

INTERNATIONAL STANDARD

ISO 8457-1

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Steel wire rod —

Part 1: Dimensions and tolerances

*Fil-machine en acier —
Partie 1: Dimensions et tolérances*



Reference number
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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8457-1 was prepared by Technical Committee ISO/TC 17, *Steel*.

ISO 8457 consists of the following parts, under the general title *Steel wire rod*:

- *Part 1: Dimensions and tolerances*
- *Part 2: Quality requirements for unalloyed steel wire rods for conversion to wire*
- *Part 3: Quality requirements for wire rods for the manufacture of welding electrodes*

Steel wire rod —

Part 1: Dimensions and tolerances

1 Scope

This part of ISO 8457 specifies dimensions and tolerances applicable to hot-rolled steel wire rod of the following types:

- a) unalloyed steel wire rods for conversion to wire, for which quality requirements are given in ISO 8457-2;
- b) wire rods for the manufacture of welding electrodes, for which quality requirements will be given in ISO 8457-3¹⁾.

2 Dimensions and tolerances on dimensions

The dimensions and tolerances applicable to the dimensions of hot-rolled steel wire rod shall be as specified in 2.1 to 2.5 inclusive.

In cases of dispute, the cross-sectional dimensions shall be measured at a distance of 4 m from the end of the rod.

2.1 Round wire rod

2.1.1 The preferred nominal sizes and tolerances on diameters shall be as specified in table 1 and table 1a) respectively.

2.1.2 The permissible out-of-round for all sizes, measured as the difference between the maximum and minimum diameters at any cross-section, shall be 80 % of the total tolerance specified on the diameter (see table 1).

2.2 Half-round wire rod

The nominal size, defined as diameter d by radius r , and tolerance on size shall be as specified in table 2 and table 2a) respectively.

2.3 Square wire rod

2.3.1 The nominal width of side and tolerance on width of side shall be as specified in table 3 and table 3a) respectively.

2.3.2 The permissible out-of-square for all sizes, measured as the difference of the distances between faces at any cross-section, shall be 80 % of the total tolerance specified on the width of side (see table 3).

2.4 Hexagonal wire rod

2.4.1 The normal thickness, measured as the width across opposite flat faces, and tolerance on thickness shall be as specified in table 4 and table 4a) respectively.

2.4.2 The permissible out-of-hexagon for all sizes measured as the difference between the widths across the flat at any cross-section, shall be 80 % of the total thickness tolerance (see table 4).

2.5 Rectangular wire rod

The nominal size, defined as width b by thickness d , and tolerance on size shall be as specified in table 5 and table 5a) respectively.

1) To be published.

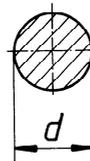
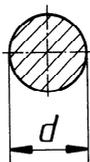


Table 1 – Preferred diameter, nominal section and nominal mass of round wire rod

| Preferred diameter <i>d</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|--------------------------------------|-------------------------------------------------------|--------------------------------------------|
| 5 | 19,63 | 0,154 |
| 5,5 | 23,76 | 0,187 |
| 6 | 28,27 | 0,222 |
| 6,5 | 33,18 | 0,260 |
| 7 | 38,48 | 0,302 |
| 7,5 | 44,18 | 0,347 |
| 8 | 50,26 | 0,395 |
| 8,5 | 56,74 | 0,445 |
| 9 | 63,62 | 0,499 |
| 9,5 | 70,88 | 0,556 |
| 10 | 78,54 | 0,617 |
| 10,5 | 86,59 | 0,680 |
| 11 | 95,03 | 0,746 |
| 11,5 | 103,9 | 0,816 |
| 12 | 113,1 | 0,888 |
| 12,5 | 122,7 | 0,963 |
| 13 | 132,7 | 1,04 |
| 13,5 | 143,1 | 1,12 |
| 14 | 153,9 | 1,21 |
| 14,5 | 165,1 | 1,30 |
| 15 | 176,7 | 1,39 |
| 15,5 | 188,7 | 1,48 |
| 16 | 201,1 | 1,58 |
| 16,5 | 213,8 | 1,68 |
| 17 | 227,0 | 1,78 |
| 17,5 | 240,5 | 1,89 |
| 18 | 254,5 | 2,00 |
| 18,5 | 268,8 | 2,11 |
| 19 | 283,5 | 2,23 |
| 19,5 | 298,6 | 2,34 |
| 20 | 314,2 | 2,47 |
| 21 | 346,3 | 2,72 |
| 22 | 380,1 | 2,98 |
| 23 | 415,5 | 3,26 |
| 24 | 452,4 | 3,55 |
| 25 | 490,9 | 3,85 |
| 26 | 530,9 | 4,17 |
| 27 | 572,6 | 4,49 |
| 28 | 615,7 | 4,83 |
| 29 | 660,5 | 5,18 |
| 30 | 706,9 | 5,55 |

1) For information only.

Table 1a) – Tolerances on diameter of round wire rod

| Nominal diameter mm | | Tolerance on diameter mm |
|------------------------|---------------------|--------------------------------|
| Over | Up to and including | |
| — | 15 | ± 0,4 |
| 15 | 25 | ± 0,5 |
| 25 | 30 | ± 0,6 |
| 30 | | See the note |

NOTE — Tolerance should be agreed at time of ordering.

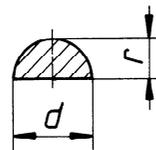


Table 2 – Size, nominal section and nominal mass of half-round wire rod

| Preferred <i>d × r</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|---------------------------------|-------------------------------------------------------|--------------------------------------------|
| 7 × 3,5 | 19,24 | 0,151 |
| 8 × 4 | 25,13 | 0,197 |
| 9 × 4,5 | 31,81 | 0,250 |
| 10 × 5 | 39,27 | 0,308 |
| 11 × 5,5 | 47,52 | 0,373 |
| 12 × 6 | 56,55 | 0,444 |
| 13 × 6,5 | 66,37 | 0,521 |
| 14 × 7 | 76,97 | 0,604 |
| 15 × 7,5 | 88,36 | 0,694 |
| 16 × 8 | 100,5 | 0,789 |
| 17 × 8,5 | 113,5 | 0,891 |
| 18 × 9 | 127,2 | 0,999 |
| 19 × 9,5 | 141,8 | 1,11 |
| 20 × 10 | 157,1 | 1,23 |
| 21 × 10,5 | 173,2 | 1,36 |
| 22 × 11 | 190,1 | 1,49 |
| 23 × 11,5 | 207,7 | 1,63 |
| 24 × 12 | 226,2 | 1,78 |
| 25 × 12,5 | 245,4 | 1,93 |
| 26 × 13 | 265,5 | 2,08 |
| 28 × 14 | 307,9 | 2,42 |
| 30 × 15 | 353,4 | 2,27 |

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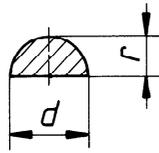


Table 2a) – Tolerances on diameter of half-round wire rod

| Nominal diameter ¹⁾ <i>d</i> mm | | Tolerance on diameter ²⁾ mm |
|--------------------------------------------------|---------------------|----------------------------------------------|
| Over | Up to and including | |
| From 7 | 15 | ± 0,4 |
| 15 | 25 | ± 0,5 |
| 25 | 30 | ± 0,6 |

1) $r = d/2$
2) Tolerance on $r = 1/2$ tolerance on d .

Table 3a) – Width tolerances of square wire rod

| Nominal width <i>a</i> mm | | Width tolerance mm |
|---------------------------------|---------------------|--------------------------|
| Over | Up to and including | |
| From 5 | 15 | ± 0,4 |
| 15 | 25 | ± 0,5 |
| 25 | — | ± 0,6 |

NOTE – Limited corner radii are permissible.

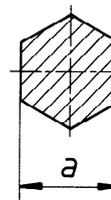
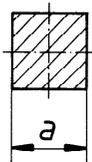


Table 3 – Width of side, nominal section and nominal mass of square wire rod

| Preferred width <i>a</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|-----------------------------------|-------------------------------------------------------|--------------------------------------------|
| 5 | 25,00 | 0,196 |
| 5,5 | 30,25 | 0,237 |
| 6 | 36,00 | 0,283 |
| 7 | 49,00 | 0,385 |
| 8 | 64,00 | 0,502 |
| 9 | 81,00 | 0,636 |
| 10 | 100,0 | 0,785 |
| 11 | 121,0 | 0,950 |
| 12 | 144,0 | 1,13 |
| 13 | 169,0 | 1,33 |
| 14 | 196,0 | 1,54 |
| 15 | 225,0 | 1,77 |
| 16 | 256,0 | 2,01 |
| 17 | 289,0 | 2,27 |
| 18 | 324,0 | 2,54 |
| 19 | 361,0 | 2,83 |
| 20 | 400,0 | 3,14 |
| 21 | 441,0 | 3,46 |
| 22 | 484,0 | 3,80 |
| 23 | 529,0 | 4,15 |
| 24 | 576,0 | 4,52 |
| 25 | 625,0 | 4,91 |
| 26 | 676,0 | 5,31 |

1) For information only.

Table 4 – Thickness, nominal section and nominal mass of hexagonal wire rod

| Preferred thickness <i>a</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|---------------------------------------|-------------------------------------------------------|--------------------------------------------|
| 6 | 31,18 | 0,245 |
| 7 | 42,44 | 0,333 |
| 8 | 55,43 | 0,435 |
| 9 | 70,15 | 0,551 |
| 10 | 86,60 | 0,680 |
| 11 | 104,8 | 0,823 |
| 12 | 124,7 | 0,979 |
| 13 | 146,4 | 1,15 |
| 14 | 169,7 | 1,33 |
| 15 | 194,9 | 1,53 |
| 16 | 221,7 | 1,74 |
| 17 | 250,3 | 1,96 |
| 18 | 280,6 | 2,20 |
| 19 | 312,6 | 2,45 |
| 20 | 346,4 | 2,72 |
| 22 | 419,2 | 3,29 |
| 23 | 458,1 | 3,60 |
| 24 | 498,8 | 3,92 |
| 25 | 541,3 | 4,25 |
| 26 | 585,4 | 4,60 |
| 27 | 631,3 | 4,96 |
| 28 | 679,0 | 5,33 |

1) For information only.

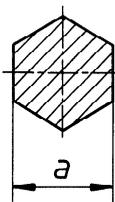


Table 4a) – Thickness tolerances of hexagonal wire rod

| Nominal thickness <i>a</i> mm | | Thickness tolerance mm |
|-------------------------------------|---------------------|------------------------------|
| Over | Up to and including | |
| From 6 | 15 | ± 0,4 |
| 15 | 25 | ± 0,5 |
| 25 | — | ± 0,6 |

NOTE – Limited corner radii are permissible.

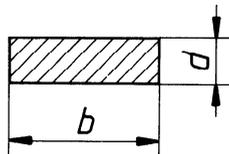


Table 5 – Size, nominal section and nominal mass of rectangular wire rod

| Preferred <i>b</i> × <i>d</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|----------------------------------------|----------------------------------------------------------|-----------------------------------------------|
| 8 × 3 | 24,00 | 0,188 |
| 8 × 4 | 32,00 | 0,251 |
| 10 × 3 | 30,00 | 0,236 |
| 10 × 4 | 40,00 | 0,314 |
| 10 × 6 | 60,00 | 0,471 |
| 12 × 3 | 36,00 | 0,283 |
| 12 × 4 | 48,00 | 0,377 |
| 12 × 6 | 72,00 | 0,565 |
| 14 × 3 | 42,00 | 0,330 |
| 14 × 4 | 56,00 | 0,440 |
| 14 × 6 | 84,00 | 0,659 |
| 14 × 8 | 112,0 | 0,879 |
| 16 × 3 | 48,00 | 0,377 |
| 16 × 4 | 64,00 | 0,502 |
| 16 × 6 | 96,00 | 0,754 |
| 16 × 8 | 128,0 | 1,00 |
| 16 × 10 | 160,0 | 1,26 |
| 18 × 3 | 54,00 | 0,424 |
| 18 × 4 | 72,00 | 0,565 |
| 18 × 6 | 108,0 | 0,848 |
| 18 × 8 | 144,0 | 1,13 |
| 18 × 10 | 180,0 | 1,41 |
| 18 × 12 | 216,0 | 1,70 |
| 20 × 3 | 60,00 | 0,471 |
| 20 × 4 | 80,00 | 0,628 |
| 20 × 6 | 120,0 | 0,942 |
| 20 × 8 | 160,0 | 1,26 |
| 20 × 10 | 200,0 | 1,57 |
| 20 × 12 | 240,0 | 1,88 |
| 20 × 14 | 280,0 | 2,20 |

Table 5 (concluded)

| Preferred <i>b</i> × <i>d</i> mm | Cross-sectional area ¹⁾ mm ² | Mass per unit length ¹⁾ kg/m |
|----------------------------------------|----------------------------------------------------------|-----------------------------------------------|
| 22 × 3 | 66,00 | 0,518 |
| 22 × 4 | 88,00 | 0,691 |
| 22 × 6 | 132,0 | 1,04 |
| 22 × 8 | 176,0 | 1,38 |
| 22 × 10 | 220,0 | 1,73 |
| 22 × 12 | 264,0 | 2,07 |
| 22 × 14 | 308,0 | 2,42 |
| 25 × 3 | 75,00 | 0,589 |
| 25 × 4 | 100,0 | 0,785 |
| 25 × 6 | 150,0 | 1,18 |
| 25 × 8 | 200,0 | 1,57 |
| 25 × 10 | 250,0 | 1,96 |
| 25 × 12 | 300,0 | 2,36 |
| 25 × 14 | 350,0 | 2,75 |
| 25 × 16 | 400,0 | 3,14 |
| 28 × 3 | 84,00 | 0,659 |
| 28 × 4 | 112,0 | 0,879 |
| 28 × 6 | 168,0 | 1,32 |
| 28 × 8 | 224,0 | 1,76 |
| 28 × 10 | 280,0 | 2,20 |
| 28 × 12 | 336,0 | 2,64 |
| 28 × 14 | 392,0 | 3,08 |
| 28 × 16 | 448,0 | 3,52 |
| 30 × 3 | 90,00 | 0,706 |
| 30 × 4 | 120,0 | 0,942 |
| 30 × 6 | 180,0 | 1,41 |
| 30 × 8 | 240,0 | 1,88 |
| 30 × 10 | 300,0 | 2,36 |
| 30 × 12 | 360,0 | 2,83 |
| 30 × 14 | 420,0 | 3,30 |
| 30 × 16 | 480,0 | 3,77 |

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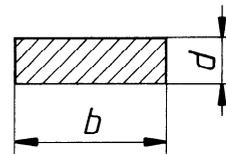


Table 5a) – Tolerances of rectangular wire rod

| Nominal width <i>b</i> or Nominal thickness <i>d</i> mm | | Width tolerance mm | Thickness tolerance mm |
|---------------------------------------------------------------|------------------------|--------------------------|------------------------------|
| Over | Up to and including | | |
| — | 8 | — | ± 0,3 |
| 8 | 14 | + 0,4 | ± 0,4 |
| 14 | 22 | ± 0,5 | ± 0,4 |
| 22 | — | ± 0,6 | — |

NOTE – Limited corner radii are permissible.