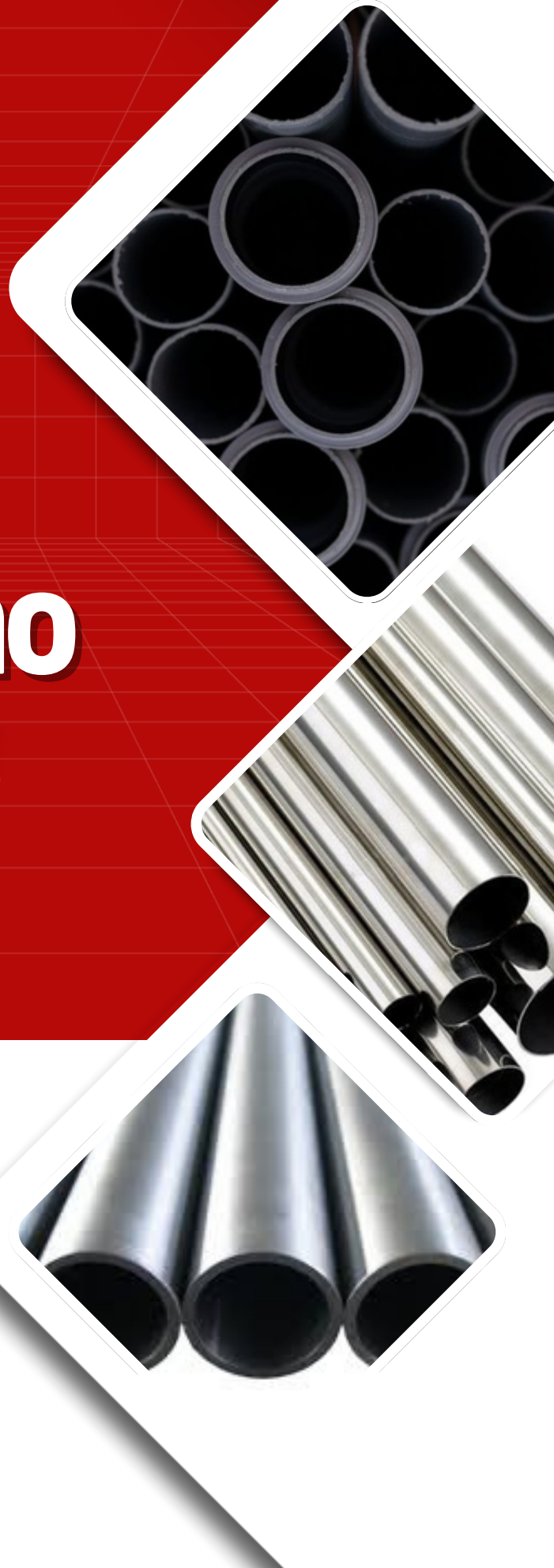


# Nippon Steel & Sumitomo

**Brochure**



**NIPPON STEEL &  
SUMITOMO METAL  
CORPORATION**



# APPLICABLE SPECIFICATION

## 1. Line Pipes (Carbon Steel)

|               |                                                                        |
|---------------|------------------------------------------------------------------------|
| API 5L        | Line Pipe (Grade B, X42, X46, X52, X56, X60, X65, X70, X80, X90, X100) |
| ISO 3183      | Petroleum and natural gas industries -Steel Pipe for Pipelines-        |
| DNVGL-ST-F101 | Submarine Pipeline Systems (Applicable Design Code)                    |
| ASTM A53      | Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Seamless               |
| ASTM A106     | Seamless Carbon Steel Pipe for High-Temperature Service                |
| ASTM A333     | Seamless Steel Pipe for Low-Temperature Service                        |
| CSA Z245.1    | Steel Line Pipe                                                        |
| JIS G3454     | Carbon Steel Pipes for Pressure Service (STPG)                         |
| JIS G3455     | Carbon Steel Pipes for high Pressure Service (STS)                     |

## 2. Line Pipes (Corrosion Resistant Alloy)

|               |                                                              |
|---------------|--------------------------------------------------------------|
| API 5LC       | CRA Line Pipe                                                |
| DNVGL-ST-F101 | Submarine Pipeline Systems (Applicable Design Code)          |
| ASTM A790     | (S31803) Seamless Ferritic / Austenitic Stainless Steel Pipe |
| ASTM A790     | (S31260) seamless Ferritic / Austenitic Stainless Steel Pipe |

# MATERIAL DESIGN TECHNOLOGY

## 1. NIPPON STEEL MATERIAL DESIGN CONCEPT FOR SOUR SERVICE

### Performance



### Performance Requirements

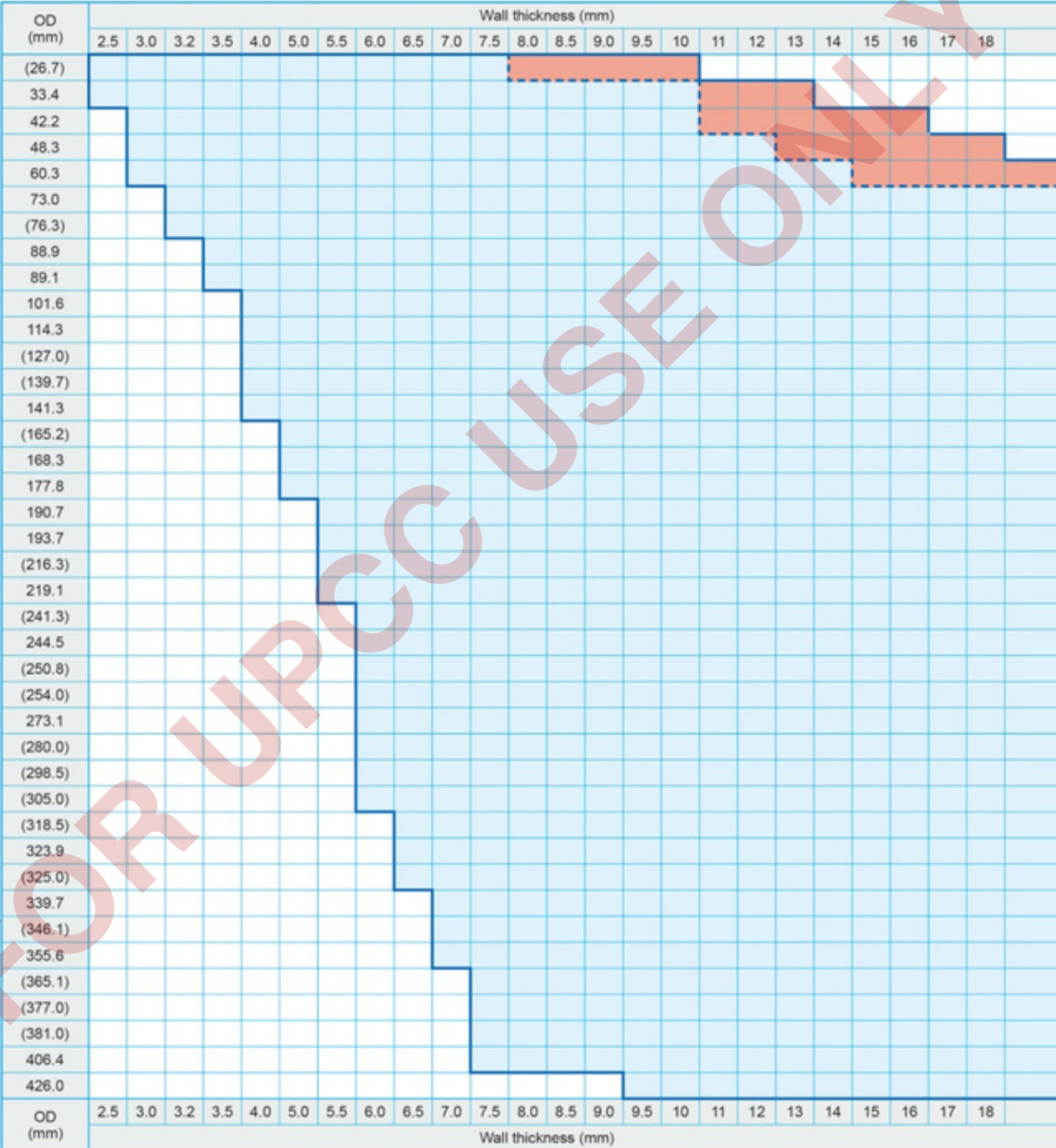


### Design Concept



# Manufacturing Available Size Range (Carbon Steel Pipes)

Available size range for seamless pipe



OD in parentheses : Please contact us in advance  
 — : Available size range for seamless pipe  
 - - - : Permissible specified size range of API 5L



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 Building, 86 Banawe St., Brgy., Sto.  
 Domingo, Quezon City, Philippines

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# CARBON STEEL LINE PIPE

NIPPON STEEL has supplied Carbon Steel Line pipe with low carbon and low Pcm material. And we can provide tighter ID tolerance at pipe end.

## NIPPON STEEL MATERIAL DESIGN CONCEPT FOR CARBON STEEL

- To Prevent HAZ Hardening in Field Girth Welding, our carbon steel is low carbon and low Pcm.

Table Chemical composition Nippon Steel compared to others

|              | Size (mm)        | C             | Si            | Mn            | P             | S             | Others                | Ceq (IIW) | Pcm  |
|--------------|------------------|---------------|---------------|---------------|---------------|---------------|-----------------------|-----------|------|
| Nippon Steel | 355.6OD x 25.4WT | 0.05/<br>0.07 | 0.05/<br>0.15 | 1.05/<br>1.40 | max.<br>0.015 | max.<br>0.002 | Cr, Mo, Ti, and V     | 0.39      | 0.17 |
|              | 406.4OD x 25.4WT |               |               |               |               |               | Cr, Mo, Ti, and V     | 0.39      | 0.16 |
| Others       | 355.6OD x 25.4WT | 0.10/<br>0.12 | 0.20/<br>0.30 | 1.05/<br>1.40 | max.<br>0.015 | max.<br>0.002 | Cr, Mo, Ti, V and Nb  | 0.37      | 0.20 |
|              | 406.4OD x 25.4WT |               |               |               |               |               | Cu, Ni, Cr, Mo and Nb | 0.37      | 0.19 |

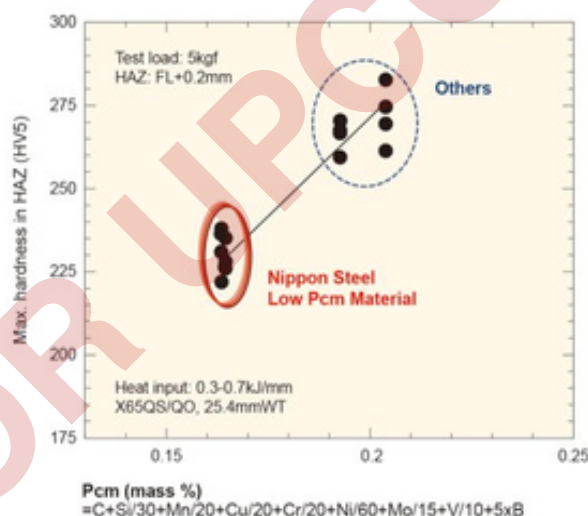
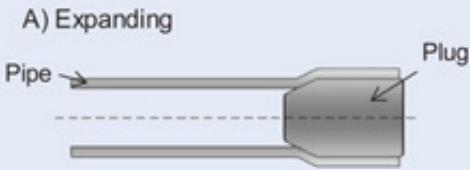
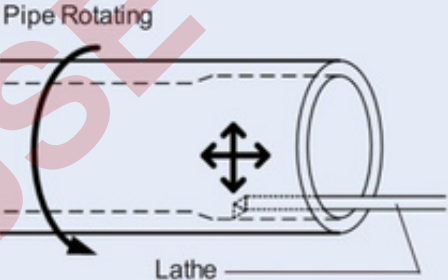


Fig. Hardness test results on typical field girth welds (Mechanized PGMAW)

Low Pcm material prevented HAZ hardening

NIPPON STEEL PIPE END AVAILABLE ID TOLERANCE

Table Available ID Tolerance and control method

| Available ID tolerance | End Sizing                                                                                                                                                                                                                 | End Machining                                                                       |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                        | +/- 1.0mm                                                                                                                                                                                                                  | +/- 0.25mm                                                                          |
| ID control method      | <p>A) Expanding</p>  <p>B) Swaging &amp; Expanding</p>  |  |



## PIPE DIMENSIONS AND WEIGHTS

| NOMINAL<br>PIPE SIZE | OD             | SCHEDULE<br>DESIGNATIONS                        | WALL<br>THICKNESS                                           |                                                          | WEIGHT                                                     |                                                             | ID                                                          |                                                                    |
|----------------------|----------------|-------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|
| INCH<br>MM           | INCH<br>MM     | ASME                                            | INCH                                                        | MM                                                       | LBS/ FOOT                                                  | KG/<br>METER                                                | INCH                                                        | MM                                                                 |
| 1/8<br>6             | 0.405<br>10.3  | STD<br>XS<br>40<br>80                           | 0.068<br>0.095                                              | 1.73<br>2.41                                             | 0.24<br>0.31                                               | 0.37<br>0.47                                                | 0.269<br>0.215                                              | 6.84<br>5.84                                                       |
| 1/4<br>8             | 0.540<br>13.7  | 10<br>STD<br>XS<br>40<br>80                     | 0.065<br>0.088<br>0.119                                     | 1.65<br>2.24<br>3.02                                     | 0.33<br>0.43<br>0.54                                       | 0.49<br>0.63<br>0.80                                        | 0.410<br>0.364<br>0.302                                     | 10.40<br>9.22<br>7.66                                              |
| 3/8<br>10            | 0.675<br>17.1  | STD<br>XS<br>40<br>80                           | 0.091<br>0.126                                              | 2.31<br>3.20                                             | 0.57<br>0.74                                               | 0.84<br>1.10                                                | 0.493<br>0.423                                              | 12.48<br>10.70                                                     |
| 1/2<br>15            | 0.840<br>21.3  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.083<br>0.109<br>0.147<br>0.188<br>0.294                   | 2.11<br>2.77<br>3.73<br>4.78<br>7.47                     | 0.67<br>0.85<br>1.09<br>1.31<br>1.72                       | 1.00<br>1.27<br>1.62<br>1.95<br>2.55                        | 0.674<br>0.622<br>0.546<br>0.464<br>0.252                   | 17.08<br>15.76<br>13.84<br>11.74<br>6.36                           |
| 3/4<br>20            | 1.050<br>26.7  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.083<br>0.113<br>0.154<br>0.219<br>0.308                   | 2.11<br>2.87<br>3.91<br>5.56<br>7.82                     | 0.86<br>1.13<br>1.48<br>1.95<br>2.44                       | 1.28<br>1.69<br>2.20<br>2.90<br>3.64                        | 0.884<br>0.824<br>0.742<br>0.612<br>0.437                   | 22.48<br>20.96<br>18.88<br>15.58<br>11.06                          |
| 1<br>25              | 1.315<br>33.4  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.109<br>0.133<br>0.179<br>0.250<br>0.358                   | 2.77<br>3.38<br>4.55<br>6.35<br>9.09                     | 1.41<br>1.68<br>2.17<br>2.85<br>3.66                       | 2.09<br>2.50<br>3.24<br>4.24<br>5.45                        | 1.094<br>1.049<br>0.957<br>0.815<br>0.599                   | 27.88<br>26.64<br>24.30<br>20.70<br>15.22                          |
| 1-1/4<br>32          | 1.660<br>42.2  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.109<br>0.133<br>0.191<br>0.250<br>0.382                   | 2.77<br>3.56<br>4.85<br>6.35<br>9.70                     | 1.81<br>2.27<br>3.00<br>3.77<br>5.22                       | 2.89<br>3.39<br>4.47<br>5.61<br>7.77                        | 1.442<br>1.380<br>1.278<br>1.160<br>0.896                   | 36.86<br>35.08<br>32.50<br>29.50<br>22.80                          |
| 1-1/2<br>40          | 1.900<br>48.3  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.109<br>0.145<br>0.200<br>0.291<br>0.400                   | 2.77<br>3.68<br>5.08<br>7.14<br>10.15                    | 2.09<br>2.72<br>3.63<br>4.86<br>6.41                       | 3.11<br>4.05<br>5.41<br>7.25<br>9.55                        | 1.682<br>1.610<br>1.500<br>1.338<br>1.100                   | 42.76<br>40.94<br>38.14<br>34.02<br>28.00                          |
| 2<br>50              | 2.375<br>60.3  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.109<br>0.154<br>0.218<br>0.344<br>0.436                   | 2.77<br>3.91<br>5.54<br>8.74<br>11.07                    | 2.64<br>3.66<br>5.03<br>7.47<br>9.04                       | 3.93<br>5.44<br>7.48<br>11.11<br>13.44                      | 2.157<br>2.067<br>1.939<br>1.687<br>1.503                   | 54.76<br>52.48<br>49.22<br>42.82<br>38.16                          |
| 2-1/2<br>65          | 2.875<br>73.0  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.120<br>0.203<br>0.276<br>0.375<br>0.552                   | 3.05<br>5.16<br>7.01<br>9.53<br>14.02                    | 3.53<br>5.80<br>7.67<br>10.02<br>13.71                     | 5.26<br>8.63<br>11.41<br>14.92<br>20.39                     | 2.635<br>2.469<br>2.323<br>2.125<br>1.771                   | 66.90<br>62.68<br>58.98<br>53.94<br>44.86                          |
| 3<br>80              | 3.500<br>88.9  | 10<br>STD<br>XS<br>40<br>80<br>160<br>XX        | 0.120<br>0.216<br>0.300<br>0.438<br>0.600                   | 3.05<br>5.49<br>7.62<br>11.13<br>15.24                   | 4.34<br>7.58<br>10.26<br>14.34<br>18.60                    | 6.46<br>11.29<br>15.27<br>21.35<br>27.68                    | 3.260<br>3.068<br>2.900<br>2.624<br>2.300                   | 82.80<br>77.92<br>73.66<br>66.64<br>58.42                          |
| 4<br>100             | 4.500<br>114.3 | 10<br>STD<br>XS<br>40<br>80<br>120<br>160<br>XX | 0.120<br>0.237<br>0.337<br>0.438<br>0.531<br>0.674          | 3.05<br>6.02<br>8.56<br>11.13<br>13.49<br>17.12          | 5.62<br>10.80<br>15.00<br>19.02<br>22.53<br>27.57          | 8.37<br>16.08<br>22.32<br>28.32<br>33.54<br>41.03           | 4.260<br>4.026<br>3.826<br>3.624<br>3.438<br>3.152          | 108.20<br>102.26<br>97.18<br>92.04<br>87.32<br>80.06               |
| 5<br>125             | 5.563<br>141.3 | 10<br>STD<br>XS<br>40<br>80<br>120<br>160<br>XX | 0.134<br>0.258<br>0.375<br>0.500<br>0.625<br>0.750          | 3.40<br>6.55<br>9.53<br>12.70<br>15.88<br>19.05          | 7.78<br>14.63<br>20.80<br>27.06<br>32.99<br>38.59          | 11.56<br>21.77<br>30.97<br>40.28<br>49.12<br>57.43          | 5.295<br>5.047<br>4.813<br>4.563<br>4.313<br>4.063          | 134.50<br>128.20<br>122.94<br>115.90<br>109.54<br>103.20           |
| 6<br>150             | 6.625<br>168.3 | 10<br>STD<br>XS<br>40<br>80<br>120<br>160<br>XX | 0.134<br>0.188<br>0.280<br>0.432<br>0.562<br>0.719<br>0.864 | 3.40<br>4.78<br>7.11<br>10.97<br>14.27<br>18.26<br>21.95 | 9.30<br>12.94<br>18.99<br>28.60<br>36.43<br>45.39<br>53.21 | 13.83<br>19.28<br>26.26<br>42.56<br>54.21<br>67.57<br>79.22 | 6.357<br>6.249<br>5.965<br>5.761<br>5.501<br>5.187<br>4.897 | 161.50<br>158.74<br>154.08<br>146.36<br>139.76<br>131.78<br>124.40 |

\*PLEASE NOTE AS PER ASME ALL PIPES HAVE A TOLERANCE OF  $\pm 12.5\%$

### SPECIFICATIONS:

#### STANDARDS:

ASTM A53/A106 GRADE B, ASME, API,  
AND ANSI B 36.10

- Wall Thickness:  $\pm 12.5\%$
- Size: 1/4" - 48"
- Thickness: Schedule: 10 - 160
- All Items will have an accompanying  
Mill Test Certificate upon request

### APPLICATIONS:

- Industrial
- Residential
- Petrochemical  
Plants
- Oil & Gas
- Refineries
- Sugar Mills
- Energy
- Construction  
& Infrastructure
- Chemicals
- Machineries
- Boilers
- Food & Beverage
- Shipping
- Desalination Plant
- Automotive  
& Transport
- High-Pressure  
Vessel
- Power Plants



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