119	0.00000000				
384	0.00024895	0.00027052	0.00000000				
504	0.00026116	0.00026915	0.00000000				
552	0.00029311	0.00026869	0.00000000				
672	0.00028426	0.00026769	0.00000000				
840	0.00029584	0.00026656	0.00000000				
1008	0.00028630	0.00026563	0.00000000				
1176	0.00022419	0.00026485	0.00000000				
1344	0.00030651	0.00026417	0.00000000				
1512	0.00028605	0.00026357	0.00000000				
1680	0.00027535	0.00026303	0.00000000				
		sum R^2 =	1.04001E-07				



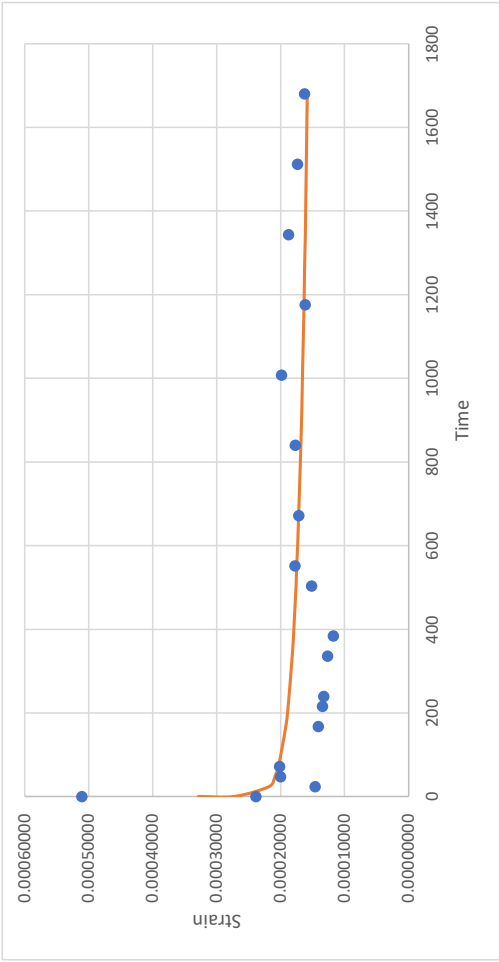
Data Set # 23

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.00029487		6104384.11				
0	0.00059851	0.00030364					
0.1	0.00028893	0.00029201					
24	0.00018366	0.00026319					
48	0.00023791	0.00025699					
72	0.00026094	0.00025305					
168	0.00019103	0.00024411					
216	0.00018764	0.00024129					
240	0.00017352	0.00024009					
336	0.00017367	0.00023615					
384	0.00016770	0.00023456					
504	0.00021742	0.00023127					
552	0.00022123	0.00023016					
672	0.00022177	0.00022773					
840	0.00022709	0.00022494					
1008	0.00022693	0.00022264					
1176	0.00020863	0.00022069					
1344	0.00023776	0.00021900					
1512	0.00021730	0.00021750					
1680	0.00021597	0.00021616					
		sum R^2 =	1.12483E-07				



Data Set # 24

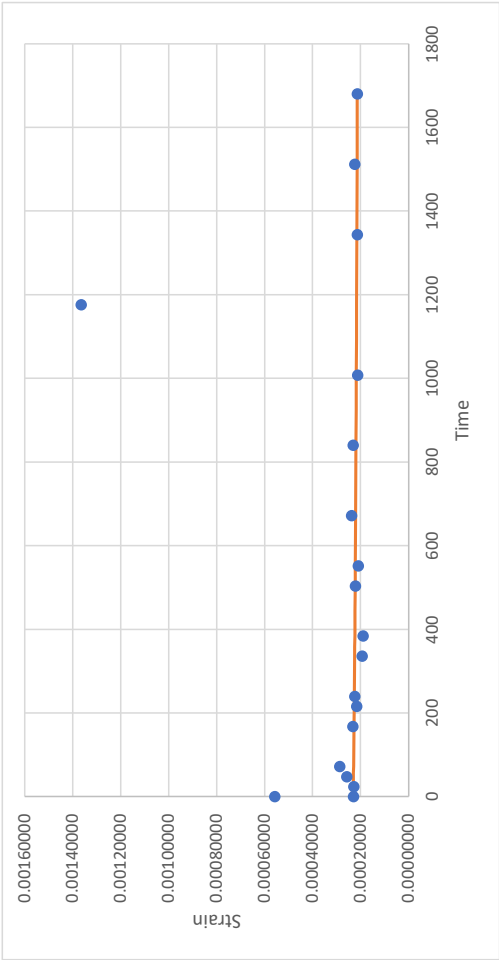
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000182249		9876601.18	10575460.00	0.15	1680	-11250
0	0.00051067	0.00032842	0.000000003				
0.1	0.00023859	0.00027259	0.000000000				
24	0.00014587	0.00021785	0.000000001				
48	0.00020011	0.00020891	0.000000000				
72	0.00020127	0.00020351	0.000000000				
168	0.00014073	0.00019181	0.000000000				
216	0.00013422	0.00018825	0.000000000				
240	0.00013260	0.00018675	0.000000000				
336	0.00012650	0.00018191	0.000000000				
384	0.00011739	0.00017997	0.000000000				
504	0.00015148	0.00017601	0.000000000				
552	0.00017718	0.00017468	0.000000000				
672	0.00017144	0.00017179	0.000000000				
840	0.00017678	0.00016849	0.000000000				
1008	0.00019851	0.00016580	0.000000000				
1176	0.00016143	0.00016351	0.000000000				
1344	0.00018745	0.00016153	0.000000000				
1512	0.00017321	0.00015978	0.000000000				
1680	0.00016252	0.00015821	0.000000000				
		sum R^2 =	5.56891E-08				



Data Set # 25

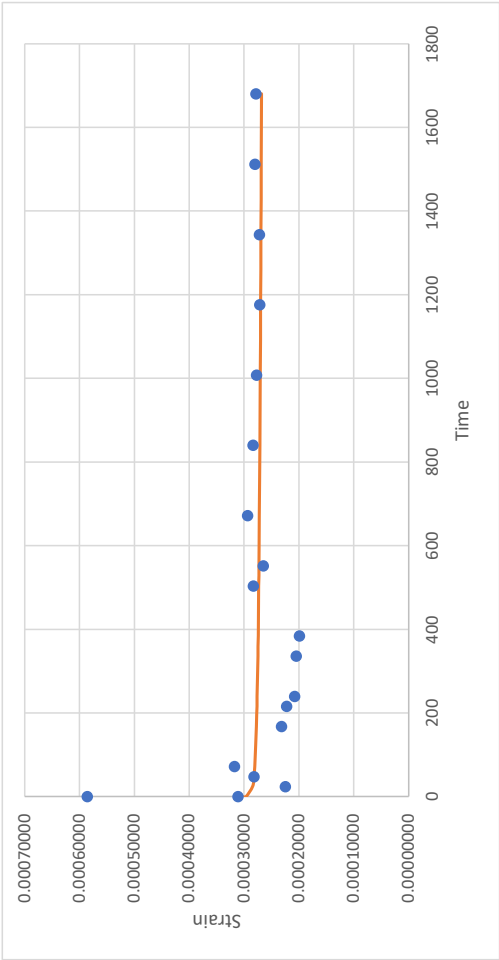
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000326047		5520677.57	100575460.00	0.80	1680	-11250
0	0.00055762	0.00023158	0.00000011				
0.1	0.00022937	0.00023157	0.00000000				
24	0.00022728	0.00023065	0.00000000				
48	0.00025648	0.00022998	0.00000000				
72	0.00028575	0.00022939	0.00000000				
168	0.00023151	0.00022743	0.00000000				
216	0.00021561	0.00022659	0.00000000				
240	0.00022338	0.00022620	0.00000000				
336	0.00019225	0.00022475	0.00000000				
384	0.00018942	0.00022409	0.00000000				
504	0.00022035	0.00022259	0.00000000				
552	0.00020853	0.00022204	0.00000000				
672	0.00023721	0.00022078	0.00000000				
840	0.00023002	0.00021921	0.00000000				
1008	0.00021109	0.00021783	0.00000000				
1176	0.00136449	0.00021661	0.00000132				
1344	0.00021254	0.00021553	0.00000000				
1512	0.00022333	0.00021456	0.00000000				
1680	0.00021264	0.00021368	0.00000000				

sum R^2 = 1.12794E-07



Data Set # 26

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000316664		5684258.08				
0	0.00058590	0.00030395	0.00000008				
0.1	0.00031075	0.00029646	0.00000000				
24	0.00022424	0.00028437	0.00000000				
48	0.00028159	0.00028211	0.00000000				
72	0.00031712	0.00028071	0.00000000				
168	0.00023160	0.00027761	0.00000000				
216	0.00022197	0.00027665	0.00000000				
240	0.00020784	0.00027624	0.00000000				
336	0.00020487	0.00027493	0.00000000				
384	0.00019890	0.00027440	0.00000001				
504	0.00028300	0.00027331	0.00000000				
552	0.00026492	0.00027294	0.00000000				
672	0.00029360	0.00027214	0.00000000				
840	0.00028328	0.00027123	0.00000000				
1008	0.00027686	0.00027048	0.00000000				
1176	0.00027108	0.00026984	0.00000000				
1344	0.00027206	0.00026929	0.00000000				
1512	0.00027974	0.00026880	0.00000000				
1680	0.00027842	0.00026836	0.00000000				
		sum R^2 =	1.05191E-07				



E0 (psi)	6384258.08	E1 (psi)	50575460.00	β	0.20	τ (hrs)	1680	P (lbs)	-11250

Test Sample: Normal Strength f'c desired: 6 ksi Load Applied: 15000 lbs
Load Applied: 40% f'c measured: 5.6 ksi

		AVERAGE STRAINS - NSC 0.40f'c RECOVERY TEST															
Date		2/15/2022	2/15/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/10/2022	3/11/2022	3/15/2022	3/22/2022	3/29/2022	4/5/2022
Time		4:00:00 AM	4:00:00 AM	10:00:00 PM	10:00:00 PM	11:00:00 PM	2:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM
Relative Humidity		49.7	50	50.3	50.3	50.3	50.3	50	50.1	50.1	50.1	50.1	50.1	50.1	50	50	50
Air Temp		23.0	23.0	22.9	22.9	22.9	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Notes		Initial Loading	0	0.1	1	3	24	48	72	168	336	504	672				
Point of Measure	1	0.00000000	0.00074078	0.00099086	0.00039692	0.00039379	0.00039535	0.00036253	0.00035940	0.00037347	0.00036878	0.00040006	0.00040317	0.00036877			
	2	0.00000000	0.00057072	0.00070051	0.00020642	0.00020173	0.00020329	0.00017828	0.00017515	0.00018766	0.00017046	0.00086169	0.00018923	0.00016577			
	3	0.00000000	0.00048556	0.00067938	0.00016463	0.00015421	0.00016046	0.00013546	0.00013546	0.00015213	0.00013754	0.00042717	0.00016256	0.00013546			
	4	0.00000000	0.00054414	0.00065201	0.00011883	0.00011570	0.00010788	0.00008130	0.00007348	0.00008912	0.00008756	0.00007818	0.00009851	0.00007192			
	5	0.00000000	0.00057053	0.00074718	0.00024384	0.00023289	0.00022820	0.00020632	0.00020006	0.00021257	0.00020319	0.00020163	0.00020476	0.00019850			
	6	0.00000000	0.00053485	0.00070373	0.00015640	0.00015327	0.00015170	0.00012981	0.00012825	0.00014232	0.00013294	0.00013763	0.00013919	0.00016474			
	7	0.00000000	0.00050189	0.00068484	0.00014228	0.00017928	0.00013446	0.00014801	0.00013967	0.00015635	0.00013967	0.00016260	0.00016052	0.00013133			
	8	0.00000000	0.00052066	0.00071142	0.00014071	0.00013602	0.00013758	0.00014800	0.00013549	0.00011413	0.00013966	0.00014851	0.00011100	0.00009849			
	9	0.00000000	0.00050968	0.00063008	0.00009536	0.00009223	0.00009067	0.00006409	0.00008337	0.00007816	0.00006565	0.00008285	0.00007973	0.00006096			
	10	0.00000000	0.00052066	0.00065670	0.00013135	0.00012040	0.00012353	0.00009852	0.00009070	0.00010946	0.00009226	0.00011259	0.00009851	0.00009070			
	11	0.00000000	0.00051440	0.00072543	0.00013758	0.00013758	0.00013758	0.00009694	0.00012925	0.00010788	0.00009693	0.00010318	0.00012194	0.00009068			
	12	0.00000000	0.00053616	0.00066903	0.00012192	0.00013338	0.00012712	0.00010212	0.00008753	0.00010420	0.00009170	0.00009378	0.00010211	0.00007919			
	13	0.00000000	0.00053312	0.00065973	0.00015006	0.00015631	0.00015006	0.00011880	0.00010838	0.00013131	0.00011672	0.00011255	0.00012296	0.00010838			
	14	0.00000000	0.00057829	0.00071427	0.00015786	0.00015942	0.00015005	0.00012035	0.00011097	0.00012348	0.00011566	0.00012973	0.00013754	0.00010316			
	15	0.00000000	0.00052368	0.00079414	0.00019386	0.00019699	0.00019855	0.00016728	0.00015634	0.00017354	0.00016259	0.00014227	0.00016415	0.00015478			
	16	0.00000000	0.00048557	0.00076066	0.00020009	0.00020009	0.00013131	0.00015632	0.00017508	0.00018133	0.00017820	0.00016882	0.00016882	0.00016882			
	17	0.00000000	0.00058456	0.00080649	0.00013285	0.00013911	0.00012504	0.00009222	0.00008596	0.00009847	0.00009221	0.00010003	0.00010941	0.00007502			
	18	0.00000000	0.00060324	0.00083460	0.00013753	0.00013753	0.00012659	0.00009689	0.00009220	0.00010158	0.00009376	0.00010002	0.00010002	0.00011460			
	19	0.00000000	0.00058139	0.00071110	0.00016565	0.00016252	0.00015471	0.00012814	0.00015627	0.00013283	0.00016252	0.00016668	0.00012658	0.00015418			
	20	0.00000000	0.00059092	0.00082382	0.00022666	0.00022510	0.00021884	0.00019070	0.00018132	0.00019696	0.00018445	0.00017038	0.00018132	0.00017351			
	21	0.00000000	0.00058750	0.00081406	0.00021560	0.00021091	0.00020779	0.00023955	0.00023955	0.00024997	0.00023539	0.00110030	0.00024997	0.00022914			
	22	0.00000000	0.00057054	0.00072995	0.00015476	0.00014537	0.00014850	0.00011255	0.00010473	0.00012036	0.00010942	0.00010942	0.00013911	0.00010317			
	23	0.00000000	0.00059546	0.00073768	0.00017815	0.00016721	0.00016409	0.00012970	0.00012658	0.00013908	0.00012658	0.00013908	0.00013595	0.00012345			
	24	0.00000000	0.00051681	0.00073356	0.00018546	0.00018546	0.00018130	0.00015837	0.00015212	0.00017087	0.00016046	0.00017713	0.00018755	0.00014378			
	25	0.00000000	0.00069408	0.00083948	0.00025949	0.00026575	0.00025793	0.00022354	0.00021729	0.00023761	0.00022823	0.00024074	0.00024855	0.00021885			
	26	0.00000000	0.00065191	0.00078011	0.00023136	0.00023293	0.00022667	0.00020010	0.00018915	0.00020948	0.00019697	0.00018602	0.00020323	0.00018603			

Test Sample: Normal Strength f'c desired: 6 ksi Load Applied: 15000 lbs
Load Applied: 40% f'c measured: 5.2 ksi

TOTAL STRAIN MINUS SHRINKAGE STRAIN													
Date	2/15/2022	2/15/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/10/2022	3/11/2022	3/15/2022	3/22/2022	3/29/2022	4/5/2022
Time	4:00:00 AM	4:00:00 AM	10:00:00 PM	10:00:00 PM	11:00:00 PM	2:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM
Relative Humidity	49.7	50	50.3	50.3	50.3	50.3	50	50.1	50.1	50.1	50	50	50
Air Temp	23.0	23.0	22.9	22.9	22.9	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0
Notes	Initial Loading												
Point of Measure	1	0.00000000	0.00073560	0.00099086	0.00039691	0.00039397	0.00039508	0.00036041	0.00035523	0.00036732	0.00035526	0.00037544	0.00036914
	2	0.00000000	0.00056554	0.00070051	0.00020641	0.00020164	0.00020302	0.00017616	0.00017098	0.00018151	0.00015694	0.00083708	0.0001552
	3	0.00000000	0.00048039	0.00067938	0.00016462	0.00015412	0.0001602	0.00013334	0.00013129	0.00014598	0.00012403	0.00040256	0.00012853
	4	0.00000000	0.00053897	0.00065201	0.00011882	0.00011561	0.00010761	7.9184E-05	6.9317E-05	8.2968E-05	7.4045E-05	5.3563E-05	6.4477E-05
	5	0.00000000	0.00056536	0.00074718	0.00024383	0.0002328	0.00022793	0.0002042	0.0001959	0.00020642	0.00018968	0.00017701	0.00015632
	6	0.00000000	0.00052968	0.00070373	0.00015639	0.00015318	0.00015144	0.00012769	0.00012408	0.00013617	0.00011942	0.00011301	0.00012256
	7	0.00000000	0.00049672	0.00068484	0.00014227	0.00017919	0.00013419	0.00014589	0.00013551	0.0001502	0.00012616	0.00013798	0.00012649
	8	0.00000000	0.00051549	0.00071142	0.0001407	0.00013593	0.00013731	0.00014588	0.00013132	0.00010798	0.00012615	0.00012389	7.6972E-05
	9	0.00000000	0.00050451	0.00063008	9.5352E-05	9.2144E-05	9.0402E-05	6.1973E-05	7.9202E-05	7.201E-05	5.2139E-05	5.8237E-05	4.5697E-05
	10	0.00000000	0.00051549	0.0006567	0.00013134	0.00012031	0.00012326	9.6397E-05	8.6531E-05	0.00010331	7.8748E-05	8.7969E-05	6.4478E-05
	11	0.00000000	0.00050923	0.00072543	0.00013757	0.00013749	0.00013732	9.482E-05	0.00012508	0.00010172	8.3417E-05	7.8563E-05	6.891E-05
	12	0.00000000	0.00053099	0.00066903	0.00012191	0.00013329	0.00012686	9.9997E-05	8.336E-05	9.8048E-05	6.9162E-05	6.8085E-05	3.7005E-05
	13	0.00000000	0.00052795	0.00065973	0.00015005	0.00015622	0.00014979	0.00011668	0.00010421	0.00012515	0.0001032	8.7928E-05	6.8933E-05
	14	0.00000000	0.00057312	0.00071427	0.00015785	0.00015933	0.00014978	0.00011823	0.00010681	0.00011733	0.00010215	0.00010511	0.00010351
	15	0.00000000	0.00051851	0.00079414	0.00019385	0.0001969	0.00019828	0.00016516	0.00015217	0.00016738	0.00014908	0.00011765	0.00013013
	16	0.00000000	0.00048040	0.00076066	0.00020008	0.0002	0.00013104	0.0001542	0.00017091	0.00017518	0.00016469	0.0001442	0.00013479
	17	0.00000000	0.00057938	0.00080649	0.00013285	0.00013902	0.00012477	9.0097E-05	8.1797E-05	9.2316E-05	7.8701E-05	7.5412E-05	7.5377E-05
	18	0.00000000	0.00059807	0.0008346	0.00013752	0.00013744	0.00012632	9.4774E-05	8.8036E-05	9.5429E-05	8.025E-05	7.5402E-05	6.5991E-05
	19	0.00000000	0.00057621	0.0007111	0.00016564	0.00016243	0.00015444	0.00012602	0.00015211	0.00012668	0.00014901	0.00014206	9.2547E-05
	20	0.00000000	0.00058575	0.00082382	0.00022665	0.00022501	0.00021857	0.00018859	0.00017716	0.00019081	0.00017094	0.00014576	0.00014729
	21	0.00000000	0.00058233	0.00081406	0.00021559	0.00021082	0.00020752	0.00023743	0.00023538	0.00024382	0.00022187	0.000107568	0.00021594
	22	0.00000000	0.00056537	0.00072995	0.00015475	0.00014528	0.00014823	0.00011043	0.00010056	0.00011421	9.5906E-05	8.4805E-05	0.00010508
	23	0.00000000	0.00059029	0.00073768	0.00017814	0.00016712	0.00016382	0.00012758	0.00012241	0.00013293	0.00011306	0.00011446	0.00010192
	24	0.00000000	0.00051164	0.00073356	0.00018545	0.00018537	0.00018103	0.00015625	0.00014795	0.00016472	0.00014694	0.00015252	0.00015352
	25	0.00000000	0.00068891	0.00083948	0.00025949	0.00026566	0.00025766	0.00022142	0.00021312	0.00023146	0.00021471	0.00021612	0.00021452
	26	0.00000000	0.00064673	0.00078011	0.00023135	0.00023284	0.0002264	0.00019798	0.00018499	0.00020333	0.00018346	0.00016141	0.0001692
FIT DATA													
Standard Deviation			7.2095E-05	5.6174E-05	5.2557E-05	5.42E-05	5.9118E-05	5.8475E-05	5.5777E-05	5.7652E-05	0.00024315	6.0673E-05	6.7421E-05
High Deviation				0.00030458	0.00028894	0.00028649	0.00028153	0.00027401	0.00026467	0.00025944	0.00062244	0.00025258	0.00026252
Low Deviation				7.9886E-05	7.8707E-05	6.9693E-05	4.5058E-05	4.0114E-05	4.1556E-05	2.8829E-05	-0.00035016	9.888E-06	-7.1681E-06

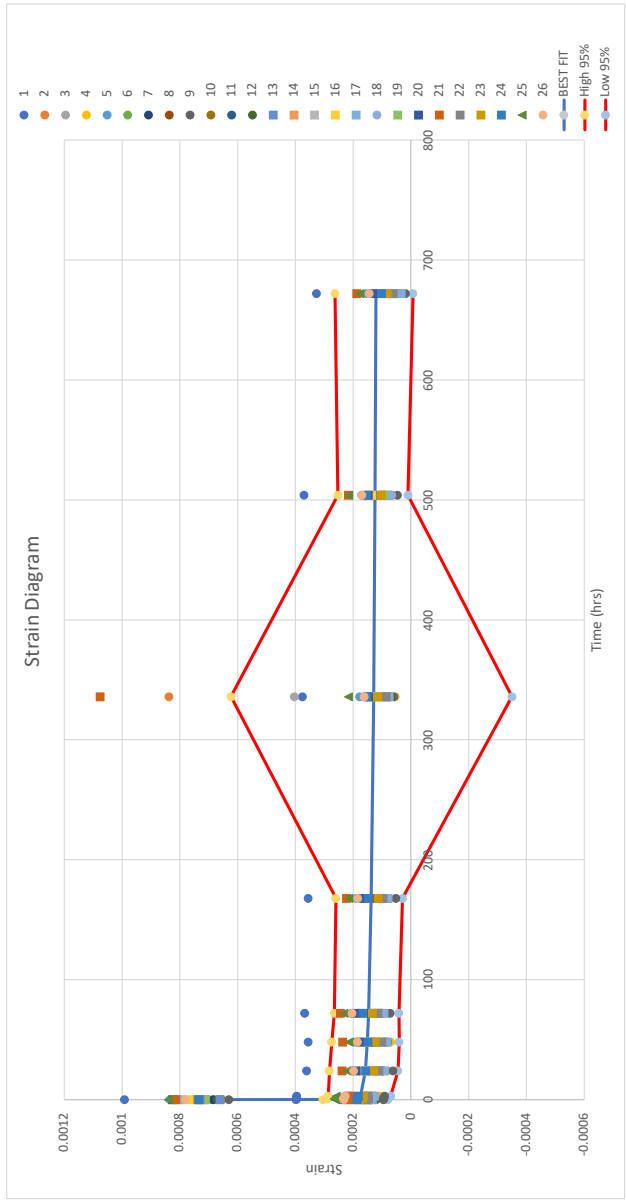
ε sh,u α V/S σ
0.00050296 0.47074074 0.625 32.5603906

Shrinkage Strain	0	0.1	627	627.1	628	630	651	675	699	795	963	1131	1299
	0	5.1715E-06	0.0001957	0.00019571	0.00019579	0.00019597	0.00019782	0.00019987	0.00020186	0.00020922	0.00022032	0.00022973	0.00023789

time (hr)	strain μ
0	0.00074195
0.1	0.00019020
1	0.00018052
3	0.00017403
24	0.00015765
48	0.00015094
72	0.00014674
168	0.00013739
336	0.00012929
504	0.00012443
672	0.00012096

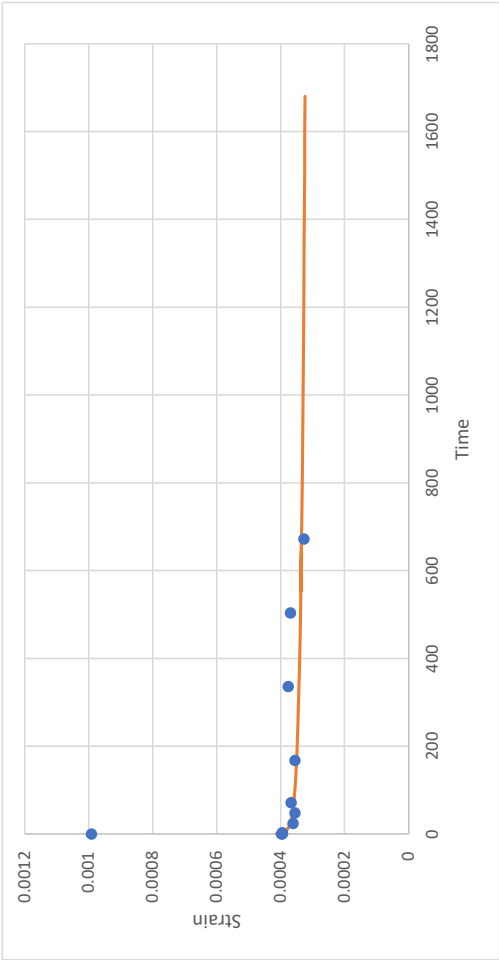
Copy and Transpose Data

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
4460694.59	28929896.43	0.25	672.00	-15000.00



Data Set # 1

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000735604		3262624.28				
0	0.000990857	0.00041430	0.000000033				
0.1	0.000396906	0.00040110	0.000000000				
1	0.000393699	0.00039179	0.000000000				
3	0.000395082	0.00038554	0.000000000				
24	0.000360408	0.00036979	0.000000000				
48	0.000355233	0.00036334	0.000000000				
72	0.000367317	0.00035930	0.000000000				
168	0.000355262	0.00035030	0.000000000				
336	0.000375438	0.00034251	0.000000000				
504	0.000369137	0.00033784	0.000000000				
672	0.000326588	0.00033450	0.000000000				
552		0.00033678					
672		0.00033450					
840		0.00033191					
1008		0.00032980					
1176		0.00032802					
1344		0.00032649					
1512		0.00032515					
1680		0.00032396					
		sum R^2 =		3.34902E-07			



Data Set # 2

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000565544		4243704.01				
0	0.00070051	0.00020502					
0.1	0.00020641	0.00019860					
1	0.00020164	0.00019265					
3	0.00020302	0.00018827					
24	0.00017616	0.00017621					
48	0.00017098	0.00017093					
72	0.00018151	0.00016755					
168	0.00015694	0.00015982					
336	0.00083708	0.00015298					
504	0.00015520	0.00014884					
672	0.00012358	0.00014587					
552		0.00014790					
672		0.00014587					
840		0.00014357					
1008		0.00014170					
1176		0.00014012					
1344		0.00013877					
1512		0.00013759					
1680		0.00013654					
		sum R^2 =	2.46609E-07				

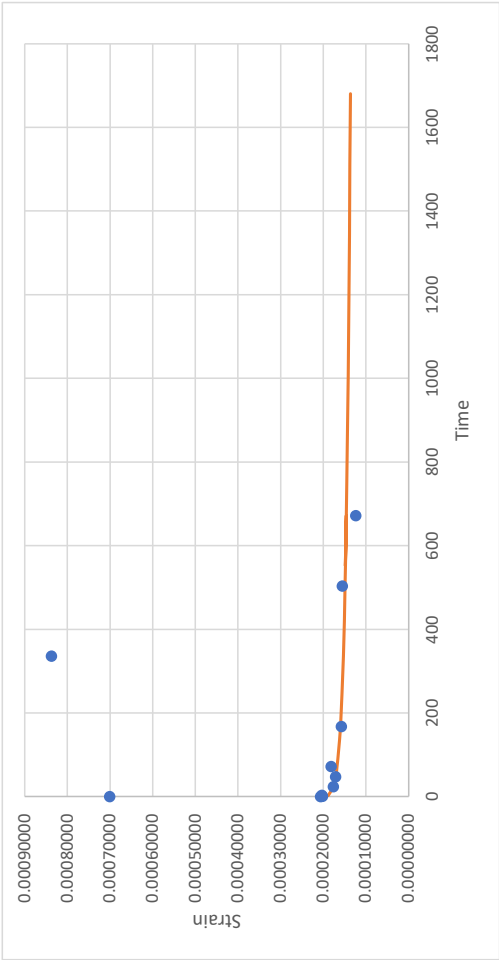
E0 (psi) 4843704.01

E1 (psi) 40575460.00

β 0.30

τ (hrs) 672

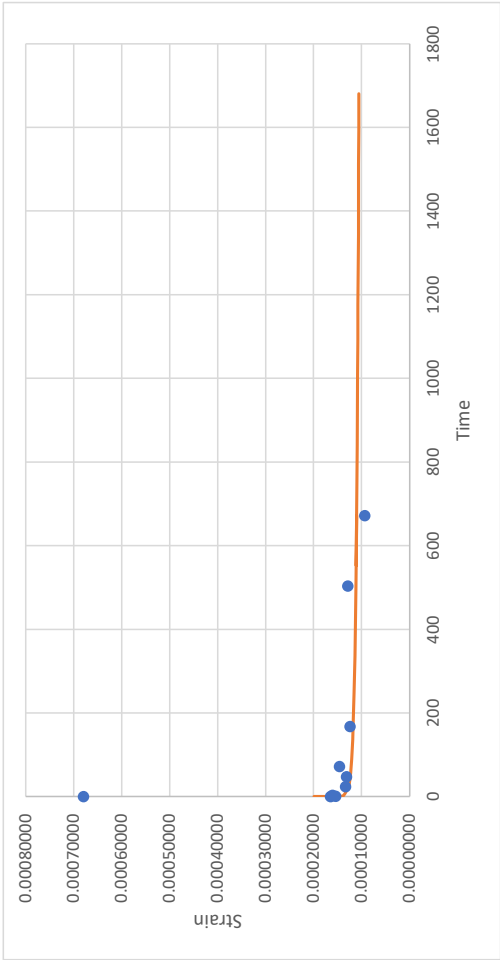
P (lbs) -15000



Data Set # 3

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000480388		4995959.81	27075460.00	0.10	672	-15000
0	0.00067938	0.00019899	0.00000023				
0.1	0.00016462	0.00015143	0.00000000				
1	0.00015412	0.00014200	0.00000000				
3	0.00016020	0.00013711	0.00000000				
24	0.00013334	0.00012725	0.00000000				
48	0.00013129	0.00012382	0.00000000				
72	0.00014598	0.00012178	0.00000000				
168	0.00012403	0.00011748	0.00000000				
336		0.00011392					
504	0.00012853	0.00011183	0.00000000				
672	0.00009327	0.00011035	0.00000000				
552		0.00011136					
672		0.00011035					
840		0.00010920					
1008		0.00010826					
1176		0.00010746					
1344		0.00010677					
1512		0.00010617					
1680		0.00010563					

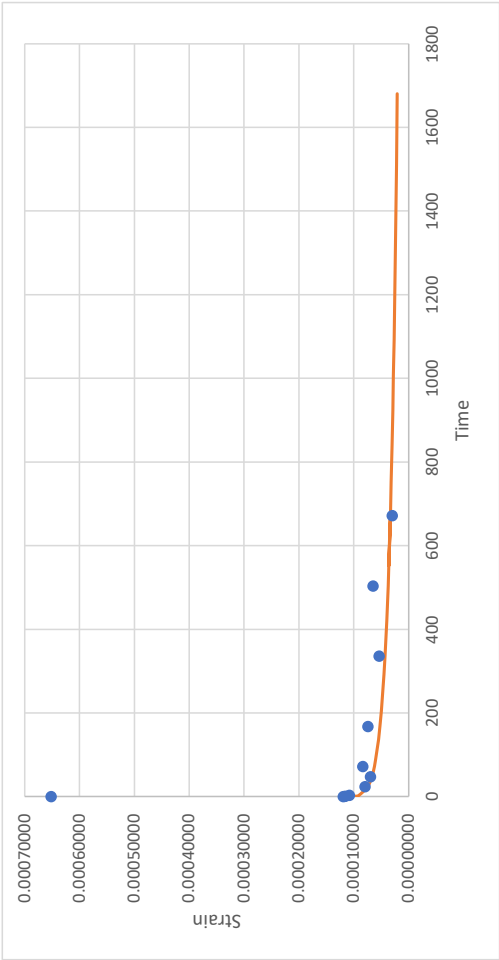
sum R^2 = 2.32918E-07



Data Set # 4

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000538969		4452949.60	30075460.00	0.30	672	-15000
0	0.00065201	0.00011304	0.00000029				
0.1	0.00011882	0.00010438	0.00000000				
1	0.00011561	0.00009635	0.00000000				
3	0.00010761	0.00009045	0.00000000				
24	0.00007918	0.00007418	0.00000000				
48	0.00006932	0.00006705	0.00000000				
72	0.00008297	0.00006248	0.00000000				
168	0.00007404	0.00005207	0.00000000				
336	0.00005356	0.00004284	0.00000000				
504	0.00006448	0.00003725	0.00000000				
672	0.00002974	0.00003325	0.00000000				
552		0.00003598					
672		0.00003325					
840		0.00003014					
1008		0.00002761					
1176		0.00002549					
1344		0.00002366					
1512		0.00002206					
1680		0.00002065					

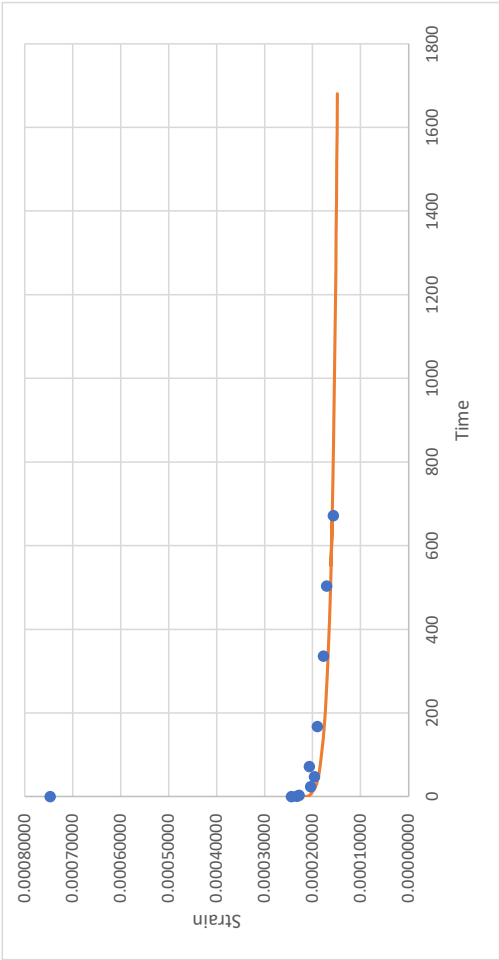
sum R^2 = 2.93163E-07



Data Set # 5

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000565359		4245086.84	40075460.00	0.35	672	-15000
0	0.00074718	0.00021914					
0.1	0.00024383	0.00021490					
1	0.00023280	0.00020992					
3	0.00022793	0.00020591					
24	0.00020420	0.00019378					
48	0.00019590	0.00018809					
72	0.00020642	0.00018435					
168	0.00018968	0.00017559					
336	0.00017701	0.00016763					
504	0.00017073	0.00016276					
672	0.00015632	0.00015925					
552		0.00016165					
672		0.00015925					
840		0.00015653					
1008		0.00015432					
1176		0.00015247					
1344		0.00015088					
1512		0.00014950					
1680		0.00014828					

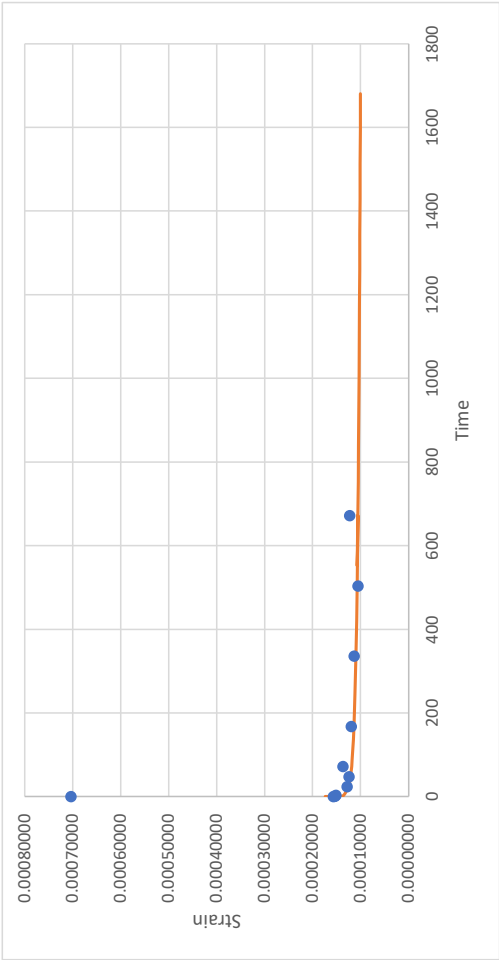
sum R^2 = 2.8169E-07



Data Set # 6

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000529675		4531080.03	35075460.00	0.15	672	-15000
0	0.00070373	0.00017406	0.00000028				
0.1	0.00015639	0.00014873	0.00000000				
1	0.00015318	0.00014009	0.00000000				
3	0.00015144	0.00013524	0.00000000				
24	0.00012769	0.00012483	0.00000000				
48	0.00012408	0.00012103	0.00000000				
72	0.00013617	0.00011875	0.00000000				
168	0.00011942	0.00011386	0.00000000				
336	0.00011301	0.00010977	0.00000000				
504	0.00010516	0.00010735	0.00000000				
672	0.00012256	0.00010563	0.00000000				
552		0.00010681					
672		0.00010563					
840		0.00010430					
1008		0.00010321					
1176		0.00010230					
1344		0.00010150					
1512		0.00010080					
1680		0.00010018					

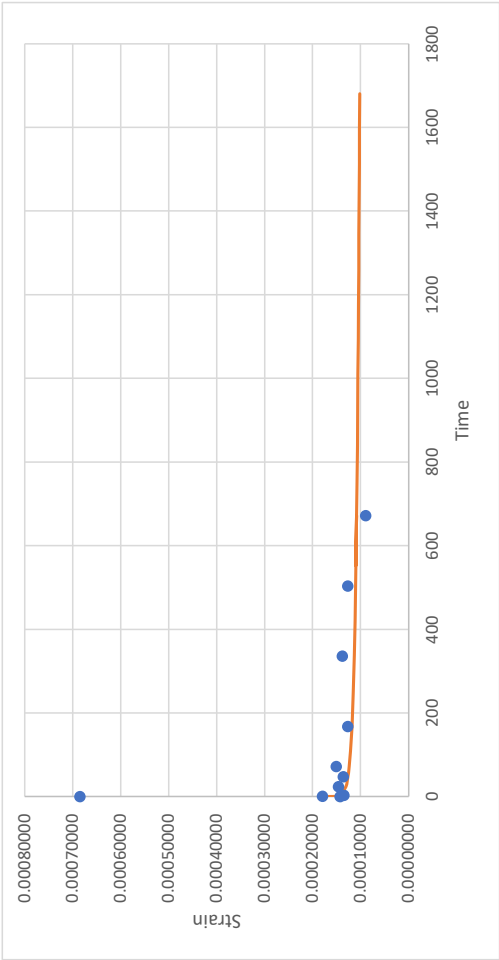
sum R^2 = 2.81702E-07



Data Set # 7

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.00049672		4831694.98	30075460.00	0.15	672	-15000
0	0.00068484	0.00018812	0.00000025				
0.1	0.00014227	0.00015858	0.00000000				
1	0.00017919	0.00014851	0.00000000				
3	0.00013419	0.00014286	0.00000000				
24	0.00014589	0.00013071	0.00000000				
48	0.00013551	0.00012628	0.00000000				
72	0.00015020	0.00012362	0.00000000				
168	0.00012616	0.00011792	0.00000000				
336	0.00013798	0.00011314	0.00000000				
504	0.00012649	0.00011033	0.00000000				
672	0.00008915	0.00010832	0.00000000				
552		0.00010969					
672		0.00010832					
840		0.00010677					
1008		0.00010550					
1176		0.00010443					
1344		0.00010350					
1512		0.00010269					
1680		0.00010196					

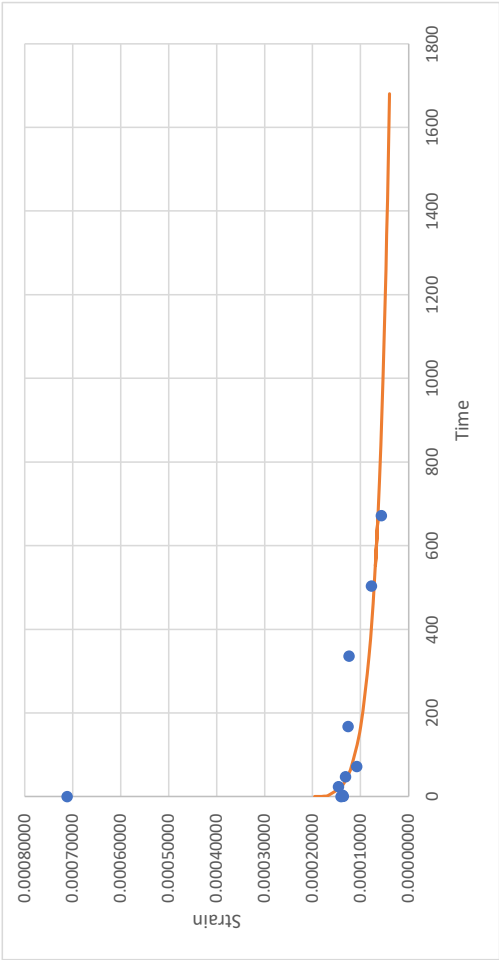
sum R^2 = 2.50349E-07



Data Set # 8

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000515485		4655809.28	18175460.00	0.35	672	-15000
0	0.00071142	0.00019593	0.00000027				
0.1	0.00014070	0.00018659	0.00000000				
1	0.00013593	0.00017560	0.00000000				
3	0.00013731	0.00016675	0.00000000				
24	0.00014588	0.00014002	0.00000000				
48	0.00013132	0.00012748	0.00000000				
72	0.00010798	0.00011923	0.00000000				
168	0.00012615	0.00009991	0.00000000				
336	0.00012389	0.00008236	0.00000000				
504	0.00007697	0.00007161	0.00000000				
672	0.00005631	0.00006389	0.00000000				
552		0.00006917					
672		0.00006389					
840		0.00005789					
1008		0.00005302					
1176		0.00004894					
1344		0.00004544					
1512		0.00004239					
1680		0.00003969					

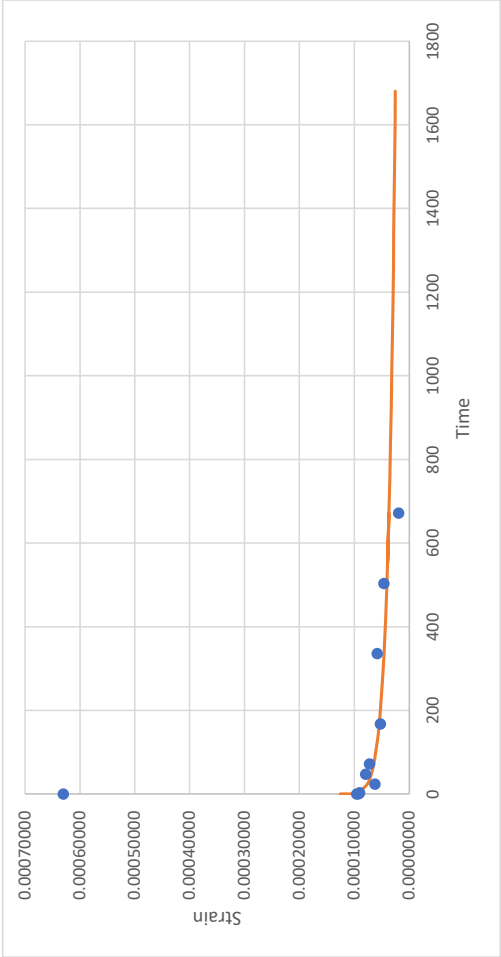
sum R^2 = 2.72947E-07



Data Set # 9

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000504507		4757118.11	27075460.00	0.25	672	-15000
0	0.00063008	0.00012557					
0.1	0.00009535	0.00011090					
1	0.00009214	0.00010056					
3	0.00009040	0.00009363					
24	0.00006197	0.00007613					
48	0.00007920	0.00006896					
72	0.00007201	0.00006447					
168	0.00005214	0.00005448					
336	0.00005824	0.00004582					
504	0.00004570	0.00004063					
672	0.00001878	0.00003693					
552		0.00003946					
672		0.00003693					
840		0.00003405					
1008		0.00003171					
1176		0.00002973					
1344		0.00002803					
1512		0.00002654					
1680		0.00002522					

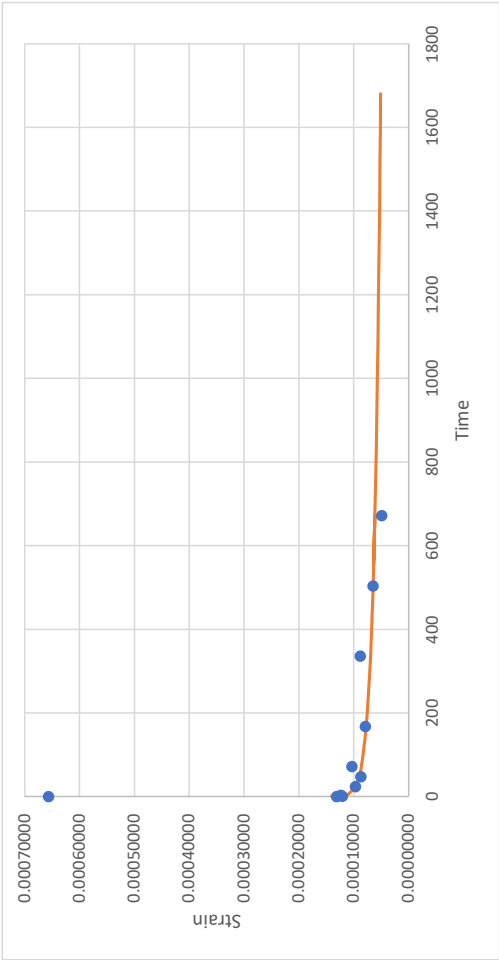
sum R^2 = 2.55727E-07



Data Set # 10

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000515492		4655748.48	30075460.00	0.25	672	-15000
0	0.00065670	0.00014121	0.00000027				
0.1	0.00013134	0.00012801	0.00000000				
1	0.00012031	0.00011870	0.00000000				
3	0.00012326	0.00011246	0.00000000				
24	0.00009640	0.00009670	0.00000000				
48	0.00008653	0.00009025	0.00000000				
72	0.00010331	0.00008621	0.00000000				
168	0.00007875	0.00007722	0.00000000				
336	0.00008797	0.00006942	0.00000000				
504	0.00006448	0.00006475	0.00000000				
672	0.00004851	0.00006141	0.00000000				
552		0.00006369					
672		0.00006141					
840		0.00005882					
1008		0.00005671					
1176		0.00005494					
1344		0.00005341					
1512		0.00005206					
1680		0.00005087					

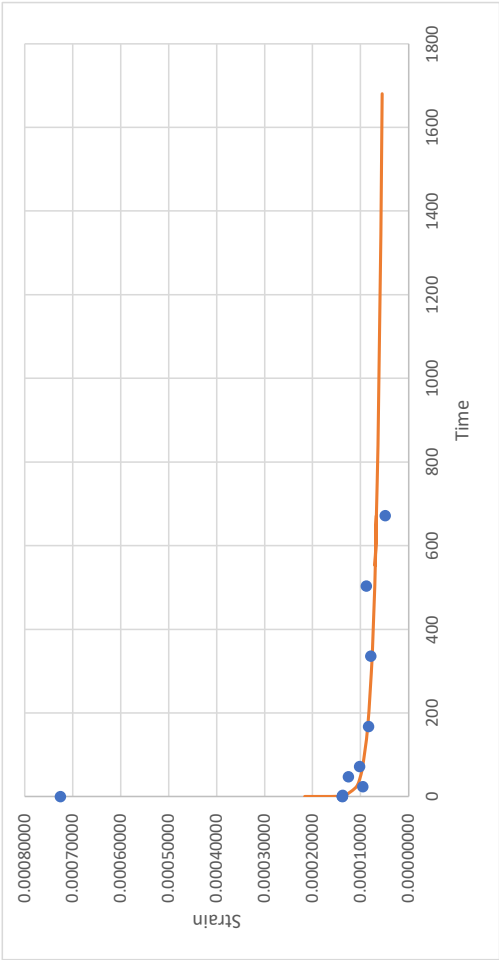
sum R^2 = 2.66681E-07



Data Set # 11

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000509229		4713010.21	16075460.00	0.15	672	-15000
0	0.00072543	0.00021620	0.000000026				
0.1	0.00013757	0.00016092	0.000000000				
1	0.00013749	0.00014208	0.000000000				
3	0.00013732	0.00013151	0.000000000				
24	0.00009482	0.00010878	0.000000000				
48	0.00012508	0.00010050	0.000000000				
72	0.00010172	0.00009552	0.000000000				
168	0.00008342	0.00008485	0.000000000				
336	0.00007856	0.00007592	0.000000000				
504	0.00008791	0.00007065	0.000000000				
672	0.00004849	0.00006690	0.000000000				
552		0.00006947					
672		0.00006690					
840		0.00006399					
1008		0.00006162					
1176		0.00005962					
1344		0.00005788					
1512		0.00005636					
1680		0.00005500					

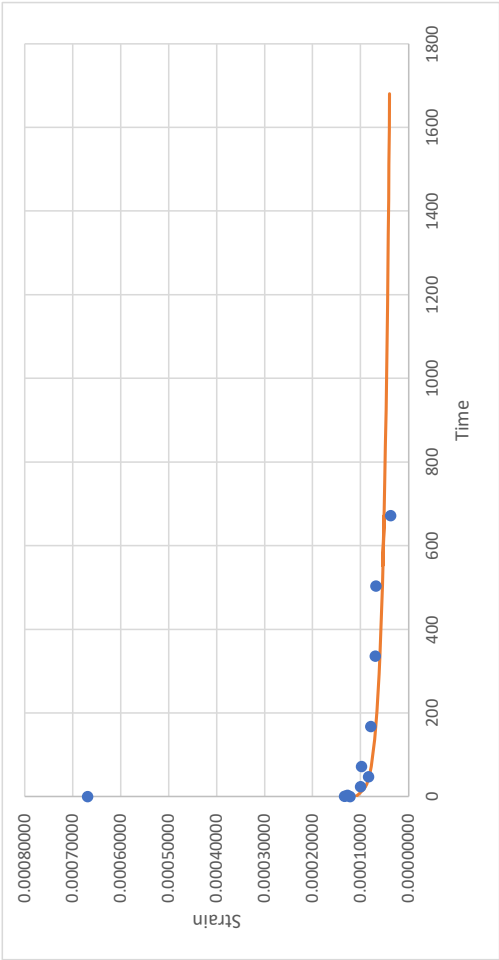
sum R^2 = 2.61397E-07



Data Set # 12

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000530985		4519898.44	27575460.00	0.25	672	-15000
0	0.00066903	0.00013804	0.00000028				
0.1	0.00012191	0.00012364	0.00000000				
1	0.00013329	0.00011349	0.00000000				
3	0.00012686	0.00010668	0.00000000				
24	0.00010000	0.00008950	0.00000000				
48	0.00008336	0.00008246	0.00000000				
72	0.00009805	0.00007805	0.00000000				
168	0.00007818	0.00006824	0.00000000				
336	0.00006916	0.00005974	0.00000000				
504	0.00006809	0.00005465	0.00000000				
672	0.00003701	0.00005101	0.00000000				
552		0.00005350					
672		0.00005101					
840		0.00004818					
1008		0.00004588					
1176		0.00004394					
1344		0.00004227					
1512		0.00004081					
1680		0.00003951					

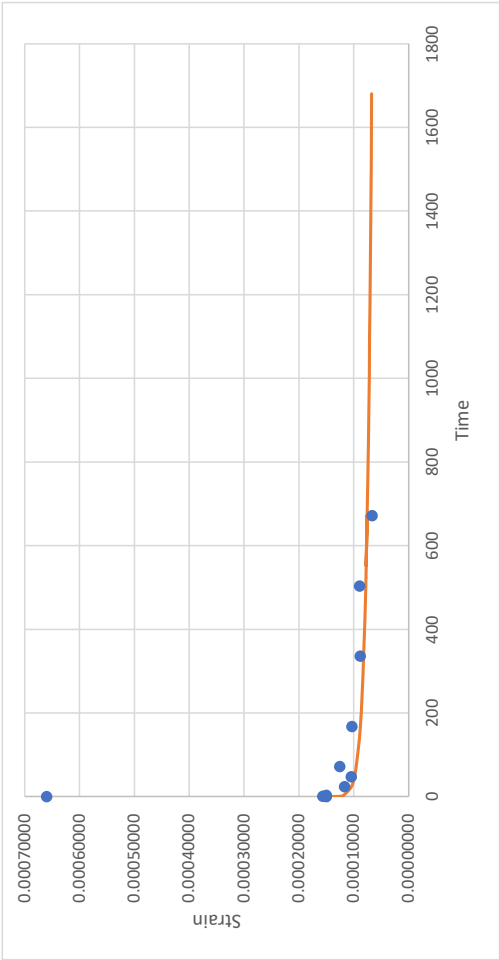
sum R^2 = 2.83823E-07



Data Set # 13

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000527949		4545891.40	30575460.00	0.20	672	-15000
0	0.00065973	0.00015402	0.000000026				
0.1	0.00015005	0.00013444	0.000000000				
1	0.00015622	0.00012446	0.000000000				
3	0.00014979	0.00011834	0.000000000				
24	0.00011668	0.00010415	0.000000000				
48	0.00010421	0.00009869	0.000000000				
72	0.00012515	0.00009534	0.000000000				
168	0.00010320	0.00008805	0.000000000				
336	0.00008793	0.00008184	0.000000000				
504	0.00008893	0.00007816	0.000000000				
672	0.00006619	0.00007553	0.000000000				
552		0.00007733					
672		0.00007553					
840		0.00007349					
1008		0.00007183					
1176		0.00007043					
1344		0.00006922					
1512		0.00006816					
1680		0.00006721					

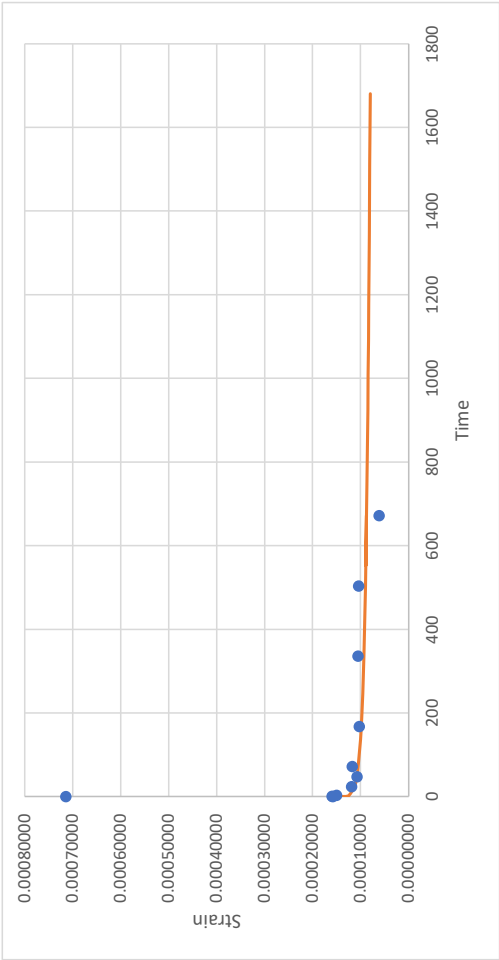
sum R^2 = 2.59522E-07



Data Set # 14

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000573122		4187589.83	42575460.00	0.25	672	-15000
0	0.00071427	0.00014387	0.000000033				
0.1	0.00015785	0.00013455	0.000000000				
1	0.00015933	0.00012797	0.000000000				
3	0.00014978	0.00012356	0.000000000				
24	0.00011823	0.00011243	0.000000000				
48	0.00010681	0.00010787	0.000000000				
72	0.00011733	0.00010502	0.000000000				
168	0.00010215	0.00009867	0.000000000				
336	0.00010511	0.00009316	0.000000000				
504	0.00010351	0.00008986	0.000000000				
672	0.00006097	0.00008750	0.000000000				
552		0.00008911					
672		0.00008750					
840		0.00008567					
1008		0.00008418					
1176		0.00008293					
1344		0.00008185					
1512		0.00008090					
1680		0.00008006					

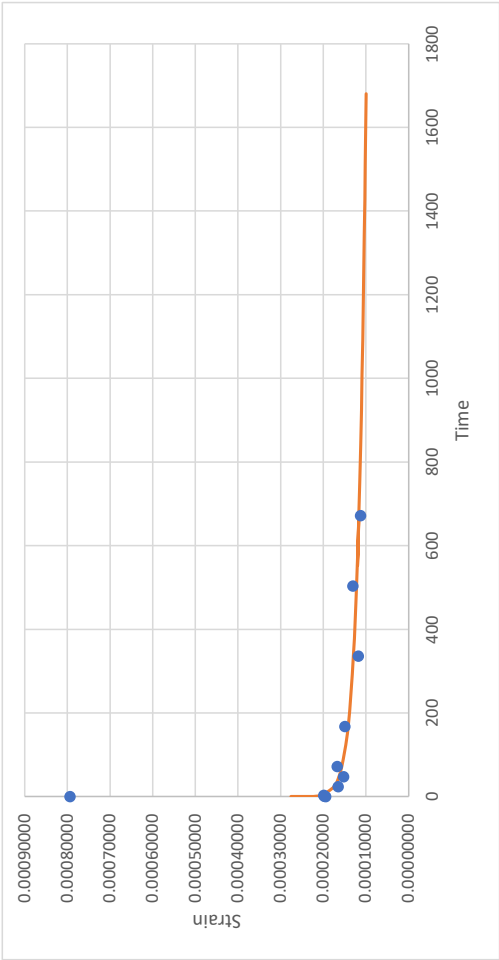
sum R^2 = 3.28799E-07



Data Set # 15

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000518511		4628636.06	15075460.00	0.20	672	-15000
0	0.00079414	0.00027563	0.00000027				
0.1	0.00019385	0.00023591	0.00000000				
1	0.00019690	0.00021565	0.00000000				
3	0.00019828	0.00020325	0.00000000				
24	0.00016516	0.00017448	0.00000000				
48	0.00015217	0.00016340	0.00000000				
72	0.00016738	0.00015661	0.00000000				
168	0.00014908	0.00014181	0.00000000				
336	0.00011765	0.00012923	0.00000000				
504	0.00013013	0.00012175	0.00000000				
672	0.00011259	0.00011643	0.00000000				
552		0.00012007	0.00020000				
672		0.00011643	0.00020000				
840		0.00011229	0.00010000				
1008		0.00010892					
1176		0.00010608					
1344		0.00010363					
1512		0.00010147					
1680		0.00009955					

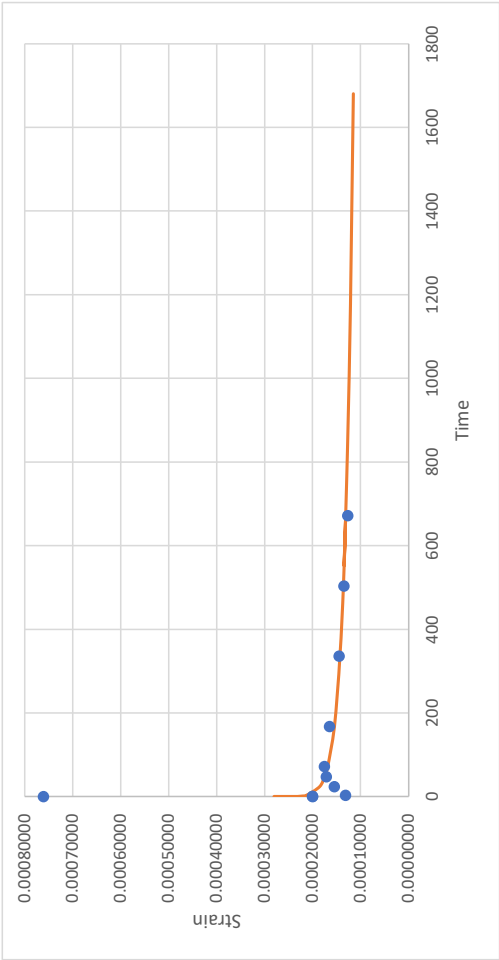
sum R^2 = 2.716E-07



Data Set # 16

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000480402		4995815.49	16075460.00	0.20	672	-15000
0	0.00076066	0.00028026	0.00000023				
0.1	0.00020008	0.00024302	0.00000000				
1	0.00020000	0.00022402	0.00000000				
3	0.00013104	0.00021239	0.00000001				
24	0.00015420	0.00018541	0.00000000				
48	0.00017091	0.00017502	0.00000000				
72	0.00017518	0.00016865	0.00000000				
168	0.00016469	0.00015477	0.00000000				
336	0.00014420	0.00014297	0.00000000				
504	0.00013479	0.00013596	0.00000000				
672	0.00012664	0.00013097	0.00000000				
552		0.00013438					
672		0.00013097					
840		0.00012709					
1008		0.00012393					
1176		0.00012126					
1344		0.00011896					
1512		0.00011694					
1680		0.00011514					

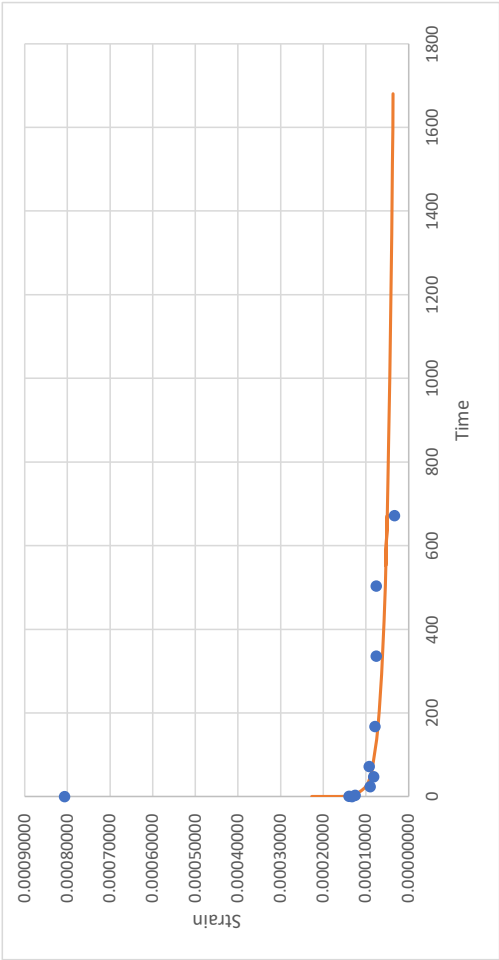
sum R^2 = 2.40978E-07



Data Set # 17

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000579384		4142328.63	13575460.00	0.15	672	-15000
0	0.00080649	0.00022711	0.00000034				
0.1	0.00013285	0.00016165	0.00000000				
1	0.00013902	0.00013934	0.00000000				
3	0.00012477	0.00012682	0.00000000				
24	0.00009010	0.00009991	0.00000000				
48	0.00008180	0.00009010	0.00000000				
72	0.00009232	0.00008420	0.00000000				
168	0.00007870	0.00007157	0.00000000				
336	0.00007541	0.00006100	0.00000000				
504	0.00007538	0.00005476	0.00000000				
672	0.00003284	0.00005032	0.00000000				
552		0.00005335					
672		0.00005032					
840		0.00004688					
1008		0.00004407					
1176		0.00004169					
1344		0.00003964					
1512		0.00003784					
1680		0.00003622					

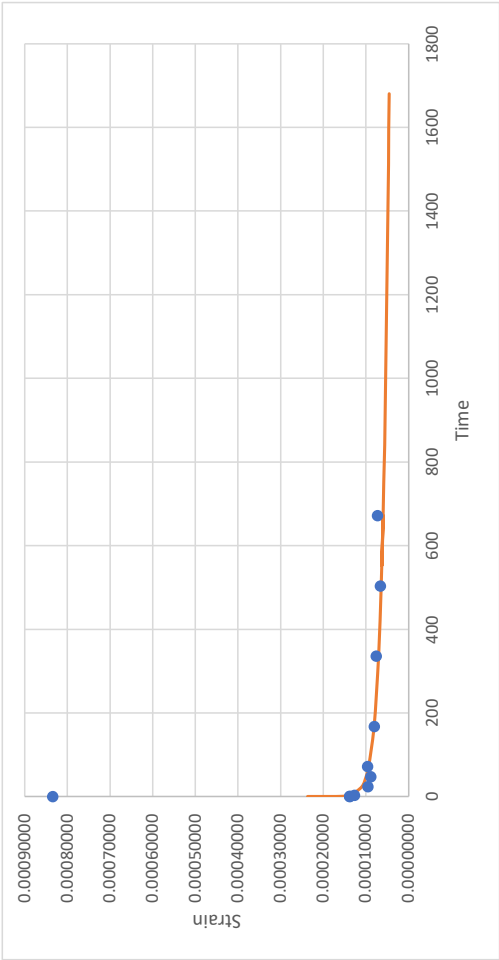
sum R^2 = 3.37741E-07



Data Set # 18

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000598069		4012916.18	13575460.00	0.15	672	-15000
0	0.00083460	0.00023653	0.00000036				
0.1	0.00013752	0.00017108	0.00000000				
1	0.00013744	0.00014877	0.00000000				
3	0.00012632	0.00013625	0.00000000				
24	0.00009477	0.00010933	0.00000000				
48	0.00008804	0.00009953	0.00000000				
72	0.00009543	0.00009363	0.00000000				
168	0.00008025	0.00008099	0.00000000				
336	0.00007540	0.00007042	0.00000000				
504	0.00006599	0.00006418	0.00000000				
672	0.00007242	0.00005974	0.00000000				
552		0.00006278					
672		0.00005974					
840		0.00005630					
1008		0.00005349					
1176		0.00005112					
1344		0.00004907					
1512		0.00004726					
1680		0.00004565					

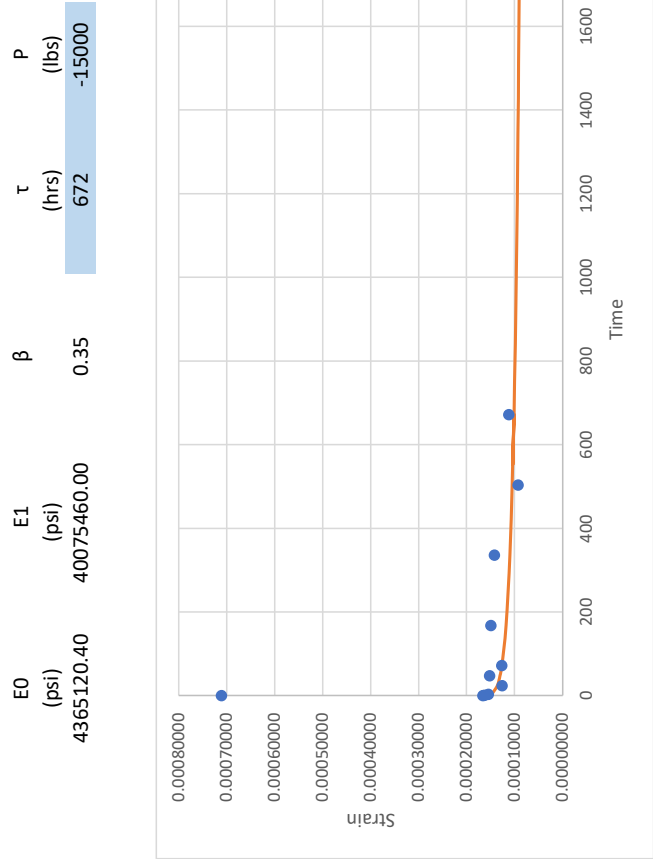
sum R^2 = 3.59576E-07



Data Set # 19

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000576214		4165120.40				
0	0.00071110	0.00016129	0.00000030				
0.1	0.00016564	0.00015705	0.00000000				
1	0.00016243	0.00015207	0.00000000				
3	0.00015444	0.00014806	0.00000000				
24	0.00012602	0.00013593	0.00000000				
48	0.00015211	0.00013024	0.00000000				
72	0.00012668	0.00012650	0.00000000				
168	0.00014901	0.00011774	0.00000000				
336	0.00014206	0.00010978	0.00000000				
504	0.00009255	0.00010491	0.00000000				
672	0.00011200	0.00010140	0.00000000				
552		0.00010380					
672		0.00010140					
840		0.00009868					
1008		0.00009647					
1176		0.00009462					
1344		0.00009304					
1512		0.00009165					
1680		0.00009043					

sum R^2 = 3.05377E-07

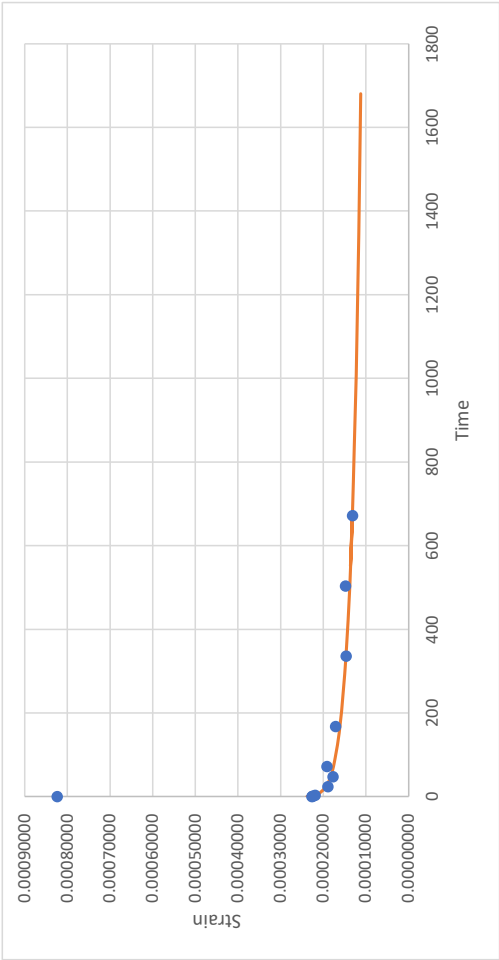


Data Set # 20

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000585746		4097337.44				
0	0.00082382	0.00023808					
0.1	0.00022665	0.00023055					
1	0.00022501	0.00022170					
3	0.00021857	0.00021458					
24	0.00018859	0.00019306					
48	0.00017716	0.00018296					
72	0.00019081	0.00017632					
168	0.00017094	0.00016077					
336	0.00014576	0.00014664					
504	0.00014729	0.00013798					
672	0.00013132	0.00013177					
552		0.00013602					
672		0.00013177					
840		0.00012694					
1008		0.00012302					
1176		0.00011973					
1344		0.00011691					
1512		0.00011445					
1680		0.00011229					

sum R^2 = 3.43595E-07

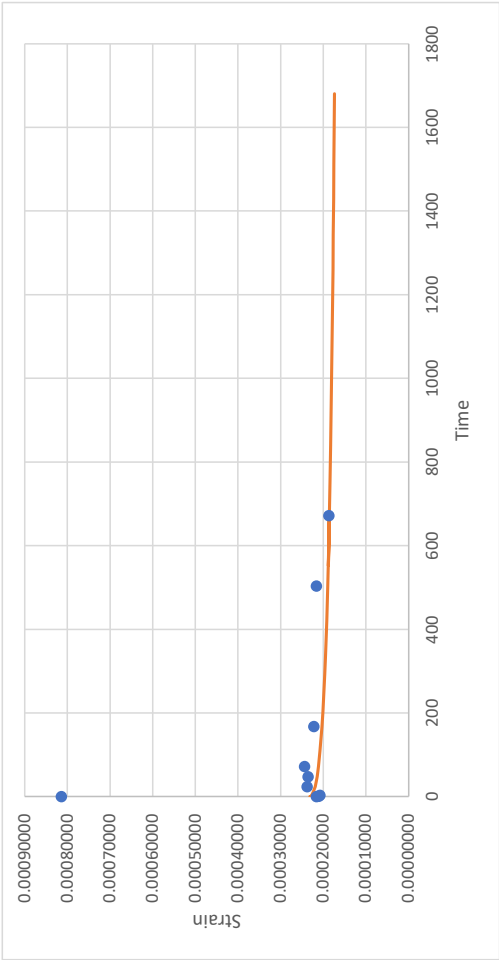
E0 (psi) 4097337.44 E1 (psi) 22575460.00 β 0.35 τ (hrs) 672 P (lbs) -15000



Data Set # 21

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000582325		4121406.35	52075460.00	0.50	672	-15000
0	0.00081406	0.00023173	0.00000034				
0.1	0.00021559	0.00023085	0.00000000				
1	0.00021082	0.00022897	0.00000000				
3	0.00020752	0.00022702	0.00000000				
24	0.00023743	0.00021918	0.00000000				
48	0.00023538	0.00021463	0.00000000				
72	0.00024382	0.00021138	0.00000000				
168	0.00022187	0.00020304	0.00000000				
336		0.00019477					
504	0.00021594	0.00018949	0.00000000				
672	0.00018695	0.00018565	0.00000000				
552		0.00018828					
672		0.00018565					
840		0.00018266					
1008		0.00018025					
1176		0.00017824					
1344		0.00017655					
1512		0.00017509					
1680		0.00017382					

sum R^2 = 3.42917E-07

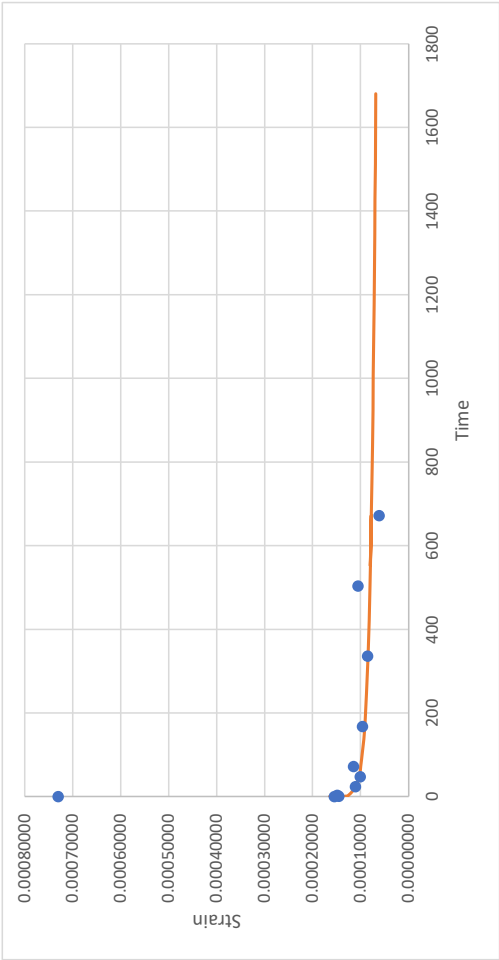


Data Set # 22

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.00056537		4245009.94				
0	0.00072995	0.00016458					
0.1	0.00015475	0.00014287					
1	0.00014528	0.00013180					
3	0.00014823	0.00012502					
24	0.00011043	0.00010929					
48	0.00010056	0.00010323					
72	0.00011421	0.00009952					
168	0.00009591	0.00009143					
336	0.00008481	0.00008455					
504	0.00010508	0.00008046					
672	0.00006098	0.00007755					
552		0.00007954					
672		0.00007755					
840		0.00007529					
1008		0.00007345					
1176		0.00007189					
1344		0.00007055					
1512		0.00006937					
1680		0.00006832					

sum R^2 = 3.21629E-07

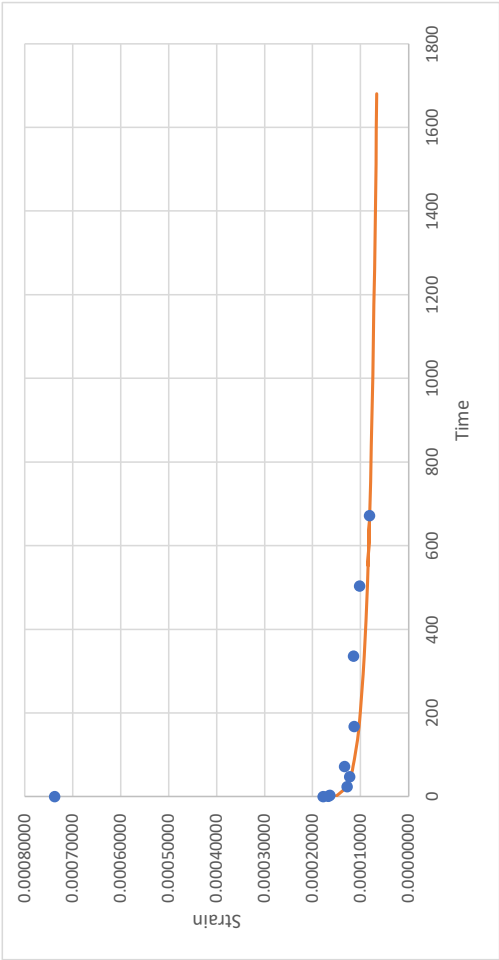
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
4245009.94	27575460.00	0.20	672	-15000



Data Set # 23

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000590288		4065808.88				
0	0.00073768	0.00017506	4265808.88	25575460.00	0.30	672	-15000
0.1	0.00017814	0.00016488	0.00000032				
1	0.00016712	0.00015543	0.00000000				
3	0.00016382	0.00014849	0.00000000				
24	0.00012758	0.00012936	0.00000000				
48	0.00012241	0.00012098	0.00000000				
72	0.00013293	0.00011561	0.00000000				
168	0.00011306	0.00010336	0.00000000				
336	0.00011446	0.00009250	0.00000000				
504	0.00010192	0.00008593	0.00000000				
672	0.00008126	0.00008122	0.00000000				
552		0.00008444					
672		0.00008122					
840		0.00007757					
1008		0.00007460					
1176		0.00007210					
1344		0.00006995					
1512		0.00006807					
1680		0.00006641					

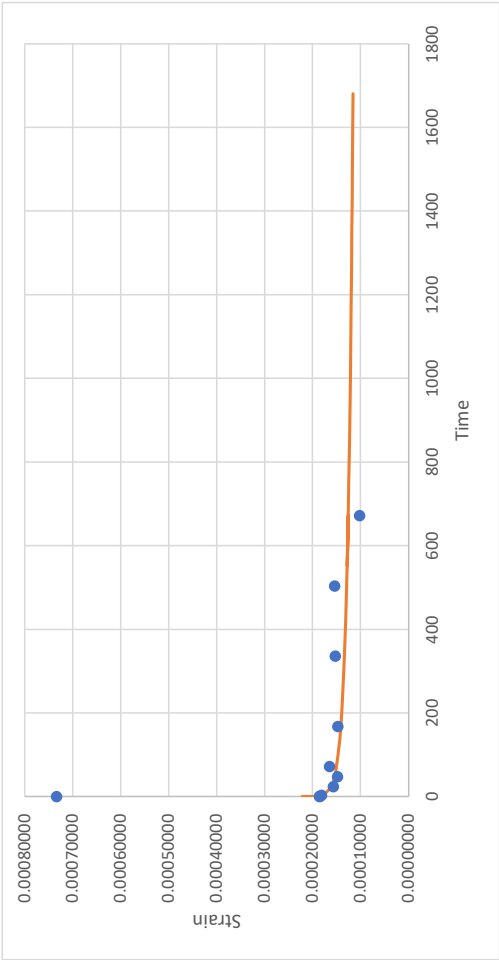
sum R^2 = 3.18219E-07



Data Set # 24

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.00051164		4690795.77		0.20	672	-15000
0	0.00073356	0.00022192					
0.1	0.00018545	0.00019797					
1	0.00018537	0.00018575					
3	0.00018103	0.00017827					
24	0.00015625	0.00016092					
48	0.00014795	0.00015424					
72	0.00016472	0.00015015					
168	0.00014694	0.00014122					
336	0.00015252	0.00013364					
504	0.00015352	0.00012913					
672	0.00010160	0.00012592					
552		0.00012812					
672		0.00012592					
840		0.00012343					
1008		0.00012139					
1176		0.00011968					
1344		0.00011820					
1512		0.00011690					
1680		0.00011574					

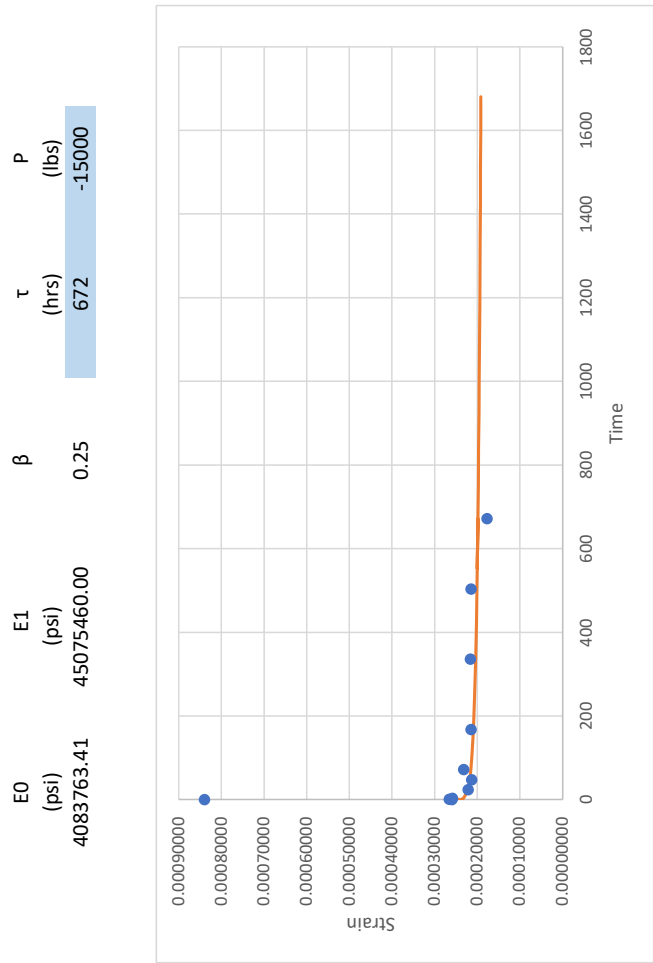
sum R^2 = 2.63789E-07



Data Set # 25

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.00068891		3483763.41				
0	0.00083948	0.00025179	0.00000035				
0.1	0.00025949	0.00024298	0.00000000				
1	0.00026566	0.00023677	0.00000000				
3	0.00025766	0.00023260	0.00000000				
24	0.00022142	0.00022209	0.00000000				
48	0.00021312	0.00021779	0.00000000				
72	0.00023146	0.00021509	0.00000000				
168	0.00021471	0.00020909	0.00000000				
336	0.00021612	0.00020389	0.00000000				
504	0.00021452	0.00020077	0.00000000				
672	0.00017666	0.00019854	0.00000000				
552		0.00020007					
672		0.00019854					
840		0.00019682					
1008		0.00019541					
1176		0.00019422					
1344		0.00019320					
1512		0.00019231					
1680		0.00019151					

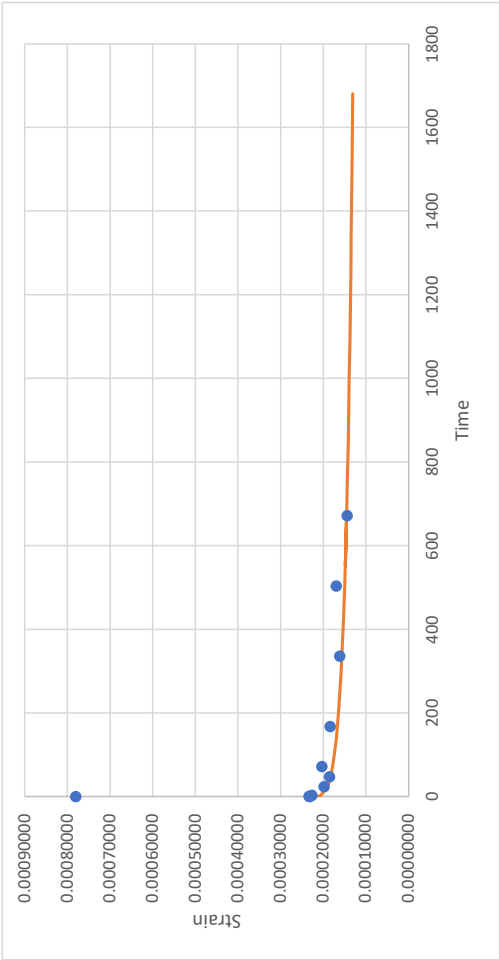
sum R^2 = 3.48257E-07



Data Set # 26

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000646734		4310955.392	30766267.26	0.35	672	-15000
0	0.00078011	0.00022339					
0.1	0.00023135	0.00021787					
1	0.00023284	0.00021138					
3	0.00022640	0.00020616					
24	0.00019798	0.00019036					
48	0.00018499	0.00018295					
72	0.00020333	0.00017808					
168	0.00018346	0.00016667					
336	0.00016141	0.00015630					
504	0.00016920	0.00014995					
672	0.00014385	0.00014539					
552		0.00014851					
672		0.00014539					
840		0.00014184					
1008		0.00013897					
1176		0.00013655					
1344		0.00013449					
1512		0.00013268					
1680		0.00013109					

sum R^2 = 3.12371E-07



Test Sample: Normal Strength f_c desired: 6 ksi lbs
Load Applied: 50% f_c measured: 5.2 ksi

AVERAGE STRAIN- NSC 0.50% C RECOVERY TEST																						
Date	12/20/2021	12/20/2021	1/17/2022	1/18/2022	1/19/2022	1/20/2022	1/21/2022	1/25/2022	1/27/2022	1/28/2022	2/10/2022	2/15/2022	2/22/2022	3/1/2022	3/8/2022	3/15/2022	3/22/2022	3/29/2022				
Time	11:30:00 AM	12:15:00 PM	12:30:00 PM	12:30:00 PM	3:00:00 PM	3:00:00 PM	12:00:00 PM	12:00:00 PM	11:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM	7:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM				
Relative Humidity	49.3	49.3	50.1	50.9	49.9	49.9	52	50.1	50.1	50	49.9	49.9	49.4	49.2	49.1	50.1	50	50				
Air Temp	23.2	23.2	22.9	23.0	23.0	23.0	23.0	23.0	22.9	22.9	23.0	23.0	22.9	22.9	22.9	23.0	23.0	23.0				
Notes	Before Loading	Initial Loading	0	0.1	24	48	72	168	216	240	336	384	504	552	672	840	1008	1176				
1	0.00000000	0.00075962	0.00115244	0.00062727	0.00052516	0.00038768	0.00061476	0.00053767	0.00055017	0.00049392	0.00053767	0.00044908	0.00054608	0.0005642	0.00056098	0.00061685	0.00058559	0.00058559	0.00060851	0.00059393	0.00061685	
2	0.00000000	0.00095436	0.00107240	0.00053620	0.00041429	0.00050026	0.00051588	0.00043617	0.00043929	0.00041897	0.00042679	0.00042678	0.00045648	0.00045642	0.00045336	0.00049577	0.00049669	0.00049712	0.00050338	0.00053620	0.00057839	
3	0.00000000	0.00049249	0.00102400	0.00048150	0.00042522	0.00047368	0.00050025	0.00045648	0.00044866	0.00044554	0.00042991	0.00044398	0.00045648	0.00044711	0.00043615	0.00047367	0.00045685	0.00045178	0.00048638	0.00045620	0.00047839	
4	0.00000000	0.00058783	0.00099109	0.00047365	0.00039394	0.00048147	0.00049867	0.00043301	0.00043145	0.00043614	0.00041425	0.00043301	0.00042519	0.00044083	0.00042207	0.00047521	0.00046271	0.00044551	0.00048303	0.00046384	0.00047521	
5	0.00000000	0.00055314	0.00111844	0.00060193	0.00056022	0.00063933	0.00062898	0.00066959	0.00059766	0.00058101	0.00058101	0.00059351	0.00058104	0.00059146	0.00067689	0.00065686	0.00062228	0.00062058	0.00063934	0.00060813	0.00061025	
6	0.00000000	0.00050636	0.00107674	0.00062040	0.00054578	0.00053447	0.00054228	0.00048916	0.00050165	0.00049853	0.00048446	0.00049384	0.00051259	0.00050947	0.00053446	0.00055009	0.00053290	0.00052978	0.00055009	0.00053603	0.00054383	
7	0.00000000	0.00050325	0.00110330	0.00059071	0.00049838	0.00047031	0.00057976	0.00054382	0.00055476	0.00054695	0.00052976	0.00054382	0.00053913	0.00053288	0.00055007	0.00057507	0.00055945	0.00056669	0.00057351	0.00058813	0.00058757	
8	0.00000000	0.00056251	0.00115470	0.00064062	0.00053747	0.00058804	0.00062653	0.00054059	0.00054841	0.00054840	0.00056562	0.00055153	0.00054916	0.00056715	0.00056870	0.00060153	0.00057965	0.00056089	0.00061403	0.00060466	0.00062028	
9	0.00000000	0.00047804	0.00107165	0.00054675	0.00044991	0.00055458	0.00052957	0.00052177	0.00053583	0.00051240	0.00051396	0.00052021	0.00049833	0.00048271	0.00048583	0.00052176	0.00051395	0.00051083	0.00055769	0.00050926	0.00050925	
10	0.00000000	0.00050470	0.00112969	0.00062812	0.00049532	0.00060939	0.00058751	0.00054376	0.00055626	0.00056407	0.00053747	0.00053126	0.00053127	0.00057032	0.00054062	0.00061290	0.00057656	0.00056410	0.00061094	0.00056720	0.00050004	
11	0.00000000	0.00049220	0.00113602	0.00067501	0.00053593	0.00058281	0.00061875	0.00055155	0.00054686	0.00053122	0.00053747	0.00055623	0.00056662	0.00057032	0.00056405	0.00061406	0.00063122	0.00063122	0.00062344	0.00061874	0.00062656	
12	0.00000000	0.00056408	0.00112525	0.00061253	0.00053908	0.00060002	0.00063596	0.00056878	0.00058440	0.00059122	0.00058597	0.00059221	0.00059278	0.00059278	0.00060471	0.00063284	0.00063128	0.00061878	0.00064222	0.00063909	0.00064221	
13	0.00000000	0.00065629	0.00126274	0.00083128	0.00059852	0.00067190	0.00072559	0.00069222	0.00068596	0.00069847	0.00069847	0.00069847	0.00070003	0.00070003	0.00070003	0.00073753	0.00073753	0.00073753	0.00074847	0.00073441	0.00074221	
14	0.00000000	0.00057509	0.00116892	0.00066260	0.00059852	0.00067190	0.00072559	0.00069222	0.00068596	0.00069847	0.00069847	0.00069847	0.00070003	0.00070003	0.00070003	0.00073753	0.00073753	0.00073753	0.00074847	0.00073441	0.00074221	
15	0.00000000	0.00065567	0.00126946	0.00077348	0.00074846	0.00082816	0.00081567	0.00077659	0.00077659	0.00076253	0.00075784	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	0.00076253	
16	0.00000000	0.00055136	0.00114995	0.00063436	0.00057957	0.00066092	0.00065155	0.00062498	0.00063123	0.00062498	0.00063126	0.00062554	0.00062567	0.00063446	0.00063446	0.00063446	0.00063446	0.00063446	0.00063446	0.00063446	0.00063446	
17	0.00000000	0.00058135	0.00118458	0.00068918	0.00062042	0.00067199	0.00072982	0.00064074	0.00064074	0.00065111	0.00061761	0.00062042	0.00061886	0.00064074	0.00063448	0.00065574	0.00065167	0.00065167	0.00065167	0.00065167	0.00065167	
18	0.00000000	0.00032931	0.00085380	0.00040229	0.00033143	0.00031940	0.00042313	0.00030640	0.00031057	0.00031058	0.00029806	0.00031265	0.00033559	0.00033558	0.00033142	0.00039560	0.00039016	0.00040022	0.00038352	0.00038352	0.00038352	
19	0.00000000	0.00057498	0.00118124	0.00067656	0.00062343	0.00070780	0.00072031	0.00068593	0.00068593	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	0.00069661	
20	0.00000000	0.00077170	0.00135443	0.00083110	0.00080141	0.00086078	0.00091544	0.00083734	0.00084515	0.00082953	0.00080922	0.00081860	0.00080141	0.00081233	0.00084985	0.00087797	0.00087797	0.00087797	0.00087797	0.00087797	0.00087797	
21	0.00000000	0.00054690	0.00114850	0.00061565	0.00055649	0.00064847	0.00067034	0.00062035	0.00062347	0.00061722	0.00058753	0.00060941	0.00062815	0.00061565	0.00064538	0.00064848	0.00064223	0.00064223	0.00064534	0.00065316	0.00063440	
22	0.00000000	0.00058913	0.00118761	0.00068132	0.00061569	0.00070475	0.00070006	0.00066881	0.00066412	0.00066568	0.00063601	0.000668131	0.00065945	0.00065788	0.00066569	0.00066569	0.00066569	0.00066569	0.00066569	0.00066569	0.00066569	
23	0.00000000	0.00059204	0.00119504	0.00070761	0.00062793	0.00070475	0.00074511	0.00065918	0.00066699	0.00066387	0.00063261	0.00064980	0.00065449	0.00066855	0.00066449	0.00069511	0.00072323	0.00072323	0.00070336	0.000699431	0.000699431	
24	0.00000000	0.00074034	0.00137454	0.00087621	0.00083246	0.00086059	0.00098709	0.00085434	0.00085278	0.00085277	0.00085277	0.00086683	0.00081997	0.00088088	0.00090369	0.00091369	0.00091369	0.00091369	0.00091369	0.00091369	0.00091369	
25	0.00000000	0.00053131	0.00123764	0.00073758	0.00067976	0.00079070	0.00076571	0.00073133	0.00074695	0.00075476	0.00071258	0.00073758	0.00073758	0.00073758	0.00075088	0.00075088	0.00075088	0.00075088	0.00075088	0.00075088	0.00075088	
26	0.00000000	0.00051858	0.00133290	0.00090172	0.00081426	0.00089759	0.00090590	0.00081010	0.00083094	0.00082468	0.00079969	0.00083094	0.00083510	0.00083510	0.00084236	0.00086217	0.00085592	0.00083510	0.00087467	0.00086633	0.00086425	

Test Sample: Normal Strength f_c desired: 6 ksi Load Applied: 18750 lbs

Load Applied: 50% f_c measured: 5.2 ksi

Date		TOTAL STRAIN MINUS SHRINKAGE STRAIN																										
Time		12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	12/20/2021	
Relative Humidity		49.3	49.3	49.9	49.9	52	50.1	50.1	50.1	50.1	50.1	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	
Air Temp		23.2	23.2	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	
Notes		Before Loading	Initial Loading																									
Point of Measure		1	0.00000000	0.00075445	0.000954674	0.00043155	0.00037374	0.00038780	0.00041291	0.00027845	0.00033757	0.00031734	0.0002492	0.00031835	0.0002675	0.0002424	0.00032269	0.00031717	0.00032993	0.00032831	0.00034596	0.00032655	0.00034502	0.00032655	0.00034502	0.00032655	0.00034502	
		2	0.00000000	0.00055919	0.00087670	0.00034049	0.00021646	0.00030039	0.00031403	0.00027695	0.00027670	0.00020475	0.00020646	0.00020362	0.00027674	0.00027900	0.00021546	0.00025049	0.00024720	0.00023984	0.00024596	0.00026883	0.00026883	0.00026883	0.00026883	0.00026883	0.00026883	0.00026883
		3	0.00000000	0.00048732	0.00082829	0.00027811	0.00022739	0.00027381	0.00029840	0.00024776	0.00023606	0.00021131	0.00020958	0.00020861	0.00027674	0.00027900	0.00019826	0.00022859	0.00021435	0.00019450	0.00022363	0.00018910	0.00018464	0.00018464	0.00018464	0.00018464	0.00018464	0.00018464
		4	0.00000000	0.00058266	0.00079539	0.00027794	0.00019612	0.00028159	0.00029681	0.00022379	0.00021885	0.00021192	0.00019393	0.00020984	0.00019546	0.00012066	0.00018418	0.00023014	0.00021122	0.00018823	0.00022048	0.00019846	0.00019846	0.00019846	0.00019846	0.00019846	0.00019846	0.00019846
		5	0.00000000	0.00052597	0.00069223	0.00040622	0.00036239	0.00043946	0.00042712	0.00040718	0.00039393	0.00038344	0.00036609	0.00037095	0.00035131	0.00035928	0.00043900	0.00039378	0.00036078	0.00036330	0.00037679	0.00034076	0.00033938	0.00033938	0.00033938	0.00033938	0.00033938	0.00033938
		6	0.00000000	0.00050119	0.00086104	0.00042469	0.00025695	0.00033460	0.00034402	0.00027994	0.00028905	0.00028644	0.00026414	0.00027068	0.00028286	0.00027724	0.00029657	0.00028501	0.00028241	0.00027250	0.00028754	0.00026855	0.00027200	0.00027200	0.00027200	0.00027200	0.00027200	0.00027200
		7	0.00000000	0.00049808	0.00090760	0.00039849	0.00029756	0.00027044	0.00037791	0.00033460	0.00034216	0.00033272	0.00030944	0.00032066	0.00033940	0.00033071	0.00031218	0.00033299	0.00030395	0.00033081	0.00033081	0.00033275	0.00033275	0.00033275	0.00033275	0.00033275	0.00033275	0.00033275
		8	0.00000000	0.00055734	0.00044490	0.00033965	0.00029756	0.00038817	0.00037791	0.00033137	0.00033581	0.00033248	0.00033418	0.00032372	0.00032022	0.00033497	0.00033081	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581	0.00033581
		9	0.00000000	0.00047287	0.00087795	0.00035104	0.00025209	0.00035471	0.00032772	0.00031255	0.00032323	0.00029817	0.00029364	0.00029705	0.00028660	0.00025053	0.00024794	0.00027668	0.00026246	0.00025355	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899
		10	0.00000000	0.00049953	0.00093398	0.00043241	0.00029749	0.00040951	0.00038565	0.00033454	0.00034366	0.00034985	0.00033179	0.00030810	0.00030153	0.00033814	0.000330273	0.00027668	0.00026246	0.00025355	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899
		11	0.00000000	0.00048703	0.00094031	0.00047930	0.00033811	0.00038294	0.00041689	0.00034233	0.00033426	0.00034985	0.00033179	0.00030810	0.00030153	0.00033814	0.000330273	0.00027668	0.00026246	0.00025355	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899	0.00024899
		12	0.00000000	0.00055891	0.00096684	0.00046884	0.00034126	0.00040015	0.00043410	0.00035966	0.00037181	0.00037799	0.00036564	0.00034280	0.00033603	0.00037030	0.00035535	0.00036682	0.00038777	0.00037979	0.00036150	0.00037967	0.00037967	0.00037967	0.00037967	0.00037967	0.00037967	0.00037967
		13	0.00000000	0.00065112	0.00046689	0.00047008	0.00042660	0.00047029	0.00053568	0.00048300	0.00047337	0.00047174	0.00047814	0.00046280	0.00043949	0.00046785	0.00055589	0.00049425	0.00047197	0.00047979	0.00046618	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592
		14	0.00000000	0.00066050	0.00047071	0.00047029	0.00042660	0.00047029	0.00053568	0.00048300	0.00047337	0.00047174	0.00047814	0.00046280	0.00043949	0.00046785	0.00055589	0.00049425	0.00047197	0.00047979	0.00046618	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592
		15	0.00000000	0.00054638	0.00047071	0.00047029	0.00042660	0.00047029	0.00053568	0.00048300	0.00047337	0.00047174	0.00047814	0.00046280	0.00043949	0.00046785	0.00055589	0.00049425	0.00047197	0.00047979	0.00046618	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592
		16	0.00000000	0.00054638	0.00047071	0.00047029	0.00042660	0.00047029	0.00053568	0.00048300	0.00047337	0.00047174	0.00047814	0.00046280	0.00043949	0.00046785	0.00055589	0.00049425	0.00047197	0.00047979	0.00046618	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592	0.00048592
		17	0.00000000	0.00057617	0.00098887	0.00049347	0.00047212	0.00047212	0.00052796	0.00041589	0.00042814	0.00041089	0.00039279	0.00039726	0.00038712	0.00040856	0.00040749	0.00039659	0.00042066	0.00040018	0.00039439	0.00042820	0.00042820	0.00042820	0.00042820	0.00042820	0.00042820	0.00042820
		18	0.00000000	0.00062414	0.00020657	0.00020657	0.00013361	0.00011903	0.00021277	0.00019718	0.000209797	0.00020636	0.00020774	0.00018949	0.00016586	0.00010341	0.00009352	0.00014052	0.00009867	0.00014294	0.00014294	0.00012097	0.00011466	0.00011466	0.00011466	0.00011466	0.00011466	0.00011466
		19	0.00000000	0.00056981	0.00098553	0.00048085	0.00042561	0.00050793	0.00047671	0.00047671	0.00047333	0.00047639	0.00042498	0.00043464	0.00042644	0.00044492	0.00057444	0.00057444	0.00059054	0.00059054	0.00057069	0.00061385	0.00057153	0.00057153	0.00057153	0.00057153	0.00057153	0.00057153
		20	0.00000000	0.00076653	0.00115873	0.00063538	0.00060359	0.00060091	0.00071359	0.00062812	0.00063235	0.00061530	0.00058890	0.00059544	0.00057168	0.00058017	0.00057444	0.00057444	0.00059054	0.00059054	0.00057069	0.00061385	0.00057153	0.00057153	0.00057153	0.00057153	0.00057153	0.00057153
		21	0.00000000	0.00054173	0.00095280	0.00041994	0.00036626	0.00044860	0.00046849	0.00041113	0.00041087	0.00040430	0.00036721	0.00038625	0.00039842	0.00038348	0.00036995	0.00036995	0.00039714	0.00039073	0.00039120	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279
		22	0.00000000	0.00058396	0.00095191	0.00048560	0.00041786	0.00044860	0.00046849	0.00041113	0.00041087	0.00040430	0.00036721	0.00038625	0.00039842	0.00038348	0.00036995	0.00036995	0.00039714	0.00039073	0.00039120	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279
		23	0.00000000	0.00058396	0.00095191	0.00048560	0.00041786	0.00044860	0.00046849	0.00041113	0.00041087	0.00040430	0.00036721	0.00038625	0.00039842	0.00038348	0.00036995	0.00036995	0.00039714	0.00039073	0.00039120	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279	0.00038279
		24	0.00000000	0.00073517	0.00117884	0.00068050	0.00063464	0.00066072	0.00078524	0.00064512	0.00064018	0.00063854	0.00063244	0.00062637	0.00059024	0.00046870	0.0004298	0.00052000	0.00056438	0.00064703	0.00064703	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925
		25	0.00000000	0.00052614	0.00054187	0.00048194	0.00048194	0.00059083	0.00056385	0.00052211	0.00053435	0.00054054	0.00049225	0.00051441	0.00050785	0.00051790	0.00052000	0.00052000	0.00056438	0.00064703	0.00064703	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925
		26	0.00000000	0.00051340	0.00113720	0.00071601	0.00061643	0.00069772	0.00070405	0.00060088	0.00061834	0.00061046	0.00057937	0.00060778	0.00060536	0.00060708	0.00057637	0.00057637	0.00064703	0.00064703	0.00064703	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925	0.00067925
FIT DATA																												
Standard Deviation																												
High Deviation																												
Low Deviation																												

ε shu α V/S α

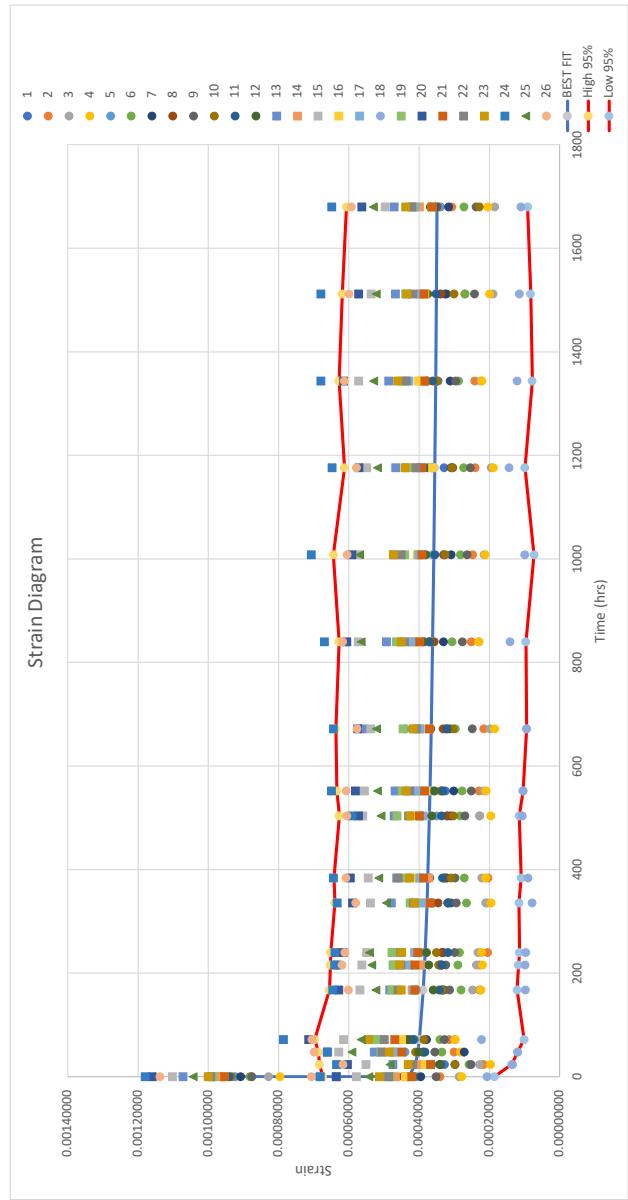
0.0050296 0.4707074 0.625 32.5603906

</

time (hr)	strain μ
0	0.00092845
0.1	0.00042981
24	0.00040955
48	0.00040321
72	0.00039887
168	0.00038811
216	0.00038448
240	0.00038289
336	0.00037760
384	0.00037541
504	0.00037080
552	0.00036921
672	0.00036571
840	0.00036165
1008	0.00035827
1176	0.00035537
1344	0.00035284
1512	0.00035060
1680	0.00034860

Copy and Transpose Data

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6052940.63	35620460.00	0.39	1680.00	-18750.00



Data Set # 1

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000754448		3976418.63				
0	0.000956739	0.00043739	0.00000027				
0.1	0.000431553	0.00042657	0.00000000				
24	0.000327337	0.00038723	0.00000000				
48	0.000387805	0.00037750	0.00000000				
72	0.000412906	0.00037115	0.00000000				
168	0.00032845	0.00035631	0.00000000				
216	0.00037568	0.00035152	0.00000000				
240	0.000329694	0.00034946	0.00000000				
336	0.000317344	0.00034268	0.00000000				
384	0.000324924	0.00033992	0.00000000				
504	0.000318347	0.00033417	0.00000000				
552	0.000324239	0.00033222	0.00000000				
672	0.00032269	0.00032793	0.00000000				
840	0.000371768	0.00032300	0.00000000				
1008	0.000329927	0.00031893	0.00000000				
1176	0.000328309	0.00031546	0.00000000				
1344	0.000345963	0.00031244	0.00000000				
1512	0.000326551	0.00030977	0.00000000				
1680	0.000345024	0.00030738	0.00000000				
		sum R^2 =	2.77732E-07				

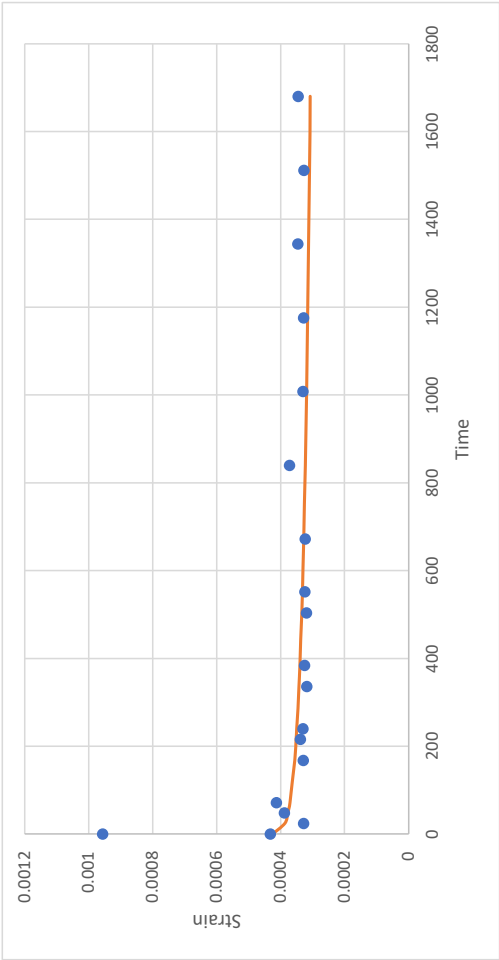
E0
(psi)
5776418.63

E1
(psi)
23075460.00

β
0.30

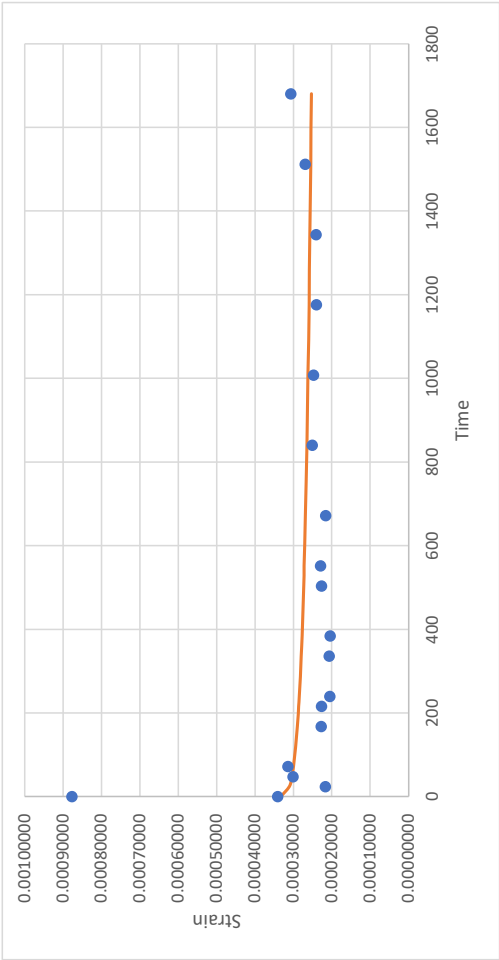
τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 2

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000559188		5364922.30				
0	0.00087670	0.00033761	0.00000029				
0.1	0.000334049	0.00033325	0.00000000				
24	0.00021646	0.00031062	0.00000001				
48	0.00030039	0.00030421	0.00000000				
72	0.00031403	0.00029992	0.00000000				
168	0.00022695	0.00028955	0.00000000				
216	0.00022670	0.00028612	0.00000000				
240	0.00020475	0.00028463	0.00000001				
336	0.00020646	0.00027970	0.00000001				
384	0.00020362	0.00027767	0.00000001				
504	0.00022675	0.00027342	0.00000000				
552	0.00022900	0.00027197	0.00000000				
672	0.00021546	0.00026877	0.00000000				
840	0.00025049	0.00026508	0.00000000				
1008	0.00024720	0.00026201	0.00000000				
1176	0.00023984	0.00025939	0.00000000				
1344	0.00024083	0.00025711	0.00000000				
1512	0.00026883	0.00025509	0.00000000				
1680	0.00030656	0.00025328	0.00000000				
		sum R^2 =	3.28452E-07				

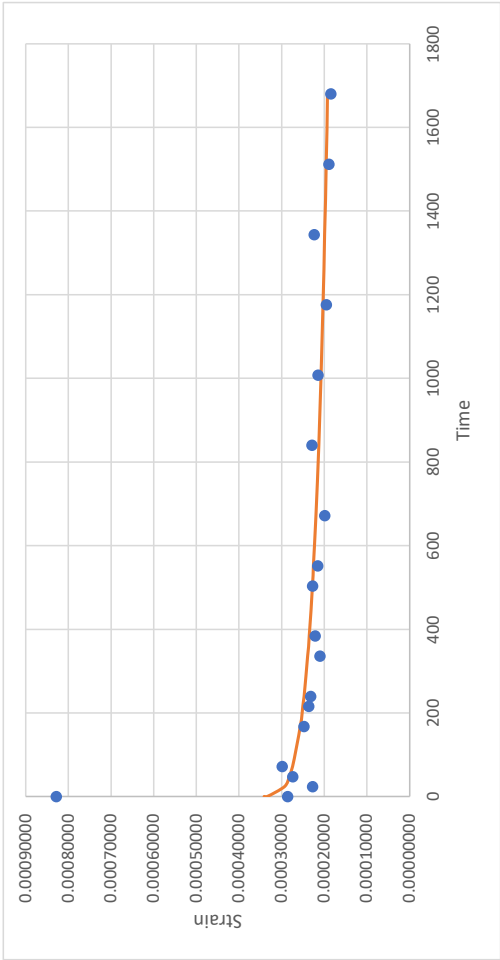


E0 (psi) 5564922.30
E1 (psi) 35575460.00
 β 0.35
 τ (hrs) 1680
P (lbs) -18750

Data Set # 3

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000487323		6156078.42	20175460.00	0.35	1680	-18750
0	0.00082829	0.00034097	0.00000024				
0.1	0.00028579	0.00033329	0.00000000				
24	0.00022739	0.00029338	0.00000000				
48	0.00027381	0.00028209	0.00000000				
72	0.00029840	0.00027451	0.00000000				
168	0.00024726	0.00025623	0.00000000				
216	0.00023606	0.00025017	0.00000000				
240	0.00023131	0.00024755	0.00000000				
336	0.00020958	0.00023886	0.00000000				
384	0.00022081	0.00023528	0.00000000				
504	0.00022674	0.00022779	0.00000000				
552	0.00021493	0.00022523	0.00000000				
672	0.00019826	0.00021959	0.00000000				
840	0.00022859	0.00021308	0.00000000				
1008	0.00021435	0.00020767	0.00000000				
1176	0.00019450	0.00020305	0.00000000				
1344	0.00022363	0.00019903	0.00000000				
1512	0.00018910	0.00019547	0.00000000				
1680	0.00018464	0.00019228	0.00000000				

sum R^2 = 2.4645E-07

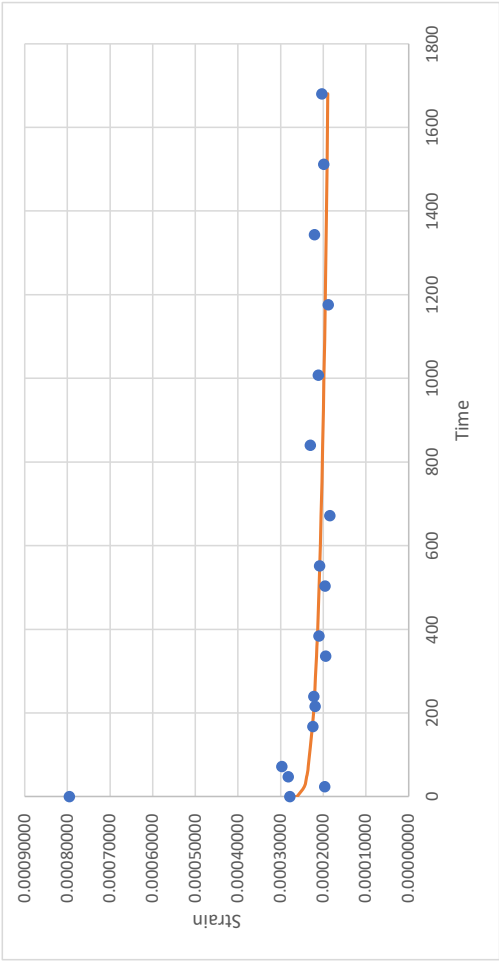


Data Set # 4

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Elastic Strain	0.000582663		5148778.07				
0	0.00079539	0.00026430	5648778.07	40075460.00	0.40	1680	-18750
0.1	0.00027794	0.00026191	0.00000028				
24	0.00019612	0.00024451	0.00000000				
48	0.00028159	0.00023892	0.00000000				
72	0.00029681	0.00023505	0.00000000				
168	0.00022379	0.00022541	0.00000000				
216	0.00021885	0.00022213	0.00000000				
240	0.00022192	0.00022070	0.00000000				
336	0.00019393	0.00021591	0.00000000				
384	0.00020984	0.00021392	0.00000000				
504	0.00019546	0.00020972	0.00000000				
552	0.00020866	0.00020827	0.00000000				
672	0.00018418	0.00020509	0.00000000				
840	0.00023014	0.00020138	0.00000000				
1008	0.00021122	0.00019828	0.00000000				
1176	0.00018823	0.00019564	0.00000000				
1344	0.00022048	0.00019332	0.00000000				
1512	0.00019846	0.00019128	0.00000000				
1680	0.00020338	0.00018944	0.00000000				

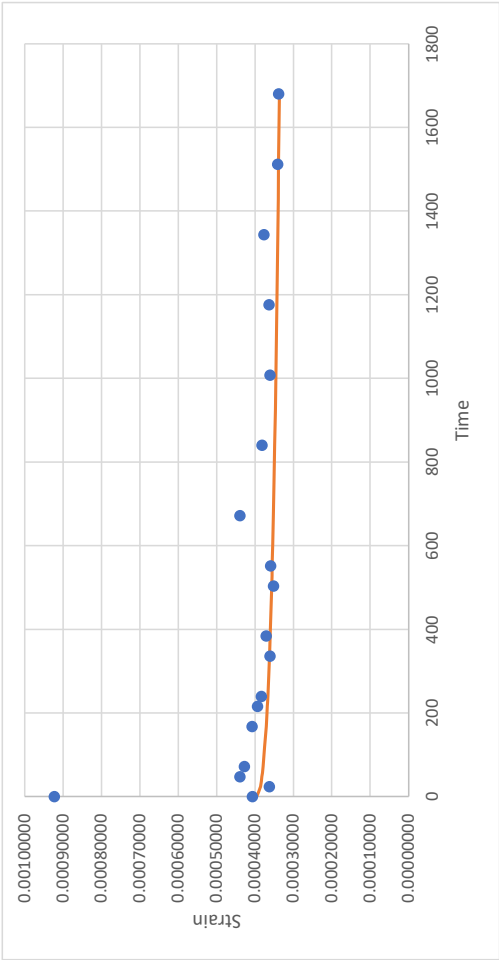
sum R^2 =

2.91008E-07



Data Set # 5

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000525973		5703714.00	50075460.00	0.50	1680	-18750
0	0.00092273	0.00039676	0.00000028				
0.1	0.00040622	0.00039603	0.00000000				
24	0.00036239	0.00038608	0.00000000				
48	0.00043946	0.00038202	0.00000000				
72	0.00042712	0.00037904	0.00000000				
168	0.00040718	0.00037107	0.00000000				
216	0.00039339	0.00036820	0.00000000				
240	0.00038344	0.00036693	0.00000000				
336	0.00036069	0.00036258	0.00000000				
384	0.00037035	0.00036074	0.00000000				
504	0.00035131	0.00035679	0.00000000				
552	0.00035928	0.00035541	0.00000000				
672	0.00043900	0.00035234	0.00000001				
840	0.00038178	0.00034872	0.00000000				
1008	0.00036078	0.00034567	0.00000000				
1176	0.00036330	0.00034304	0.00000000				
1344	0.00037679	0.00034073	0.00000000				
1512	0.00034076	0.00033869	0.00000000				
1680	0.00033842	0.00033685	0.00000000				
		sum R^2 =	2.85276E-07				



Data Set # 6

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000501193		5985713.41				
0	0.00088104	0.00041124	0.00000022				
0.1	0.00042469	0.00039136	0.00000000				
24	0.00025695	0.00034214	0.00000001				
48	0.00033460	0.00033154	0.00000000				
72	0.00034042	0.00032482	0.00000000				
168	0.00027994	0.00030955	0.00000000				
216	0.00028905	0.00030473	0.00000000				
240	0.00028431	0.00030267	0.00000000				
336	0.00026414	0.00029595	0.00000000				
384	0.00027068	0.00029324	0.00000000				
504	0.00028286	0.00028761	0.00000000				
552	0.00027729	0.00028571	0.00000000				
672	0.00029657	0.00028156	0.00000000				
840	0.00030501	0.00027680	0.00000000				
1008	0.00028141	0.00027288	0.00000000				
1176	0.00027250	0.00026955	0.00000000				
1344	0.00028754	0.00026665	0.00000000				
1512	0.00026865	0.00026409	0.00000000				
1680	0.00027200	0.00026180	0.00000000				
		sum R^2 =	2.32405E-07				

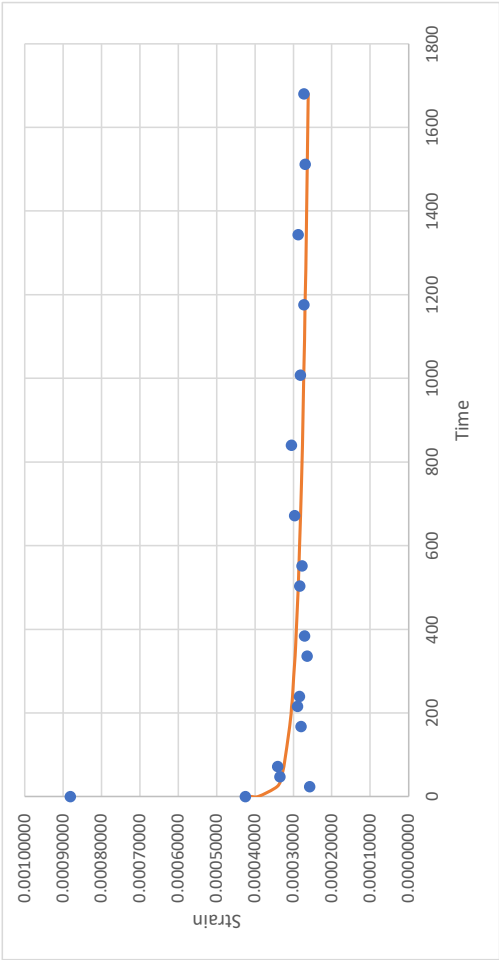
E0
(psi)
6385713.41

E1
(psi)
20075460.00

β
0.25

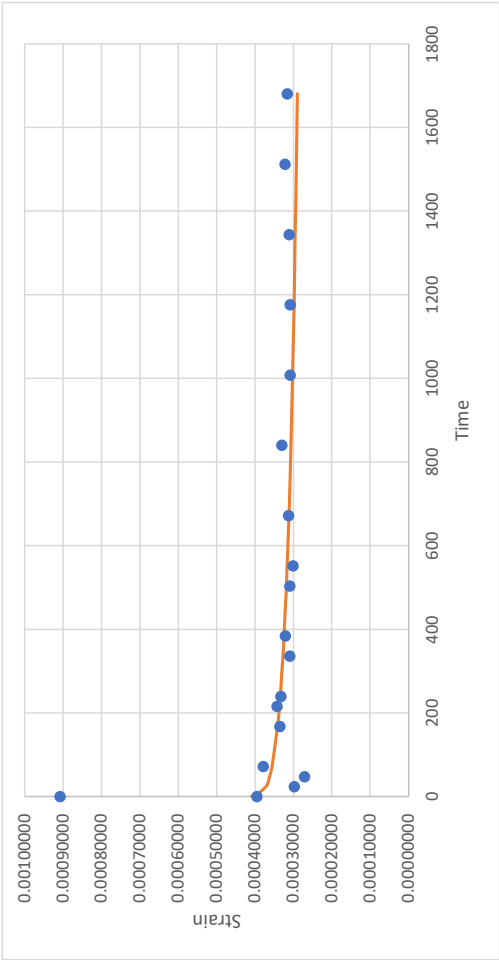
τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 7

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000498078		6023148.15	25075460.00	0.35	1680	-18750
0	0.00090760	0.00040952	0.00000025				
0.1	0.00039499	0.00040334	0.00000000				
24	0.00029756	0.00037122	0.00000001				
48	0.00027044	0.00036214	0.00000001				
72	0.00037791	0.00035604	0.00000000				
168	0.00033460	0.00034133	0.00000000				
216	0.00034216	0.00033646	0.00000000				
240	0.00033272	0.00033435	0.00000000				
336	0.00030944	0.00032736	0.00000000				
384	0.00032066	0.00032448	0.00000000				
504	0.00030940	0.00031845	0.00000000				
552	0.00030071	0.00031639	0.00000000				
672	0.00031218	0.00031186	0.00000000				
840	0.00032999	0.00030662	0.00000000				
1008	0.00030795	0.00030226	0.00000000				
1176	0.00030841	0.00029855	0.00000000				
1344	0.00031096	0.00029531	0.00000000				
1512	0.00032175	0.00029245	0.00000000				
1680	0.00031574	0.00028988	0.00000000				
		sum R^2 =	2.6321E-07				



Data Set # 8

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.00057339		5382721.37				
0	0.00095899	0.00044021	0.00000027				
0.1	0.00044490	0.00043403	0.00000000				
24	0.00033965	0.00040191	0.00000000				
48	0.00038917	0.00039283	0.00000000				
72	0.00042468	0.00038673	0.00000000				
168	0.00033137	0.00037202	0.00000000				
216	0.00033581	0.00036715	0.00000000				
240	0.00033418	0.00036504	0.00000000				
336	0.00034529	0.00035805	0.00000000				
384	0.00032837	0.00035517	0.00000000				
504	0.00032022	0.00034914	0.00000000				
552	0.00033497	0.00034708	0.00000000				
672	0.00033081	0.00034255	0.00000000				
840	0.00035645	0.00033730	0.00000000				
1008	0.00032815	0.00033295	0.00000000				
1176	0.00030361	0.00032924	0.00000000				
1344	0.00035148	0.00032600	0.00000000				
1512	0.00033728	0.00032313	0.00000000				
1680	0.00034845	0.00032057	0.00000000				
		sum R^2 =	2.80039E-07				

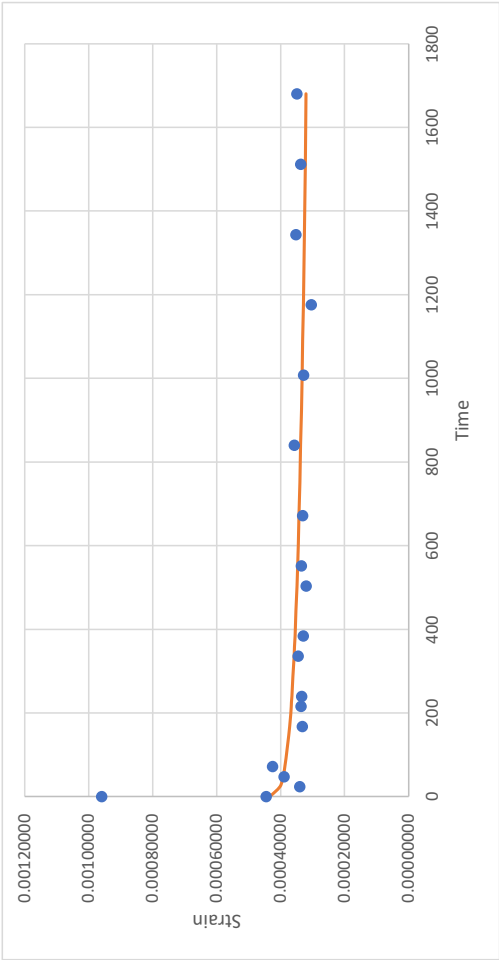
E0 (psi) 5782721.37

E1 (psi) 25075460.00

β 0.35

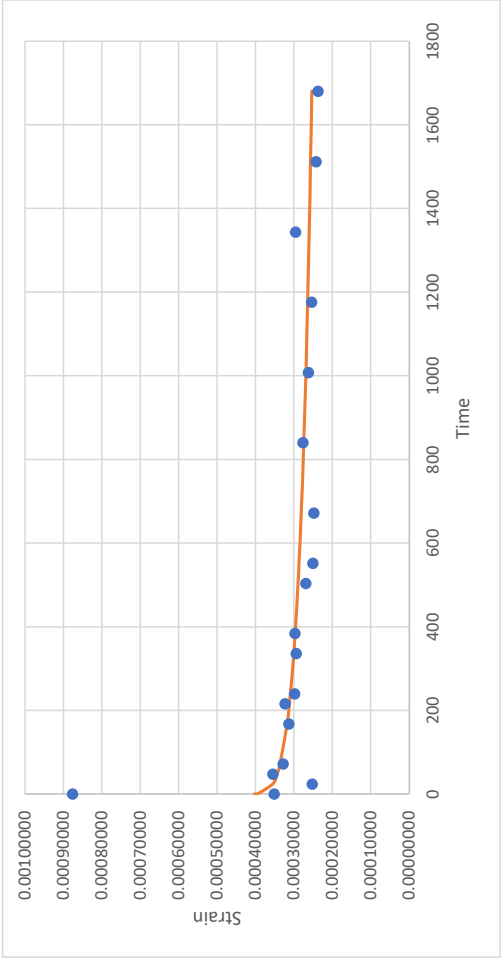
τ (hrs) 1680

P (lbs) -18750



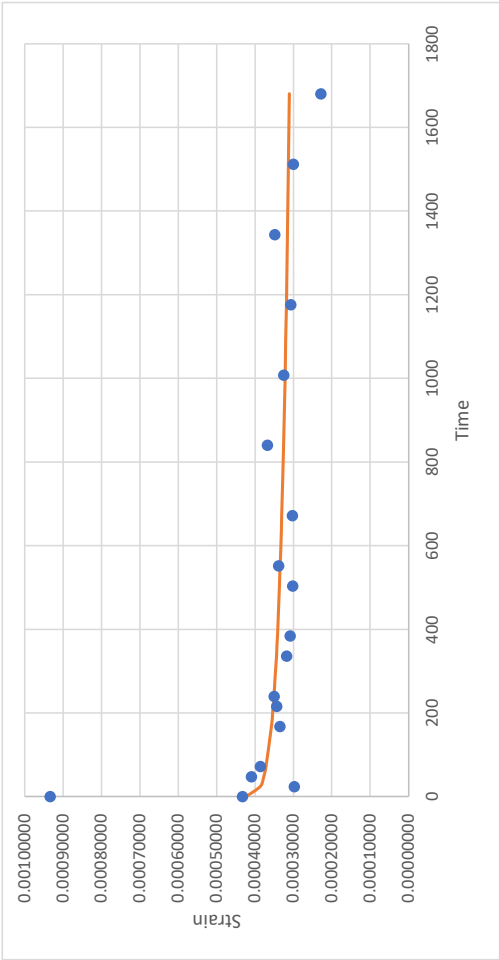
Data Set # 9

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000472869		6344247.45	20075460.00	0.35	1680	-18750
0	0.00087595	0.00040308	0.00000022				
0.1	0.00035104	0.00039536	0.00000000				
24	0.00025209	0.00035525	0.00000001				
48	0.00035471	0.00034390	0.00000000				
72	0.00032772	0.00033628	0.00000000				
168	0.00031255	0.00031791	0.00000000				
216	0.00032323	0.00031183	0.00000000				
240	0.00029817	0.00030919	0.00000000				
336	0.00029364	0.00030046	0.00000000				
384	0.00029705	0.00029686	0.00000000				
504	0.00026860	0.00028933	0.00000000				
552	0.00025053	0.00028676	0.00000000				
672	0.00024794	0.00028110	0.00000000				
840	0.00027668	0.00027455	0.00000000				
1008	0.00026246	0.00026911	0.00000000				
1176	0.00025355	0.00026447	0.00000000				
1344	0.00029514	0.00026043	0.00000000				
1512	0.00024189	0.00025685	0.00000000				
1680	0.00023742	0.00025364	0.00000000				
		sum R^2 =	2.3847E-07				



Data Set # 10

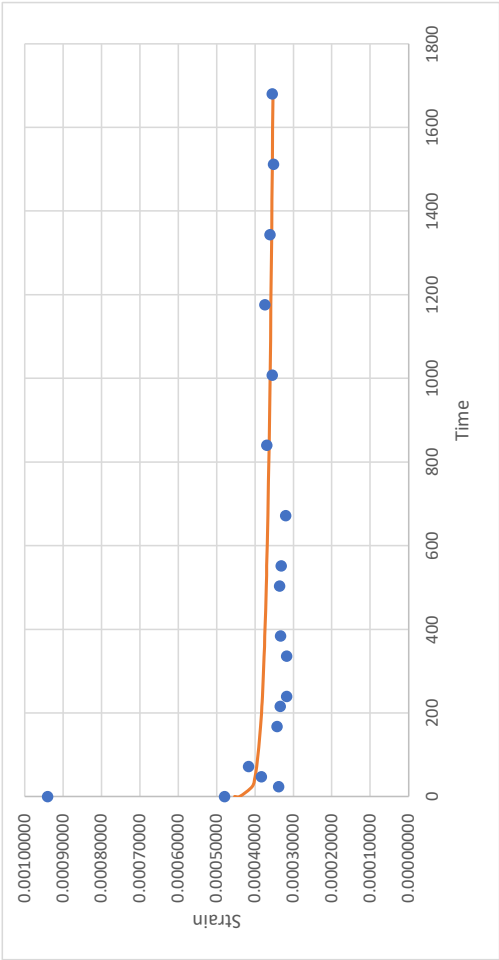
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000499526		6005695.43	24275460.00	0.30	1680	-18750
0	0.00093398	0.00043446	0.00000025				
0.1	0.00043241	0.00042418	0.00000000				
24	0.00029749	0.00038678	0.00000001				
48	0.00040951	0.00037753	0.00000000				
72	0.00038565	0.00037149	0.00000000				
168	0.00033454	0.00035739	0.00000000				
216	0.00034366	0.00035283	0.00000000				
240	0.00034985	0.00035087	0.00000000				
336	0.00031719	0.00034443	0.00000000				
384	0.00030810	0.00034181	0.00000000				
504	0.00030153	0.00033634	0.00000000				
552	0.00033814	0.00033448	0.00000000				
672	0.00030273	0.00033041	0.00000000				
840	0.00036742	0.00032573	0.00000000				
1008	0.00032507	0.00032185	0.00000000				
1176	0.00030682	0.00031856	0.00000000				
1344	0.00034839	0.00031569	0.00000000				
1512	0.00029982	0.00031315	0.00000000				
1680	0.00022821	0.00031087	0.00000001				
		sum R^2 =	2.625E-07				



Data Set # 11

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000487032		6159757.42	30075460.00	0.25	1680	-18750
0	0.00094031	0.00045328	0.00000024				
0.1	0.00047930	0.00044001	0.00000000				
24	0.00033811	0.00040716	0.00000000				
48	0.00038294	0.00040009	0.00000000				
72	0.00041689	0.00039560	0.00000000				
168	0.00034233	0.00038541	0.00000000				
216	0.00033426	0.00038219	0.00000000				
240	0.00031700	0.00038081	0.00000000				
336	0.00031715	0.00037633	0.00000000				
384	0.00033307	0.00037451	0.00000000				
504	0.00033588	0.00037076	0.00000000				
552	0.00033187	0.00036949	0.00000000				
672	0.00031990	0.00036672	0.00000000				
840	0.00036898	0.00036354	0.00000000				
1008	0.00035475	0.00036093	0.00000000				
1176	0.00037394	0.00035870	0.00000000				
1344	0.00036089	0.00035677	0.00000000				
1512	0.00035136	0.00035506	0.00000000				
1680	0.00035473	0.00035353	0.00000000				

sum R^2 = 2.60335E-07



Data Set # 12

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000558912		5367573.22				
0	0.00096684	0.00040793	0.00000031				
0.1	0.00041682	0.00040721	0.00000000				
24	0.00034126	0.00039736	0.00000000				
48	0.00040015	0.00039334	0.00000000				
72	0.00043410	0.00039038	0.00000000				
168	0.00035956	0.00038249	0.00000000				
216	0.00037181	0.00037966	0.00000000				
240	0.00037799	0.00037840	0.00000000				
336	0.00036564	0.00037409	0.00000000				
384	0.00036905	0.00037227	0.00000000				
504	0.00036404	0.00036836	0.00000000				
552	0.00035535	0.00036699	0.00000000				
672	0.00036682	0.00036395	0.00000000				
840	0.00038777	0.00036036	0.00000000				
1008	0.00037979	0.00035734	0.00000000				
1176	0.00036150	0.00035474	0.00000000				
1344	0.00037967	0.00035246	0.00000000				
1512	0.00037484	0.00035043	0.00000000				
1680	0.00036726	0.00034862	0.00000000				
		sum R^2 =	3.18403E-07				

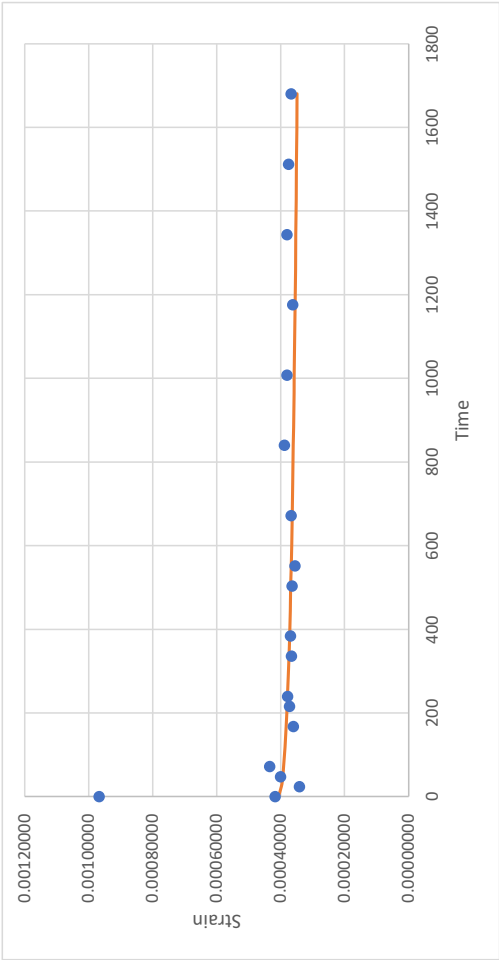
E0
(psi)
5367573.22

E1
(psi)
50575460.00

β
0.50

τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 13

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.00065112		4607445.85				
0	0.00107153	0.00061052	0.00000021				
0.1	0.00063557	0.00059084	0.00000000				
24	0.00047408	0.00054210	0.00000000				
48	0.00052672	0.00053161	0.00000000				
72	0.00053568	0.00052496	0.00000000				
168	0.00048300	0.00050984	0.00000000				
216	0.00047337	0.00050506	0.00000000				
240	0.00047174	0.00050302	0.00000000				
336	0.00047814	0.00049638	0.00000000				
384	0.00046280	0.00049368	0.00000000				
504	0.00047030	0.00048812	0.00000000				
552	0.00046785	0.00048623	0.00000000				
672	0.00055589	0.00048212	0.00000001				
840	0.00049245	0.00047741	0.00000000				
1008	0.00047197	0.00047353	0.00000000				
1176	0.00046618	0.00047023	0.00000000				
1344	0.00048592	0.00046736	0.00000000				
1512	0.00046703	0.00046483	0.00000000				
1680	0.00047038	0.00046256	0.00000000				
		sum R^2 =	2.23943E-07				

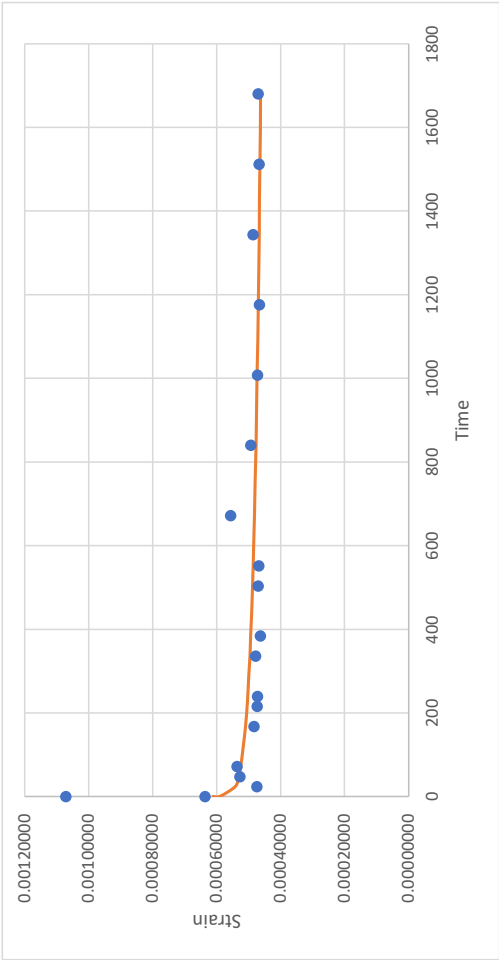
E0
(psi)
6507445.85

E1
(psi)
20275460.00

β
0.25

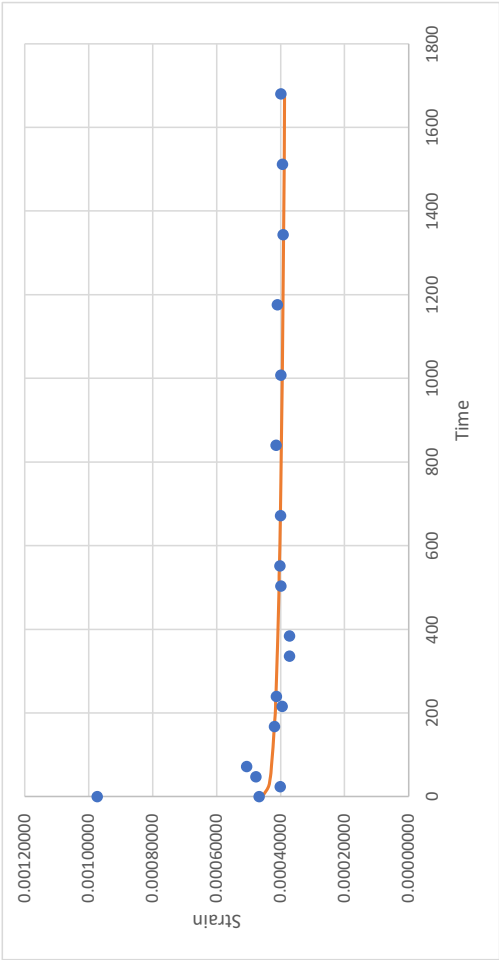
τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 14

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000569918		5263911.25				
0	0.00097321	0.00046161	0.00000026				
0.1	0.00046689	0.00045778	0.00000000				
24	0.00040070	0.00043788	0.00000000				
48	0.00047679	0.00043226	0.00000000				
72	0.00050604	0.00042848	0.00000001				
168	0.00041901	0.00041937	0.00000000				
216	0.00039530	0.00041635	0.00000000				
240	0.00041244	0.00041504	0.00000000				
336	0.00037196	0.00041071	0.00000000				
384	0.00037223	0.00040893	0.00000000				
504	0.00039849	0.00040519	0.00000000				
552	0.00040228	0.00040391	0.00000000				
672	0.00039969	0.00040111	0.00000000				
840	0.00041439	0.00039786	0.00000000				
1008	0.00039860	0.00039516	0.00000000				
1176	0.00040999	0.00039286	0.00000000				
1344	0.00039222	0.00039085	0.00000000				
1512	0.00039365	0.00038908	0.00000000				
1680	0.00039856	0.00038749	0.00000000				
		sum R^2 =	2.74549E-07				



E0 (psi) 5863911.25
E1 (psi) 40475460.00
 β 0.35
 τ (hrs) 1680
P (lbs) -18750

Data Set # 15

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.00060503		4541992.05				
0	0.00110125	0.00057879	0.00000027				
0.1	0.00057777	0.00057851	0.00000000				
24	0.00055064	0.00057166	0.00000000				
48	0.00062828	0.00056820	0.00000000				
72	0.00061381	0.00056550	0.00000000				
168	0.00056737	0.00055773	0.00000000				
216	0.00056243	0.00055478	0.00000000				
240	0.00054831	0.00055344	0.00000000				
336	0.00053752	0.00054878	0.00000000				
384	0.00054406	0.00054675	0.00000000				
504	0.00055936	0.00054233	0.00000000				
552	0.00055536	0.00054076	0.00000000				
672	0.00053715	0.00053723	0.00000000				
840	0.00057215	0.00053301	0.00000000				
1008	0.00057198	0.00052941	0.00000000				
1176	0.00054900	0.00052628	0.00000000				
1344	0.00057186	0.00052353	0.00000000				
1512	0.00053579	0.00052108	0.00000000				
1680	0.00049540	0.00051888	0.00000000				
		sum R^2 =	2.80174E-07				

E0
(psi)

5741992.05

E1
(psi)

50075460.00

β

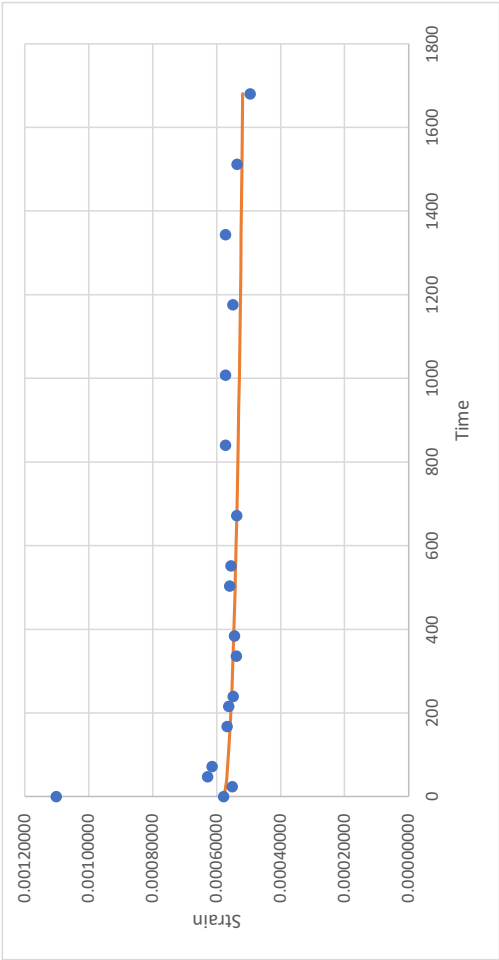
0.60

τ
(hrs)

1680

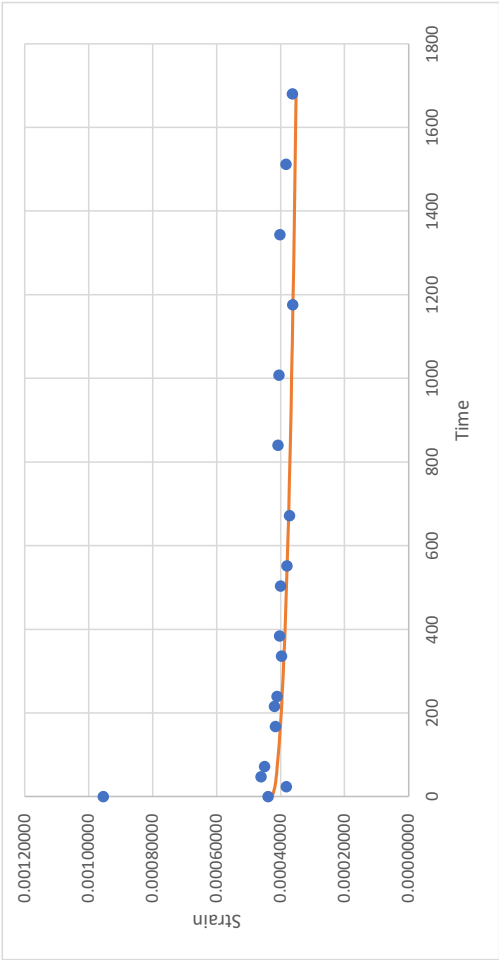
P
(lbs)

-18750



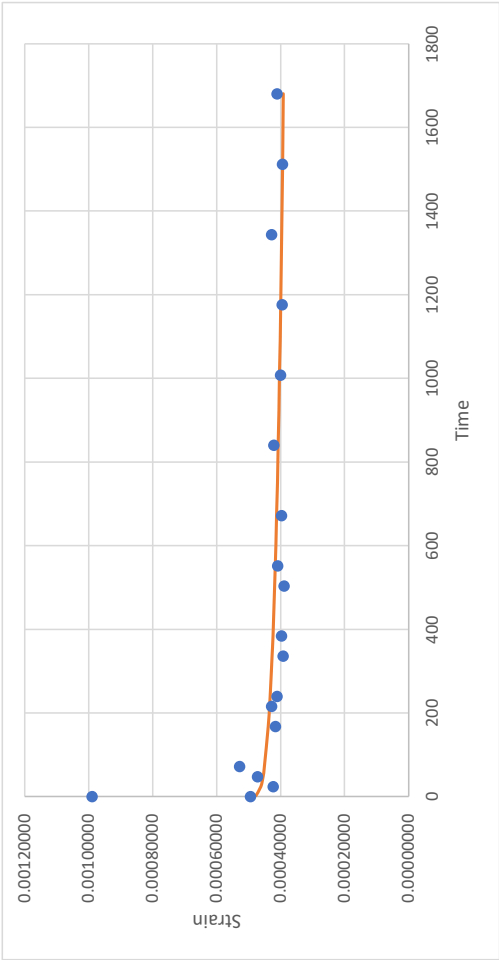
Data Set # 16

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000546384		5490642.95	40075460.00	0.60	1680	-18750
0	0.00095428	0.00042710	0.00000028				
0.1	0.00043865	0.00042675	0.00000000				
24	0.00038184	0.00041820	0.00000000				
48	0.00046104	0.00041387	0.00000000				
72	0.00044969	0.00041049	0.00000000				
168	0.00041576	0.00040079	0.00000000				
216	0.00041863	0.00039710	0.00000000				
240	0.00041075	0.00039543	0.00000000				
336	0.00039684	0.00038960	0.00000000				
384	0.00040338	0.00038707	0.00000000				
504	0.00039993	0.00038155	0.00000000				
552	0.00038030	0.00037959	0.00000000				
672	0.00037146	0.00037517	0.00000000				
840	0.00040803	0.00036990	0.00000000				
1008	0.00040474	0.00036540	0.00000000				
1176	0.00036145	0.00036150	0.00000000				
1344	0.00040150	0.00035806	0.00000000				
1512	0.00038260	0.00035499	0.00000000				
1680	0.00036253	0.00035224	0.00000000				
		sum R^2 =	2.84724E-07				



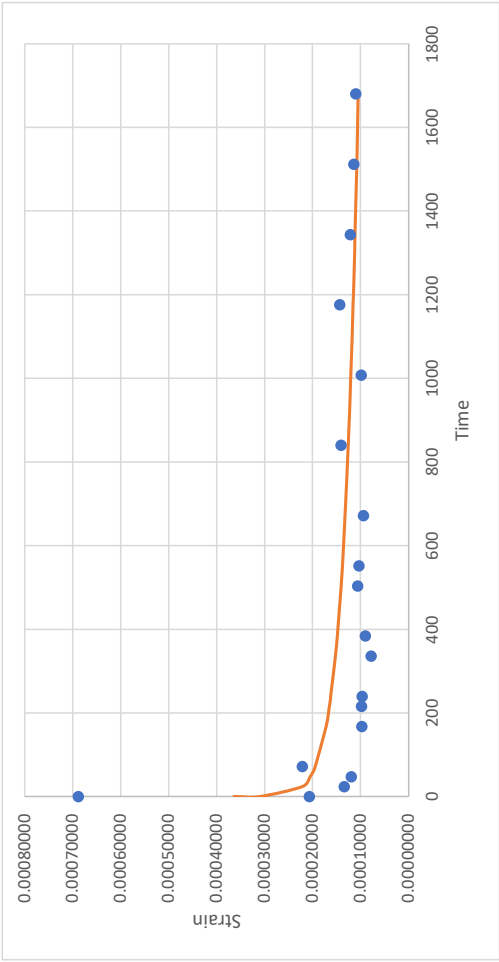
Data Set # 17

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000576174		5206756.66				
0	0.00098887	0.00048098	0.00000026				
0.1	0.00049347	0.00047922	0.00000000				
24	0.00042260	0.00046156	0.00000000				
48	0.00047212	0.00045514	0.00000000				
72	0.00052796	0.00045056	0.00000001				
168	0.00041589	0.00043876	0.00000000				
216	0.00042814	0.00043464	0.00000000				
240	0.00041089	0.00043282	0.00000000				
336	0.00039229	0.00042669	0.00000000				
384	0.00039726	0.00042411	0.00000000				
504	0.00038912	0.00041864	0.00000000				
552	0.00040856	0.00041674	0.00000000				
672	0.00039659	0.00041253	0.00000000				
840	0.00042066	0.00040761	0.00000000				
1008	0.00040018	0.00040348	0.00000000				
1176	0.00039439	0.00039994	0.00000000				
1344	0.00042820	0.00039684	0.00000000				
1512	0.00039367	0.00039409	0.00000000				
1680	0.00041110	0.00039163	0.00000000				
		sum R^2 =	2.69843E-07				



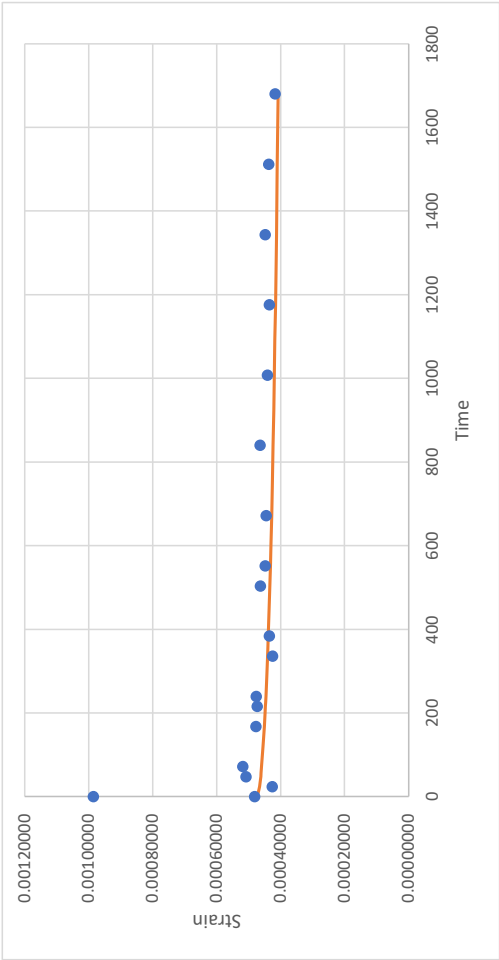
Data Set # 18

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000324138		9255308.34	11575460.00	0.20	1680	-18750
0	0.00068810	0.00036396	0.00000011				
0.1	0.00020657	0.00030938	0.00000001				
24	0.00013361	0.00022133	0.00000001				
48	0.00011903	0.00020486	0.00000001				
72	0.00022127	0.00019466	0.00000000				
168	0.00009718	0.00017212	0.00000001				
216	0.00009797	0.00016513	0.00000000				
240	0.00009636	0.00016217	0.00000000				
336	0.00007774	0.00015258	0.00000001				
384	0.00008949	0.00014872	0.00000000				
504	0.00010586	0.00014078	0.00000000				
552	0.00010341	0.00013811	0.00000000				
672	0.00009352	0.00013229	0.00000000				
840	0.00014052	0.00012564	0.00000000				
1008	0.00009867	0.00012018	0.00000000				
1176	0.00014294	0.00011554	0.00000000				
1344	0.00012097	0.00011152	0.00000000				
1512	0.00011406	0.00010797	0.00000000				
1680	0.00010960	0.00010479	0.00000000				
		sum R^2 =	1.57394E-07				



Data Set # 19

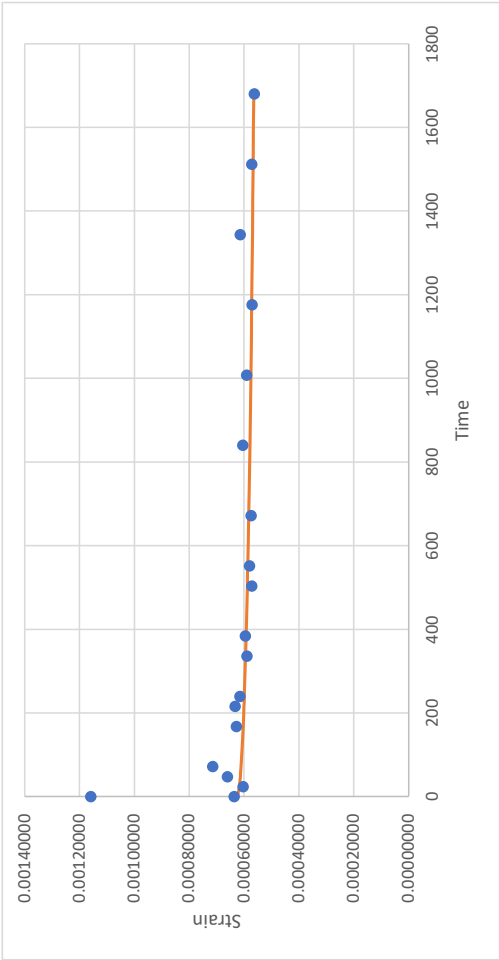
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000569813		5264882.19				
0	0.00098553	0.00047401	0.00000026				
0.1	0.00048085	0.00047371	0.00000000				
24	0.00042561	0.00046618	0.00000000				
48	0.00050793	0.00046238	0.00000000				
72	0.00051846	0.00045941	0.00000000				
168	0.00047671	0.00045088	0.00000000				
216	0.00047333	0.00044764	0.00000000				
240	0.00047639	0.00044617	0.00000000				
336	0.00042498	0.00044104	0.00000000				
384	0.00043464	0.00043882	0.00000000				
504	0.00046244	0.00043396	0.00000000				
552	0.00044751	0.00043223	0.00000000				
672	0.00044492	0.00042835	0.00000000				
840	0.00046429	0.00042371	0.00000000				
1008	0.00044068	0.00041976	0.00000000				
1176	0.00043490	0.00041633	0.00000000				
1344	0.00044839	0.00041330	0.00000000				
1512	0.00043730	0.00041061	0.00000000				
1680	0.00041723	0.00040819	0.00000000				
		sum R^2 =	2.72471E-07				



E0 (psi)	5864882.19	E1 (psi)	45575460.00	β	0.60	τ (hrs)	1680	P (lbs)	-18750

Data Set # 20

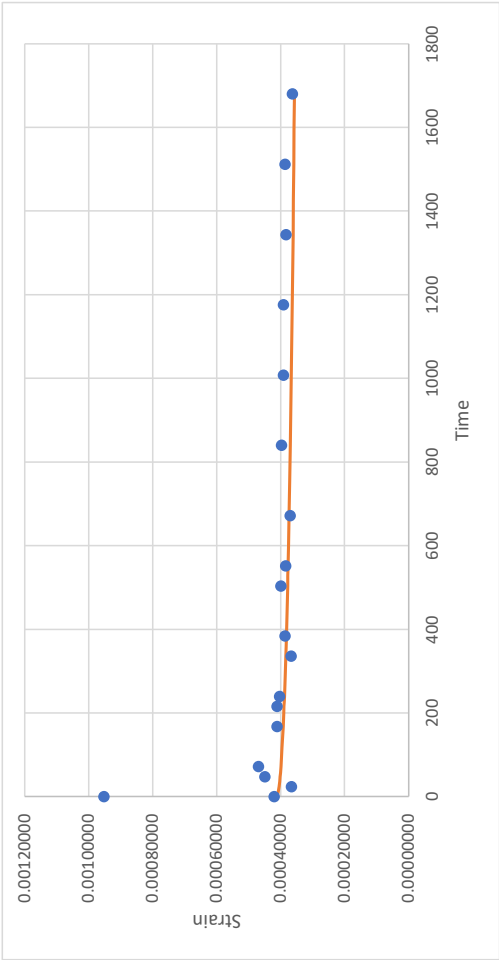
time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000766527		3913756.38				
0	0.00115873	0.00062433	0.00000029				
0.1	0.00063538	0.00062405	0.00000000				
24	0.00060359	0.00061727	0.00000000				
48	0.00066091	0.00061384	0.00000000				
72	0.00071359	0.00061117	0.00000001				
168	0.00062812	0.00060348	0.00000000				
216	0.00063255	0.00060056	0.00000000				
240	0.00061530	0.00059924	0.00000000				
336	0.00058890	0.00059461	0.00000000				
384	0.00059544	0.00059261	0.00000000				
504	0.00057168	0.00058823	0.00000000				
552	0.00058017	0.00058668	0.00000000				
672	0.00057444	0.00058318	0.00000000				
840	0.00060477	0.00057900	0.00000000				
1008	0.00059054	0.00057544	0.00000000				
1176	0.00057069	0.00057234	0.00000000				
1344	0.00061385	0.00056962	0.00000000				
1512	0.00057153	0.00056719	0.00000000				
1680	0.00056240	0.00056501	0.00000000				
		sum R^2 =	3.00851E-07				



E0 (psi) 5613756.38
E1 (psi) 50575460.00
 β 0.60
 τ (hrs) 1680
P (lbs) -18750

Data Set # 21

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000541733		5537780.15	55575460.00	0.60	1680	-18750
0	0.00095280	0.00041106	0.00000029				
0.1	0.00041994	0.00041082	0.00000000				
24	0.00036626	0.00040465	0.00000000				
48	0.00044860	0.00040153	0.00000000				
72	0.00046849	0.00039909	0.00000000				
168	0.00041113	0.00039210	0.00000000				
216	0.00041087	0.00038944	0.00000000				
240	0.00040300	0.00038823	0.00000000				
336	0.00036721	0.00038403	0.00000000				
384	0.00038625	0.00038220	0.00000000				
504	0.00039842	0.00037822	0.00000000				
552	0.00038348	0.00037680	0.00000000				
672	0.00036995	0.00037362	0.00000000				
840	0.00039714	0.00036982	0.00000000				
1008	0.00039073	0.00036657	0.00000000				
1176	0.00039120	0.00036376	0.00000000				
1344	0.00038279	0.00036128	0.00000000				
1512	0.00038578	0.00035907	0.00000000				
1680	0.00036258	0.00035708	0.00000000				
		sum R^2 =	3.03854E-07				



Data Set # 22

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000583956		5137377.14				
0	0.00099191	0.00048663	0.00000026				
0.1	0.00048560	0.00047962	0.00000000				
24	0.00041786	0.00045410	0.00000000				
48	0.00050488	0.00044779	0.00000000				
72	0.00049821	0.00044367	0.00000000				
168	0.00045959	0.00043405	0.00000000				
216	0.00045152	0.00043094	0.00000000				
240	0.00045146	0.00042960	0.00000000				
336	0.00041568	0.00042521	0.00000000				
384	0.00045814	0.00042341	0.00000000				
504	0.00042971	0.00041968	0.00000000				
552	0.00042570	0.00041842	0.00000000				
672	0.00040749	0.00041564	0.00000000				
840	0.00044093	0.00041244	0.00000000				
1008	0.00045014	0.00040980	0.00000000				
1176	0.00040841	0.00040755	0.00000000				
1344	0.00043595	0.00040559	0.00000000				
1512	0.00041707	0.00040386	0.00000000				
1680	0.00042042	0.00040230	0.00000000				
		sum R^2 =	2.65889E-07				

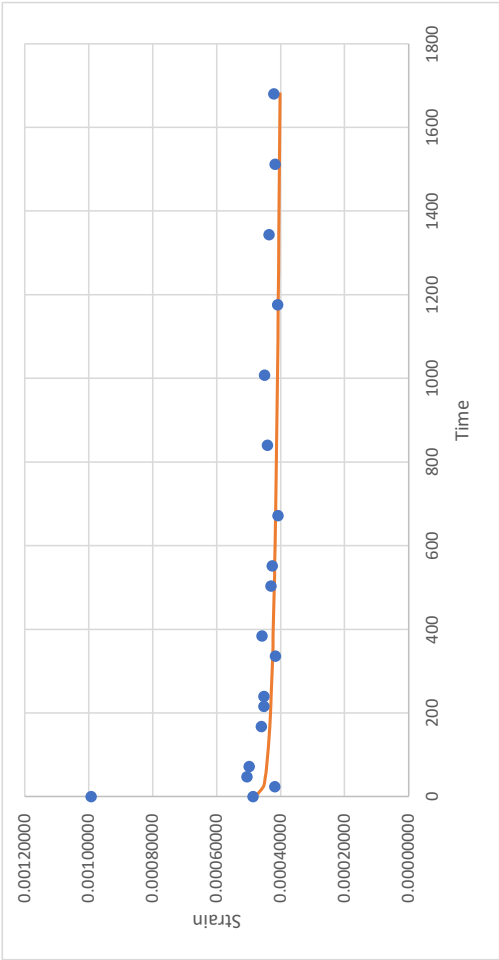
E0
(psi)
5937377.14

E1
(psi)
35575460.00

β
0.30

τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 23

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000586872		5111844.52				
0	0.00099934	0.00050849	0.00000024				
0.1	0.00051190	0.00049814	0.00000000				
24	0.00043011	0.00047253	0.00000000				
48	0.00048430	0.00046701	0.00000000				
72	0.00054326	0.00046351	0.00000001				
168	0.00044996	0.00045557	0.00000000				
216	0.00045439	0.00045306	0.00000000				
240	0.00044964	0.00045198	0.00000000				
336	0.00041229	0.00044849	0.00000000				
384	0.00042663	0.00044708	0.00000000				
504	0.00042475	0.00044415	0.00000000				
552	0.00043637	0.00044316	0.00000000				
672	0.00041660	0.00044100	0.00000000				
840	0.00045003	0.00043852	0.00000000				
1008	0.00047174	0.00043648	0.00000000				
1176	0.00043939	0.00043475	0.00000000				
1344	0.00046068	0.00043324	0.00000000				
1512	0.00043398	0.00043191	0.00000000				
1680	0.00043734	0.00043072	0.00000000				
		sum R^2 =	2.5177E-07				

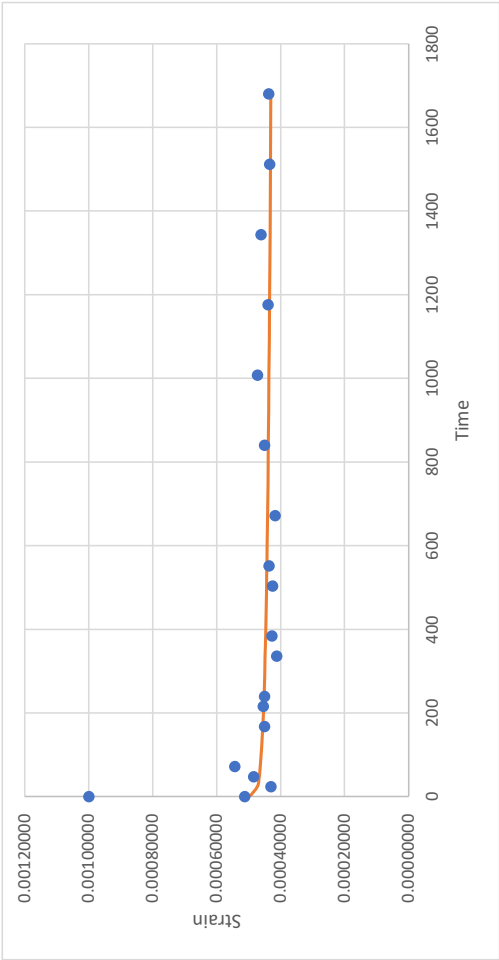
E0
(psi)
6111844.52

E1
(psi)
38575460.00

β
0.25

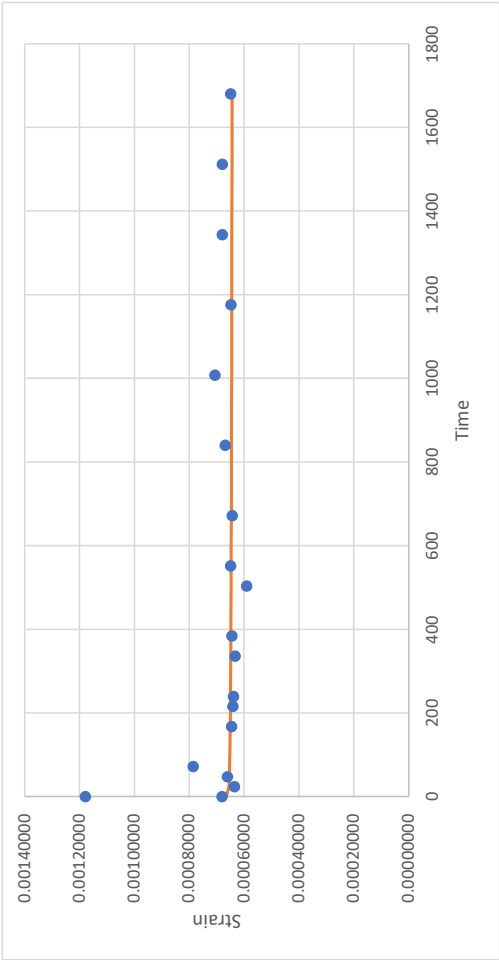
τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 24

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000735168		4080701.30				
0	0.00117884	0.00067722	0.00000025				
0.1	0.00068050	0.00066636	0.00000000				
24	0.00063464	0.00065571	0.00000000				
48	0.00066072	0.00065397	0.00000000				
72	0.00078524	0.00065292	0.00000002				
168	0.00064512	0.00065064	0.00000000				
216	0.00064018	0.00064995	0.00000000				
240	0.00063854	0.00064965	0.00000000				
336	0.00063244	0.00064871	0.00000000				
384	0.00064367	0.00064834	0.00000000				
504	0.00059024	0.00064757	0.00000000				
552	0.00064870	0.00064731	0.00000000				
672	0.00064298	0.00064674	0.00000000				
840	0.00066861	0.00064610	0.00000000				
1008	0.00070592	0.00064558	0.00000000				
1176	0.00064703	0.00064513	0.00000000				
1344	0.00067925	0.00064475	0.00000000				
1512	0.00067910	0.00064441	0.00000000				
1680	0.00064810	0.00064410	0.00000000				
		sum R^2 =	2.73639E-07				



Data Set # 25

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Strain	0.000526137		5701940.86				
0	0.00104193	0.00053363	0.00000026				
0.1	0.00054187	0.00053326	0.00000000				
24	0.00048194	0.00052831	0.00000000				
48	0.00059083	0.00052629	0.00000000				
72	0.00056385	0.00052480	0.00000000				
168	0.00052211	0.00052083	0.00000000				
216	0.00053435	0.00051941	0.00000000				
240	0.00054054	0.00051877	0.00000000				
336	0.00049225	0.00051661	0.00000000				
384	0.00051441	0.00051569	0.00000000				
504	0.00050785	0.00051373	0.00000000				
552	0.00051790	0.00051304	0.00000000				
672	0.00052000	0.00051151	0.00000000				
840	0.00056438	0.00050971	0.00000000				
1008	0.00056890	0.00050819	0.00000000				
1176	0.00051780	0.00050688	0.00000000				
1344	0.00052816	0.00050573	0.00000000				
1512	0.00052177	0.00050471	0.00000000				
1680	0.00052981	0.00050380	0.00000000				
		sum R^2 =	2.67643E-07				

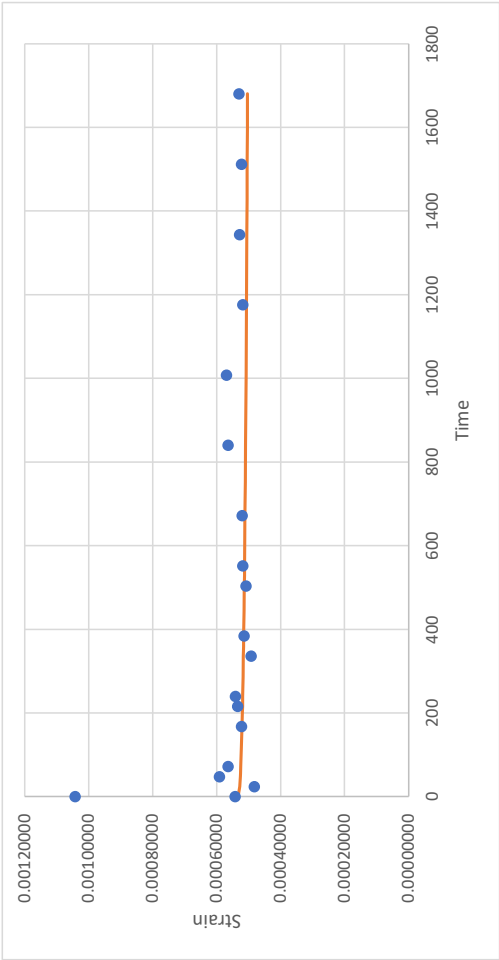
E0
(psi)
5901940.86

E1
(psi)
100575460.00

β
0.50

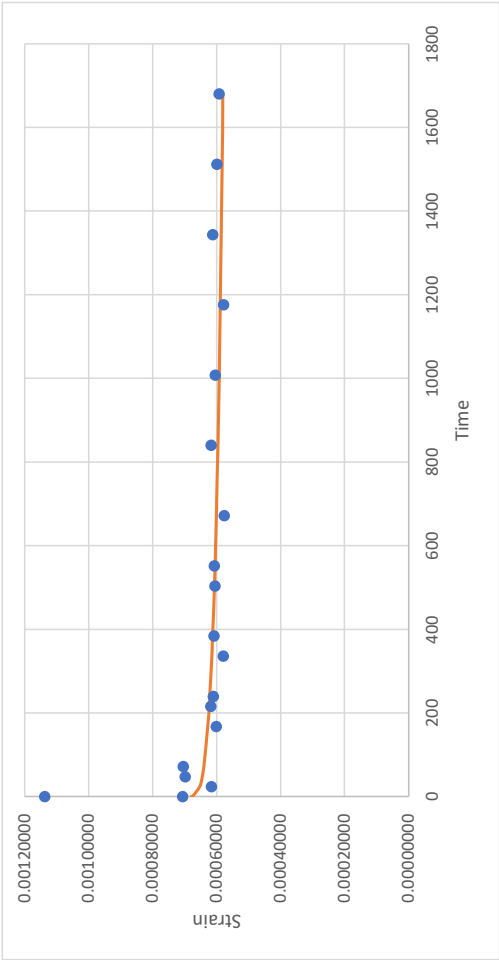
τ
(hrs)
1680

P
(lbs)
-18750



Data Set # 26

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Elastic Stain	0.000513404		5843348.93	30575460.00	0.40	1680	-18750
0	0.00113720	0.00067872	0.00000021				
0.1	0.00070601	0.00067558	0.00000000				
24	0.00061643	0.00065279	0.00000000				
48	0.00069772	0.00064545	0.00000000				
72	0.00070405	0.00064038	0.00000000				
168	0.00060088	0.00062774	0.00000000				
216	0.00061834	0.00062344	0.00000000				
240	0.00061046	0.00062157	0.00000000				
336	0.00057937	0.00061529	0.00000000				
384	0.00060778	0.00061268	0.00000000				
504	0.00060536	0.00060718	0.00000000				
552	0.00060708	0.00060529	0.00000000				
672	0.00057637	0.00060111	0.00000000				
840	0.00061709	0.00059624	0.00000000				
1008	0.00060443	0.00059219	0.00000000				
1176	0.00057781	0.00058872	0.00000000				
1344	0.00061212	0.00058569	0.00000000				
1512	0.00059896	0.00058300	0.00000000				
1680	0.00059242	0.00058060	0.00000000				
		sum R^2 =	2.2143E-07				

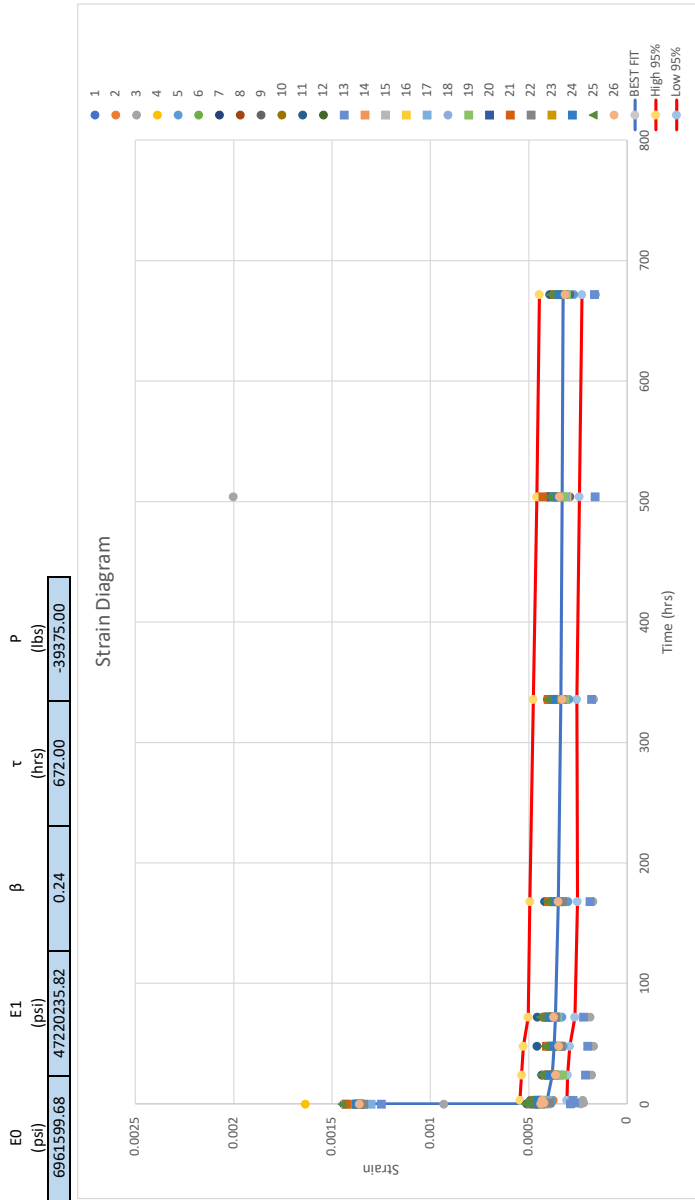


Test Sample: UHPC f'c desired: 21 ksi Load Applied: 39375 lbs
Load Applied: 30% f'c measured: 18.7 ksi

		AVERAGE STRAINS - UHPC 0.30f'c RECOVERY TEST															
Date	2/15/2022	2/15/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/10/2022	3/11/2022	3/15/2022	3/22/2022	3/29/2022	4/5/2022			
Time	4:00:00 AM	4:00:00 AM	10:00:00 PM	10:00:00 PM	11:00:00 PM	2:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	1:00:00 PM	12:00:00 PM	12:00:00 PM	12:00:00 PM			
Relative Humidity	49.7	50	50.3	50.3	50.3	50.3	50.3	50	50.1	50.1	50.1	50	50	50			
Air Temp	23.0	23.0	22.9	22.9	22.9	22.9	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0			
Notes	Initial Loading		0	0.1	1	3	24	48	72	168	336	504	672				
Point of Measure	1	0.00000000	0.00093931	0.00149726	0.00061110	0.00059078	0.00058765	0.00053764	0.00052670	0.00054233	0.00051889	0.00052201	0.00055014	0.00051263			
	2	0.00000000	0.00095935	0.00154218	0.00057813	0.00054531	0.00049849	0.00048282	0.00050157	0.00047813	0.00050470	0.00054378	0.00047501				
	3	0.00000000	0.00066580	0.00105493	0.00035789	0.00034382	0.00034850	0.00030474	0.00029537	0.00031567	0.00030473	0.00030941	0.000214621				
	4	0.00000000	0.00094314	0.00175936	0.00056211	0.00054337	0.00054805	0.00047308	0.00049651	0.00046840	0.00046220	0.00049191	0.00045748				
	5	0.00000000	0.00085474	0.00146259	0.00052814	0.00050783	0.00050627	0.00045470	0.00045002	0.00045783	0.00043126	0.00043439	0.00042189				
	6	0.00000000	0.00092819	0.00147043	0.00058442	0.00055942	0.00057349	0.00051411	0.00050786	0.00051879	0.00049067	0.00050317	0.00051412	0.00047973			
	7	0.00000000	0.00089874	0.00147234	0.00057674	0.00055485	0.00055798	0.00050171	0.00049390	0.00050327	0.00048139	0.00047983	0.00047982	0.00047358			
	8	0.00000000	0.00092822	0.00148454	0.00058601	0.00056413	0.00056256	0.00050943	0.00049537	0.00051568	0.00049224	0.00049381	0.00050162	0.00048443			
	9	0.00000000	0.00092200	0.00146119	0.00054541	0.00052353	0.00052978	0.00047821	0.00046883	0.00048133	0.00045945	0.00043600	0.00044070				
	10	0.00000000	0.00095332	0.00150343	0.00057981	0.00056262	0.00056887	0.00051261	0.00050011	0.00051574	0.00048448	0.00051106	0.00047667				
	11	0.00000000	0.00098932	0.00156292	0.00063298	0.00061579	0.00061423	0.00055796	0.00058453	0.00058297	0.00055015	0.00054233	0.00054389				
	12	0.00000000	0.00093775	0.00148789	0.00057984	0.00056890	0.00055952	0.00050795	0.00050482	0.00052358	0.00049075	0.00049388	0.00050013	0.00049232			
	13	0.00000000	0.00095694	0.00137127	0.00041120	0.00038931	0.00039713	0.00033459	0.00032520	0.00034710	0.00032051	0.00031895	0.00030644	0.00031582			
	14	0.00000000	0.00093930	0.00149726	0.00057515	0.00055796	0.00055484	0.00049545	0.00047982	0.00049857	0.00047669	0.00048451	0.00046888				
	15	0.00000000	0.00094709	0.00155350	0.00057827	0.00056108	0.00056420	0.00050013	0.00049231	0.00051263	0.00048137	0.00048919	0.00049857				
	16	0.00000000	0.00095195	0.00152248	0.00054865	0.00054083	0.00053771	0.00048769	0.00047675	0.00049081	0.00046893	0.00046580	0.00045017	0.00045955			
	17	0.00000000	0.00093455	0.00142366	0.00052975	0.00052507	0.00052507	0.00046881	0.00045944	0.00047819	0.00046256	0.00045630	0.00045631				
	18	0.00000000	0.00092211	0.00147850	0.00057358	0.00055483	0.00055639	0.00050012	0.00048762	0.00050637	0.00047199	0.00047980	0.00049388	0.00047199			
	19	0.00000000	0.00097199	0.00148613	0.00056726	0.00054069	0.00055320	0.00045163	0.00047037	0.00048756	0.00046569	0.00045476	0.00047038	0.00045788			
	20	0.00000000	0.00093467	0.00148483	0.00057831	0.00058456	0.00058143	0.00052360	0.00051735	0.00053454	0.00050641	0.00049702	0.00052672	0.00050015			
	21	0.00000000	0.00093916	0.00154860	0.00061569	0.00059381	0.00060006	0.00054068	0.00053443	0.00054381	0.00053131	0.00054069	0.00057193	0.00051724			
	22	0.00000000	0.00094415	0.00146157	0.00055963	0.00051587	0.00058150	0.00049710	0.00049599	0.00048929	0.00045803	0.00046896	0.00050803	0.00047365			
	23	0.00000000	0.00092673	0.00150339	0.00059385	0.00056572	0.00057041	0.00051415	0.00050634	0.00052822	0.00050009	0.00049227	0.00049540	0.00048915			
	24	0.00000000	0.00097391	0.00150073	0.00059560	0.00057685	0.00057841	0.00051588	0.00050494	0.00052526	0.00050337	0.00051588	0.00051900	0.00050025			
	25	0.00000000	0.00095198	0.00157101	0.00063937	0.00062374	0.00062218	0.00056121	0.00054558	0.00056746	0.00053933	0.00054245	0.00054090	0.00053933			
	26	0.00000000	0.00094270	0.00148360	0.00056123	0.00054559	0.00055497	0.00048775	0.00047368	0.00050025	0.00048305	0.00046898	0.00048930	0.00044658			

time (hr)	strain μ
0	0.00136279
0.1	0.00043369
1	0.00041773
3	0.00040724
24	0.00038126
48	0.00037076
72	0.00036422
168	0.00034973
336	0.00033722
504	0.00032974
672	0.00032440

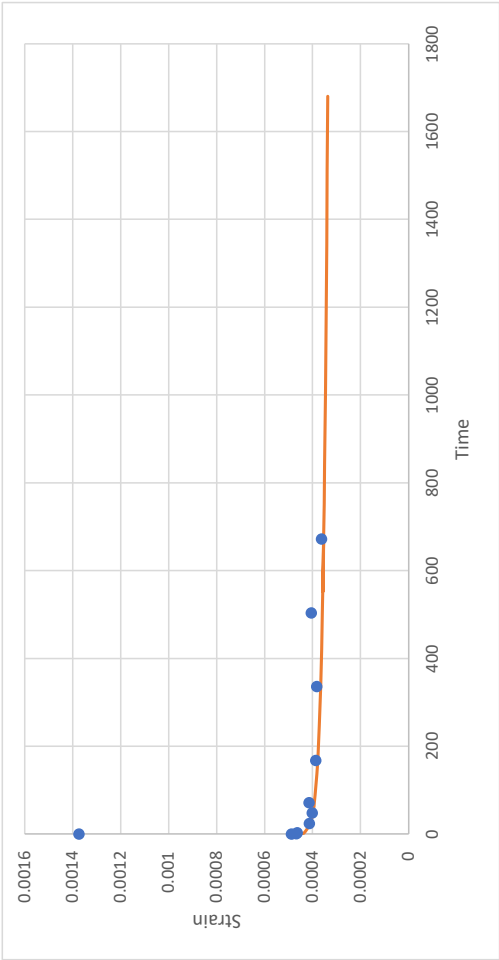
Copy and Transpose Data



Data Set # 1

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000933804		6746600.67				
0	0.001373674	0.00047963					
0.1	0.000487509	0.00045881					
1	0.000467142	0.00044413					
3	0.000463904	0.00043429					
24	0.000412742	0.00040946					
48	0.000400521	0.00039928					
72	0.000414907	0.00039291					
168	0.000386825	0.00037873					
336	0.000382861	0.00036644					
504	0.000404887	0.00035908					
672	0.000362019	0.00035382					
552		0.00035741					
672		0.00035382					
840		0.00034973					
1008		0.00034641					
1176		0.00034361					
1344		0.00034119					
1512		0.00033908					
1680		0.00033720					
		sum R^2 =	8.04549E-07				

E0 (psi)	7046600.67
E1 (psi)	50075460.00
β	0.25
τ (hrs)	672
P (lbs)	-39375

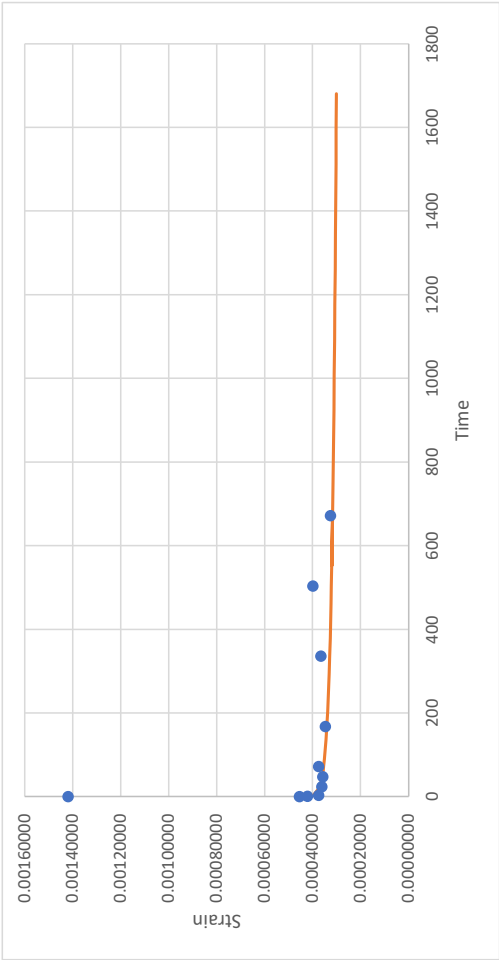


Data Set # 2

time (hr)	strain μ	Ei	E0
Initial Loading	0.000953843		6604858.43
0	0.00141860	0.00046476	
0.1	0.00045454	0.00042784	
1	0.00042167	0.00040901	
3	0.00037474	0.00039748	
24	0.00036104	0.00037074	
48	0.00035664	0.00036044	
72	0.00037415	0.00035413	
168	0.00034607	0.00034038	
336	0.00036555	0.00032868	
504	0.00039853	0.00032173	
672	0.00032439	0.00031678	
552		0.00032017	
672		0.00031678	
840		0.00031294	
1008		0.00030981	
1176		0.00030716	
1344		0.00030488	
1512		0.00030288	
1680		0.00030109	

sum R^2 = 9.19063E-07

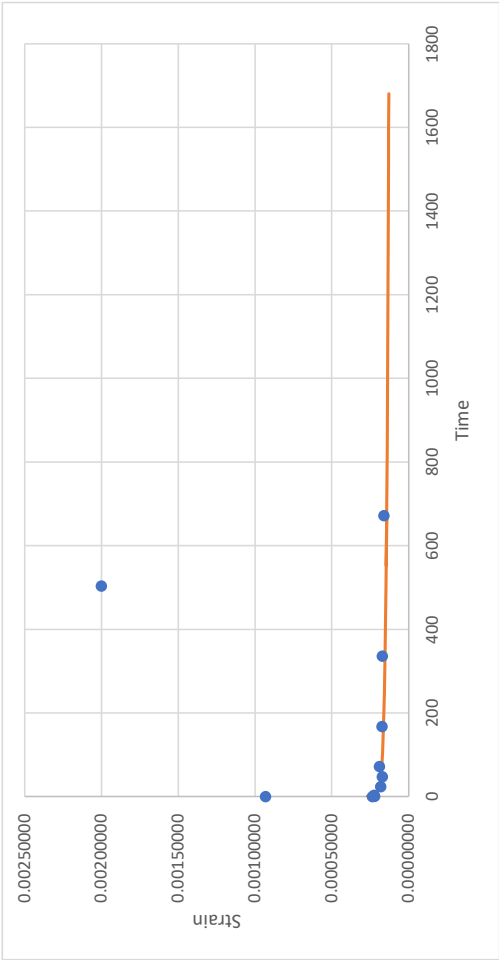
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6604858.43	42575460.00	0.20	672	-39375



Data Set # 3

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.00060292		9541226.74	49075460.00	0.20	672	-39375
0	0.00093135	0.00027106	0.00000044				
0.1	0.00023430	0.00023903	0.00000000				
1	0.0002018	0.00022270	0.00000000				
3	0.00022475	0.00021270	0.00000000				
24	0.00017984	0.00018949	0.00000000				
48	0.00016919	0.00018056	0.00000000				
72	0.00018825	0.00017509	0.00000000				
168	0.00017267	0.00016315	0.00000000				
336	0.00017027	0.00015301	0.00000000				
504	0.00200096	0.00014698	0.00000000				
672	0.00016036	0.00014268	0.00000000				
552		0.00014562					
672		0.00014268					
840		0.00013935					
1008		0.00013663					
1176		0.00013434					
1344		0.00013236					
1512		0.00013062					
1680		0.00012907					

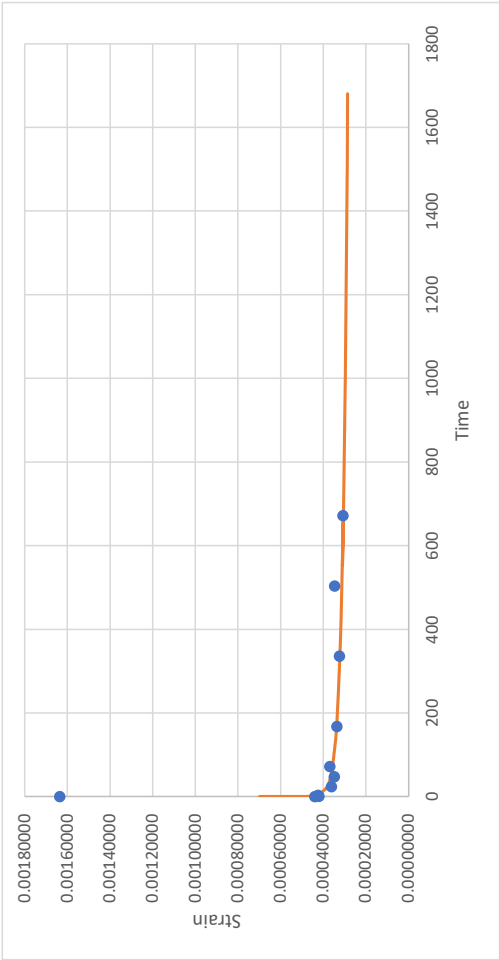
sum R^2 = 4.37256E-07



Data Set # 4

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000937634		6719038.43	16075460.00	0.10	672	-39375
0	0.00163577	0.00069814	0.000000088				
0.1	0.00043852	0.00048786	0.000000000				
1	0.00041973	0.00044619	0.000000000				
3	0.00042430	0.00042457	0.000000000				
24	0.00036067	0.00038096	0.000000000				
48	0.00034690	0.00036578	0.000000000				
72	0.00036909	0.00035678	0.000000000				
168	0.00033634	0.00033776	0.000000000				
336	0.00032305	0.00032204	0.000000000				
504	0.00034666	0.00031280	0.000000000				
672	0.00030687	0.00030624	0.000000000				
552		0.00031072	0.000400000	0.000400000			
672		0.00030624	0.000400000	0.000400000			
840		0.00030115	0.000200000	0.000200000			
1008		0.00029699	0.000200000	0.000200000			
1176		0.00029348	0.000200000	0.000200000			
1344		0.00029044	0.000200000	0.000200000			
1512		0.00028776	0.000200000	0.000200000			
1680		0.00028537	0.000200000	0.000200000			

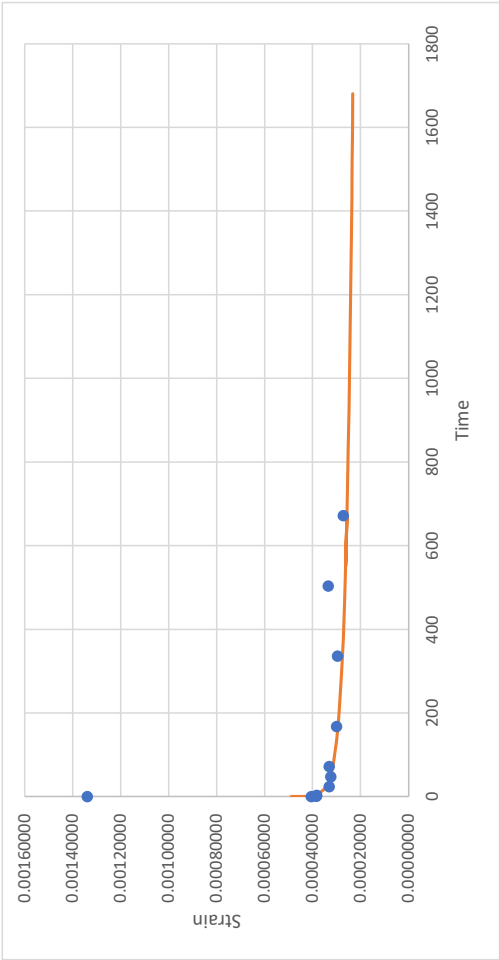
sum R^2 = 8.84362E-07



Data Set # 5

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000849242		7418384.47		0.20	672	-39375
0	0.00133901	0.00048976	0.00000072				
0.1	0.00040455	0.00043172	0.00000000				
1	0.00038419	0.00040211	0.00000000				
3	0.00038252	0.00038398	0.00000000				
24	0.00032980	0.00034193	0.00000000				
48	0.00032384	0.00032573	0.00000000				
72	0.00033041	0.00031581	0.00000000				
168	0.00029920	0.00029418	0.00000000				
336	0.00029524	0.00027580	0.00000000				
504	0.00033446	0.00026487	0.00000000				
672	0.00027127	0.00025708	0.00000000				
552		0.00026241					
672		0.00025708					
840		0.00025104					
1008		0.00024611					
1176		0.00024196					
1344		0.00023837					
1512		0.00023522					
1680		0.00023241					

sum R^2 = 7.28084E-07

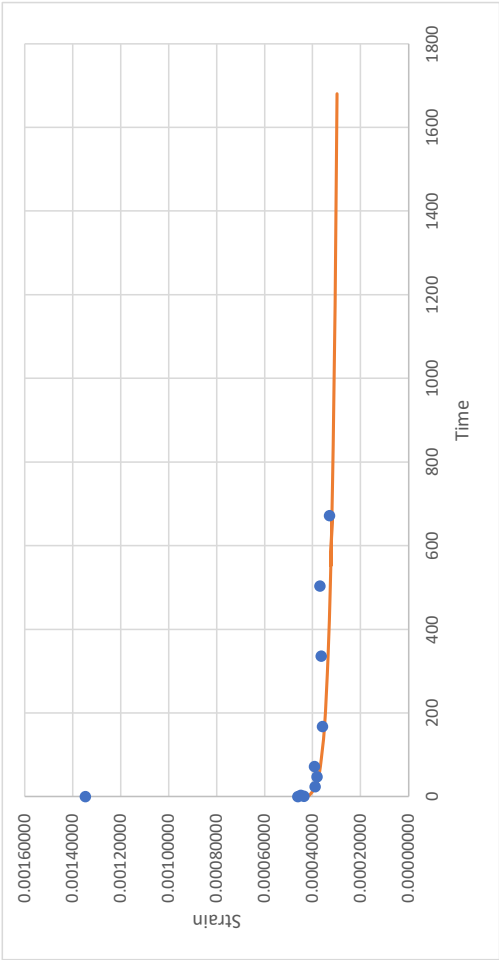


Data Set # 6

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000922687		6827881.06				
0	0.00134685	0.00045042	0.00000080				
0.1	0.00046084	0.00043619	0.00000000				
1	0.00043578	0.00042300	0.00000000				
3	0.00044974	0.00041331	0.00000000				
24	0.00038920	0.00038659	0.00000000				
48	0.00038168	0.00037489	0.00000000				
72	0.00039137	0.00036739	0.00000000				
168	0.00035861	0.00035028	0.00000000				
336	0.00036402	0.00033513	0.00000000				
504	0.00036887	0.00032595	0.00000000				
672	0.00032911	0.00031937	0.00000000				
552		0.00032387					
672		0.00031937					
840		0.00031427					
1008		0.00031012					
1176		0.00030663					
1344		0.00030364					
1512		0.00030101					
1680		0.00029869					

sum R^2 = 8.09152E-07

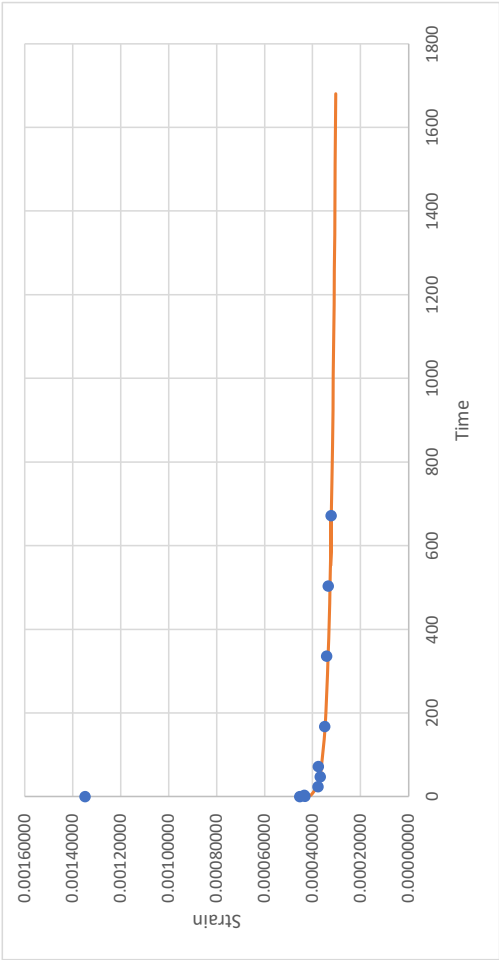
E0 (psi)	7027881.06	β	0.30	τ (hrs)	672	P (lbs)	-39375



Data Set # 7

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000893238		7052989.87	47075460.00	0.25	672	-39375
0	0.00134876	0.00045552	0.000000080				
0.1	0.00045315	0.00043338	0.000000000				
1	0.00043122	0.00041777	0.000000000				
3	0.00043423	0.00040730	0.000000000				
24	0.00037681	0.00038088	0.000000000				
48	0.00036772	0.00037006	0.000000000				
72	0.00037585	0.00036328	0.000000000				
168	0.00034933	0.00034820	0.000000000				
336	0.00034068	0.00033513	0.000000000				
504	0.00033457	0.00032729	0.000000000				
672	0.00032296	0.00032169	0.000000000				
552		0.00032552					
672		0.00032169					
840		0.00031735					
1008		0.00031381					
1176		0.00031083					
1344		0.00030827					
1512		0.00030602					
1680		0.00030402					

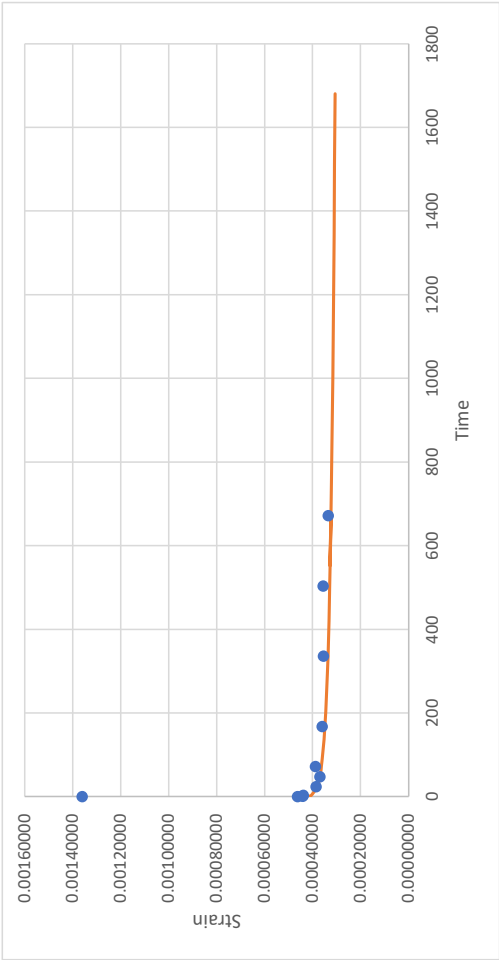
sum R^2 = 7.99438E-07



Data Set # 8

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000922722		6827628.05				
0	0.00136096	0.00045156					
0.1	0.00046242	0.00043036					
1	0.00044049	0.00041542					
3	0.00043882	0.00040539					
24	0.00038453	0.00038010					
48	0.00036919	0.00036974					
72	0.00038826	0.00036326					
168	0.00036018	0.00034882					
336	0.00035466	0.00033630					
504	0.00035637	0.00032880					
672	0.00033381	0.00032344					
552		0.00032711					
672		0.00032344					
840		0.00031929					
1008		0.00031590					
1176		0.00031305					
1344		0.00031059					
1512		0.00030844					
1680		0.00030652					
		sum R^2 =		8.31765E-07			

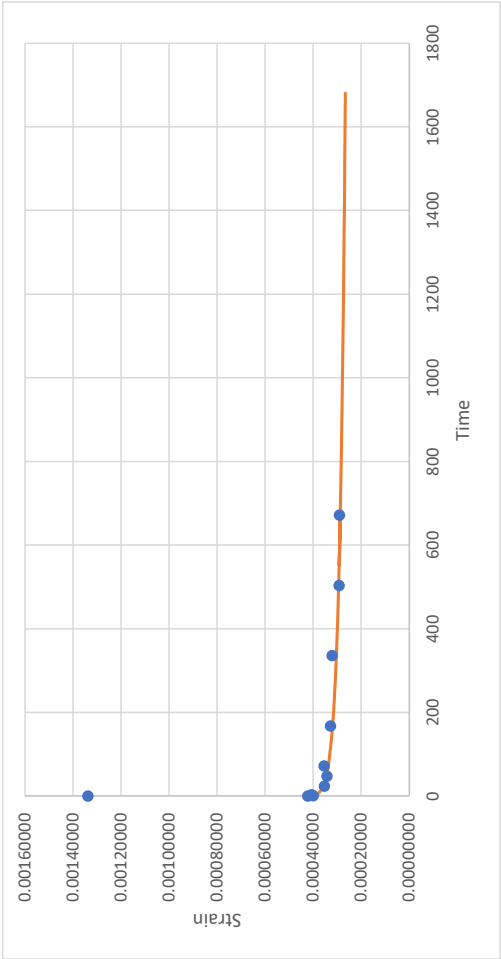
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6927628.05	49175460.00	0.25	672	-39375



Data Set # 9

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000916499		6873983.40	47075460.00	0.30	672	-39375
0	0.00133760	0.00042110	0.000000084				
0.1	0.00042182	0.00040658	0.000000000				
1	0.00039989	0.00039311	0.000000000				
3	0.00040603	0.00038321	0.000000000				
24	0.00035331	0.00035592	0.000000000				
48	0.00034265	0.00034397	0.000000000				
72	0.00035391	0.00033631	0.000000000				
168	0.00032739	0.00031884	0.000000000				
336	0.00032030	0.00030336	0.000000000				
504	0.00029075	0.00029399	0.000000000				
672	0.00029009	0.00028728	0.000000000				
552		0.00029187					
672		0.00028728					
840		0.00028207					
1008		0.00027783					
1176		0.00027427					
1344		0.00027120					
1512		0.00026853					
1680		0.00026615					

sum R^2 = 8.41466E-07

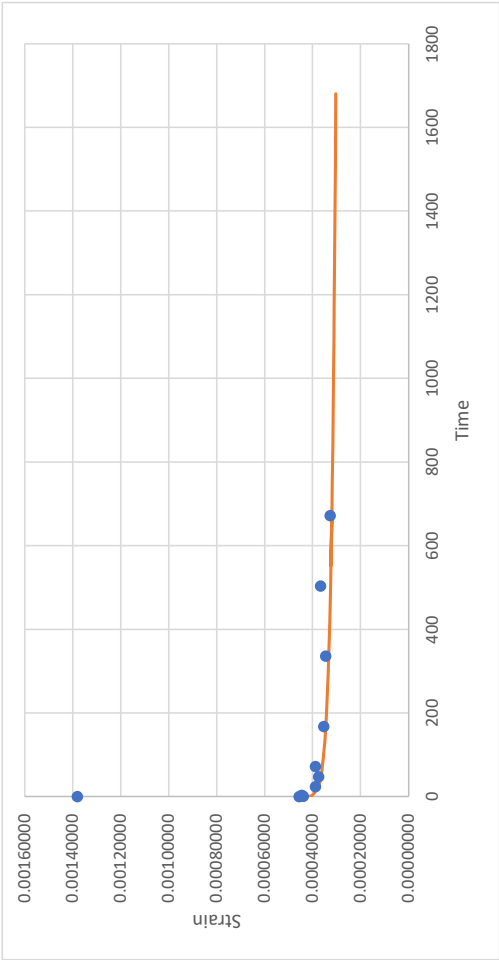


Data Set # 10

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000947817		6646849.92				
0	0.00137985	0.00044608					
0.1	0.00045623	0.00042527					
1	0.00043898	0.00041059					
3	0.00044512	0.00040074					
24	0.00038771	0.00037591					
48	0.00037393	0.00036573					
72	0.00038832	0.00035937					
168	0.00035242	0.00034518					
336	0.00034534	0.00033290					
504	0.00036581	0.00032553					
672	0.00032605	0.00032027					
552		0.00032387					
672		0.00032027					
840		0.00031619					
1008		0.00031286					
1176		0.00031006					
1344		0.00030765					
1512		0.00030553					
1680		0.00030365					

sum R^2 = 8.78567E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6746849.92	50075460.00	0.25	672	-39375

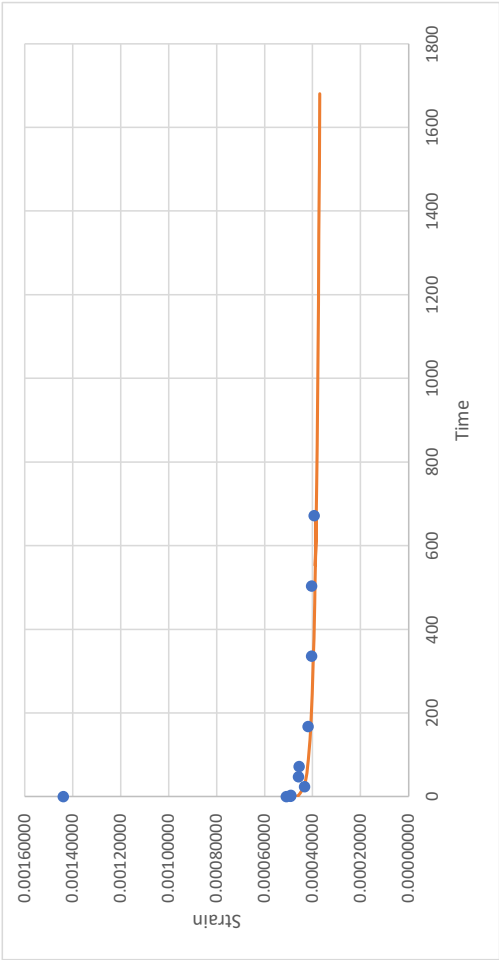


Data Set # 11

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000983816		6403639.22				
0	0.00143934	0.00049955					
0.1	0.00050939	0.00048063					
1	0.00049215	0.00046728					
3	0.00049048	0.00045833					
24	0.00043306	0.00043575					
48	0.00045835	0.00042650					
72	0.00045554	0.00042071					
168	0.00041808	0.00040782					
336	0.00040318	0.00039664					
504	0.00040333	0.00038995					
672	0.00039328	0.00038516					
552		0.00038843					
672		0.00038516					
840		0.00038145					
1008		0.00037843					
1176		0.00037588					
1344		0.00037369					
1512		0.00037176					
1680		0.00037005					

sum R^2 = 8.88309E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6703639.22	55075460.00	0.25	672	-39375

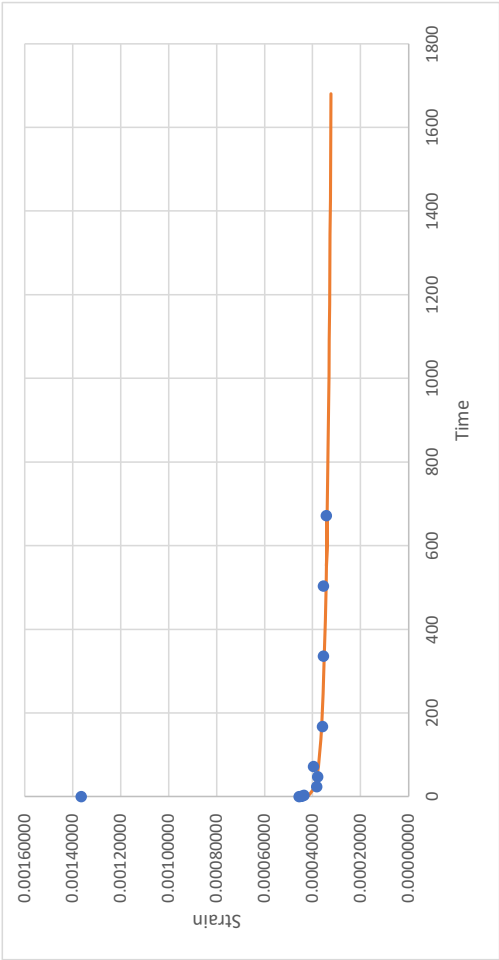


Data Set # 12

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000932246		6757870.04				
0	0.00136431	0.00045886					
0.1	0.00045625	0.00043904					
1	0.00044526	0.00042506					
3	0.00043577	0.00041568					
24	0.00038305	0.00039203					
48	0.00037864	0.00038234					
72	0.00039615	0.00037627					
168	0.00035869	0.00036276					
336	0.00035473	0.00035106					
504	0.00035488	0.00034404					
672	0.00034170	0.00033903					
552		0.00034246					
672		0.00033903					
840		0.00033514					
1008		0.00033198					
1176		0.00032931					
1344		0.00032701					
1512		0.00032500					
1680		0.00032320					

sum R^2 = 8.21591E-07

E0 (psi)	6957870.04	E1 (psi)	52575460.00	β	0.25	τ (hrs)	672	P (lbs)	-39375

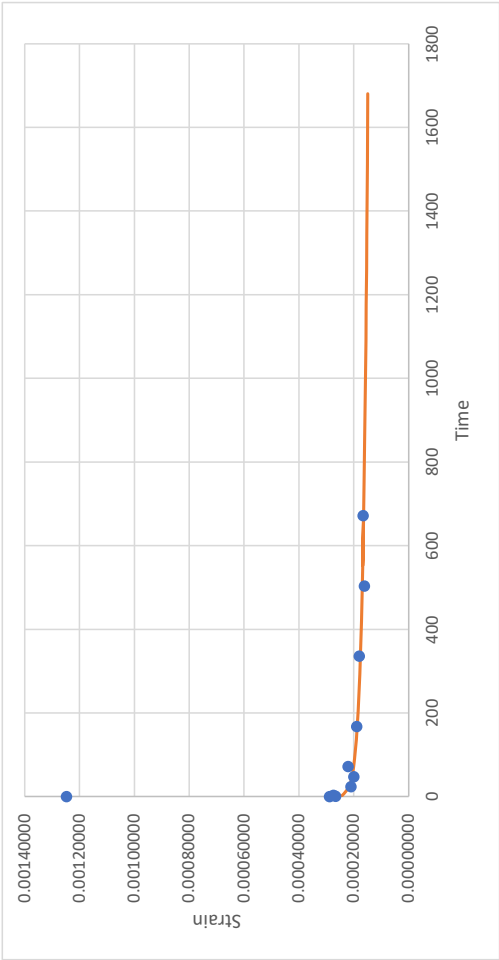


Data Set # 13

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000951433		6621592.12				
0	0.00124769	0.00029626					
0.1	0.00028762	0.00026819					
1	0.00026567	0.00025176					
3	0.00027338	0.00024134					
24	0.00020969	0.00021635					
48	0.00019902	0.00020649					
72	0.00021967	0.00020040					
168	0.00018845	0.00018701					
336	0.00017980	0.00017555					
504	0.00016119	0.00016871					
672	0.00016521	0.00016384					
552		0.00016717					
672		0.00016384					
840		0.00016006					
1008		0.00015697					
1176		0.00015438					
1344		0.00015213					
1512		0.00015017					
1680		0.00014841					

sum R^2 = 9.07372E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6621592.12	47575460.00	0.22	672	-39375

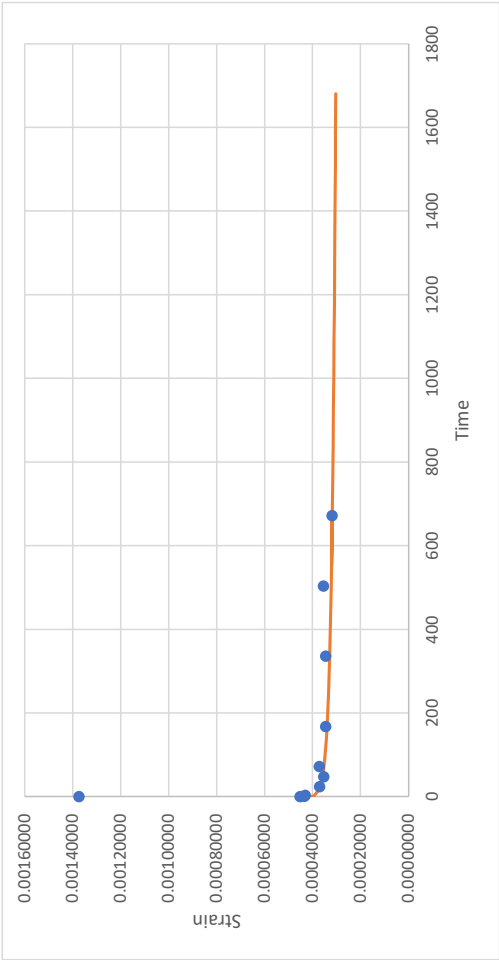


Data Set # 14

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000933799		6746635.70				
0	0.00137368	0.00045352	0.00000085				
0.1	0.00045156	0.00041978	0.00000000				
1	0.00043433	0.00040257	0.00000000				
3	0.00043109	0.00039203	0.00000000				
24	0.00037054	0.00036758	0.00000000				
48	0.00035364	0.00035817	0.00000000				
72	0.00037115	0.00035240	0.00000000				
168	0.00034463	0.00033982	0.00000000				
336	0.00034536	0.00032914	0.00000000				
504	0.00035489	0.00032278	0.00000000				
672	0.00031826	0.00031826	0.00000000				
552		0.00032135					
672		0.00031826					
840		0.00031474					
1008		0.00031188					
1176		0.00030946					
1344		0.00030738					
1512		0.00030555					
1680		0.00030391					

sum R^2 = 8.51937E-07

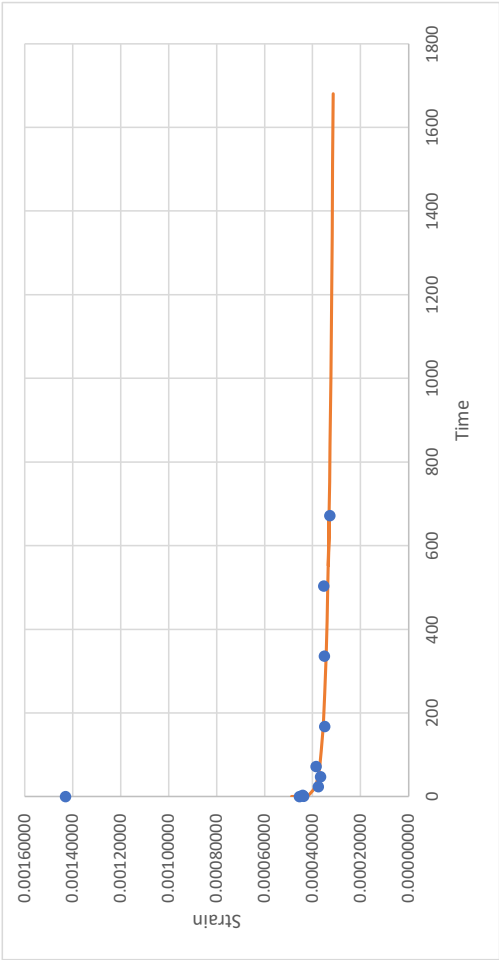
E0 (psi)	6846635.70	β	0.20	τ (hrs)	672	P (lbs)	-39375



Data Set # 15

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000941591		6690806.40	40075460.00	0.20	672	-39375
0	0.00142991	0.00048832	0.000000089				
0.1	0.00045468	0.00044911	0.000000000				
1	0.00043744	0.00042910	0.000000000				
3	0.00044046	0.00041685	0.000000000				
24	0.00037522	0.00038844	0.000000000				
48	0.00036613	0.00037750	0.000000000				
72	0.00038521	0.00037080	0.000000000				
168	0.00034931	0.00035619	0.000000000				
336	0.00035004	0.00034376	0.000000000				
504	0.00035332	0.00033638	0.000000000				
672	0.00032763	0.00033112	0.000000000				
552		0.00033472					
672		0.00033112					
840		0.00032704					
1008		0.00032371					
1176		0.00032090					
1344		0.00031848					
1512		0.00031635					
1680		0.00031445					

sum R^2 = 8.88148E-07

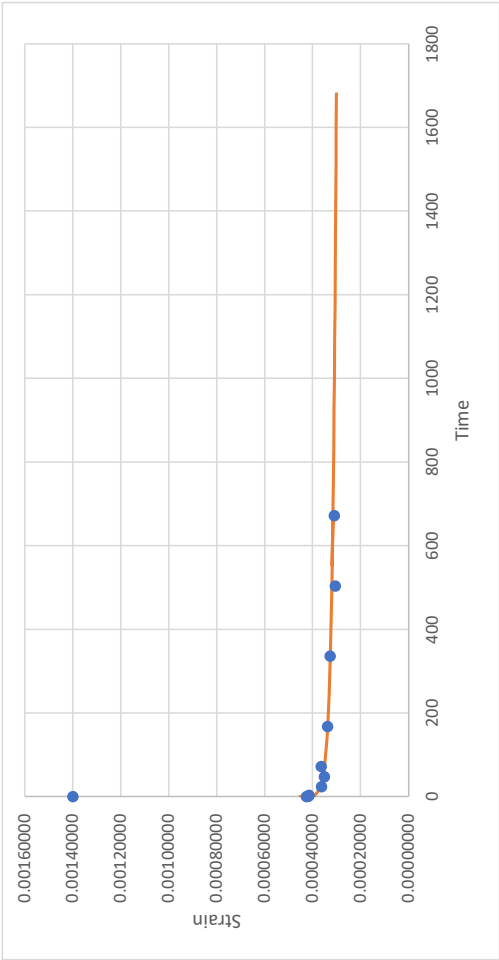


Data Set # 16

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000946442		6656510.04				
0	0.00139890	0.00045246	0.000000090				
0.1	0.00042506	0.00041835	0.000000000				
1	0.00041719	0.00040095	0.000000000				
3	0.00041396	0.00039029	0.000000000				
24	0.00036279	0.00036558	0.000000000				
48	0.00035057	0.00035607	0.000000000				
72	0.00036339	0.00035024	0.000000000				
168	0.00033687	0.00033753	0.000000000				
336	0.00032666	0.00032672	0.000000000				
504	0.00030492	0.00032030	0.000000000				
672	0.00030894	0.00031572	0.000000000				
552		0.00031885					
672		0.00031572					
840		0.00031217					
1008		0.00030928					
1176		0.00030684					
1344		0.00030473					
1512		0.00030288					
1680		0.00030123					

sum R^2 = 8.97115E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6656510.04	46075460.00	0.20	672	-39375

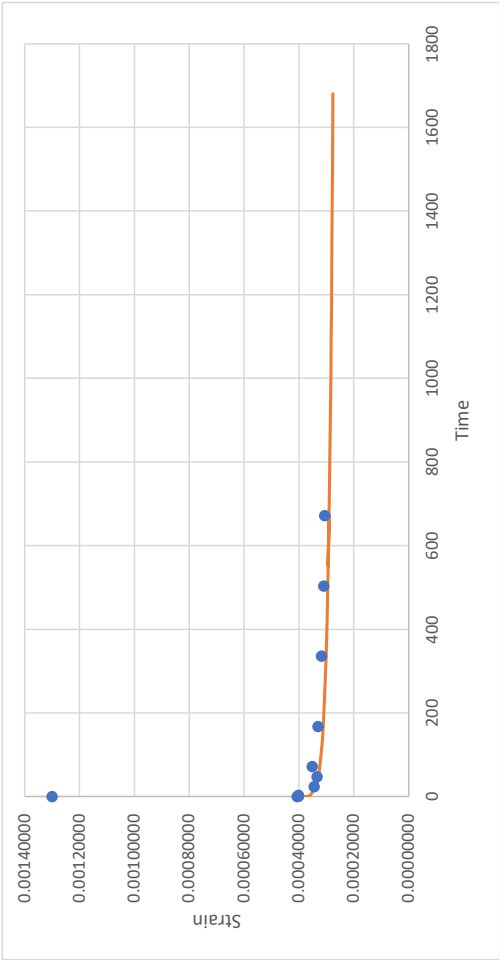


Data Set # 17

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000929045		6781156.59				
0	0.00130008	0.00039765					
0.1	0.00040617	0.00037986					
1	0.00040143	0.00036731					
3	0.00040132	0.00035889					
24	0.00034391	0.00033766					
48	0.00033326	0.00032896					
72	0.00035077	0.00032352					
168	0.00033050	0.00031139					
336	0.00031716	0.00030089					
504	0.00030949	0.00029459					
672	0.00030569	0.00029009					
552		0.00029317					
672		0.00029009					
840		0.00028660					
1008		0.00028376					
1176		0.00028137					
1344		0.00027930					
1512		0.00027749					
1680		0.00027589					

sum R^2 = 8.1993E-07

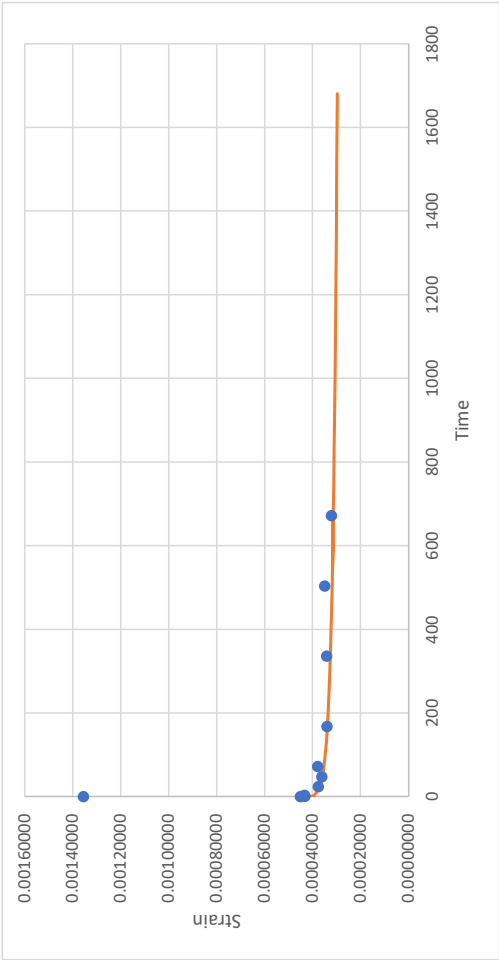
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6981156.59	58575460.00	0.25	672	-39375



Data Set # 18

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000916612		6873140.62	50575460.00	0.25	672	-39375
0	0.00135492	0.00043831					
0.1	0.00045000	0.00041770					
1	0.00043119	0.00040317					
3	0.00043264	0.00039342					
24	0.00037522	0.00036883					
48	0.00036144	0.00035876					
72	0.00037895	0.00035245					
168	0.00033993	0.00033841					
336	0.00034065	0.00032624					
504	0.00034863	0.00031895					
672	0.00032137	0.00031374					
552		0.00031730					
672		0.00031374					
840		0.00030970					
1008		0.00030640					
1176		0.00030363					
1344		0.00030124					
1512		0.00029915					
1680		0.00029729					

sum R^2 = 8.45442E-07

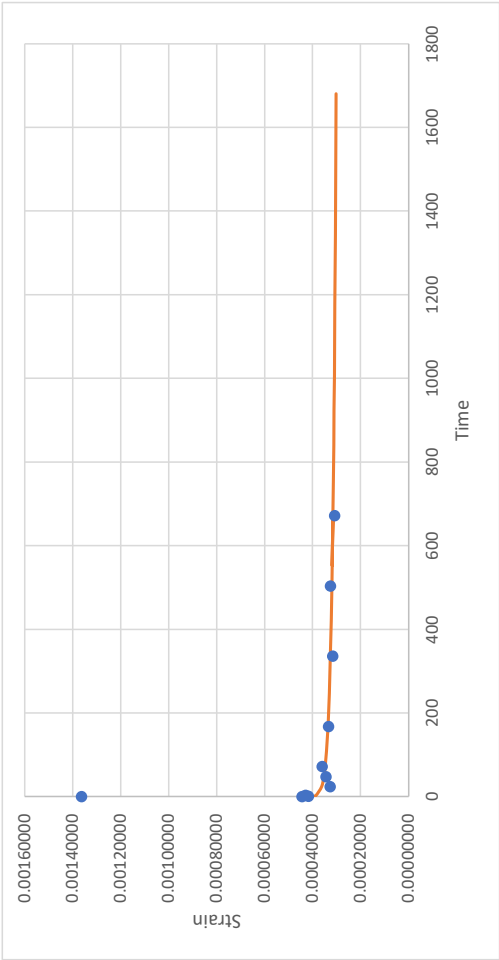


Data Set # 19

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.00096649		6518429.50				
0	0.00136255	0.00044263	0.00000085				
0.1	0.00044367	0.00041093	0.00000000				
1	0.00041705	0.00039476	0.00000000				
3	0.00042945	0.00038486	0.00000000				
24	0.00032673	0.00036189	0.00000000				
48	0.00034419	0.00035305	0.00000000				
72	0.00036014	0.00034763	0.00000000				
168	0.00033363	0.00033582	0.00000000				
336	0.00031561	0.00032578	0.00000000				
504	0.00032513	0.00031981	0.00000000				
672	0.00030726	0.00031555	0.00000000				
552		0.00031846					
672		0.00031555					
840		0.00031225					
1008		0.00030956					
1176		0.00030729					
1344		0.00030534					
1512		0.00030361					
1680		0.00030208					

sum R^2 = 8.51485E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6848429.50	49575460.00	0.20	672	-39375

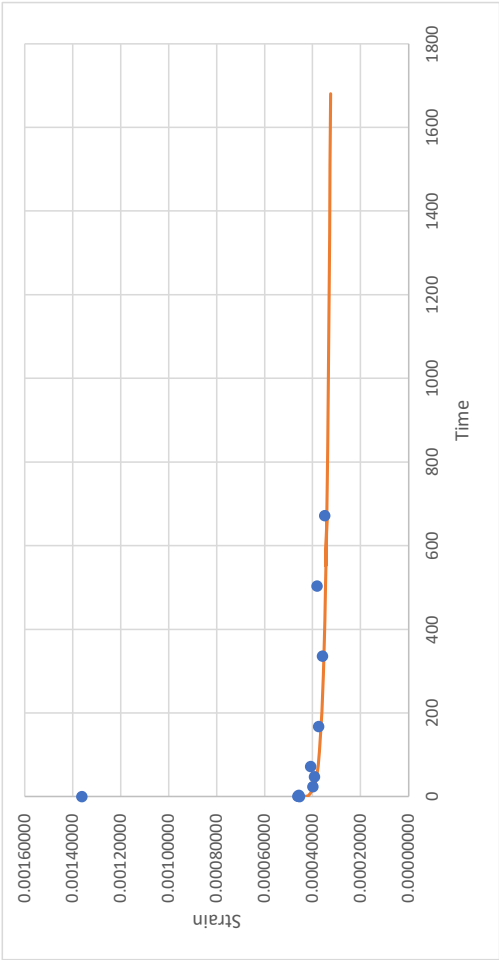


Data Set # 20

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000929162		6780300.30				
0	0.00136125	0.00045871	0.00000081				
0.1	0.00045472	0.00043926	0.00000000				
1	0.00046092	0.00042554	0.00000000				
3	0.00045768	0.00041634	0.00000000				
24	0.00039870	0.00039312	0.00000000				
48	0.00039117	0.00038361	0.00000000				
72	0.00040712	0.00037766	0.00000000				
168	0.00037435	0.00036441	0.00000000				
336	0.00035787	0.00035292	0.00000000				
504	0.00038147	0.00034604	0.00000000				
672	0.00034954	0.00034112	0.00000000				
552		0.00034448					
672		0.00034112					
840		0.00033730					
1008		0.00033419					
1176		0.00033158					
1344		0.00032932					
1512		0.00032734					
1680		0.00032559					

sum R^2 = 8.20185E-07

E0 (psi)	6980300.30	E1 (psi)	53575460.00	β	0.25	τ (hrs)	672	P (lbs)	-39375

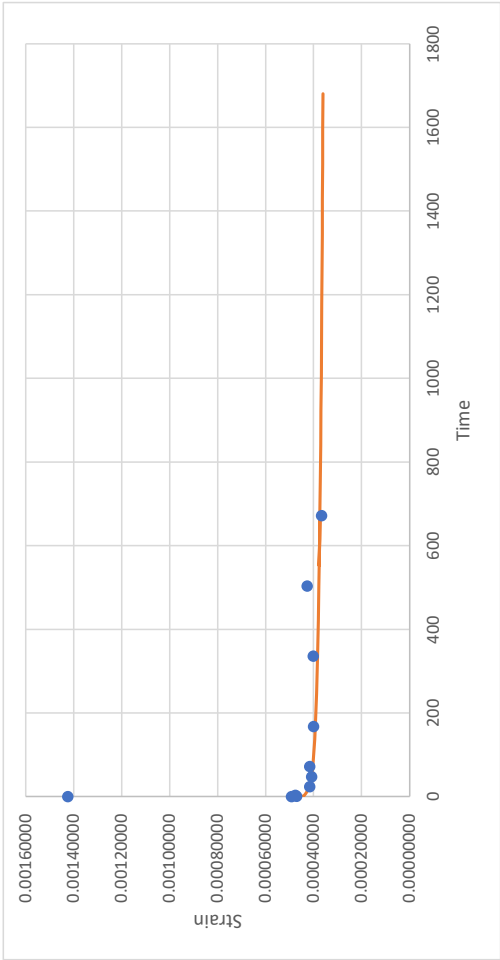


Data Set # 21

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000933661		6747632.79				
0	0.00142502	0.00049136					
0.1	0.00049210	0.00046202					
1	0.00047018	0.00044706					
3	0.00047632	0.00043790					
24	0.00041578	0.00041665					
48	0.00040825	0.00040846					
72	0.00041639	0.00040345					
168	0.00039925	0.00039252					
336	0.00040154	0.00038322					
504	0.00042668	0.00037770					
672	0.00036663	0.00037377					
552		0.00037646					
672		0.00037377					
840		0.00037071					
1008		0.00036822					
1176		0.00036612					
1344		0.00036431					
1512		0.00036272					
1680		0.00036130					

sum R^2 = 8.77636E-07

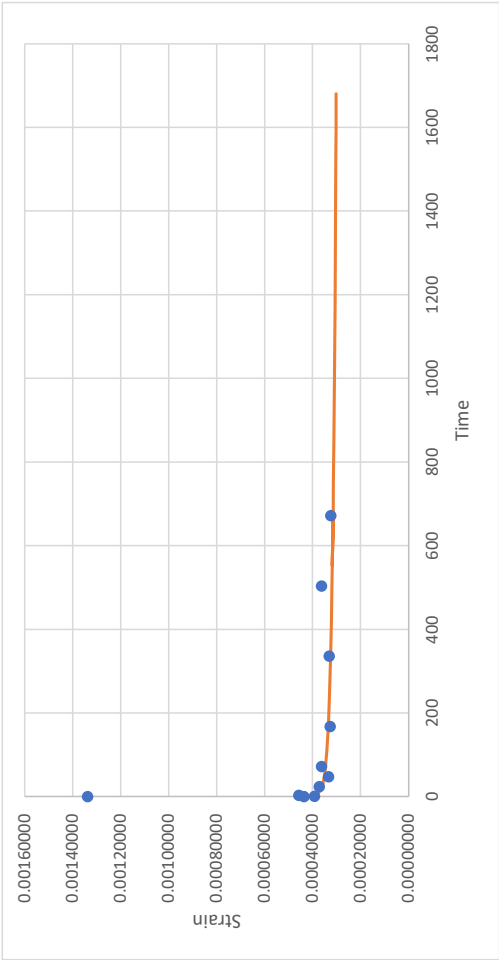
E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6747632.79	53575460.00	0.20	672	-39375



Data Set # 22

time (hr)	strain μ	Ei	E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
Initial Loading	0.000938649		7011772.44	50575460.00	0.20	672	-39375
0	0.00133798	0.00043950	0.000000081				
0.1	0.00043604	0.00040842	0.000000000				
1	0.00039223	0.00039257	0.000000000				
3	0.00045775	0.00038286	0.000000001				
24	0.00037220	0.00036035	0.000000000				
48	0.00033341	0.00035168	0.000000000				
72	0.00036186	0.00034637	0.000000000				
168	0.00032597	0.00033479	0.000000000				
336	0.00032982	0.00032495	0.000000000				
504	0.00036278	0.00031910	0.000000000				
672	0.00032304	0.00031493	0.000000000				
552		0.00031778					
672		0.00031493					
840		0.00031169					
1008		0.00030906					
1176		0.00030683					
1344		0.00030491					
1512		0.00030322					
1680		0.00030172					

sum R^2 = 8.16443E-07

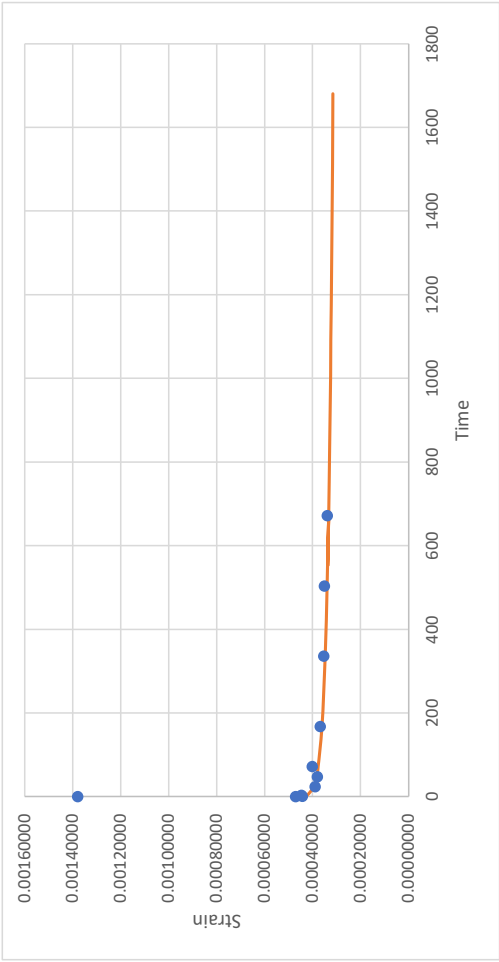


Data Set # 23

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000921225		6838719.18				
0	0.00137981	0.00047186	0.000000082				
0.1	0.00047027	0.00044899	0.000000000				
1	0.00044209	0.00043287	0.000000000				
3	0.00044666	0.00042205	0.000000000				
24	0.00038925	0.00039476	0.000000000				
48	0.00038016	0.00038358	0.000000000				
72	0.00040079	0.00037659	0.000000000				
168	0.00036803	0.00036101	0.000000000				
336	0.00035312	0.00034750	0.000000000				
504	0.00035015	0.00033941	0.000000000				
672	0.00033853	0.00033363	0.000000000				
552		0.00033758					
672		0.00033363					
840		0.00032914					
1008		0.00032549					
1176		0.00032241					
1344		0.00031976					
1512		0.00031744					
1680		0.00031537					

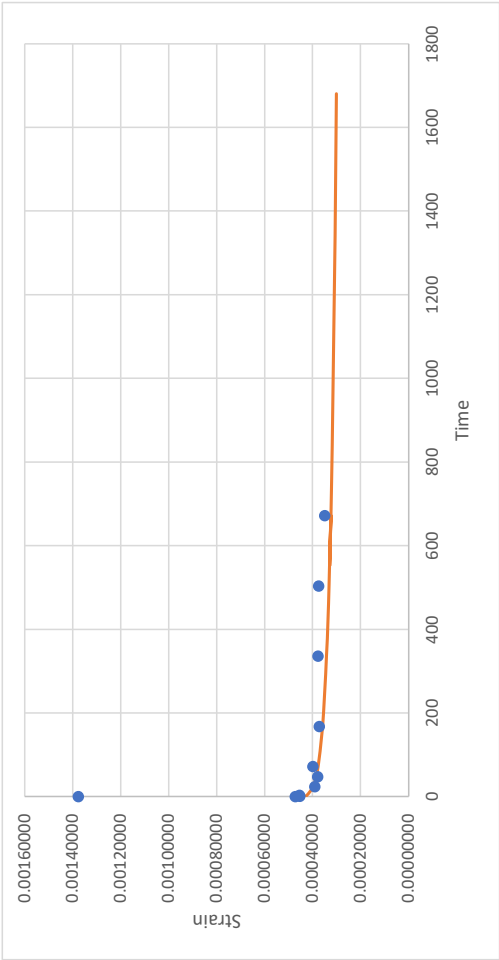
sum R^2 = 8.26362E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6938719.18	45575460.00	0.25	672	-39375



Data Set # 24

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000968406		6505533.96				
0	0.00137715	0.00045143	6805533.96	49548824.00	0.35	672	-39375
0.1	0.00047202	0.00044244	0.00000086				
1	0.00045321	0.00043185	0.00000000				
3	0.00045466	0.00042333	0.00000000				
24	0.00039098	0.00039759	0.00000000				
48	0.00037876	0.00038552	0.00000000				
72	0.00039784	0.00037757	0.00000000				
168	0.00037131	0.00035897	0.00000000				
336	0.00037673	0.00034207	0.00000000				
504	0.00037375	0.00033172	0.00000000				
672	0.00034963	0.00032428	0.00000000				
552		0.00032937					
672		0.00032428					
840		0.00031851					
1008		0.00031382					
1176		0.00030989					
1344		0.00030652					
1512		0.00030358					
1680		0.00030099					
		sum R^2 =	8.63527E-07				

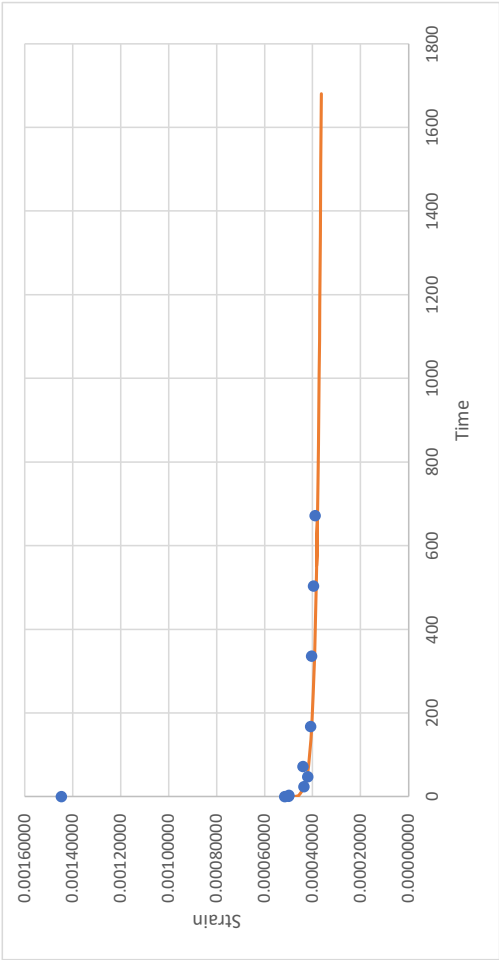


Data Set # 25

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.000946477		6656264.23				
0	0.00144743	0.00050095	0.000000090				
0.1	0.00051578	0.00048094	0.000000000				
1	0.00050010	0.00046682	0.000000000				
3	0.00049843	0.00045736	0.000000000				
24	0.00043631	0.00043348	0.000000000				
48	0.00041940	0.00042369	0.000000000				
72	0.00044004	0.00041757	0.000000000				
168	0.00040727	0.00040393	0.000000000				
336	0.00040330	0.00039211	0.000000000				
504	0.00039565	0.00038503	0.000000000				
672	0.00038871	0.00037997	0.000000000				
552		0.00038343					
672		0.00037997					
840		0.00037605					
1008		0.00037285					
1176		0.00037016					
1344		0.00036784					
1512		0.00036580					
1680		0.00036399					

sum R^2 = 9.00684E-07

E0 (psi)	E1 (psi)	β	τ (hrs)	P (lbs)
6656264.23	52075460.00	0.25	672	-39375



Data Set # 26

time (hr)	strain μ	Ei	E0	E1	β	τ (hrs)	P (lbs)
Initial Loading	0.0009372		6722147.591	49766267.26	0.40	672	-39375
0	0.00136002	0.00042282					
0.1	0.00043764	0.00041701					
1	0.00042196	0.00040854					
3	0.00043122	0.00040110					
24	0.00036285	0.00037639					
48	0.00034750	0.00036396					
72	0.00037283	0.00035556					
168	0.00035099	0.00033531					
336	0.00032984	0.00031641					
504	0.00034405	0.00030468					
672	0.00031524	0.00029622					
552		0.00030202					
672		0.00029622					
840		0.00028966					
1008		0.00028433					
1176		0.00027988					
1344		0.00027608					
1512		0.00027277					
1680		0.00026987					

sum R^2 = 8.82948E-07

