

## 钢管公称直径与内、外径的关系对照

### 1. 总则

1.0.1 本标准规定了石油化工企业用DN10-DN2000的碳钢素钢、合金钢、奥氏体不锈钢无缝钢管及焊接钢管的尺寸系列。

10.2 本标准适用于石油化工企业中的一般钢制管道。本标准不适用于仪表用管道。

1.0.3 本标准代替《钢管的公称直径、外径和壁厚》（BA3-4-1-92）。

### 2. 引用标准

GB8163 输送液体用无缝钢管

GB9948 石油裂化用无缝钢管

GB6479 化肥设备用高压无缝钢管

GB5130 高压锅炉用无缝钢管

GB/T14976 流体输送用不锈钢无缝钢管

GB/T3091 低压流体输送用镀锌焊接钢管

GB/T3092 低压流体输送用焊接钢管

GB/T14980 低压流体输送用大直径电焊钢管

SY/T5037 普通流体输送管道用螺旋埋弧焊钢管

SH3405 石油化工企业钢管尺寸系列

GB3274 普通碳素结构钢和低合金结构钢热轧厚钢板技术条件

GB912 普通碳素结构钢和低合金结构钢薄钢板技术条件

GB6654 压力容器用碳素钢和低合金钢厚钢板

GB3531 低温压力容器用低合金厚钢板技术条件

GB5681 压力容器用热轧钢带

GB711 优质碳结构钢热轧厚钢板和宽钢带

GB713 锅炉用碳素钢和低合金钢板

GB3280 不锈钢冷轧钢板

GB/T4237 不锈钢热轧钢板

GB4238 耐热钢板

执行本标准时，尚应符合上述相关标准的要求。

### 3. 一般规定

3.0.1 中国石油化工总公司标准SH3045-96《石油化工企业钢管尺寸系列》已颁布代替SHJ405-89并开始实施。考虑国内目前钢管及管道法兰组件生产和供应的实际情

况。全部执行该标准尚有一定困难。本标准基本按照SH3405-96的规定，但作了若干修改，主要有：

a) 公称直径DN350~DN1000钢管的外径仍按我院现行规定编制，以便于与机械部法兰（JB/T81-94~JB/T86-94）配套连接。

b) 考虑到在老厂改造设计中仍有可能选用小外径钢管，本标准补充列入了外径钢管系列，但不推荐选用。

c) 本标准列出了中国石化总公司标准《石油化工企业钢管尺寸系列》（SH3405-96），当选用该系列时，DN≥350须选用与SH相配套的的法兰、管件、紧固件和垫片系列。DN≤300可选用SH标准，也可选用其他相配套的标准。

d) 表4.0.1~表4.0.4中DN≤300的钢管尺寸，亦可与国外某些标准（例如ANSI标准）配套使用。但如果管子为国外订货，则其外径和壁厚应符合国外有关标准。

3.0.2 有缝钢管DN6~DN150按《低压流体输送用镀锌焊接钢管》（GB/T3091-93）和《低压流体输送用焊接钢管》（GB/T3092-93）选用。DN150~500按《低压流体输送用大直径电焊钢管》（GB/T14980-94）选用。

#### 4. 钢管尺寸系列

4.0.1 奥氏体不锈钢无缝钢管尺寸和理论质量见表4.0.1。

4.0.2 碳素钢、合金钢无缝钢管的尺寸和理论质量见表4.0.2。

4.0.3 奥氏体不锈钢焊接钢管的尺寸和理论质量见表4.0.3。

4.0.4 碳素钢、合金钢焊接钢管的尺寸和理论质量见表4.0.4。

4.0.5 小外径系列碳素钢、合金钢、奥氏体不锈钢无缝钢管的尺寸和理论质量见表4.0.5。

4.0.6 有缝钢管的尺寸和理论质量见表4.0.6.1表4.0.6.2表4.0.6.3。

4.0.7 中国石化总公司标准SH3046的钢管尺寸系列见附录A。

4.0.8 钢管的每米理论质量可按下式计算：

$$M=0.02466t(D-t) \dots\dots\dots (4.0.8)$$

式中：

M……钢管质量，kg/m

t……钢管壁厚，mm

D……钢管外径，mm

对于奥氏体不锈钢钢管，按上式计算后再乘以1.015。精确计算时，各种奥氏体钢的密度见GB/T14976-94中的表5。

表4.0.1 奥氏体不锈钢无缝钢管尺寸和理论质量

| 公称<br>直径<br>DN | 外径<br>mm | 壁厚及理论质量 |       |        |       |        |       |        |       |        |       |
|----------------|----------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
|                |          | sch5s   |       | sch10s |       | sch20s |       | sch40s |       | sch80s |       |
|                |          | mm      | kg/m  | mm     | kg/m  | mm     | kg/m  | mm     | kg/m  | mm     | kg/m  |
| 10             | 17       | 1.2     | 0.47  | 1.6    | 0.62  | 2.0    | 0.75  | 2.5    | 0.91  | 3.2    | 1.11  |
| 15             | 22       | 1.6     | 0.82  | 2.0    | 1.00  | 2.5    | 1.22  | 3.0    | 1.43  | 4.0    | 1.80  |
| 20             | 27       | 1.6     | 1.02  | 2.0    | 1.25  | 2.5    | 1.53  | 3.0    | 1.80  | 4.0    | 2.30  |
| 25             | 34       | 1.6     | 1.30  | 2.8    | 2.19  | 3.0    | 2.33  | 3.5    | 2.67  | 4.5    | 3.32  |
| (32)           | 42       | 1.6     | 1.62  | 2.8    | 2.75  | 3.0    | 2.93  | 3.5    | 3.37  | 5.0    | 4.63  |
| 40             | 48       | 1.6     | 1.86  | 2.8    | 3.17  | 3.0    | 3.38  | 4.0    | 4.41  | 5.0    | 5.38  |
| 50             | 60       | 1.6     | 2.34  | 2.8    | 4.01  | 3.5    | 4.95  | 4.0    | 5.61  | 5.5    | 7.50  |
| (65)           | 76       | 2.0     | 3.70  | 3.0    | 5.48  | 3.5    | 6.35  | 5.0    | 8.89  | 7.0    | 12.09 |
| 80             | 89       | 2.0     | 4.36  | 3.0    | 6.46  | 4.0    | 8.51  | 5.5    | 11.50 | 7.5    | 15.30 |
| 100            | 114      | 2.0     | 5.61  | 3.0    | 8.33  | 4.0    | 11.01 | 6.0    | 16.22 | 8.5    | 22.45 |
| (125)          | 140      | 2.8     | 9.62  | 3.5    | 11.96 | 5.0    | 16.90 | 6.5    | 21.72 | 9.5    | 31.03 |
| 150            | 168      | 2.8     | 11.58 | 3.5    | 14.41 | 5.0    | 20.40 | 7.0    | 28.21 | 11.0   | 43.23 |
| 200            | 219      | 2.8     | 15.15 | 4.0    | 21.53 | 6.5    | 34.57 | 8.0    | 42.25 | 13.0   | 67.03 |
| 250            | 273      | 3.5     | 23.61 | 4.0    | 26.93 | 6.5    | 43.36 | 9.5    | 62.66 | 15.0   | 96.87 |
| 300            | 325      | 4.0     | 32.13 | 4.5    | 36.10 | 6.5    | 51.82 | 9.5    | 75.02 | 17.0   | 131.0 |
| 350            | 377      | 4.0     | 37.34 | 5.0    | 46.56 |        |       |        |       |        | 6     |
| 400            | 426      | 4.5     | 47.48 | 5.0    | 52.69 |        |       |        |       |        |       |

注：

- ①公称壁厚超过sch80s的不锈钢钢管按表4.0.2选手；
- ②粗实线以下的数据已超过我国现行的钢管标准的规格范围；
- ③带括号者不推荐使用。

|                                                                                                                   |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                  |   |   |     |
|-------------------------------------------------------------------------------------------------------------------|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------|---|---|-----|
| <div></div> <div>中国石化北京设计院</div> | 工 程 标 准       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 标准号：BA3-4-1-1997 |   |   |     |
|                                                                                                                   | 钢管的公称直径、外径和壁厚 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                  |   |   |     |
|                                                                                                                   |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 日期               | 年 | 月 | 日   |
|                                                                                                                   |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 共                | 页 | 第 | 5 页 |

表 4.0.2

碳素钢、合金钢无缝钢管的尺寸和理论质量

| 公称<br>直径<br>DN | 外 径<br>mm | 壁厚及理论质量 |        |       |        |       |        |       |        |       |        |        |        |        |        |        |        |        |        |      |        |
|----------------|-----------|---------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|
|                |           | sch20   |        | sch30 |        | sch40 |        | sch60 |        | sch80 |        | sch100 |        | sch120 |        | sch140 |        | sch160 |        | xxs  |        |
|                |           | mm      | kg/m   | mm    | kg/m   | mm    | kg/m   | mm    | kg/m   | mm    | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   | mm   | kg/m   |
| 10             | 17        |         |        |       |        | 2.5   | 0.89   |       |        | 3.5   | 1.17   |        |        |        |        |        |        |        |        |      |        |
| 15             | 22        |         |        |       |        | 3.0   | 1.41   |       |        | 4.0   | 1.78   |        |        |        |        |        |        | 5.0    | 2.10   | 7.5  | 2.68   |
| 20             | 27        |         |        |       |        | 3.0   | 1.78   |       |        | 4.0   | 2.27   |        |        |        |        |        |        | 5.5    | 2.92   | 8.0  | 3.75   |
| 25             | 34        |         |        |       |        | 3.5   | 2.63   |       |        | 4.5   | 3.27   |        |        |        |        |        |        | 6.5    | 4.41   | 9.0  | 5.55   |
| (32)           | 42        |         |        |       |        | 3.5   | 3.33   |       |        | 5.0   | 4.56   |        |        |        |        |        |        | 6.5    | 5.69   | 10.0 | 7.89   |
| 40             | 48        |         |        |       |        | 4.0   | 4.34   |       |        | 5.0   | 5.30   |        |        |        |        |        |        | 7.0    | 7.08   | 10.0 | 9.37   |
| 50             | 60        | 3.5     | 4.88   |       |        | 4.0   | 5.52   | 5.0   | 6.78   | 5.5   | 7.39   |        |        | 7.0    | 9.15   |        |        | 8.5    | 10.79  | 11.0 | 13.29  |
| (65)           | 76        | 4.5     | 7.93   |       |        | 5.0   | 8.75   | 6.0   | 10.36  | 7.0   | 11.91  |        |        | 8.0    | 13.42  |        |        | 9.5    | 15.58  | 14.0 | 21.40  |
| 80             | 89        | 4.5     | 9.38   |       |        | 5.5   | 11.33  | 6.5   | 13.22  | 7.5   | 15.07  |        |        | 9.0    | 17.76  |        |        | 11.0   | 21.16  | 15.0 | 27.37  |
| 100            | 114       | 5.0     | 13.44  |       |        | 6.0   | 15.98  | 7.0   | 18.47  | 8.5   | 22.11  |        |        | 11.0   | 27.94  |        |        | 14.0   | 34.52  | 17.0 | 40.66  |
| (125)          | 140       | 5.0     | 16.65  |       |        | 6.5   | 21.40  | 8.0   | 26.04  | 9.5   | 30.57  |        |        | 13.0   | 40.71  |        |        | 16.0   | 48.93  | 19.0 | 56.69  |
| 150            | 168       | 5.5     | 22.04  | 6.5   | 25.89  | 7.0   | 27.79  | 9.5   | 37.13  | 11.0  | 42.59  |        |        | 14.0   | 53.17  |        |        | 18.0   | 66.58  | 22.0 | 79.21  |
| 200            | 219       | 6.5     | 34.06  | 7.0   | 36.60  | 8.0   | 41.63  | 10.0  | 51.54  | 13.0  | 66.04  | 15.0   | 75.46  | 18.0   | 89.22  | 20.0   | 98.15  | 24.0   | 115.41 | 23.0 | 111.17 |
| 250            | 273       | 6.5     | 42.72  | 8.0   | 52.28  | 9.5   | 61.73  | 13.0  | 83.35  | 15.0  | 95.43  | 18.0   | 113.19 | 22.0   | 136.17 | 25.0   | 152.89 | 28.0   | 169.17 | 25.0 | 152.89 |
| 300            | 325       | 6.5     | 51.05  | 8.5   | 66.34  | 10.0  | 77.68  | 14.0  | 107.37 | 17.0  | 129.12 | 22.0   | 164.38 | 25.0   | 184.95 | 28.0   | 205.07 | 34.0   | 244.00 | 26.0 | 191.71 |
| 350            | 377       | 8.0     | 72.80  | 9.5   | 86.10  | 11.0  | 99.28  | 15.0  | 133.90 | 19.0  | 167.74 | 24.0   | 208.92 | 28.0   | 240.98 | 32.0   | 272.25 | 36.0   | 302.73 |      |        |
| 400            | 426       | 8.0     | 82.46  | 9.5   | 97.57  | 13.0  | 132.40 | 17.0  | 171.46 | 22.0  | 219.18 | 26.0   | 256.46 | 32.0   | 310.91 | 36.0   | 346.23 | 40.0   | 380.75 |      |        |
| 450            | 480       | 8.0     | 93.12  | 11.0  | 127.22 | 14.0  | 160.88 | 19.0  | 216.00 | 24.0  | 269.88 | 30.0   | 332.91 | 35.0   | 384.08 | 40.0   | 436.02 | 45.0   | 482.72 |      |        |
| 500            | 530       | 9.5     | 121.94 | 13.0  | 165.74 | 15.0  | 190.50 | 20.0  | 251.53 | 26.0  | 323.14 | 32.0   | 392.98 | 38.0   | 461.04 | 45.0   | 538.20 | 50.0   | 591.84 |      |        |
| 550            | 559       | 9.5     | 128.73 | 13.0  | 175.04 | 17.0  | 227.22 | 22.0  | 291.33 | 28.0  | 366.64 | 35.0   | 452.26 | 42.0   | 535.48 | 48.0   | 604.86 | 54.0   | 672.48 |      |        |
| 600            | 630       | 9.5     | 145.36 | 14.0  | 212.57 | 18.0  | 271.65 | 25.0  | 372.98 | 32.0  | 471.89 | 38.0   | 554.75 | 45.0   | 649.17 | 52.0   | 741.18 | 60.0   | 843.37 |      |        |

注:①粗实践以下的数据已超过我国现行的钢管标准的规格范围;②带括号者不推荐使用.

|                                                                                                |               |  |                   |
|------------------------------------------------------------------------------------------------|---------------|--|-------------------|
| <br>中国石化北京设计院 | 工 程 标 准       |  | 标准号:BA12-3-1-1997 |
|                                                                                                | 钢管的公称直径、外径和壁厚 |  | 修改号:              |
|                                                                                                |               |  | 日期1997年 4 月 15 日  |
|                                                                                                |               |  | 共 页 第 6 页         |

表 4.0.3 奥氏体不锈钢焊接钢管的尺寸和理论质量

| 公称<br>直径<br>DN | 外 径<br>mm | 公称壁厚 mm   |       |       |       |       |       |       |        |        |        |        |        |        |        |
|----------------|-----------|-----------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
|                |           | 2.0       | 2.5   | 3.0   | 3.5   | 4.0   | 4.5   | 5.0   | 6.0    | 7.0    | 8.0    | 9.0    | 10.0   | 11.0   | 12.0   |
|                |           | 理论质量 kg/m |       |       |       |       |       |       |        |        |        |        |        |        |        |
| 80             | 89        | 4.36      | 5.41  | 6.46  | 7.49  | 8.51  | 9.52  | 10.51 | 12.46  | 14.36  | 16.22  |        |        |        |        |
| 100            | 114       | 5.61      | 6.98  | 8.33  | 9.68  | 11.01 | 12.33 | 13.64 | 16.22  | 18.75  | 21.23  | 23.65  |        |        |        |
| (125)          | 140       |           | 8.60  | 10.29 | 11.96 | 13.62 | 15.26 | 16.90 | 20.12  | 23.30  | 26.43  | 29.51  | 32.54  |        |        |
| 150            | 168       |           | 10.36 | 12.39 | 14.41 | 16.42 | 18.42 | 20.40 | 24.33  | 28.21  | 32.04  | 35.82  | 39.55  | 43.23  |        |
| 200            | 219       |           | 13.55 | 16.22 | 18.88 | 21.53 | 24.16 | 26.78 | 31.99  | 37.14  | 42.25  | 47.31  | 52.31  | 57.27  | 62.18  |
| 250            | 273       |           |       |       | 23.61 | 26.93 | 30.24 | 33.54 | 40.10  | 46.61  | 53.06  | 59.47  | 65.83  | 72.14  | 78.39  |
| 300            | 325       |           |       |       |       | 32.14 | 35.10 | 40.05 | 47.91  | 55.72  | 63.48  | 71.19  | 78.84  | 86.45  | 94.01  |
| 350            | 377       |           |       |       |       |       |       |       | 55.72  | 64.83  | 73.89  | 82.90  | 91.87  | 100.77 | 109.64 |
| 400            | 426       |           |       |       |       |       |       |       | 63.07  | 73.41  | 83.71  | 93.94  | 104.13 | 114.27 | 124.36 |
| 450            | 480       |           |       |       |       |       |       |       | 71.19  | 82.87  | 94.52  | 106.11 | 117.64 | 129.14 | 140.57 |
| 500            | 530       |           |       |       |       |       |       |       | 78.70  | 91.64  | 104.53 | 117.37 | 130.16 | 142.90 | 155.59 |
| (550)          | 559       |           |       |       |       |       |       |       | 83.05  | 96.72  | 110.33 | 123.90 | 137.41 | 150.88 | 164.30 |
| 600            | 630       |           |       |       |       |       |       |       | 93.71  | 109.15 | 124.55 | 139.89 | 155.18 | 170.43 | 185.62 |
| (650)          | 660       |           |       |       |       |       |       |       | 98.22  | 114.41 | 130.56 | 146.65 | 162.69 | 178.69 | 194.64 |
| 700            | 720       |           |       |       |       |       |       |       | 107.22 | 124.93 | 142.57 | 160.17 | 177.72 | 195.20 | 212.65 |
| (750)          | 762       |           |       |       |       |       |       |       |        | 132.28 | 150.98 | 169.63 | 188.22 | 206.78 | 225.27 |
| 800            | 820       |           |       |       |       |       |       |       |        | 142.45 | 162.59 | 182.69 | 202.75 | 222.74 | 242.69 |
| (850)          | 864       |           |       |       |       |       |       |       |        |        | 171.40 | 192.61 | 213.76 | 234.85 | 255.90 |
| 900            | 920       |           |       |       |       |       |       |       |        |        | 182.62 | 205.22 | 227.78 | 250.28 | 272.73 |
| (950)          | 965       |           |       |       |       |       |       |       |        |        | 191.63 | 215.35 | 239.03 | 262.66 | 286.24 |
| 1000           | 1020      |           |       |       |       |       |       |       |        |        | 202.64 | 227.75 | 252.81 | 277.81 | 302.77 |

注:带括号者不推荐使用

表 4.0.4

碳素钢、合金钢焊接钢管的尺寸和理论质量

| 公称<br>直径<br>DN | 外径<br>mm | 公称壁厚 mm   |       |        |        |        |        |        |        |        |        |        |        |        |        |
|----------------|----------|-----------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                |          |           |       |        |        | LG     |        | STD    |        | XS     |        |        |        |        |        |
|                |          | 4.0       | 5.0   | 6.0    | 7.0    | 8.0    | 9.0    | 10.0   | 11.0   | 12.0   | 13.0   | 14.0   | 15.0   | 16.0   | 18.0   |
|                |          | 理论质量 kg/m |       |        |        |        |        |        |        |        |        |        |        |        |        |
| 150            | 168      | 16.18     | 20.10 | 23.97  | 27.79  | 31.56  | 35.29  | 38.96  |        |        |        |        |        |        |        |
| 200            | 219      | 21.21     | 26.39 | 31.52  | 36.60  | 41.63  | 46.61  | 51.54  |        |        |        |        |        |        |        |
| 250            | 273      | 26.53     | 33.04 | 39.51  | 45.92  | 52.28  | 58.59  | 64.86  | 71.07  | 77.24  | 83.35  |        |        |        |        |
| 300            | 325①     |           | 39.46 | 47.20  | 54.89  | 62.54  | 70.13  | 77.68  | 85.18  | 92.62  | 100.02 | 107.37 |        |        |        |
| 350            | 377      |           | 45.88 | 54.90  | 63.87  | 72.80  | 81.67  | 90.51  | 99.28  | 108.02 | 116.69 | 125.32 |        |        |        |
| 400            | 426      |           | 51.91 | 62.14  | 72.33  | 82.46  | 92.55  | 102.59 | 112.58 | 122.52 | 132.40 | 142.24 | 152.03 |        |        |
| 450            | 480      |           |       | 70.14  | 81.65  | 93.12  | 104.54 | 115.90 | 127.23 | 138.49 | 149.72 | 160.88 | 172.00 |        |        |
| 500            | 530①     |           |       | 77.54  | 90.29  | 102.99 | 115.64 | 128.24 | 140.79 | 153.29 | 165.75 | 178.14 | 190.50 | 202.80 |        |
| (550)          | 559      |           |       | 81.82  | 95.29  | 108.70 | 122.07 | 135.38 | 148.65 | 161.87 | 175.04 | 188.16 | 201.22 | 214.25 |        |
| 600            | 630      |           |       | 92.33  | 107.54 | 122.71 | 137.82 | 152.89 | 167.91 | 182.88 | 197.80 | 212.67 | 227.49 | 242.26 |        |
| (650)          | 660      |           |       | 96.77  | 112.72 | 128.63 | 144.48 | 160.29 | 176.05 | 191.76 | 207.42 | 223.03 | 238.59 | 254.10 |        |
| 700            | 720      |           |       | 105.64 | 123.08 | 140.46 | 157.80 | 175.09 | 192.32 | 209.51 | 226.65 | 243.74 | 260.78 | 277.77 |        |
| (750)          | 762      |           |       |        | 130.33 | 148.75 | 267.12 | 185.44 | 203.72 | 221.94 | 240.11 | 258.24 | 276.32 | 294.34 |        |
| 800            | 820      |           |       |        | 140.34 | 160.19 | 179.99 | 199.75 | 219.45 | 239.10 | 258.71 | 278.26 | 297.77 | 317.23 |        |
| (850)          | 864      |           |       |        |        | 168.87 | 189.76 | 210.60 | 231.38 | 252.12 | 272.81 | 293.45 | 314.05 | 334.59 |        |
| 900            | 920      |           |       |        |        | 179.92 | 202.19 | 224.41 | 246.58 | 268.70 | 290.77 | 312.79 | 334.76 | 356.68 |        |
| (950)          | 965      |           |       |        |        | 188.80 | 212.17 | 235.50 | 258.78 | 282.01 | 305.10 | 328.32 | 351.41 | 374.44 |        |
| 1000           | 1020     |           |       |        |        | 199.65 | 224.38 | 249.07 | 273.70 | 298.30 | 322.82 | 347.31 | 371.75 | 396.14 |        |
| (1100)         | 1118     |           |       |        |        |        |        | 273.23 | 300.28 | 327.29 | 354.24 | 381.14 | 408.00 | 434.81 |        |
| 1200           | 1220     |           |       |        |        |        |        | 298.39 | 327.95 | 357.47 | 386.94 | 416.36 | 445.73 | 475.05 | 533.54 |
| (1300)         | 1321     |           |       |        |        |        |        | 323.29 | 355.35 | 387.36 | 419.32 | 451.23 | 483.09 | 514.90 | 578.38 |

续上表

| 公称<br>直径<br>DN | 外径<br>mm | 公称壁厚mm         |     |     |     |     |     |        |        |        |        |        |        |        |        |
|----------------|----------|----------------|-----|-----|-----|-----|-----|--------|--------|--------|--------|--------|--------|--------|--------|
|                |          |                |     |     |     | LG  |     | STD    |        | XS     |        |        |        |        |        |
|                |          | 4.0            | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0   | 11.0   | 12.0   | 13.0   | 14.0   | 15.0   | 16.0   | 18.0   |
|                |          | 理论质量      kg/m |     |     |     |     |     |        |        |        |        |        |        |        |        |
| 1400           | 1420     |                |     |     |     |     |     | 347.71 | 383.21 | 416.66 | 451.06 | 485.41 | 519.71 | 553.96 | 622.32 |
| (1500)         | 1524     |                |     |     |     |     |     | 373.35 | 410.42 | 447.43 | 484.40 | 521.31 | 558.18 | 595.00 | 668.48 |
| 1600           | 1620     |                |     |     |     |     |     | 397.03 | 436.46 | 475.84 | 515.17 | 554.46 | 593.69 | 632.87 | 711.10 |
| (1700)         | 1727     |                |     |     |     |     |     | 423.41 | 465.48 | 507.50 | 549.47 | 591.40 | 633.27 | 675.09 | 758.59 |
| 1800           | 1820     |                |     |     |     |     |     | 446.35 | 490.71 | 535.02 | 579.29 | 623.50 | 667.67 | 711.79 | 799.87 |
| (1900)         | 1930     |                |     |     |     |     |     | 473.47 | 520.55 | 567.57 | 614.55 | 661.48 | 708.36 | 755.19 | 848.70 |
| 2000           | 2020     |                |     |     |     |     |     | 495.67 | 544.96 | 594.21 | 643.40 | 692.55 | 741.65 | 790.70 | 888.65 |
| 2200           | 2220     |                |     |     |     |     |     | 544.99 | 599.21 | 653.39 | 707.52 | 761.60 | 815.63 | 869.61 | 977.42 |

注：

①螺旋缝钢管分别为323.9和529。

②黑线范围内规格为SY/T5037-92(普通流体输送管道用螺旋缝埋弧焊钢管)中生产的规格。

③“LG”、“STD”和“XS”与SH3409-96《钢板制对焊管件》中的壁厚等级相对应，分别表示“薄”、“标准”和“加厚”。

④带括号者不推荐使用。

|                                                                                                    |               |                   |
|----------------------------------------------------------------------------------------------------|---------------|-------------------|
| <br><br>中国石化北京设计院 | 工 程 标 准       | 标准号：BA3-4-1-1997  |
|                                                                                                    | 钢管的公称直径、外径和壁厚 |                   |
|                                                                                                    |               | 日期1997 年 4 月 15 日 |
|                                                                                                    |               | 共 页 第 9 页         |

表 4.0.5 小外径系列碳素钢、合金钢无缝钢管的尺寸和理论质量

| 公称<br>直径<br>mm | 外径<br>mm | 壁厚及理论质量 |       |        |       |       |        |        |       |       |        |       |        |        |        |       |        |       |        |        |        |        |        |        |        |        |        |
|----------------|----------|---------|-------|--------|-------|-------|--------|--------|-------|-------|--------|-------|--------|--------|--------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                |          | sch5s   |       | sch10s |       | sch20 |        | sch20s |       | sch30 |        | sch40 |        | sch40s |        | sch60 |        | sch80 |        | sch100 |        | sch120 |        | sch140 |        | sch160 |        |
|                |          | mm      | kg/m  | mm     | kg/m  | mm    | kg/m   | mm     | kg/m  | mm    | kg/m   | mm    | kg/m   | mm     | kg/m   | mm    | kg/m   | mm    | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   |
| 15             | 18       | 1.6     | 0.66  | 2.0    | 0.80  |       |        | 2.5    | 0.97  |       |        | 3.0   | 1.01   | 3.0    | 1.13   |       |        | 4.0   | 1.38   |        |        |        |        |        |        | 5.0    | 1.60   |
| 20             | 25       | 1.6     | 0.94  | 2.0    | 1.15  |       |        | 2.5    | 1.41  |       |        | 3.0   | 2.63   | 3.0    | 1.65   |       |        | 4.0   | 2.07   |        |        |        |        |        |        | 5.5    | 2.64   |
| 25             | 32       | 1.6     | 1.22  | 2.8    | 2.05  |       |        | 3.0    | 2.18  |       |        | 3.5   | 2.46   | 3.5    | 2.50   |       |        | 4.5   | 3.05   |        |        |        |        |        |        | 6.5    | 4.09   |
| (32)           | 38       | 1.6     | 1.46  | 2.8    | 2.47  |       |        | 3.0    | 2.63  |       |        | 3.5   | 2.98   | 3.5    | 3.02   |       |        | 5.0   | 4.07   |        |        |        |        |        |        | 6.5    | 5.05   |
| 40             | 45       | 1.6     | 1.74  | 2.8    | 2.95  |       |        | 3.0    | 3.16  |       |        | 4.0   | 4.04   | 4.0    | 4.10   |       |        | 5.0   | 4.93   |        |        |        |        |        |        | 7.0    | 6.56   |
| 50             | 57       | 1.6     | 2.22  | 2.8    | 3.80  | 3.5   | 4.62   | 3.5    | 4.69  |       |        | 4.0   | 5.23   | 4.0    | 5.31   | 5.0   | 6.41   | 5.5   | 6.99   |        |        | 7.0    | 8.63   |        |        | 8.5    | 10.17  |
| (65)           | 76       | 2.0     | 3.70  | 3.0    | 5.48  | 4.5   | 7.93   | 3.5    | 6.35  |       |        | 5.0   | 8.70   | 5.0    | 8.89   | 6.0   | 10.36  | 7.0   | 11.91  |        |        | 8.0    | 13.42  |        |        | 9.5    | 15.58  |
| 80             | 89       | 2.0     | 4.36  | 3.0    | 6.46  | 4.5   | 9.38   | 4.0    | 8.51  |       |        | 5.5   | 11.33  | 5.5    | 11.50  | 6.5   | 13.22  | 7.5   | 15.07  |        |        | 9.0    | 17.76  |        |        | 11.00  | 21.16  |
| 100            | 108      | 2.0     | 5.31  | 3.0    | 7.89  | 5.0   | 12.70  | 4.0    | 10.41 |       |        | 6.0   | 15.09  | 6.0    | 15.32  | 7.0   | 17.43  | 8.5   | 20.86  |        |        | 11.0   | 26.31  |        |        | 14.0   | 32.48  |
| (125)          | 133      | 2.8     | 9.12  | 3.5    | 11.34 | 5.0   | 15.78  | 5.0    | 16.02 |       |        | 6.5   | 20.28  | 6.5    | 20.58  | 8.0   | 24.66  | 9.5   | 28.93  |        |        | 13.0   | 38.47  |        |        | 16.0   | 46.16  |
| 150            | 159      | 2.8     | 10.95 | 3.5    | 13.62 | 5.5   | 20.82  | 5.0    | 19.27 | 6.5   | 24.44  | 7.0   | 26.24  | 7.0    | 26.63  | 9.5   | 35.02  | 11.0  | 40.15  |        |        | 14.0   | 50.06  |        |        | 18.0   | 62.59  |
| 200            | 219      | 2.8     | 15.15 | 4.0    | 21.53 | 6.5   | 34.06  | 6.5    | 34.57 | 7.0   | 36.60  | 8.0   | 41.63  | 8.0    | 42.25  | 10.0  | 51.54  | 13.0  | 66.04  | 15.0   | 75.46  | 18.0   | 89.22  | 20.0   | 98.15  | 24.0   | 115.41 |
| 250            | 273      | 3.5     | 23.61 | 4.0    | 26.93 | 6.5   | 42.72  | 6.5    | 43.36 | 8.0   | 52.28  | 9.5   | 61.73  | 9.5    | 62.66  | 13.0  | 83.35  | 15.0  | 95.43  | 18.0   | 113.19 | 22.0   | 136.17 | 25.0   | 152.89 | 28.0   | 169.17 |
| 300            | 325      | 4.0     | 32.14 | 4.5    | 36.10 | 6.5   | 51.05  | 6.5    | 51.82 | 8.5   | 66.34  | 10.0  | 77.68  | 9.5    | 75.02  | 14.0  | 107.37 | 17.0  | 129.12 | 22.0   | 164.38 | 25.0   | 184.95 | 28.0   | 205.07 | 34.0   | 244.00 |
| 350            | 377      |         |       |        |       | 8.0   | 72.80  |        |       | 9.5   | 86.10  | 11.0  | 99.28  | 11.0   | 100.79 | 15.0  | 133.90 | 19.0  | 167.74 | 24.0   | 208.92 | 28.0   | 240.98 | 32.0   | 272.25 | 36.0   | 302.73 |
| 400            | 426      |         |       |        |       | 8.0   | 82.47  |        |       | 9.5   | 97.57  | 13.0  | 132.40 | 13.0   | 134.39 | 17.0  | 171.46 | 22.0  | 219.18 | 26.0   | 256.46 | 32.0   | 310.9  | 36.0   | 346.23 | 40.0   | 380.75 |
| 450            | 480      |         |       |        |       | 8.0   | 93.12  |        |       | 11.0  | 127.22 | 14.0  | 160.88 | 15.0   | 174.58 | 19.0  | 216.00 | 24.0  | 269.88 | 30.0   | 332.91 | 35.0   | 384.08 | 40.0   | 436.02 | 45.0   | 482.72 |
| 500            | 530      |         |       |        |       | 9.5   | 121.94 |        |       | 13.0  | 165.74 | 15.0  | 190.50 |        |        | 20.0  | 251.53 | 26.0  | 323.14 | 32.0   | 392.98 | 38.0   | 461.04 | 45.0   | 538.20 | 50.0   | 591.84 |

注① 有括号者不推荐选用      ②表号中有s者仅为奥氏体不锈钢钢管。

|                                                                                                    |               |                   |
|----------------------------------------------------------------------------------------------------|---------------|-------------------|
| <br><br>中国石化北京设计院 | 工 程 标 准       | 标准号：BA3-4-1-1997  |
|                                                                                                    | 钢管的公称直径、外径和壁厚 |                   |
|                                                                                                    |               | 日期1997 年 4 月 15 日 |
|                                                                                                    |               | 共 页 第 12 页        |

表 4.0.6.1 低压流体输送用镀锌钢管的尺寸和理论质量(GB/T3091-93)

| 公称直径 |       | 外径<br>mm | 普通钢管 |              | 加厚钢管 |              |
|------|-------|----------|------|--------------|------|--------------|
| mm   | in    |          | 壁厚mm | 理论质量<br>kg/m | 壁厚mm | 理论质量<br>kg/m |
| 6    | 1/8   | 10.0     | 2.00 | 0.41         | 2.50 | 0.49         |
| 8    | 1/4   | 13.5     | 2.25 | 0.65         | 2.75 | 0.76         |
| 10   | 3/8   | 17.0     | 2.25 | 0.87         | 2.75 | 1.01         |
| 15   | 1/2   | 21.3     | 2.75 | 1.32         | 3.25 | 1.51         |
| 20   | 3/4   | 26.8     | 2.75 | 1.70         | 3.50 | 2.09         |
| 25   | 1     | 33.5     | 3.25 | 2.51         | 4.00 | 3.00         |
| 32   | 1 1/4 | 42.3     | 3.25 | 3.25         | 4.00 | 3.90         |
| 40   | 1 1/2 | 48.0     | 3.50 | 3.98         | 4.25 | 4.72         |
| 50   | 2     | 60.0     | 3.50 | 5.06         | 4.50 | 6.33         |
| 65   | 2 1/2 | 75.5     | 3.75 | 6.87         | 4.50 | 8.10         |
| 80   | 3     | 88.5     | 4.00 | 8.61         | 4.75 | 10.07        |
| 100  | 4     | 114.0    | 4.00 | 11.20        | 5.00 | 13.79        |
| 125  | 5     | 140.0    | 4.00 | 13.80        | 5.50 | 18.66        |
| 150  | 6     | 165.0    | 4.50 | 118.31       | 5.50 | 22.13        |

表 4.0.6.2 低压流体输送用焊接钢管的尺寸和理论质量(GB/T3092-93)

| 公称直径 |     | 外径<br>mm | 普通钢管 |              | 加厚钢管 |              |
|------|-----|----------|------|--------------|------|--------------|
| mm   | in  |          | 壁厚mm | 理论质量<br>kg/m | 壁厚mm | 理论质量<br>kg/m |
| 6    | 1/8 | 10.0     | 2.00 | 0.39         | 2.50 | 0.46         |
| 8    | 1/4 | 13.5     | 2.25 | 0.62         | 2.75 | 0.73         |

|     |       |       |      |       |      |       |
|-----|-------|-------|------|-------|------|-------|
| 10  | 3/8   | 17.0  | 2.25 | 0.82  | 2.75 | 0.97  |
| 15  | 1/2   | 21.3  | 2.75 | 1.26  | 3.25 | 1.45  |
| 20  | 3/4   | 26.8  | 2.75 | 1.63  | 3.50 | 2.01  |
| 25  | 1     | 33.5  | 3.25 | 2.42  | 4.00 | 2.91  |
| 32  | 1 1/4 | 42.3  | 3.25 | 3.13  | 4.00 | 3.78  |
| 40  | 1 1/2 | 48.0  | 3.50 | 3.84  | 4.25 | 4.58  |
| 50  | 2     | 60.0  | 3.50 | 4.88  | 4.50 | 6.16  |
| 65  | 2 1/2 | 75.5  | 3.75 | 6.64  | 4.50 | 7.88  |
| 80  | 3     | 88.5  | 4.00 | 8.34  | 4.75 | 9.81  |
| 100 | 4     | 114.0 | 4.00 | 10.85 | 5.00 | 13.44 |
| 125 | 5     | 140.0 | 4.00 | 13.42 | 5.50 | 18.24 |
| 150 | 6     | 165.0 | 4.50 | 17.81 | 5.50 | 21.63 |
|     |       |       |      |       |      |       |

表4.0.6.3 低压流体输送用大直径电焊钢管的尺寸系列和理论质量(GB/T14980-94)

| 公称外径     |       | 公称壁厚 mm       |       |       |       |       |       |       |       |       |       |
|----------|-------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|          |       | 4.0           | 4.5   | 5.0   | 5.5   | 6.0   | 7.0   | 8.0   | 10.0  | 11.0  | 12.0  |
| (in)     | mm    | 理论质量(重量),kg/m |       |       |       |       |       |       |       |       |       |
| (6 5/8)  | 168.3 | 16.21         | 18.18 | 20.13 | 22.08 | 24.01 |       |       |       |       |       |
| (7)      | 177.8 | 17.14         | 19.23 | 21.30 | 23.37 | 25.42 |       |       |       |       |       |
| (7 5/8)  | 193.7 | 18.71         | 20.10 | 23.27 | 25.52 | 27.80 |       |       |       |       |       |
| (8 5/8)  | 219.1 | 21.22         | 23.81 | 26.40 | 28.97 | 31.53 | 36.61 | 41.63 | 51.56 |       |       |
| (9 5/8)  | 244.5 | 23.72         | 26.63 | 29.53 | 32.42 | 35.29 | 41.00 | 46.66 | 57.83 |       |       |
| (10 3/4) | 273   |               |       | 33.04 | 36.28 | 39.51 | 45.92 | 52.28 | 64.86 |       |       |
| (12 3/4) | 323.9 |               |       | 39.32 | 43.19 | 47.04 | 54.70 | 62.32 | 77.41 | 84.88 | 92.30 |
| (14)     | 355.6 |               |       |       | 47.48 | 51.73 | 60.18 | 68.57 | 85.22 | 93.48 | 101.7 |
| (16)     | 406.4 |               |       |       | 54.37 | 59.24 | 68.94 | 78.59 | 97.75 | 107.3 | 116.7 |
| (18)     | 457.2 |               |       |       | 61.26 | 66.76 | 77.71 | 88.62 | 110.3 | 121.4 | 131.7 |
| (20)     | 508   |               |       |       | 68.15 | 74.28 | 86.48 | 98.64 | 122.8 | 134.8 | 146.8 |

注:根据需方要求,并经供需双方协议,可供应介于上表所列外径和壁厚之间尺寸的钢管。

## 5. 常用钢管材料和标准

### 5.0.1 用于无缝钢管的标准和材料牌号见表5.0.1。

表5.0.1 无缝钢管标准和材料牌号

| 材料牌号 | 钢管标准号                      | 材料牌号      | 钢管标准号            | 材料牌号                                                                                                  | 钢管标准号            |
|------|----------------------------|-----------|------------------|-------------------------------------------------------------------------------------------------------|------------------|
| 10   | GB8163<br>GB6479<br>GB9948 | 16Mn      | GB6479           | 1Cr5Mo                                                                                                | GB9948           |
|      |                            | 09MnV     | GB8163           | GB8163                                                                                                | 1Cr18Ni9         |
|      |                            | 12Cr1MoVG | GB5310           | 1Cr19Ni9                                                                                              | GB9948           |
|      |                            | 12CrMoG   | GB5310           | 1Cr19Ni11Nb                                                                                           | GB9948<br>GB5310 |
| 20   | GB8163                     | 12CrMo    | GB6479<br>GB9948 | 0Cr18Ni9<br>00Cr19Ni10<br>0Cr17Ni12Mo2<br>00Cr17Ni14Mo2<br>0Cr18Ni10Ti<br>0Cr18Ni11Nb<br>(1Cr18Ni9Ti) | GB/T14976        |
|      | GB9948                     | 15CrMoG   | GB5310           |                                                                                                       |                  |
| 20G  | GB5310<br>GB6479           | 15CrMo    | GB6479<br>GB9948 |                                                                                                       |                  |
| 16Mn | GB8163                     | 1Cr5Mo    | GB6479           |                                                                                                       |                  |

注:带括号者不推荐使用。

5.0.2 焊接钢管及用于焊接钢管的钢板材料牌号和标准见表5.0.2

表5.0.2 焊接钢管和钢板材料牌号及标准

| 材料牌号  | 钢管标准号     | 钢板标准号  | 材料牌号          | 钢管标准号 | 钢板标准号    |
|-------|-----------|--------|---------------|-------|----------|
| Q235A | GB/T3091  | GB3274 | 20R           |       | GB6654   |
| Q235B | GB/T3092  | GB912  | 16MnR         |       | GB5681   |
|       | GB/T14980 |        | 20g           |       | GB713    |
|       | SY/T5037  |        | 15Mng         |       |          |
|       |           |        | 16MnDR        |       | GB3531   |
|       |           |        | 09Mn2VDR      |       |          |
|       |           |        | 12CrMoR       |       |          |
|       |           |        | 15CrMoR       |       |          |
|       |           |        | 0Cr19Ni9      |       | GB3280   |
|       |           |        | 00Cr19Ni11    |       | GB/T4237 |
|       |           |        | 0Cr17Ni12Mo2  |       | GB4238   |
|       |           |        | 00Cr17Ni14Mo2 |       |          |
|       |           |        | 0Cr18Ni11Ti   |       |          |
|       |           |        | 0Cr18Ni11Nb   |       |          |
|       |           |        | (1Cr18Ni9Ti)  |       |          |
| 10    |           | GB711  |               |       |          |
| 20    |           |        |               |       |          |
| 16Mn  |           |        |               |       |          |

注:带括号者不推荐使用

附录A 中国石化总公司标准SH3405钢管尺寸系列

A.0.1 奥氏体不锈钢无缝钢管的尺寸和理论质量见表A.0.1

A.0.2 碳素钢、合金钢无缝钢管的尺寸和理论质量见表A.0.2

A.0.3 奥氏体不锈钢焊接钢管的尺寸和理论质量见表A.0.3

A.0.4 碳素钢、合金钢焊接钢管的尺寸和理论质量见表A.0.4

表A.0.1 奥氏体不锈钢无缝钢管尺寸和理论质量

| 公称<br>直径<br>DN | 外径<br>mm |       |       |        |       |        |       |        |       |        |        |
|----------------|----------|-------|-------|--------|-------|--------|-------|--------|-------|--------|--------|
|                |          | sch5s |       | sch10s |       | sch20s |       | sch40s |       | sch80s |        |
|                |          | mm    | kg/m  | mm     | kg/m  | mm     | kg/m  | mm     | kg/m  | mm     | kg/m   |
| 10             | 17       | 1.2   | 0.47  | 1.6    | 0.62  | 2.0    | 0.75  | 2.5    | 0.91  | 3.2    | 1.11   |
| 15             | 22       | 1.6   | 0.82  | 2.0    | 1.00  | 2.5    | 1.22  | 3.0    | 1.43  | 4.0    | 1.80   |
| 20             | 27       | 1.6   | 1.02  | 2.0    | 1.25  | 2.5    | 1.53  | 3.0    | 1.80  | 4.0    | 2.30   |
| 25             | 34       | 1.6   | 1.30  | 2.8    | 2.19  | 3.0    | 2.33  | 3.5    | 2.67  | 4.5    | 3.32   |
| (32)           | 42       | 1.6   | 1.62  | 2.8    | 2.75  | 3.0    | 2.93  | 3.5    | 3.37  | 5.0    | 4.63   |
| 40             | 48       | 1.6   | 1.86  | 2.8    | 3.17  | 3.0    | 3.38  | 4.0    | 4.41  | 5.0    | 5.38   |
| 50             | 60       | 1.6   | 2.34  | 2.8    | 4.01  | 3.5    | 4.95  | 4.0    | 5.61  | 5.5    | 7.50   |
| (65)           | 76       | 2.0   | 3.70  | 3.0    | 5.48  | 3.5    | 6.35  | 5.0    | 8.89  | 7.0    | 12.09  |
| 80             | 89       | 2.0   | 4.36  | 3.0    | 6.46  | 4.0    | 8.51  | 5.5    | 11.50 | 7.5    | 15.30  |
| 100            | 114      | 2.0   | 5.61  | 3.0    | 8.33  | 4.0    | 11.01 | 6.0    | 16.22 | 8.5    | 22.45  |
| (125)          | 140      | 2.8   | 9.62  | 3.5    | 11.96 | 5.0    | 16.90 | 6.5    | 21.72 | 9.5    | 31.03  |
| 150            | 168      | 2.8   | 11.58 | 3.5    | 14.41 | 5.0    | 20.40 | 7.0    | 28.21 | 11.0   | 43.23  |
| 200            | 219      | 2.8   | 15.15 | 4.0    | 21.53 | 6.5    | 34.57 | 8.0    | 42.25 | 13.0   | 67.03  |
| 250            | 273      | 3.5   | 23.61 | 4.0    | 26.93 | 6.5    | 43.36 | 9.5    | 62.66 | 15.0   | 96.87  |
| 300            | 325      | 4.0   | 32.13 | 4.5    | 36.10 | 6.5    | 51.82 | 9.5    | 75.02 | 17.0   | 131.06 |
| 350            | 356      | 4.0   | 35.24 | 5.0    | 43.93 |        |       |        |       |        |        |
| 400            | 406      | 4.5   | 45.22 | 5.0    | 50.18 |        |       |        |       |        |        |

注:①公称壁厚超过sch80s的不锈钢钢管按表3-2选用;

②粗实践以下的数据已超过我国现行的钢管标准的规格范围;

③带括号者不推荐使用。

|                                                                                                |               |                    |
|------------------------------------------------------------------------------------------------|---------------|--------------------|
| <br>中国石化北京设计院 | 工 程 标 准       | 标准号：BA3-4-1-1997   |
|                                                                                                | 钢管的公称直径、外径和壁厚 |                    |
|                                                                                                |               | 日期 1997 年 4 月 15 日 |
|                                                                                                |               | 共 页 第 16 页         |

表A.0.2 碳素钢、合金钢无缝钢管的尺寸和理论质量

| 公称<br>直径<br>DN | 外 外<br>mm | 壁厚及理论质量 |        |       |        |       |        |       |        |       |        |        |        |        |        |        |        |        |        |      |        |
|----------------|-----------|---------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|
|                |           | sch20   |        | sch30 |        | sch40 |        | sch60 |        | sch80 |        | sch100 |        | sch120 |        | sch140 |        | sch160 |        | xxs  |        |
|                |           | mm      | kg/m   | mm    | kg/m   | mm    | kg/m   | mm    | kg/m   | mm    | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   | mm     | kg/m   | mm   | kg/m   |
| 10             | 17        |         |        |       |        | 2.5   | 0.89   |       |        | 3.5   | 1.17   |        |        |        |        |        |        |        |        |      |        |
| 15             | 22        |         |        |       |        | 3.0   | 1.41   |       |        | 4.0   | 1.78   |        |        |        |        |        |        | 5.0    | 2.10   | 7.5  | 2.68   |
| 20             | 27        |         |        |       |        | 3.0   | 1.78   |       |        | 4.0   | 2.27   |        |        |        |        |        |        | 5.5    | 2.92   | 8.0  | 3.75   |
| 25             | 34        |         |        |       |        | 3.5   | 2.63   |       |        | 4.5   | 3.27   |        |        |        |        |        |        | 6.5    | 4.41   | 9.0  | 5.55   |
| ( 32 )         | 42        |         |        |       |        | 3.5   | 3.33   |       |        | 5.0   | 4.56   |        |        |        |        |        |        | 6.5    | 5.69   | 10.0 | 7.89   |
| 40             | 48        |         |        |       |        | 4.0   | 4.34   |       |        | 5.0   | 5.30   |        |        |        |        |        |        | 7.0    | 7.08   | 10.0 | 9.37   |
| 50             | 60        | 3.5     | 4.88   |       |        | 4.0   | 5.52   | 5.0   | 6.78   | 5.5   | 7.39   |        |        | 7.0    | 9.15   |        |        | 8.5    | 10.79  | 11.0 | 13.29  |
| ( 65 )         | 76        | 4.5     | 7.93   |       |        | 5.0   | 8.75   | 6.0   | 10.36  | 7.0   | 11.91  |        |        | 8.0    | 13.42  |        |        | 9.5    | 15.58  | 14.0 | 21.40  |
| 80             | 89        | 4.5     | 9.38   |       |        | 5.5   | 11.33  | 6.5   | 13.22  | 7.5   | 15.07  |        |        | 9.0    | 17.76  |        |        | 11.0   | 21.16  | 15.0 | 27.37  |
| 100            | 114       | 5.0     | 13.44  |       |        | 6.0   | 15.98  | 7.0   | 18.47  | 8.5   | 22.11  |        |        | 11.0   | 27.94  |        |        | 14.0   | 34.52  | 17.0 | 40.66  |
| ( 125 )        | 140       | 5.0     | 16.65  |       |        | 6.5   | 21.40  | 8.0   | 26.04  | 9.5   | 30.57  |        |        | 13.0   | 40.71  |        |        | 16.0   | 48.93  | 19.0 | 56.69  |
| 150            | 168       | 5.5     | 22.04  | 6.5   | 25.89  | 7.0   | 27.79  | 9.5   | 37.13  | 11.0  | 42.59  |        |        | 14.0   | 53.17  |        |        | 18.0   | 66.58  | 22.0 | 79.21  |
| 200            | 219       | 6.5     | 34.06  | 7.0   | 36.60  | 8.0   | 41.63  | 10.0  | 51.54  | 13.0  | 66.04  | 15.0   | 75.46  | 18.0   | 89.22  | 20.0   | 98.15  | 24.0   | 115.41 | 23.0 | 111.17 |
| 250            | 273       | 6.5     | 42.72  | 8.0   | 52.28  | 9.5   | 61.73  | 13.0  | 83.35  | 15.0  | 95.43  | 18.0   | 113.19 | 22.0   | 136.17 | 25.0   | 152.89 | 28.0   | 169.17 | 25.0 | 152.89 |
| 300            | 325       | 6.5     | 51.05  | 8.5   | 66.34  | 10.0  | 77.68  | 14.0  | 107.37 | 17.0  | 129.12 | 22.0   | 164.38 | 25.0   | 184.95 | 28.0   | 205.07 | 34.0   | 244.00 | 26.0 | 191.71 |
| 350            | 356       | 8.0     | 68.65  | 9.5   | 81.17  | 11.0  | 93.58  | 15.0  | 126.14 | 19.0  | 157.90 | 24.0   | 196.49 | 28.0   | 226.48 | 32.0   | 255.67 | 36.0   | 284.08 |      |        |
| 400            | 406       | 8.0     | 78.52  | 9.5   | 92.89  | 13.0  | 125.99 | 17.0  | 163.08 | 22.0  | 208.33 | 26.0   | 243.64 | 32.0   | 295.13 | 36.0   | 328.47 | 40.0   | 361.02 |      |        |
| 450            | 457       | 8.0     | 88.58  | 11.0  | 120.98 | 14.0  | 152.94 | 19.0  | 205.22 | 24.0  | 256.27 | 30.0   | 315.89 | 35.0   | 364.23 | 40.0   | 411.33 | 45.0   | 457.20 |      |        |
| 500            | 508       | 9.5     | 116.78 | 13.0  | 158.69 | 15.0  | 182.36 | 20.0  | 240.68 | 26.0  | 309.04 | 32.0   | 375.62 | 38.0   | 440.43 | 45.0   | 513.79 | 50.0   | 564.71 |      |        |
| 550            | 559       | 9.5     | 128.73 | 13.0  | 175.04 | 17.0  | 227.22 | 22.0  | 291.33 | 28.0  | 366.64 | 35.0   | 452.26 | 42.0   | 535.47 | 48.0   | 604.86 | 54.0   | 672.48 |      |        |
| 600            | 610       | 9.5     | 140.68 | 14.0  | 205.76 | 18.0  | 262.78 | 25.0  | 360.65 | 32.0  | 456.11 | 38.0   | 536.01 | 45.0   | 626.98 | 52.0   | 715.53 | 60.0   | 813.78 |      |        |

|                                                                                                |                         |  |                  |
|------------------------------------------------------------------------------------------------|-------------------------|--|------------------|
| <br>中国石化北京设计院 | 工 程 标 准                 |  | 标准号:BA3-4-1-1997 |
|                                                                                                | 钢 管 的 公 称 直 径、外 径 和 壁 厚 |  | 修改号:             |
|                                                                                                |                         |  | 日期1997年 4 月 15 日 |
|                                                                                                |                         |  | 共 页 第 17 页       |

表A.0.3 奥氏体不锈钢焊接钢管的尺寸和理论质量

| 公称<br>直径<br><br>DN | 外径<br><br>mm | 公称壁厚 mm   |       |       |       |       |       |       |        |        |        |        |        |        |        |
|--------------------|--------------|-----------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
|                    |              | 2.0       | 2.5   | 3.0   | 3.5   | 4.0   | 4.5   | 5.0   | 6.0    | 7.0    | 8.0    | 9.0    | 10.0   | 11.0   | 12.0   |
|                    |              | 理论质量 kg/m |       |       |       |       |       |       |        |        |        |        |        |        |        |
| 80                 | 89           | 4.36      | 5.41  | 6.46  | 7.49  | 8.51  | 9.52  | 10.51 | 12.46  | 14.36  | 16.22  |        |        |        |        |
| 100                | 114          | 5.61      | 6.98  | 8.33  | 9.68  | 11.01 | 12.33 | 13.64 | 16.22  | 18.75  | 21.23  | 23.65  |        |        |        |
| (125)              | 140          |           | 8.60  | 10.29 | 11.96 | 13.62 | 15.26 | 16.90 | 20.12  | 23.30  | 26.43  | 29.51  | 32.54  |        |        |
| 150                | 168          |           | 10.36 | 12.39 | 14.41 | 16.42 | 18.42 | 20.40 | 24.33  | 28.21  | 32.04  | 35.82  | 39.55  | 43.23  |        |
| 200                | 219          |           | 13.55 | 16.22 | 18.88 | 21.53 | 24.16 | 26.78 | 31.99  | 37.14  | 42.25  | 47.31  | 52.31  | 57.27  | 62.18  |
| 250                | 273          |           |       |       | 23.61 | 26.93 | 30.24 | 33.54 | 40.10  | 46.61  | 53.06  | 59.47  | 65.83  | 72.14  | 78.39  |
| 300                | 325          |           |       |       |       | 32.14 | 35.10 | 40.05 | 47.91  | 55.72  | 63.48  | 71.19  | 78.84  | 86.45  | 94.01  |
| 350                | 356          |           |       |       |       | 35.24 | 39.59 | 43.93 | 52.56  | 61.15  | 69.68  | 78.17  | 86.60  | 94.99  | 103.32 |
| 400                | 406          |           |       |       |       | 40.25 | 45.22 | 50.18 | 60.07  | 69.91  | 79.70  | 89.43  | 99.12  | 108.75 | 118.34 |
| 450                | 457          |           |       |       |       | 45.35 | 50.97 | 56.57 | 67.73  | 78.84  | 89.91  | 100.92 | 111.88 | 122.80 | 133.66 |
| 500                | 508          |           |       |       |       |       | 56.71 | 62.95 | 75.39  | 87.78  | 100.12 | 112.41 | 124.65 | 136.84 | 148.98 |
| 550                | 559          |           |       |       |       |       |       | 69.33 | 83.05  | 96.72  | 110.33 | 123.90 | 137.41 | 150.88 | 164.30 |
| 600                | 610          |           |       |       |       |       |       | 75.72 | 90.71  | 105.65 | 120.54 | 135.39 | 150.18 | 164.92 | 179.61 |
| (650)              | 660          |           |       |       |       |       |       |       | 98.22  | 114.41 | 130.56 | 146.65 | 162.69 | 178.69 | 194.63 |
| 700                | 711          |           |       |       |       |       |       |       | 105.87 | 123.35 | 140.77 | 158.14 | 175.46 | 192.73 | 209.95 |
| (750)              | 762          |           |       |       |       |       |       |       |        | 132.28 | 150.98 | 169.63 | 188.22 | 206.77 | 225.27 |
| 800                | 813          |           |       |       |       |       |       |       |        | 141.22 | 161.19 | 181.12 | 200.99 | 220.81 | 240.59 |
| (850)              | 864          |           |       |       |       |       |       |       |        |        | 171.40 | 192.61 | 213.76 | 234.86 | 255.91 |
| 900                | 914          |           |       |       |       |       |       |       |        |        | 181.42 | 203.87 | 226.27 | 248.62 | 270.92 |
| (950)              | 965          |           |       |       |       |       |       |       |        |        | 191.63 | 215.36 | 239.04 | 262.66 | 286.24 |
| 1000               | 1016         |           |       |       |       |       |       |       |        |        | 201.84 | 226.85 | 251.80 | 276.71 | 301.56 |

注:带括号者不推荐使用

表A.0.4 碳素钢、合金钢接钢管的尺寸和理论质量

| 公称<br>直径<br><br>DN | 外径<br><br>mm | 公称壁厚 mm   |       |        |        |        |        |        |        |        |        |        |        |        |        |
|--------------------|--------------|-----------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                    |              | 4.0       | 5.0   | 6.0    | 7.0    | 8.0    | 9.0    | 10.0   | 11.0   | 12.0   | 13.0   | 14.0   | 15.0   | 16.0   | 18.0   |
|                    |              | 理论质量 kg/m |       |        |        |        |        |        |        |        |        |        |        |        |        |
| 150                | 168          | 16.18     | 20.10 | 23.97  | 27.79  | 31.56  | 35.29  | 38.96  |        |        |        |        |        |        |        |
| 200                | 219          | 21.21     | 26.39 | 31.52  | 36.60  | 41.63  | 46.61  | 51.54  |        |        |        |        |        |        |        |
| 250                | 273          | 26.53     | 33.04 | 39.51  | 45.92  | 52.28  | 58.59  | 64.86  | 71.07  | 77.24  | 83.35  |        |        |        |        |
| 300                | 325          |           | 39.46 | 47.20  | 54.89  | 62.54  | 70.13  | 77.68  | 85.18  | 92.62  | 100.02 | 107.37 |        |        |        |
| 350                | 356          |           |       | 51.79  | 60.24  | 68.65  | 77.01  | 85.32  | 93.58  | 101.80 | 109.96 | 118.07 | 126.14 |        |        |
| 400                | 406          |           |       | 59.18  | 68.88  | 78.52  | 88.11  | 97.65  | 107.15 | 116.59 | 125.99 | 135.33 | 144.63 |        |        |
| 450                | 457          |           |       | 66.73  | 77.68  | 88.58  | 99.43  | 110.23 | 120.98 | 131.68 | 142.34 | 152.94 | 163.50 | 174.00 |        |
| 500                | 508          |           |       | 74.28  | 86.48  | 98.64  | 110.75 | 122.81 | 134.82 | 146.78 | 158.69 | 170.55 | 182.36 | 194.12 |        |
| 550                | 559          |           |       | 81.82  | 95.29  | 108.70 | 122.07 | 135.38 | 148.65 | 161.87 | 175.04 | 188.16 | 201.22 | 214.25 |        |
| 600                | 610          |           |       | 89.37  | 104.09 | 118.76 | 133.39 | 147.96 | 162.48 | 176.96 | 191.39 | 205.76 | 220.09 | 234.37 |        |
| (650)              | 660          |           |       | 96.77  | 112.72 | 128.63 | 144.48 | 160.29 | 176.05 | 191.76 | 207.42 | 223.03 | 238.59 | 254.10 |        |
| 700                | 711          |           |       | 104.31 | 121.52 | 138.69 | 155.80 | 172.87 | 189.88 | 206.85 | 223.76 | 240.63 | 257.45 | 274.22 |        |
| (750)              | 762          |           |       |        | 130.33 | 148.75 | 167.12 | 185.44 | 203.72 | 221.94 | 240.11 | 258.24 | 276.32 | 294.34 |        |
| 800                | 813          |           |       |        | 139.13 | 158.81 | 178.44 | 198.02 | 217.55 | 237.04 | 256.46 | 275.85 | 295.18 | 314.46 |        |
| (850)              | 864          |           |       |        |        | 168.87 | 189.76 | 210.60 | 231.38 | 252.12 | 272.81 | 293.45 | 314.05 | 334.59 |        |
| 900                | 914          |           |       |        |        | 178.74 | 200.86 | 222.93 | 244.95 | 266.92 | 288.84 | 310.72 | 332.54 | 354.31 |        |
| (950)              | 965          |           |       |        |        | 188.80 | 212.17 | 235.50 | 258.78 | 282.01 | 305.19 | 328.32 | 351.41 | 374.44 |        |
| 1000               | 1016         |           |       |        |        | 198.86 | 223.49 | 248.08 | 272.62 | 297.10 | 321.54 | 345.93 | 370.27 | 394.56 |        |
| (1100)             | 1118         |           |       |        |        |        |        | 273.23 | 300.28 | 327.29 | 354.24 | 381.14 | 408.00 | 434.81 |        |
| 1200               | 1220         |           |       |        |        |        |        | 298.39 | 327.95 | 357.47 | 386.94 | 416.36 | 445.73 | 475.05 | 533.54 |
| (1300)             | 1321         |           |       |        |        |        |        | 323.29 | 355.35 | 387.36 | 419.32 | 451.23 | 483.09 | 514.90 | 578.38 |
| 1400               | 1420         |           |       |        |        |        |        | 347.71 | 382.21 | 416.66 | 451.06 | 485.41 | 519.71 | 553.96 | 622.32 |
| (1500)             | 1524         |           |       |        |        |        |        | 373.35 | 410.42 | 447.43 | 484.40 | 521.31 | 558.18 | 595.00 | 668.48 |
| 1600               | 1620         |           |       |        |        |        |        | 397.03 | 436.46 | 475.84 | 515.17 | 554.46 | 593.69 | 632.87 | 711.10 |
| (1700)             | 1727         |           |       |        |        |        |        | 423.41 | 465.48 | 507.50 | 549.47 | 591.40 | 633.27 | 675.09 | 758.59 |
| 1800               | 1820         |           |       |        |        |        |        | 446.35 | 490.71 | 535.02 | 579.29 | 623.50 | 667.67 | 711.79 | 799.87 |
| (1900)             | 1930         |           |       |        |        |        |        | 473.47 | 520.55 | 567.57 | 614.55 | 661.48 | 708.36 | 755.19 | 848.70 |
| 2000               | 2020         |           |       |        |        |        |        | 495.67 | 544.96 | 594.21 | 643.40 | 692.55 | 741.65 | 790.70 | 888.65 |

注:带括号者不推荐使用