

Wire and Cable

From housing and power to automotive and medical, wires allow electricity to keep flowing, tires to keep rolling and hearts to keep beating. In addition, windings of wires or cables can be utilized in an additional number of higher-force applications from bridges to ski gondolas.

Wire and cable manufacturers need to have confidence in the quality, safety, and performance of their products. Test methods determine critical engineering information like breaking strength, durability, breaking strain, modulus, and more. By quantifying these properties engineers and developers can make appropriate decisions concerning the usage of their products and the materials and processes used in their manufacture.



Cable Tension

The Challenge

Unlike wire, cables are typically a combination of several wires wound in a torsional fashion. The combination of unwinding forces and high breaking forces make cables difficult specimens to grip when testing in tension mode. If inappropriate grips and grip faces are used, stress concentration at the face edges can cause premature failure of the specimens (i.e. jaw breaks). Along with gripping challenges, many cable manufactures want to measure the actual strain to calculate material properties like modulus. Because of the twisting nature of the cable under test, attaching anything to the specimen can become a complex adventure. Finally, cable failures often produce high-energy breaks that can be dangerous if appropriate safety measures are not considered.

Our Solution

Instron® offers a broad range of systems that provide the capacity, gripping, strain measurements, and safety features to test cables for a variety of industries. Both electromechanical and hydraulic systems can be utilized to test cable up to 10 MN (2,500,000 lbf) and accommodate specimen lengths of over 20 m (approximately 60 ft).

Instron offers pneumatic and hydraulic actuated grips specially designed to minimize slippage. Grip faces are manufactured in a 'V' design to maximize the gripping surface area. This 'V' design can include either a serrated surface or specially-roughened surface in order to prevent premature failures at these gripping points. (This premature failure would create strain measurements that were too low and not truly reflective of the actual material being tested.) Because cable and wire strands are manufactured in a wide variety of materials and wire-winding combinations, specialty grips are available to meet application demands. Some of these applications include multi-strand cable, Speltor sockets for wire rope, and wire mesh grips.



▲ SATEC™ series horizontal testing system with 10 MN (2,250,000 lbf) loading capacity for testing steel cables.