

TORQ-TEST

Purpose

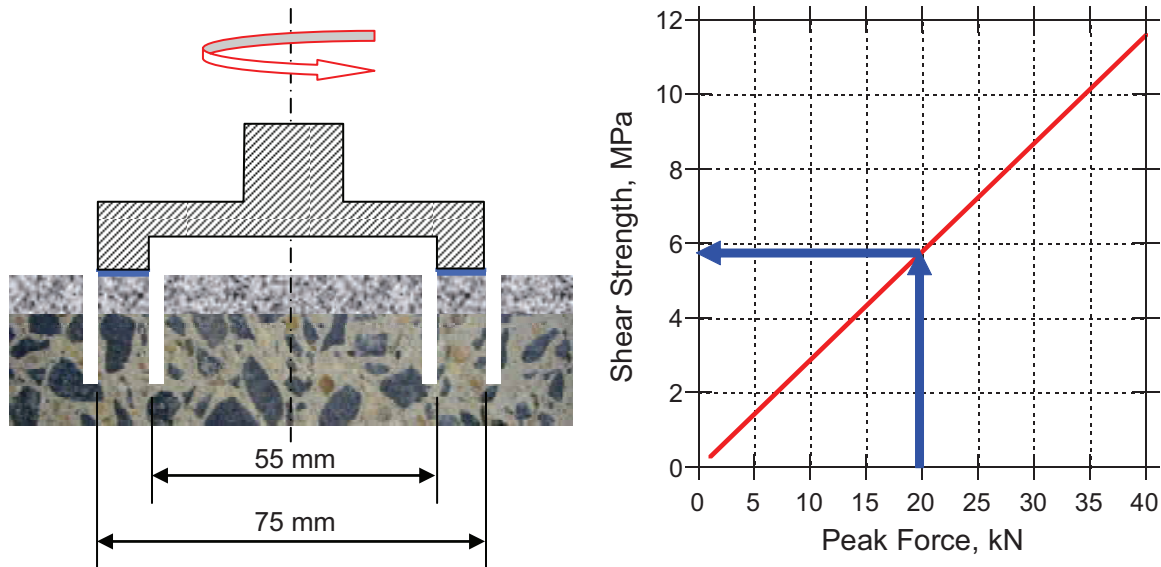
The **TORQ-TEST** is used to evaluate the shear strength of

- Surface concrete
- The bond between carbon fiber reinforced polymer (CFRP) sheets or strips and concrete
- The bond between an overlay and concrete

Principle

A disc with an integral ring, 55-mm inner diameter and 75-mm outer diameter, is bonded to the surface using a rapid curing adhesive (GRA) and is used to impart shearing stress to the test surface.

For tests of bare concrete, the surface should be prepared first with a diamond grinding tool to produce a flat surface and to expose the coarse aggregate. Before bonding the ring, a special double-barrel coring bit is used to produce partial cores as illustrated below. The coring bit diameters match the inner and outer diameters of the ring.



After the adhesive has cured, a torque is applied to the ring until rupture occurs due to shearing stress. The torque is applied with a special torque housing that is anchored to the surface. The loading is accomplished with one of the pull machines used for the **CAPO-TEST**, as shown on page 23. The load from the pull machine is applied eccentrically to the torque housing, thus producing a torsional moment.

The peak force is recorded and is converted to a shear strength using the provided conversion relationship, as shown above (right).

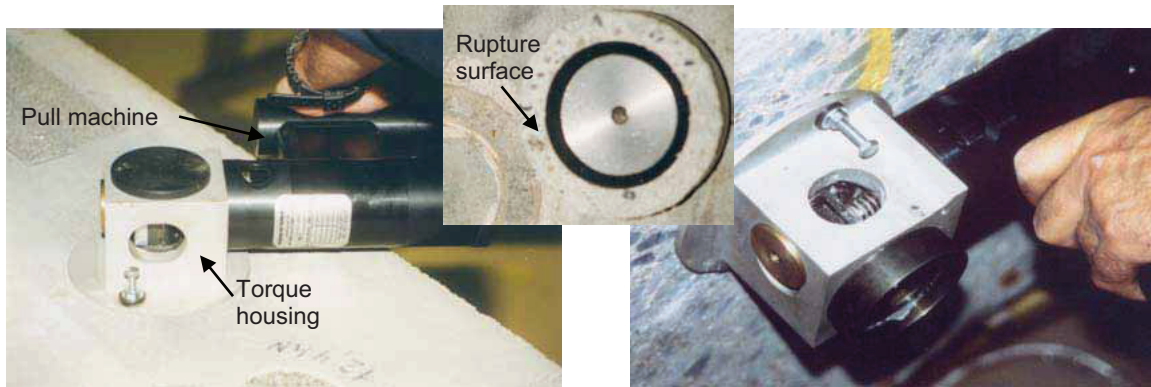
Additional information can be found in the following reference:

Petersen, C.G. and Poulsen, E., "In-Situ Testing of Near-to-Surface Layer of Concrete and Epoxy-Bonded CFRP Strips," US-Canada-Europe Workshop on Bridge Engineering, Zürich, Switzerland, 1997.

Variation

The coefficient of variation of replicate test results is about 10 % on concrete with a maximum aggregate size of 38 mm.

Testing Example



Testing with the **TORQ-TEST** on a bridge girder before application of CFRP strips

The **TORQ-TEST** Equipment and Ordering Numbers

TORQ-800 kit

Item	Order #
Torque housing with eccentric loading	TORQ-810
Torque discs, 6 pcs	TORQ-820
Steel brush	TORQ-830
GRA glue, box	B-11060
Set of anchoring tools, 8 mm	TORQ-850
Anchors, 8 mm, 20 pcs	TORQ-860
Emery cloth	TORQ-870
Rubber ball dust remover	TORQ-880
Hammer	TORQ-890
Manual	TORQ-900
Attaché case	TORQ-910



C-104 **CAPO-TEST** Pull Machine Kit

As shown on page 23, consisting of:

Item	Order #
Hydraulic pull machine with electronic gauge, 0-100 kN, 0.1 kN digital division	L-11-1
AMIGAS printout software	L-13
Cable for printout	L-14
Oil refilling cup	L-24
Oil refilling bottle	L-25
Large screwdriver	C-149
Small screwdriver	C-157
Calibration table	TORQ-920
Manual	TORQ-930
Attaché case	TORQ-940



The twin drill bit for partial coring (Order # TORQ-950) is used with the CS-75 **CORECASE**, page 29.

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Test smart - Build right