



Texas Overlay Tester

CRT-TOT

State-of-the-art test equipment for determining the crack initiation and crack propagation properties of asphalt mixtures. In recent years many mixture design methods have produced materials that are stiffer, leaner and more resistant to rutting, however, such materials are often more susceptible to fatigue and reflection cracking. The Texas Overlay Tester (CRT-TOT) was designed to simulate the expansion and contraction movements that occur in the vicinity of joints or cracks and which result in reflection cracking in overlays. With the CRT-TOT it is possible to characterize both the crack initiation and crack propagation properties of asphalt mixtures. Cooper has developed the CRT-TOT, which is a dedicated, state-of-the-art piece of equipment for carrying out this test. Increasing bitumen content will significantly improve the reflective cracking resistance of asphalt mixtures and materials with low resistance can fail in minutes. TOT results have correlated well with field performance and have shown good correlation with both beam fatigue test results and the low temperature performance of asphalt mixtures in the field. The test is rapid and has been shown to be repeatable. The TOT is performed on standard size samples, typically 6 inch (150 mm) long by 3 inch (75 mm) wide by 0.5 to 1.5 inch (12mm to 38 mm) high. These specimens can be cut from field cores or from laboratory compacted specimens, which can be prepared with the Cooper Gyratory Compactor (CRT-GYR). The specimen is precisely positioned and glued to two base plates using the gluing frame (CRT-TOT-GLUE). This glued assembly is put into the machine using the "zero stress" carrying frame. Sample dimension and test conditions are entered through the surface mounted Cooper TOUCH+ touch-screen panel. A test can be instantly started by the user, or will commence after a target test temperature has been reached. A triangular waveform in constant deformation mode is applied, alternately extending and contracting the specimen so as to simulate the movement of the cracked, rigid material under the overlay. The test will automatically stop when the test end conditions have been met. It is suggested that the TOT could complement mixture design methods where the emphasis is mainly on resistance to rutting thus ensuring that mixtures are not too lean and prone to cracking. It will also provide the means of assessing different binders and binder modifiers. A proposed new ASTM International standard for "Determining the Susceptibility of Bituminous Mixtures to Reflective Cracking using the Overlay Tester" is currently under development. It is hoped that this International standard will improve the test method by providing a unified sample preparation procedure as well as overall improved precision. The CRT-TOT will, of course, meet any changes prescribed in this new standard.

Standards

- ASTM WK26816 (Proposed draft)
- Tex-248-F

Key Features

- Dedicated no compromise Texas Overlay machine
- Designed according to the proposed ASTM
- Integral surface mounted touch screen control (Touch +)
- Double GSF cold rolled container slides for ultra accurate inline sample deformation
- Intelligently designed specimen gluing and "zero stress" carrying frame
- Interface SSM environmentally sealed S-Type load cell
- Fitted with high performance hydraulic actuator and powerpack

- Ergonomically designed for easy operation
- Designed and manufactured in the United Kingdom

Key Use

- Determination of crack initiation and crack propagation in asphalt mixtures

Cooper Texas Overlay Tester includes:

- CRT-TOT-PL Pair of Platens with pins for Texas Overlay
- CRT-TOT-2EPOX - Two-part epoxy with minimum 24 hour tensile strength of 4.1MPa and 24hr shear strength of 13.8MPa in accordance with Tex-614-J (Devcon™ two tone 30-Minute Plastic Steel Epoxy Cement)
- CRT-TOT-SBAR - 4.2 mm spacer bar for plate separation and alignment
- CRT-TOT-2.25WEIGHT 2.25 kg (5 lb) weight (in the shape of the specimen to ensure load is spread evenly and does not overhang the edges of the specimen)
- CRT-TOT-TAPE - ¼ inch width adhesive tape
- CRT-TOT-MARKER - Permanent marker
- CRT-TOT-GLUE - Gluing jig

Accessories

Accessories are not included in the price of main device (unless stated otherwise) and may be purchased separately if required.

CRT-TOT-PL	Pair of Platens with Pins (Recommended Qty. 5)
CRT-TOT-GLUE	Texas Overlay Prep Table/Gluing Jig
CRT-TOT-2EPOX	Two-part epoxy with minimum 24 hour tensile strength of 4.1 MPa / Shear Strength of 13.8 MPa (Tex-614-J)
CRT-TOT-SPBAR	Spacer Bar - 2mm x 4.2mm
CRT-TOT-4.5WEIGHT	4.5Kg (10 lb) Weight
CRT-TOT-2.25WEIGHT	2.25Kg (5 lb) Weight

Specifications

Technical specifications are subject to change without notice.

Resolution of Displacement Measurement μm	1
Control Loop Rate Hz	>1000
Load Cell Capacity kN	22.5 (5klbf)
Load Cell Accuracy (%FS)	0.25
Cycle Time (s)	5 to 1000
Cycle Time Measurement Resolution (%)	0.1
Temperature Control Range $^{\circ}\text{C}$	-5 to 40
Temperature Control Accuracy $\pm^{\circ}\text{C}$	0.5
Ambient Temperature Range $^{\circ}\text{C}$	15 to 30
Test End Conditions	(0 to 100)% load reduction and/or (0 to 10000) cycles
Specimen Dimensions	150 \pm 2
Length mm	38 to 50 \pm 0.5
Height mm	76
Width mm	
Plate Dimensions	300
Length mm	150
Width mm	Optional 13 or 19
Height mm	
Base Plate Hardness (Brinell Hardness)	> 95 (Not lower than that of 6061-T6 aluminum)
Plate Groove Depth x Width mm	1.5 x 1.3
Plate Groove Separation mm	6.35
Initial Separation of Plates mm	2
Vertical movement of sample (% of crack opening)	<3
Dimensions mm (W x D x H)	1580 x 650 x 1100
Weight (approx.) Kg	500
Electrical supply	1 Ph 240 V 50 Hz

Calibration & Maintenance

Calibration, Annual Service and Maintenance Contracts are available for this device.
Please enquire for further details. Note: This device should be checked and calibrated annually.

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