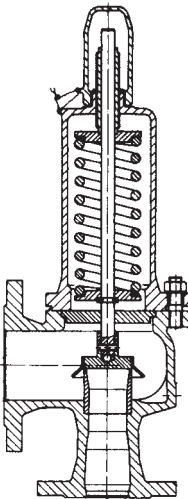
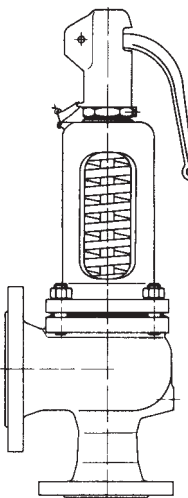


GSV...441 – closed-bonnet design



GSV...441H2 – with gas-tight cap



GSV...442 – open bonnet design

## Safety Valves

**GSV...441, GSV...442**
**PN 16 – 40**
**DN 20 – 150 (¾" – 6")**

### Description

For use with steam, non-corrosive gases, vapours and liquids.

### Design

Direct spring-loaded safety valve, with stainless steel valve seat, disc and spindle in accordance with VdTÜV bulletin 100, AD bulletin A2, TRD 421.

### Type-Approval Numbers

**TÜV · SV-99-576-D/G**

#### Full-lift valve – GSV 442

 $\alpha d = 0.7$ 

For set pressure range see "Discharge Capacities"

**TÜV · SV-99-576-F**

#### Standard valve – GSV 441

 $\alpha d = 0.45$ 

For set pressure range see "Discharge Capacities"

| Type            | Inlet/Outlet                                                                           |
|-----------------|----------------------------------------------------------------------------------------|
| <b>GSV 4421</b> | DN 20/32 to DN 150/250<br>GJL-250 (GG 25)<br>PN 16/16<br>–10 °C to +300 °C             |
| <b>GSV 4425</b> | DN 25/40 to DN 100/150<br>GJS-400-18-LT (GGG 40.3)<br>PN 40/16<br>–60 °C to +350 °C    |
| <b>GSV 4422</b> | DN 20/40 to DN 150/250<br>GP 240 GH (GS-C 25)<br>PN 40/16<br>–85 °C to +450 °C         |
| <b>GSV 4414</b> | DN 25/40 to DN 100/150<br>GX5CrNiMo 19-11-2 (1.4408)<br>PN 40/16<br>–270 °C to +400 °C |

### Valve Sizing

For steam, air and water see discharge capacities tables, calculation in accordance with DIN 3320, part 1, TRD 421 and AD-A2, data required for determination of size:

#### Gaseous media

Mass flow [kg/h], molar mass [kg/kmol], temperature [°C], set pressure [barg], back pressure [barg]

#### Liquid media

Mass flow [kg/h], density [kg/m³], viscosity [mm²/s], temperature [°C], set pressure [barg], back pressure [barg]

### Special Designs

**GSV...441/442**

Available soft seat valve discs:

|                 |                   |                                    |
|-----------------|-------------------|------------------------------------|
| <b>EPDM</b>     | –45 °C to +150 °C | } <b>D</b><br><b>L</b><br><b>K</b> |
| <b>Viton</b>    | –20 °C to +180 °C |                                    |
| <b>Neoprene</b> | –40 °C to +100 °C |                                    |

Gas-tight cap

Heat-resistant spring

Stainless steel bellows

Rubber bellows

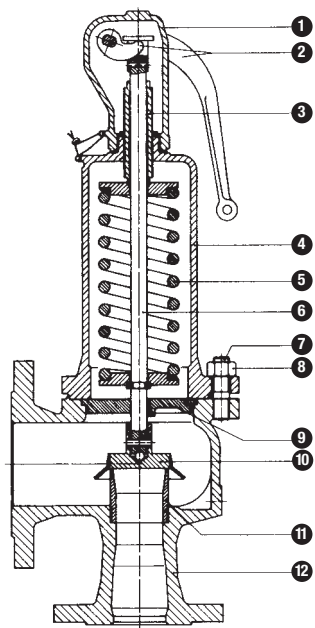
Detachable lift support

Disc/seat with hard facing

Heating jacket

Drain hole

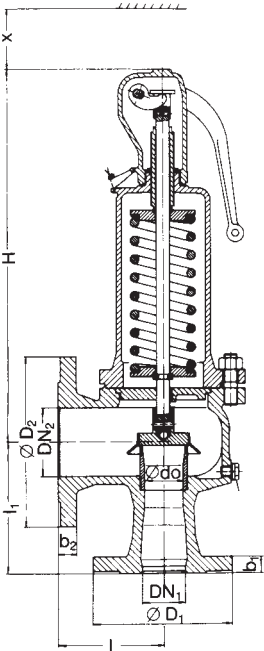
**More information and further ancillary equipment available on request.**



Materials

| Part No.                   | Designation         | Materials of types GSV ... 441/442  |               |             |              |
|----------------------------|---------------------|-------------------------------------|---------------|-------------|--------------|
|                            |                     | 4421                                | 4425          | 4422        | 4414         |
| 1                          | Cap                 | GJS-400-18-LT 0.7043                |               |             | 1.4408       |
| 2                          | Lifting lever       | GJS-400-18-LT 0.7043                |               |             | 1.4408       |
| 3                          | Setting screw       | 1.4404 / 1.4104                     |               |             | 1.4404       |
| 4                          | Bonnet              | GJS-400-18-LT 0.7043                |               |             | 1.4408       |
| 5                          | Spring              | t < 200 °C 1.1200 t > 200 °C 1.7102 |               |             | 1.4310       |
| 6                          | Spindle             | X 20 Cr 13 1.4021                   |               |             | 1.4404       |
| 7                          | Fixing stud         | Ck 35 1.1181                        |               |             | A4 - 70      |
| 8                          | Hexagonal nut       | C 35 1.0501                         |               |             | A4           |
| 9                          | Guide disc          | X14CrMo S 17 1.4104                 |               |             | 1.4404       |
| 10                         | Valve disc hardened | X39CrMo 17-1 1.4122                 |               |             | 1.4404       |
| 11                         | Seat                | X2CrNiMo 17-12-2 1.4404             |               |             | 1.4404       |
| 12                         | Body                | GJL-250                             | GJS-400-18-LT | GP 240 GH   | 1.4408       |
| Operating temperature [°C] |                     | -10 to +300                         | -60 to +350   | -85 to +450 | -270 to +400 |

Dimensions [mm] and Weights [kg]



| DN <sub>1</sub> x DN <sub>2</sub>                                                               |               | 20x32 | 25x40 | 32x50 | 40x65 | 50x80 | 65x100 | 80x125 | 100x150 | 125x200 | 150x250 |
|-------------------------------------------------------------------------------------------------|---------------|-------|-------|-------|-------|-------|--------|--------|---------|---------|---------|
| d <sub>0</sub>                                                                                  |               | 18    | 23    | 29    | 37    | 46    | 60     | 74     | 92      | 98      | 125     |
| PN 16 EN 1092-1, Form D                                                                         |               | 105   | 115   | 140   | 150   | 165   | 185    | 200    | 220     | 250     | 285     |
| PN 40 EN 1092-1, Form D<br>PN 40 EN 1092-1, Form D<br>D <sub>1</sub>                            |               |       |       |       |       |       |        |        | 235     | 270     | 300     |
| PN 16 EN 1092-1, Form D<br>PN 16 EN 1092-1, Form D<br>PN 16 EN 1092-1, Form D<br>D <sub>2</sub> |               | 140   | 150   | 165   | 185   | 200   | 220    | 250    | 285     | 340     | 405     |
| b <sub>1</sub>                                                                                  | GJL-250       | 16    | 16    | 18    | 18    | 20    | 20     | 22     | 24      | 26      | 26      |
|                                                                                                 | GJS-400-18-LT | 18    | 18    | 18    | 19    | 20    | 22     | 24     | 24      |         |         |
|                                                                                                 | GP 240 GH     | 20    | 20    | 20    | 21    | 22    | 24     | 26     | 28      | 31      | 34      |
|                                                                                                 | 1.4408        | 16    | 16    | 18    | 19    | 20    | 22     | 22     | 23      |         |         |
| b <sub>2</sub>                                                                                  | GJL-250       | 18    | 18    | 20    | 20    | 22    | 24     | 26     | 26      | 30      | 32      |
|                                                                                                 | GJS-400-18-LT | 19    | 19    | 20    | 20    | 20    | 20     | 22     | 22      |         |         |
|                                                                                                 | GP 240 GH     | 19    | 19    | 20    | 20    | 20    | 20     | 22     | 22      | 27      | 29      |
|                                                                                                 | 1.4408        | 15    | 16    | 17    | 17    | 17    | 17     | 19     | 19      |         |         |
| I                                                                                               |               | 95    | 100   | 110   | 115   | 120   | 140    | 160    | 180     | 200     | 225     |
| I <sub>1</sub>                                                                                  |               | 85    | 105   | 115   | 140   | 150   | 170    | 195    | 220     | 250     | 285     |
| H <sup>1)</sup>                                                                                 |               | 215   | 233   | 325   | 366   | 413   | 526    | 603    | 660     | 660     | 735     |
| H <sup>2)</sup>                                                                                 |               | —     | 234   | 331   | 372   | 419   | 529    | 606    | 663     | 663     | 735     |
| X                                                                                               |               | 150   | 150   | 200   | 250   | 300   | 350    | 400    | 450     | 450     | 450     |
| Weight                                                                                          |               | 9     | 9     | 12    | 16    | 22    | 32     | 56     | 75      | 85      | 131     |

<sup>1)</sup> 4421, 4425, 4422    <sup>2)</sup> 4414

Discharge Capacities, GSV . . . 442 (Saturated Steam and Air)

| Set pressure<br><br>[bar] | Discharge capacity         |      |       |      |       |       |       |       |       |       |                                    |       |       |       |                                            |        |                                                                                                                |       |        |        |  |  |  |  |
|---------------------------|----------------------------|------|-------|------|-------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|--------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------|-------|--------|--------|--|--|--|--|
|                           | I = Saturated steam [kg/h] |      |       |      |       |       |       |       |       |       | II = Air 0 °C and 1.013 bar [m³/h] |       |       |       |                                            |        |                                                                                                                |       |        |        |  |  |  |  |
|                           | DN 20                      |      | DN 25 |      | DN 32 |       | DN 40 |       | DN 50 |       | DN 65                              |       | DN 80 |       | DN 100                                     |        | DN 125                                                                                                         |       | DN 150 |        |  |  |  |  |
| p                         | I                          | II   | I     | II   | I     | II    | I     | II    | I     | II    | I                                  | II    | I     | II    | I                                          | II     | I                                                                                                              | II    | I      | II     |  |  |  |  |
| 0.2                       | 84                         | 99   | 137   | 162  | 217   | 258   | 354   | 419   | 547   | 648   | 930                                | 1100  | 1410  | 1670  | 2180                                       | 2590   | 2480                                                                                                           | 2940  | 4030   | 4780   |  |  |  |  |
| 0.5                       | 130                        | 159  | 212   | 260  | 337   | 414   | 549   | 673   | 849   | 1040  | 1440                               | 1770  | 2190  | 2690  | 3390                                       | 4160   | 3850                                                                                                           | 4720  | 6260   | 7680   |  |  |  |  |
| 1.0                       | 189                        | 237  | 308   | 387  | 490   | 616   | 798   | 1000  | 1230  | 1540  | 2090                               | 2630  | 3190  | 4000  | 4930                                       | 6190   | 5590                                                                                                           | 7030  | 9100   | 11400  |  |  |  |  |
| 2.0                       | 302                        | 384  | 493   | 627  | 783   | 997   | 1270  | 1620  | 1970  | 2500  | 3350                               | 4260  | 5100  | 6490  | 7880                                       | 10000  | 8940                                                                                                           | 11300 | 14500  | 18500  |  |  |  |  |
| 3.0                       | 406                        | 522  | 663   | 852  | 1050  | 1350  | 1710  | 2200  | 2650  | 3400  | 4510                               | 5790  | 6860  | 8810  | 10600                                      | 13600  | 12000                                                                                                          | 15400 | 19500  | 25100  |  |  |  |  |
| 4.0                       | 507                        | 655  | 827   | 1060 | 1310  | 1700  | 2140  | 2760  | 3300  | 4270  | 5620                               | 7270  | 8560  | 11000 | 13200                                      | 17100  | 15000                                                                                                          | 19400 | 24400  | 31500  |  |  |  |  |
| 5.0                       | 607                        | 788  | 990   | 1280 | 1570  | 2040  | 2560  | 3330  | 3960  | 5140  | 6740                               | 8760  | 10200 | 13300 | 15800                                      | 20500  | 17900                                                                                                          | 23300 | 29200  | 38000  |  |  |  |  |
| 6.0                       | 706                        | 922  | 1150  | 1500 | 1830  | 2390  | 2980  | 3890  | 4610  | 6020  | 7840                               | 10200 | 11900 | 15500 | 18400                                      | 24000  | 20900                                                                                                          | 27300 | 34000  | 44400  |  |  |  |  |
| 7.0                       | 806                        | 1050 | 1310  | 1720 | 2090  | 2730  | 3400  | 4450  | 5260  | 6890  | 8950                               | 11700 | 13600 | 17800 | 21000                                      | 27500  | 23800                                                                                                          | 31200 | 38800  | 50800  |  |  |  |  |
| 8.0                       | 905                        | 1180 | 1470  | 1940 | 2340  | 3080  | 3820  | 5020  | 5910  | 7760  | 10000                              | 13200 | 15200 | 20000 | 23600                                      | 31000  | 26800                                                                                                          | 35200 | 43600  | 57300  |  |  |  |  |
| 9.0                       | 1000                       | 1320 | 1630  | 2150 | 2600  | 3430  | 4240  | 5580  | 6550  | 8630  | 11100                              | 14600 | 16900 | 22300 | 26200                                      | 34500  | 29700                                                                                                          | 39100 | 48400  | 63700  |  |  |  |  |
| 10.0                      | 1100                       | 1450 | 1800  | 2370 | 2860  | 3770  | 4660  | 6150  | 7200  | 9500  | 12200                              | 16100 | 18600 | 24600 | 28800                                      | 38000  | 32600                                                                                                          | 43100 | 53100  | 70100  |  |  |  |  |
| 12.0                      | 1300                       | 1720 | 2120  | 2810 | 3370  | 4470  | 5490  | 7270  | 8490  | 11200 | 14400                              | 19100 | 21900 | 29100 | 33900                                      | 44900  | 38500                                                                                                          | 51000 | 62700  | 83000  |  |  |  |  |
| 14.0                      | 1490                       | 1980 | 2440  | 3240 | 3890  | 5160  | 6330  | 8400  | 9780  | 12900 | 16600                              | 22100 | 25300 | 33600 | 39100                                      | 51900  | 44400                                                                                                          | 58900 | 72200  | 95900  |  |  |  |  |
| 16.0                      | 1690                       | 2250 | 2770  | 3680 | 4400  | 5850  | 7170  | 9530  | 11000 | 14700 | 18800                              | 25000 | 28600 | 38100 | 44300                                      | 58900  | 50300                                                                                                          | 66800 | 81800  | 108000 |  |  |  |  |
| 18.0                      | 1890                       | 2520 | 3090  | 4110 | 4910  | 6540  | 8000  | 10600 | 12300 | 16400 | 21000                              | 28000 | 32000 | 42600 | 49500                                      | 65900  | 56100                                                                                                          | 74700 | 91400  | 121000 |  |  |  |  |
| 20.0                      | 2090                       | 2780 | 3410  | 4550 | 5430  | 7240  | 8840  | 11700 | 13600 | 18200 | 23200                              | 30900 | 35300 | 47100 | 54600                                      | 72800  | 62000                                                                                                          | 82600 | 100000 | 134000 |  |  |  |  |
| 22.0                      | 2290                       | 3050 | 3740  | 4990 | 5950  | 7930  | 9680  | 12900 | 14900 | 19900 | 25400                              | 33900 | 28700 | 51600 | 59900                                      | 79800  | 67900                                                                                                          | 90600 | 111000 | 149000 |  |  |  |  |
| 24.0                      | 2490                       | 3320 | 4070  | 5420 | 6470  | 8620  | 10500 | 14000 | 16200 | 21700 | 27700                              | 36900 | 42100 | 56100 | 65100                                      | 86800  | 73900                                                                                                          | 99800 | 120000 | 162000 |  |  |  |  |
| 26.0                      | 2690                       | 3590 | 4390  | 5860 | 6990  | 9310  | 11300 | 15100 | 17500 | 23400 | 29900                              | 39800 | 45500 | 60600 | 70400                                      | 95000  | <div>TÜV · SV-99-576-D/G</div> <div>DN 20 – DN 150</div> <div>Calculation in acc. with TRD 421 and AD-A2</div> |       |        |        |  |  |  |  |
| 28.0                      | 2890                       | 3850 | 4720  | 6290 | 7510  | 10000 | 12200 | 16200 | 18900 | 25100 | 32100                              | 42800 | 48900 | 65100 | 75600                                      | 102000 |                                                                                                                |       |        |        |  |  |  |  |
| 30.0                      | 3090                       | 4120 | 5050  | 6730 | 8030  | 10700 | 13000 | 17400 | 20200 | 26900 | 34400                              | 45800 | 52300 | 69700 | 80900                                      | 109000 |                                                                                                                |       |        |        |  |  |  |  |
| 32.0                      | 3290                       | 4390 | 5380  | 7160 | 8560  | 11300 | 13900 | 18500 | 21500 | 28600 | 36600                              | 48700 | 55700 | 74200 | 86200                                      | 116000 |                                                                                                                |       |        |        |  |  |  |  |
| 34.0                      |                            | 4650 |       | 7600 |       | 12000 |       | 19600 |       | 30400 |                                    | 51700 |       | 79700 |                                            | 123000 |                                                                                                                |       |        |        |  |  |  |  |
| 36.0                      |                            | 4920 |       | 8040 |       | 12700 |       | 20800 |       | 32100 |                                    | 55400 |       | 84300 | Calculation in acc. with TRD 421 and AD-A2 |        |                                                                                                                |       |        |        |  |  |  |  |
| 38.0                      |                            | 5190 |       | 8470 |       | 13400 |       | 21900 |       | 33900 |                                    | 58400 |       | 88900 |                                            |        |                                                                                                                |       |        |        |  |  |  |  |
| 40.0                      |                            | 5450 |       | 8910 |       | 14100 |       | 23000 |       | 35600 |                                    | 61400 |       | 93500 |                                            |        |                                                                                                                |       |        |        |  |  |  |  |

Pressure/Temperature Ratings (Set Pressure/Temperature)

| Body material | PN | Set pressure in barg [psig] at temperatures of |       |       |       |                                        |                              |       |
|---------------|----|------------------------------------------------|-------|-------|-------|----------------------------------------|------------------------------|-------|
|               |    | 120 °C                                         | 200°C | 250°C | 300°C | 350°C                                  | 400°C                        | 450°C |
| GP 240 GH     | 40 | 40                                             | 35    | 32    | 28    | 24                                     | 21                           | 18    |
| GJS-400-18-LT | 40 | 40                                             | 32    | 28    | 24    | 21                                     | GJS-400-18-LT acc. to TRD/AD |       |
| GJL-250       | 16 | 16                                             | 13    | 11    | 10    | GP 240 GH and GJL-250 acc. to DIN 2401 |                              |       |

Safety Valves

**GSV...441, GSV...442**

**PN 16 – 40**

**DN 20 – 150 (¾" – 6")**

Important Notes

Any particular regulations, e.g. SR Safety Valves, AD Bulletin A2, TRD, DIN 4570/4571/4572 etc., must be considered when selecting and installing safety valves.

The service pressure of the plant should be approx. 15 % below the desired set pressure of the valve to ensure correct reseating of the valve after blowdown has occurred.

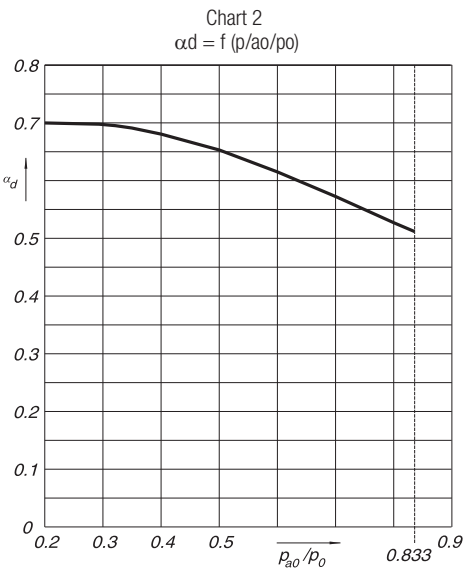
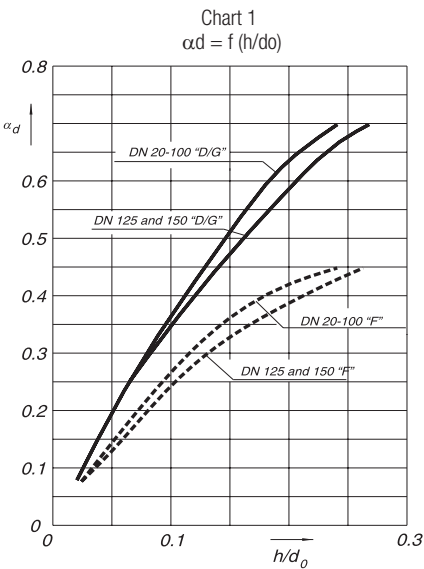
The valve should be installed vertically with valve spindle upward. Be sure that heavy vibrations from the plant are not transferred to the valve.

The safety valve is drained via the outlet line. The outlet line should be laid with a slight fall in accordance with the relevant regulations and correctly drained. If the valve is supplied with drain hole an additional drain line **can** be connected.

Order and Enquiry Specifications

- ...pieces GESTRA safety valves
- Type GSV...
- Inlet size DN...
- Nominal pressure PN...
- Set pressure ...barg (psig)

Discharge Coefficient  $\alpha_d$



- h** = Lift [mm]
- d<sub>o</sub>** = Smallest orifice area [mm]
- p<sub>ao</sub>** = Pressure (absolute) on outlet side [bara]
- p<sub>o</sub>** = Set pressure (absolute) [bara]

Discharge Capacities, GSV ... 441 (Water)

| Differential pressure [bar] | Discharge capacities <b>Water</b> 20 °C [t/h] |           |           |           |           |           |           |           |           |            |
|-----------------------------|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
|                             | DN 20                                         | DN 25     | DN 32     | DN 40     | DN 50     | DN 65     | DN 80     | DN 100    | DN 112    | DN 150     |
| <b>d<sub>o</sub> [mm]</b>   | <b>18</b>                                     | <b>23</b> | <b>29</b> | <b>37</b> | <b>46</b> | <b>60</b> | <b>74</b> | <b>92</b> | <b>98</b> | <b>125</b> |
| <b>p</b>                    | III                                           | III       | III       | III       | III       | III       | III       | III       | III       | III        |
| <b>0.2</b>                  | 3.19                                          | 5.21      | 8.28      | 13.5      | 20.8      | 35.4      | 53.9      | 83.3      | 94.6      | 154.0      |
| <b>0.5</b>                  | 4.51                                          | 7.37      | 11.7      | 19.1      | 29.5      | 50.1      | 76.3      | 118.0     | 134.0     | 218.0      |
| <b>1.0</b>                  | 6.11                                          | 9.97      | 15.9      | 25.8      | 39.9      | 67.9      | 103.0     | 160.0     | 181.0     | 295.0      |
| <b>2.0</b>                  | 8.64                                          | 14.1      | 22.4      | 36.5      | 56.4      | 96.0      | 146.0     | 226.0     | 256.0     | 417.0      |
| <b>3.0</b>                  | 10.6                                          | 17.3      | 27.5      | 44.7      | 69.1      | 118.0     | 179.0     | 276.0     | 314.0     | 510.0      |
| <b>4.0</b>                  | 12.2                                          | 19.9      | 31.7      | 51.6      | 79.8      | 136.0     | 206.0     | 319.0     | 362.0     | 589.0      |
| <b>5.0</b>                  | 13.7                                          | 22.3      | 35.5      | 57.7      | 89.2      | 152.0     | 231.0     | 357.0     | 405.0     | 659.0      |
| <b>6.0</b>                  | 15.0                                          | 24.4      | 38.8      | 63.2      | 97.7      | 166.0     | 253.0     | 391.0     | 444.0     | 722.0      |
| <b>7.0</b>                  | 16.2                                          | 26.4      | 42.0      | 68.3      | 106.0     | 180.0     | 273.0     | 422.0     | 479.0     | 779.0      |
| <b>8.0</b>                  | 17.3                                          | 28.2      | 44.8      | 73.0      | 113.0     | 192.0     | 292.0     | 451.0     | 512.0     | 833.0      |
| <b>9.0</b>                  | 18.3                                          | 29.9      | 47.6      | 77.4      | 120.0     | 204.0     | 310.0     | 479.0     | 543.0     | 884.0      |
| <b>10.0</b>                 | 19.3                                          | 31.5      | 50.1      | 81.6      | 126.0     | 215.0     | 326.0     | 505.0     | 573.0     | 932.0      |
| <b>12.0</b>                 | 21.2                                          | 34.6      | 54.9      | 89.4      | 138.0     | 235.0     | 358.0     | 553.0     | 627.0     | 1020.0     |
| <b>14.0</b>                 | 22.9                                          | 37.3      | 59.3      | 96.6      | 149.0     | 254.0     | 386.0     | 597.0     | 678.0     | 1100.0     |
| <b>16.0</b>                 | 24.4                                          | 39.9      | 63.4      | 103.0     | 160.0     | 271.0     | 413.0     | 638.0     | 724.0     | 1170.0     |
| <b>18.0</b>                 | 25.9                                          | 42.3      | 67.3      | 110.0     | 169.0     | 288.0     | 438.0     | 677.0     | 768.0     | 1240.0     |
| <b>20.0</b>                 | 27.3                                          | 44.6      | 70.9      | 115.0     | 178.0     | 304.0     | 462.0     | 714.0     | 810.0     | 1310.0     |
| <b>22.0</b>                 | 28.7                                          | 46.8      | 74.4      | 121.0     | 187.0     | 318.0     | 484.0     | 748.0     | 849.0     | 1380.0     |
| <b>24.0</b>                 | 29.9                                          | 48.9      | 77.7      | 126.0     | 195.0     | 333.0     | 506.0     | 782.0     | 887.0     | 1440.0     |
| <b>26.0</b>                 | 31.1                                          | 50.9      | 80.9      | 132.0     | 203.0     | 346.0     | 526.0     | 814.0     |           |            |
| <b>28.0</b>                 | 32.3                                          | 52.8      | 83.9      | 137.0     | 211.0     | 359.0     | 546.0     | 844.0     |           |            |
| <b>30.0</b>                 | 33.5                                          | 54.6      | 86.8      | 141.0     | 219.0     | 372.0     | 565.0     | 874.0     |           |            |
| <b>32.0</b>                 | 34.6                                          | 56.4      | 89.7      | 146.0     | 226.0     | 384.0     | 584.0     | 903.0     |           |            |
| <b>34.0</b>                 | 35.6                                          | 58.2      | 92.5      | 151.0     | 233.0     | 396.0     | 602.0     | 931.0     |           |            |
| <b>36.0</b>                 | 36.7                                          | 59.8      | 95.1      | 155.0     | 239.0     | 407.0     | 619.0     |           |           |            |
| <b>38.0</b>                 | 37.7                                          | 61.5      | 97.7      | 159.0     | 246.0     | 418.0     | 636.0     |           |           |            |
| <b>40.0</b>                 | 38.6                                          | 63.1      | 100.0     | 163.0     | 252.0     | 429.0     | 653.0     |           |           |            |

Supply in accordance with our general terms of business.

