www.SimtechUSA.com

# Pure Tech Piping Systems
# Polypropylene Socket Fusion

# Submittal Package

SIMTECH

*Corrosion Resistant Fluid and Air Handling Systems.*

Engineer:

Contractor:

Distributor:

Dated 07-08-2010

## TABLE OF CONTENTS





**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

## Section 1

# Material Specification



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

## SIMTECH GUIDE SPECIFICATION
## ALPHAPLUS POLYPROPYLENE PIPING SYSTEM

### 1.0 PIPE

**1.1 Material**

Pipe shall be extruded from Group 1, Class 2, Alpha nucleated homopolymer pigmented material in accordance with ASTM D-4101. AP polypropylene resin shall achieve a minimum tensile strength of 300 bar when tested at 23°C according to ASTM D 638. Material shall allow continuous operating temperatures to 95° C. AP resin shall comply with relevant food substance regulation, US FDA guidelines as specified in Code of Federal Regulators (CFR), Title 21, Chapter 1: Section 177.1520 and Section 178.3297 suitable for contact with foodstuff, pharmaceutical use and potable water.

**1.2 Stress Relieved**

Pipe shall be stress relieved by post-extrusion annealing to eliminate inherent stresses in the pipe wall created by the extrusion process.

**1.3 Pressure Rating**

Pipe shall be pressure rated in accordance with ASTM D-2837 and Din 8077 for hydrostatic design basis. Pipe shall be manufactured to an SDR (standard dimension ratio) in order to provide the same pressure rating in all diameters. Pipe shall be:

SDR 11 = 150 PSI (PN10)*

*PN = Nominal Pressure Rating in Bar

### 2.0 FITTINGS

**2.1 Material**

See material under PIPE section 1.0

**2.2 Pressure Fittings**

All pressure pattern fittings from ½" (20 mm) through 4" (110 mm) shall be injection molded and shall have the same pressure rating as the pipe. Fittings ½" (20mm) through 2½" (75mm) shall be injection molded socket fusion type. Fittings larger than 2½" shall be butt fusion type.

**2.4 Dimensions and Tolerances**

Socket fusion fittings dimension are in accordance with ISO 7279 and DIN 16962. Butt fusion conform to SDR (standard dimension ratio) series that defines the wall thickness and outer diameter

**2.4 Joining**

All joints ½" (20 mm) through 2½" (75 mm) shall be interference fit socket fusion type. Butt fusion joints may be used on pipe and fittings above 2½". All fusion-welded joints to be performed in accordance with ASTM D-2657 and piping manufacturers recommendations. All installers shall be factory certified by a representative of the manufacturer.

### 3.0 MANUFACTURER

SIMTECH
877-777-2467
www.SimtechUSA.com

# Material Information

## Material Type - Polypropylene (PP)

SIMTECH'S SR Series Polypropylene piping is extruded from A Group 1. Class 1, Grade 0 Polypropylene Homopolymer material per ASTM-D4101, Federal Specifications L-P-39413 and Military Spec Mil P 461096. PP material to be heat stabilized UV stabilized and pigmented to RAL 7032. Temperature stabilizers are added to provide the material with enhanced resistance to aggressive media at elevated temperatures.

## Stress Relieved

SIMTECH'S SR Series pipe is Stress Relieved, through a post extrusion annealing process. This process allows the pipe to perform to its fullest potential. SR Series pipe possess higher impact strength, higher quick burst pressures, improved resistance to oxidizing acids and longer service life expectancy, compared to pipe that is not subject to a post extrusion annealing process.

### Material Characteristics, PP

| Properties | Test Standard | Test Method Test Specimen | Dimension | PP |
|---|---|---|---|---|
| | | | | Type 1 |
| **Mechanical Properties** | | | | |
| Density | DIN 53479 | Method C | $g/cm^3$ | 0.91 |
| Melting Index Group | DIN 16776 | MFI 190-5 | Group | 006 |
| Tensile Test | DIN 53455 | Test Bar 3 | — | — |
| Yield Stress | — | Test Speed 50 mm/min | $N/mm^2$ | 33 |
| Elongation At Yield Stress | — | — | % | 15 |
| Elongation At Rupture | — | — | % | 70 |
| Bending Test | DIN 53457 | Test Bar | — | — |
| Bending Modulus E | 1 min. | 120 x 10 x 4 mm | $N/mm^2$ | 1200 |
| Impact Bending Test | DIN 53453 | Charpy | — | |
| Impact Strength | — | Standard Miniature Bar | $kj/m^2$ | Without Break |
| Notched Bar Impact Strength | — | Standard Miniature Bar With U-Notch | $kj/m^2$ | 7 |
| **Surface Hardness** | | | | |
| Ball Impression Hardness | DIN 53456 | H 358/30 | $N/mm^2$ | 70 |
| Shore Hardness | DIN 53505 | D | — | 72 |
| **Thermal Properties** | | | | |
| Crystallite Melting Range | — | Polarization Microscope | K (°C) | 160 - 165 |
| Mean Thermal Coefficient Of Linear Expansion | DIN 53752 | — | K (°C) | $1.6 \times 10^{-4}$ |
| Thermal Conductivity | DIN 52612 | Two-Plate Method | W/m x K | 0.22 |
| **Electrical Properties** | | | | |
| Dielectric Strength | DIN 53481 | K 20/P 50 | kV/mm | 52 |
| Impedance | DIN 53482 | Annular Electrode | Ohm x cm | $> 10^{16}$ |
| Surface Resistance | DIN 53482 | Electrode A | Ohm | $10^{14}$ |
| Leakage Path Resistance | DIN 53480 | Method KC | Step | > 600 |
| **Other Properties** | | | | |
| Flammability | DIN 4102 | — | Class | B2 |
| Water Absorption | DIN 53495 | Method C | % / 24h | < 0.01 |
| Physiologically Harmless | Recommendation | BGA/KTW | — | YES |
| Chemical Resistance | DIN 8078 Addendum | — | — | Complies |

## Permissible Gauge Pressure For SIMTECH Homopolymer Polypropylene Depending Upon Temperature and Time

| Temperature | | Operation Years | PN10 / SDR 11 |
|---|---|---|---|
| F | C | | PSI |
| 68° | 20° | 1 | 222 |
| | | 5 | 203 |
| | | 10 | 194 |
| | | 25 | 184 |
| | | 50 | 180 |
| 86° | 30° | 1 | 175 |
| | | 5 | 165 |
| | | 10 | 158 |
| | | 25 | 151 |
| | | 50 | 145 |
| 104° | 40° | 1 | 144 |
| | | 5 | 129 |
| | | 10 | 123 |
| | | 25 | 115 |
| | | 50 | 110 |
| 122° | 50° | 1 | 117 |
| | | 5 | 106 |
| | | 10 | 100 |
| | | 25 | 94 |
| | | 50 | 88 |
| 140° | 60° | 1 | 96 |
| | | 5 | 84 |
| | | 10 | 78 |
| | | 25 | 71 |
| | | 50 | 65 |
| 158° | 70° | 1 | 78 |
| | | 5 | 68 |
| | | 10 | 64 |
| | | 25 | 51 |
| | | 50 | 46 |
| 176° | 80° | 1 | 64 |
| | | 5 | 49 |
| | | 10 | 38 |
| | | 25 | 30 |
| | | 50 | 22 |
| 203° | 95° | 1 | 42 |
| | | 5 | 24 |
| | | 10 | 17 |

NOTE: The continuous permissible operating pressures shown above are reflective of the improved properties of the Stress Relived Homopolymer Resin Pipe produced by SIMTECH. Ratings include a safety factor of 1.7 at 50 years service life.



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

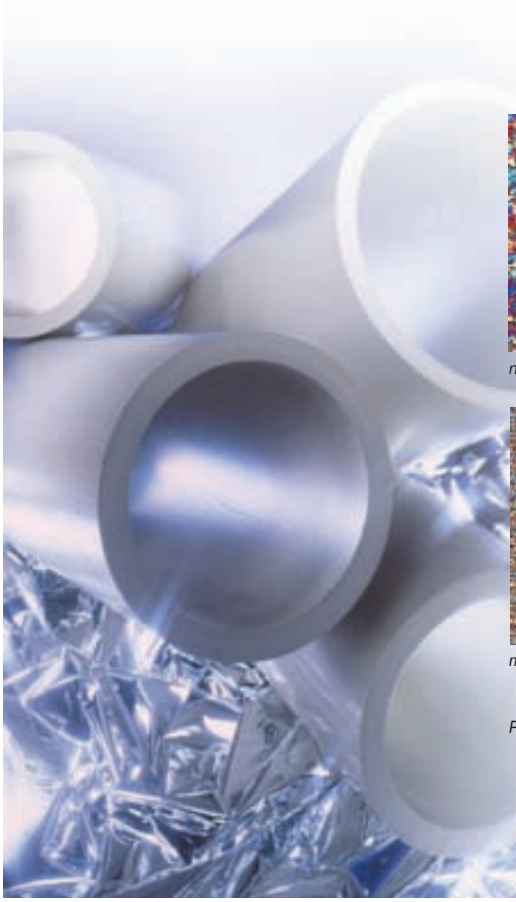
# SIMTECH®AP AlphaPlus
# The new generation of polypropylene

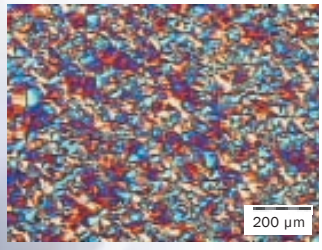
**SIMTECH®PP AlphaPlus is a homo-polymeric polypropylene (PP-H) that offers a host of possibilities within the area of industrial pipeline construction. The various types of polypropylene that have been used up till now have their individual material-related strengths and weaknesses. SIMTECH®PP AlphaPlus combines the advantages of the respective types of polypropylene, and in doing so it displays properties that are far superior to standard forms of PP-H:**

- **Increased impact strength with improved rigidity**
- **Finer and more homogeneous super-lattice**
- **Reduced internal tension**
- **Stable crystalline structure**
- **Considerably smoother surface**
- **Lower friction losses**
- **Further improved chemical resistance**
- **Considerable heat resistance**
- **Extreme resistance to tension cracks**
- **Improved weld quality**

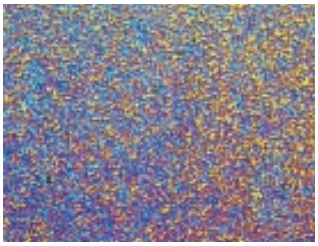
**Nucleation and crystalline structure**

Using special nucleating agents, it has become possible to produce a PP-H with an extremely fine crystal super-lattice in the α-crystalline form: **SIMTECH®PP AlphaPlus.** The spherulites are smaller than 5 µm, so that they are difficult to see under an optical microscope. Pipes made of SIMTECH®PP-H 100 AlphaPlus display an ideal combination of the properties found in α-crystalline standard PP-H 100 pipes and β-nucleated PP-H 100 pipes.






*non-nucleated PP-H*



*β-nucleated PP-H*

*mildly α-nucleated PP-H*

*SIMTECH®PP-H AlphaPlus*

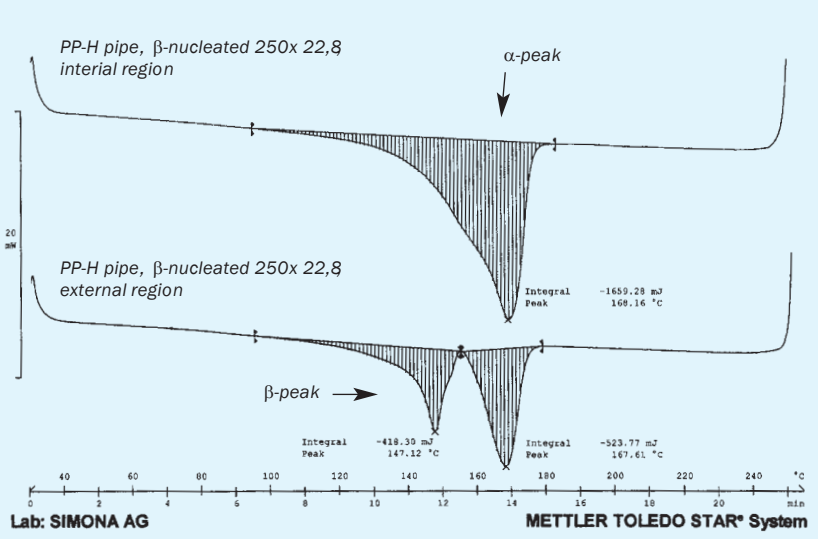
*Photographs taken under an optical microscope of PP-H types with and without nucleating agents.*



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

**Increased impact strength with improved rigidity**

SIMTECH®PP-H 100 AlphaPlus offers users considerably improved rigidity in addition to increased toughness. In fact, the level of rigidity at 100 °C is more than twice as high as that achieved by β-nucleated PP. Moreover, the results of the impact bending test clearly show that the improved resistance of SIMTECH® PP-H 100 AlphaPlus to impact loads is also maintained at low temperatures. This facilitates handling, even at temperatures down to 0 °C.




*DSC-analysis of a PP-H 100pipe, β-nucleated*

**Improved surface roughness**

SIMTECH®PP-H 100 AlphaPlus pipes have surface roughness values ($R_a$) of ≤ 0.3 µm – a clear improvement on roughness values achieved by other types of PP-H. The reason for this improvement is the uniform, very fine supper-lattice structure on the internal surfaces of the pipe over the entire wall thickness.

**Low degree of stress**

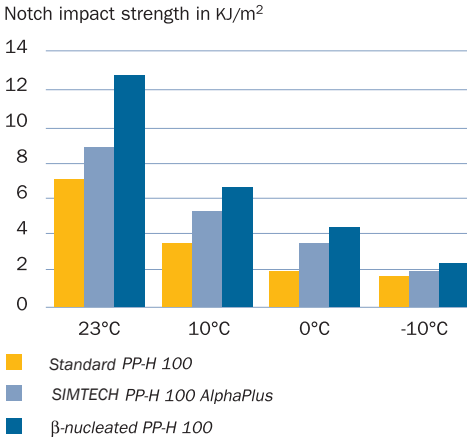
One often observes varying super-lattice structures in β-nucleated pipes, particularly in connection with a high wall thickness. DSC analysis of β-nucleated PP-H 100 pipes showed the presence of little or no β-crystalline regions on the internal side of the pipes. In contrast, distinct β-crystalline regions were observed on the external side of the pipes. This also applies to weld seams, which are made up almost entirely of α-crystalline regions. This leads to an increased level of stress in pipes and weld seams. The SIMTECH nucleating agent prevents this effect. Due to the extremely uniform and fine super-lattice structure of SIMTECH®PP-H AlphaPlus, there is a low degree of stress in the extruded pipe.

**Optimised hydraulic properties**

The fine crystalline structure of SIMTECH®PP-H 100 AlphaPlus pipes has an advantageous effect on the surface roughness. The level of pipe friction $F_R$ is drastically reduced, and the loss of pressure Δp decreases by more than 10 per cent. Depending on the flow rate, energy can be saved for the transport of liquids for an economic efficient use of piping systems.

**No more incrustations**

For applications in the pharmaceutical and food industries and in semiconductor technology, an extremely low surface roughness is essential when it comes to minimising the deposition of particles or bacteria colonies. The considerably improved surface roughness of the pipes significantly reduces the adhesion of particles (incrustations). This allows potential cost savings for users due to longer intervals between cleaning treatments.




*Notch impact strength according to the Charpy method*



SIMTECH
Phone: 877-777-2467 • Fax: 215-547-9129
www.SimtechUSA.com

**Improved chemical resistance**

The improved toughness and low roughness both have a palpable effect on the chemical resistance. The minimised roughness reduces the surface area for attack. Thus, the surface will be attacked at a much slower rate. The working life of the pipe increases, the number of required repairs decreases, and there is optimum functioning of the pipeline.

**Extreme resistance to tension cracks**

The increased toughness also minimises tension crack formation, due to the fact that the material is less notch-sensitive. Particularly in critical zones such as weld seams and fixed points, where internal tension or tension from external sources is observed, the resistance when contacted with tension crack-promoting chemicals such as chromic acid, hydrogen peroxide or chlorine-containing wastewater is considerably increased.

**Increased lifetime**

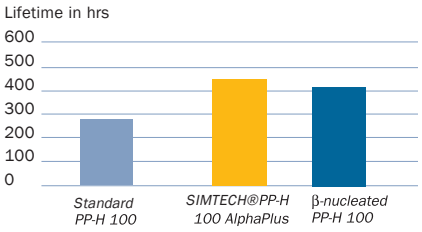
Compared to standard PP-H 100 with a lifetime between 250 and 300 hrs, the lifetime of SIMTECH®PP-H 100 AlphaPlus is increased to more than 420 hrs. Thus, the chemical resistance to tension crack-promoting substances is further enhanced. This characteristic is largely due to the crystalline structure of the material, which has outstanding tension-reducing properties.

**Reducing the residual tension**

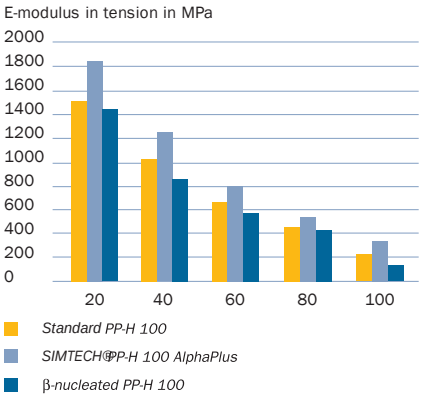
The internal tension, which is dependent on the manufacturing process, can be minimised by tempering. For this reason, all SIMTECH®PP-H 100 AlphaPlus pipes undergo inline tempering. Studies have shown that a limit value of 2.5 N/mm² must be maintained in order to largely avoid tension cracks on being exposed to chemicals. Tempering of SIMTECH®PP-H 100 AlphaPlus reduces the residual tension to below 1.4 N/mm².

**Excellent weld quality**

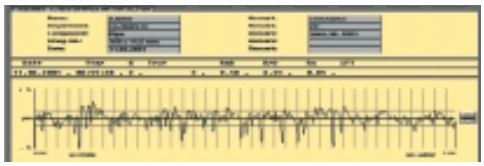
The machine welding process produces a welding bead. Depending on the character of the welding bead, a notch is produced in the transition from the pipe to the bead. Around these notches there are tension peaks, which reduce the strength of the joint. When subjected to tensile forces and chemicals, these may also cause cracks. The tension peaks are reduced by the improved toughness of SIMTECH®PP-H AlphaPlus, and the result is a considerably greater strength. Therefore, SIMTECH®PP-H AlphaPlus provides a particularly high degree of safety. This is an important advantage when work is being carried out in places where pipeline components have to be welded at points which are difficult to access.



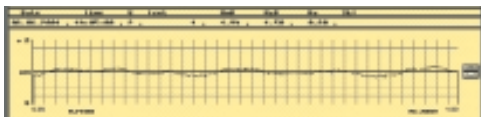

*Lifetimes of different PP types in the FNCT at 80°C*



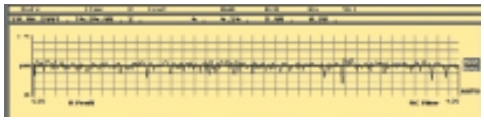

*Modulus of elasticity in tension of different type of PP (single analysis on pressed sheets)*



*Standard PP-H 100*



*SIMTECH®PP-H 100 AlphaPlus*



*β-nucleated PP-H 100*

*Comparison of the roughness of different types of PP-H 100 pipes*

# Our expertise is your gain

**Summary**

The significantly improved material properties of SIMTECH® AP AlphaPlus have numerous advantages for users:

- Considerably lower loss of pressure due to the improved hydraulic properties
- Significantly lower leachables and deposition of particles and bacteria (colony formation) due to the surface finish value of RA 12
- Significant cost-savings as a result of the increased intervals between cleaning treatments
- Safe laying and assembly of pipes due to the improved impact strength, even at low temperatures
- Improved chemical resistance and minimised risk of tension cracks
- Improved weld quality and a significantly higher degree of safety when welding pipes – especially at points which are difficult to access

**Comparison of the properties of different PP-H 100[①] pipes**

| Test | Units | Standard PP-H 100 pipe | SIMTECH® PP-H 100 AlphaPlus pipe | PP-H 100 pipe with β-nucleation |
|---|---|---|---|---|
| Modulus of elasticity in tension | MPa | ≥ 1,400 | ≥ 1,700 | ≥ 1,300 |
| Yield stress | MPa | 32 | 34 | 30 |
| Notch impact strength | kJ/m² | ≥ 7 | ≥ 8 | ≥ 12 |
| FNCT 80 °C / 4 MPa | h | ≥ 250 | > 420 | 413 [4] |
| Surface roughness $R_a$ | µm | ≤ 0,8 | ≤ 0,3 [②] | ≥ 0,3 [③] |

① The number 100 expresses the creep-rupture strength of the pipe. The classification was made based on the minimum circumferential stress to be reached in the pipe subjected to an internal pressure by 20 °C over 50 years (PP-B 80 and PP-R 80 ≥ 8 N/mm²; PP-H 100 ≥ 10 N/mm²).

② For pipes with d = 20 – 250 mm

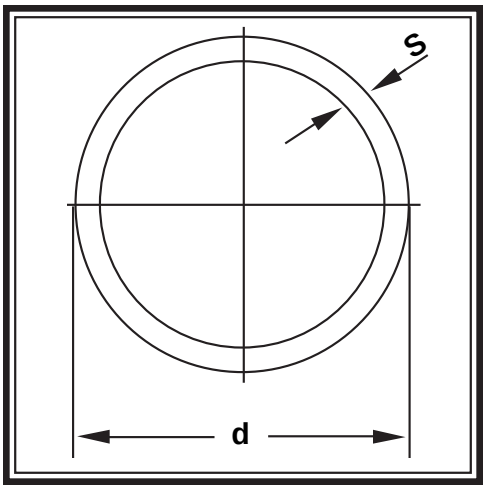
③ According to information provided by the manufacturer: $R_a$ approx. 0.3 µm for d = 20 – 63 mm; approx. 0.6 µm for d = 75 – 110 mm; approx. 1.0 µm for d = 125 – 160 mm



SIMTECH
Phone: 877-777-2467 • Fax: 215-547-9129
www.SimtechUSA.com

## Section 2

# Dimensional Data




# PRESSURE PIPE

Description: Pressure Pipe
PN10 / SDR 11 - 150psi

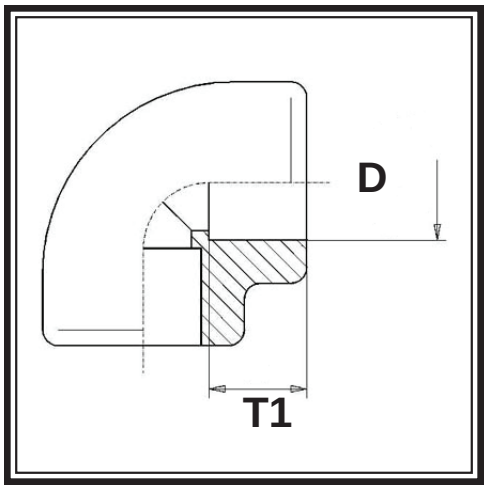
Material: AlphaPlus® Polypropylene

Connection: Butt Fusion

| Nomnial Size | Actual OD Size | d in | S in | Weight (lbs./ m) | Weight Lbs. Foot | Part Number |
|---|---|---|---|---|---|---|
| **3/8"** | 0.630 (16mm) | 0.630 | 0.087 | 0.209 | 0.065 | PP05000016 |
| ½" | 0.787 (20mm) | 0.787 | 0.075 | 0.235 | 0.074 | PP05000020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.091 | 0.361 | 0.113 | PP05000025 |
| 1" | 1.260 (32mm) | 1.260 | 0.114 | 0.574 | 0.179 | PP05000032 |
| 1¼" | 1.575 (40mm) | 1.575 | 0.146 | 0.906 | 0.283 | PP05000040 |
| 1½" | 1.969 (50mm) | 1.969 | 0.181 | 1.404 | 0.439 | PP05000050 |
| 2" | 2.480 (63mm) | 2.480 | 0.228 | 2.222 | 0.694 | PP05000063 |
| 2½" | 2.953 (75mm) | 2.953 | 0.268 | 3.102 | 0.969 | PP05000075 |
| 3" | 3.543 (90mm) | 3.543 | 0.323 | 4.466 | 1.396 | PP05000090 |
| 4" | 4.331 (110mm) | 4.331 | 0.394 | 6.622 | 2.069 | PP05000110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# 90° Elbow

Description: 90° Elbow
PN10 / SDR 11 - 150psi

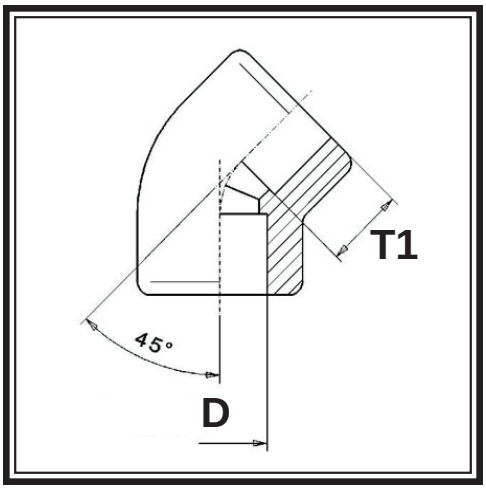
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|
| 3/8" | 0.630 (16mm) | 0.630 | 0.512 | 0.033 | PP07010016 |
| ½" | 0.787 (20mm) | 0.787 | 0.591 | 0.046 | PP07010020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.630 | 0.068 | PP07010025 |
| 1" | 1.260 (32mm) | 1.260 | 0.709 | 0.108 | PP07010032 |
| 1¼" | 1.575 (40mm) | 1.575 | 0.827 | 0.198 | PP07010040 |
| 1½" | 1.969 (50mm) | 1.969 | 0.945 | 0.295 | PP07010050 |
| 2" | 2.480 (63mm) | 2.480 | 1.063 | 0.552 | PP07010063 |
| 2½" | 2.953 (75mm) | 2.953 | 1.220 | 0.616 | PP07010075 |
| 3" | 3.543 (90mm) | 3.543 | 1.417 | 1.100 | PP07010090 |
| 4" | 4.331 (110mm) | 4.331 | 1.654 | 1.903 | PP07010110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# 45° Elbow

Description: 45° Elbow
PN10 / SDR 11 - 150psi

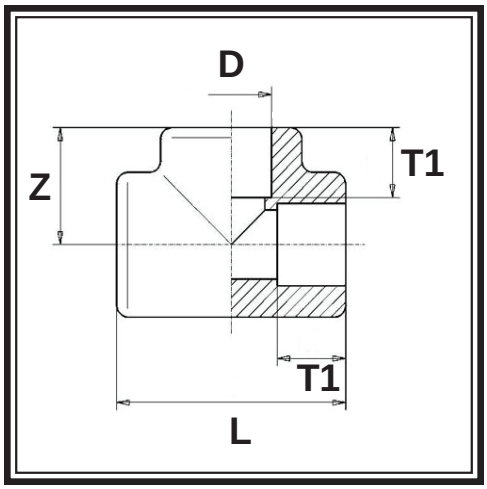
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|
| 3/8" | 0.630 (16mm) | 0.630 | 0.512 | 0.009 | PP07020016 |
| ½" | 0.787 (20mm) | 0.787 | 0.591 | 0.042 | PP07020020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.630 | 0.059 | PP07020025 |
| 1" | 1.260 (32mm) | 1.260 | 0.709 | 0.088 | PP07020032 |
| 1¼" | 1.575 (40mm) | 1.575 | 0.827 | 0.165 | PP07020040 |
| 1½" | 1.969 (50mm) | 1.969 | 0.945 | 0.242 | PP07020050 |
| 2" | 2.480 (63mm) | 2.480 | 1.063 | 0.403 | PP07020063 |
| 2½" | 2.953 (75mm) | 2.953 | 1.220 | 0.473 | PP07020075 |
| 3" | 3.543 (90mm) | 3.543 | 1.417 | 0.781 | PP07020090 |
| 4" | 4.331 (110mm) | 4.331 | 1.654 | 1.342 | PP07020110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com



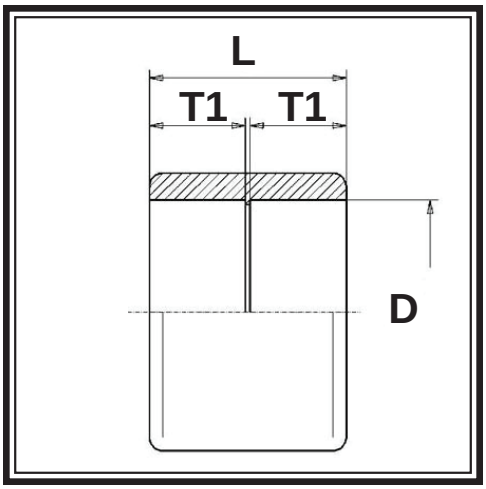

# Tee

Description: Tee
PN10 / SDR 11 - 150psi

Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | L in | T1 in | Z in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|
| 3/8" | 0.630 (16mm) | 0.630 | 1.693 | 0.512 | 0.866 | 0.044 | PP07030016 |
| ½" | 0.787 (20mm) | 0.787 | 2.008 | 0.591 | 1.004 | 0.064 | PP07030020 |
| ¾" | 0.984 (25mm) | 0.984 | 2.323 | 0.630 | 1.161 | 0.099 | PP07030025 |
| 1" | 1.260 (32mm) | 1.260 | 2.756 | 0.709 | 1.378 | 0.141 | PP07030032 |
| 1¼" | 1.575 (40mm) | 1.575 | 3.268 | 0.827 | 1.634 | 0.246 | PP07030040 |
| 1½" | 1.969 (50mm) | 1.969 | 3.898 | 0.945 | 1.949 | 0.370 | PP07030050 |
| 2" | 2.480 (63mm) | 2.480 | 4.724 | 1.102 | 2.362 | 0.684 | PP07030063 |
| 2½" | 2.953 (75mm) | 2.953 | 5.472 | 1.220 | 2.736 | 0.770 | PP07030075 |
| 3" | 3.543 (90mm) | 3.543 | 6.417 | 1.417 | 3.209 | 1.320 | PP07030090 |
| 4" | 4.331 (110mm) | 4.331 | 7.677 | 1.654 | 3.839 | 2.266 | PP07030110 |




# Coupling

Description: Coupling
PN10 / SDR 11 - 150psi

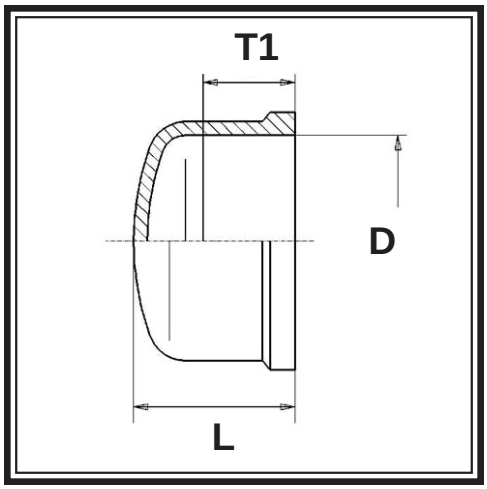
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | T1 in | L in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|
| 3/8" | 0.630 (16mm) | 0.630 | 0.512 | 1.142 | 0.220 | PP07110016 |
| ½" | 0.787 (20mm) | 0.787 | 0.591 | 1.260 | 0.031 | PP07110020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.630 | 1.378 | 0.046 | PP07110025 |
| 1" | 1.260 (32mm) | 1.260 | 0.709 | 1.535 | 0.062 | PP07110032 |
| 1¼" | 1.575 (40mm) | 1.575 | 0.827 | 1.732 | 0.103 | PP07110040 |
| 1½" | 1.969 (50mm) | 1.969 | 0.945 | 1.969 | 0.174 | PP07110050 |
| 2" | 2.480 (63mm) | 2.480 | 1.063 | 2.283 | 0.290 | PP07110063 |
| 2½" | 2.953 (75mm) | 2.953 | 1.220 | 2.598 | 0.370 | PP07110075 |
| 3" | 3.543 (90mm) | 3.543 | 1.417 | 2.992 | 0.662 | PP07110090 |
| 4" | 4.331 (110mm) | 4.331 | 1.654 | 3.465 | 0.935 | PP07110110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# End Cap

Description: End Cap
PN10 / SDR 11 - 150psi

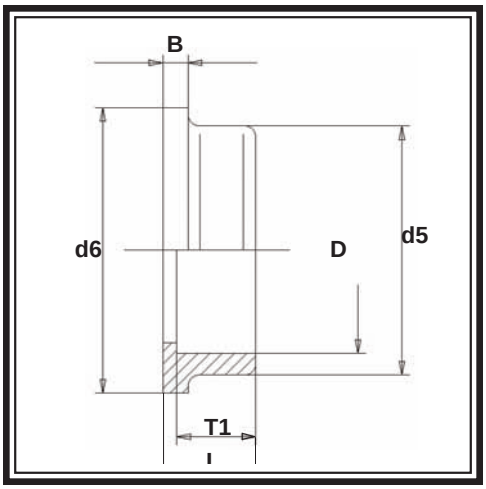
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | L in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.787 | 0.886 | 0.591 | 0.024 | PP07090020 |
| ¾" | 0.984 (25mm) | 0.984 | 1.063 | 0.630 | 0.037 | PP07090025 |
| 1" | 1.260 (32mm) | 1.260 | 1.220 | 0.709 | 0.057 | PP07090032 |
| 1¼" | 1.575 (40mm) | 1.575 | 1.417 | 0.827 | 0.086 | PP07090040 |
| 1½" | 1.969 (50mm) | 1.969 | 1.693 | 0.945 | 0.141 | PP07090050 |
| 2" | 2.480 (63mm) | 2.480 | 2.047 | 1.063 | 0.207 | PP07090063 |
| 2½" | 2.953 (75mm) | 2.953 | 2.323 | 1.220 | 0.306 | PP07090075 |
| 3" | 3.543 (90mm) | 3.543 | 2.717 | 1.417 | 0.554 | PP07090090 |
| 4" | 4.331 (110mm) | 4.331 | 3.228 | 1.654 | 0.906 | PP07090110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Stub End

Description: Stub End
PN10 / SDR 11 - 150psi

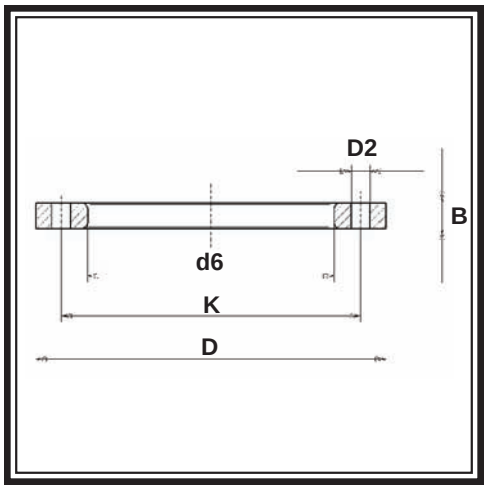
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D in | d5 in | d6 in | B in | L in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.787 | 1.024 | 1.732 | 0.394 | 0.846 | 0.591 | 0.040 | PP07060020 |
| ¾" | 0.984 (25mm) | 0.984 | 1.260 | 2.126 | 0.394 | 0.858 | 0.630 | 0.055 | PP07060025 |
| 1" | 1.260 (32mm) | 1.260 | 1.535 | 2.480 | 0.394 | 0.974 | 0.709 | 0.070 | PP07060032 |
| 1¼" | 1.575 (40mm) | 1.575 | 1.890 | 2.874 | 0.433 | 1.102 | 0.827 | 0.143 | PP07060040 |
| 1½" | 1.969 (50mm) | 1.969 | 2.362 | 3.248 | 0.472 | 1.280 | 0.945 | 0.213 | PP07060050 |
| 2" | 2.480 (63mm) | 2.480 | 2.835 | 3.976 | 0.551 | 1.447 | 1.102 | 0.334 | PP07060063 |
| 2½" | 2.953 (75mm) | 2.953 | 3.346 | 4.173 | 0.394 | 1.388 | 1.220 | 0.352 | PP07060075 |
| 3" | 3.543 (90mm) | 3.543 | 4.173 | 4.921 | 0.433 | 1.722 | 1.417 | 0.473 | PP07060090 |
| 4" | 4.331 (110mm) | 4.331 | 4.882 | 5.906 | 0.472 | 1.811 | 1.634 | 0.792 | PP07060110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Backing Ring

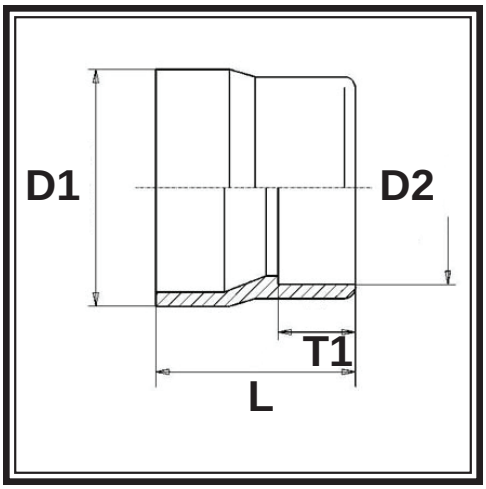
Description: Backing Ring
150 lbs. ANSI Drilling

Material: Glass Filled Polypropylene with Steel Core

| Nominal Size | Actual OD Size | B in | D in | D2 in | d6 in | K in | # Holes | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.472 | 3.504 | 0.630 | 1.240 | 2.362 | 4 | 0.484 | PP99070020 |
| ¾" | 0.984 (25mm) | 0.472 | 3.858 | 0.630 | 1.319 | 2.756 | 4 | 0.660 | PP99070025 |
| 1" | 1.260 (32mm) | 0.630 | 4.252 | 0.630 | 1.634 | 3.110 | 4 | 0.970 | PP99070032 |
| 1¼" | 1.575 (40mm) | 0.630 | 4.606 | 0.630 | 1.988 | 3.504 | 4 | 1.188 | PP99070040 |
| 1½" | 1.969 (50mm) | 0.709 | 5.000 | 0.630 | 2.421 | 3.858 | 4 | 1.254 | PP99070050 |
| 2" | 2.480 (63mm) | 0.709 | 5.984 | 0.748 | 3.051 | 4.764 | 4 | 1.782 | PP99070063 |
| 2½" | 2.953 (75mm) | 0.709 | 7.008 | 0.748 | 3.484 | 5.512 | 4 | 2.418 | PP99070075 |
| 3" | 3.543 (90mm) | 0.709 | 7.480 | 0.748 | 4.252 | 5.984 | 8 | 2.330 | PP99070090 |
| 4" | 4.331 (110mm) | 0.709 | 9.016 | 0.748 | 5.039 | 7.520 | 8 | 4.048 | PP99070110 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Reducer Bushing

Description: Reducer Bushing
PN10 / SDR 11 - 150psi

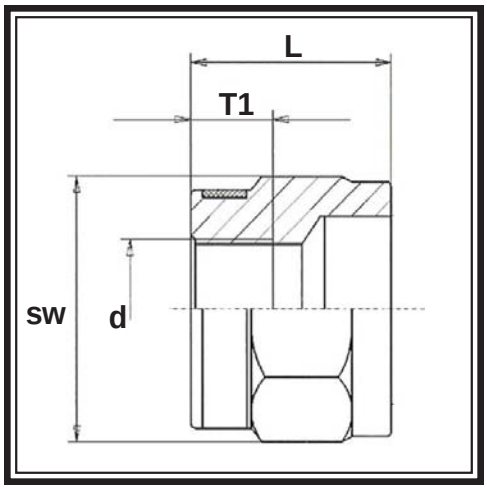
Material: AlphaPlus® Polypropylene

Connection: Socket Fusion

| Nominal Size | Actual OD Size | D1 in | D2 in | T1 in | L in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|
| **½" x 3/8"** | 0.787 (20mm) x 0.630 (16mm) | 0.787 | 0.630 | 0.512 | 1.063 | 0.022 | PP0704020016 |
| ¾" x 3/8" | 0.984 (25mm) x 0.630 (16mm) | 0.984 | 0.630 | 0.512 | 1.220 | 0.022 | PP0704025016 |
| ¾" x ½" | 0.984 (25mm) x 0.787 (20mm) | 0.984 | 0.787 | 0.591 | 1.220 | 0.024 | PP0704025020 |
| 1" x ½" | 1.260 (32mm) x 0.787 (20mm) | 1.260 | 0.787 | 0.551 | 1.693 | 0.044 | PP0704032020 |
| 1" x ¾" | 1.260 (32mm) x 0.984 (25mm) | 1.260 | 0.984 | 0.630 | 1.457 | 0.040 | PP0704032025 |
| 1¼" x ½" | 1.575 (40mm) x 0.787 (20mm) | 1.575 | 0.787 | 0.551 | 1.890 | 0.044 | PP0704040020 |
| 1¼" x ¾" | 1.575 (40mm) x 0.984 (25mm) | 1.575 | 0.984 | 0.630 | 1.890 | 0.057 | PP0704040025 |
| 1¼" x 1" | 1.575 (40mm) x 1.260 (32mm) | 1.575 | 1.260 | 0.709 | 1.732 | 0.068 | PP0704040032 |
| 1½" x ½" | 1.969 (50mm) x 0.787 (20mm) | 1.969 | 0.787 | 0.551 | 2.126 | 0.088 | PP0704050020 |
| 1½" x ¾" | 1.969 (50mm) x 0.984 (25mm) | 1.969 | 0.984 | 0.630 | 2.067 | 0.066 | PP0704050025 |
| 1½" x 1" | 1.969 (50mm) x 1.260 (32mm) | 1.969 | 1.260 | 0.709 | 2.067 | 0.081 | PP0704050032 |
| 1½" x 1¼" | 1.969 (50mm) x 1.575 (40mm) | 1.969 | 1.575 | 0.827 | 2.142 | 0.117 | PP0704050040 |
| 2" x ¾" | 2.480 (63mm) x 0.984 (25mm) | 2.480 | 0.984 | 0.630 | 2.520 | 0.132 | PP0704063025 |
| 2" x 1" | 2.480 (63mm) x 1.260 (32mm) | 2.480 | 1.260 | 0.709 | 2.500 | 0.130 | PP0704063032 |
| 2" x 1¼" | 2.480 (63mm) x 1.575 (40mm) | 2.480 | 1.575 | 0.807 | 2.500 | 0.220 | PP0704063040 |
| 2" x 1½" | 2.480 (63mm) x 1.969 (50mm) | 2.480 | 1.969 | 0.945 | 2.500 | 0.194 | PP0704063050 |
| 2½" x 2" | 2.953 (75mm) x 2.480 (63mm) | 2.953 | 2.480 | 1.063 | 2.776 | 0.246 | PP0704075063 |
| 3" x 2" | 3.543 (90mm) x 2.480 (63mm) | 3.543 | 2.480 | 1.063 | 3.287 | 0.396 | PP0704090063 |
| 3" x 2½" | 3.543 (90mm) x 2.953 (75mm) | 3.543 | 2.953 | 1.220 | 3.287 | 0.343 | PP0704090075 |
| 4" x 3" | 4.331 (110mm) x 3.543 (90mm) | 4.331 | 3.543 | 1.417 | 3.957 | 0.603 | PP0704110090 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Female Adapter

Description: Threaded Female Adapter
PN10 / SDR 11 - 150psi

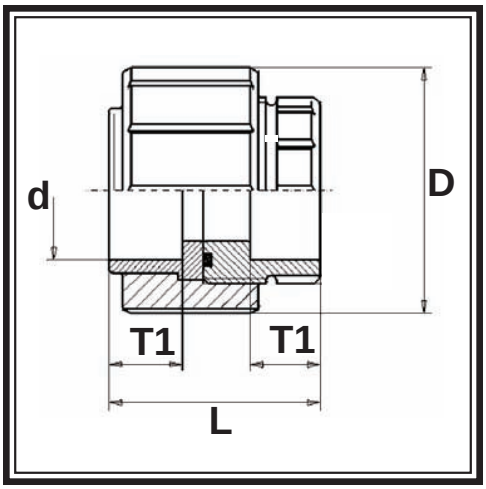
Material: AlphaPlus® Polypropylene

Connection: Butt Fusion

| Nominal Size | Actual OD Size | d in | L in | SW in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.787 | 1.378 | 1.260 | 0.512 | 0.040 | PP07140020 |
| ¾" | 0.984 (25mm) | 0.984 | 1.535 | 1.417 | 0.591 | 0.068 | PP07140025 |
| 1" | 1.260 (32mm) | 1.260 | 1.772 | 1.811 | 0.630 | 0.088 | PP07140032 |
| 1¼" | 1.575 (40mm) | 1.575 | 2.087 | 2.165 | 0.709 | 0.119 | PP07140040 |
| 1½" | 1.969 (50mm) | 1.969 | 2.126 | 2.559 | 0.827 | 0.264 | PP07140050 |
| 2" | 2.480 (63mm) | 2.480 | 2.441 | 3.150 | 0.945 | 2.640 | PP07140063 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Union with EPDM

Description: Union with EPDM O-Ring
PN10 / SDR 11 - 150psi

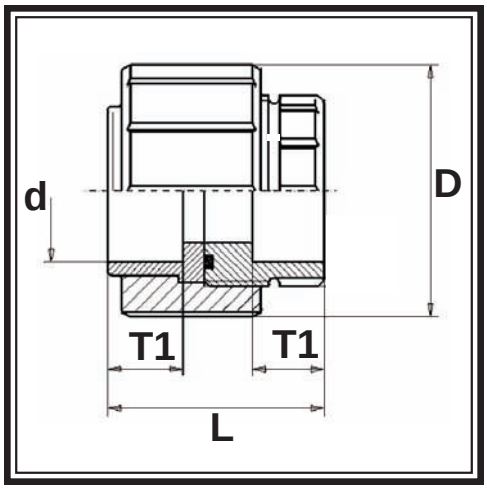
Material: AlphaPlus® Polypropylene

Connection: Butt Fusion

| Nominal Size | Actual OD Size | d in | D in | L in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.787 | 0.512 | 1.870 | 0.591 | 0.150 | PP07100020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.709 | 1.949 | 0.630 | 0.200 | PP07100025 |
| 1" | 1.260 (32mm) | 1.260 | 0.984 | 2.087 | 0.709 | 0.297 | PP07100032 |
| 1¼" | 1.575 (40mm) | 1.575 | 1.220 | 2.323 | 0.827 | 0.438 | PP07100040 |
| 1½" | 1.969 (50mm) | 1.969 | 1.535 | 2.638 | 0.945 | 0.576 | PP07100050 |
| 2" | 2.480 (63mm) | 2.480 | 1.929 | 3.150 | 1.063 | 0.913 | PP07100063 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com




# Union with VITON

Description: Union with VITON O-Ring
PN10 / SDR 11 - 150psi

Material: AlphaPlus® Polypropylene

Connection: Butt Fusion

| Nominal Size | Actual OD Size | d in | D in | L in | T1 in | Weight lbs | Part Number |
|---|---|---|---|---|---|---|---|
| ½" | 0.787 (20mm) | 0.787 | 0.512 | 1.870 | 0.591 | 0.150 | PP07270020 |
| ¾" | 0.984 (25mm) | 0.984 | 0.709 | 1.949 | 0.630 | 0.200 | PP07270025 |
| 1" | 1.260 (32mm) | 1.260 | 0.984 | 2.087 | 0.709 | 0.297 | PP07270032 |
| 1¼" | 1.575 (40mm) | 1.575 | 1.220 | 2.323 | 0.827 | 0.438 | PP07270040 |
| 1½" | 1.969 (50mm) | 1.969 | 1.535 | 2.638 | 0.945 | 0.576 | PP07270050 |
| 2" | 2.480 (63mm) | 2.480 | 1.929 | 3.150 | 1.063 | 0.913 | PP07270063 |

## Section 3

# Valves



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

# VB Series

## True Union Blocking Ball Valve

**Material:** PP, PVDF
**Size:** ½″ - 4″
**Pressure Rating:** 230 psi ½″ - 2″; 150 psi 2 ½″ - 4″
**Seats:** PTFE
**Seals:** EPDM or VITON
**Connections:** Metric Socket
NPT Threaded
ANSI 150 Flanged
Metric Butt Fusion

***ISO 9002 CERTIFIED***

## Engineering Guide Specification

### *Materials of Construction:*

**PP:** Class PP 110B76383 per ASTM D4101
**PVDF:** Type 1 per ASTM D3222
**Seals:** EPDM or Viton
**Seats:** PTFE

**Guide Specification:** All ball valves constructed of the materials indicated. Valves shall be manufactured with an adjustable carrier, threaded into the body to ensure the valve is blocking in both directions. Valve stem shall be a safety shear stem with double O-ring seals. Body shall have unions on both ends and handle shall incorporate a spanner for adjusting and removing the carrier, teflon seat shall be energized by O-ring, ball shall be machined and tumbled to ensure roundness, as manufactured by SIMTECH.

## Special Features

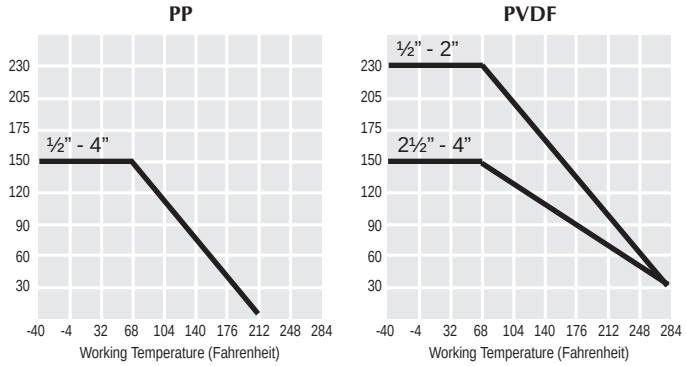
- Full port
- Bidirectional flow
- Low maintenance and extended operational life
- Handle equipped as a spanner device to adjust carrier
- Teflon seat energized by O-ring
- Ball machined and tumbled to ensure roundness
- Special mounting pads are molded on body for actuator mounting or valve anchoring
- Blowout proof stem
- Safety shear stem design
- Double O-Ring Seal on Stem

## Flow Rate in Gallons Per Minute

| ND | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Bore Size | .512 | .709 | .910 | 1.18 | 1.50 | 1.89 | 2.36 | 2.72 | 3.94 |
| $C_v$ | 12.5 | 28 | 50.9 | 81 | 150 | 230 | 360 | 485 | 768 |

***Cv is the number of gallons per minute of water at a temperature of 68°F that will flow through a valve with a 1 psi pressure differential at a specified travel.***

## Pressure/Temperature Graph: Working PSI/Fahrenheit



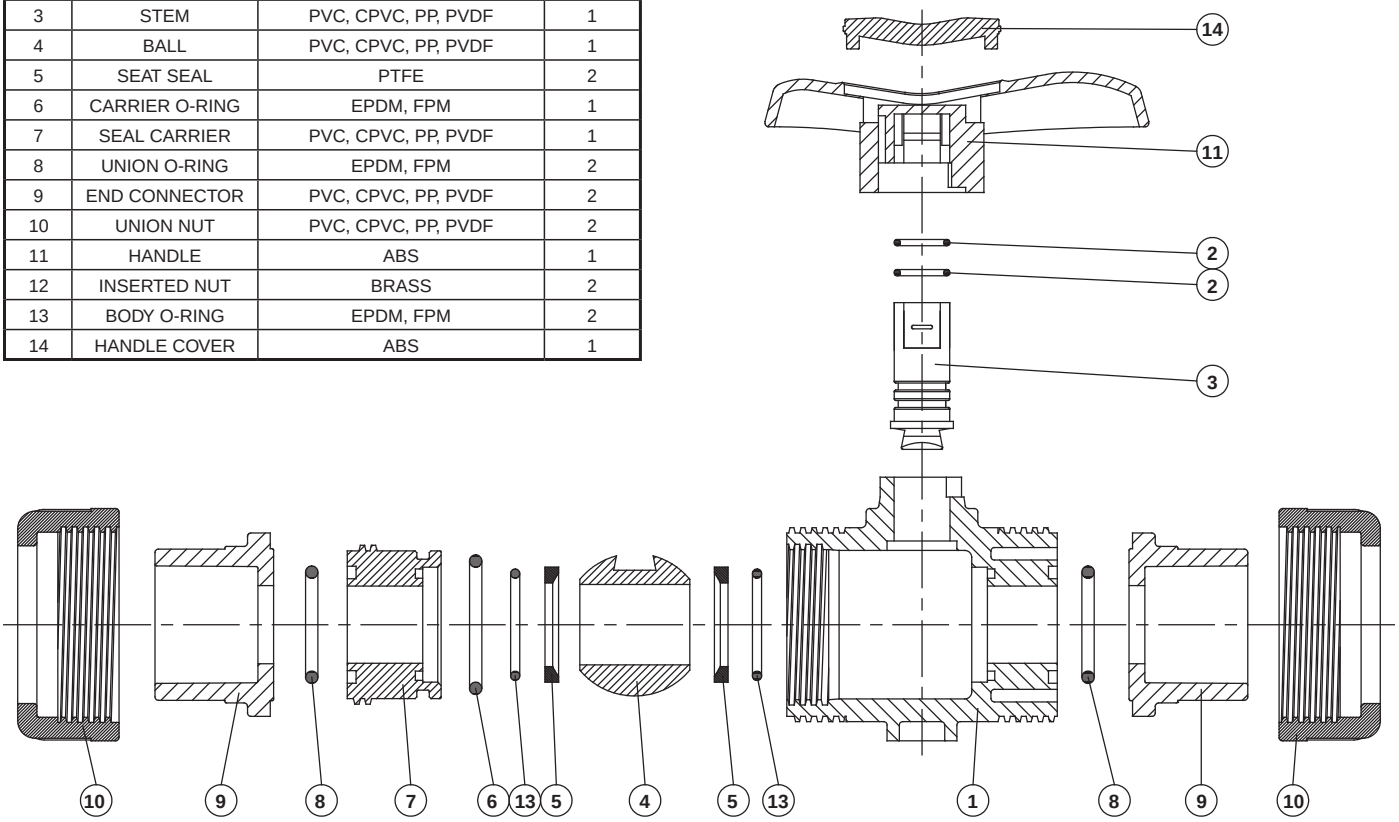



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

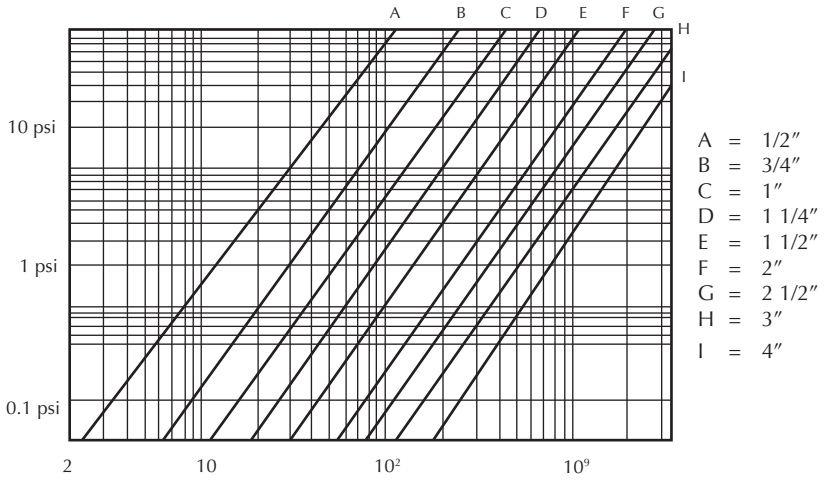
# VB Series

## Parts Listing

| NO. | PART | MATERIAL | Q'TY |
|---|---|---|---|
| 1 | BODY | PVC, CPVC, PP, PVDF | 1 |
| 2 | STEM O-RING | EPDM, FPM | 2 |
| 3 | STEM | PVC, CPVC, PP, PVDF | 1 |
| 4 | BALL | PVC, CPVC, PP, PVDF | 1 |
| 5 | SEAT SEAL | PTFE | 2 |
| 6 | CARRIER O-RING | EPDM, FPM | 1 |
| 7 | SEAL CARRIER | PVC, CPVC, PP, PVDF | 1 |
| 8 | UNION O-RING | EPDM, FPM | 2 |
| 9 | END CONNECTOR | PVC, CPVC, PP, PVDF | 2 |
| 10 | UNION NUT | PVC, CPVC, PP, PVDF | 2 |
| 11 | HANDLE | ABS | 1 |
| 12 | INSERTED NUT | BRASS | 2 |
| 13 | BODY O-RING | EPDM, FPM | 2 |
| 14 | HANDLE COVER | ABS | 1 |




## Pressure Loss—Flow Diagram





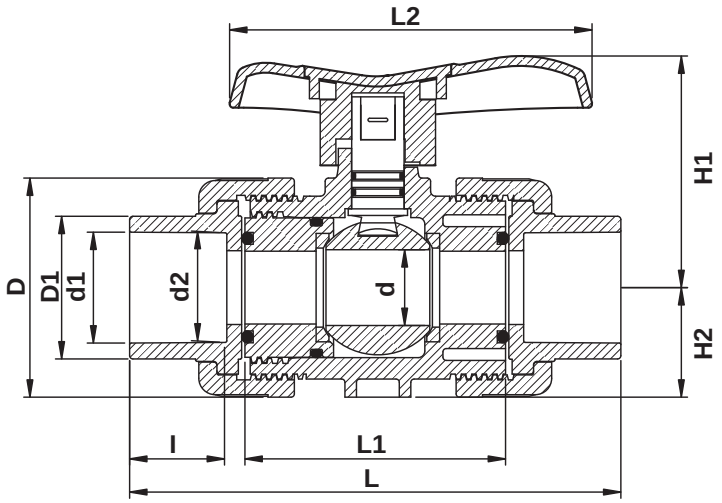

**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

## Dimensional Data - True Union

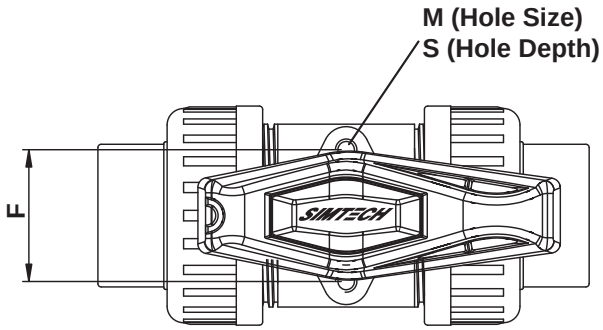
| Nom. | PVC & CPVC | | | | PP & PVDF | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | I | d1 | d2 | L | I | d1 | d2 | L | D | D1 | L1 | L2 | H1 | H2 | F | M | S |
| ½" | 0.87 | 0.85 | 0.84 | 4.49 | 0.58 | 0.76 | 0.75 | 4.27 | 1.82 | 1.19 | 2.36 | 3.03 | 1.81 | 0.83 | 1.18 | 0.20 | 0.28 |
| ¾" | 1.00 | 1.06 | 1.05 | 5.31 | 0.64 | 0.94 | 0.94 | 4.87 | 2.19 | 1.43 | 2.87 | 3.74 | 2.24 | 1.02 | 1.30 | 0.24 | 0.31 |
| 1" | 1.13 | 1.32 | 1.31 | 5.87 | 0.74 | 1.23 | 1.22 | 5.45 | 2.62 | 1.70 | 3.11 | 4.33 | 2.76 | 1.30 | 1.57 | 0.24 | 0.43 |
| 1¼" | 1.25 | 1.67 | 1.66 | 6.69 | 0.85 | 1.53 | 1.53 | 6.10 | 3.23 | 2.08 | 3.46 | 5.00 | 2.95 | 1.54 | 1.85 | 0.31 | 0.43 |
| 1½" | 1.38 | 1.91 | 1.89 | 6.93 | 0.96 | 1.92 | 1.91 | 6.10 | 3.88 | 2.46 | 3.74 | 5.63 | 3.58 | 1.61 | 2.05 | 0.31 | 0.43 |
| 2" | 1.50 | 2.39 | 2.37 | 8.15 | 1.12 | 2.44 | 2.43 | 7.20 | 4.72 | 3.01 | 4.49 | 6.46 | 4.45 | 2.05 | 2.76 | 0.31 | 0.59 |
| 2½" | 1.75 | 2.89 | 2.87 | 10.83 | 1.22 | 2.90 | 2.90 | 9.57 | 5.51 | 3.62 | 5.35 | 7.09 | 4.57 | 2.56 | - | - | - |
| 3" | 1.88 | 3.52 | 3.49 | 11.97 | 1.41 | 3.50 | 3.50 | 10.59 | 6.42 | 4.25 | 6.22 | 8.82 | 5.12 | 2.95 | - | - | - |
| 4" | 2.25 | 4.52 | 4.49 | 13.07 | 1.63 | 4.29 | 4.28 | 11.30 | 8.86 | 5.75 | 6.93 | 10.94 | 7.01 | 4.06 | - | - | - |
| 6" * | 6.63 | 4.49 | 2.25 | 26.57 | - | - | - | - | 7.00 | 5.75 | 6.93 | 10.94 | 7.01 | 4.06 | - | - | - |

*4" Valve Ventured to 6"

* For metric spigot dimensions, contact factory



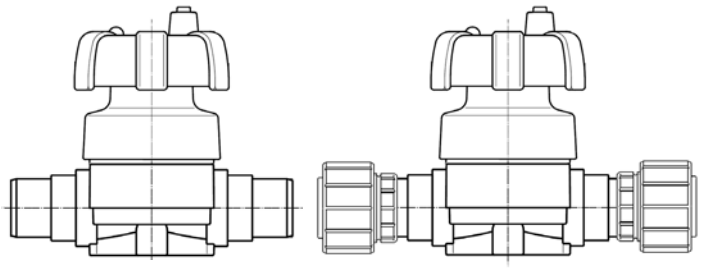

½" Through 4"



# VV Series

## True Union, Socket, Non-Union Spigot Compact Diaphragm Valves

**Material:** PP or PVDF
**Size:** ½″ - 4″ Spigot
½″ - 2″ True Union
**Seal/Diaphragm:** EPDM, Viton or TEFLON
**Connections:** Metric Socket ( True Union)
Metric Spigot (Non-Union)



***ISO 9002 CERTIFIED***

## Engineering Guide Specification

***Materials - Body:***

**PP**: Class PP 110B76383 per ASTM D4101

**PVDF**: Type 1 per ASTM D3222

**Diaphragms:** EPDM, FPM or PTFE

**Union Seals:** EPDM or Viton

**Guide Specification**: Diaphragm valves shall be weir pattern body molded from the material indicated. Diaphragms shall be as indicated. (PTFE diaphragm shall be two piece assembly consisting of solid PTFE diaphragm with a reinforced EPDM backing cushion.) All hardware shall be protected from atmosphere. Visual indicator and locking handle is standard, as manufactured by SIMTECH.

## Special Features

- Position indicator standard
- Glass Filled PP bonnet on all models
- Stainless steel assembly bolts
- Bottom Fasteners for Anchoring / Panel Mount
- Bonnet Bolts are Protected from Atmosphere

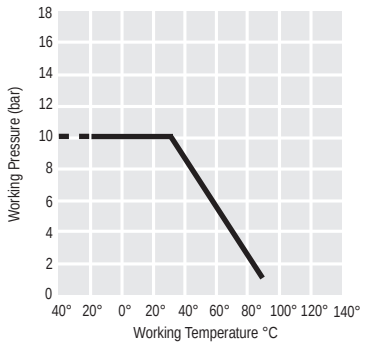
## Flow Rate in Gallons Per Minute

| Size | ½" | ¾" | 1" | 1¼" | 1½" | 2" | 2½" | 3" | 4" |
|---|---|---|---|---|---|---|---|---|---|
| Cv | 6.5 | 9.5 | 12.2 | 20.9 | 29.1 | 53.5 | 90.7 | 139.5 | 219.8 |

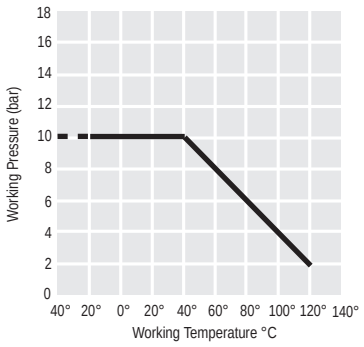
***Cv is the number of gallons per minute of water at a temperature of 68ºF that will flow through a valve with a 1 psi pressure differential at a specified travel.***

## Pressure/Temperature Graph:

**PP**




**PVDF**

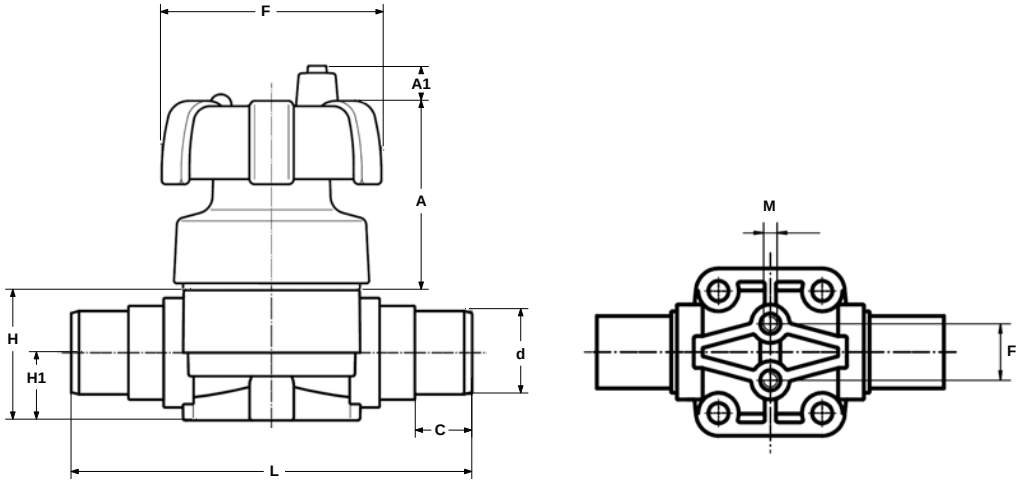





**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

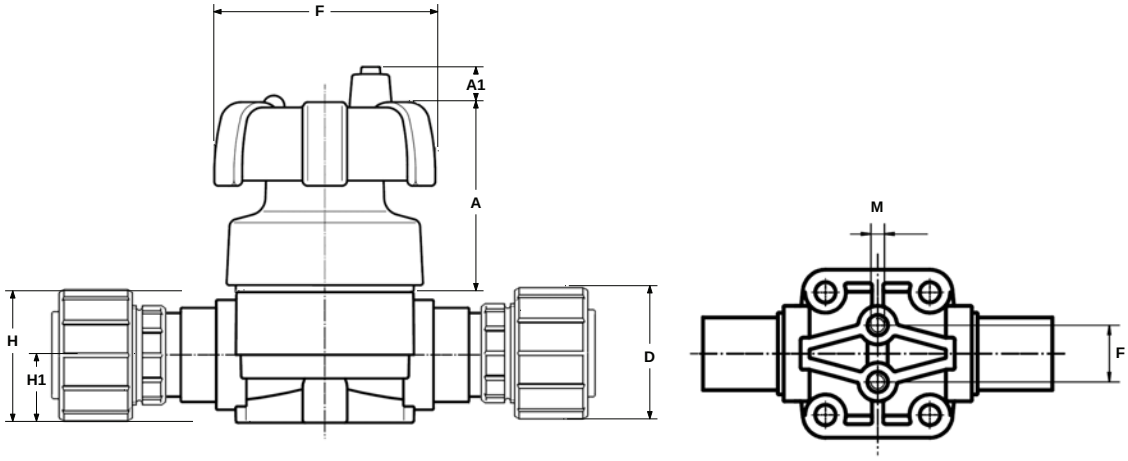
# VV Series

## Dimensional Data - Spigot




| Nom. Size | A | A1 | B | C | d | F | H | H1 | L | M |
|---|---|---|---|---|---|---|---|---|---|---|
| ½" | 2.87 | 0.55 | 3.54 | 0.63 | 0.79 | 0.98 | 1.97 | 1.02 | 4.88 | 0.24 |
| ¾" | 2.87 | 0.55 | 3.54 | 0.75 | 0.98 | 0.98 | 1.97 | 1.02 | 5.67 | 0.24 |
| 1" | 2.87 | 0.55 | 3.54 | 0.87 | 1.26 | 0.98 | 1.97 | 1.02 | 6.06 | 0.24 |
| 1¼" | 3.54 | 0.55 | 4.49 | 0.94 | 1.57 | 1.75 | 2.91 | 1.57 | 6.85 | 0.31 |
| 1½" | 3.54 | 0.55 | 4.49 | 1.02 | 1.97 | 1.75 | 2.91 | 1.57 | 7.64 | 0.31 |
| 2" | 4.37 | 0.31 | 5.51 | 1.14 | 2.48 | 1.75 | 3.23 | 1.57 | 8.82 | 0.31 |
| 2½" | 5.59 | 0.67 | 8.43 | 1.73 | 2.95 | 3.94 | 4.61 | 2.17 | 11.18 | 0.47 |
| 3" | 5.59 | 0.67 | 8.43 | 2.01 | 3.54 | 3.94 | 4.61 | 2.17 | 11.81 | 0.47 |
| 4" | 6.30 | 0.98 | 8.43 | 2.40 | 4.33 | 4.72 x 2.36 | 5.51 | 2.56 | 13.39 | 0.39 |

## Dimensional Data - True Union



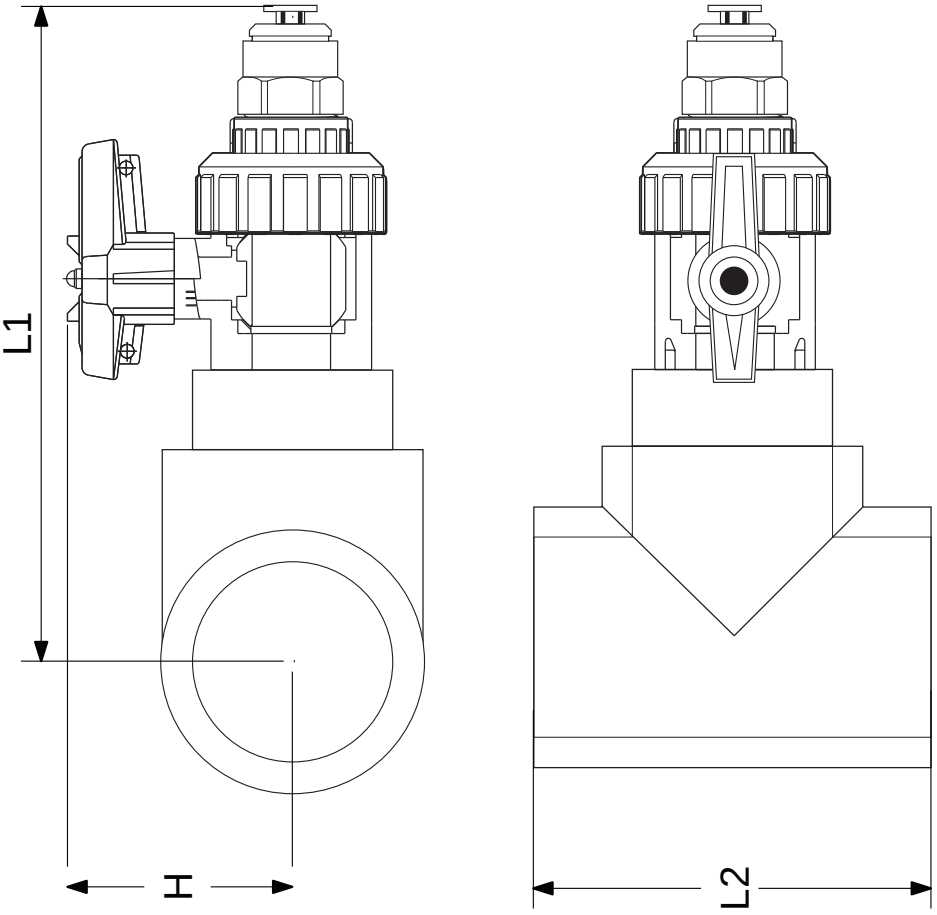

| Nom. Size | A | A1 | B | d | D | F | H | H1 | L | M |
|---|---|---|---|---|---|---|---|---|---|---|
| ½" | 2.87 | 0.55 | 3.54 | 0.79 | 0.51 | 0.98 | 1.97 | 1.02 | 6.16 | 0.24 |
| ¾" | 2.87 | 0.55 | 3.54 | 0.98 | 0.71 | 0.98 | 1.97 | 1.02 | 6.99 | 0.24 |
| 1" | 2.87 | 0.55 | 3.54 | 1.26 | 0.98 | 0.98 | 1.97 | 1.02 | 7.44 | 0.24 |
| 1¼" | 3.54 | 0.55 | 4.49 | 1.57 | 1.22 | 1.75 | 2.91 | 1.57 | 8.35 | 0.31 |
| 1½" | 3.54 | 0.55 | 4.49 | 1.97 | 1.54 | 1.75 | 2.91 | 1.57 | 9.33 | 0.31 |
| 2" | 4.37 | 0.31 | 5.51 | 2.48 | 1.93 | 1.75 | 3.23 | 1.57 | 10.91 | 0.31 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

## RODI Drop Tee Assembly - Ball Valve - Socket Fusion

| Size | H | L1 | L2 |
|---|---|---|---|
| ½" x ½" x 3/8" | 2.83 | 5.75 | 2.01 |
| ¾" x ½" x 3/8" | 2.83 | 5.76 | 2.32 |
| 1" x ½" x 3/8" | 2.83 | 5.98 | 2.76 |
| 1¼" x ½" x 3/8" | 2.83 | 6.23 | 3.27 |
| 1½" x ½" x 3/8" | 2.83 | 6.55 | 3.90 |
| 2" x ½" x 3/8" | 2.83 | 6.96 | 4.72 |




**Drawing Details**

REF-RODI Drop Tee Assembly - Ball Valve - SF
DRAWING #: 091009-1
CREATED: 9/10/09
REVISED: 3/3/10
APPROVED BY: Edward McDonough

**Job Details**

CUSTOMER:
JOB NAME:
JOB LOCATION:

**Customer Approval**

COMPANY:
SIGNATURE:
DATE:

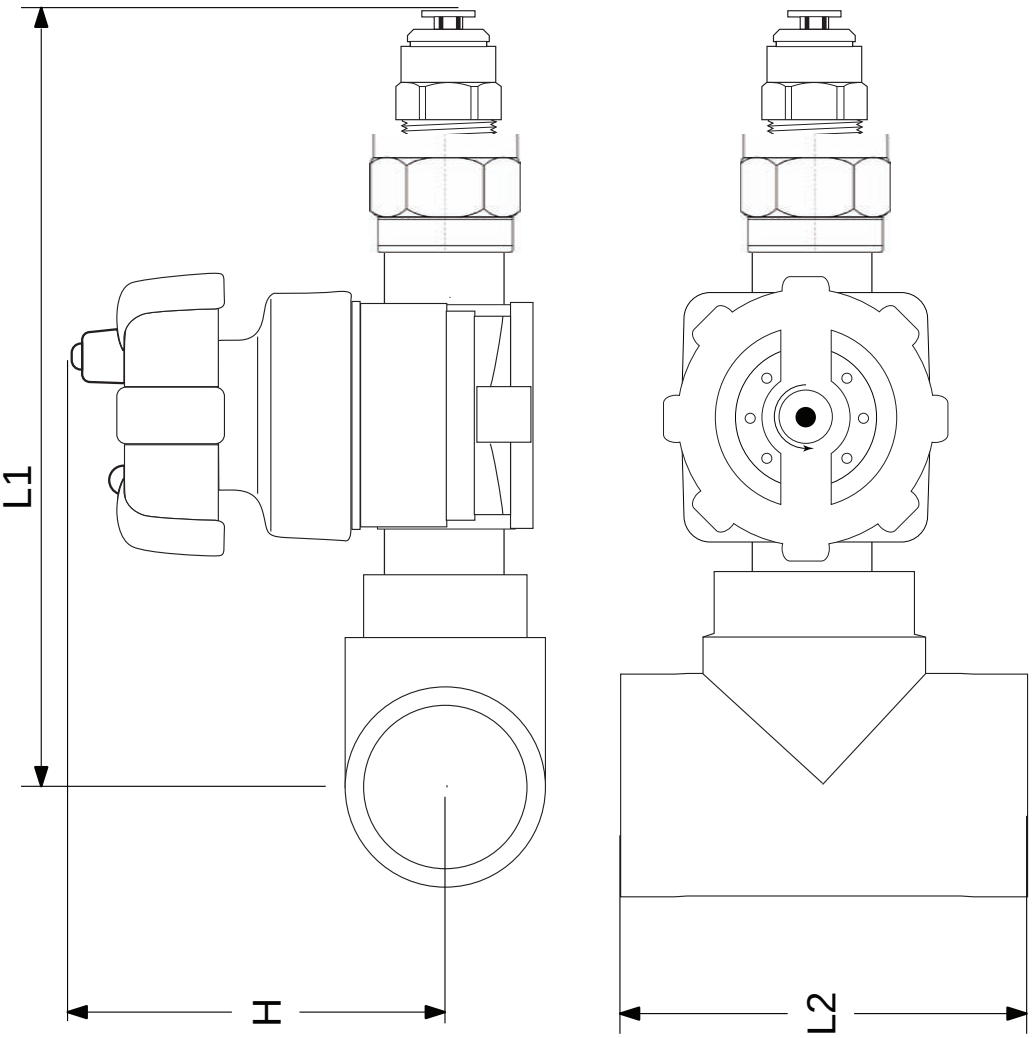
Drawing Subject to Change without Notice

All Dimensions +/- 3mm

SIMTECH
www.SimtechUSA.com
1-877-777-2467

## RODI Drop Tee Assembly - Diaphragm Valve - Socket Fusion

| Size | H | L1 | L2 |
|---|---|---|---|
| ½" x ½" x 3/8" | 4.45 | 7.50 | 2.01 |
| ¾" x ½" x 3/8" | 4.45 | 8.16 | 2.32 |
| 1" x ½" x 3/8" | 4.45 | 8.37 | 2.76 |
| 1¼" x ½" x 3/8" | 4.45 | 8.63 | 3.27 |
| 1½" x ½" x 3/8" | 4.45 | 8.94 | 3.90 |
| 2" x ½" x 3/8" | 4.45 | 9.36 | 4.72 |




Drawing Details

SIMTECH
www.SimtechUSA.com
1-877-777-2467

REF: Drop Tee Assembly - Diaphragm Valve - SF
DRAWING #: 032210-2
CREATED: 3/22/10
REVISED:
APPROVED BY: Edward McDonough

Job Details

CUSTOMER:
JOB NAME:
JOB LOCATION:

Customer Approval

COMPANY:
SIGNATURE:
DATE:

Drawing Subject to Change without Notice  All Dimensions +/- 3mm

# RDP Series

## Diaphragm Pressure Regulator

**Material:** PVC, PP, PVDF, TEFLON
**Size:** ¼″ - 2″
**Pressure Rating:** 150 psi
**Upstream Pressure:** Vacuum to 150psig
**Regulated Pressure:** 1 to 100 psig (¼″) 5 to 100 psig (½″ -2″)
**Seals:** EPDM, VITON, KALREZ
**Connections:** FNPT Threaded (¼″ - 1″)
MPT Threaded (1½″ - 2″)
**Mounting:** ¼-20 tapped holes (¼″ - 1″)

***ISO 9002 CERTIFIED***

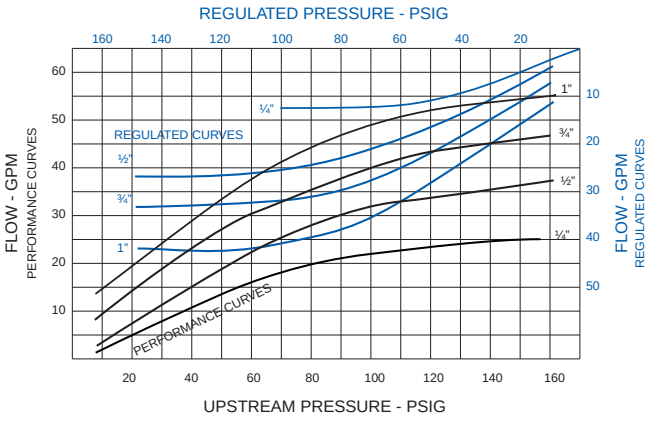
## Engineering Guide Specification

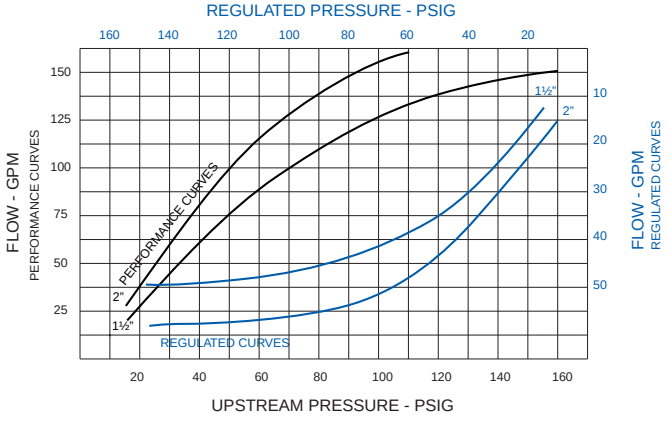
### *Materials of Construction:*

**PVC:** Class 12454B per ASTM D1784
**PP:** Class PP 110B76383 per ASTM D4101
**PVDF:** Type 1 per ASTM D3222

**Guide Specification:** The SIMTECH RDP Series diaphragm pressure regulator is designed to be more sensitive to pressure changes while protecting piping systems. This pressure reducing valve is designed to provide excellent flow ratios over a wide pressure range. Teflon (primary) and EPDM (back-up) diaphragms are ideal for DI water or other ultra pure applications. Adjustable screw and lock-nut makes pre-set downstream pressure more precise and accurate. Wide working pressure range (5 to 100 PSIG) Top entry and parallel inlet and outlet ports to facilitate installation and avoid piping problems. This compact pressure reducing valve is designed to keep the stainless steel spring totally isolated from the fluid chamber insuring no metal contact with the fluid. It is ideally suitable for most harsh chemicals, DI water, and other high purity applications.

## Pressure/Temperature Graph: Working PSI/Fahrenheit



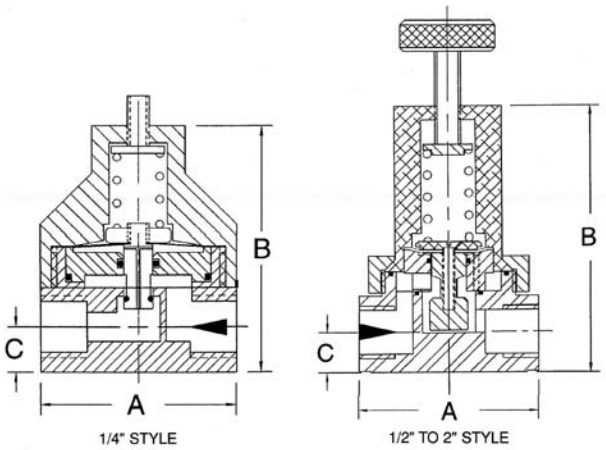




Performance curves show the flow rate of RDP valves with piston seal fully open. Regulated curves show the flow rate of RDP valves at the points of pre-set downstream pressure. Test data was performed with 68°F water, and 160 psig maximum pressure.

These performance curves will be changed with higher viscosity liquid and/or higher temperature. Consult manufacturer directly for custom products or special applications.

## Dimensional Data

| Nom. Size | A | B | C | $C_v$ |
|---|---|---|---|---|
| ¼" | 1.60 | 2.10 | 0.39 | 0.72 |
| ½" | 3.00 | 4.20 | 0.70 | 2.85 |
| ¾" | 3.50 | 4.90 | 0.90 | 4.67 |
| 1" | 4.00 | 5.40 | 1.10 | 6.84 |
| 1½" | 5.00 | 8.00 | 1.50 | 16.60 |
| 2" | 6.00 | 9.00 | 1.70 | 22.10 |






**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

# POLYSULFONE VARIABLE AREA FLOWMETERS

## VERSATILE F-451 SERIES


### F-451 BENEFITS

- A Heat and Chemical resistant meter body of injection molded Polysulfone.*
- Floats are #316 S.S. or Teflon, depending on calibration. Many calibrations are offered in GPM, LPM and SCFM.
- Permanent, easy to read screen printed scales.
- 1" F/NPT Polysulfone adapters, or, 1 1/2" PVC adapters (depending on model ordered).
- Viton® o-ring seals.
- Accuracy ± 3%.
- May be ordered with 90˚ elbow adapters.
- Available with brass sweat or brass 1" F/NPT adapters.
- Available with Polycarbonate Protective Shield.
- Not recommended for direct sunlight applications.

### F-451 SPECIFICATIONS

**Max. Working Pressure** ..... 150 psi (10 Bar) @ 70°F (21°C)
**Max. Fluid Temperature** ..... 212°F (100°C) @ 0 pressure
**Full Scale Accuracy** ..... ± 3%
**Meter Body Material** ..... Polysulfone
**Adapter Material** ..... 1" Polysulfone & 1 1/2" PVC
**O-Rings** ..... Viton®
**Float Material** ..... #316 SS, Hastelloy C or Teflon, depending on calibration.
**Max. Pressure Drop** ..... 1 psi
**Approx. Shipping Weight** .... 3 lbs. (1.36 kg.)

**PIPE SIZES**
1", 1-1/2 F/NPT

**DIMENSIONS**
Height: 14-1/2"
Width: 3-5/16"

**FLOW RATES**
0.5 to 40 GPM
2 to 155 LPM
4 to 80 SCFM
7 to 140 M3/Hr

### F-451 ORDERING GUIDELINES

| MODEL NUMBER | CALIBRATION GPM | CALIBRATION LPM | ADAPTER SIZE |
|---|---|---|---|
| F-451006LHN | 0.5 to 6 | to 22 | 1" F/NPT |
| F-451001LHN | 1.0 to 10 | 4 to 40 | 1" F/NPT |
| F-451002LHN | 2.0 to 20 | 7.5 to 75 | 1" F/NPT |
| F-451003LHN | 3.0 to 30 | 12 to 115 | 1" F/NPT |
| F-451004LHN | 4.0 to 40 | 15 to 155 | 1" F/NPT |

**1-1/2" F/NPT PVC Adapters**

| MODEL NUMBER | CALIBRATION GPM | CALIBRATION LPM | ADAPTER SIZE |
|---|---|---|---|
| F-451006LHN-24 | 0.5 to 6 | to 22 | 1-1/2" F/NPT |
| F-451001LHN-24 | 1.0 to 10 | 4 to 40 | 1-1/2" F/NPT |
| F-451002LHN-24 | 2.0 to 20 | 7.5 to 75 | 1-1/2" F/NPT |
| F-451003LHN-24 | 3.0 to 30 | 12 to 115 | 1-1/2" F/NPT |
| F-451004LHN-24 | 4.0 to 40 | 15 to 155 | 1-1/2" F/NPT |

**Models calibrated for Air**

| MODEL NUMBER | CALIBRATION GPM | CALIBRATION LPM | ADAPTER SIZE |
|---|---|---|---|
| F-451001GHN | 4 to 40 | 7 to 70 | 1" F/NPT |
| F-451001GHN-24 | 4 to 40 | 7 to 70 | 1-1/2" F/NPT |
| F-451002GHN | 8 to 80 | 14 to 140 | 1" F/NPT |
| F-451002GHN-24 | 8 to 80 | 14 to 140 | 1-1/2" F/NPT |


## HIGH CAPACITY F-452N SERIES

### F-452N BENEFITS

- One piece Polysulfone meter body resists high temperatures and pressures.*
- 316 Stainless Steel or Hastelloy rod guided float.
- Direct reading permanent scale.
- Adapters and unions engineered for maximum protection from misalignment and vibration.
- Optional Polycarbonate Protective Shield.
- Available OEM options: Private labeling, custom calibrations and custom materials.
- Not recommended for direct sunlight.

### F-452N SPECIFICATIONS

**Max. Working Pressure** ..... 150 psig (10.3 bar) @ 70˚F (21˚C)
**Max. Fluid Temperature** ..... 200˚F (93˚C) @ 0 PSI
**Full Scale Accuracy** ..... +/- 2%
**Meter Body Material** ..... Polysulfone
**Union Nuts** ..... Glass fiber reinforced Nylon
**Guide Rod Material** ..... 316 Stainless Steel
Options: Hastelloy C-276
**O-Ring Material** ..... Viton®; Options: EPDM
**Max. Pressure Drop** ..... 2 psi
**Approx. Shipping Weight** .... 5 lb. (2.27 kg)

**PIPE SIZES**
2" F/NPT

**DIMENSIONS**
Height: 18-7/8"
Width: 4-5/8"

**FLOW RATES**
2 to 175 U.S. GPM
8 to 675 LPM
4 to 240 SCFM
7 to 400 M3/Hr

### F-452 ORDERING GUIDELINES

| MODEL NUMBER | DUAL SCALE RANGE GPM | DUAL SCALE RANGE LPM | ADAPTER SIZE |
|---|---|---|---|
| F-452020LHN | 2 to 20 | 8 to 78 | 2" F/NPT |
| F-452060LHN | 6 to 60 | 30 to 230 | 2" F/NPT |
| F-452080LHN | 8 to 80 | 40 to 300 | 2" F/NPT |
| F-452100LHN | 6 to 100 | 20 to 380 | 2" F/NPT |
| F-452130LHN | 20 to 130 | 80 to 500 | 2" F/NPT |
| F-452175LHN | 25 to 175 | 100 to 675 | 2" F/NPT |

**Models calibrated for Air**

| MODEL NUMBER | DUAL SCALE RANGE SCFM | DUAL SCALE RANGE M3/hr | ADAPTER SIZE |
|---|---|---|---|
| F-452040GHN | 4 to 40 | 7 to 67 | 2" F/NPT |
| F-452250GHN | 40 to 240 | 70 to 400 | 2" F/NPT |

* Viton® is a registered trademark of DuPont.

* The factory does not guarantee their flowmeters for use with liquids other than water. Customers are required to do their own compatibility testing. Request Kit #70000-718, at no charge.

**Protect & Isolate Pressure Sensing Instruments from Corrosive and Ultra Pure Fluids**

# TUFF GUARD™ Gauge Isolators

## Introduction

Marquest Scientific's new line of gauge and instrument isolators are engineered to provide total protection and isolation of corrosive & ultra pure fluids while offering a design with the most rugged features in the industry.

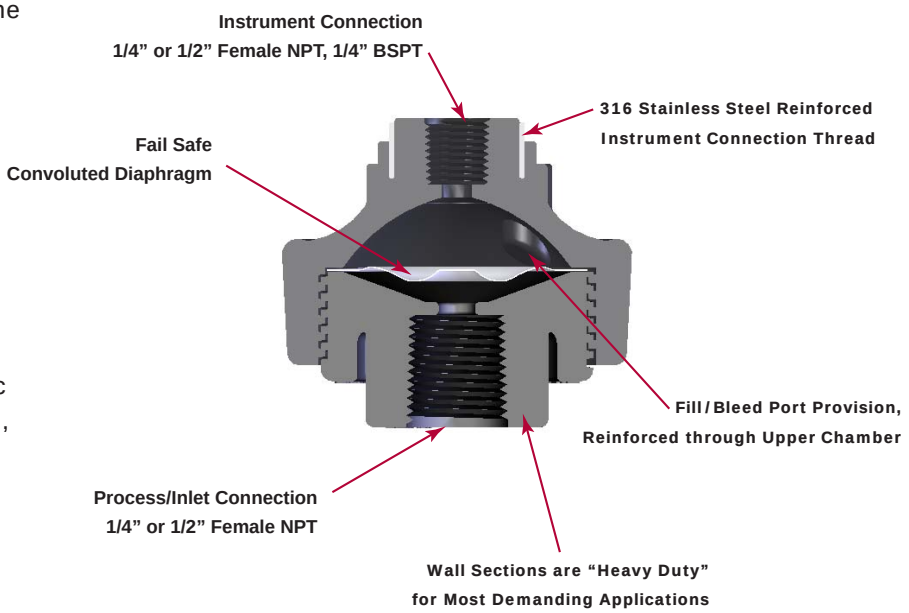
Branded "TUFF GUARD" to represent all its inherent strengths, the many features address the problematic issues associated with all existing product designs.

**Series TG**

**Materials of Construction:** PVC, CPVC, PP, & PVDF
**Diaphragm Materials:** Teflon, Viton, & EPDM
**Connection Sizes:** 1/4" x 1/2", 1/4" x 1/4", 1/2" x 1/2"
Instrument x Process Female, NPT/BSP Connections
Solvent Cement Socket Process Joints

## Features and Benefits

- Stainless steel reinforcement of the instrument connection to prevent fracturing associated with metal to plastic threads.This stainless steel reinforcing component is integrally molded into the the Upper Chamber to completely surround the full length of the female thread and is for all practical purposes "unbreakable".
- Reinforced process connection with compressive spoke ribs to transfer the tensile stresses into compression.
- Sufficient displacement to handle the required volumetric displacement of all instrument sizes and pressure ranges.
- Fill / bleed port provision, reinforced through upper chamber to allow for threaded connections in vacuum fill processing.
- Integral wrench provisions for field service and maintenace.
- Diaphragms in PTFE Teflon, Viton and EPDM offer the choices for each application. Field Replaceable.
- Wall Thickness meet or exceed ANSI Schedule 120
- Low Profile Design eliminates dead volume




## Fields of Application

Wet Processing Waste Water Treatment, Chemical Feed Systems, Commercial Industrial RO Systems, Plating Equipment, Water Purification, Photographic Processing, Car Wash, Farming, Pharma Processing, SemiFab Wafer Manufacturing.

MARQUEST SCIENTIFIC
Fluid Handling Products

*The Tuffest Guard in the Industry!*

## Body

- **PVC:** Polyvinyl Chloride
- **CPVC:** Chlorinated Polyvinyl Chloride
- **PP:** Polypropylene, unpigmented homopolymer, glass & mineral reinforced
- **PVDF:** 100% Virgin Polyvinylidene Flouride

## Diaphragm

- Virgin PTFE, Teflon®
- Viton®
- EPDM

## Connection Types

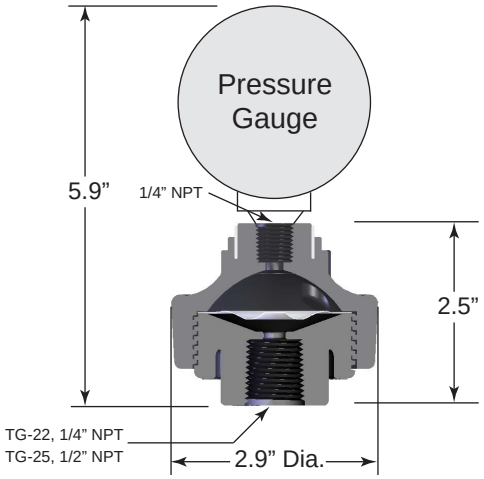
**Instrument Connection:**

- 1/4" or 1/2" Female NPT
- 1/4" Female BSPT

**Inlet Connection:**

- 1/4" or 1/2" Female NPT
- 1/4" Female BSPT

## DIMENSIONAL DATA - inches




## PRESSURE/TEMPERATURE DATA

**WORKING PRESSURE** PSI

**WEIGHTS**

| Material | 50°C 10°F | 68°C 10°F | 30°C 86°F | 40°C 104°F | 50°C 122°F | 60°C 140°F | 70°C 158°F | 80°C 176°F | 90°C 194°F | 100°C 212°F | 120°C 248°F | Net Weights Pounds* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PVC | 200 | 250 | 250 | 220 | 140 | 135 | — | — | — | — | — | 0.33 |
| CPVC | 230 | 250 | 250 | 230 | 200 | 200 | 150 | 120 | 60 | — | — | 0.36 |
| PP | 200 | 240 | 240 | 210 | 145 | 125 | 75 | 60 | — | — | — | 0.31 |
| PVDF | 240 | 250 | 250 | 250 | 250 | 230 | 220 | 200 | 160 | 140 | 80 | 0.39 |

**Temperature Ranges: PVC**: 14 to 140°F (10 to 60°C), **CPVC**: 50 to 194°F (10 to 90°C), **PP**: 46 to 176°F (8 to 80°C), **PVDF**: -22 to 248°F (-30 to 120°C). * Weights are for unfilled 1/4" x 1/2" without gauges.

## HOW TO ORDER

**Body Material**
PVC = Polyvinyl Chloride
CPVC = Chlorinated Polyvinyl Chloride
PPR = Natural Polypropylene, homopolymer glass and mineral reinforced No Pigment
PVD = High Purity Virgin PVDF

**Diaphragm Material**
T = Teflon®
V = Viton®
E = EPDM

**Gauge Side**
2 = 1/4" FNPT
5 = 1/2" FNPT
2B = 1/4" BSPT

TG - ____ ____ ____ ____ - ____

**Model Number**
TUFF GUARD Gauge Isolator

**Inlet Side**
2 = 1/4" FNPT
5 = 1/2" FNPT

**Gauge Range**
XXX = None
000 = 0-30" HG
015 = 0-15 psi
030 = 0-30 psi
060 = 0-60 psi
100 = 0-100 psi
160 = 0-160 psi
200 = 0-200 psi
300 = 0-300 psi

**Gauge Style**
S = Standard Black Painted Steel Case
SB = Stainless Case Brass Internals
SS = All Stainless

**Example Part Number: TG-25T060S-PVC**

Tuff Guard Gauge Isolator with 1/4" Female NPT Outlet, 1/2" Female NPT Inlet, Convoluted Teflon Diaphragm, w/ 0-60 PSI Standard Black Painted Steel Case Gauge with Brass Internals, Polyvinyl Chloride Body

**Notes:**

- Dual scale dials available
- Max pressure rating is 250 psi
- Back mount style gauges available
- Gauge Guard assembled with pressure switch or sensor avaialble

MARQUEST SCIENTIFIC 31 YEARS Since 1979 MADE IN USA

*Come Visit Us*

*WWW.MARQUESTSCIENTIFIC.COM*

*WWW.GAUGEGUARDS.COM*

MARQUEST SCIENTIFIC
Fluid Handling Products

2950 Airway Avenue, Bldg C-5, Costa Mesa, CA 92626
Toll Free: (866) 452-2349 Fax: (714) 491-9199
*e-mail: sales@marquestscientific.com*

Bulletin No. TGGI0210

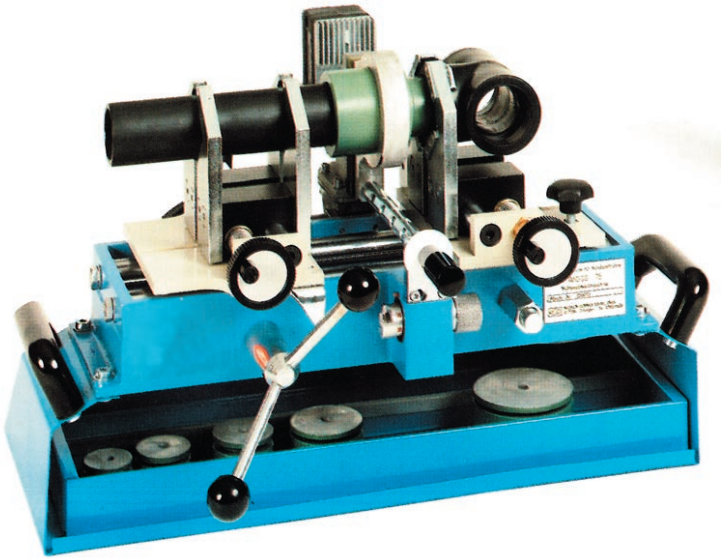
## Section 4

# WeldTech® Equipment



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

# WeldTech 75



**WeldTech 75**

Welding machine for heating element socket welding of PE, PP, and PVDF tubes and fittings from 20mm up to 75mm. The motion for socket welding is controlled by a rack-and-pinion mechanism. For the accommodation of the work pieces temper steel prismatic clamping tools are available, which make it possible to clamp the work pieces regardless of their diameter. There is a double-clamping on the pipe side and a single-clamping with insertion stop on the fitting side. The two tool slides can be aligned axially. For the simple fixing of the pipe and the socket fittings the machine has an automatic insertion stop. The insertion depth of the welding is limited by a stop. The electronically controlled heating element (230V/630 W) which can be swivelled into the machine accommodates the anti-stick-coated heating tools. It can also be taken out of the prismatic mount and accommodated in a table locking device for external use. Machine version also available in inches, °F and 110 V.

## Set composition

| Description | Qty. | kg | Order-no. |
|---|---|---|---|
| Basic machine with heating element (230 V/50 Hz), electronically controlled and prismatic clamping tools | 1 | 30.0 | 3701220 |
| Table locking device | 1 | 1.00 | 371520 |
| Spigot and socket OD 20 | 1 | 0.10 | HD020S |
| Spigot and socket OD 25 | 1 | 0.20 | HD025S |
| Spigot and socket OD 32 | 1 | 0.40 | HD032S |
| Spigot and socket OD 40 | 1 | 0.30 | HD040S |
| Spigot and socket OD 50 | 1 | 0.40 | HD050S |
| Spigot and socket OD 63 | 1 | 0.70 | HD063S |
| Spigot and socket OD 75 | 1 | 0.80 | HD075S |
| Cheese head screw M 8 x 50 | 3 | 0.10 | 091H050 |
| Disc M 8 | 3 | 0.05 | 0125H |
| Spring washer M 8 | 3 | 0.05 | 0127H |
| Nut M 8 | 3 | 0.05 | 0934H |
| Socket wrench opening 13 mm | 1 | 0.10 | |
| Allen key, size 5 | 1 | 0.05 | ZIG05 |
| Allen key, size. 3 | 1 | 0.05 | ZIG03 |
| Allen key with T-handle, size 5 | 1 | 0.10 | ZIT05 |
| Sheet steel carrying case (approx. 480 x 640 x 360 mm) | 1 | 10.0 | TK0075 |
| Pipe chamfering device, size 1 | 1 | 0.70 | W510200 |
| Pipe cutter, size 2 | 1 | 1.50 | W550110 |
| Pipe cutter, size 1 | 1 | 0.70 | W550100 |



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

# *Weld*Tech Hand-Held Socket Welders

½″ to 2″ Tool

½″ to 4″ Tool

**WeldTech Socket Heating Elements**

Socket fusion tools with electronically or thermostatically temperature control for the reception of teflon-coated heating spigots and sockets from 16mm up to 125mm (depending on the model). All tools are equipped with on/off switch, mains control lamp and interval control lamp for heating intervals. For support on the building site or in the workshop various holding devices and a steel carrying case are available.

Special voltages and dimensions upon request.

## Set composition

| Description | Qty. | kg | Order-no. |
|---|---|---|---|
| Multi 2/2 T 230 V/315 W, OD 16 - 32 mm | 1 | 1.4 | HM22E230 |
| Multi 2/2 E 230 V/315 W, OD 16 - 32 mm | 1 | 1.4 | HM22T230 |
| Multi 2/3 T 230 V/500 W, OD 16 - 32 mm | 1 | 1.5 | HM23E230 |
| Multi 2/3 E 230 V/500 W, OD 16 - 32 mm | 1 | 1.5 | HM23T230 |
| Multi 3/2 T 230 V/700 W, OD 20 - 63 mm | 1 | 2.3 | HM32E230 |
| Multi 3/2 E 230 V/700 W, OD 20 - 63 mm | 1 | 2.3 | HM32T230 |
| Multi 3/3 T 230 V/850 W, OD 20 - 63 mm | 1 | 2.5 | HM33E230 |
| Multi 3/3 E 230 V/850 W, OD 20 - 63 mm | 1 | 2.5 | HM33T230 |
| | | | |
| Socket fusion tool 16-90 mm (thermostatical), 630 W | 1 | 1.6 | HM0090T |
| Socket fusion tool 16-90 mm (electronical), 630 W | 1 | 1.6 | HM0090E |
| Socket fusion tool 16-160 mm (thermostatical), 1150 W | 1 | 3.6 | HM0160T |
| Socket fusion tool 16-160 mm (electronical), 1150 W | 1 | 3.6 | HM0160E |
| | | | |
| Spigots and sockets (PTFE grey) | | | |
| OD 16 | 1 | 0.1 | HD016S |
| OD 20 | 1 | 0.1 | HD020S |
| OD 25 | 1 | 0.1 | HD025S |
| OD 32 | 1 | 0.2 | HD032S |
| OD 40 | 1 | 0.3 | HD040S |
| OD 50 | 1 | 0.4 | HD050S |
| OD 63 | 1 | 0.6 | HD063S |
| OD 75 | 1 | 1.0 | HD075S |
| OD 90 | 1 | 1.5 | HD090S |
| OD 110 | 1 | 2.2 | HD110S |
| OD 125 | 1 | 3.0 | HD125S |
| | | | |
| Accessories: | | | |
| | | | |
| Table clamp | 1 | 0.2 | |
| Clamping piece | 1 | 0.1 | HM001 |
| Steel carrying case Multi 2 | 1 | 4.0 | TK0022 |
| Multi 3 | 1 | 4.0 | TK0033 |
| Steel carrying case MH 0090 | 1 | 5.0 | TK0200 |
| MH 0160 | 1 | 5.0 | TK0200 |
| | | | |
| Floor rack | 1 | 0.3 | |



SIMTECH
Phone: 877-777-2467 • Fax: 215-547-9129
www.SimtechUSA.com

# Socket Fusion Welding

**Joining**

All joints ½″ (20 mm) through 2½″ (75 mm) shall be interference fit socket fusion type. Butt fusion joints may be used on pipe and fittings above 2½″. All fusion-welded joints to be performed in accordance with ASTM D-2657 and piping manufacturers recommendations. All installers shall be factory certified by a representative of the manufacturer.

**Socket Fusion Welding**

Pipes and connectors are welded with an overlap. Using a socket or bulkhead-shaped heater element, both faces are heated to welding temperature and are then joined. Pipe end heater element and socket element are dimensionally matched to one another (Fig. 7).

**Preparation For Socket Welding**

Pipe must be cut square and the end must be chamfered. The fitting interior should be thoroughly cleaned using a cleaning agent, e.g. methylated spirits, and absorbent, lint free cloth.

The pipe end should be chamfered on the outside to approximately 15° over a width of 3/32″ (2mm) in the case of diameters up to 1½″ (50 mm), and over a width of 1/8″ (3mm) in the case of larger diameters.

**Welding Process**

The welding tools are preheated to 260°±10°C. Fitting and pipe should be pushed quickly and axially against the abutment or the marking of the tools and should be held there. The parts to be welded should be heated in accordance with the information and time below.

After the Heating Time, the fitting and pipes should be withdrawn from the heater element abruptly and without twisting. They should be pushed together right up to the mark or the abutment. The joined parts need to be held together for the length of time stated in below.

## Reference Values for Heater Element Socket Welding of PP

| Pipe | | Insertion Time | Maximum Changeover Time | Cooling Time | |
|---|---|---|---|---|---|
| OD (Inches) | OD (MM) | PN10/SR150 (sec) | (sec) | Clamped (sec) | Cooling Time (min) |
| 3/8 | 16 | 8 | 4 | 8 | 2 |
| 1/2 | 20 | 10 | 4 | 10 | 2 |
| 3/4 | 25 | 15 | 4 | 15 | 2 |
| 1 | 32 | 18 | 6 | 15 | 4 |
| 1-1/4 | 40 | 22 | 6 | 20 | 4 |
| 1-1/2 | 50 | 35 | 6 | 20 | 4 |
| 2 | 63 | 45 | 8 | 30 | 6 |
| 2-1/2 | 75 | 60 | 8 | 30 | 6 |
| 3 | 90 | 75 | 8 | 40 | 6 |
| 4 | 110 | 80 | 10 | 50 | 8 |

## Section 5

# Installation Practices



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

# Support Spacing

Support spacing for plastic pipe is dependent on the pipe material, mean pipe wall temperature, the pipe size and the density of the medium being transported. For simplicity, we have assumed a maximum deflection of:

- $f_{max}$ = 1cm — PP Type 1 and Type 2
- $f_{max}$ = 0.5cm — PVDF

The resulting distances for supporting the pipes apply when the pipes are laid horizontally. When the pipes are installed vertically, the distances between pipe shackles can be multiplied by the factor 1.3.

The distances for supporting the pipes under other condition, i.e. when the wall thickness is thinner, when the medium has a different density or when very low sag is required, other factors should be taken into consideration.

## PP Support Spacing

| Nominal Diameter (inches) | 68° F/ 20° C | 86° F/ 30° C | 104° F/ 40° C | 122° F/ 50° C | 140° F/ 60° C | 158° F/ 70° C | 176° F/ 80° C |
|---|---|---|---|---|---|---|---|
| 1/2 | 3 | 2.5 | 2.5 | 2 | 2 | 2 | 2 |
| 3/4 | 3 | 3 | 2.5 | 2.5 | 2.5 | 2.5 | 2 |
| 1 | 3.5 | 3 | 3 | 3 | 3 | 2.5 | 2.5 |
| 1 1/2 | 4 | 3.5 | 3 | 3 | 3 | 3 | 3 |
| 2 | 4.5 | 4 | 4 | 3.5 | 3 | 3 | 3 |
| 2 1/2 | 5 | 4.5 | 4 | 4 | 3.5 | 3 | 3 |
| 3 | 5.5 | 5 | 4 | 4 | 4 | 3.5 | 3.5 |
| 4 | 6 | 5 | 5 | 4 | 4 | 4 | 4 |
| 6 | 7 | 6 | 6 | 5 | 5 | 4.5 | 4.5 |
| 8 | 7.5 | 7 | 6 | 6 | 5.5 | 5 | 5 |
| 10 | 8.5 | 7.5 | 7 | 6.5 | 6 | 6 | 5.5 |
| 12 | 9.5 | 8.5 | 8 | 7 | 7 | 6.5 | 6 |
| 14 | 10 | 8.5 | 8 | 7.5 | 7 | 6.5 | 6.5 |
| 16 | 10.5 | 9.5 | 8.5 | 8 | 7.5 | 7 | 6.5 |
| 18 | 11.5 | 10 | 9 | 8.5 | 8 | 7.5 | 7 |

Distance in Feet

## HANGING PRACTICES

Hanging any thermoplastic system is not that much different than hanging a metal system. Typically the spacing between hangers is shorter, due to the flexibility of plastic. In addition, the type of hanger is important.

### Hanging Distances

Hangers should be placed based on the spacing requirements Since thermoplastic materials vary in strength and rigidness, it is important to select hanging distances based on the material you are hanging. Also, operating conditions must be considered. If the pipe is operated at a higher temperature, then the amount of hangers will be increased. Finally, if the system is exposed to thermal cycling, the placement of hangers, guides, and anchors is critical. In these cases, the hanger locations should be identified by the system engineer and laid out to allow for expansion and contraction of the pipe over its life of operation.

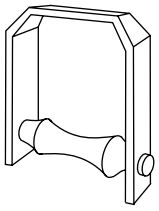
### Hanger Types

When selecting hangers for a system, it is important to avoid using a hanger that will place a pinpoint load on the pipe when tightened. For example, a U-bolt hanger is not recommended for thermoplastic piping.

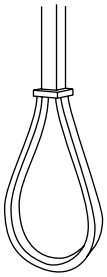
Hangers that secure the pipe 360° around the pipe are preferred. Thermoplastic clamps are also recommended over metal clamps, as they are less likely to scratch the pipe in the event of movement. If metal clamps are specified for the project, they should be inspected for rough edges that could damage the pipe. Ideally, if a metal clamp is being used, an elastomeric material should be used in between the pipe and the clamp. This is a must for PVDF and E-CTFE systems, which are less tolerant to scratching. Figure 2 illustrates some recommended hanger types.


**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

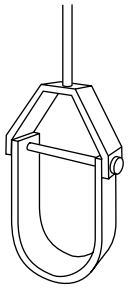
# Typical Plastic Piping Restraints / Hangers



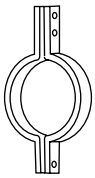
Roller Hanger



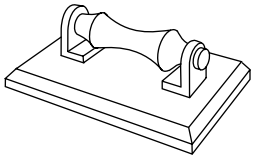
Adjustable Solid Ring
(swivel type)



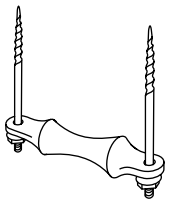
Clevis Hanger



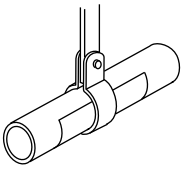
Double-Bolt Clamp



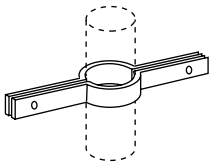
Pipe Roller and Plate



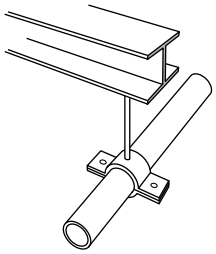
Single Pipe Roller



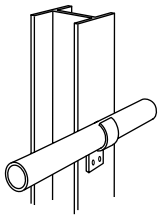
Band Hanger with
Protective Sleeve



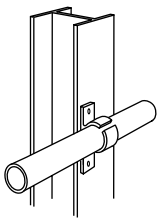
Riser Clamp



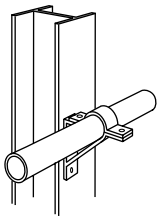
Suspended Ring Clamp



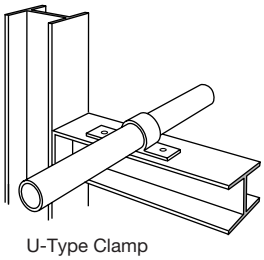
Vertical Clamp



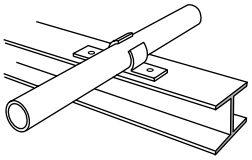
Vertical Pipe Clip



Vertical Offset Clamp



U-Type Clamp



Horizontal Pipe Clip



**SIMTECH**
**Phone: 877-777-2467 • Fax: 215-547-9129**
www.SimtechUSA.com

***Simtech Industrial Products, Inc.***
47-A Runway Road, Levittown, PA 19057
Phone: 215-547-0444 Fax: 215-547-9129
E-mail: info@SimtechUSA.com
Web site: www.SimtechUSA.com

## WARRANTY

Simtech Industrial Products, Inc. products are warranted to be free from defects in materials and workmanship for one (1) year from date of shipment. No claim shall be permitted under this warranty unless Buyer gives Simtech Industrial Products, Inc. written notice of all respects in which Buyer claims the product to be defective. Notice must be received within ten (10) days from the date which the Buyer discovers, or should have discovered the defect. Buyer shall give Simtech Industrial Products, Inc. a reasonable opportunity to inspect the product after notice has been given. This warranty shall not apply to any products or components, which have been subjected to abnormal use, negligence or accident.

Seller's sole obligation under this warranty shall be limited solely on the repair or replacement, as elected by Simtech Industrial Products, Inc., of defective or nonconforming material. To the maximum extent permitted by law, Buyer irrevocably waives all claims for money damages relating to the condition, use and performance of the goods purchased. In no event shall Simtech Industrial Products, Inc. liability exceed the purchase price of the product sold by Simtech Industrial Products, Inc.

In no event, whether because of a breach of warranty or representation or any other cause, whether based upon contract, tort, warranty or otherwise, arising out of the performance or nonperformance by seller of its obligations under this agreement or with respect to the products sold pursuant here to; shall seller be liable for lost earnings, income or profits or indirect, incidental, liquidated or consequential damages.

The implied warranties of merchantability and fitness for a particular purpose except as set forth in this warranty, express or implied, are hereby disclaimed and excluded. Nothing shall be construed as an additional warranty unless specifically designated as such in writing and signed by Simtech Industrial Products, Inc.

Simtech Industrial Products, Inc. reserves the right, in its discretion, at any time and from time to time, to make changes to any specification, data or information contained herein.