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Testing Solutions for the
Civil & Construction Industry

EQUIPMENT, SOFTWARE, CALIBRATION, SERVICE AND AFTER SALES SUPPORT

Tinius Olsen

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Specifications in
this catalogue are
subject to change
without notice



The industrial history of materials testing by machine can be traced to Tinius Olsen, a visionary inventor who built the first universal testing machine.

By 1880, he had proven and patented enough revolutionary ideas and designs to create an entire line of testing machines and launch his own company. Over the years, he introduced and innovated application-specific solutions for materials testing that spanned industrial manufacturing and construction.

After the turn of the century and the innovations of motor vehicles and modern highways, the scope of Tinius Olsen's offerings expanded to include a new product line dedicated to the testing of cement, concrete and road materials.

Nearly 140 years later and many of Tinius Olsen's original designs and technological approaches are still viewed as industry standards and are testament to his knowledge of the sciences, the natural and man-made materials that make up

our world, and of best engineering practices.

At Tinius Olsen, we are proud of our founder's legacy and continue to seek to build on it with new and creative systems that combine the best of proven materials testing machine technologies with the latest in automation and in digital monitoring, control and analysis software.

We offer equipment for testing high performance metals, the latest engineering grades of plastics, the toughest textiles and the most exotic composites. Building on some of the early solutions of our founder, we also offer one of the industry's most comprehensive and reliable lines of products and services for testing construction-related materials.

The breadth of machines and testing resources on the following pages is supported by our technical team, which keeps our ever-growing customer base up and running with precisely-calibrated testing machinery.



Tinius Olsen



Tinius Olsen proudly owns in US, UK, India and China:

- Customer service centers
- Training centers
- Showrooms
- Calibration facilities

Our global partner for the civil and construction industry is PowerCept Technologies. Contact details are:

PowerCept Middle East LLC
PO BOX 123489
Dubai – UAE

Website: www.powercept.com
Email: info@powercept.com

Key highlights of PowerCept are:

- Combines 45 years of regional knowledge and experience in the field of testing and measurement across the dynamic markets of the Middle East, Europe, India SAARC and Asia Pacific
- Specialises in packaged product and support solutions for civil engineering, education & research and manufacturing.
- Provides clients with comprehensive application advice, customer service, calibration, repair and training.
- Ensures value through close working relationships with regulatory bodies, technology partners and end users.
- Empowers local customers with proven track record of bringing diverse business cultures together with best-in-class engineering solutions.

Package Solutions



Turnkey Project Management

All Tinius Olsen Package Solutions include the following:

- Lab layouts and machine placements
- Power requirements
- Manpower requirements
- Comprehensive product training
- Application and technical support
- Calibration support
- Installation & commissioning
- Pre and post-sales support
- Certification and traceability
- User application training
- After sales and warranty support



Tinius Olsen offers Package Solutions as per BS/ASTM/EN/ISO/AASHTO International Standards for the following:

- Ready Mix Plant
- Pre Cast Factory
- Educational Laboratory
- Cement Plant
- Contractors Laboratory
- Accredited Commercial Laboratories for testing:
 - Rebar
 - Geotextiles
 - Membranes
 - Concrete
 - Aggregate
 - Soil
 - Asphalt
 - Cement
 - General Laboratory Testing

Horizon Software

Key features

- Test method library
- Test Editor
- Tabbed Test and Recall Area
- Multiple Machine Control
- Closed loop control of compression testers
- Output Editor
- Multilingual with translation
- Basic statistics
- Exporting (printing and ASCII)
- Central server capability and connectivity
- Help Desk access
- Multifaceted security
- Tinius Olsen Knowledge Center (requires internet access)



Tinius Olsen is proud to introduce the next evolution of its testing software with the Horizon package. As part of the development process, we have taken the best features of our existing software offerings, added a host of report writing and data manipulation capabilities and, in the process, created a new, unparalleled testing platform. This will make easy work of your materials testing programs, whether they're designed for the demanding rigors of R&D or the charting and analysis functions of QC testing.

Horizon software uses the most current Windows environments. These familiar formats make it easy to use and learn, especially because the same familiar functionality is maintained throughout the program.

Horizon software can accept data from not only our tension compression materials testing machines but it can also take manual data entry from equipment such as the Marshall tester,

CBR, Soil Compactor, Speedy testers, Blaine apparatus, Sieve grading results and all types of Civil Engineering Equipment test results.

If your testing hardware has PC communication and control capabilities, then Horizon software can also automatically control the tests for you, in accordance with the appropriate testing specifications, gather the test data and calculate the required results. Horizon can then take these results and produce a consolidated testing report that can incorporate your or your customer's logo.

Modular in design, Horizon software can be configured in a number of different ways so that your immediate needs are addressed; further enhancements are readily available as your testing needs change and grow.

Talk to your sales engineer to see how Horizon software can best meet your needs.

FA Series

Fully Automatic Concrete Compression Testers

The machine pictured right is from the FA Series – Model TO317E-FA – with a maximum testing capacity of 450,000lbf or 2000kN. This machine is primarily designed for the testing of 4in (100mm) and 6in (150mm) concrete cubes, 100mm and 150mm concrete cylinders.

The Tinius Olsen FA Series of digital compression testers features highly robust frames for exceptional stability when testing concrete cylinders or cubes. These compact testers are made up of three core pieces: the heavy duty load frame, hydraulic pump, and control and display systems.

The large lower bearing block includes a bellows to prevent leaks caused by dust and debris getting into the loading piston. The other advantage of this large bearing block is that it allows for a wide horizontal entrance opening and plenty of ready access for loading and removing specimens.

This series also includes the rapid change platen system with which operators can quickly and easily change accessories, quickly switching between cylinder, block, cube and beam specimen testing.

The hydraulic pumping system is attached to the loadframe and connected to the piston by a high pressure hydraulic hose. The rate of loading and piston return on test completion is controlled automatically by the controller.

While these machines are ideally positioned to test cubes and cylinders, testing can be taken to another level by adding a flexure testing attachment that will work with the pumping unit in the TO317E-FA frame. After installing a simple manual valve system, you are ready to test the flexural strength of concrete beams, up to 100kN (22,000lbf) maximum load.

Alternatively, a different attachment for testing the compression of hollow prisms can be attached to the main test frame. This attachment, model TO314-LU-SPL, can test up to three stacks of hollow prisms.

The FA Series features front and rear doors for easy loading of

Key features

- Meets or exceeds key ASTM, EN, AASHTO standards.
- Manual pace rate control.
- Automatic stress determination and display.
- Interlocked safety doors with mesh window as standard.
- Overload and over travel safety protection.
- Self-aligning platen with fast accessory change capability.
- Menu driven interface.
- Automatic data logging.
- Peak load capture and recording.

cylinders and also brushing out of broken specimens to the rear. The rear also features a debris chute that doubles as protection for the hydraulic hose and valve connections.

Further safety features include physical limit switches, electronic limit switches and emergency panic button to ensure that your investment lasts for years of testing.

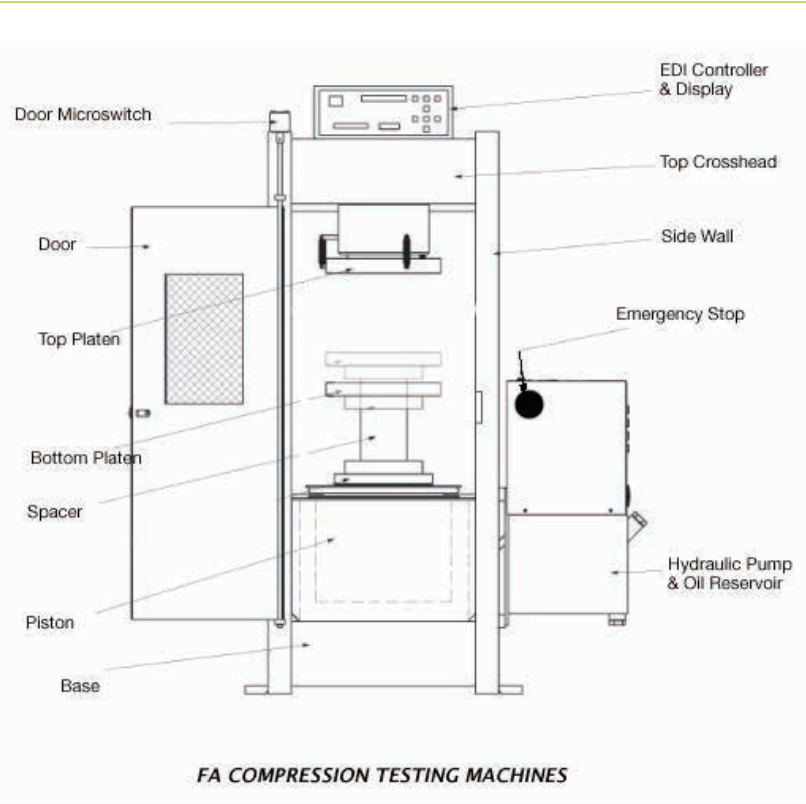
The FA Series comes with three controller options:

- EDI, a straightforward design using a membrane keypad and an LCD display to let operators select the test parameters simply and efficiently.
- A more advanced system with 10in TFT resistive touchscreen display. Easy to read and operate, it features simple and logical input screens and displays a real-time graph of test load vs time.
- The FA Series can also be connected to a PC running TO's Horizon software and the test and machine controlled by computer. At the same time, Horizon software will generate and display load, or stress, vs time graphs; complete SPC analyses are also available.



Notes: 1. These models conform to all relevant European CE Health and Safety Directives EN 50081-1, 580081-1, 73/23/EEC, EN 61010-1. 2. Specifications are subject to change without notice. 3. Appropriate brick platens can be supplied as an option. 4. A set of spacers to suit stated specimen sizes is supplied with the machine.

Specifications



Model	Capacity	Horizontal clearance	Vertical clearance	Piston stroke	Lower platen diameter
TO-302E	50kN/11,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-305E	100kN/22,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-308E	250kN/55,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-309E	25-250kN	230-260mm	230-390mm	50mm/2in	150mm
TO-311E	500kN/110,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	222mm/8.75in
TO-314E	1000kN/225,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	222mm/8.75in
TO-315E	1500kN/338,000lbf	305mm/12in	370mm/14.57in	50mm/2in	222mm/8.75in
TO-317E	2000kN/450,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-317E-STD	2000kN/450,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-320E	3000kN/675,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-320E-FA-CT-5000	5000kN	620mm	610mm	50mm/2in	341mm

Ordering

ORDERING INFORMATION

- **TO-302E-FA-01** 50kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-302E-FA-02** 50kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-302E-FA-03** 50kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-305E-FA-01** 100kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-305E-FA-02** 100kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-305E-FA-03** 100kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-308E-FA-01** 250kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-308E-FA-02** 250kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-308E-FA-03** 250kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-309E-FA-01** 25/250kN FA Compression Tester, dual mode, configured for 110VAC, 60Hz
- **TO-309E-FA-02** 25/250kN FA Compression Tester, dual mode, configured for 220VAC, 60Hz
- **TO-309E-FA-03** 25/250kN FA Compression Tester, dual mode, configured for 220VAC, 50Hz
- **TO-311E-FA-01** 500kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-311E-FA-02** 500kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-311E-FA-03** 500kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-314E-FA-01** 1000kN FA Compression Tester configured for 110VAC, 60Hz

- **TO-314E-FA-02** 1000kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-314E-FA-03** 1000kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-315E-FA-01** 1500kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-315E-FA-02** 1500kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-315E-FA-03** 1500kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-317E-FA-01** 2000kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-317E-FA-02** 2000kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-317E-FA-03** 2000kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-317E-STD-FA-01** 2000kN FA Standard Compression Tester configured for 110VAC, 60Hz
- **TO-317E-STD-FA-02** 2000kN FA Standard Compression Tester configured for 220VAC, 60Hz
- **TO-317E-STD-FA-03** 2000kN FA Standard Compression Tester configured for 220VAC, 50Hz
- **TO-320E-FA-01** 3000kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-320E-FA-02** 3000kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-320E-FA-03** 3000kN FA Compression Tester configured for 220VAC, 50Hz
- **TO-320E-FA-CT-5000-01** 5000kN FA Compression Tester configured for 110VAC, 60Hz
- **TO-320E-FA-CT-5000-02** 5000kN FA Compression Tester configured for 220VAC, 60Hz
- **TO-320E-FA-CT-5000-03** 5000kN FA Compression Tester configured for 220VAC, 50Hz

Accessories

SUPPLIED AS STANDARD

- RS232 cable
- Spacers (150, 100, 60, 35mm)
- Lower platen
- Spherical seat with upper platen

OPTIONAL ACCESSORIES

- **TO-320-5500** Platen set for 6 x 12in concrete cylinders
- **TO-320-5502** Platen set for 4 x 8in concrete cylinders
- **TO-320-5504** Platen set for 3 x 6in concrete cylinders
- **TO-320-5510** Platen set for 2in cubes
- **TO-320-5512** Platen set for 6in cubes
- **TO-320-5518** Platen set for blocks up to 12in
- **TO-320-5519** Cylindrical Specimen caps – two caps per set
- **TO-320-5520** Rubber insert for 6in cap with 60 shore A hardness (bag of 10)
- **TO-320-5521** Compression frame jig assembly (without platens)
- **TO-320-5521-01** 50mm square platen set for TO 320-5521
- **TO-320-5521-02** 2in square platen for TO 320-5521
- **TO-320-5521-03** 40mm square platens
- **TO-320-5522** Flex jig/attachment
- **TO-320-5524** Cylindrical specimen cap, 4in dia – two per set
- **TO-320-5525** Rubber insert for 4in cap with 60 shore A hardness (bag of 10)
- **TO-320-5523** BSEN 12390 stability compliant oil-filled ball seat, platens
- **TO-320-5527** BSEN 12390 stability compliant oil-filled retrofit ball seating
- **TO-320-5528** Tensile split strength test attachment
- **TO-320-5529** RS232 cable
- **TO-320-5532** Rectangular platen set for prisms, 475 x 250mm

- **TO-320-5534** Platen set, 165mm dia., with concentric rings in upper platen
- **TO-31727-1** Strain measurement attachment
- **TO-33101-BS** Flexural test frame, 100kN, no pump, using CTM 2-way valve
- **TO-33101-ASTM** Flexural test frame, 100kN, no pump, using CTM 2-way valve
- **TO-314-LU-SPL** 1000kN loading frame for testing hollow prisms – three stack max.
- **TO-320-LU-SPL** Prism/block test frame 3000kN, no pump, uses CTM valve
- **TO-343** Mold in cast iron for 100mm cube
- **TO-344** Mold in cast iron for 150mm cube
- **TO-344-20** Mold in cast iron for 200mm cube
- **TO-417** Mold in cast iron for 50mm cube
- **TO-414** Mold in steel for 70.6mm cube
- **TO-417-CI** Three-gang mold in cast iron for 50mm cube
- **TO-417-3-NB** Three-gang mold in Navy Brass for 50mm cubes – per ASTM
- **TO-320-5541** Platen Handling Assembly w/250x445mm platen set for 2000kN or 3000kN CTM
- **TO-320-5542** Platen Handling Assembly w/250x750mm platen set for 3000kN CTM

Controller Options



The FA Series comes with three controller options:

- EDI – a straightforward design using a membrane keypad and an LCD display to let operators select the test parameters simply and efficiently.
- A more advanced system with 10in TFT resistive touchscreen display. Easy to read and operate, the controller features simple and logical input screens and displays a real-time graph of test load vs time.
- The FA Series can also be connected to a PC running TO's Horizon software and the test and machine controlled by computer. At the same time, Horizon software will generate and display load, or stress, vs time graphs.

Key features

- Test Method Library
- Test Editor
- Tabbed Test and Recall Area
- Multiple Machine Control
- Output Editor
- Multilingual
- Method Editor
- Result Editor
- Multifaceted security
- Touchscreen-enabled*

*Touchscreens require the use of Windows 8 operating system and a touchscreen.

Horizon Software

Tinius Olsen is proud to introduce the next evolution of testing software with our Horizon package.

As part of our development process, we have taken the best features of our existing software offerings, including Test Navigator, QMat, and EP600 software, added a host of report writing and data manipulation capabilities and in the process, created a new, unparalleled testing platform that will make easy work of your materials testing programs, whether they're designed for the demanding rigors of R&D or the charting and analysis functions of QC testing.

One of the first features you will see within the Horizon software is its use of the most current Windows environments. These familiar formats make it easy to use and learn, especially since the same familiar functionality is maintained throughout the program.

ORDERING INFORMATION

- **21001104** Civil Engineering primary platform for Horizon software
- **21001146** Civil Engineering (concrete) library for Horizon software

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Touchscreen-based Enhanced Digital Indicator

Tinius Olsen's new touchscreen-based EDI display is an enhancement of our existing EDI offering. It is an advanced digital control and display system with a 10in (diagonal) resistive touchscreen display, and is supplied complete with a stylus for easier operation for users wearing gloves.

This new touchscreen display is compatible with all test frames that use the existing EDI controller. Easy to read and operate, the controller features simple and logical input screens and displays a real-time graph of test load vs time.

ORDERING INFORMATION

- **TO-30235-DG-T** Touchscreen-based enhanced digital indicator for DG models
- **TO-30235-FA-T** Touchscreen-based enhanced digital indicator for FA models

Key features

- Touchscreen TFT with 800 x 480 pixels.
- Icon-driven software showing figures and diagrams for ease of use.
- Unique data storage options with both internal storage (of 200 tests) and direct to USB thumb drive storage.
- Optional integrated thermal printer.
- Simultaneous display of load vs time graph, stress and actual load rate.

Controller Options

Enhanced Digital Indicator

EDI is a straightforward design using a membrane keypad and an LCD to let operators select the test parameters simply and efficiently. The TO EDI head is supplied with all TO concrete Compression Testing Machines DG, FA models and the Flex Testing Machine DG model.

ORDERING INFORMATION

- **TO-30235-DG** Enhanced Digital Indicator with pressure sensor for digital compression testing machine
- **TO-30235-FA** Enhanced Digital Indicator with Pressure Sensor for fully automatic compression testing machine

Key features

- White backlit LCD display, four lines, 40 characters per line.
- Multi unit Force and Stress, Imperial, Metric, SI.
- Force calibration range 1% to 100% accuracy +/- 1% of applied force.
- Pace rate control indication.
- Peak Force and Stress results.
- Specimen area input from specimen menu.
- Parallel printer O/P dot matrix format any size paper.
- RS232 output – ASCII comma delimited results data.
- Two channel I/P to accommodate CTM and flex unit or CTM and Block test unit.
- Approximately 2000 stored results.
- Young's modulus and strain measurement can be calculated when accompanied by compressometer.

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CONCRETE

Accessories

Ball Seating and Platen Handling options enhance the system in support of test compliance and efficient specimen handling.

Ball Seating Platen

BS EN 12390 requires certified stability and alignment, which is achieved using an oil-filled ball seating and upper platen.

APPLICABLE STANDARD

- **BS EN 12390**

ORDERING INFORMATION

- **TO-320-5523** BSEN 12390 stability compliant oil-filled ball seat, platens
- **TO-320-5527** BSEN 12390 stability compliant oil-filled retrofit ball seating



Platen Handling Assembly

Block platens 460 x 280 x 75mm with sliding rail assembly can be installed for testing concrete blocks and other structural materials. Sliding rail assembly allows the platens to be easily installed without removing existing circular compression platens. They can be installed on all semi-auto and automatic compression machines. They must be factory installed.

Key features

- Improves laboratory efficiency.
- Reduces manual handling.
- Compatible with Semi-Automatic and Fully Automatic Compression Machines.

ORDERING INFORMATION

- **TO-320-5541** Platen Handling Assembly w/250 x 445mm platen set for 2000kN or 3000kN CTM
- **TO-320-5542** Platen Handling Assembly w/250 x 450mm platen set for 3000kN CTM



Compressometer & Extensometer

An extensometer is a device that is used to measure changes in the length of an object. It is useful for stress-strain measurements and tensile tests. Its name comes from 'extension-meter'. Compressometers are used for determining strain and deformation characteristics of concrete cylinders.

Longitudinal Compressometer

This apparatus is used for determining strain and deformation characteristics of standard concrete cylinders of 150mm diameter x 300mm length.

The compressometer consists of two frames for clamping to the specimen using five tightening screws with hardened and tapered ends. Two spacers hold the frames in position. An adjustable pivot rod rests on pivot screws.

A spring enables the pivot rod to remain in contact with pivot screws. The ball chain is for adjusting the tension of the spring. A dial gage, fixed to a bracket on the top frame, is used for making deformation measurements.

ORDERING INFORMATION

- **TO-372** Longitudinal Compressometer with TO-072 analog dial gage

OPTIONAL ACCESSORIES

- **TO-072** Analog dial gage, 5mm x 0.002mm
- **TO-072-DG** Digital gage, 5mm x 0.001mm

Lateral Extensometer

This is used to determine the lateral extension of 150mm diameter x 300mm high cement concrete cylinders while running a compression test. The extensometer consists of two movable frames pivoted at one end. A dial gage measures the lateral extension, and a removable spacer strip is for the initial setting of the dial gage. The extensometer is attached to the specimen by screws. Supplied complete with TO-072 dial gage or TO-072DG digital gage.

APPLICABLE STANDARD

- **ASTM C469**

ORDERING INFORMATION

- **TO-373** Lateral extensometer to fit 150 x 300mm cylinders with dial gage
- **TO-373-DG** Lateral extensometer to fit 150 x 300mm cylinders with digital gage

OPTIONAL ACCESSORIES

- **TO-072** Analog dial gage, 5 x 0.002mm
- **TO-072-DG** Digital gage, 5 x 0.001mm



Accessories

Flexural Testing Machine

These machines are designed to test the flexural strength of concrete beams. Their design provides maximum rigidity throughout their working range as the downward movement of the piston applies load.

A spacer is provided for testing different size of beams and load is indicated on a digital indicator. For the 150 x 150 x 700mm beams, the support span is 600mm and the loading span is 200mm, whereas for the 100 x 100 x 500mm beams, the support span is 400mm and the loading span is 133mm.

One of the key considerations when using concrete in construction projects is how well the concrete is going to stand up to bending pressures and how often it needs to be supported. With concrete, the most effective way to study the destructive testing is the Flexural Test. On a specimen beam ideally of 150 x 150 x 750mm and/or 100 x 100 x 500mm, the maximum tensile stress reach at the bottom of the test beam is considered as the Flexural Strength/Modulus of Rupture of the material.

Key features

- Lightweight, rugged high strength frame.
- Self-aligning four-point loading roller assembly.
- Maximum capacity of either frame is 100kN (22,000lbf).
- For testing beams of 100 x 100 x 500mm and 150 x 150 x 700mm.

APPLICABLE STANDARDS

- **BS 1881; ASTM C78-02; BS EN 12390-5:2000**

ORDERING INFORMATION

- **TO-33101-ASTM** Flexure Testing Frame 100kN machine no pump for use with CTMs using 2-way valve
- **TO-33101-BS** Flexure Testing Frame 100kN machine no pump for use with CTMs using 2-way valve
- **TO-331-ASTM** Flexure Testing Manual Machine ECO, for 10 x 10 x 50cm & 15 x 15 x 70cm beams
- **TO-331-BS** Flexure Testing Manual Machine ECO, for 10 x 10 x 50cm & 15 x 15 x 70cm beams
- **TO-332-ASTM-01** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 110V, 60Hz
- **TO-332-ASTM-02** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 60Hz
- **TO-332-ASTM-03** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 50Hz
- **TO-332-BS-01** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 110V, 60Hz
- **TO-332-BS-02** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 60Hz
- **TO-332-BS-03** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 50Hz



Key features

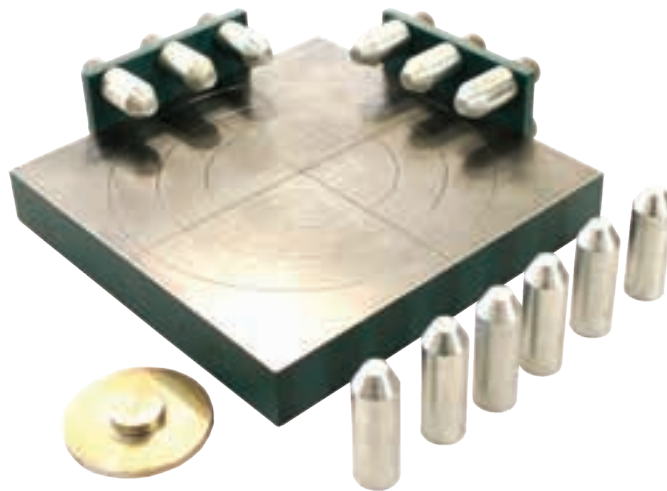
- 150mm and 200mm cubes.
- Adjustable spacer pins on two axes
- Specimen self-centers against the pins.
- Shorter middle pins for cylindrical specimens.
- Only for 2000kN and 3000kN machines.

Accessories

Other accessories that can be used with FA Series machines to assist with most of the processes of the Compression Tester.

Self-Centering Platen

The self-centering platen is a cubical platen with pins mounted on two sides that help the sample to center itself in position. These adjustable pins on two axes are of different sizes and are used based on the type and size of sample. The platens are specially designed and can only be used with 2000kN and 3000kN compression testers.



ORDERING INFORMATION

- **TO-320-5535** Self-centering 220mm square lower platen, suitable for use with 2000kN and 3000kN frames

Compression Frame Stand

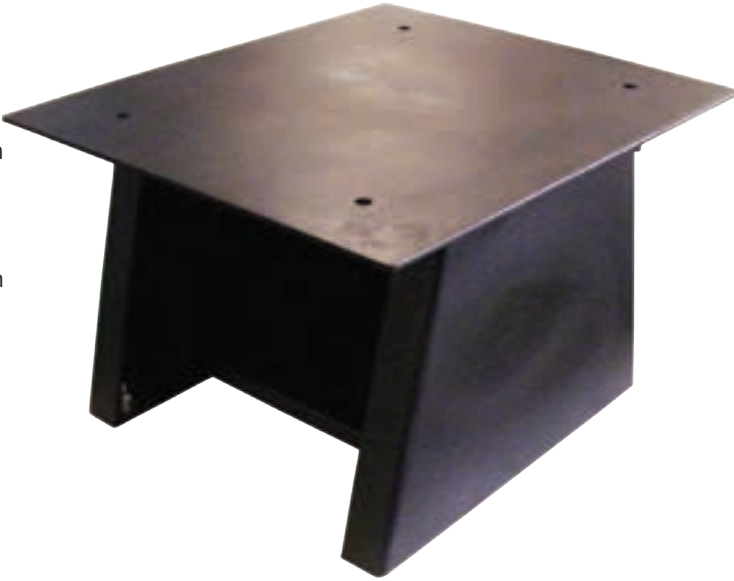
All models in the series can be mounted on a machine stand to bring the testing area to a convenient and safe working height.

ORDERING INFORMATION

- **TO-STAN01** Compression Testing machine stand for 1000kN frame and below
- **TO-STAN02** Compression Testing machine stand for 2000kN frame
- **TO-STAN03** Compression Testing machine stand for 3000kN frame

PACKAGING INFORMATION

- 1000kN & 2000kN CTM
- **Net weight:** 62kg; **gross weight:** 87kg
 - **Packaging dimensions:** 76 x 73 x 68cm
- 3000kN CTM
- **Net weight:** 90kg; **gross weight:** 110kg
 - **Packaging dimensions:** 89 x 73 x 74cm



DG Series

Semi Automatic Concrete Compression Testers

The machine pictured right is from the DG Series – Model TO317E-DG – with a maximum testing capacity of 450,000lbf or 2000kN. This machine is primarily designed for the testing of 4in (100mm) and 6in (150mm) concrete cubes, 100mm and 150mm concrete cylinders.

The Tinius Olsen DG Series of digital compression testers features highly robust frames for exceptional stability when testing concrete cylinders or cubes. These compact testers are made up of three core pieces: the heavy duty load frame, hydraulic pump, and control and display systems.

The large lower bearing block includes a bellows to prevent leaks caused by dust and debris getting into the loading piston. The other advantage of this large bearing block is that it allows for a wide horizontal entrance opening and plenty of ready access for loading and removing specimens.

This series also includes the rapid change platen system with which operators can quickly and easily change accessories, quickly switching between cylinder, block, cube and beam specimen testing.

The hydraulic pumping system is attached to the loadframe and connected to the piston by a high pressure hydraulic hose. The rate of loading and piston return on test completion is controlled automatically by the controller.

While these machines are ideally positioned to test cubes and cylinders, testing can be taken to another level by adding a flexure testing attachment that will work with the pumping unit in the TO317E-DG frame. After installing a simple manual valve system, you are ready to test the flexural strength of concrete beams, up to 100kN (22,000lbf) maximum load.

Alternatively, a different attachment for testing the compression of hollow prisms can be attached to the main test frame. This attachment, model TO314-LU-SPL, can test up to three stacks of hollow prisms.

The DG Series has front and rear doors for easy loading of

Key features

- Meets or exceeds key ASTM, EN, AASHTO standards.
- Manual pace rate control.
- Automatic stress determination and display.
- Interlocked safety doors with mesh window as standard.
- Overload and over travel safety protection.
- Self aligning platen with fast accessory change capability.
- Menu driven interface.
- Automatic data logging.
- Peak load capture and recording.

cylinders and brushing out broken specimens. The rear also has a debris chute that doubles as protection for the hydraulic hose and valve connections.

Further safety features include physical and electronic limit switches and emergency panic button to ensure that your investment lasts for years.

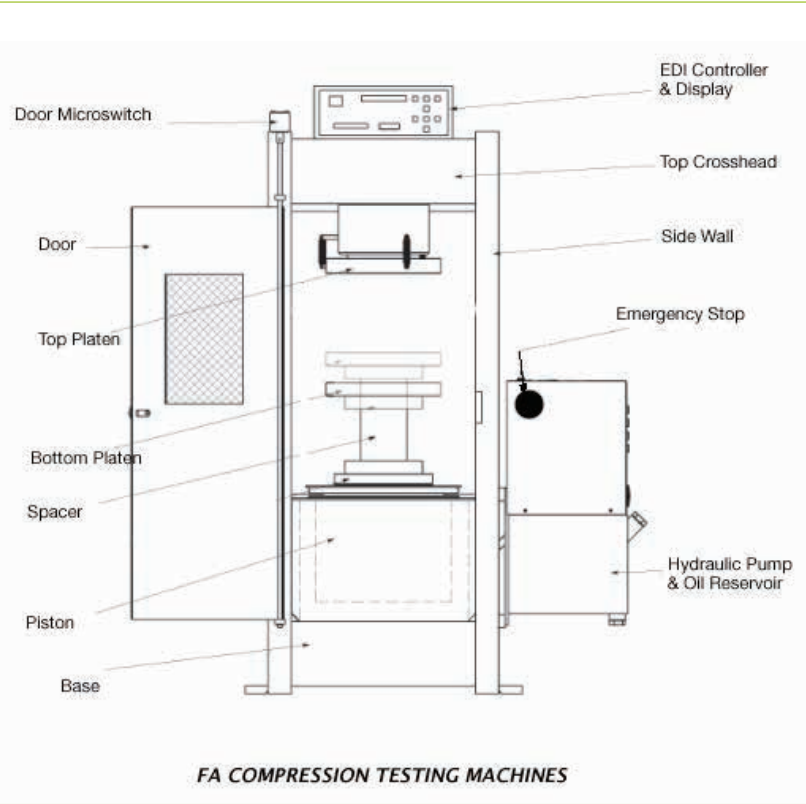
The DG Series comes with two controller options:

- EDI, a straightforward design using a membrane keypad and an LCD display to let operators select the test parameters simply and efficiently.
- A more advanced system with 10in TFT resistive touchscreen display. Easy to read and operate, it features simple and logical input screens and displays a real-time graph of test load vs time.



Notes: 1. These models conform to all relevant European CE Health and Safety Directives EN 50081-1, 580081-1, 73/23/EEC, EN 61010-1. 2. Specifications are subject to change without notice. 3. Appropriate brick platens can be supplied as an option. 4. A set of spacers to suit stated specimen sizes are supplied with the machine.

Specifications



Model	Capacity	Horizontal clearance	Vertical clearance	Piston stroke	Lower platen diameter
TO-302E	50kN/11,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-305E	100kN/22,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-308E	250kN/55,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	150mm/5.9in
TO-309E	25-250kN	230-260mm	230-390mm	50mm/2in	150mm
TO-311E	500kN/110,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	222mm/8.75in
TO-314E	1000kN/225,000lbf	260mm/10.24in	390mm/15.35in	50mm/2in	222mm/8.75in
TO-315E	1500kN/338,000lbf	305mm/12in	370mm/14.57in	50mm/2in	222mm/8.75in
TO-317E	2000kN/450,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-317E-STD	2000kN/450,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-320E	3000kN/675,000lbf	340mm/13.4in	340mm/13.4in	50mm/2in	222mm/8.75in
TO-320E-DG-CT-5000	5000kN	620mm	610mm	50mm/2in	341mm

Ordering

ORDERING INFORMATION

- **TO-302E-DG-01** 50kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-302E-DG-02** 50kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-302E-DG-03** 50kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-305E-DG-01** 100kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-305E-DG-02** 100kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-305E-DG-03** 100kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-308E-DG-01** 250kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-308E-DG-02** 250kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-308E-DG-03** 250kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-309E-DG-01** 25/250kN DG Compression Tester, dual mode, configured for 110VAC, 60Hz
- **TO-309E-DG-02** 25/250kN DG Compression Tester, dual mode, configured for 220VAC, 60Hz
- **TO-309E-DG-03** 25/250kN DG Compression Tester, dual mode, configured for 220VAC, 50Hz
- **TO-311E-DG-01** 500kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-311E-DG-02** 500kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-311E-DG-03** 500kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-314E-DG-01** 1000kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-314E-DG-02** 1000kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-314E-DG-03** 1000kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-315E-DG-01** 1500kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-315E-DG-02** 1500kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-315E-DG-03** 1500kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-316E-DG-01** 1500kN, Pillar type Digital Compression Tester configured for 110VAC, 60Hz
- **TO-316E-DG-02** 1500kN, Pillar type Digital Compression Tester configured for 220VAC, 60Hz
- **TO-316E-DG-03** 1500kN, Pillar type Digital Compression Tester configured for 220VAC, 50Hz
- **TO-317E-DG-01** 2000kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-317E-DG-02** 2000kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-317E-DG-03** 2000kN DG Compression Tester configured for 220VAC, 50Hz
- **TO-317E-STD-DG-01** 2000kN DG Standard Compression Tester configured for 110VAC, 60Hz
- **TO-317E-STD-DG-02** 2000kN DG Standard Compression Tester configured for 220VAC, 60Hz
- **TO-317E-STD-DG-03** 2000kN DG Standard Compression Tester configured for 220VAC, 50Hz
- **TO-320E-DG-01** 3000kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-320E-DG-02** 3000kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-320E-DG-03** 3000kN DG Compression Tester configured for 220VAC, 50Hz

Accessories

- **TO-320E-DG-CT-5000-01** 5000kN DG Compression Tester configured for 110VAC, 60Hz
- **TO-320E-DG-CT-5000-02** 5000kN DG Compression Tester configured for 220VAC, 60Hz
- **TO-320E-DG-CT-5000-03** 5000kN DG Compression Tester configured for 220VAC, 50Hz

SUPPLIED AS STANDARD

- RS232 cable
- Spacers (150, 100, 60, 35mm)
- Lower platen
- Spherical seat with upper platen

OPTIONAL ACCESSORIES

- **TO-320-5500** Platen set for 6 x 12in concrete cylinders
- **TO-320-5502** Platen set for 4 x 8in concrete cylinders
- **TO-320-5504** Platen set for 3 x 6in concrete cylinders
- **TO-320-5510** Platen set for 2in cubes
- **TO-320-5512** Platen set for 6in cubes
- **TO-320-5518** Platen set for blocks up to 12in
- **TO-320-5519** Cylindrical Specimen caps – two caps per set
- **TO-320-5520** Rubber insert for 6in cap with 60 shore A hardness (bag of 10)
- **TO-320-5521** Compression frame jig assembly (without platens)
- **TO-320-5521-01** 50mm square platen set for TO 320-5521
- **TO-320-5521-02** 2in square platen for TO 320-5521
- **TO-320-5521-03** 40mm square platens
- **TO-320-5522** Flex jig/attachment
- **TO-320-5524** Cylindrical specimen cap, 4in dia – two per set
- **TO-320-5525** Rubber insert for 4in cap with 60 shore A hardness (bag of 10)
- **TO-320-5523** BSEN 12390 stability compliant oil-filled ball seat, platens
- **TO-320-5527** BSEN 12390 stability compliant oil-filled retrofit ball seating
- **TO-320-5528** Tensile split strength test attachment
- **TO-320-5529** RS232 cable
- **TO-320-5532** Rectangular platen set for prisms, 475 x 250mm
- **TO-320-5534** Platen set, 165mm dia., with concentric rings in upper platen
- **TO-31727-1** Strain measurement attachment
- **TO-33101-BS** Flexural test frame, 100kN, no pump, using CTM 2-way valve
- **TO-33101-ASTM** Flexural test frame, 100kN, no pump, using CTM 2-way valve
- **TO-314-LU-SPL** 1000kN loading frame for testing hollow prisms – three stack max.
- **TO-320-LU-SPL** Prism/block test frame 3000kN, no pump, uses CTM valve
- **TO-343** Mold in cast iron for 100mm cube
- **TO-344** Mold in cast iron for 150mm cube
- **TO-344-20** Mold in cast iron for 200mm cube
- **TO-417** Mold in cast iron for 50mm cube
- **TO-414** Mold in steel for 70.6mm cube
- **TO-417-CI** Three-gang mold in cast iron for 50mm cube
- **TO-417-3-NB** Three-gang mold in Navy Brass for 50mm cubes – per ASTM
- **TO-320-5541** Platen Handling Assembly w/250x445mm platen set for 2000kN or 3000kN CTM
- **TO-320-5542** Platen Handling Assembly w/250x750mm platen set for 3000kN CTM

DG Series



500kN frame

2000kN frame



5000kN frame

Controller Options



Enhanced Digital Indicator

EDI is a straightforward design using a membrane keypad and an LCD to let operators select the test parameters simply and efficiently. The TO EDI head is supplied with all TO concrete Compression Testing Machines DG, FA models and the Flex Testing Machine DG model.

Key features

- White backlit LCD display, four lines, 40 characters per line.
- Multi unit Force and Stress, Imperial, Metric, SI.
- Force calibration range 1% to 100% accuracy $\pm 1\%$ of applied force.
- Pace rate control indication.
- Peak Force and Stress results.
- Specimen area input from specimen menu.
- Parallel printer OVP dot matrix format any size paper.
- RS232 output – ASCII comma delimited results data.
- Two channel I/P to accommodate CTM and flex unit or CTM and Block test unit.
- Approximately 2000 stored results.
- Young's modulus and strain measurement can be calculated when accompanied by compressometer.

ORDERING INFORMATION

- **TO-30235-DG** Enhanced Digital Indicator with pressure sensor for digital compression testing machine
- **TO-30235-FA** Enhanced Digital Indicator with Pressure Sensor for fully automatic compression testing machine

The DG Series now comes with two controller options:

- EDI – a straightforward design using a membrane keypad and an LCD display to let operators select the test parameters simply and efficiently.
- A more advanced system with 10in TFT resistive touchscreen display. Easy to read and operate, the controller features simple and logical input screens and displays a real-time graph of test load vs time.

Touchscreen-based Enhanced Digital Indicator

Tinius Olsen's new touchscreen-based EDI display is an enhancement of its existing EDI offering. It is an advanced digital control and display system with a 10in (diagonal) resistive touchscreen display, and is supplied complete with a stylus for easier operation for users wearing gloves.

This new touchscreen display is compatible with all test frames that use the existing EDI controller. Easy to read and operate, the controller features simple and logical input screens and displays a real-time graph of test load vs time.

Key features

- Touchscreen TFT with 800 x 480 pixels.
- Icon-driven software showing figures and diagrams for ease of use.
- Unique data storage options with both internal storage (of 200 tests) and direct to USB thumb drive storage.
- Optional integrated thermal printer.
- Simultaneous display of load vs time graph, stress and actual load rate.

ORDERING INFORMATION

- **TO-30235-DG-T** Touchscreen-based enhanced digital indicator for DG models
- **TO-30235-FA-T** Touchscreen-based enhanced digital indicator for FA models



Accessories

Ball Seating and Platen Handling options enhance the system in support of test compliance and efficient specimen handling.

Ball Seating Platen

BS EN 12390 requires certified stability and alignment, which is achieved using an oil-filled ball seating and upper platen.

APPLICABLE STANDARD

- **BS EN 12390**

ORDERING INFORMATION

- **TO-320-5523** BSEN 12390 stability compliant oil-filled ball seat, platens
- **TO-320-5527** BSEN 12390 stability compliant oil-filled retrofit ball seating



Platen Handling Assembly

Block Platens 460 x 280 x 75mm with sliding rail assembly can be installed for testing concrete blocks and other structural materials. Sliding rail assembly allows the platens to be easily installed without removing existing circular compression platens. They can be installed on all semi-auto and automatic compression machines. They must be factory installed.

ORDERING INFORMATION

- **TO-320-5541** Platen Handling Assembly w/250 x 445mm platen set for 2000kN or 3000kN CTM
- **TO-320-5542** Platen Handling Assembly w/250 x 450mm platen set for 3000kN CTM

Key features

- Improves laboratory efficiency.
- Reduces manual handling.
- Compatible with Semi-Automatic and Fully Automatic Compression Machines.



Compressometer and Extensometer

An extensometer is a device that is used to measure changes in the length of an object. It is useful for stress-strain measurements and tensile tests. Its name comes from 'extension-meter'. Compressometers are used for determining strain and deformation characteristics of concrete cylinders.

Longitudinal Compressometer

This apparatus is used for determining strain and deformation characteristics of standard concrete cylinders of 150mm diameter x 300mm length. The compressometer consists of two frames for clamping to the specimen using five tightening screws with hardened and tapered ends. Two spacers hold the frames in position. An adjustable pivot rod rests on pivot screws.

A spring enables the pivot rod to remain in contact with pivot screws. The ball chain is for adjusting the tension of the spring. A dial gage, fixed to a bracket on the top frame, is used for making deformation measurements.



ORDERING INFORMATION

- **TO-372** Longitudinal Compressometer with TO-072 analog dial gage

OPTIONAL ACCESSORIES

- **TO-072** Analog dial gage, 5mm x 0.002mm
- **TO-072-DG** Digital gage, 5mm x 0.001mm

Lateral Extensometer

This is used to determine the lateral extension of 150mm diameter x 300mm high cement concrete cylinders while running a compression test. The extensometer consists of two movable frames pivoted at one end. A dial gage measures the lateral extension, and a removable spacer strip is for the initial setting of the dial gage. The extensometer is attached to the specimen by screws. Supplied complete with TO-072 dial gage or TO-072DG digital gage.



APPLICABLE STANDARD

- **ASTM C469**

ORDERING INFORMATION

- **TO-373** Lateral extensometer to fit 150 x 300mm cylinders with dial gage
- **TO-373-DG** Lateral extensometer to fit 150 x 300mm cylinders with digital gage

OPTIONAL ACCESSORIES

- **TO-072** Analog dial gage, 5 x 0.002mm
- **TO-072-DG** Digital gage, 5 x 0.001mm

Accessories

These machines are designed to test the flexural strength of concrete beams. Their design provides maximum rigidity throughout their working range as the downward movement of the piston applies load. A spacer is provided for testing different size of beams and load is indicated on a digital indicator. For the 150 x 150 x 700mm beams, the support span is 600mm and the loading span is 200mm, whereas for the 100 x 100 x 500mm beams, the support span is 400mm and the loading span is 133mm.

One of the key considerations when using concrete in construction projects is how well the concrete is going to stand up to bending pressures and how often it needs to be supported. With concrete, the most effective way to study the destructive testing is the Flexural Test. On a specimen beam ideally of 150 x 150 x 750mm and/or 100 x 100 x 500mm, the maximum tensile stress reach at the bottom of the test beam is considered as the Flexural Strength/Modulus of Rupture of the material.

Key features

- Lightweight, rugged high strength frame.
- Self-aligning four-point loading roller assembly.
- Maximum capacity of either frame is 100kN (22,000lbf).
- For testing beams of 100 x 100 x 500mm and 150 x 150 x 700mm.

APPLICABLE STANDARDS

- **BS 1881; ASTM C78-02; BS EN 12390-5:2000**

ORDERING INFORMATION

- **TO-33101-ASTM** Flexure Testing Frame 100kN machine no pump for use with CTMs using 2-way valve
- **TO-33101-BS** Flexure Testing Frame 100kN machine no pump for use with CTMs using 2-way valve
- **TO-331-ASTM** Flexure Testing Manual Machine ECO, for 10 x 10 x 50cm & 15 x 15 x 70cm beams
- **TO-331-BS** Flexure Testing Manual Machine ECO, for 10 x 10 x 50cm & 15 x 15 x 70cm beams
- **TO-332-ASTM-01** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 110V, 60Hz
- **TO-332-ASTM-02** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 60Hz
- **TO-332-ASTM-03** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 50Hz
- **TO-332-BS-01** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 110V, 60Hz
- **TO-332-BS-02** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 60Hz
- **TO-332-BS-03** Flexure Testing Machine, 100kN, for 10 x 10 x 50cm & 15 x 15 x 70cm beams DG EDI, 220V, 50Hz



Accessories

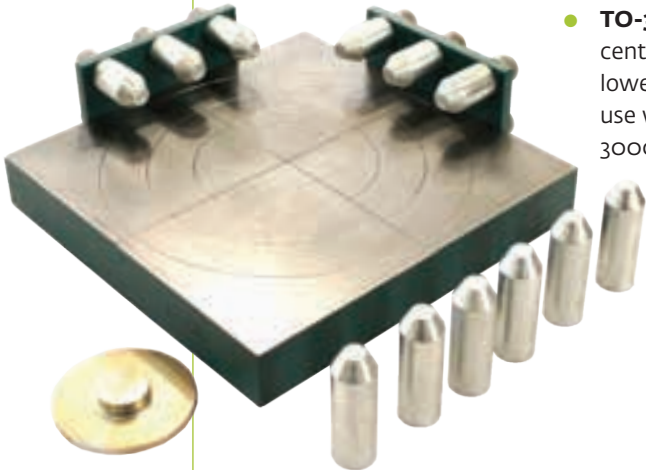
Other accessories that can be used with DG Series machines to assist with most of the processes of the Compression Tester.

Self Centering Platen

The self-centering platen is a cubical platen with pins mounted on two sides that help the sample to center itself in position. These adjustable pins on two axes are of different sizes and are used based on the type and size of sample. The platens are specially designed and can only be used with 2000kN and 3000kN compression testers.

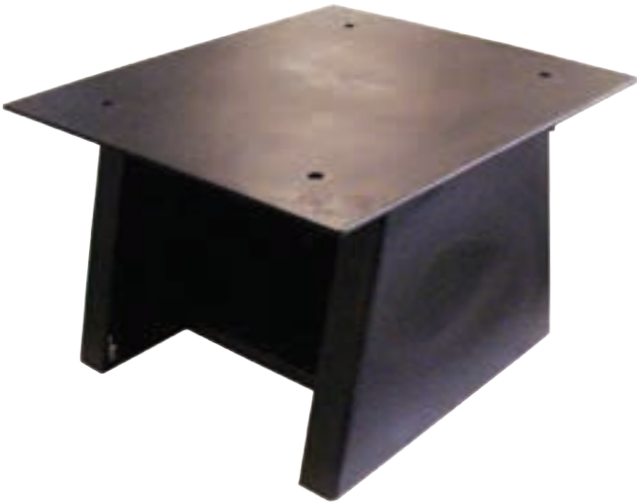
ORDERING INFORMATION

- **TO-320-5535** Self-centering 220mm square lower platen, suitable for use with 2000kN and 3000kN frames



Key features

- 150mm and 200mm cubes.
- Adjustable spacer pins on two axes
- Specimen self-centers against the pins.
- Shorter middle pins for cylindrical specimens.
- Only for 2000kN and 3000kN machines.



Compression Frame Stand

All models in the series can be mounted on a machine stand to bring the testing area to a convenient and safe working height.

ORDERING INFORMATION

- **TO-STAN01** Compression Testing machine stand for 1000kN frame and below
- **TO-STAN02** Compression Testing machine stand for 2000kN frame
- **TO-STAN03** Compression Testing machine stand for 3000kN frame

PACKAGING INFORMATION

- 1000kN & 2000kN CTM
- **Net weight:** 62kg; **gross weight:** 87kg
 - **Packaging dimensions:** 76 x 73 x 68cm
- 3000kN CTM
- **Net weight:** 90kg; **gross weight:** 110kg
 - **Packaging dimensions:** 89 x 73 x 74cm

MODEL TO-340-A

Air Entrainment Meter – Type A

APPLICABLE STANDARDS

- EN 12350-7; ASTM C231

ORDERING INFORMATION

- TO-340-A Air Entrainment Meter Type A
- TO-341-A Air Entrainment 10 liters Type A
- TO-342-A Air Entrainment 100 liters Type A

STANDARD FEATURES

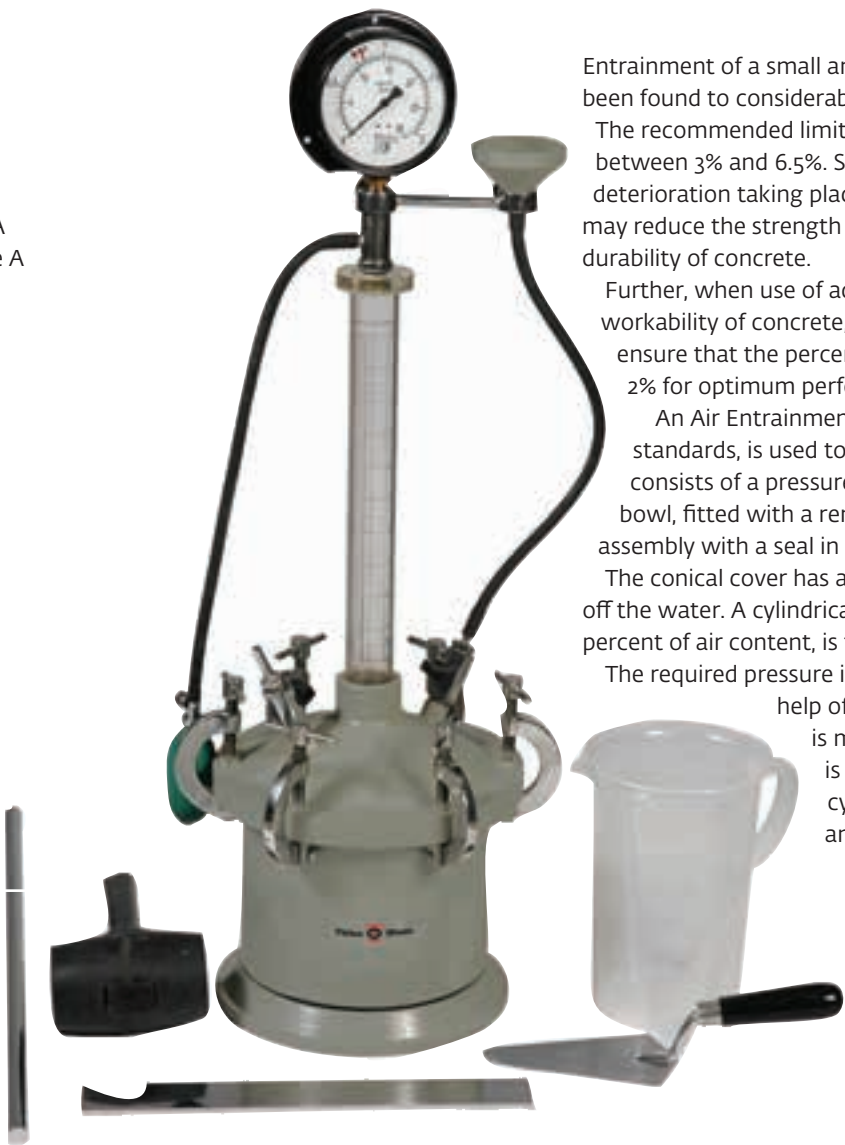
- Calibration kit
- Rubber mallet
- Tamping rod
- Gaging trowel
- Measuring cylinder
- Straight edge

OPTIONAL ACCESSORIES

- – Calibration kit
- – Rubber mallet
- TO-345 Tamping rod
- TO-428 Gaging trowel
- – Measuring cylinder
- – Straight edge
- – Syringe

PACKAGING INFORMATION

- Net weight: 22kg; gross weight: 34kg
- Packaging dimensions: 41 x 91 x 41cm



Entrainment of a small amount of air in cement concrete has been found to considerably improve the durability of concrete. The recommended limits specified for the air content are between 3% and 6.5%. Smaller percentages may result in deterioration taking place more quickly and larger percentages may reduce the strength without any improvement in the durability of concrete.

Further, when use of admixtures is made to increase workability of concrete, the air content should be checked to ensure that the percentage of air remains between 1% and 2% for optimum performance of the concrete structure.

An Air Entrainment Meter, as specified in ASTM standards, is used to determine these percentages. It consists of a pressure-tight flanged cylindrical measuring bowl, fitted with a removable flanged and conical cover assembly with a seal in between.

The conical cover has an air valve and a pet cock for bleeding off the water. A cylindrical stand pipe, which is graduated in percent of air content, is fixed on the conical cover assembly.

The required pressure is applied to the specimen with the help of a pressure bulb. The whole assembly is mounted on a flat base. Each apparatus is supplied complete with a calibrating cylinder, pressure gage, funnel, trowel and tamping bar.



Key features

- Seven-liter capacity.
- Shock-proof pressure gage mounting.
- Lightweight aluminum construction.
- Heavy-duty plastic carrying case for easy transport to site.

MODEL TO-340-B SPECIFICATIONS

Dimensions	248 x 337mm
Capacity	7 liters
Readings	Up to 22% entrained air
Accuracy	±0.25% full scale
Aggregate size	50mm maximum
Container	Tare weight stamped on bottom; two-piece clamping device for positive seal
Pressure gage	In shockproof mounting
Weight	6.8kg

MODEL TO-340-B

Air Entrainment Meter – Type B

The proper control of entrained air in concrete is recognized as one of the most important functions in modern concrete manufacture. To the concrete engineer and technician, the Air Entrainment Meter offers an instrument for use in the testing and designing of concrete mixes.

The instrument is designed so that the operating parts form an integral unit. The container is rigid, thus providing an accurate device for the performance of unit weight testing. For convenience, the tare weight in grams is stamped on the bottom. When used with the supplied monograph, the air meter provides quick and easy particle density and percent of free moisture in aggregate determinations.

The Air Entrainment Meter's multi-range feature accurately measures entrained air up to 22%. It is supplied complete with straight edge, syringe and carrying case.

APPLICABLE STANDARDS

- EN 12350-7; ASTM C231, ASTM C213; AASHTO T152

ORDERING INFORMATION

- TO-340-B Air Entrainment Meter Type B

STANDARD FEATURES

- – Calibration kit
- – Rubber mallet
- TO-345 Tamping rod
- TO-428 Gaging trowel
- – Measuring cylinder
- – Straight edge

OPTIONAL ACCESSORIES

- – Calibration kit
- – Rubber mallet
- TO-345 Tamping rod
- TO-428 Gaging trowel
- – Measuring cylinder
- – Straight edge
- – Syringe



MODEL TO-334

Slump Cone Test

The Sheet Steel Slump Cone is filled with freshly mixed concrete and tamped with a tamping bar in four layers. The top of the concrete is levelled off with the top of the slump cone; the cone is lifted off the base and the slump of the sample is immediately measured.

This test is considered suitable for cohesive and plastic mixes of concrete containing aggregate smaller than 50mm.

The cone is supplied complete with a base plate that has cleats and a swivel handle, and a 16mm-diameter x 600mm-long tamping rod (part number TO-345).

APPLICABLE STANDARDS

- EN 12350-2; ASTM C143

ORDERING INFORMATION

- TO-334 Slump test apparatus with tamping rod

STANDARD FEATURES

- TO-33401 Slump cone
- TO-33402 Standard slump test base plate with swivel handle
- TO-345 Tamping rod, steel, 16mm diameter, 600mm long

OPTIONAL ACCESSORIES

- TO-33401 Slump cone
- TO-33402 Standard slump test base plate with swivel handle
- TO-33403 Slump cone funnel
- TO-33404 Extended slump test base plate with two handles, 400x600mm
- TO-345 Tamping rod, steel, 16mm diameter, 600mm long

PACKAGING INFORMATION

- Net weight: 8kg; gross weight: 9kg
- Packaging dimensions: 41 x 41 x 39cm

Key features

- Base has cleats on its underside to help dig into the ground surface.
- Positive clamping of slump cone to the base while filling and tamping the concrete.
- A combination swivel carrying handle also serves as the datum, making the conventional and somewhat awkward measuring procedure of using a rule and a datum bar a thing of the past.



MODEL TO-336

Motorized Flow Table

The Flow Table is designed for determining the workability of Portland cement concrete.

The 76.2cm diameter table top is finely machined from a solid brass casting; the stand is made from cast iron. Operation is simple, whereby the ground and hardened steel cam is designed to drop the table by 12.5mm.



APPLICABLE STANDARD

- AASHTO T126

ORDERING INFORMATION

- TO-336-01 Motorized Flow Table, 110V, 60Hz
- TO-336-02 Motorized Flow Table, 220V, 60Hz
- TO-336-03 Motorized Flow Table, 220V, 50Hz

PACKAGING INFORMATION

- Net weight: 135kg; gross weight: 175kg
- Packaging dimensions: 102 x 83 x 89cm

MODEL TO-337

Compaction Factor Apparatus

The Compaction Factor Apparatus consists of a hopper and receiver assembly: TO-345 tamping rod measuring 16mm diameter x 60cm long with a hopper and two trowels.

APPLICABLE STANDARDS

- **ASTM C403; AASHTO T197**

ORDERING INFORMATION

- **TO-337** Compaction Factor Apparatus

STANDARD FEATURES

- **TO-428** Two gaging trowels
- **TO-345** Tamping rod, steel, 16mm diameter

OPTIONAL ACCESSORIES

- **TO-428** Two gaging trowels
- **TO-345** Tamping rod, steel, 16mm diameter

PACKAGING INFORMATION

- **Net weight:** 50kg; **gross weight:** 85kg
- **Packaging dimensions:** 76 x 53 x 155cm



ORDERING INFORMATION

- Cube molds
- **TO-344-1** Two Part Cast Iron 150mm cube mold

APPLICABLE STANDARDS

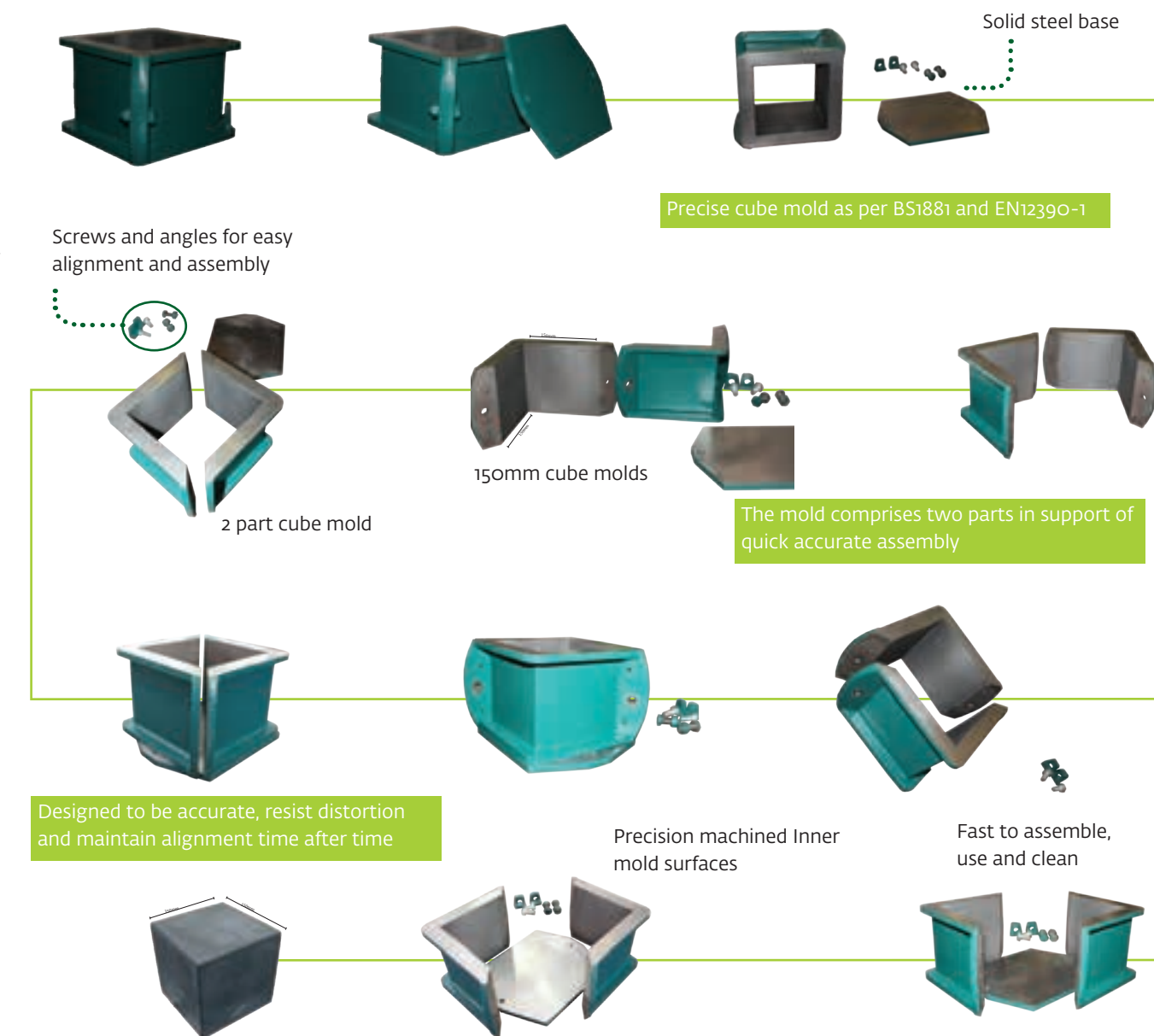
- **BS 1881**
- **EN 12390-1**
- **ASTM C31, ASTM C192**

SPECIFICATIONS

- Multiple use
- Light weight 15.5kg
- Designed for quick striking of the mold with no damage to the cube
- 150mm x 150mm cube mold
- Temperature range 10-40°C
- Simply clean after use with running water

2-PART CAST IRON

Cube



MODEL TO-355

Accelerated Curing Tank

ORDERING INFORMATION

- **TO-355-1-ACB-02** Accelerated Curing Tank for six molds of 150mm size ambient to 100°C, 415V, 60Hz, 3ph
- **TO-355-1-ACB-03** Accelerated Curing Tank for six molds of 150mm size ambient to 100°C, 415V, 50Hz, 3ph
- **TO-355-1-ACW-02** Accelerated Curing Tank for six molds of 150mm size ambient to 55°C, 415V, 60Hz, 3ph
- **TO-355-1-ACW-03** Accelerated Curing Tank for six molds of 150mm size ambient to 55°C, 415V, 50Hz, 3ph
- **TO-355-2-ACB-02** Accelerated Curing Tank for 12 molds of 150mm size ambient to 100°C, 415V, 60Hz, 3ph
- **TO-355-2-ACB-03** Accelerated Curing Tank for 12 molds of 150mm size ambient to 100°C, 415V, 50Hz, 3ph
- **TO-355-2-ACW-02** Accelerated Curing Tank for 12 molds of 150mm size ambient to 55°C, 415V, 60Hz, 3ph
- **TO-355-2-ACW-03** Accelerated Curing Tank for 12 molds of 150mm size ambient to 55°C, 415V, 50Hz, 3ph

APPLICABLE STANDARDS

- **EN 12390-2; ASTM C31, C192; AASHTO T23**

Key features

- Warm water method.
- Temperature range: 55 ± 2°C.
- Boiling water option where temperature range is 100 ± 2°C.
- Accelerated curing tanks with refrigeration system for low temperature are also available on special request.



Curing is the process of maintaining satisfactory moisture content and temperature in freshly cast concrete for a definite period of time immediately following placement.

This serves two major purposes: it prevents or replenishes the loss of moisture from the concrete and maintains a favorable temperature for hydration to occur for a definite period.

The fully insulated water tank holds standard cast cubes that are placed on two removable racks with sufficient free circulation of water around each cube.

The pump, drain valves, heater, thermostat and recirculation pump are housed in a compartment at one end of the tank. The models can cure in warm, cold and boiling water.

MODEL TO-364

Vibrating Table



Tinius Olsen's Vibrating Table is ideal for this type of compaction and capable of securing four 150 mm cube molds at once. In addition to the securing clamp, the table has ridges along its edges to prevent molds from sliding off during operation. The specially designed vibro motor means vibration frequency can be varied from 60Hz to 43Hz. Maximum load capacity is 140kg.

ORDERING INFORMATION

- **TO-364-01** Vibrating Table, table top 750 x 750mm, 110V, 60Hz
- **TO-364-02** Vibrating Table, table top 750 x 750mm, 220V, 60Hz
- **TO-364-03** Vibrating Table, table top 750 x 750mm, 220V, 50Hz
- **TO-365-01** Vibrating Table, table top 500 x 500mm, capacity 140kg, 110V, 60Hz
- **TO-365-02** Vibrating Table, table top 500 x 500mm, capacity 140kg, 220V, 60Hz
- **TO-365-03** Vibrating Table, table top 500 x 500mm, capacity 140kg, 220V, 50Hz
- **TO-366-01** Vibrating Table, table top 2 x 1m, 110V, 60Hz
- **TO-366-02** Vibrating Table, table top 2 x 1m, 220V, 60Hz
- **TO-366-03** Vibrating Table, table top 2 x 1m, 220V, 50Hz
- **TO-367-01** Vibrating Table, table top 1 x 1m, 110V, 60Hz
- **TO-367-02** Vibrating Table, table top 1 x 1m, 220V, 60Hz
- **TO-367-03** Vibrating Table, table top 1 x 1m, 220V, 50Hz

PACKAGING INFORMATION

For 750 x 750mm

- **Net weight:** 107kg; **gross weight:** 135kg
- **Packaging dimensions:** 86 x 86 x 75cm

For 500 x 500mm

- **Net weight:** 70kg; **gross weight:** 105kg

MODEL TO-368

Core Case Apparatus



Tinius Olsen's Core Case is for drilling concrete cores and to keep the surface clean and cool; it also allows the core drill to easily produce cores up to 100mm in diameter without the use of a frame and feed.

Water is fed into the jacket and flows through a manifold, into a drill spindle and continues to the inside of the diamond core bit. The water jacket surrounding the core barrel is flanged so that it can be clamped to the surface to be drilled with the supplied clamping pliers and anchors.

A rubber O-ring, fitted on this flange, seals the assembly against the concrete surface, enabling return flushing water containing the cuttings to be hosed away from the site.

Drill feed assembly is common to all models and makes the system adaptable to all core diameters with simple conversion kits. Core Case is a portable, self-contained system, easily carried by one person in a standard briefcase.

Caution

1. Coring is not possible on concrete reinforced with steel.
2. Not to be used on M60-strength concrete because this may overload the motor and damage the drill bit.

APPLICABLE STANDARDS

- **EN 12350-7; ASTM C231, ASTM C213**

ORDERING INFORMATION

- **TO-368-01** Core case, 110V, 60Hz
- **TO-368-02** Core case, 220V, 60Hz
- **TO-368-03** Core case, 220V, 50Hz

STANDARD FEATURES

- Electric drill machine

- Feed assembly
- Hammer drill bit 8mm
- Anchor bolt (one set)
- Two x rubber coupling
- 15 x fasteners
- Clamp for holding water jacket (one set)

OPTIONAL ACCESSORIES

- **TO-36801** Core bit and water jacket, 25mm diameter x 75mm long
- **TO-36802** Core bit and water jacket, 38mm diameter x 100mm long
- **TO-36803** Core bit and water jacket, 50mm diameter x 100mm long
- **TO-36804** Core bit and water jacket, 75mm diameter x 100mm long
- **TO-36805** Core bit and water jacket, 100mm diameter x 100mm long
- **TO-36810** Core bit 50mm diameter x 200mm long
- **TO-36811** Core bit 75mm diameter x 200mm long
- **TO-36812** Core bit 100mm diameter x 200mm long
- **TO-36807** Feed assembly
- **TO-36813** Hammer drill bit 8mm
- **TO-36816** Anchor bolt (one set)
- **TO-36817** Two x rubber coupling
- **TO-36820** Clamp for water jacket (one set)
- **TO-36823** 15 x fasteners

Notes: To obtain 200mm-long core samples, 100mm-long core bits of the corresponding diameter should be used first and replaced with 200mm-long core bits in the same water jacket to advance the core length.

CAST IRON MOLDS

For Cubes, Beams and Cylinders



International specifications require test specimens to be cast in a number of standard sizes for compressive and flexural strength determinations. Tinius Olsen offers Cube molds, Cylindrical molds and Beam molds of various sizes as listed below.

Cube Molds

Tinius Olsen's quality grade metal molds are strong enough to resist distortion and retain their shape and size under harsh conditions. These molds have the required quality surface finish and are designed so that they maintain superior alignment despite constant dismantling and re-assembly.

APPLICABLE STANDARDS

- **BS 1881; EN 12390-1,-2; ASTM C31, C192; DIN 51229**

ORDERING INFORMATION

- **TO-343** Cast iron mold for 100mm cube
- **TO-344** Cast iron mold for 150mm cube
- **TO-344-20** Cast iron mold for 200mm cube

Cube Molds – 2-Part

Tinius Olsen also offers a 2-part mold weighing 15.5kg. These quality grade metal molds are strong enough to resist distortion and retain their shape and size under harsh conditions.

APPLICABLE STANDARDS

- **BS 1881; EN 12390-1,-2; ASTM C31, C192; DIN 51229**

ORDERING INFORMATION

- **TO-344-1** Cast iron 2-part mold 150mm cube

Beam Molds

Tinius Olsen has two standard molds for casting test specimens for flexural strength determination. These steel molds are supplied complete with a base plate.

APPLICABLE STANDARDS

- **BS 1881; EN 12390-1,-2; ASTM C31, C192; DIN 51229**

ORDERING INFORMATION

- **TO-346** Cast iron mold for 100 x 100 x 500mm beam
- **TO-347** Cast iron mold for 150 x 150 x 700mm beam

Cylindrical Molds

Tinius Olsen's longitudinally split cast iron cylindrical molds are supplied complete with a base plate and top plate.

APPLICABLE STANDARDS

- **BS 1881; BS EN 12390-5: 2000; ASTM C78-02**

PACKAGING INFORMATION

- Net weight: 22kg; gross weight: 24kg

ORDERING INFORMATION

- **TO-349** Cast iron mold, split lengthwise, for 150mm diameter x 300mm high cylinder
- **TO-350** Cast iron mold, split lengthwise, for 100mm diameter x 200mm high cylinder
- **TO-351** Cast iron mold, split lengthwise, for 100mm diameter x 100mm high cylinder
- **TO-352** Cast iron mold, split lengthwise, for 150mm diameter x 150mm high cylinder
- **TO-354** Cast iron mold, split lengthwise, for 300mm diameter x 300mm high cylinder

MODEL TO-9891

Pan Type Concrete Mixer

For quality specimens to be manufactured, efficient mixing of concrete prior to molding is essential. Efficient mixing helps by coating the surface of all aggregate particles with cement paste and also creates uniformity in the mixture. The pan model is suitable for mixing small quantities of concrete, typically used in laboratories.

The design of the paddles ensures uniform and efficient mixing of cement, aggregate and other materials, in both wet and dry conditions. The lid and mixing paddles can be easily removed, giving operators maximum access and convenience when loading and emptying the pan. This mixer has wheels and is truly mobile.

MODEL TO-9891 SPECIFICATIONS

Mixing capacity	40 litres
Overall dimension	910 x 875 x 1250mm
Motor	2HP, 3ph AC, 960rpm

APPLICABLE STANDARD

- **BS 1881 Part 125:1986**

ORDERING INFORMATION

- **TO-9891-01** Pan Mixer, 40-liter capacity, 415V, 60Hz, 3ph
- **TO-9891-02** Pan Mixer, 40-liter capacity, 415V, 50Hz, 3ph

Key features

- Motorized Unit
- Portable and compact
- Adjustable blades
- Simple to clean and maintain
- Easy to operate



MODEL TO-320-55XX

Cylindrical Specimen Caps and Rubber Pads

An alternative to Tinius Olsen's capping equipment is our steel caps and rubber pads; these are quicker and simpler to set up and use.

ORDERING INFORMATION

- **TO-320-5519** Cylindrical specimen for 6in cap
- **TO-320-5520** Rubber insert for 6in cap (pack of 10)
- **TO-320-5524** Cylindrical specimen for 4in cap
- **TO-320-5525** Rubber insert for 4in cap (pack of 10)



MODEL TO-335

Consistometer

This method is a mechanical variation of the simple slump test that includes determination of the workability of concrete. The concrete is formed in a slump cone positioned in a container. It is vibrated at a fixed amplitude and frequency after the cone is removed, on a small vibrating table. A plastic spacer disc on the top surface of the wet concrete allows the operator to judge when the compaction is complete. The time to complete the required vibrations gives an indication of the workability of the concrete, which is expressed in Vee-Bee degrees. The consistometer includes a vibrating table, specimen pot, slump cone, graduated rod, and acrylic plate.

APPLICABLE STANDARDS

- **BS 1881 (Part 104:1983); AASHTO T126; BS EN 12350-3; ASTM C1170; AS 1012 (Part 3)**

ORDERING INFORMATION

ASTM

- **TO-335-02-ASTM** Consistometer per ASTM 415V, 60Hz
- **TO-335-03-ASTM** Consistometer per ASTM 415V, 50Hz

BS

- **TO-335-02-BS** Consistometer per BS 415V, 60Hz
- **TO-335-03-BS** Consistometer per BS 415V, 50Hz

PACKAGING INFORMATION

- **Net weight:** 88kg; **gross weight:** 118kg
- **Packaging dimensions:** 76 x 53 x 99cm



MODEL TO-338

Spring Type Concrete Penetrometer

The penetrometer consists of a cylindrical spring housing with a plunger attached to the top of the spring. The penetration needle is attached to the other end of the spring housing. The plunger is graduated in 1kg divisions, to a maximum capacity of 60kg, which can be read with respect to the top end of the spring housing. A set of six needle points with areas of 645, 323, 161, 65, 32 and 16mm² is provided. It is supplied complete in a carrying case.

APPLICABLE STANDARDS

- **ASTM C403; ASSHTO T197**

ORDERING INFORMATION

- **TO-338-lmp** Concrete penetrometer, spring type, lb
- **TO-338-SI** Concrete penetrometer, spring type, kg



MODEL TO-339

Bulk Density Measures



These are used to determine the weight per cubic meter of freshly mixed concrete. Formulae are provided for calculating the volume of concrete per batch, the yield per bag of cement, and the cement factor. Bulk Density Measures, set of two, conform to ASTM/BS Standards. The set comprises one each of 20 and 10 liter Bulk Density Measure.

APPLICABLE STANDARDS

- BS 812, EN 1097-3; EN 12350-6; ASTM C138

ORDERING INFORMATION

- TO-339 Bulk density apparatus

SUPPLIED AS STANDARD

- TO-33901 Bulk density 20 liter
- TO-33902 Bulk density 10 liter

OPTIONAL ACCESSORIES

- TO-33901 Bulk density 20 liter
- TO-33902 Bulk density 10 liter
- TO-345 Tamping rod, steel, 16mm dia

MODEL TO-355

Curing Tank



The fully insulated water tank holds up to 36 150mm cast cubes or 72 70.6mm cast cubes as standard. These cubes are placed on two removable racks with sufficient free circulation of water around each cube. An immersion heater heats the tank and the temperature is controlled at 35°C or 100°C ±2°C or, optionally, a refrigeration system can be used to cure grey cement. The pump, drain valves, heater, thermostat and recirculation pump are housed in a compartment located at one end of the tank.

ORDERING INFORMATION

- TO-355-1-01 Curing tank for 6/12 molds of 150mm/70.6mm size, 110V, 60Hz
- TO-355-1-02 Curing tank for 6/12 molds of 150mm/70.6mm size, 220V, 60Hz
- TO-355-1-03 Curing tank for 6/12 molds of 150mm/70.6mm size, 220V, 50Hz
- TO-355-2-01 Curing tank for 12/24 molds of 150mm/70.6mm size, 110V, 60Hz
- TO-355-2-02 Curing tank for 12/24 molds of 150mm/70.6mm size, 220V, 60Hz
- TO-355-2-03 Curing tank for 12/24 molds of 150mm/70.6mm size, 220V, 50Hz
- TO-355-3-02 Curing tank for 24/48 molds of 150mm/70.6mm size, 415V, 60Hz
- TO-355-3-03 Curing tank for 24/48 molds of 150mm/70.6mm size, 415V, 50Hz
- TO-355-4-02 Curing tank for 36/72 molds of 150mm/70.6mm size, 415V, 60Hz
- TO-355-4-03 Curing tank for 36/72 molds of 150mm/70.6mm size, 415V, 50Hz

Key features

- 24-hour cycle from time of mixing.
- Temperature range: Ambient + 5 to 100°C.
- Accuracy of ± 2°C.

APPLICABLE STANDARDS

- EN 12390-2; ASTM C31, C192; AASHTO T23

PACKAGING INFORMATION

- Net weight: 175kg; gross weight: 221kg
- Packaging dimensions: 165 x 78 x 105cm

MODEL TO-357

Cylindrical Specimen Capping Equipment



It is essential that the ends of concrete cylinder specimens are flat and parallel for compressive strength tests; if they aren't, the end surfaces must be capped with capping compound, using capping sets to achieve this. These capping sets are designed for use both in the field and in the laboratory.

The capping set comprises a base with an upright, which serves as a guide for positioning the capping plate and a cylinder. The capping plate is machined to keep molten compound precise, and to position the cylinder. The set is supplied complete with cylinder carrier and ladle.



APPLICABLE STANDARDS

- **EN 12390-3; ASTM C617; AASHTO T231**

PACKAGING INFORMATION

Capping Set

- **Net weight:** 5.2kg; **gross weight:** 5.3kg
- **Packaging dimensions:** 28 x 24 x 17cm

Capping Mold

- **Net weight:** 16.4kg; **gross weight:** 17.7kg
- **Packaging dimensions:** 32 x 30 x 24cm

ORDERING INFORMATION

- **TO-357** Capping set, vertical, for capping 150mm dia cylinders and cores
- **TO-357-1** Capping set, vertical, for capping 150mm dia cylinders and cores, no handle
- **TO-358** Capping set, vertical, for capping 100mm dia cylinders and cores
- **TO-358-1** Capping set, vertical, for capping 100mm dia cylinders and cores, no handle
- **TO-35901** Capping mold, for capping 150mm dia concrete cylinders

- **TO-35902** Capping mold, for capping 100mm dia concrete cylinders

OPTIONAL ACCESSORIES

- **TO-35701** Capping compound, pack of 5kg
- **TO-35702** Warmer for melting the capping compound
- **TO-35703** Bowl, metallic for carrying the capping compound
- **TO-35704** Ladle, metallic for pouring the molten capping compound

MODEL TO-375

Volume Change Apparatus and Length Comparator



Length Comparator with reference bar



Prism mold

The apparatus consists of a mold of 75 x 75 x 285mm gauge length (distance between innermost points of reference points) with base plate and four reference points of standard length. Supplied with TO-374 Length Comparator, which consists of a frame with adjustable cross head. The base is a stainless steel circular platen with recessed seating and 300mm + 0.5mm long steel reference bar with coefficient of thermal expansion less than $2 \times 10^{-6} \text{mm/}^\circ\text{C}$ with 6mm diameter steel balls mounted at the ends. The frame is supplied with TO-072 0.002 x 5mm dial gage or TO-072-DG 0.001 x 5mm digital gage.

APPLICABLE STANDARDS

- **BS 6073-1, 812-120; EN 1367-4; ASTM C490, C151, C157, C531; AASHTO T107, T160**

ORDERING INFORMATION

- **TO-375** Volume change apparatus
- **TO-374-DG** Length comparator, Digital 0.001-5mm

SUPPLIED AS STANDARD

- **TO-37401** Reference bar 300mm long
- **TO-072** Dial gage (analog) - with TO-374
- **TO-072-DG** Digital gage - with TO-374-DG
- **TO-376** Prism mold 75 x 75 x 285mm

OPTIONAL ACCESSORIES

- **TO-37401** Reference bar 300mm long
- **TO-072** Dial gage (analog)
- **TO-072-DG** Digital gage
- **TO-376** Prism mold 75 x 75 x 285mm
- **TO-37601** Prism mold 100 x 100 x 285mm
- **TO-374-DG** Length comparator

PACKAGING INFORMATION

- **Net weight:** 9.2kg; **gross weight:** 9.5kg
- **Packaging dimensions:** 30 x 28 x 58cm

Standards Reference Listing

AASHTO			
Standard	Title	Equipment Reference	Page
E131	Test is used to determine the quantity of water required to produce a cement paste of 'standard' consistency	Vicat Apparatus	55
IP49	In this test, a chosen force is applied over a given area for a know period of time and the depth of penetration or the depression made in the sample is measured in tenths of a millimeter, which is expressed as a penetration number	Bitumen Penetration Kit	88
T22	Standard method of test for compressive strength of cylindrical concrete specimens	DG Series Semi Automatic Concrete Compression Testers	18
		FA Series Fully Automatic Concrete Compression Testers	8
T23	Making and curing concrete compression and flexural test specimens in the field	Curing Tank	34, 43
T49	Standard method of test for penetration of bituminous materials	Bitumen Penetration Kit	88
T51	Standard method of test for ductility of asphalt materials	Ductility Testing Machine	83
T53	Standard method of test for softening point of bitumen (ring-and-ball apparatus)	Softening Point – Ring and Ball Apparatus	81
T58	Test for determining bitumen percentage in bituminous paving mixtures	Centrifuge Extractor Apparatus	82
T71	Standard method of test for effect of organic impurities in fine aggregate on strength of mortar	Flow Table	48
T85	Standard method of test for specific gravity and absorption of coarse aggregate	Density Basket	76

AASHTO			
Standard	Title	Equipment Reference	Page
T88	Standard method of test for particle size analysis of soils	High Speed Stirrer	117
		Particle Size Sieve Analysis	72
T89	Test for determining the liquid limit of soils	Liquid Limit Device	89
T90	Standard method of test for determining the plastic limit and plasticity index of soils	Liquid Limit Device	89
T92	Standard method of test for determining the shrinkage factors of soils	Shrinkage Limit	115
T96	Standard method of test for resistance to degradation of small-size coarse aggregate by abrasion and impact in the Los Angeles machine	Los Angeles Abrasion Apparatus	64
T99	These methods of test are intended for determining the relation between the moisture content and density of soils compacted in a mold of a given size with a 2.5kg (5.5lb) rammer dropped from a height of 305mm (12in)	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
T100	This method covers determination of the specific gravity of soils by means of a pycnometer	Pycnometer	116
T106	Standard method of test for compressive strength of hydraulic cement mortar	Flow Table	48
T107	Standard method of test for autoclave expansion of hydraulic cement	Cement Autoclave	47
		Volume Change Apparatus with Length Comparator	45
T126	Standard method of test for making and curing concrete test specimens in the laboratory	Consistometer	40
		Motorized Flow Table	31

AASHTO			
Standard	Title	Equipment Reference	Page
T129	Standard method of test for normal consistency of hydraulic cement	Vicat Apparatus	55
T134	Standard method of test for moisture density relations of soil-cement mixtures	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
T135	Standard method of test for wetting-and drying test of compacted soil-cement	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
T136	Standard method of test for freezing-and thawing tests of compacted soil-cement mixtures	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
T137	Standard method of test for air content of hydraulic cement mortar	Flow Table	48
T152	Standard method of test for air content of freshly mixed concrete by the pressure method	Air Entrainment Meter – Type B	29
T153	Standard method of test for fineness of hydraulic cement by air permeability apparatus	Air Permeability Apparatus (Blaine type)	54
		Auto Blaine Apparatus	46
T160	Standard method of test for length change of hardened hydraulic cement mortar and concrete	Volume Change Apparatus with Length Comparator	45
T164	Standard method of test for quantitative extraction of asphalt binder from hot mix asphalt (HMA)	Centrifuge Extractor Apparatus	82

AASHTO			
Standard	Title	Equipment Reference	Page
T180	This method of test is intended for determining the relationship between the moisture content and density of soils when compacted in a given mold of a given size with a 4.54kg (10lb) rammer dropped from a height of 457mm (18in)	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
T193	Standard method of test for the California Bearing Ratio	CBR Test Apparatus – Analog	101
		CBR Test Apparatus – Digital	104
		Triaxial Test Load Frame	91
T197	Standard method of test for time of setting of concrete mixtures by penetration resistance	Spring Type Concrete Penetrometer	41
T215	Standard method of test for permeability of granular soils (constant head)	Laboratory Permeability Apparatus (Falling Head)	120
T216	Standard method of test for one-dimensional consolidation properties of soils	Consolidation Apparatus – Analog	107
		Consolidation Apparatus – Digital	108
T217	This test is used to determine the moisture content of soils by means of a calcium carbide gas pressure moisture tester in the field. The tester is referred to as the “Speedy”	Speedy Moisture Meter	113
T231	Standard practice for capping cylindrical concrete specimens	Cylindrical Specimen Capping Equipment	44
T245	Standard method of test for resistance to plastic flow of bituminous mixtures using Marshall Apparatus	Automatic Compactor for Bituminous Mixes – Light Compaction	80
		Marshall Stability Test Machine – Analog	86
		Marshall Stability Test Machine – Digital	87
T256	Standard method of test for pavement deflection measurements	Benkelman Beam	84

AS			
Standard	Title	Equipment Reference	Page
1012	Methods of testing concrete — sampling of fresh concrete	Consistometer	40
ASTM			
Standard	Title	Equipment Reference	Page
C29	Standard test method for bulk density (unit weight) and voids in aggregate	Bulk Density, Voids and Bulking	73
C31	Standard practice for making and curing concrete test specimens in the field	Beam Molds	33
		Cube Molds	33
		Curing Tank	34, 43
C39	Standard test method for compressive strength of cylindrical concrete specimens	DG Series Semi Automatic Concrete Compression Testers	18
		FA Series Fully Automatic Concrete Compression Testers	8
C78-02	Standard test method for flexural strength of concrete (using simple beam with third-point loading), beams, concrete, flexural strength testing	Cylindrical Molds	33
		Flexural Testing Machine	16, 26
C87	Standard test method for effect of organic impurities in fine aggregate on strength of mortar	Flow Table	48
C109	Standard test method for compressive strength of hydraulic cement mortars (using 2in or 50mm cube specimens)	Cement Molds	58
		Compression Frame Jig	52
		Flow Table	48

ASTM			
Standard	Title	Equipment Reference	Page
C127	Standard test method for density, relative density (specific gravity), and absorption of coarse aggregate	Density Basket	76
C131	Standard specification for liquid membrane forming compounds having special properties for curing and sealing concrete, acid resistance	Los Angeles Abrasion Apparatus	64
C138	Standard test method for density (unit weight), yield and air content (gravimetric) of concrete	Bulk Density Measures	42
C141	Standard specification for hydraulic hydrated lime for structural purposes	Cement Autoclave	47
		Vicat Apparatus	55
C143	Standard test method for slump of hydraulic-cement concrete	Slump Cone Test	30
		Universal Penetrometer	78
C151	Standard test method for autoclave expansion of hydraulic cement	Cement Autoclave	47
		Shrinkage Bar Mold	57
		Volume Change Apparatus with Length Comparator	45
C155	Standard classification of insulating firebrick	Cement Autoclave	47
C157	Standard test method for length change of hardened hydraulic-cement mortar and concrete	Volume Change Apparatus with Length Comparator	45

ASTM			
Standard	Title	Equipment Reference	Page
C185	Standard test method for air content of hydraulic cement mortar	Flow Table	48
C187	Standard test method for normal consistency of hydraulic cement	Vicat Apparatus	55
C188	Standard test method for density of hydraulic cement	Cement Autoclave	47
C191	Standard test method for time of setting of hydraulic cement by Vicat needle	Vicat Apparatus	55
C192	Standard practice for making and curing concrete test specimens in the laboratory	Beam Molds	33
		Cube Molds	33
		Curing Tank	34, 43
C204	Standard test methods for fineness of hydraulic cement by air-permeability apparatus	Air Permeability Apparatus (Blaine type)	54
		Auto Blaine Apparatus	46
C213	Specification for alumina-silica castable refractories for boiler furnaces and incinerators	Air Entrainment Meter – Type B	29
		Core Case Apparatus	36
C230	Standard specification for flow table for use in tests of hydraulic cement	Flow Table	48

ASTM			
Standard	Title	Equipment Reference	Page
C231	Standard test method for air content of freshly mixed concrete by the pressure method	Air Entrainment Meter –Type A	28
		Air Entrainment Meter – Type B	29
		Core Case Apparatus	36
C243	Standard test method for bleeding of cement pastes and mortars	Flow Table	48
C308	Standard test methods for working, initial setting and service strength setting times of chemical-resistant resin mortars	Vicat Apparatus	55
C348	Standard test method for flexural strength of hydraulic-cement mortars	Flow Table	48
C359	Standard test method for early stiffening of hydraulic cement (mortar method)	Vicat Apparatus	55
C403	Standard test method for time of setting of concrete mixtures by penetration resistance	Spring Type Concrete Penetrometer	41
C469	Standard test method for static modulus of elasticity and Poisson’s ratio of concrete in compression	Lateral Extensometer	15, 25
C472	Standard test methods for physical testing of gypsum, gypsum plasters and gypsum concrete	Vicat Apparatus	55
C490	Standard practice for use of apparatus for the determination of length change of hardened cement paste, mortar, and concrete	Volume Change Apparatus with Length Comparator	45
C531	Standard test method for linear shrinkage and coefficient of thermal expansion of chemical resistant mortars, grouts, monolithic surfacings and polymer concretes	Volume Change Apparatus with Length Comparator	45

ASTM			
Standard	Title	Equipment Reference	Page
C535	Standard test method for resistance to degradation of large-size coarse aggregate by abrasion and impact in the Los Angeles machine	Los Angeles Abrasion Apparatus	64
C617	Standard practice for capping cylindrical concrete specimens	Cylindrical Specimen Capping Equipment	44
C1170	Standard test method for determining consistency and density of roller-compacted concrete using a vibrating table	Consistometer	40
D36	Standard test method for softening point of bitumen (ring-and-ball apparatus)	Softening Point – Ring and Ball Apparatus	81
D113	Standard test method for ductility of bituminous materials	Ductility Testing Machine	83
D422	Standard test method for particle-size analysis of soils	High Speed Stirrer	117
		Particle Size Sieve Analysis	72
D427	Test method for shrinkage factors of soils by the mercury method	Shrinkage Limit	115
D558	Standard test methods for moisture-density (unit weight) relations of soil-cement mixtures	Automatic Soil Compactor	98
		Proctor Compaction Apparatus	119
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