



MIL-LX Leg FE Model



The MIL-LX (Military Lower Extremity) Leg Finite Element Model will be available soon in LS-DYNA FE format. This model represents the physical MIL-LX advanced ATD lower extremity manufactured and sold exclusively by Denton. This leg is used to investigate the effects of explosive blast events which produce peak axial loads in the tibia within two milliseconds after blast occurrence.

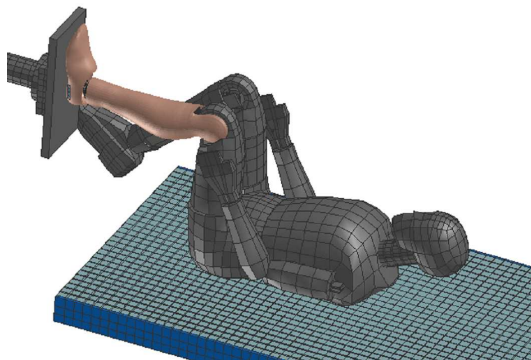
This model and the physical lower extremity are based on the anthropomorphic dimensions for the average (50th percentile) adult male population, as established by the Society of Automotive Engineers (SAE) design and test corridors.

The MIL-LX FE model has been developed using accurate geometry, mass and material data. Geometry has been compiled from a combination of CAD data and scans of actual parts. Mass properties have been implemented and verified using measured masses of actual components. Material data has been collected using a wide range of material tests, including Volumetric Compression, Quasi-Static Tension and Compression, Strain Rate Tension and Compression, Stress Relaxation, and Biaxial testing. The hyper-elastic and visco-elastic material properties have been collected and represented using the latest numerical techniques, including optimization of the material constitutive model constants.

To validate the model, Denton has used numerous system level tests. All system level validation test cases were based on previous studies of physical device design for the highly dynamic nature of blast induced impacts. The validation impacts were performed at various rates, with and without footwear. The model will be validated against the certification procedure for the physical test device.

System level validations performed include:

- Rigid plate axial loads at multiple rates and intrusions to the base of the foot
- Rigid plate axial loads at multiple rates and intrusions to the base of the booted foot



Model Information*	Data
Number of Nodes	19918
Number of Shell Elements	1265
Number of Solid Elements	11381
Number of Beam Elements	44
Total Number of Elements	12690
Model Time Step	≈ 0.3 μsec

**Preliminary Release Data*

Creating the Standard in Safety Measurement

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