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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 18685-2017

Replacing GB/T 18685—2002

The blank diameters for rolling general purpose metric screw threads

用于轧制通用公制螺纹的毛坯直径

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Standardization Administration of the People's Republic of China.

Foreword

This standard has been drafted in accordance with the rules given in GB/T 1.1—2009.

This standard replaces GB/T 18685—2002 The blank diameters for rolling general purpose metric screw threads. Compared with GB/T 18685—2002, apart from editorial changes, the main technical changes are as follows:

— where the blank is machined by a turning process, this standard corrects the blank diameter by

twice the arithmetical mean deviation of the surface roughness profile (2Ra); the 2002 edition corrected the blank diameter by the maximum height of the surface roughness profile (Rz) (see 7.1, and Clause 7, first paragraph, of the 2002 edition);

diameter tolerance be not less than 0.20; for the 11 sizes that do not satisfy this condition the maximum blank diameter of grade 4 thread blanks has been adjusted (the shrinkage factor fT of the pitch diameter at the GO end of the thread ring gauge is not taken into account in the calculation) (M18×2.5, M20×2.5, M22×2.5, M30×3.5, M33×3.5, M36×4, M39×4, M42×4, M45×4, M48×4, M52×4); the condition given in the 2002 edition for the blank diameter tolerance was that it be not less than 0.01 mm, and that edition did not adjust the maximum blank diameter (see Clause 7 and Table 1; A.3 and Table 1 of the 2002 edition);

ring gauge differs from that of the 2002 edition (see A.1; A.1 of the 2002 edition).

This standard was proposed by, and is under the jurisdiction of, the National Technical Committee on Screw Threads of Standardization Administration of China (SAC/TC 108).

Drafting organizations of this standard: Shaoxing Shannai High-Pressure Fastener Co., Ltd.; China Machinery Productivity Promotion Center; AVIC The First Aircraft Institute; China Aero- Polytechnology Establishment.

Main drafters of this standard: Song Weidong, Li Xiaobin, Zhao Huiting, Xu Aling, Ling Yunxia.

The previous editions of the standard replaced by this standard are as follows:

This standard specifies the blank diameter dimensions for general purpose metric screw threads before flat-die rolling and cylindrical-die rolling. The range of nominal thread diameters is 1 mm to 52 mm (diameter series 1 and 2; maximum pitch 4 mm); the thread tolerance classes covered are the five classes 4h, 6h, 6g, 6f and 6e.

This standard applies to general purpose metric screw threads machined by the full-form extrusion process in carbon steel and alloy steel materials.

thread material completely fills the root space of the tool.

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

The terms and definitions given in GB/T 14791 apply to this document.

The formulas for calculating the blank diameters of flat-die rolled and cylindrical-die rolled threads shall conform to the provisions of Annex A.

The limiting dimensions of the blank diameters of general purpose metric screw threads before flatdie rolling and cylindrical-die rolling shall conform to the provisions of Table 1.

The accuracy grade of the flat rolling die or of the circular rolling die shall be selected according to the correspondence between the thread tolerance grade and the tool accuracy grade specified in Table 2.

The dimensions of flat rolling dies and circular rolling dies for general purpose metric screw threads shall conform to the provisions of GB/T 972—2008 and GB/T 971—2008 respectively.

7.1 It is recommended that the blank diameter be machined by drawing or grinding. Where the blank is machined by a turning process, its blank diameter shall be increased, over the value specified in Table 1, by twice the arithmetical mean deviation of the surface roughness profile (2Ra).

7.2 Where the thread is machined by a process other than full-form extrusion, the minimum blank diameter may take a value smaller than that specified in Table 1.

7.3 Where the blank diameter tolerance obtained from the formulas is too small (the ratio of the blank diameter tolerance to the corresponding thread pitch diameter tolerance is less than 0.20), it is recommended to increase the maximum blank diameter by one of the following methods:

maximum blank diameter using the actual pitch error and flank angle error values of the tool used;

(delete the term fT from the formula) and then recalculate the maximum blank diameter.

7.4 Where flat rolling dies, circular rolling dies and thread gauges specified in other standards are used, the blank diameter shall be recalculated according to the parameter accuracies of the corresponding standards.

a When calculating the maximum blank diameter of grade 4 thread blanks of these 11 sizes, the shrinkage of the pitch diameter at the GO end of the new thread ring gauge is not taken into account.

a For threads with a nominal diameter of less than 4 mm, grade 2 accuracy tools are still used for machining. b The use of grade 1 flat rolling dies (GB/T 972—2008) to machine

grade 4 threads is not recommended.

Annex A Blank diameter calculation formulas

d — major diameter of the external thread (nominal diameter) (mm); d2 — pitch diameter of the external thread (mm); d1 — minor diameter of the external thread (mm); d1 = d2 − 2h2,workpiece es — fundamental deviation of the external thread diameter (μm); Td2 — pitch diameter tolerance of the external thread (μm); α — thread profile angle (α = 60°); Δα/2 — flank angle error of the tool thread (′); P — pitch (mm); ΔPΣ — cumulative pitch error of the tool thread (mm); where the value of Δα/2 shall conform to the limit deviations specified in Table 8 of GB/T 971—2008 or in Table 4 of GB/T 972—2008. B — thread length of the GO end of the thread ring gauge (mm);