
**Hexagon head screws with metric fine
pitch thread — Product grades A and B**

*Vis à tête hexagonale à filetage métrique à pas fin entièrement
filetées — Grades A et B*

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8676 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 10, *Product standards for fasteners*.

This third edition cancels and replaces the second edition (ISO 8676:1999), of which it constitutes a minor revision.

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Introduction

This International Standard belongs to a complete group of product standards developed by ISO on external hexagon drive fasteners. It comprises the following:

- a) hexagon head bolts (ISO 4014, ISO 4015, ISO 4016 and ISO 8765);
- b) hexagon head screws (ISO 4017, ISO 4018 and ISO 8676);
- c) hexagon nuts (ISO 4032, ISO 4033, ISO 4034, ISO 4035, ISO 4036, ISO 7040, ISO 7041, ISO 7042, ISO 7719, ISO 7720, ISO 8673, ISO 8674, ISO 8675, ISO 10511, ISO 10512 and ISO 10513);
- d) hexagon bolts with flange (ISO 4162, ISO 15071 and ISO 15072);
- e) hexagon nuts with flange (ISO 4161, ISO 7043, ISO 7044, ISO 10663, ISO 12125, ISO 12126 and ISO 21670).

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Hexagon head screws with metric fine pitch thread — Product grades A and B

1 Scope

This International Standard specifies the characteristics of hexagon head screws with metric fine pitch thread with nominal thread diameters, d , from 8 mm to 64 mm, of product grade A for nominal thread diameters, d , from 8 mm to 24 mm and nominal lengths, l , up to and including $10d$ or 150 mm, whichever is the shorter, and of product grade B for nominal thread diameters, d , over 24 mm or nominal lengths, l , over $10d$ or 150 mm, whichever is the shorter.

If, in special cases, specifications other than those listed in this International Standard are required, they can be selected from existing International Standards, for example ISO 724, ISO 888, ISO 898-1, ISO 965-1, ISO 3506-1, ISO 4753 and ISO 4759-1.

It is intended that coarse thread screws according to ISO 4017 be the first choice.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 965-1, *ISO general-purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4753, *Fasteners — Ends of parts with external ISO metric thread*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

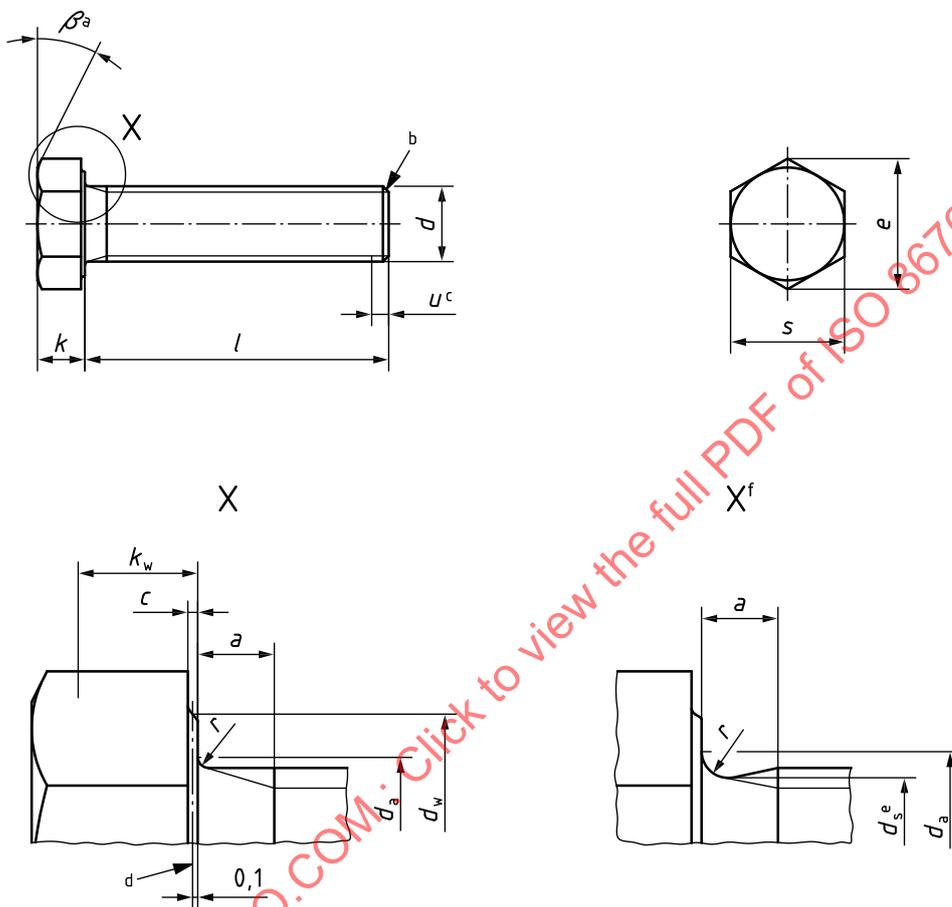
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

3 Dimensions

See Figure 1 and Tables 1 and 2.

Symbols and descriptions of dimensions are specified in ISO 225.

Dimensions in millimetres



- a $\beta = 15^\circ$ to 30° .
- b The point shall be chamfered in accordance with ISO 4753.
- c Incomplete thread $u \leq 2P$.
- d Reference datum for d_w .
- e $d_s \approx$ pitch diameter.
- f Permissible shape.

Figure 1

Table 1 — Preferred threads

Dimensions in millimetres

| Thread ($d \times P$) | M8 x 1 | M10 x 1 | M12 x 1,5 | M16 x 1,5 | M20 x 1,5 | M24 x 2 | M30 x 2 | M36 x 3 | M42 x 3 | M48 x 3 | M56 x 4 | M64 x 4 |
|-------------------------|------------|---------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|
| a | max. 3 | 3 | 4,5 | 4,5 | 4,5 | 6 | 6 | 9 | 9 | 9 | 12 | 12 |
| | min. 1 | 1 | 1,5 | 1,5 | 1,5 | 2 | 2 | 3 | 3 | 3 | 4 | 4 |
| c | max. 0,60 | 0,60 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 1,0 | 1,0 | 1,0 | 1,0 |
| | min. 0,15 | 0,15 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,3 | 0,3 | 0,3 | 0,3 |
| d_a | max. 9,2 | 11,2 | 13,7 | 17,7 | 22,4 | 26,4 | 33,4 | 39,4 | 45,6 | 52,6 | 63 | 71 |
| | min. 11,63 | 14,63 | 16,63 | 22,49 | 28,19 | 33,61 | — | — | — | — | — | — |
| d_w | max. 11,47 | 14,47 | 16,47 | 22 | 27,7 | 33,25 | 42,75 | 51,11 | 59,95 | 69,45 | 78,66 | 88,16 |
| | min. 14,38 | 17,77 | 20,03 | 26,75 | 33,53 | 39,98 | — | — | — | — | — | — |
| e | max. 14,20 | 17,59 | 19,85 | 26,17 | 32,95 | 39,55 | 50,85 | 60,79 | 71,3 | 82,6 | 93,56 | 104,86 |
| | min. 5,3 | 6,4 | 7,5 | 10 | 12,5 | 15 | 18,7 | 22,5 | 26 | 30 | 35 | 40 |
| k | max. 5,45 | 6,58 | 7,68 | 10,18 | 12,715 | 15,215 | — | — | — | — | — | — |
| | min. 5,15 | 6,22 | 7,32 | 9,82 | 12,285 | 14,785 | — | — | — | — | — | — |
| | max. 5,54 | 6,69 | 7,79 | 10,29 | 12,85 | 15,35 | 19,12 | 22,92 | 26,42 | 30,42 | 35,5 | 40,5 |
| | min. 5,06 | 6,11 | 7,21 | 9,71 | 12,15 | 14,65 | 18,28 | 22,08 | 25,58 | 29,58 | 34,5 | 39,5 |
| k_w^a | max. 3,61 | 4,35 | 5,12 | 6,87 | 8,6 | 10,35 | — | — | — | — | — | — |
| | min. 3,54 | 4,28 | 5,05 | 6,8 | 8,51 | 10,26 | 12,8 | 15,46 | 17,91 | 20,71 | 24,15 | 27,65 |
| r | max. 0,4 | 0,4 | 0,6 | 0,6 | 0,8 | 0,8 | 1 | 1 | 1,2 | 1,6 | 2 | 2 |
| | min. 13,00 | 16,00 | 18,00 | 24,00 | 30,00 | 36,00 | 46 | 55,0 | 65,0 | 75,0 | 85,0 | 95,0 |
| s | max. 12,73 | 15,73 | 17,73 | 23,67 | 29,67 | 35,38 | — | — | — | — | — | — |
| | min. 12,57 | 15,57 | 17,57 | 23,16 | 29,16 | 35 | 45 | 53,8 | 63,1 | 73,1 | 82,8 | 92,8 |

Table 1 (continued)

Dimensions in millimetres

| Thread ($d \times P$) | Product grade | | | | | | | | | | | M8 x 1 | M10 x 1 | M12 x 1,5 | M16 x 1,5 | M20 x 1,5 | M24 x 2 | M30 x 2 | M36 x 3 | M42 x 3 | M48 x 3 | M56 x 4 | M64 x 4 | | | | |
|-------------------------|---------------|-------|--------|--------|------|-------|--|--|--|--|--|--------|---------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|
| | A | | | | | B | | | | | | | | | | | | | | | | | | | | | |
| | nom. | min. | max. | min. | max. | f_b | | | | | | | | | | | | | | | | | | | | | |
| 16 | 15,65 | 16,35 | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 19,58 | 20,42 | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 24,58 | 25,42 | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 29,58 | 30,42 | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| 35 | 34,5 | 35,5 | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 39,5 | 40,5 | 38,75 | 41,25 | — | | | | | | | | | | | | | | | | | | | | | | |
| 45 | 44,5 | 45,5 | 43,75 | 46,25 | — | | | | | | | | | | | | | | | | | | | | | | |
| 50 | 49,5 | 50,5 | 48,75 | 51,25 | — | | | | | | | | | | | | | | | | | | | | | | |
| 55 | 54,4 | 55,6 | 53,5 | 56,5 | — | | | | | | | | | | | | | | | | | | | | | | |
| 60 | 59,4 | 60,6 | 58,5 | 61,5 | — | | | | | | | | | | | | | | | | | | | | | | |
| 65 | 64,4 | 65,6 | 63,5 | 66,5 | — | | | | | | | | | | | | | | | | | | | | | | |
| 70 | 69,4 | 70,6 | 68,5 | 71,5 | — | | | | | | | | | | | | | | | | | | | | | | |
| 80 | 79,4 | 80,6 | 78,5 | 81,5 | — | | | | | | | | | | | | | | | | | | | | | | |
| 90 | 89,3 | 90,7 | 88,25 | 91,75 | — | | | | | | | | | | | | | | | | | | | | | | |
| 100 | 99,3 | 100,7 | 98,25 | 101,75 | — | | | | | | | | | | | | | | | | | | | | | | |
| 110 | 109,3 | 110,7 | 108,25 | 111,75 | — | | | | | | | | | | | | | | | | | | | | | | |
| 120 | 119,3 | 120,7 | 118,25 | 121,75 | — | | | | | | | | | | | | | | | | | | | | | | |
| 130 | 129,2 | 130,8 | 128 | 132 | — | | | | | | | | | | | | | | | | | | | | | | |
| 140 | 139,2 | 140,8 | 138 | 142 | — | | | | | | | | | | | | | | | | | | | | | | |
| 150 | 149,2 | 150,8 | 148 | 152 | — | | | | | | | | | | | | | | | | | | | | | | |
| 160 | — | — | 158 | 162 | — | | | | | | | | | | | | | | | | | | | | | | |
| 180 | — | — | 178 | 182 | — | | | | | | | | | | | | | | | | | | | | | | |
| 200 | — | — | 197,7 | 202,3 | — | | | | | | | | | | | | | | | | | | | | | | |
| 220 | — | — | 217,7 | 222,3 | — | | | | | | | | | | | | | | | | | | | | | | |

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Table 1 (continued)

| Thread (d × P) | Dimensions in millimetres | | | | | | | | | | | | | |
|----------------|---------------------------|------|--------|---------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|
| | Product grade | | M8 × 1 | M10 × 1 | M12 × 1,5 | M16 × 1,5 | M20 × 1,5 | M24 × 2 | M30 × 2 | M36 × 3 | M42 × 3 | M48 × 3 | M56 × 4 | M64 × 4 |
| | A | B | | | | | | | | | | | | |
| | l ^b | | | | | | | | | | | | | |
| nom. | min. | max. | min. | max. | | | | | | | | | | |
| 240 | — | — | 237,7 | 242,3 | | | | | | | | | | |
| 260 | — | — | 257,4 | 262,6 | | | | | | | | | | |
| 280 | — | — | 277,4 | 282,6 | | | | | | | | | | |
| 300 | — | — | 297,4 | 302,6 | | | | | | | | | | |
| 320 | — | — | 317,15 | 322,85 | | | | | | | | | | |
| 340 | — | — | 337,15 | 342,85 | | | | | | | | | | |
| 360 | — | — | 357,15 | 362,85 | | | | | | | | | | |
| 380 | — | — | 377,15 | 382,85 | | | | | | | | | | |
| 400 | — | — | 397,15 | 402,85 | | | | | | | | | | |
| 420 | — | — | 416,85 | 423,15 | | | | | | | | | | |
| 440 | — | — | 436,85 | 443,15 | | | | | | | | | | |
| 460 | — | — | 456,85 | 463,15 | | | | | | | | | | |
| 480 | — | — | 476,85 | 483,15 | | | | | | | | | | |
| 500 | — | — | 496,85 | 503,15 | | | | | | | | | | |

a $k_{w,min} = 0,7 k_{min}$

b Range of preferred lengths between the solid, bold, stepped lines:

— for product grade A, above the discontinuous, stepped line;

— for product grade B, below this stepped line.

Table 2 — Non-preferred threads

Dimensions in millimetres

| Thread ($d \times P$) | M10 × 1,25 | M12 × 1,25 | M14 × 1,25 | M18 × 1,5 | M20 × 2 | M22 × 1,5 | M27 × 2 | M33 × 2 | M39 × 3 | M45 × 3 | M52 × 4 | M60 × 4 |
|-------------------------|-------------------------------|---------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | a | max. 4 min. 1,25 | 4 | 4,5 | 4,5 | 6 | 4,5 | 6 | 6 | 9 | 9 | 12 |
| c | max. 0,60 min. 0,15 | 0,60 0,15 | 0,60 0,15 | 0,8 0,2 | 0,8 0,2 | 0,8 0,2 | 0,8 0,2 | 0,8 0,2 | 1,0 0,3 | 1,0 0,3 | 1,0 0,3 | 1,0 0,3 |
| d_a | max. 11,2 | 13,7 | 15,7 | 20,2 | 22,4 | 24,4 | 30,4 | 36,4 | 42,4 | 48,6 | 56,6 | 67 |
| d_w | Product grade A min. 14,63 | 16,63 | 19,64 | 25,34 | 28,19 | 31,71 | — | — | — | — | — | — |
| e | Product grade A min. 14,47 | 16,47 | 19,15 | 24,85 | 27,7 | 31,35 | 38 | 46,55 | 55,86 | 64,7 | 74,2 | 83,41 |
| | Product grade B min. 17,77 | 20,03 | 23,36 | 30,14 | 33,53 | 37,72 | — | — | — | — | — | — |
| | nom. 17,59 | 19,85 | 22,78 | 29,56 | 32,95 | 37,29 | 45,2 | 55,37 | 66,44 | 76,95 | 88,25 | 99,21 |
| | 6,4 | 7,5 | 8,8 | 11,5 | 12,5 | 14 | 17 | 21 | 25 | 28 | 33 | 38 |
| k | Product grade A max. 6,58 | 7,68 | 8,98 | 11,715 | 12,715 | 14,215 | — | — | — | — | — | — |
| | min. 6,22 | 7,32 | 8,62 | 11,285 | 12,285 | 13,785 | — | — | — | — | — | — |
| | Product grade B max. 6,69 | 7,79 | 9,09 | 11,85 | 12,85 | 14,35 | 17,35 | 21,42 | 25,42 | 28,42 | 33,5 | 38,5 |
| | min. 6,11 | 7,21 | 8,51 | 11,15 | 12,15 | 13,65 | 16,65 | 20,58 | 24,58 | 27,58 | 32,5 | 37,5 |
| k_w^a | Product grade A min. 4,35 | 5,12 | 6,03 | 7,9 | 8,6 | 9,65 | — | — | — | — | — | — |
| | Product grade B min. 4,28 | 5,05 | 5,96 | 7,81 | 8,51 | 9,56 | 11,66 | 14,41 | 17,21 | 19,31 | 22,75 | 26,25 |
| r | min. 0,4 | 0,6 | 0,6 | 0,6 | 0,8 | 0,8 | 1 | 1 | 1 | 1,2 | 1,6 | 2 |
| | nom. = max. 16,00 | 18,00 | 21,00 | 27,00 | 30,00 | 34,00 | 41 | 50 | 60,0 | 70,0 | 80,0 | 90,0 |
| s | Product grade A min. 15,73 | 17,73 | 20,67 | 26,67 | 29,67 | 33,38 | — | — | — | — | — | — |
| | Product grade B min. 15,57 | 17,57 | 20,16 | 26,16 | 29,16 | 33 | 40 | 49 | 58,8 | 68,1 | 78,1 | 87,8 |

Table 2 (continued)

| Thread (<i>d × P</i>) | Product grade | | Dimensions in millimetres | | | | | | | | | | | | | | |
|-------------------------|---------------|-------|---------------------------|--------|------------|------------|-----------|-----------|---------|-----------|---------|---------|---------|---------|---------|---------|------|
| | A | | B | | M10 × 1,25 | M12 × 1,25 | M14 × 1,5 | M18 × 1,5 | M20 × 2 | M22 × 1,5 | M27 × 2 | M33 × 2 | M39 × 3 | M45 × 3 | M52 × 4 | M60 × 4 | |
| | nom. | min. | max. | min. | | | | | | | | | | | | | max. |
| 20 | 19,58 | 20,42 | — | — | | | | | | | | | | | | | |
| 25 | 24,58 | 25,42 | — | — | | | | | | | | | | | | | |
| 30 | 29,58 | 30,42 | — | — | | | | | | | | | | | | | |
| 35 | 34,5 | 35,5 | — | — | | | | | | | | | | | | | |
| 40 | 39,5 | 40,5 | — | — | | | | | | | | | | | | | |
| 45 | 44,5 | 45,5 | — | — | | | | | | | | | | | | | |
| 50 | 49,5 | 50,5 | — | — | | | | | | | | | | | | | |
| 55 | 54,4 | 55,6 | 53,5 | 56,5 | | | | | | | | | | | | | |
| 60 | 59,4 | 60,6 | 58,5 | 61,5 | | | | | | | | | | | | | |
| 65 | 64,4 | 65,6 | 63,5 | 66,5 | | | | | | | | | | | | | |
| 70 | 69,4 | 70,6 | 68,5 | 71,5 | | | | | | | | | | | | | |
| 80 | 79,4 | 80,6 | 78,5 | 81,5 | | | | | | | | | | | | | |
| 90 | 89,3 | 90,7 | 88,25 | 91,75 | | | | | | | | | | | | | |
| 100 | 99,3 | 100,7 | 98,25 | 101,75 | | | | | | | | | | | | | |
| 110 | 109,3 | 110,7 | 108,25 | 111,75 | | | | | | | | | | | | | |
| 120 | 119,3 | 120,7 | 118,25 | 121,75 | | | | | | | | | | | | | |
| 130 | 129,2 | 130,8 | 128 | 132 | | | | | | | | | | | | | |
| 140 | 139,2 | 140,8 | 138 | 142 | | | | | | | | | | | | | |
| 150 | 149,2 | 150,8 | 148 | 152 | | | | | | | | | | | | | |
| 160 | — | — | 158 | 162 | | | | | | | | | | | | | |
| 180 | — | — | 178 | 182 | | | | | | | | | | | | | |

Table 2 (continued)

| Thread (<i>d</i> × <i>P</i>) | Dimensions in millimetres | | | | | | | | | | | | | | |
|--------------------------------|--|------|------------|------------|-----------|-----------|---------|-----------|---------|---------|---------|---------|---------|---------|--|
| | Product grade | | M10 × 1,25 | M12 × 1,25 | M14 × 1,5 | M18 × 1,5 | M20 × 2 | M22 × 1,5 | M27 × 2 | M33 × 2 | M39 × 3 | M45 × 3 | M52 × 4 | M60 × 4 | |
| | A | B | | | | | | | | | | | | | |
| | <i>p</i> | | | | | | | | | | | | | | |
| nom. | min. | max. | min. | max. | | | | | | | | | | | |
| 200 | — | — | 197,7 | 202,3 | | | | | | | | | | | |
| 220 | — | — | 217,7 | 222,3 | | | | | | | | | | | |
| 240 | — | — | 237,7 | 242,3 | | | | | | | | | | | |
| 260 | — | — | 257,4 | 262,6 | | | | | | | | | | | |
| 280 | — | — | 277,4 | 282,6 | | | | | | | | | | | |
| 300 | — | — | 297,4 | 302,6 | | | | | | | | | | | |
| 320 | — | — | 317,15 | 322,85 | | | | | | | | | | | |
| 340 | — | — | 337,15 | 342,85 | | | | | | | | | | | |
| 360 | — | — | 357,15 | 362,85 | | | | | | | | | | | |
| 380 | — | — | 377,15 | 382,85 | | | | | | | | | | | |
| 400 | — | — | 397,15 | 402,85 | | | | | | | | | | | |
| 420 | — | — | 416,85 | 423,15 | | | | | | | | | | | |
| 440 | — | — | 436,85 | 443,15 | | | | | | | | | | | |
| 460 | — | — | 456,85 | 463,15 | | | | | | | | | | | |
| 480 | — | — | 476,85 | 483,15 | | | | | | | | | | | |
| 500 | — | — | 496,85 | 503,15 | | | | | | | | | | | |
| a | $k_{w,min} = 0,7 k_{min}$. | | | | | | | | | | | | | | |
| b | Range of preferred lengths between the solid, bold, stepped lines: | | | | | | | | | | | | | | |
| | — for product grade A, above the discontinuous, stepped line; | | | | | | | | | | | | | | |
| | — for product grade B, below this stepped line. | | | | | | | | | | | | | | |

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