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# 中华人民共和国国家标准

GB 10745~10751-89  
GB 2501~2508-89

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## 船 用 法 兰 (四 进 位)

Marine pipe flanges

1989-03-31 发布

1989-12-01 实施

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国家技术监督局 发布

船用法兰连接尺寸和密封面  
(四进位)

GB 2501—89

代替 GB 2501—81

Marine pipe flanges—Connection  
dimensions and mating face

本标准参照采用国际标准ISO 2084—1974《一般用途管道法兰——公制系统——配合尺寸》和ISO 2441—1975《一般用途管道法兰——密封面的形状和尺寸》。

1 主题内容与适用范围

本标准规定了船用法兰连接尺寸和密封面。

本标准适用于船舶管路公称压力不大于6.4MPa，公称通径为10~2000mm的一般用途的各种管路法兰连接尺寸和密封面形状及尺寸。

本标准亦适用于船用设备与管子或附件相连接的法兰。

2 代号

$D_N$ ——公称通径，mm；

$D$ ——法兰外径，mm；

$D_1$ ——螺栓孔中心圆直径，mm；

$d_g$ ——螺栓孔直径，mm；

$T_h$ ——螺栓的螺纹直径，mm；

$P_N$ ——公称压力，MPa；

$n$ ——螺栓孔数，个。

3 圆形法兰连接尺寸按图1和表1。

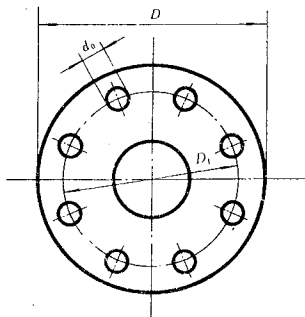


图1

表 1

mm

| 公称通径<br>$D_N$ | 公称压力 $P_N$ , MPa |       |       |     |     |      |       |     |     |     |      |       |       |     |     |
|---------------|------------------|-------|-------|-----|-----|------|-------|-----|-----|-----|------|-------|-------|-----|-----|
|               | 0.25             |       |       |     |     | 0.6  |       |     |     |     | 1.0  |       |       |     |     |
|               | $D$              | $D_1$ | $d_0$ | Th  | $n$ | $D$  | $D_1$ | $d$ | Th. | $n$ | $D$  | $D_f$ | $d_0$ | Th. | $n$ |
| 10            |                  |       |       |     |     | 75   | 50    |     |     |     |      |       |       |     |     |
| 15            |                  |       |       |     |     | 80   | 55    | 11  | M10 |     |      |       |       |     |     |
| 20            |                  |       |       |     |     | 90   | 65    |     |     |     |      |       |       |     |     |
| 25            |                  |       |       |     |     | 100  | 75    |     |     | 4   |      |       |       |     |     |
| 32            |                  |       |       |     |     | 120  | 90    |     |     |     |      |       |       |     |     |
| 40            |                  |       |       |     |     | 130  | 100   | 14  | M12 |     |      |       |       |     |     |
| 50            |                  |       |       |     |     | 140  | 110   |     |     |     |      |       |       |     |     |
| 65            |                  |       |       |     |     | 160  | 130   |     |     |     |      |       |       |     |     |
| 80            |                  |       |       |     |     | 190  | 150   |     |     |     |      |       |       |     |     |
| 100           |                  |       |       |     |     | 210  | 170   |     |     |     |      |       |       |     |     |
| 125           |                  |       |       |     |     | 240  | 200   |     |     |     |      |       |       |     |     |
| 150           |                  |       |       |     |     | 265  | 225   | 18  | M16 | 8   |      |       |       |     |     |
| 175           |                  |       |       |     |     | 295  | 255   |     |     |     |      |       |       |     |     |
| 200           |                  |       |       |     |     | 320  | 280   |     |     |     |      |       |       |     |     |
| 225           |                  |       |       |     |     | 345  | 305   |     |     |     | 340  | 295   |       |     |     |
| 250           |                  |       |       |     |     | 375  | 335   |     |     |     | 370  | 325   |       |     | 8   |
| 300           |                  |       |       |     |     | 440  | 395   |     |     | 12  | 395  | 350   | 22    | M20 | 12  |
| 350           |                  |       |       |     |     | 490  | 445   |     |     |     | 445  | 400   |       |     |     |
| 400           |                  |       |       |     |     | 540  | 495   | 22  | M20 | 16  | 505  | 460   |       |     | 16  |
| 450           |                  |       |       |     |     | 595  | 550   |     |     |     | 565  | 515   | 26    | M24 |     |
| 500           |                  |       |       |     |     | 645  | 600   |     |     | 20  | 615  | 565   |       |     | 20  |
| 600           |                  |       |       |     |     | 755  | 705   | 26  | M24 | 24  | 670  | 620   |       |     |     |
| 700           |                  |       |       |     |     | 860  | 810   |     |     |     | 780  | 725   | 30    | M27 |     |
| 800           |                  |       |       |     |     | 975  | 920   |     |     |     | 895  | 840   |       |     | 24  |
| 900           |                  |       |       |     |     | 1075 | 1020  | 30  | M27 | 28  | 1015 | 950   | 33    | M30 |     |
| 1000          |                  |       |       |     |     | 1175 | 1120  |     |     |     | 1115 | 1050  |       |     | 28  |
| 1200          | 1375             | 1320  |       |     | 32  | 1405 | 1340  | 33  | M30 | 32  | 1230 | 1160  | 36    | M33 |     |
| 1400          |                  |       |       |     |     |      |       |     |     |     | 1455 | 1350  | 39    | M36 | 32  |
| 1600          | 1575             | 1520  |       |     | 36  | 1630 | 1560  | 36  | M33 | 36  | 1675 | 1590  | 42    | M39 | 36  |
| 1800          | 1790             | 1730  | 30    | M27 | 40  | 1830 | 1760  |     |     | 40  | 1915 | 1820  |       |     | 40  |
| 2000          | 1990             | 1930  |       |     | 44  | 2045 | 1970  | 39  | M36 | 44  | 2115 | 2020  | 48    | M45 | 44  |
| 2000          | 2190             | 2130  |       |     | 48  | 2265 | 2180  | 42  | M39 | 48  | 2325 | 2230  |       |     | 48  |

续表 1

mm

| 公称<br>直径<br>$D_N$ | 公称压力 $P_N$ , MPa |       |       |     |     |             |       |       |     |     |     |       |       |     |     |     |       |       |     |     |     |     |    |     |  |
|-------------------|------------------|-------|-------|-----|-----|-------------|-------|-------|-----|-----|-----|-------|-------|-----|-----|-----|-------|-------|-----|-----|-----|-----|----|-----|--|
|                   | 1.6              |       |       |     |     | 2.5         |       |       |     |     | 4.0 |       |       |     |     | 6.4 |       |       |     |     |     |     |    |     |  |
|                   | $D$              | $D_1$ | $d_0$ | Th  | $n$ | $D$         | $D_1$ | $d_0$ | Th  | $n$ | $D$ | $D_1$ | $d_0$ | Th  | $n$ | $D$ | $D_1$ | $d_0$ | Th  | $n$ |     |     |    |     |  |
| 10                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 90  | 60    |       |     |     | 100 | 70    | 14    | M12 |     |     |     |    |     |  |
| 15                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 95  | 65    |       |     |     | 105 | 75    |       |     |     |     |     |    |     |  |
| 20                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 105 | 75    | 14    | M12 | 4   | 130 | 90    |       | 18  | M16 | 4   |     |    |     |  |
| 25                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 115 | 85    |       |     |     | 140 | 100   |       |     |     |     |     |    |     |  |
| 32                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 140 | 100   |       |     |     | 155 | 110   |       |     |     |     |     |    |     |  |
| 40                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 150 | 110   |       |     |     | 170 | 125   |       |     |     |     |     |    |     |  |
| 50                | 按 $P_N 4.0$      |       |       |     |     |             |       |       |     |     | 165 | 125   | 18    | M16 |     | 180 | 135   |       | 22  | M20 |     |     |    |     |  |
| 65                | 185              | 145   | 18    | M16 | 4   | 按 $P_N 4.0$ |       |       |     |     |     |       |       |     |     | 185 | 145   |       |     |     | 205 | 160 |    |     |  |
| 80                | 按 $P_N 4.0$      |       |       |     |     | 按 $P_N 4.0$ |       |       |     |     |     |       |       |     |     | 200 | 160   |       |     |     | 215 | 170 |    |     |  |
| 100               | 220              | 180   | 18    | M16 |     | 按 $P_N 4.0$ |       |       |     |     |     |       |       |     |     | 220 | 180   | 22    | M20 | 8   | 250 | 200 | 26 | M24 |  |
| 125               | 250              | 210   |       |     | 8   | 按 $P_N 4.0$ |       |       |     |     |     |       |       |     |     | 270 | 220   | 26    | M24 |     | 295 | 240 | 30 | M27 |  |
| 150               | 285              | 240   |       |     |     | 按 $P_N 4.0$ |       |       |     |     |     |       |       |     |     | 300 | 250   |       |     |     | 345 | 280 |    |     |  |
| 175               | 315              | 270   | 22    | M20 |     | 330         | 280   | 26    | M24 |     | 350 | 295   | 30    | M27 |     | 375 | 310   |       |     |     | 33  | M30 |    |     |  |
| 200               | 340              | 295   |       |     |     | 360         | 310   |       |     | 12  | 375 | 320   |       |     |     | 415 | 345   |       |     |     |     |     | 12 |     |  |
| 225               | 370              | 325   |       |     |     | 395         | 340   |       |     |     | 420 | 355   |       |     |     | 440 | 370   |       |     |     |     |     |    |     |  |
| 250               | 405              | 355   | 26    | M24 | 12  | 425         | 370   | 30    | M27 |     | 450 | 385   | 33    | M30 |     | 470 | 400   |       |     |     | 36  | M33 |    |     |  |
| 300               | 460              | 410   |       |     |     | 485         | 430   |       |     |     | 515 | 450   |       |     |     | 530 | 460   |       |     |     |     |     |    |     |  |
| 350               | 520              | 470   |       |     |     | 555         | 490   | 33    | M30 | 16  | 580 | 510   | 36    | M33 | 16  | 600 | 525   | 39    | M36 |     | 39  | M36 | 16 |     |  |
| 400               | 580              | 525   | 30    | M27 |     | 620         | 550   |       |     |     | 660 | 585   | 39    | M36 |     | 670 | 585   | 42    | M39 |     | 42  | M39 |    |     |  |
| 450               | 640              | 585   |       |     |     | 670         | 600   | 36    | M33 |     | 685 | 610   |       |     | 20  | 715 | 630   |       |     |     |     |     | 20 |     |  |
| 500               | 715              | 650   | 33    | M30 | 20  | 730         | 660   |       |     | 20  | 755 | 670   | 42    | M39 |     | 800 | 705   | 48    | M45 |     | 48  | M45 |    |     |  |
| 600               | 840              | 770   | 36    | M33 |     | 845         | 770   | 39    | M36 |     | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 700               | 910              | 840   |       |     |     | 960         | 875   | 42    | M39 |     | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 800               | 1025             | 950   |       |     | 24  | 1085        | 990   |       |     | 24  | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 900               | 1125             | 1050  | 39    | M36 |     | 1185        | 1090  | 48    | M45 |     | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 1 000             | 1255             | 1170  | 42    | M39 | 28  | 1320        | 1210  | 56    | M52 | 28  | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 1 200             | 1485             | 1390  |       |     | 32  | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 1 400             | 1685             | 1590  | 48    | M45 |     | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 1 600             | 1930             | 1820  |       |     | 36  | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 1 800             | 2130             | 2020  | 56    | M52 | 40  | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
| 2 000             | 2345             | 2230  | 62    | M56 | 44  | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |
|                   |                  |       |       |     | 48  | —           | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —     | —     | —   | —   | —   | —   | —  |     |  |

4 扁圆形法兰连接尺寸按图 2 和表 2。

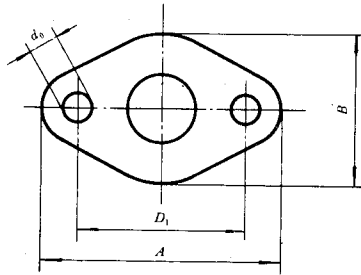


图 2  
表 2

mm

| 公称通径<br>$D_N$ | 公称压力 $P_N = 0.6 \text{ MPa}$ |     |       |       |     |
|---------------|------------------------------|-----|-------|-------|-----|
|               | $A$                          | $B$ | $D_1$ | $d_0$ | T h |
| 10            | 75                           | 40  | 50    | 11    | M10 |
| 15            | 80                           | 45  | 55    |       |     |
| 20            | 90                           | 64  | 65    |       |     |
| 25            | 100                          | 72  | 75    | 14    | M12 |
| 32            | 118                          | 85  | 90    |       |     |
| 40            | 132                          | 95  | 100   |       |     |

5 法兰密封面凸面形状和尺寸按图 3 和表 3。

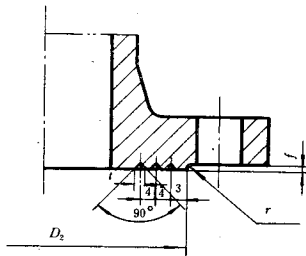


图 3

表 3

mm

| 公称通径<br>$D_N$ | 公称压力 $P_N$ , MPa      |       |       |     |       |     |     | $f^{1)}$ | $r_{min}^{2)}$ | $f$ | 槽数 |  |
|---------------|-----------------------|-------|-------|-----|-------|-----|-----|----------|----------------|-----|----|--|
|               | 0.25                  | 0.6   | 1.0   | 1.6 | 2.5   | 4.0 | 6.4 |          |                |     |    |  |
|               | 公称压力 $P_N$ 下的直径 $D_2$ |       |       |     |       |     |     |          |                |     |    |  |
| 10            | 35                    |       | 42    |     | 42    |     |     | 2        | 1              | 1   |    |  |
| 15            | 40                    |       | 47    |     | 47    |     |     |          |                |     |    |  |
| 20            | 50                    |       | 58    |     | 58    |     |     |          |                |     |    |  |
| 25            | 60                    |       | 68    |     | 68    |     |     | 3        | 1.5            | 2   |    |  |
| 32            | 70                    |       | 78    |     | 78    |     |     |          |                |     |    |  |
| 40            | 80                    |       | 88    |     | 88    |     |     |          |                |     |    |  |
| 50            | 90                    |       | 102   |     | 102   |     |     |          |                |     |    |  |
| 65            | 110                   |       | 122   |     | 122   |     |     |          |                |     |    |  |
| 80            | 128                   |       | 133   |     | 133   |     |     |          |                |     |    |  |
| 100           | 148                   |       | 158   |     | 158   |     |     | 4        | 2              | 3   |    |  |
| 125           | 178                   |       | 184   |     | 184   |     |     |          |                |     |    |  |
| 150           | 202                   |       | 212   |     | 212   |     |     |          |                |     |    |  |
| 175           | 232                   |       | 242   |     | 242   |     |     | 5        | 2.5            | 4   |    |  |
| 200           | 258                   |       | 268   |     | 278   | 285 |     |          |                |     |    |  |
| 225           | 282                   |       | 295   |     | 305   | 315 |     |          |                |     |    |  |
| 250           | 312                   |       | 320   |     | 335   |     | 345 |          | 5              | 2.5 | 4  |  |
| 300           | 365                   |       | 370   |     | 390   |     | 410 |          |                |     |    |  |
| 350           | 415                   |       | 430   |     | 450   |     | 465 |          |                |     |    |  |
| 400           | 465                   |       | 482   |     | 505   |     | 535 |          | 5              | 2.5 | 5  |  |
| 450           | 520                   |       | 532   |     | 555   |     | 560 |          |                |     |    |  |
| 500           | 570                   |       | 585   |     | 615   |     | 615 |          |                |     |    |  |
| 600           | 670                   |       | 685   |     | 720   |     | — — |          | 5              | 2.5 | 5  |  |
| 700           | 775                   |       | 800   |     | 820   |     | — — |          |                |     |    |  |
| 800           | 880                   |       | 905   |     | 930   |     | — — |          |                |     |    |  |
| 900           | 980                   |       | 1 005 |     | 1 030 |     | — — |          | 5              | 2.5 | 4  |  |
| 1 000         | 1 080                 |       | 1 110 |     | 1 140 |     | — — |          |                |     |    |  |
| 1 200         | 1 280                 | 1 295 | 1 330 |     | — —   |     | — — |          |                |     |    |  |
| 1 400         | 1 480                 | 1 510 | 1 530 |     | — —   |     | — — |          | 5              | 2.5 | 5  |  |
| 1 600         | 1 690                 | 1 710 | 1 750 |     | — —   |     | — — |          |                |     |    |  |
| 1 800         | 1 890                 | 1 920 | 1 950 |     | — —   |     | — — |          |                |     |    |  |
| 2 000         | 2 090                 | 2 125 | 2 150 |     | — —   |     | — — |          |                |     |    |  |

注：1)  $f$  尺寸是最大值。2) 可以用  $45^\circ$  倒角代替半径  $r$ 。

## 6 法兰密封面榫槽面形状和尺寸按图 4 和表 4。

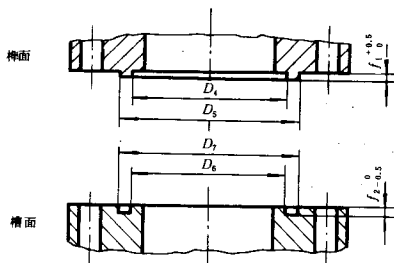


图 4

表 4

mm

| 公称通径<br>$D_N$ | 公称压力 $P_N = 4.0, 6.4 \text{ MPa}$ |       |       |       |       |       |
|---------------|-----------------------------------|-------|-------|-------|-------|-------|
|               | $D_4$                             | $D_5$ | $D_6$ | $D_7$ | $f_1$ | $f_2$ |
| 10            | 24                                | 34    | 23    | 35    | 4     | 3     |
| 15            | 29                                | 39    | 28    | 40    |       |       |
| 20            | 36                                | 50    | 35    | 51    |       |       |
| 25            | 43                                | 57    | 42    | 58    |       |       |
| 32            | 51                                | 65    | 50    | 66    |       |       |
| 40            | 61                                | 75    | 60    | 76    |       |       |
| 50            | 73                                | 87    | 72    | 88    |       |       |
| 65            | 95                                | 109   | 94    | 110   |       |       |
| 80            | 106                               | 120   | 105   | 121   |       |       |
| 100           | 129                               | 149   | 128   | 150   |       |       |
| 125           | 155                               | 175   | 154   | 176   |       |       |
| 150           | 183                               | 203   | 182   | 204   |       |       |
| 175           | 213                               | 233   | 212   | 234   |       |       |
| 200           | 239                               | 259   | 238   | 260   |       |       |
| 225           | 266                               | 286   | 265   | 287   |       |       |
| 250           | 292                               | 312   | 291   | 313   |       |       |
| 300           | 343                               | 363   | 342   | 364   | 5     | 4     |
| 350           | 395                               | 421   | 394   | 422   |       |       |
| 400           | 447                               | 473   | 446   | 474   |       |       |
| 450           | 497                               | 523   | 496   | 524   |       |       |
| 500           | 549                               | 575   | 548   | 576   |       |       |

## 附加说明:

本标准由中国船舶工业总公司六〇三所提出。

本标准由中华造船厂归口。

本标准由中华造船厂负责起草。

本标准主要起草人俞伟海、孙镜明、吴绍曾。