INTERNATIONAL STANDARD ISO 2547

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Welded plain end tubes made from unalloyed steel and without quality requirements

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2547 was drawn up by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and circulated to the Member Bodies in April 1972.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	Portugal
Austria	Hungary	Romania
Belgium	India	South Africa, Rep. of
Chile	Ireland	Spain
Czechoslovakia	Israel	Sweden
Denmark	Italy	Switzerland
Egypt, Arab Rep. of	Japan	Thailand
Finland	Netherlands	Turkey
France	Norway	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
United Kingdom
U.S.A.

Printed in Switzerland

Welded plain end tubes made from unalloyed steel and without quality requirements

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of welded plain end tubes made from unalloyed steel and without quality requirements, intended for the conveyance of fluids and for other purposes where leak tightness is required.

2 REFERENCES

ISO 134, *Plain end steel tubes for general purposes.**

ISO/R 404, *General technical delivery requirements for steel.*

3 GENERAL REQUIREMENTS

3.1 The tubes shall be made by forming strip, sheet or plate into a tubular shape, followed by welding.

3.2 The tubes shall be suitable for fabrication and shaping by normal techniques.

3.3 The tubes shall be weldable.

3.4 Mechanical tests and chemical analyses are not required.

4 MATERIAL

The tubes shall be made of steel of commercial quality without verified test values.

For guidance, the steel shall have the following properties on longitudinal test pieces cut from the tube :

Steel designation (symbol)	Tensile strength	Minimum elongation after fracture[2]	Chemical composition (ladle analysis)	
	N/mm²	%	P % max.	S % max.
TW.O[1]	320 to 520	15	0,06	0,06

1) Provisional symbol.

2) $L_0 = 5{,}65 \sqrt{S_0}$.

The tensile strength and elongation values do not apply to the weld area.

5 APPEARANCE

5.1 The tubes shall have smooth external and internal surfaces, the degree of smoothness depending on the method of manufacture. The tubes shall have a workmanlike finish but small imperfections are permissible provided that the thickness remains within the lower tolerance limit.

The weld shall be free from cracks, large inclusions and other unacceptable defects.

5.2 Surface imperfections may be dressed provided that the thickness after dressing remains within the lower tolerance limit.

5.3 Peening of surface defects is not permitted.

5.4 Repair of the weld is permitted.

5.5 The tubes shall be cut square with the axis of the tube, and shall be free from burrs, and reasonably straight. Straightness cannot be guaranteed.

6 DIMENSIONS

6.1 The preferred values of outside diameter and thickness shall be those quoted in ISO 134.

6.2 The tubes are normally supplied in random lengths of 4 to 8 m. If specified in the order, they may be supplied in longer lengths.

6.2.1 If specified in the order, they may be supplied in limited lengths or exact lengths.

* At present at the stage of draft; revision of ISO/R 134.

7 TOLERANCES

7.1 On the outside diameter

– up to and including 50 mm :	± 0,5 mm	Tolerance grade ISO D_2
– above 50 mm up to and including 200 mm :	± 1 %	
– above 200 mm up to and including 1 000 mm :	± (0,005 D + 1) mm	
– above 1 000 mm :	± 6 mm	

For tubes with outside diameters greater than 325 mm, the tolerance shall be checked by taping the outside circumference. The ovality shall not exceed the limits on diameter.

7.2 On thickness (apart from the weld area)

Upper deviation : limited by the tolerance on the mass, tolerance grade ISO T_2.

Lower deviation : – 12,5 % .

7.3 On the weld

7.3.1 The height of the weld bead above the tube surface for tubes welded using a filler material shall not exceed the following values, depending on the wall thickness :

- up to 8 mm : 3 mm max.
- over 8 mm up to 14 mm : 3,5 mm max.
- over 14 mm : 4 mm max.

7.3.2 The height of the external flash remaining on pressure welded tubes shall not exceed 0,3 mm + 0,05 a (a being the wall thickness, in millimetres).

By agreement between the interested parties, the internal flash may be trimmed, and its height shall then not exceed 0,3 mm + 0,05 a (a being the wall thickness, in millimetres).

7.4 On the length

7.4.1 *Random lengths*

It is permitted to supply 6 % of the order in short lengths. These lengths shall not be shorter than 2,5 m.

7.4.2 *Limited lengths*

± 500 mm

7.4.3 *Exact lengths*

– up to and including 6 m :	$^{+\ 10}_{0}$ mm
– above 6 m :	$^{+\ 15}_{0}$ mm

Subject to agreement, closer tolerances may be specified in the order.

7.5 On the mass per metre

± 10 % per tube;

± 7,5 % per batch of 10 tonnes minimum.

8 TESTS

8.1 The tubes shall be submitted to visual inspection and a hydraulic test.

8.2 Each tube shall be hydraulically tested at the manufacturer's works at a pressure of 50 bar.

If necessary, the test pressure shall be reduced so that the stress in the tube does not exceed 40 % of the minimum tensile strength of the material.

The pressure shall be maintained for at least 5 s.

8.3 Alternatively, the manufacturer may substitute for the hydraulic test other tests which ensure an equivalent quality.

8.4 Tubes which do not satisfy the test shall be rejected.

8.5 Tubes which have been repaired by welding shall be re-tested.

9 CERTIFICATE

9.1 When required by the purchaser in the order, the manufacturer shall supply a certificate stating that the tubes comply with this International Standard.

9.2 This certificate shall comply with the requirements of clause 4.1.1 of ISO/R 404.