

STRESS CORROSION CRACKING TESTING MACHINE - SCC TESTER



ASTM E4, ISO 7500-1, EN 10002-2, JIS B7721

ToronSCC™-250 Stress Corrosion Cracking Testing Machine – SCC Tester is designed to evaluate the formation and growth of cracks in metals exposed to corrosive environments under tensile stress. This type of cracking can lead to sudden and unexpected failure in otherwise ductile materials, especially at elevated temperatures.

APPLICATIONS

Stress Corrosion Cracking Testing Machine – SCC Tester

Precision driving system

The servo-controlled motor is mounted at the top to drive the ball screw, allowing for high-precision loading with minimal noise. This design has proven to be exceptionally reliable in long-term use, requiring virtually no maintenance.

Stress Corrosion Cracking Testing Machine – SCC Tester

Zero-leak design

The wire strand specimen is fully immersed within the test cell, and tensile force is applied from the top via the actuator mounted on the load frame. No fixtures pass through the bottom of the cell, effectively addressing the issue of liquid seeping through the gaps between the stranded wires. This design ensures the entire test is conducted within a sealed environment.

Stress Corrosion Cracking Testing Machine “ SCC Tester

Temperature gradient	2℃/f
Uniform temperature length	≥250mm
Temperature fluctuation	±1℃/f
Heating zone	3
Temperature sensor	Thermocouple

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Well considered heating system

1. Two independent heating systems are used: one for the pre-heating chamber and one for the test cell.
2. Insert the sample through the two access ports on the test cell, seal the openings, and secure the sample in the grips.
3. Connect the lower hose of the test cell to the pre-heating chamber, where the thiocyanate solution will be heated to 50°C - 55°C. Simultaneously, heat the test cell to 50°C. Connect the upper hose of the test cell to the air outlet.
4. Apply the specified load to the sample. Then open the valve on the pre-heating chamber to allow the thiocyanate to flow into the test cell. Once the cell is fully filled, close the valve.

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Highly Integrated Console

ToronSCC™-250 Stress Corrosion Cracking Testing Machine – SCC Tester features a compact console housing all control electronics for easy access and real-time monitoring.

Control Processor

At the core of the system is a powerful control unit. The EDC Series Controller from DOLI, Germany is a high-performance, cost-effective electronic system specifically designed for controlling and acquiring data from testing instruments.

Key features include:

1. Resolution up to $\pm 180,000$
2. Visible PID Adjustment – Provides immediate feedback from PID settings, making tuning transparent and intuitive
3. Expandable Configuration – Supports multiple load or deformation sensors within a single machine
4. Automatic Transducer Recognition – Sensors are automatically identified, calibrated, and balanced via coded sensor plugs, significantly reducing setup time and ensuring data accuracy. Each sensor plug contains setup and calibration data stored in onboard flash memory (EPROM)
5. Software-Based System Configuration – All system settings can be managed via software. Settings can be exported and saved as data files, enabling quick system recovery or control unit replacement by simply importing the saved file

THEORY & METHOD

SCC is highly dependent on specific chemical environments—certain alloys may only be affected when exposed to particular substances, many of which are only mildly corrosive under normal conditions. As a result, metal components affected by SCC may appear visually intact, yet contain extensive microscopic cracks, often making detection difficult before failure occurs.

SCC progresses quickly and is more prevalent in alloys than in pure metals. Even small amounts of aggressive chemicals can trigger severe cracking, emphasizing the importance of environmental control. The source of stress may include localized

forces such as those caused by crevices, design configurations, or residual stresses introduced during manufacturing processes like cold working. These stresses can often be reduced through heat treatment or surface conditioning techniques such as annealing.

ToronSCC™-250 features a servo-controlled system known for its fast response and long-term reliability. ToronSCC™-250 includes a rigid load frame, accurate force and time measurement systems, a tightly sealed test cell, and a precise temperature control unit. The structural layout is optimized for stable, consistent testing performance.

TECHNICAL SPECIFICATIONS

Model	ToronSCC™-250
Load capacity	250kN
Measuring range	1%-100%F.S.
Load accuracy	±0.5%
Load resolution	±180000
Actuator range	100mm
Actuator speed	0.1mm/s ~ 1×10 ⁻⁸ mm/s
Position accuracy	±0.5%
Position resolution	0.01µm
General Specifications	
Load Measurement Accuracy:	
±0.5% of reading to 1/100 of load weighing system capacity meets or exceeds the requirements of the following standards: ISO 7500-1, EN 10002-2, ASTM E4, JIS B7721.	

Speed Accuracy:

Set speed <0.05% Max. speed: $\pm 1\%$
Set speed $\geq 0.05\%$ Max. speed: $\pm 0.5\%$

Position measurement accuracy:

$\pm 0.01\%$ of reading or 0.0001 mm, whichever is greater

Voltage:

Standard optional voltages 380Vac, 50-60 Hz.
Power must be free of spikes and surges exceeding 10% of the nominal voltage.

Humidity Range:

10% to 90% non-condensing

Storage Temperature:

-40 to +66°C (-40 to +150°F)



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