

13 MN (3,000 kip) Southwark-Emery uniaxial Testing Frame



The Southwark-Emery testing machine will load specimens in either tension or compression to 3,000,000 lb (13 MN). Specimens will be loaded to failure, if requested, up to full machine capacity. Maximum specimen length is approximately 26 ft (8 m), allowing for full ram stroke of 36 in (0.9 m). The distance between screws is 86 in (2.2 m), and the bedplate is 142 in (3.6 m) long. Maximum loading rate at rated capacity is 1.5 in/min (0.63 mm/s). Maximum loading rate for loads not exceeding 100,000 lb (450 kN) is 24 in/min (10 mm/s).

For tension testing, either flat grips or V-grips are available. The flat grips will accept specimen ends up to 8 in (0.2 m) thick and 12 in (0.3 m) wide. The V-grips will accept specimens from 6 in (0.15 m) in diameter up to 15 in (0.38 m) in diameter. All grips are 18 in (0.46 m) long. Specialized jigs are either available or can be fabricated for loading specimens of unusual shape, such as hooks.

For compression testing, two 36-in (0.9 m) diameter swivel platens are available. These platens are ground flat to 0.001 in (0.025 mm) over the face. The platens may be locked against rotation if requested. Other bearing surfaces are available, including a 3 x 42 x 96 in (0.08 x 1.1 x 2.4 m) flat plate. Specimens may also be placed directly on the bedplate, which has a working area of 86 x 142 in (2.2 x 3.6 m).

The machine is used routinely for testing large components, such as crane hooks, wire rope, marine fenders, and bridge bearings. The NIST traceability also makes the machine valuable for calibrating other devices, such as the large-capacity load cells used in rolling mills and the hydraulic cylinders used in bridge post-tensioning rams. Dr. James W. Phillips is the faculty supervisor for the testing facility.

Read more at: <https://mechanical.illinois.edu/research/mechse-laboratories/3-million-pound-testing-facility>