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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

GB/T 17185-2012

Replacing GB/T 17185-1997

Steel Flanged Fittings

钢制法兰管件

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Foreword

This Standard was drafted according to the rules specified in GB/T 1.1-2009.

This Standard replaces GB/T 17185-1997, "Steel Pipe Fittings for Flanged Joint". Compared with GB/T 17185-1979, this Standard has the main technical changes as follows:

- ADJUST the standard structure dimension; DELETE the dimension data of PN11.0, PN15.0 and PN26.0 according to ASME B16.5:2009;
- REVISE the nominal pressures of PN2.0 and PN5.0 TO Class 150 and Class 300, and ADJUST the specific dimension values such as the distance between end surfaces of the reducing joint etc.;
- MODIFY the categories and designations of steel flanged fittings;
- ADD the related technical specifications of reducing fittings;
- ADD the materials of steel flanged fittings;
- MODIFY the mark and its contents.

This Standard is modified in relation to flanged fittings in ASME B16.5:2009 "Pipe Flanges and Flanged Fittings", and the types, dimensions and technical requirements are basically consistent with those specified in ASME B16.5:2009.

This Standard is proposed by China Machinery Industry Federation.

This Standard is under the jurisdiction of China State Technical Committee for Standardization of Pipe Fittings (SAC/TC 237).

Drafting organizations of this Standard: China Productivity Center for Machinery, East China Design Branch of China Petroleum Engineering Construction Corporation, China Tianchen Engineering Corporation, Jintong Petrochemical Pipe Fittings Co., Ltd. (Jiang Yin), Huzhou Jiuli Pipe Fittings Co., Ltd., Yangzhou Pipe Fitting Factory Co., Ltd.

Main drafters of this Standard: Feng Feng, Liu Hongfu, Liu Jianxin, Yang Lijian, Yao Minghua, Zhou Jiafeng, Li Junying.

The previous edition of the standard replaced by this standard is as:

- GB/T 17185-1997.

Steel Flanged Fittings

1 Scope

This Standard specifies the category and designation, dimensions and tolerances, technical requirements, hydrostatic test, inspection mark and package of the class-designated steel flanged fittings.

This Standard is applicable to the steel flanged fittings with the nominal pressures of Class 150 and Class 300.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 9113-2010 Integral Steel Pipe Flanges

GB/T 9124-2010 Specification for Steel Pipe Flanges

3 Expression method of designation

The categories and designations of steel flanged fittings are as those specified in Table 1.

Table 1 Categories and Designations of Steel Flanged Fittings

Variety	Category	Designation
45° elbow	Straight	F45ES
	Reducing	F45ER
90° elbow	Straight	F90ES
	Reducing	F90ER
	Straight long radius	F90ELS
	Reducing long radius	F90ELR
Tee	Straight	FTS
	Reducing	FTR
Cross	Straight	FCRS

Table 2 Dimensions of Class 150 Steel Flanged Fittings

In mm

Nominal dimensions		Minimum wall thickness t_m^a	Inner diameter d	Raised face						Ring joint face					
NPS	DN			Distance between the center and joint face of the elbow, tee and cross A	Distance between the center and joint face of the long radius elbow B	Distance between the center and joint face of 45° elbow C	Distance between the long center and joint face of the lateral tee E	Distance between the short center and joint face of the lateral tee F	Distance between joint faces of the reducing joint G	Distance between the center and end of the elbow, tee and cross A	Distance between the center and end of the long radius elbow B	Distance between the center to end face of 45° elbow C	Distance between the long center and end face of the lateral tee E	Distance between the short center and end face of the lateral tee F	Distance between end faces of a reducing joint G
1	25	4.0	25	89	127	44	146	44	114	95	133	51	152	51	127
1 1/4	32	4.8	32	95	140	51	159	44	114	102	146	57	165	51	127
1 1/2	40	4.8	38	102	152	57	178	51	114	108	159	64	184	57	127
2	50	5.6	51	114	165	64	203	64	127	121	171	70	210	70	140
2 1/2	65	5.6	64	127	178	76	241	64	140	133	184	83	248	70	153
3	80	5.6	76	140	197	76	254	76	152	146	203	83	260	70	165
4	100	6.4	102	165	229	102	305	76	178	171	235	108	311	83	191
5	125	7.1	127	190	260	114	343	89	203	197	267	121	349	95	216
6	150	7.1	152	203	292	127	368	89	229	210	398	133	375	95	242
8	200	7.9	203	229	356	140	444	114	279	235	362	146	451	121	292

12	300	14.3	305	330	483	203	698	152	356	338	491	211	706	160	372
14	350	15.9	337	381	546	216	787	165	406	389	554	224	795	173	422
16	400	17.5	387	419	610	241	876	190	457	427	618	249	884	198	473
18	450	19.0	432	457	673	254	952	203	483	465	681	262	960	211	499
20	500	20.6	483	495	737	267	1029	216	508	505	746	276	1038	225	527
24	600	23.8	584	572	864	305	1206	254	610	583	875	316	1218	285	632

^a The thicknesses are those specified in the standard for the outside diameter and wall thickness of pipe, GB/T 9124-2010, corresponding to STD. If the user does not have special ordering requirements, the pipes with such wall thicknesses are to be supplied. The additional wall thicknesses needed to be added due to the stress, non-round shape and stress concentration generated by the fastening bolt during assembly shall be determined by the manufacturer.

Partial wall thickness is allowed to be less than the minimum wall thickness provided that the following conditions are met:

- The part with smaller wall thickness is closed within the range of circumference whose diameter does not exceed $\sqrt{dt_m}$;
- The measured thickness $\geq 0.75t_m$;
- The interval between close circles in which the part with smaller wall thickness locates $> 1.75\sqrt{dt_m}$.

mechanical property and heat treating system shall meet the corresponding standard provisions specified in Table 2 of GB/T 9124-2010. For other requirements, refer to those specified in Chapter 3 in GB/T 9124-2010.

5.1.3 All the raw materials of flanged fittings must be provided with the material manufacturer's quality certification or other copies, and acceptance is carried out for steels in accordance with the certificate. If necessary, re-inspection shall also be carried out for steels and only those pass such inspection may be used.

5.2 Surface quality

All the finished fittings surfaces shall be free from defects such as crack, interlayer, slag inclusion and oxide skin; the casting fittings surfaces shall be free from defects such as crack, pore, cold shut and sand burning which have no effect on the using.

5.3 Surface treatment

5.3.1 De-rusting shall be carried out for internal and external surfaces of carbon steel alloy-steel pipe fittings, and antirust paint is coated. As for the casting fittings, shot peening shall be carried out, if necessary.

5.3.2 Acid cleaning and passivation shall be conducted for fittings made of austenitic stainless steel.

5.4 Pressure/temperature ratings

The pressure/temperature ratings of steel flanged fittings shall meet the requirements for flanges in 4.2 of GB/T 9124-2010. If the pressure/temperature rating of flanges for a reducing fitting differs, it shall be determined by the flange with lowest rating among them.

5.5 Mark

The 45° straight elbow with the nominal dimension of NPS4 (DN 100), the nominal pressure of Class 150 and made of WCB is marked as:

F45ES NPS4 (or DN100)-Class150 WCB GB/T 17185-2012

The concentric reducing joint with the nominal dimension of NPS4x2 (DN100x50), the nominal pressure of Class 300 and made of ZG12Cr2Mo1G is marked as:

FRC NPS4x2 (or DN100x50)-Class300 ZG12Cr2Mo1G GB/T 17185-2012

6 Hydraulic Test

6.1 The hydraulic test shall be conducted for the enclosure of each steel flanged

testing or other inspection items may be added according to the user requirements and during order. However, the inspection items shall be noted in the contract through negotiation between the supplier and the purchaser.

As for the finished fittings, other inspection items such as chemical composition, mechanical performance, hydraulic test and intergranular corrosion test may be added according to the user requirements and during order. But the inspection items must be noted in the contract based on the agreement of both the supplier and the purchaser.

8 Mark

The finished flanged fittings made of steels shall be sprayed or printed with endurance marks at an conspicuous position, and the words shall be clear and complete; mark shall include:

- a) Manufacturer name or trademark;
- b) Code number of this standard;
- c) Type code of flange;
- d) The nominal dimension;
- e) Nominal pressure;
- f) Material designation or code.

Other marks required by the contract.

9 Package

9.1 The antirust oil shall be sprayed for the finished fittings after de-rusting, and protective measures shall be properly taken for the flange joint face to prevent it from scratch, impact and damage.

9.2 The finished fittings shall be packed separately according to the steel grade and specification and based on the contract requirements, and moisture-proof measures shall be taken.

9.3 The packing box shall be provided with the product packing list and product quality certificate wrapped by plastic bag. The box with finished products shall be stored in dry rooms, and shall not be stored in the open air.

9.4 The packing list of products includes:

- a) The manufacturer name;
- b) The manufacturing number and date;
- c) The product name, specification, quantity and net weight;
- d) The ordering unit and contract number.

The names and copy numbers of enclosing documents.

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