



## DG Series

Semi-Automatic  
Concrete Compression Testers

Tinius Olsen

# DG Series

The machine pictured below 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 features front and rear doors for easy loading of 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 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.

## 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.



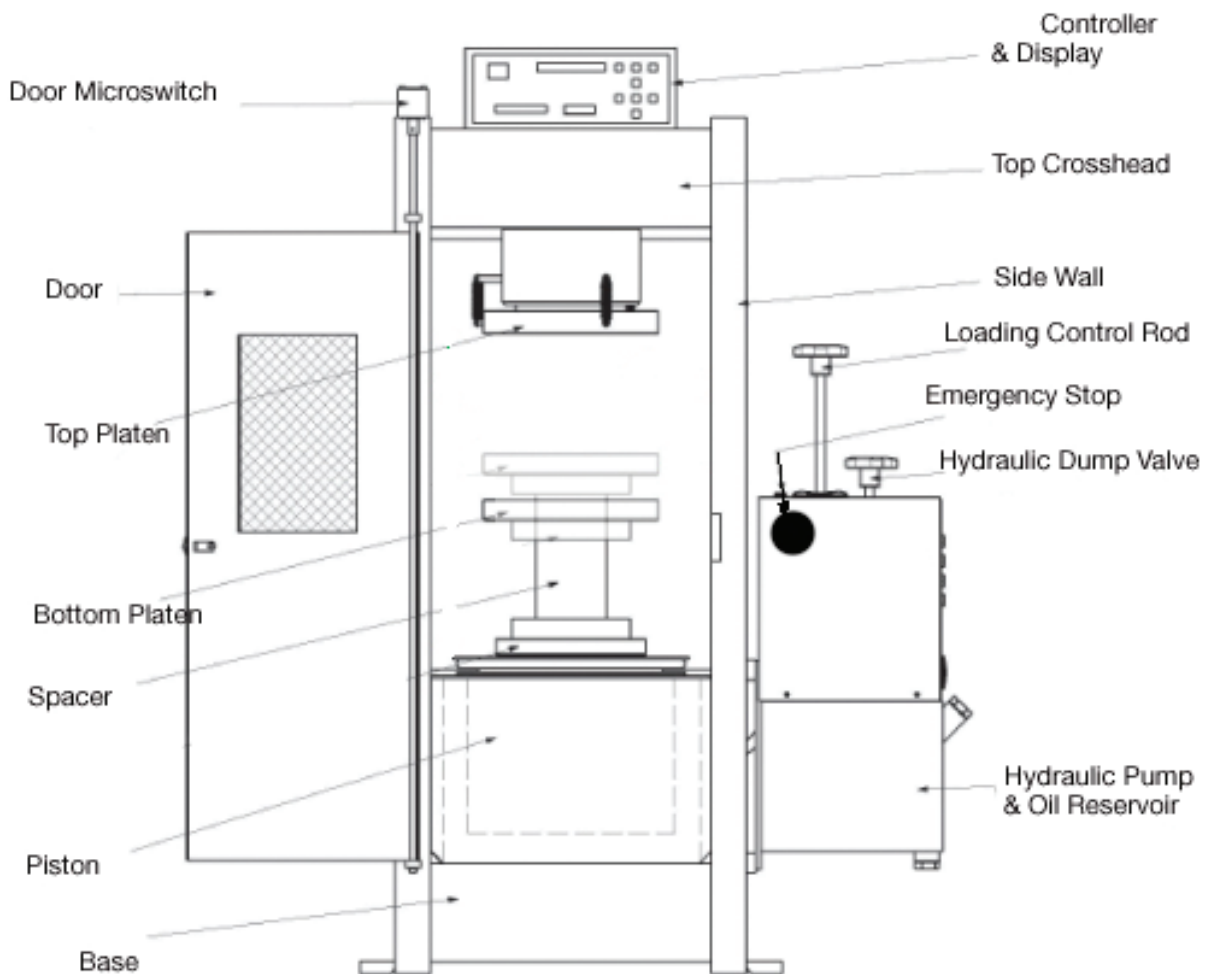


# SPECIFICATIONS

## DG SERIES SPECIFICATIONS

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

**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.



## DG DIGITAL COMPRESSION TESTING MACHINE

# ACCESSORIES

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## 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

# ORDERING

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## 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-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 110VAC, 60Hz
- **TO-317E-STD-DG-03** 2000kN DG Standard Compression Tester configured for 110VAC, 60Hz
- **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
- **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, 60Hz

# MODELS



500kN frame



2000kN frame



5000kN frame

# CONTROLLER OPTIONS

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.

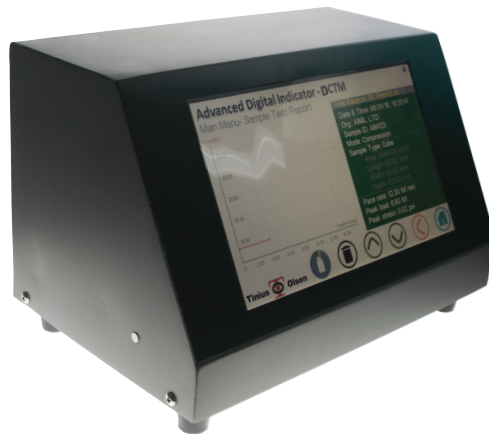
## Touchscreen-based Enhanced Digital Indicator

Tinius Olsen's new touchscreen-based EDI display is an enhancement of 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.

## 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 +/- 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.

### 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



# 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.

## 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.



### OPTIONAL ACCESSORIES

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

### ORDERING INFORMATION

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

## 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 STANDARDS

- ASTM C469

### OPTIONAL ACCESSORIES

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

### 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



# 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 C 78-02, 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

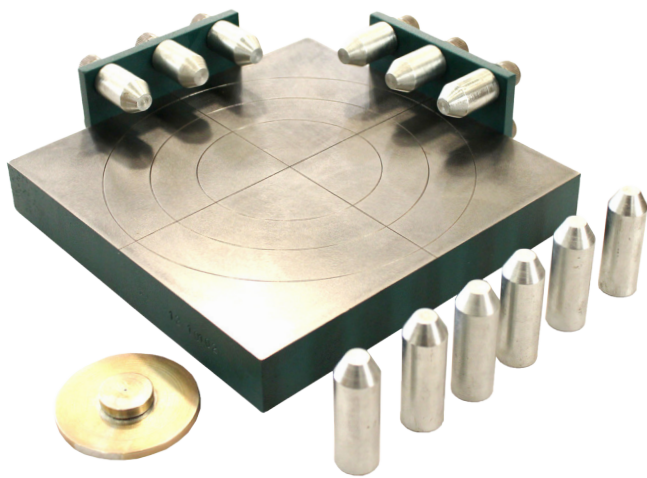
# ACCESSORIES

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.



### 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.

### 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





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