

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
HOUSING - FEDERAL HOUSING COMMISSIONER

TO: AREA OFFICE DIRECTORS
INSURING OFFICE DIRECTORS

Series and Series No.

USE OF MATERIALS
BULLETIN NO. 76

Date

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SUBJECT: CHLORINATED POLY (VINYL CHLORIDE) CPVC AND POLYBUTYLENE (PB)
HOT AND COLD WATER DISTRIBUTION PIPING

Members of the HUD Staff processing cases and inspecting construction shall use this information in determining acceptability of the subject material for the uses indicated.

This bulletin should be filed with Bulletins on Special Methods of Construction and Materials as required by prescribed procedures. Additional copies may be requisitioned by the field offices.

The technical description, requirements and limitations expressed herein do not constitute an endorsement, approval or acceptance by the Department of Housing and Urban Development (HUD/FHA) of the subject matter, and any statement or representation, however made, indicating approval or endorsement by the Department of Housing and Urban Development is unauthorized and false, and will be considered a violation of the United States Criminal Code 18, U. S. C. 709.

Any reproduction of this Bulletin must be in its entirety and any use in sales promotion or advertising is not authorized.

Subject to good workmanship, compliance with applicable codes, and the methods of application listed herein, the materials described in this bulletin may be considered suitable for HUD Housing Programs, including Housing for the Elderly and Care-Type Housing.

The eligibility of a property under these Programs is determined on the property as an entity and involves the consideration of underwriting and other factors not indicated herein. Thus, compliance with this bulletin should not be construed as qualifying the property as a whole, or any part thereof, as to its eligibility.

The methods of application for the materials listed herein are to be considered as part of the HUD Minimum Property Standards and shall remain effective until this Bulletin is cancelled or superseded.

SECTION I - GENERAL STATEMENT

This bulletin sets forth the requirements and conditions for the acceptance of hot and cold water distribution piping manufactured from Chlorinated Poly (Vinyl Chloride) (CPVC) or Polybutylene (PB) plastic.^{1/} The information contained herein may be used as a guide by manufacturers, architects, engineers, and builders seeking appropriate HUD/FHA acceptance. These materials may be used in the applications detailed in Section II. Terminology used is consistent with that of the nationally recognized model plumbing codes.

This bulletin supersedes the following Use of Materials Bulletins:

<u>Number</u>	<u>Subject</u>	<u>Date</u>
UM 61a	(CPVC) Hot & Cold Water Distribution Systems - Chlorinated Polyvinyl Chloride	December 5, 1973
UM 68	(PB) Hot & Cold Water Distribution System - Polybutylene	November 18, 1974

SECTION II - ALLOWABLE USES

CPVC and PB pipe, tubing, fittings and joining systems conforming to the standards and other publications referenced in Section III may be used for interior hot and cold water distribution piping in diameters of 2 inches and less for single and multifamily structures including Housing for the Elderly and Care-Type Housing.

These materials shall not be used in any application in which the design water temperature exceeds 180°F.

SECTION III - REFERENCE STANDARDS

The latest editions of the following publications, dated prior to the issue date of this bulletin, form a part of this Bulletin:

ASTM^{2/} Standards and Specifications

D 1784 Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

^{1/} For Polybutylene (PB) building cold water service piping, See UM 78.

^{2/} American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

- D 2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- D 2581 Polybutylene (PB) Plastics
- D 2774 Underground Installation of Thermoplastic Pressure Piping
- D 2846 Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot Water Distribution Systems
- D 2855 Making Solvent Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
- D 3309 Polybutylene (PB) Plastic Hot-Water Distribution Systems
- E 119 Standard Methods of Fire Tests of Building Construction and Materials
- F 402 Safe Handling of Solvent Cements Used for Joining Thermoplastic Pipe and Fittings

Other Publications

- PPI^{3/} - TR^{4/} 13 Poly (Vinyl Chloride) (PVC) Plastic Piping Design and Installation
- PPI-TR 16 Thermoplastic Water Piping Systems
- PPI-TR 21 Thermal Expansion and Contraction of Plastic Pipe
- PPI-TR 26 Recommendations for Storage and Handling of Polyvinyl Chloride Plastic (PVC) Pipe
- PPI-TN^{5/} 2 Sealants for Polyvinyl Chloride (PVC) Plastic Piping
- PPI Plastics Piping Manual

^{3/} Plastics Pipe Institute, a Division of the Society of the Plastics Industry, 355 Lexington Avenue, New York, New York 10017

^{4/} Technical Report (of the Plastics Pipe Institute)

^{5/} Technical Note (of the Plastics Pipe Institute)

NSF^{6/} Standard No. 14. Thermoplastic Materials, Pipe, Fittings, Valves, Traps and Joining Materials

SECTION IV - MATERIALS

A. Composition and Properties

Pipe, tubing, fittings and joining systems shall be manufactured from materials as defined in the following specifications:

Pipe, Tubing & Fitting Materials	Joining Materials
<u>CPVC</u> - ASTM D 1784 ASTM D 2846 (Section 4)	<u>CPVC</u> (Solvent Cement) Method) ASTM D 2564 ASTM D 2846 (Section 7)
<u>PB</u> - ASTM D 2581 ASTM D 3309 (Section 4)	<u>PB</u> (Heat Fusion or Compression Methods) ASTM D 3309

B. Dimensional Details and Test Requirements

Dimensions, tolerances, shapes and applicable test requirements for pipe, fittings and joint cements shall conform with the following specifications:

Pipe & Tubing	Fittings & Joining Systems
<u>CPVC</u> - ASTM D 2846	<u>CPVC</u> - ASTM D 2564 ASTM D 2846
<u>PB</u> - ASTM D 3309	<u>PB</u> - ASTM D 3309

^{6/} National Sanitation Foundation, P. O. Box 1468, Ann Arbor, Michigan 48106

SECTION V - SYSTEM DESIGN AND INSTALLATION REQUIREMENTS

A. General Requirements

The selection, design, installation and leak testing of plastic piping systems shall conform with all applicable requirements of the HUD Minimum Property Standards, the applicable nationally recognized model code and industry standards of good practice. A summary appendix of industry standards of good practice is being prepared, based on the referenced publications listed below.

B. Pressure Rating

Thermoplastic piping used for domestic hot and cold water distribution shall be pressure rated as follows:

Not less than 160 psi working pressure at 73°F
Not less than 100 psi working pressure at 180°F

C. Requirements for Making Joints and Connections

The materials and installation techniques used for joining pipes, tubes and fittings shall assure adequate resistance of the completed system to leaking, and shall assure adequate resistance to joint failure from long-term exposure to the service environment. No joints shall be made in or beneath slab or foundation. Where solvent cements are required, only cements with shelf-life marking shall be used. The recommendations of the manufacturer and applicable industry standards shall be followed in making joints and connections. Standards and other publications defining generally accepted practice include the following:

CPVC -

ASTM D 2846 (Appendix X2)
ASTM D 2855
ASTM F 402
PPI TR 13, Paragraph 6.2
PPI TR 16, Paragraph 4.1
PPI Plastics Piping Manual; Chapter 4, Pages 40-41

PB -

ASTM D 3309 (Appendix X2)
PPI TR 16, Paragraph 4.1
PPI Plastics Piping Manual; Chapter 4, Pages 40-41
Chapter 9, Page 68

D. Control of Expansion and Contraction

Installation procedures shall provide for accommodation of thermal expansion and contraction without compromising the essential performance of the system. Installation procedures shall be in accordance with the manufacturer's recommendations and applicable industry standards. Publications defining generally accepted practice include the following:

ASTM D 2846 (Appendix X2)

ASTM D 3309 (Appendix X2)

PPI TR 21

PPI Plastics Piping Manual, Chapter 3, Page 22

E. Requirements for Hangers and Supports

Hangers and straps shall not damage the pipe or fittings. Supports shall be provided for horizontal piping at intervals sufficient to prevent deflections likely to interfere with drainage or leak resistance. Vertical piping shall be anchored at appropriate intervals.

Selection and installation of hangers and supports shall be in accordance with the manufacturer's recommendations and applicable industry standards. Publications defining generally accepted practice include the following:

ASTM D 2846 (Appendix X2)

ASTM D 3309 (Appendix X2)

F. Requirements for Underground Installation

Techniques used for trenching and back-filling shall not produce stresses and strains, or cutting or abrasive effects, likely to interfere with leak resistance or result in structural collapse. Earth and live loads, without internal pressure, shall be less than the manufacturer's published load rating for the material and conditions of installation used. Methods used shall be in accordance with the manufacturer's recommendations and applicable industry standards. Publications defining generally accepted practice include the following:

ASTM D 2774

PPI TR 13, Paragraph 6.3

PPI TR 16, Paragraphs 4.4 and 4.7

PPI Plastics Piping Manual; Chapter 4, pp, 41, 43

G. Requirements for Fire Safety

The hot and cold water distribution system, as designed and installed in fire rated walls and chases, shall not compromise the fire endurance ratings of such building elements as required in Section 405 of the HUD Minimum Property Standards and as evaluated by methods based on ASTM E 119, Standard Methods of Fire Tests of Building Construction and Materials.

The following construction requirements for the use of thermoplastic piping shall be complied with:

1. With the exception of one and two family housing, all plastic piping installed in private or public spaces shall be installed in enclosed walls, floors, ceilings, chases or shafts complying with the fire resistance ratings of Table 4-5.1 of the Minimum Property Standards for Multifamily and Care Construction, as applicable.
2. All penetrations through required fire resistive walls, partitions or chases, which are cut to allow the passage of plastic pipe, shall not be excessively larger than required for passage of the lateral and shall be backpacked or sealed with plaster spackling or suitable non-combustible material resistant to deterioration or disruption caused by movement of the pipe.
3. Thermoplastic risers in chases more than forty feet in height shall be sleeved with galvanized steel not thinner than eighteen gauge and shall be fire-stopped and backpacked as described above at each floor where the pipe is anchored, but not less than every fourth floor. Sleeves shall be not less than four pipe diameters in length or twelve inches, whichever is greater, and shall be positioned midway in the firestop.
4. The pipe and fittings of a plastic piping assembly in an enclosed fire resistive wall or chase shall have sufficient clearance so that no part of the assembly, other than the pipe lateral, penetrates the backside of the wall membrane.

Departure from the above construction requirements may be taken only on the basis of tests demonstrating that fire safety is not compromised by the proposed construction.

SECTION VI - HANDLING AND STORAGE REQUIREMENTS

Handling and storage shall not compromise the essential performance characteristics of pipe and fittings from exposure to sunlight, heat and cold, impact, and superimposed weight. Handling and storage methods shall be in accordance with the manufacturer's recommendations and applicable industry standards. Publications defining generally accepted practice include the following:

- ASTM D 2846 (Appendices X2 and X4)
- ASTM D 3309 (Appendix X2)
- ASTM F 402
- PPI TR 16, Paragraph 4.2
- PPI Plastics Piping Manual, Chapter 4, Page 40

SECTION VII - DETERMINATION OF COMPLIANCE

Marking

Pipe, tubing, fittings, and joining materials shall be marked or labeled in accordance with the following standards as applicable:

- ASTM D 1784
- ASTM D 2581
- ASTM D 2846
- ASTM D 3309

The marking shall indicate the applicable ASTM specification and shall show the logo of an acceptable, nationally recognized testing laboratory. ^{1/} In addition, the marking shall identify the manufacturer's name or trademark.

^{1/} One such testing laboratory is the National Sanitation Foundation Testing Laboratory, whose logo for thermoplastic piping materials intended for the conveyance of potable water is "NSF-pw" which certifies compliance with the requirements of the standard(s) identified by the marking. This program is administered under the protocol detailed in NSF Standard No. 14, Thermoplastic Materials, Pipe, Fittings, Valves, Traps, and Joining Materials.