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Indian Standard

DIMENSIONS AND TOLERANCES FOR
WROUGHT ALUMINIUM AND ALUMINIUM
ALLOY DRAWN ROUND TUBES

(Second Revision)

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DIMENSIONS AND TOLERANCES FOR WROUGHT ALUMINIUM AND ALUMINIUM ALLOY DRAWN ROUND TUBES

(Second Revision)

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Indian Standard

DIMENSIONS AND TOLERANCES FOR WROUGHT ALUMINIUM AND ALUMINIUM ALLOY DRAWN ROUND TUBES

(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 15 January 1987, after the draft finalized by the Light Metals and Their Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1963 and subsequently revised in 1972. In this revision the tolerances on straightness have been added.

0.3 This standard should be used in conjunction with IS : 738-1977*.

0.4 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†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the dimensions and tolerances for wrought aluminium and aluminium alloy drawn round tube with parallel bore.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition as well as those given in IS : 5047 (Part 1)-1986‡ shall apply.

*Specification for wrought aluminium and aluminium alloy drawn tube for general engineering purposes (*second revision*).

†Rules for rounding off numerical values (*revised*).

‡Glossary of terms relating to aluminium and aluminium alloys: Part 1 Unwrought and wrought metals (*second revision*).

2.1 Drawn Tube — A hollow product of uniform wall thickness produced by cold drawing from tube bloom.

3. DIMENSIONS

3.1 The standard outside diameters and wall thicknesses of drawn tube shall be as given in Table 1.

TABLE 1 DIMENSIONS OF DRAWN ROUND TUBE WITH PARALLEL BORE

| NOMINAL OUTSIDE DIAMETER | All dimensions in millimetres. | | | | | | | | | |
|--------------------------------|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| | NOMINAL WALL THICKNESS | | | | | | | | | |
| 4.0 } 5.0 } 6.3 } | 0.50, | 0.63, | 0.80, | 1.00 | | | | | | |
| 8.0 | 0.50, | 0.63, | 0.80, | 1.00, | 1.25, | 1.60, | 2.00 | | | |
| 10.0 } 12.5 } | 0.50, | 0.63, | 0.80, | 1.00, | 1.25, | 1.60, | 2.00, | 2.50 | | |
| 16.0 } 20.0 } 25.0 } | 0.80, | 1.00, | 1.25, | 1.60, | 2.00, | 2.50, | 3.15 | | | |
| 31.5 | 0.80, | 1.00, | 1.25, | 1.60, | 2.00, | 2.50, | 3.15 | 4.0, | 5.0 | |
| 40.0 } 50.0 } | 0.80, | 1.00, | 1.25, | 1.60, | 2.00, | 2.50, | 3.15, | 4.0, | 5.0, | 6.3 |
| 63.0 } 80.0 } | 1.60, | 2.00, | 2.50, | 3.15, | 4.0, | 5.0, | 6.3, | 8.0, | 10.0, | 12.5 |
| 100 } 125 } | 2.00, | 2.50, | 3.15, | 4.0, | 5.0, | 6.3, | 8.0, | 10.0, | 12.5 | |
| 160 | 3.15, | 4.0, | 5.0, | 6.3, | 8.0, | 10.0, | 12.5 | | | |
| 200 | 6.3, | 8.0, | 10.0, | 12.5 | | | | | | |
| 250 | 8.0, | 10.0, | 12.5 | 16.0 | | | | | | |

NOTE 1 — Nominal dimension means specified dimensions.

NOTE 2 — Sizes other than standard shall be as agreed to between the manufacturer and the purchaser.

4. TOLERANCES

4.1 Tolerances on wall thicknesses of drawn round tube shall be as given in Table 2.

TABLE 2 TOLERANCES ON WALL THICKNESSES OF DRAWN ROUND TUBE WITH PARALLEL BORE

(Clause 4.1)

All dimensions in millimetres.

| NOMINAL WALL THICKNESS | TOLERANCE ON MEAN THICKNESS \pm | TOLERANCE ON THICKNESS AT ANY POINT \pm |
|------------------------|--------------------------------------|--|
| 0.50 | 0.05 | 0.09 |
| 0.63 | 0.05 | 0.11 |
| 0.80 | 0.05 | 0.14 |
| 1.00 | 0.05 | 0.16 |
| 1.25 | 0.05 | 0.18 |
| 1.60 | 0.08 | 0.22 |
| 2.00 | 0.09 | 0.28 |
| 2.50 | 0.10 | 0.36 |
| 3.15 | 0.13 | 0.46 |
| 4.0 | 0.20 | 0.61 |
| 5.0 | 0.26 | 0.74 |
| 6.3 | 0.33 | 0.99 |
| 8.0 | 0.40 | 1.21 |
| 10.0 | 0.51 | 1.50 |
| 12.5 | 0.63 | 1.89 |
| 16.0 | 0.80 | 2.40 |

NOTE — Mean wall thickness of round tube in the average of two measurements taken opposite to each other.

4.2 The tolerances on outside or inside diameters of drawn round tube for different wall thicknesses shall be as given in Table 3.

4.3 Tolerances on straightness of drawn round tubes shall be as given in Table 4.

TABLE 3 TOLERANCES ON OUTSIDE OR INSIDE DIAMETERS OF DRAWN ROUND TUBE WITH PARALLEL BORE

(Clause 4.2)

All dimensions in millimetres.

| NOMINAL OUTSIDE DIAMETER | NOMINAL WALL THICKNESS OF TUBE | | | | | | | | | | | | | | | |
|--------------------------------|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0.50 | 0.63 | 0.80 | 1.00 | 1.25 | 1.60 | 2.00 | 2.50 | 3.15 | 4.0 | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 | 16.0 |
| | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± | ± |
| 4.0 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — | — | — | — | — |
| 5.0 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — | — | — | — | — |
| 6.3 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — | — | — | — | — |
| 8.0 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — | — |
| 10.0 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — |
| 12.5 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — | — |
| 16.0 | — | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — |
| 20.0 | — | 0.15 | 0.15 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — |
| 25.0 | — | 0.18 | 0.15 | 0.15 | 0.15 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — | — | — |
| 31.5 | — | 0.20 | 0.18 | 0.18 | 0.15 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | — | — | — | — | — |
| 40.0 | — | 0.23 | 0.23 | 0.20 | 0.18 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | — | — | — | — |
| 50.0 | — | — | 0.28 | 0.25 | 0.20 | 0.18 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | — | — |
| 63.0 | — | — | — | — | 0.35 | 0.28 | 0.25 | 0.23 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | — |
| 80.0 | — | — | — | — | — | 0.43 | 0.35 | 0.30 | 0.25 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | — |

| | | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|------|------|------|------|------|------|------|------|------|------|------|
| 100 | — | — | — | — | — | 0·61 | 0·51 | 0·46 | 0·41 | 0·36 | 0·33 | 0·30 | 0·30 | 0·30 | 0·28 | — |
| 125 | — | — | — | — | — | — | 0·64 | 0·56 | 0·48 | 0·40 | 0·38 | 0·38 | 0·36 | 0·36 | 0·33 | — |
| 160 | — | — | — | — | — | — | — | — | 0·64 | 0·58 | 0·58 | 0·58 | 0·56 | 0·56 | 0·51 | — |
| 200 | — | — | — | — | — | — | — | — | — | — | 0·94 | 0·94 | 0·92 | 0·92 | 0·86 | 0·84 |
| 250 | — | — | — | — | — | — | — | — | — | — | — | — | 1·37 | 1·37 | 1·32 | 1·30 |

NOTE 1 — For drawn tube supplied in *O* or *W* condition, the limits shown in the table apply to the inside or outside mean diameter. The mean diameter is the average of two diameter measurements taken at right angle to each other. For drawn tube supplied in *M*, *O*, *W*, *WP*, *H₂* and *H₄* condition, limits shown in the table apply to the actual inside or outside diameter. Symbols used are defined below:

M = material in the 'as manufactured' condition, for example, as rolled, as extruded, straightened and/or drawn to size or as forged without subsequent treatment of any kind;

O = material in the annealed condition;

W = material which has been solution-treated and will respond to precipitation treatment;

WP = material which has been solution-treated and precipitation-treated; and

H₂, *H₄* = various tempers in non-heat-treatable alloys (see IS : 5052-1969 Temper designation of aluminium and its alloys).

NOTE 2 — Tolerances on sizes other than those covered in Table 1 may be agreed to between the supplier and the purchaser. Any drawn tube of intermediate diameter may have tolerances of the next higher diameter, and of any intermediate wall thickness the tolerance of the previous lower thickness.

**TABLE 4 TOLERANCES ON STRAIGHTNESS OF DRAWN ROUND
TUBES WITH PARALLEL BORE***(Clause 4.3)*

All dimensions in millimetres.

| NOMINAL OUTSIDE DIAMETER | TOLERANCE ON STRAIGHTNESS |
|---------------------------------|------------------------------|
| From 10 up to and including 150 | 1.25 mm/m |
| Over 150 | 2.00 mm/m |

NOTE — Tolerances on straightness for sizes other than above and tubes in *O* temper shall be mutually agreed to between the supplier and the purchaser.

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