

# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

## ISO RECOMMENDATION R 165

~~IT IS A STANDARD PREVIEW~~  
FLANGING TEST ON STEEL TUBES  
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## BRIEF HISTORY

The ISO Recommendation R 165, *Flanging Test on Steel Tubes*, was drawn up by Technical Committee ISO/TC 17, *Steel*, the Secretariat of which is held by the British Standards Institution (B.S.I.).

At the fourth meeting of the Technical Committee, held in Stockholm, in June 1955, a draft proposal concerning a flanging test on steel tubes was first submitted. It was, however, suggested at that meeting that the drafts should be submitted to Technical Committee ISO/TC 5, *Pipes and Fittings*, for comments, and that these comments, together with those of the members of Technical Committee ISO/TC 17, should be considered by Working Group No. 1 with a view to establish the revised draft proposal.

At the time of the fifth meeting of the Technical Committee, held in London, in March 1957, this test, together with four others for steel tubes, was still under consideration by Working Group No. 1.

At the sixth plenary meeting, held in Harrogate, in June 1958, a new draft proposal was placed before Technical Committee ISO/TC 17 for consideration and, with one or two minor editorial amendments, was accepted as suitable for circulation to the members of the Technical Committee for postal approval.

As a result of that circulation, certain other minor amendments were made and a revised draft was sent to the General Secretariat as a Draft ISO Recommendation.

On 24 July 1959, the Draft ISO Recommendation (No. 288) was distributed to all the ISO Member Bodies and was approved by the following Member Bodies:

Australia	Germany	Norway
Austria	Greece	Poland
Belgium	Hungary	Portugal
Bulgaria	India	Romania
Burma	Israel	Spain
Chile	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Mexico	United Kingdom
Finland	Netherlands	U.S.S.R.
France	New Zealand	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1960, to accept it as an ISO RECOMMENDATION.

## FLANGING TEST ON STEEL TUBES

### 1. SCOPE

This ISO Recommendation applies to the flanging test on steel tubes having an external diameter not greater than 150 mm (5.9 in) and a thickness not greater than 9 mm (0.35 in).

### 2. PRINCIPLE OF TEST

The test consists in forming on the end of a tube or on the end of a test piece cut from a tube, a flange in a plane perpendicular to the axis of the tube.

The test is carried out until the external diameter of the flange has reached the minimum value laid down in the relevant material specification (see Fig. 2).

### 3. SYMBOLS AND DESIGNATIONS

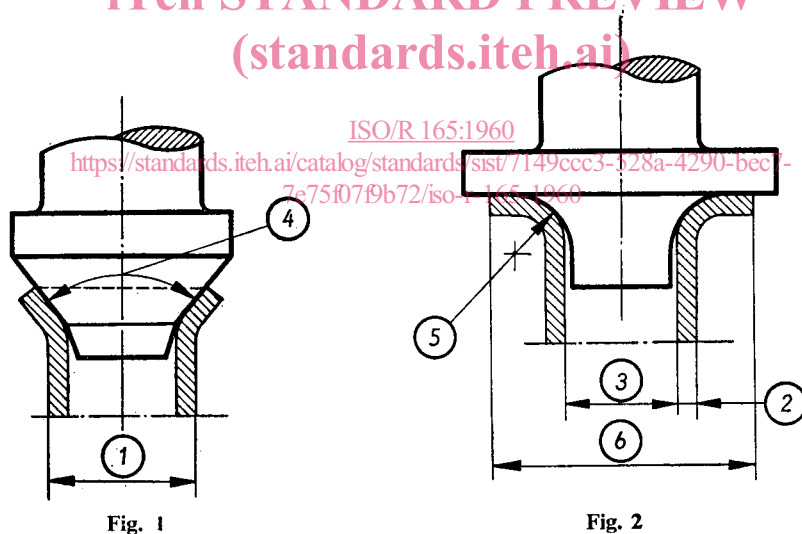


Fig. 1

Fig. 2

Number	Symbol	Designation
1	$D$	External diameter of test piece
2	$a$	Thickness of test piece
3	$d$	Internal diameter of test piece
4	$L$	Length of test piece
4		Conical angle of first forming tool *
5	$r$	Corner radius of second forming tool
6	$c$	External diameter of flange

\* 90° in cases of dispute.

#### 4. TEST PIECE

- 4.1 The test piece consists of a piece of tube of length  $L$ , such that, after the test, the remaining cylindrical portion is not less than  $\frac{1}{2} D$ .

Alternatively, the test may be made on one end of a tube without the test piece being removed.

- 4.2 The end to be tested should be in a plane perpendicular to the axis of the tube.

The edges of the end to be tested may be rounded by filing. However, a test on a test piece, the edges of which have not been rounded, is acceptable, provided the test is satisfactory.

#### 5. PROCEDURE

- 5.1 To commence the formation of the flange a conical forming tool having a suitable conical angle (in cases of dispute this angle should be  $90^\circ$ ) is forced into the test piece, under pressure, until the diameter of the drifted tube is such that a flange having the specified diameter can be formed (see Fig. 1, page 3).

- 5.2 The conical forming tool may then be replaced by a second forming tool (see Fig. 2, page 3), having

- a cylindrical end of a diameter about 1 mm less than the internal diameter of the tube;
- a flat concentric portion, perpendicular to the axis of the forming tool and having a diameter not less than the external diameter of the required flange;
- a fillet joining the cylindrical end and the flat portion, the radius being such that the external radius of the flange is at least equal to that laid down in the relevant material specification.

- 5.3 The flange is then formed by applying pressure axially to the test piece until the drifted portion has formed a flange perpendicular to the axis of the test piece and of the specified diameter.

#### 6. TEST REQUIREMENTS

- 6.1 The forming tools should be of polished steel of suitable hardness. They should be well lubricated, and there should be no rotation of the tube or the forming tools during the test.
- 6.2 In cases of dispute, the rate of movement of the forming tools should not exceed 50 mm (1.96 in) per minute.
- 6.3 The temperature of the test piece should be equal to the ambient temperature (but in no case less than  $10^\circ\text{C}$ ), unless some other temperature is specified.
- 6.4 At the conclusion of the test, the tube, both the cylindrical and the flanged portions, should be examined.
- 6.5 The interpretation of the appearance of the test piece after testing is a matter for the material specification.