

## Pipe & Fittings Instructions and Installation Sheet

### INSTRUCTIONS

#### Unloading and Handling

##### Pipe

1. Remove restraints from the top unit loads.
2. Use a forklift with chisel forks, extend forks to remove each top unit from the truck. Remove back unit first. Do not run forks too far under units as fork ends striking adjacent units may cause damage. Insure forks are fully engaged.
3. If a forklift is not available, a spreader bar with fabric straps, which are capable of handling the load, may be used.
4. During removal and handling, be sure that the units do not strike anything. Severe impact could cause damage (particularly during cold weather).
5. To unload lower units, repeat the above unloading process.
6. If unloading equipment is not available, pipe may be unloaded by removing individual pieces. However, care should be taken to insure that pipe is not dropped or damaged.
7. Pipe should be lowered, not dropped, from trucks and into trenches.
8. In preparation for pipe installation, placement of pipe should be as close to the trench as practical and on the opposite side from excavated earth.

##### Fabricated Fittings

1. Use a forklift to unload fittings packaged on pallets or in crates. If a forklift is not available, fittings may be unpackaged and unloaded by hand.
2. During removal and handling, be sure that the units do not strike anything. Severe impact could cause damage (particularly during cold weather).

#### Storage

##### Pipe

1. Pipe package units should be stored and placed on level ground.
2. Package units should not be stacked more than eight feet high.
3. Pipe should be stored if possible at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to bell ends of the pipe.
4. Racks or dunnage to prevent damage to the bottom during storage should support PVC pipe unit packages. Supports should be spaced to prevent pipe bending.
5. When exposure in excess of two years to direct sunlight is unavoidable, PVC pipe should be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excessive heat accumulation.
6. The interior as well as all sealing surfaces should be kept free from dirt and foreign matter.
7. Gaskets should be protected from excessive exposure to heat, direct sunlight, ozone, oil, and grease.

##### Fabricated Fittings

1. As a result of the molding process, fabricated fittings can discolor after a few months of exposure to direct sunlight. To minimize discoloration, fittings should be covered with an opaque material while permitting adequate air circulation above and around the fittings as required to prevent excessive heat accumulation.

2. The interior as well as all sealing surfaces should be kept free from dirt and foreign matter.
3. Gaskets should be protected from excessive exposure to heat, direct sunlight, ozone, oil, and grease.

Above information on Unloading, Handling, and Storage was taken from *Uni-bell handbook of PVC Pipe*, Uni-bell PVC Pipe Association, 2655 Villa Creek Drive, Suite 155, Dallas, Texas 75234.

### INSTALLATIONS

#### Underground Installation

1. Materials for foundation, bedding, haunching, initial backfill, and final backfill shall be as specified in ASTM D-2321 for non-pressure pipe and shall be as specified in ASTM D-2774 or AWWA C-605 for pressure pipe.
2. Trench excavation and pipe installation shall comply with ASTM D-2321 for non-pressure pipe and shall comply with Uni-Bell UNI-B-3 or AWWA C-605 for pressure pipe.
3. Fittings branches for deep laterals (7 feet and deeper) shall not exceed an angle of 45° from the horizontal and risers should be designed to rest against the trench wall to minimize problems created by soil settlement, drag down, and forces created by poor backfill practices.

#### Hanger Installation

1. Pipe vertical displacement (sag) should be limited to 0.2 percent of the span length.
2. A support should be secured to the PVC pipe on both sides of the pipe joint with interval between support and joint not exceeding 2 feet.
3. Pipe supports should provide a smooth bearing surface conforming closely to the bottom half of the pipe. Bearing surfaces should be at least 2 inches wide.
4. Supports should permit longitudinal pipe movement in expansion and contraction without abrasion, cutting, or restriction. Supports should be mounted rigidly to prevent lateral or vertical pipe movement perpendicular to the longitudinal axis in response to thrust from internal pressure.
5. Changes in pipe line size and direction should be adequately anchored.

Above information on Hanger installation was taken from *Uni-Bell Handbook of PVC Pipe*, Uni-Bell PVC Pipe Association, 2655 villa Creek Drive, Suite 155 Dallas, Texas 75234.

#### Assembly Instructions

##### Solvent Cement Joints

1. Pipe is cut square with the axis, using a fine-tooth handsaw or fine-tooth power saw. All burrs should be removed with a knife, file, or abrasive paper.
2. Chamfer or debur the cut pipe using the pipe manufacturer's chamfer as a guide.
3. Surfaces to be joined must be cleaned and free of dirt, moisture, oil, and other foreign material. If this cannot be accomplished by wiping with a clean dry cloth, a chemical or mechanical cleaner must be used.
4. Keep cement can closed and in a shady place when not actually in used. Discard the cement if it does not flow freely from the brush or if it appears lumpy and stringy.
5. The surface temperature of the mating surfaces should not exceed 110°F at the time of assembly. First apply primer to inside socket surface. Next, uniformly apply a liberal coat of primer to surface of male end of pipe. Again, brush inside socket surface with primer.
6. Without delay, apply cement to pipe while surfaces are still wet with primer. Apply cement uniformly to inside

of socket. Apply a second coat of cement to the pipe end. (NOTE: The procedure above may be followed in the case of bell-end pipe except that great care should be taken not to apply an excess of cement in the bell socket, nor should any cement be applied on the bell-to-pipe transition area. This precaution is particularly important for installation of bell end pipe with wall thickness of less than 1/8".)

7. Immediately after applying the last coat of cement to the pipe, insert the pipe into the socket until it bottoms at the shoulder. Assembly should be completed within 20 seconds after the last application of cement. Hold the joints securely for approximately one minute for the cement to set. After assembly, wipe excess cement from the pipe at the end of the socket.
8. Follow the solvent cement manufacturer's instructions regarding cure times for working temperatures. NOTE: Pressure lines require a minimum of 48 hours cure time prior to testing.
9. After the set period, the pipe can be carefully placed in prepared ditch and snaked from side to side. Prior to backfilling, the pipe should be brought to approximate operating temperature either by shade backfilling, or by filling with water, or by allowing to stand overnight. The pipe system should be allowed to stand vented to the atmosphere prior to testing.

Above information on solvent cement joint assembly was taken from ASTM D-2855 Standard Practice for Making Solvent Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings. ASTM, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.

#### Gasket Joints

1. Clean all dirt and moisture from socket and spigot.
2. Apply a uniformly thin coat of lubricant to the spigot end of the pipe only. Do not lubricate the gasket.
3. Insert spigot into bell. Using hand installation or block and bar, inserting should continue until reference mark is flush with bell end. Some joint deflection is allowable. Manufacturer should be contacted if excessive joint deflection is anticipated.

#### Miscellaneous

1. Thrust restraints should be used at all of the following locations:
  - a. Changes in direction of the water (tees, elbow, etc.)
  - b. Pipe size changes (reducers, increasers, etc.)
  - c. At the end of the pipeline (caps and plugs)
  - d. At in-line valves
2. Air and/or vacuum relief valves shall be installed where necessary or check with your engineer.
3. Drainage shall be provided for when any of the following conditions exists:
  - a. Damage from freezing is possible
  - b. Recommended by pipe manufacturer
  - c. Specified by others for any reasonIf drainage by gravity is not possible, provisions shall be made to empty the line by pumping.
4. When pressure testing the line, the line should be filled with water slowly while care is taken to remove all air from the line.

Freedom Plastics Inc. will not be responsible for leaks due to improper installation or foreign material in the joints. Also, Freedom will not be responsible for installations made using methods other than those listed above.

#### **IMPORTANT: KEEP JOINT ASSEMBLY CLEAN! NOTICE TO INSTALLERS: RECOMMENDATION**

Plastic piping systems should be engineered and installed in accordance with established design and installation practices. Designs for roof drains must examine vertical loads and velocities on tall risers. High velocity protection is required where velocities may exceed 15 ft/sec. Freedom Plastics, Inc. will not accept responsibility for damage resulting from unnatural misalignment of fittings.

#### **IMPORTANT: WATER HAMMER**

Freedom Plastics, Inc. recommends that all PVC and CPVC plastic piping systems be designed and constructed to AVOID EXCESSIVE WATER

HAMMER. Water hammer can cause damage, and failure to pipe, valves, and fittings within the piping system.

#### **CAUTION:**

Freedom Plastics, Inc. DOES NOT RECOMMEND the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases. The use of Freedom Plastics, Inc. products in exposed, compressed air or gas systems automatically voids Freedom's warranty for such products, and their use against our recommendation is entirely the responsibility and liability of the installer. Freedom Plastics, Inc. will not accept responsibility for damage or impairment of its products, or other consequential or incidental damages caused by misapplication, incorrect assembly, and / or exposure to harmful substances or conditions.

#### **PLEASE NOTE:**

When temperatures rise above 73°F, the tensile strength of thermoplastics decreases, thereby de-rating the pipe or fittings Maximum Internal Pressure. When temperatures fall below 73°F, the tensile strength of thermoplastics increases, however, their impact strength decreases.

Freedom Plastics reserves the right to alter dimensions of fabricated fittings without advance notice.

#### **WARRANTY**

Freedom Plastics, Inc., 215 S. Arch, Janesville, WI 53545, does hereby warrant subject to the limitations hereinafter stated, its products to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of invoice. This limited warranty extends only to the original purchaser for use, and will be void if the product is used under conditions other than those for which it was designed or if it is not used in compliance with all instructions contained in any operating manual or specification sheets provided for such project.

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