

# TEST REPORT MDT080xx

*Material characterization of baseline and fatigued Sponsor test samples*

*Device Manufacturer:*

**Contact**

Testing Facility:

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Report #MDT080xx

Date:

## Scope

This benchtop test was conducted to provide information relating the material properties before and after durability testing. The testing was conducted at 37C to ensure similar material properties to *in vivo* conditions.

## Summary

Devices were supplied by the customer and arranged/deployed according to customers protocol and diagrams on an ELF3300 tester (ELF MDT-3300-002) in the MDTS laboratory. Devices were pulled in tension to failure at a rate of 0.2 mm/sec. Load, displacement, and strain data were recorded. Baseline and fatigued samples were tested. Each sample was analyzed for elastic modulus, plateau stress, modulus above plateau, UTS, and strain before and after plateau.

## Equipment

- 1.0 EnduraTec ELF3300 tester (MDT ELF3300-002)
- 2.0 EnduraTEC WinTest® Controls and Software
- 3.0 Enduratec PC/PCI Series controller
- 4.0 DAQ PC Control card
- 5.0 Computer, typically  $\geq 400\text{MHz}$  CPU
- 6.0 Customer supplied devices (P/N xxxxxxxx)
- 7.0 Custom Test fixturing
- 8.0 Thermal Chamber with Temperature Controller (ISN#)

9.0 3.00 mm gage length extensometer (ISN#

## **Procedures**

The test followed test protocol agreed upon by MDTs and Sponsor.

### *Machine Calibration and Validations:*

The ELF 3300 (MDT ELF3300-002) and temperature controller were verified to be up to date with all calibration schedules. Tester functionality was verified by running the tester without samples.

### *Fixturing:*

Custom fixturing was designed, assembled and installed on the ELF 3300-002 according to protocol. Custom grips were loaded onto the tester inside a temperature controlled chamber (ISN#). The extensometer was loaded onto each sample in the gage length where the sample has been ground.

### *Alignment:*

Fixturing was aligned to achieve proper test conditions according to protocol.

### *Device Deployment/Installation:*

Customer devices were deployed and installed according to protocol.

### *Mechanical Testing:*

Device location and position were marked as reference points. The EnduraTec ELF 3300 (MDT ELF3300-002) was used for testing on x/x/2008. The autolog function was enabled. The temperature, load, displacement, and strain gage levels are monitored and recorded at 0.075 sec intervals. Additionally, a hard copy scan at a single location is saved for each test to the project file.

### *Disassembly:*

At test completion the samples were carefully removed from the tester and labeled with a number corresponding to the order of testing.



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## Results

### Baseline samples

10 baseline samples were tested. All samples failed in the gage region except for sample 2, which slipped out of the grips. A sample load – displacement curve can be seen in figure 1. Figure 2 shows a sample stress – strain plot. Both are for baseline sample 7.

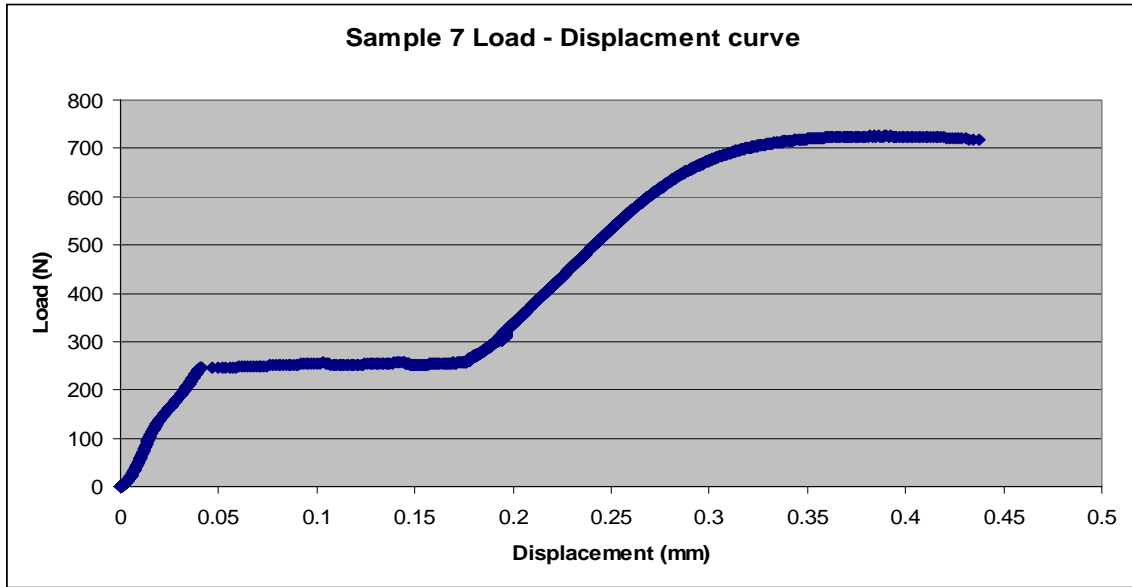
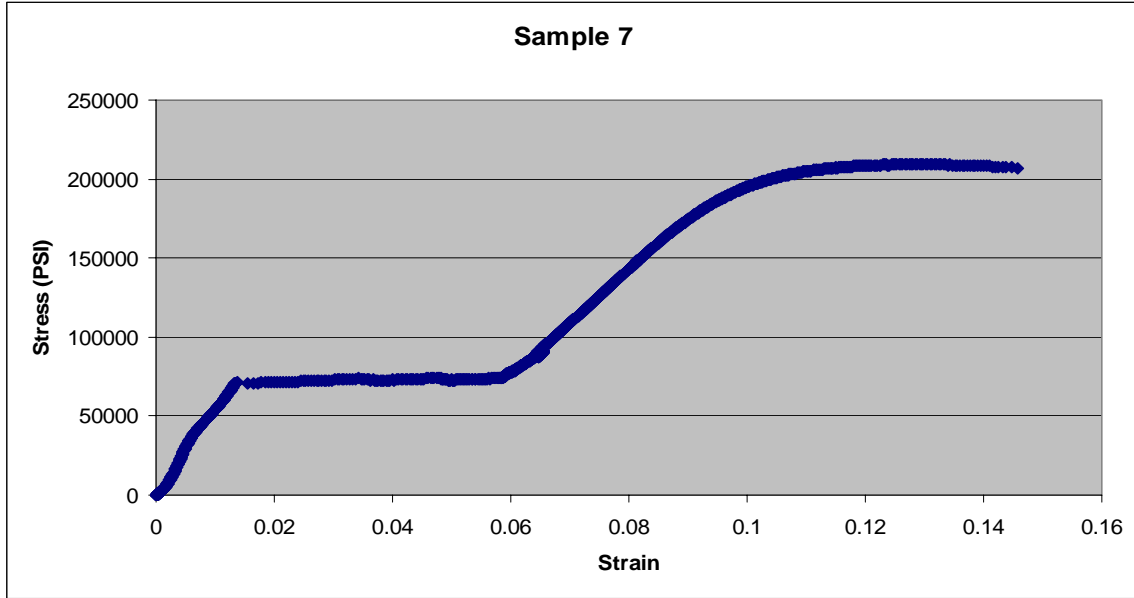


Figure 1: Sample Load – Displacement curve. This curve was taken from baseline sample 7.



**Figure 1:** Sample Stress - Strain curve. This curve was taken from baseline sample 7. Standard features shown in this plot: Nonlinear initial stress/strain relation, large region of uniform stress, large linear region and non-linear failure region. This plot was constructed with strain defined as change/initial length.

**Revision History:**

<i>Version</i>	<i>Change</i>	<i>Date</i>



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