HG

CHEMICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HG/T 20592-2009

Replacing HG/T 20592-1997

Steel Pipe Flanges

钢制管法兰

(English Translation)

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1 General provisions

1.0.1

This standard specifies the basic technical requirements for steel pipe flanges (PN designated), including nominal size, nominal pressure, materials, pressure-temperature ratings, flange types, dimensions, sealing faces, tolerances and marking.

1.0.2

This standard applies to steel pipe flanges and blind flanges of nominal pressure PN 2.5 to PN 160. The nominal pressure classes of flanges are designated PN and comprise nine classes: PN 2.5, PN 6, PN 10, PN 16, PN 25, PN 40, PN 63, PN 100 and PN 160.

1.0.3

Nominal size and outside diameter of steel pipe

The steel pipe outside diameters covered by this standard form two series, A and B. Series A is the internationally used series (commonly called "inch pipe"), series B the domestically used series (commonly called "metric pipe"). The nominal size DN and the corresponding pipe outside diameters are given in Table 1.0.3. Flanges for series B pipe shall be marked "B" after the nominal size.

3.1 Flange type

3.1.1

The flange type and its code are in accordance with those specified in Figure 3.1.1 and Table 3.1.1.

3.2 Flange seal contact face

3.2.1

The mode and code of the seal contact face of the flange are in accordance with those specified in Figure 3.2.1 and Table 3.2.1. The mode of the seal contact face of the flange includes: raised face (RF), male-female face (MFM), tongue and groove face (TG), flat face (FF) and ring joint face (RJ).

3.2.2

Mode applicability of flange seal contact face types is in accordance with those specified in Table 3.2.2.

3.2.3 Roughness of flange sealing surface

1 The flange seal contact face shall be made with machine work, and the roughness of surface is in accordance with those specified in Table 3.2.3-1. When the flange seal contact face is customer-oriented, it shall be indicated when ordering.

2 The flange seal contact face defects shall not exceed the scope specified in Table 3.2.3-2. The distance between any two adjacent defects shall be more than or equal to 4 times of the maximum radial dimension of the defect, and bulge flange seal contact face defect is not allowed.

Note: Such seal contact face as raised face, male-female face and flat face is a sort of serrate concentric circle or helical tooth groove formed naturally when being processed with processing

cutters. Fillet radius of the processing cutter shall not be less than 1.5mm, while groove depth of the formed serrate concentric circle or helical tooth is about 0.05mm, the pitch is about 0.45~055mm.

Note: 1 The radial projection dimension of the defect is the difference between the maximum radius and minimum radius of the defect away from the flange hole center. 2 h is the groove depth of serrate concentric circle or helical tooth of the flange seal contact face.

3.2.4 Supporting surface of the bolt

1 The supporting surface of the bolt shall be made with machine work or counter boring (fisheye hole). Counter boring dimension is in accordance with those specified in GB/T 152.4, and the parallelism between the supporting surface of the bolt and the seal contact face shall be in accordance with those specified in Table 10.0.1 of this Standard. 2 After the machine work or counter boring on the supporting surface of the bolt, flange thickness shall be ensured to be in accordance with the requirements of dimension tolerance specified in Table 10.0.1 of this Standard. 3 The following flanges adopting B series outside diameter of the steel pipe shall be on the bolt supporting surface of the flange, based on the center of bolt hole, and counter boring face with diameter similar to that listed in Table 3.2.

4.0.4 Stainless steel lining blind flange (BL<S>)

1 The backing layer and blind flange shall be compacted tightly and welding according to the requirements of Figure 4.0.4 and JB/T 4709. The welding material on the fillet weld and plug welding hole bottom layer is adopted according to transition layer welding rod, while the facing welding material is adopted according to welding rod on the capping layer. The plug welding is in accordance with those specified in Table 4.0.4. 3 The maximum allowable working pressure under nominal pressure and working temperature of the Lining Blind Flange (BL<S>) complies with the requirements of Chapter 7 according to Blind Flange (BL) material sorts. While the upper limit for the service temperature of the stainless steel lining blind flange is no greater than 350°C. 4 The Blind Flange (BL) shall be opened with a M6 ventilating hole and gauged orifice, while their positions are set by themselves. After plug welding, let in compressed air with pressure of no greater than 0.1MPa for leak hunting, or gauged orifices with other dimensions may be opened according to the conditions of the manufactory. 5 The thickness tolerance of backing layer thickness t is -1mm. 4.0.5 Unless otherwise specified in this Standard, the materials for pipe flange shall also comply with the requirements of relevant standards and codes. 5.0.1 The gasket shall comply with the sealing property of flange joint under working conditions. Acting by pretension load of bolt, gasket stress under pretension and working conditions shall be ensured, and no deleterious deformation or crush can be generated. 5.0.2 The gasket complies with the requirements of HG/T 20606~HG/T 20612. 5.0.3 The bolting includes hex bolt, double end studs (tamping type), full thread stud and nut, the applied bolt quantity and specification are in accordance with the requirements of Table 8.1.1 shown in this Standard. 5.0.4 The bolting is classified into high strength, medium strength and low strength. The

bolting materials shall be adopted according to the gasket, pressure, temperature, flange and sealing face mode, so as to meet the requirements of the sealing property and bearing strength of flange joint under pretension and working conditions. 5.0.5 The bolting complies with the requirements of HG/T 20613. The fitting between the flange and gasket or bolting complies with the requirements of HG/T 20614. 7.0.1 For the steel pipe flange and blind flange with nominal pressure grade of PN2.5~PN160, the maximum allowable working pressure under working temperature complies with the requirements of Table 7.0.1-1~Table 7.0.1-9. The medium temperature may be determined by interpolation method. 7.0.2 The sorts of pipe flange materials listed in Table 7.0.1-1~Table 7.0.1-9 comply with the requirements of Table 4.0.1 of this Standard. 7.0.

8.1 Flanged coupling dimension

8.1.1

The coupling dimension of the flange complies with the requirements of Figure 8.1.1 and Table 8.1.1 (they are flanges have their different pressure grades within mourning border of table 8.1.1, but they are equipped with same coupling dimension). The domestic and international flanges standards assorted with this Standard may refer to Appendix C of this Standard.

8.1.2 The bolt holes shall be evenly distributed.

4 bolt holes may also be adopted, and they shall be supplied according to the agreement signed between the manufacturer and the purchaser.

The coupling dimensions of PN10~40 and DN80 flange are identical.

8.3 Flange neck

8.3.1

The outer flank slope for the neck of the slip on neck flange, socket welding flange and thread flange shall be no greater than 7°. 8.3.2 The taper neck slope of the weld neck flange shall be no greater than 45°, and it shall also be provided with straight section in slope of no greater than 7°; the sealing end complies with the requirements of Chapter 9 of this Standard. 8.3.3 The neck thickness S of the weld neck flange is generally no less than the nominal thickness of the steel pipe, of which shall be indicated by the user when ordering. S values listed in this Standard are only applicable to the occasions that users are not proposing specific requirements. 8.3.4 The butt welding ring wall thickness S of the butt welding ring loose flange is generally no less than the nominal thickness of the steel pipe, which shall be indicated by the user when ordering. Flanging thickness S1 of the butt welding ring shall be no less than the minimum wall thickness of the steel pipe (0.875S).