

P5030 UNIVERSAL TESTING MACHINE

APPLICATIONS

- Performs tensile, indentation and compression tests.
- Tests on stability of struts.
- Use at all levels of study.

FEATURES

- Compact robust and low capital cost.
- Sufficient headroom for large test specimens.
- No installation demands.

INTRODUCTION

Cussons Universal Testing Machine has been developed to perform tensile, indentation and compression tests in Strength of Materials courses and is known for short as the TIC Machine. The capacity of the machine is 10 tons (90kN).

The design of the TIC Machine is due to the University of Leeds and was influenced by need to provide means for testing a range of specimens that are particularly suitable for teaching purposes and with the minimum of complication so that the

functions of the machine might be readily apparent. Successful development of the design has resulted in a machine low in capital cost that is compact and makes no demands as regards installation. In consequence a number of TIC Machines can be installed in any laboratory so that a complete class of students can carry out tests simultaneously.

The TIC Machine is intended to be used with tensile specimens of the internationally agreed preferred dimensions of 50, 100, 150 and 200 mm² cross sectional area and gauge length 5.65 C.S.A. Normal steel specimens of 150 mm² (13.82 mm diameter) can be tested to fracture while 100 or 500 mm² specimens are used for high tensile materials and 200 mm² specimens for low grade materials. In compression 14 mm or 12 mm specimens are normally used. There is ample load capacity for indenting with a 10 mm ball. The machine has sufficient headroom for carrying out tests on the stability of struts, and specimens may be fitted with strain gauges in addition to mechanical extensometers (not included).

In use the TIC machine has proved to be a most valuable constituent of Strength of Materials courses at all levels.

DESCRIPTION

The diagram shows the principal elements of the TIC Machine. The load is supplied by a hydraulic ram of which the working stroke is downwards so that tension is exerted above the ram and compression below it. The reaction of the loading force whether the machine is used in tension or compression is provided by the main frame through the medium of a proof ring which is used to suspend the inner rectangular frame from the main frame. The horizontal contraction of the diameter of the proof ring is used to measure the load and amounts to approximately 0.75 mm at full load.

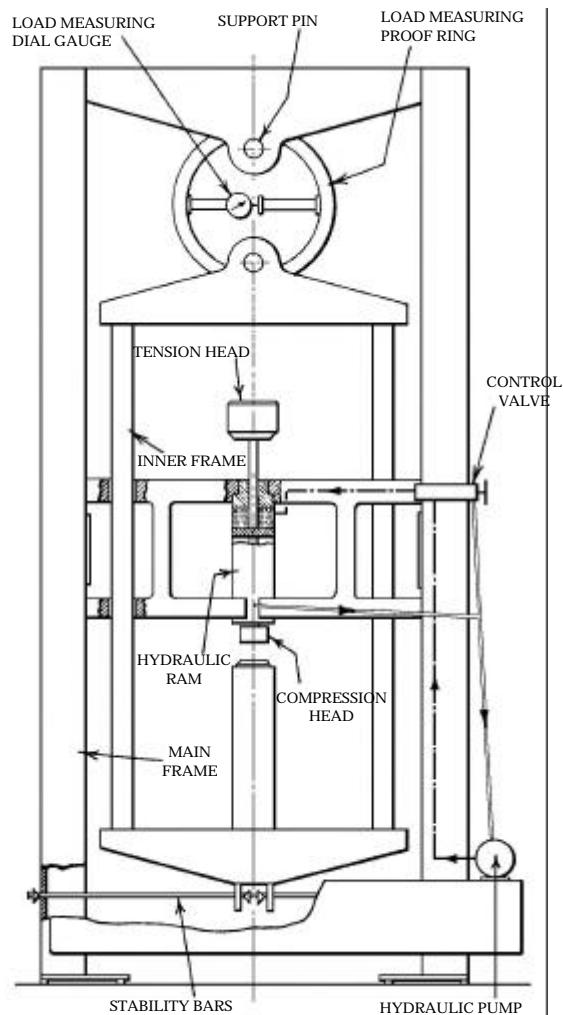
The machine is designed for tensile specimens with dolly ends; split collets are fitted to the upper cross member of the inner frame and to the tension head of the ram. The compression head of the ram can be fitted at will with a hardened platen or a spherical seat or a 10 mm ball. The compression specimen is supported on a column attached to the lower cross member of the internal frame. The column can be replaced by a shorter one for strut tests. The design of the machine permits accurate alignment of the straining and reaction members so that pure tensile forces can be applied and true cup and cone fractures achieved. The hydraulic loading system is sensitive and easy to operate so that accurate load increments may be readily applied. The proof ring is calibrated against a dynamometer with an accuracy of 1/5% at full load and 1/3% at one-tenth of full load. Strain is normally measured by dial type extensometers.

Tensile specimens are normally of overall length 200 mm and diameter 13.82 mm or 7.98 mm with gauge lengths of 69.2 mm or 40 mm respectively. Extensometers of various types may therefore readily be used. Compression specimens are normally of 25 mm length by 14 mm or 12 mm diameter.

Cussons Technology Ltd can supply a range of specimens in different materials for tensile, compression, indentation and strut test.

P5031 Additional set of specimens

Comprising 10 off each brass, aluminium and mild steel tensile specimens.



P5030 GENERAL ARRANGEMENT

TENDER SPECIFICATION

P5030 Cussons Tensile, Indentation and Compression Machine comprising fabricated steel straining frame, inner frame with anvils, calibrated proof ring, hydraulic loading ram with double shaft extension, hand operated hydraulic pump, control valve, split collet heads (2) for tensile specimens, compression head with 1) hardened platen, 2) spherical seat, 3) 10 mm ball, one long and one short column and load measuring dial gauge. Supplied with 5 off each brass aluminium and mild steel tensile specimens. Complete and tested. Arranged for floor mounting.

DIMENSIONS

Overall dimensions 80 cm wide x 76 cm deep x 225 cm high

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