IS 15747 (2007): Angular deflection for straight sided hydraulic presses [PGD 4: Metal Forming Machines]

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भारतीय मानक

स्ट्रेट साईडिड द्रवचालित प्रेस के कोणीय डिफलेक्शन — विशिष्टि

Indian Standard

ANGULAR DEFLECTION FOR STRAIGHT SIDED HYDRAULIC PRESSES — SPECIFICATION

ICS 25.120.10

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 2007

Price Group 1

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal Forming Machines Sectional Committee had been approved by the Production and General Engineering Division Council.

This standard has been formulated based on the expertize available in the Indian industry. In the formulation of this standard, considerable assistance has been derived from various press manufacturers in the country.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ANGULAR DEFLECTION FOR STRAIGHT SIDED HYDRAULIC PRESSES — SPECIFICATION

1 SCOPE

1.1 This standard describes the method of measurement of deflection of the straight sided hydraulic presses.

1.2 This standard specifies the standard permissible deflection of straight sided hydraulic presses as well as alternative optional permissible deflection.

1.3 This standard does not cover the special purpose presses such as horizontal presses, travelling frame presses, presses without slide guides and forging presses.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given below:

IS No.	*Title*
2092 : 1983	Specification for plunger type dial gauges (*first revision*)
6652	Glossary of terms relating to metal forming machines and tools:
(Part 1) : 1986	Metal forming tools (*first revision*)
(Part 2) : 1986	Metal forming machines relating to sheet metal (*first revision*)
(Part 3) : 1986	Metal forming technology and operations relating to sheet metal (*first revision*)
11498 : 1985	Specification for lever type dial gauges
14877 (Part 1) : 2000	Hydraulic presses — Straight sided column/C frame type: Part 1 Test chart for geometrical accuracy

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 6652 (Parts 1, 2 and 3) shall apply.

4 MEASURING INSTRUMENTS

The measuring instruments shall be dial gauges with magnetic base of least count of 0.01 mm or better and straight edge. These instruments shall conform to IS 2092 or IS 11498.

5 METHOD OF DEFLECTION MEASUREMENT

5.1 Before conducting deflection tests, ensure that;

a) geometrical tests are conducted and completed as per 14877 (Part 1),

b) test blocks are of same height (alike within ± 0.03 mm), and

c) test blocks are symmetrically placed about the centreline of press so that load centre and press centre are same (within ± 0.5 percent of longer dimension of bolster).

5.2 Set the slide at appropriate position (very near to bottom of stroke in case of hydraulic presses).

Arrange suitable means (hydraulic jacks) to apply force on 2/3 of left to right dimension and full front to back of bolster.

Set the dial gauges D_1, D_2, D_3 and straight edge on suitable blocks of equal height as shown in Fig. 1.

5.3 Set the dial gauges at zero and apply full press force through hydraulic jacks. Note the readings of dial gauges under full load condition.

Calculate bed deflection from the formula given below:

$$\text{Deflection/metre of bed length} = \frac{(D_3 - D_1) + (D_3 - D_2)}{2 \times (L - 2L_1) \times 1\,000} \text{ (mm/m)}$$

where

D_1, D_2 and D_3 = readings of dial gauges, in mm;

L = left to right dimensions of bolster, in mm; and

L_1 = distance of dial gauge from the edge of the bolster. The value will be determined from the table given below:

	$L \leq 1\,000$ mm	$1\,000 < L \leq 2\,000$ mm	$L > 2\,000$ mm
L_1	$0.1 \times L$	100 mm	150 mm

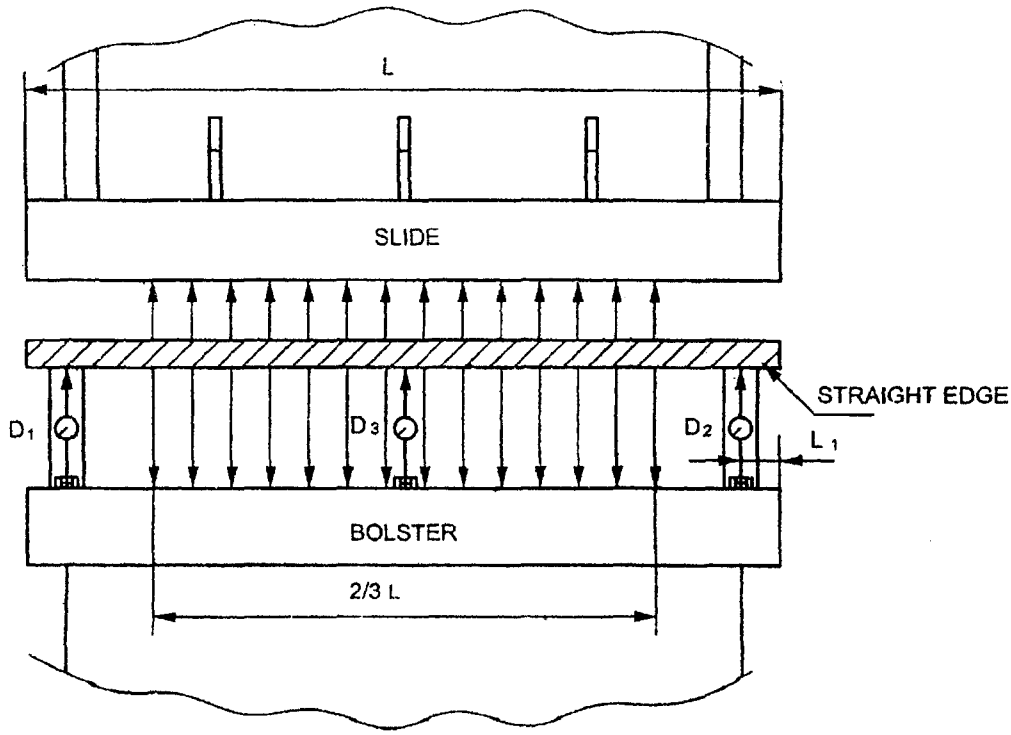

FIG. 1 STRAIGHT SIDED HYDRAULIC PRESS

For slide deflection, measure the total deflection (bolster top and slide bottom) D_1, D_2, D_3 and calculate deflection/m as above.

Slide deflection/m length = Total deflection/m length – bed deflection/m length measured already

5.4 Permissible Deflection in Presses

5.4.1 Standard permissible deflection shall be 0.17 mm/1 000 mm for sheet metal forming industries.

5.4.2 Optional permissible deflection shall be 0.13 mm/1 000 mm.

The presses may be supplied with optional permissible deflection, if it has been mutually agreed to between the customer and the supplier.

Bureau of Indian Standards

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