

Creep Behavior of S2- Glass/Epoxy

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Overview

- Background
- Preparation Procedures
- Test Setup Procedure
- Testing Procedure
- Results
- Discussion
- Conclusions
- Questions

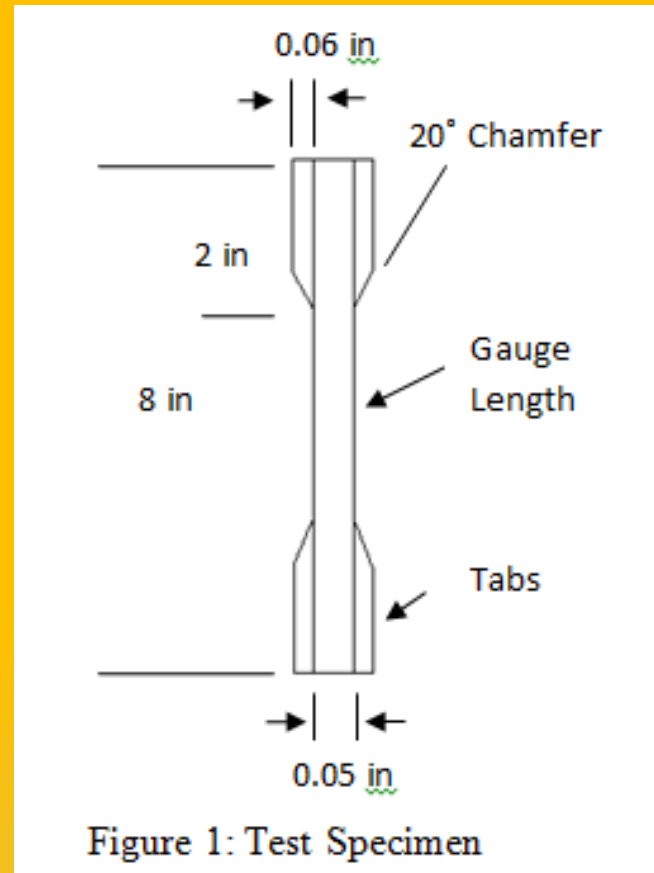
Background

- Creep-Time dependent deformation under a constant load
- Many Variables
- Affects Part Lifetime

Preparation Procedures

- Laminate Plate Fabricated
- Tabbed
- Test Specimens Cut
- Strain Gauged
- Soldered Leads

Test Specimen



Test Setup Procedures

- Placed in Top Hydraulic Grip
- Shunt Calibrated
- Zeroed Force Measurement
- Closed Bottom Grip
- Manually Removed Load

Testing Apparatus



Figure 2: Testing Apparatus

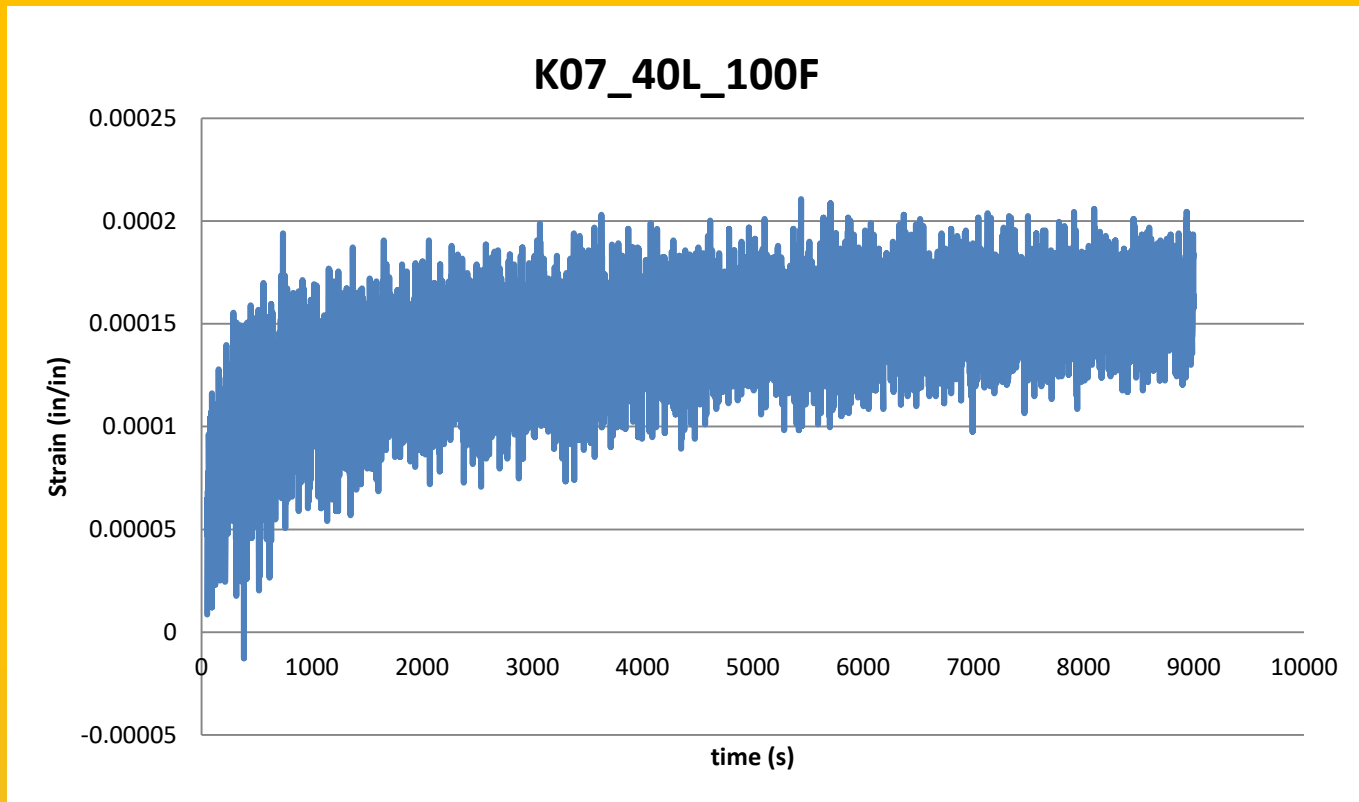
Test Procedure

- Reach Temperature, (Room or 100°F)
- Apply 20 , 40, or 60% Strength
- Hold Load for 5 Hours
- Relax and Recover Overnight

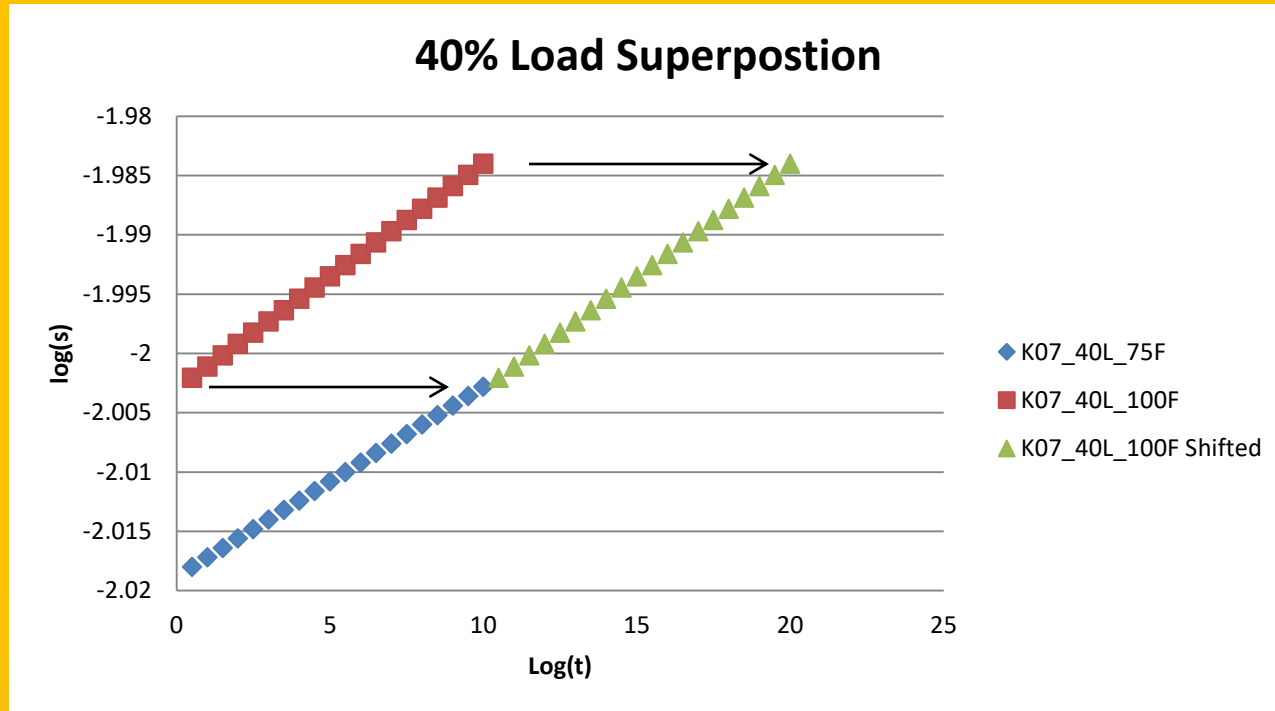
Results

- Creep Data Was Recorded
- 0.02% Strain
- Time-Temperature Superposition
- Master Curve

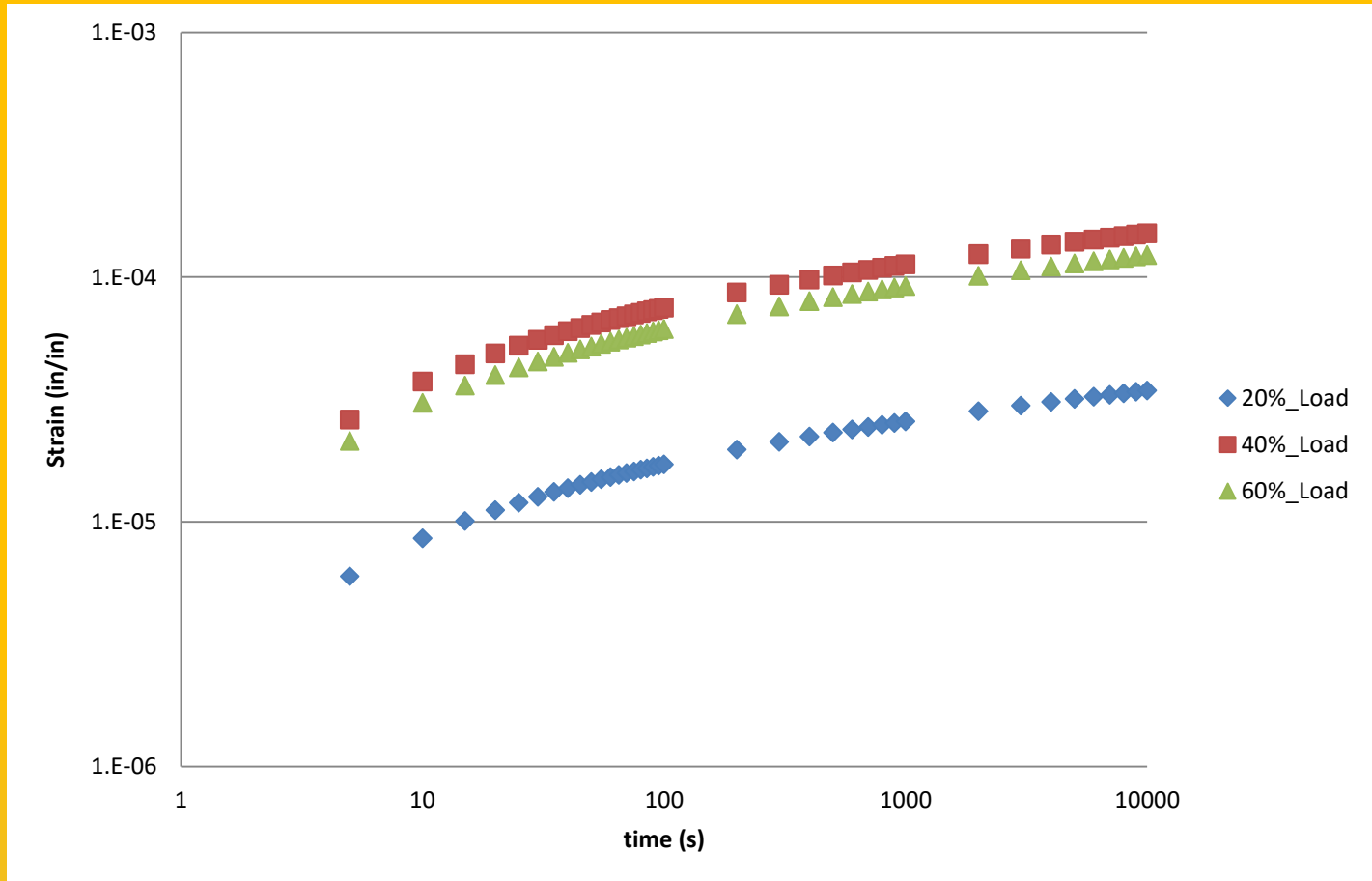
Example of Original Data



Time-Temperature Superposition



Master Creep Strain



Relationships

20% relation is $\varepsilon = 0.00461t^{0.008}$

40% relation is $\varepsilon = 0.00956t^{0.002}$

60% relation is $\varepsilon = 0.0148t^{0.0009}$

Discussion

- 60% Load Unexpected Behavior
- Sample Size
- Time Period

Conclusions

Creep Behavior of the S2-Glass/Epoxy was measured and characterized. Additional testing is required for statistical analysis and explanation of the 60% load behavior.

Questions?

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