

| INCH-POUND |

MIL-P-28584B  
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SUPERSEDING  
MIL-P-28584A  
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## MILITARY SPECIFICATION

### PIPE AND PIPE FITTINGS, GLASS FIBER REINFORCED PLASTIC, ADHESIVE BONDED JOINT TYPE, FOR CONDENSATE RETURN LINES

This specification is approved for use by the Naval Facilities Engineering Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers plastic pipe and fittings made from epoxy resin and glass fiber reinforcement, together with epoxy adhesive necessary for joint assembly, for continuous service up to 125 pounds per square inch (psi) operating pressure at 250 degrees Fahrenheit (°F) in condensate return lines.

#### 1.2 Classification.

1.2.1 Pipe. The reinforced plastic pipe will be of the following types:

- Type I - Filament wound.
- Type II - Centrifugally cast.

1.2.2 Fittings. The reinforced plastic fittings will be of the following types:

- Type I - Filament wound.
- Type II - Molded.

#### 2. APPLICABLE DOCUMENTS

2.1 Government documents.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4710

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

#### SPECIFICATIONS

##### FEDERAL

PPP-B-636 - Boxes, Shipping, Fiberboard.

##### MILITARY

MIL-C-52950 - Crate, Wood, Open and Covered.

#### STANDARDS

##### MILITARY

MIL-STD-2073-1A - DoD Materiel Procedures for Development and Applications of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 Non-Government publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents which is current on the date of the solicitation (see 6.2).

##### AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

ANSI B16.5 - Steel Pipe Flanges and Flanged Fittings.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

##### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3951 - Standard Practice for Commercial Packaging.

ASTM D 2310 - Classification for Machine-Made Reinforced Thermosetting Resin Pipe.

ASTM D 3567 - Method for Determining Dimensions of Reinforced Thermosetting Resin Pipe (RTRP) and Fittings.

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(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 General. The plastic pipe and fittings shall be round and straight, and of uniform density, resin content, and surface finish. All pipe ends shall be cut at right angles to the axis of the pipe and any sharp edges removed. The bore of the pipe shall contain a smooth, uniform liner to protect the glass fiber reinforcement. The liner shall be composed of an epoxy resin formulation and may contain a reinforcement. The bore of the fittings shall have a smooth, uniform surface with no exposed fibers.

3.2 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification.

3.2.1 Pipe and fittings. The pipe and fittings shall be made from epoxy resins and glass fiber reinforcement. Fillers, colorants, and other materials may be added, provided the pipe and fittings produced meet all the requirements of this specification.

### 3.3 Dimensions.

3.3.1 Pipe. The pipe shall be 2, 3, 4, 6, 8, 10, or 12-inch nominal size, as specified (see 6.2), and shall have the dimensions and tolerances shown in table 1.

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TABLE I. Dimensions of pipe.

Nominal pipe size, inches	Outside diameter, inches	Tolerance, inches	
		Type I	Type II
2	2.375	+0.060 -0.018	+0.012
3	3.500	+0.060 -0.018	+0.012
4	4.500	+0.060 -0.018	+0.015
6	6.625	+0.066 -0.028	+0.025
8	8.625	+0.086 -0.040	+0.025
10	10.750	+0.108 -0.048	+0.025
12	12.750	+0.128 -0.056	+0.025

3.3.1.1 Length. Unless other lengths are specified (see 6.2 and 6.8), the length of the pipe shall be 20 feet (ft), with a plus tolerance of 2 feet and a minus tolerance of 5 feet.

3.3.1.2 Wall thickness. The minimum wall thickness of the pipe shall be not less than 87.5 percent (%) of the wall thickness as tested in section 4.

3.3.2 Fittings. Fittings shall be 2, 3, 4, 6, 8, 10, or 12-inch nominal size, as specified (see 6.2), and shall have dimensions suitable for joining to the pipe and enabling the pipe and fitting joint to meet the requirements of this specification. For purposes of this specification, fittings shall include couplings and flanges.

3.3.2.1 Flanges. Flanges shall conform to the bolt hole sizes and pattern for 150-pound (lb) steel flanges in ANSI B16.5.

3.4 Adhesive. Adhesive for joint assembly shall be a material suitable for providing a permanent seal between the pipe and fittings in continuous service up to 125 psi at 250°F. The adhesive shall be supplied as a kit which includes containers of all components in the amounts needed for each adhesive mixture. Instructions for use shall be marked on each container or listed on an instruction sheet included in each adhesive kit. When specified (see 6.2 and 6.6), adhesive kits shall be furnished in a sufficient quantity, as recommended by the supplier, for the particular procurement of pipe and fittings.

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3.5 Joint strength. Pipe, fittings, and joints shall show no porosity or other evidence of failure when tested in accordance with 4.5.2.

3.6 Impact resistance. Pipe and fittings shall show no porosity or visual evidence of damage that would affect serviceability when tested in accordance with 4.5.3.

3.7 Boil resistance. Pipe and fittings shall show no evidence of delamination or other impairment and shall have a weight gain no greater than 1.0% when tested in accordance with 4.5.4.

3.8 Beam strength. The elastic modulus of the pipe shall be a minimum of 1,000,000 psi when tested in accordance with 4.5.5.

3.9 Cycling resistance. The pipe and fittings assembly shall not show evidence of leakage or other visible signs of damage after being subjected to a series of (a) initial deflection cycles, (b) pressure cycles, (c) temperature cycles, (d) water hammer cycles, and (e) final deflection cycles when tested in accordance with 4.5.6.

3.10 Hydrostatic proof pressure. The pipe and fittings shall withstand 200 psi or 1-1/2 times the manufacturer's rated pressure, whichever is greater, without any indication of porosity when tested in accordance with 4.5.7.

### 3.11 Identification marking.

3.11.1 Pipe. Each length of pipe shall be marked at intervals of not more than 15 feet. Each marking shall include at least the manufacturer's name or trademark, the nominal pipe size, and the type of reinforced plastic pipe. The type of reinforced plastic pipe may be designated in accordance with ASTM D 2310 or some other easily identifiable system. The marking shall be of a contrasting color and a type that remains legible under normal handling and installation procedures.

3.11.2 Fittings. Each fitting shall be marked on the body or hub with at least the manufacturer's name or trademark and the nominal size. The marking shall be of a contrasting color and a type that remains legible under normal handling and installation procedures.

3.11.3 Adhesive. Each container shall be marked with at least the manufacturer's name or trademark, adhesive component type, date of manufacture, special storage conditions, and instructions for use (if a separate instruction sheet is not included in the adhesive kit).

3.12 Workmanship. The pipe and fittings shall be free from all defects including delaminations, cracks, indentations, bubbles, pinholes, porosity, resin rich areas, and resin starved areas which due to their nature, degree, or extent, detrimentally affect the strength and serviceability of the pipe and fittings. The pipe liner shall be free of cracks, chips, or other damage.

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#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the packaging inspection of 4.6. Recommended sampling and inspection procedures are cited in 6.4.

4.3 Destructive tests. The destructive tests specified in 4.5.2 to 4.5.6 shall be performed by an independent commercial laboratory acceptable to the Government or in the supplier's own facilities under the observation of a factory inspection agency acceptable to the Government.

#### 4.4 Examination.

4.4.1 Pipe. Sample pipe selected shall be examined for the following defects: incorrect dimensions; ends of pipe not cut at right angles to the axis; liner missing, cracked, or chipped; bubbles; pinholes; delamination; cracks; indentations; resin rich or resin starved areas in the outer pipe wall; and incorrect or missing identification marking. Any sample pipe having one or more of the defects listed shall be considered a defective unit.

4.4.1.1 Dimensions. The outside diameter, wall thickness, and length of the pipe shall be determined in accordance with the applicable sections of ASTM D 3567.

4.4.2 Fittings. Sample fittings selected shall be examined for the following defects: delamination; cracks; indentations; resin rich or resin starved areas; bubbles; pinholes; exposed fibers or non-uniform surface on bore of fitting; and incorrect or missing identification marking. Any sample fitting having one or more of the defects listed shall be considered a defective unit.

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4.4.3 Adhesive. Sample kits of adhesive selected shall be examined for missing adhesive components, missing instructions for use, and missing or incorrect identification marking. Any sample adhesive kit having one or more of the defects listed shall be considered a defective unit.

4.5 Tests. Sample pipe, fittings, and adhesive selected shall be subjected to the tests specified in 4.5.2 through 4.5.7. Any sample failing to pass any of these tests shall be considered a defective unit.

4.5.1 Test conditions. Unless otherwise specified in the test method, test specimens shall be conditioned for not less than 48 hours in a room maintained at 50°F to 100°F, and tested at the same temperature range. Unless otherwise specified, the test pressure in the individual test methods shall have a tolerance of +10 psi and -0 psi.

4.5.2 Joint strength. Joint assemblies containing the pipe, fittings, and adhesive shall be fabricated. The adhesive shall be applied and cured as under field conditions in accordance with the manufacturer's printed instructions. The completed test section may be an assembly containing each kind of fitting to be furnished under a contract, or may be simply one fitting joined between two pieces of pipe. When a section containing just one fitting is used, then similar test sections containing the other kinds of fittings to be furnished must also be tested. If the test section containing the one fitting is used, the longest end-to-end dimension shall be 18 inches or seven times the outside diameter of the pipe, whichever is greater. If the test section contains more than one fitting, the pipe length between fittings shall be 6 inches or three times the outside diameter of the pipe, whichever is greater. The test section shall be subjected to a hydrostatic pressure of 200 psi or 1-1/2 times the manufacturer's rated pressure, whichever is greater, at 300°F for 168 hours. The liquid medium used shall be an oil selected by the testing laboratory and shall contain a soluble fluorescent dye. Observations with an ultra-violet lamp shall be made each 24 hours for porosity or other evidence of failure of the pipe, fittings, or joints.

4.5.3 Impact resistance. A steel ball, 2 inches in diameter and weighing approximately 1.2 lb shall be dropped squarely onto the surface of the pipe or fitting specimen with a free fall (which may be guided) from a height of 1 foot. The pipe specimen shall be a minimum of 2 feet in length and the fitting specimen shall be the complete fitting. The ball may be caught or deflected after the hit so that the rebound does not hit the specimen. The specimen shall be full of water containing a soluble fluorescent dye, but not pressurized. The test shall be made at room temperature and the specimen shall be supported on a solid, flat support. Four drops shall be made on randomly selected areas of the pipe specimen, 90° clockwise from each other. One drop shall be made on the fitting specimen. The specimen shall then be pressurized to 200 psi or 1-1/2 times the rated pressure, whichever is greater, and shall remain at this pressure for 168 hours, at the end of which the specimen shall be examined for porosity with an ultraviolet lamp and then emptied and examined for evidence of damage.



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**4.5.4 Boil resistance.** A test specimen, 1.5 inches in length, shall be cut from the sample pipe. Fittings shall be tested using either the whole fitting or a 1.5 inch length cut from the fitting. The test specimens shall be conditioned for 8 hours at 200°F, dessicated, and an initial weighing made. The specimens shall be suspended in a boiling distilled water bath for 3 hours. The specimens shall be removed one at a time, blotted dry of excess water, and weighed. This weighing shall be made within 1.5 minutes after removal from the bath. After weighing, the specimens shall be visually examined for delamination or other evidence of impairment and the percentage weight gain of the specimens shall be calculated as follows:

$$\text{Percent weight gain} = \frac{B - A}{A} \times 100$$

Where A = initial weight

B = weight after immersion

**4.5.5 Beam strength.** A minimum 6 foot length of pipe shall be capped and filled completely with water at 200°F, but not pressurized. The pipe shall be suspended by laying the end caps on appropriate supports, allowing the pipe to hang free between the supports, and supporting the end caps at their centers of gravity. The sag in the pipe shall be measured and recorded every 168 hours for a period of 1008 hours plus or minus 8 hours. The sag at the end of the test shall be used to calculate the value of E in the formula:

$$Y = \frac{22.5 WL^4}{EI}$$

Where,

$$I = \frac{3.14}{64} \times (D^4 - d^4)$$

E = elastic modulus, psi

W = weight (pounds) per inch of pipe, including water

L = length of span, inches

Y = deflection or sag, inches

D = outside diameter of pipe inches

d = inside diameter of pipe, inches

Sag is measured from the horizontal plane of the pipe supports to the lower surface of the loaded pipe.

#### **4.5.6 Cycling resistance.**

**4.5.6.1 Test equipment.** A test rack having a structural steel frame shall be used to test various assemblies of piping system components. The test rack shall provide a means of firmly securing a one-foot reinforced plastic pipe nipple comprising the supply side of the assembly being tested to the supply side of the rack, and a means of continuously deflecting the outlet side of the assembly not less than the deflections specified in



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table II in both directions at a rate of not less than 8 cycles per minute. The deflection pressure shall be applied not more than 46 inches from the centerline of the pipe nipple. Inlet and outlet headers shall be provided with traps, heat exchangers, pressure reducing valves, shut-off valves and other equipment necessary to provide the specified test conditions. The outlet side of each assembly shall consist of a reinforced plastic flange bolted in a steel flange connected to a flexible outlet pipe having a diameter not larger than half the diameter of the test pipe. The flexible pipe shall be connected to the outlet header. The test rack shall be so constructed that the assembly being tested is not restrained from blowing apart if a joint or connection fails under test.

TABLE II. Deflection for cycling resistance.

<u>Nominal pipe size, inches</u>	<u>Minimum deflection from unrestrained position, inches</u>
2	0.50
3	0.50
4	0.50
6	0.29
8	0.20
10	0.13
12	0.09

4.5.6.2 Test assembly. The test assembly shall consist of (1) a one-foot nipple secured to the test rack, (2) a 90° elbow, (3) a one-foot nipple, (4) a coupling, (5) a three-foot length of pipe, and (6) a reinforced plastic flange bolted to the steel outlet flange. The entire assembly shall be wrapped with 3/4-inch fiber glass insulation to simulate ground cover. All change of direction-type fittings, such as 45° elbows, tees, crosses, laterals, and saddles, shall be tested by substituting them for the 90° elbow in the above assembly. All other types of joints, such as bell-end pipe, reinforced plastic pipe to steel pipe adapters, flanges and gaskets, and reducers, shall be tested by substituting them for the coupling in the above assembly. Open ends shall be blanked off as necessary, and the inlet nipple shall be realigned as necessary to accomodate changes in direction other than 90°.

4.5.6.3 Test procedure. The test shall be performed with the assembly being continuously deflected to the right of the unrestrained position the deflection amount specified in table II, and then deflected the same amount to the left of the unrestrained position, and back again to the right of the unrestrained position. The direction of the deflections shall be in the plane of the fitting being tested. The deflection rate shall be not less than 8 cycles per minute. Overnight shutdowns are permissible. The cycling shall be conducted in the following sequence.

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4.5.6.3.1 Initial deflection cycles. The assembly shall be subjected to 1000 deflection cycles with water inside the assembly maintained at 115 psi and 250°F.

4.5.6.3.2 Pressure cycles. With deflection cycles continuing, the test pressure shall be rapidly lowered to 30 psi and then immediately allowed to build back to 115 psi by opening and closing an outlet valve. This shall be repeated for 20 pressure cycles at a rate of not more than 5 minutes per cycle.

4.5.6.3.3 Temperature cycles. With deflection cycles continuing, the temperature of the water inside the assembly shall be increased to 300°F, lowered to 60°F, and then increased to 300°F for 20 complete cycles. The pressure shall be allowed to vary during the temperature cycling, but shall be not less than 115 psi when the temperature is 300°F. The cycles may be as rapid as desired, but shall not be more than 30 minutes per cycle.

4.5.6.3.4 Water hammer cycles. With deflection cycles continuing, water hammer shall be produced by pressurizing the assembly with 15 psi steam from the supply header and then introducing water at 50 psi and 80°F from the outlet header until the pressure steadies at 50 psi. The water shall then be drained until the assembly contains only steam, and the process shall be repeated for 20 cycles. The maximum time per cycle shall not exceed 15 minutes.

4.5.6.3.5 Final deflection cycles. Following the water hammer cycles, the pressure and temperature shall be steadied at 115 psi and 250°F, and the deflection cycles continued for 1000 cycles.

4.5.6.4 Inspection. Following the final deflection cycles, and while still deflecting, the fiber glass insulation shall be removed and the assembly shall be visually inspected for leaks and other signs of damage. The deflection shall then be stopped and the assembly pressurized to 1-1/2 times the manufacturer's rated pressure and reinspected for leaks and damage.

4.5.7 Hydrostatic proof. The pipe shall be filled completely with fresh water and pressurized to 200 psi or 1-1/2 times the manufacturer's rated pressure, whichever is greater. The test shall be made at room temperature and after the water in the pipe has had time to reach room temperature. The pipe shall remain under pressure for not less than 5 minutes, and then shall be examined for porosity while still under pressure.

4.6 Packaging inspection. The preservation, packing, and marking of the pipe and fittings, and adhesive kits when furnished, shall be examined to determine conformance with the requirements of section 5 of this specification (see 4.2).

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## 5. PACKAGING

5.1 Preservation. Preservation shall be level A or commercial, as specified (see 6.2).

5.1.1 Level A. Pipe shall have the open ends sealed with suitable caps or plugs. When kits of adhesive are furnished they shall be packaged in boxes conforming to PPP-B-636, weather-resistant. Contents of boxes shall be cushioned to prevent movement within the boxes.

5.1.2 Commercial. The pipe and fittings, and kits of adhesive when furnished, shall be packaged in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, or commercial as specified (see 6.2).

5.2.1 Level A.

5.2.1.1 Pipe. The pipe shall be packed in open wood crates conforming to MIL-C-52950, style B, type III, with a maximum net load of 500 lb.

5.2.1.2 Fittings. The fittings shall be packed in accordance with requirements of MIL-STD-2073 and placed in woodboxes selected from table VII of MIL-STD-2073.

5.2.1.3 Adhesive. Kits of adhesive, when furnished, shall be packed as specified for fittings.

5.2.2 Commercial. The pipe and fittings, and adhesive when furnished, shall be packed in accordance with ASTM D 3951.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The pipe and fittings covered by this specification are intended for service up to 125 psi at 250°F in condensate return lines. The pressure rating of these products is usually higher for the smaller nominal sizes and at lower service temperatures. Although the pipe and fittings have been tested to 200 psi at 300°F, the manufacturer's recommended pressure and temperature limits for sustained operation may be lower. The pipe and fittings may be suitable for other applications, but consideration should be given to the necessity of evaluating these products for the specific requirements of those applications and the possibility that lower cost reinforced plastic pipe and fittings (such as unlined pipe) might also be suitable for those applications.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1 and 2.2).
- c. ~~Size of pipe required and length, if other than 20 feet (see 3.3.1, 3.3.1.1, and 6.6).~~
- d. Kind and size of fittings required (see 3.3.2).
- e. Whether adhesive kits are to be provided (see 3.4 and 6.4).
- f. Level of preservation and level of packing required (see 5.1 and 5.2).
- g. If a certificate of compliance for the destructive tests is not acceptable (see 6.9).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID is tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference Paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
6.9	D1-E-2121	Certificate of Compliance	

The above DID were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSCL), must be researched to ensure that only current, cleared DIDs are cited on the DD Form 1423.

6.4 Recommended sampling and inspection procedures. Sampling and inspection procedures should be in accordance with MIL-STD-105. The unit of product should be one length of pipe, one pipe fitting, and one adhesive kit. All pipe of the same type and nominal size, all fittings of the same type, kind, and nominal size, and all adhesive kits offered for delivery at one time shall be considered a lot for the purpose of inspection. When a certificate of compliance is not acceptable, each lot shall contain sufficient pipe, fittings, and adhesive kits to perform all the destructive tests specified herein (see 4.5 (except hydrostatic proof test), and 6.9).

6.5 Fittings. The fittings covered by this specification are classified as filament wound and molded (see 1.2.2). The term "molded" is used to

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describe those fittings manufactured by compression molding, contact molding, or hand fabrication. Some fittings may be available which are manufactured using two or more of the above methods.

6.6 Adhesive. When pipe and fittings are being procured for stock and will be stored for more than 1 year before use, the adhesive kits should not be ordered at the same time since the adhesive might have a limited shelf life.

6.7 Joints. Different joint systems, such as tapered socket or untapered socket joints, and adhesives with properties based on the requirements of the specific pipe and fittings to be joined are used by reinforced plastic pipe and fitting manufacturers. Therefore, to assure that joints are assembled properly, only pipe, fittings, and adhesive furnished by the same manufacturer should be used together.

6.8 Pipe lengths. In addition to the standard length (see 3.3.1.1), pipe may be available from some manufacturers in random or exact lengths up to 40 feet. Exact lengths may be more expensive per foot than random lengths.

6.9 Certificate of compliance. Unless otherwise specified (see 6.2 and 6.3), a certificate of compliance from an independent commercial laboratory or factory inspection agency acceptable to the Government will be accepted as proof that the requirements in 3.5 to 3.9 for the destructive tests specified in 4.5.2 to 4.5.6 (joint strength, impact resistance, boil resistance, beam strength, and cycling resistance) have been met. The certificate of compliance shall be accompanied by a certification from the manufacturer that the tests have been performed on products manufactured from the same materials and by the same manufacturing processes as the items being offered, and that any proposed changes in material or processes will be promptly reported to the Government. The Government reserves the right to require additional testing and certification when such changes are made or when otherwise deemed necessary.

6.10 Part or identifying number (PIN). PIN will be formulated to identify each item covered by this specification by selecting from the requirement options available in this specification as follows:

PIN	M28584	XX	XX	XX
Specification number _____				
Pipe size in inches _____				
Fittings size in inches _____				
Length in feet _____				

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6.11 Subject term (key word) listing.

Filament wound  
Centrifugally cast  
Molded  
Impact resistance  
Cycling resistance  
Boil resistance

6.12 Changes from previous issue. Asterisks are not used in this specification to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - CE  
Navy - YD  
Air Force - 11

Preparing Activity:

Navy - YD  
(Project No. 4710-0983)

Review:

DLA - CS

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-P-28584B		2. DOCUMENT TITLE MILITARY SPECIFICATION - PIPE AND PIPE FITTINGS, GLASS FIBER REINFORCED PLASTIC, ADHESIVE BONDED JOINT TYPE FOR CONDENSATE	
3. NAME OF SUBMITTING ORGANIZATION RETURN LINES		4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
5. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	