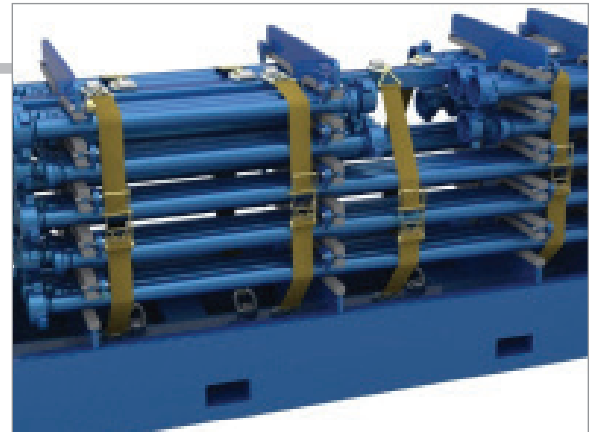


TETRA utilizes piping systems to transport well flow between the various equipment components in the well test systems. Generally, the piping is hammer union type or flanged and provided in lengths of 3, 5, or 10 feet along with "90s", "45s", "Tees", etc. to fit the process. All TETRA flowline connections and equipment are designed to industry standards. TETRA's flowline construction standards include ASME B31.3 and/or API 6A. These standards are used for all relevant production testing flowline systems above 285 psi working pressure. TETRA U.S.A. and some operations outside of the U.S. allow for the use of Non-Pressurized-Seal-Thread, (NPST) pipe. The design is based on approval by API 5B, Specification for Threading, Gauging & Thread Inspection, and API 5C3, Bulletin on Formulas & Calculations.

### Features/Benefits

- Construction as per ASME B31.3 & NACE MR-01-75
- Provides for NPST flow systems as per API 5B & API 5CE
- Color-coded to identify service and pressure rating
- Color-coded to identify hammer union and union type
- Individually serialized and traceable
- Various sealing mechanisms available (i.e., Metal-to-Metal, O-Ring, Lip Seal)
- Bi-annual certification as standard, can be changed to meet regional content as needed



### Applications

- Solids removal during frac flow back of plug material resulting from a mill-out process
- Positioned upstream of sand separators and choke manifolds
- Onshore and offshore operations
- Helps prevent plugging of chokes and process equipment

### Technical Specifications

| Press (psi)      | BAND COLOR               | PIPE COLOR                               |
|------------------|--------------------------|--|
| 20,000           | White - RAL 9010         | Flange & Hub API Pipe and 1502 are Blue  |
| 15,000           | Safety Purple - RAL 4005 |  |
| 10,000           | Sulfur Yellow - RAL 1023 |  |
| 5,000            | Safety Orange - RAL 2009 |  |
| 2,500            | Signal Brown - RAL 8002  |  |
| 2,000            | Black - RAL 9017         | 602, 206, 200, 100 & ANSI 600, 300 & 150 |
| 1,000            | Signal Red - RAL 3001    | Flange Pipe are Grey                     |
| H <sub>2</sub> S | Medium Green - RAL 6024  | All Sour Service                         |

| ANSI-Rated Flanges                              |                        |                       |
|---|------------------------|-----------------------|
| Class   | MACWP <sup>1</sup> psi | MATP <sup>2</sup> psi |
| 150   | 285                    | 427.5                 |
| 300   | 740                    | 1110                  |
| 600   | 1480                   | 2220                  |
| 900   | 2220                   | 3330                  |
| 1500  | 3700                   | 5550                  |
| 2500  | 6170                   | 9255                  |
| Maximum Allowable Cold Working Pressure @ 100°F |                        |                       |
| Maximum Allowable Test Pressure                 |                        |                       |

- » Pipe color indicates connection type; Band color indicates pressure rating.
- » H<sub>2</sub>S service is identified by a green band.
- » Pressure ratings are identified in alphanumeric characters of contrasting color to the background.
- » For pipe work pressure ratings, the lettering is to be a minimum of 0.75 inches high for small items (crossovers, elbows, etc.) and 1.5 inches high for larger items (pipes, etc.) and are to be placed in a minimum of three positions around the circumference of the pipe. Pressure rating, color coding, and lettering may be stenciled or a suitable, all-weather tape used.

| Typical Hammer Unions Used by TETRA |            |                             |          |            |
|-------------------------------------|------------|-----------------------------|----------|------------|
| Figure                              | Size       | MACWP <sup>1</sup> psi Sour | MATP psi | Color Code |
| 206                                 | 2"/3"/4"6" | 2,000                       | 3,000    | Grey       |
| 602                                 | 3"/4"      | 5,000                       | 7,500    | Grey       |
| 1502                                | 2"/3"      | 10,000                      | 15,000   | Blue       |
| 2202                                | 2"         | 15,000                      | 22,500   | Blue       |

| API-Rated (High Temperature)                       |                        |          |
|--|------------------------|----------|
| Size   | MACWP <sup>1</sup> psi | MATP psi |
| 1-13/16", 2-1/16",<br>2-9/16", 3-1/16",<br>4-1/16" | 5,000                  | 7,500    |
|  | 10,000                 | 15,000   |
|  | 15,000                 | 22,500   |
|  | 20,000                 | 30,000   |
|  | 25,000                 | 37,500   |

