

**Material Specifications for  
Carbon Steel  
BUTT WELDING FITTINGS**

|                               | ASTM SPECIFICATION<br>A234 |                           |
|-------------------------------|----------------------------|---------------------------|
|                               | WPA<br>(Grade A)           | WPB<br>(Grade B)          |
| GRADE SYMBOL                  | WPA<br>(Grade A)           | WPB<br>(Grade B)          |
| TYPE OF STEEL                 | Carbon                     | Carbon                    |
| CHEMICAL COMPOSITION          | C-0.25 max.                | C-0.30 max.               |
| MINIMUM PHYSICAL REQUIREMENTS | TS-48,000<br>YP-30,000     | TS-60,000<br>YP-35,000    |
| HEAT TREATMENT                | Cooled<br>in<br>Still Air  | Cooled<br>in<br>Still Air |

**Material Specifications for  
Carbon Steel  
FLANGES**

|                               | ASTM SPECIFICATION*   |                        |                        |                        |
|-------------------------------|---|------------------------|------------------------|------------------------|
|                               | A181  |                        | A105                   |                        |
| GRADE SYMBOL                  | I   | II                     | I                      | II                     |
| TYPE OF STEEL                 | Carbon  |                        | Carbon                 |                        |
| CHEMICAL COMPOSITION          | C-0.35 max.   |                        | C-0.35 max.            |                        |
| MINIMUM PHYSICAL REQUIREMENTS | TS-60,000<br>YP-30,000  | TS-70,000<br>YP-36,000 | TS-60,000<br>YP-30,000 | TS-70,000<br>YP-36,000 |
| HEAT TREATMENT                | Hot forged with<br>finishing temp. above<br>upper critical<br>Cooled in still air |                        | Normalized             |                        |

**GRADE AND COMPOSITION  
SYMBOLS FOR CARBON STEEL BUTT-  
WELDING FITTINGS**

|     |                    |                         |
|-----|--------------------|-------------------------|
| WPA | Seamless Pipe..... | ASTM A106 Grade A       |
|     | Plate.....         | ASTM A285 Grade C       |
|     | Forgings.....      | ASTM A105 Grade 1       |
|     | Bars*.....         | ASTM A107 GR. 1008-1022 |
| WPB | Seamless Pipe..... | ASTM A106 Grade B       |
|     | Plate.....         | ASTM A515 Grade 6S      |
|     | Forgings.....      | ASTM A105 Grade 11      |
|     | Bars*.....         | ASTM A107 Gr. 1025-1030 |
| WPC | Seamless Pipe..... | ASTM A106 Grade C       |
|     | Plate.....         |                         |
|     | Forgings.....      | ASTM A104 Grade 11'     |

\* For fittings 2" nominal size and smaller

**Low Temperature Carbon Steel**

|      |                           |                     |
|------|---------------------------|---------------------|
| WPLO | Seamless and Welded Pipe. | ASTM A332 Grade O   |
|      | Plate.....                | ASTM A300 Class 1   |
|      | Forgings.....             | ASTM A350 Grade LF1 |

\*Material specifications for the ASME Boiler Code are the same ASTM except the letter S is prefixed thereto.

A 35% Carbon maximum for flanges which are to be welded has been established by ASTM A181 and A105.