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NEMA STANDARDS PUBLICATION NO. TC 10

nema

PVC and ABS Plastic Communications Duct and Fittings for Underground Installation

NEMA

ICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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NEMA TC 10-1990

TC 10

PVC AND ABS PLASTIC COMMUNICATIONS DUCT AND FITTINGS FOR UNDERGROUND INSTALLATION

Published by:

National Electrical Manufacturers Association
2101 L Street, N.W.
Washington, DC 20037

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Foreword

The purpose of these standards for plastic communications duct for underground installation is:

1. To list dimensions and other significant requirements.
2. To set forth some of the properties of this product and to assist in selecting and obtaining the proper product for a particular need.

User needs have been considered throughout the development of these standards. Test methods and performance values have been related as closely as possible to end-use applications.

The Plastic Conduit, Duct, and Accessories Section of NEMA, through its members, has worked (and continues to work) closely with such organizations as the American Society for Testing and Materials, the Plastic Pipe Institute, the Western Underground Committee, appropriate government agencies, and others in the periodic review and revision of these standards for any changes necessary to keep them up-to-date with advancing technology. Proposed or recommended revisions should be submitted to:

Vice President, Engineering
National Electrical Manufacturers Association
2101 L Street, N.W.
Washington, DC 20037

NEMA Standards Publication No. TC 10-1990 supersedes TC 10-1983, which revised and superseded the publication for *Plastic Communications Duct and Fittings for Underground Installation,* Publication No. TC 10-1978. Prior to publication, the NEMA Standards, Suggested Standards for Future Design, and Authorized Engineering Information which appear in this publication unchanged since their appearance in TC 10-1983 were reaffirmed. Those which have been revised are followed by their appropriate classification and the date "1-23-1990."

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Scope

These standards cover the following types of plastic communications duct and fittings having a nominal size of 3½ or 4 inches and intended for the underground installation of communication wire and cable:

Type EB—Designed for encased burial in concrete when installed in trenches underground.

Type DB—Designed for direct burial in trenches underground without a requirement for encasement in concrete.

NOTE—The values stated in U.S. customary units are to be regarded as the standard.

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PVC AND ABS PLASTIC COMMUNICATIONS DUCT AND FITTINGS FOR UNDERGROUND INSTALLATION

Section 1
REFERENCED STANDARDS

In this publication, reference is made to the standards listed below. Copies are available from the indicated sources.

American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

D 543-1987	*Test for Resistance of Plastics to Chemical Reagents*
D 618-1961 (R1981)	*Conditioning Plastics and Electrical Insulating Materials for Testing*
D 648-1982 (R1988)	*Test for Deflection Temperature of Plastics Under Flexural Load*
D 883-1989	*Definitions of Terms Relating to Plastics*
D 1600-1986a	*Abbreviations of Terms Relating to Plastics*
D 4396-1984	*Specifications for Rigid Poly (Vinyl Chloride) (PVC) and Related Plastic Compounds for Non-Pressure Piping Products*
D 1788-1981	*Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Plastics*
D 2122-1988	*Determining Dimensions of Thermoplastic Pipe and Fittings*
D 2235-1989	*Specifications for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings*
D 2412-1987	*Test for External Loading Properties of Plastic Pipe by Parallel-Plate Loading*
D 2444-1984	*Test for Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)*
D 2564-1988	*Specifications for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings*
D 3138-1989	*Specifications for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components*
F 402-1988	*Recommended Practice for Safe Handling of Solvent Cements Used for Joining Thermoplastic Pipe and Fittings*
F 412-1987	*Definitions of Terms Relating to Plastic Piping Systems*

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TC 2-1990	*Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)*
TC 8-1990	*Extra-strength Plastic Utilities Duct for Underground Installation*

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Section 2
GENERAL

2.1 DEFINITIONS AND ABBREVIATIONS

Definitions for plastic communications duct and fittings shall be in accordance with ASTM D 883 or ASTM F 412, or both, and abbreviations shall be in accordance with ASTM D 1600, unless otherwise specified.

NEMA Standard 7-12-1978.

2.2 MATERIALS

2.2.1 Duct and Fittings

Plastic communication duct and fittings shall be made from:

1. Poly (Vinyl Chloride) (PVC) plastic compound that meets cell classification PVC 11232 A, B, or C (with a minimum tensile strength of 4000 psi) as defined in ASTM D 4396, or

   NEMA Standard 1-12-1984.

2. Acrylonitrile-Butadiene-Styrene (ABS) plastic compound that meets minimum cell classification ABS 1-2-3 as defined in ASTM D 1788*.

   NEMA Standard 7-12-1978.

*ABS compounds that have different cell classifications because one or more properties are superior to those listed above shall also be permitted to be used.

Reworked material may be used, provided that the duct or fittings produced meet all of the requirements of these standards.

Authorized Engineering Information 7-12-1978.

2.2.2 Solvent Cements

PVC solvent cements, in accordance with ASTM D 2564, should be used with PVC systems. ABS solvent cements, in accordance with ASTM D 2235, should be used with ABS systems.

NOTE—Combination solvent cements, in accordance with ASTM D 3138, are available for joining PVC to ABS. ASTM F 402 is referenced as a recommended practice for safe handling of solvent cements.

Authorized Engineering Information 7-12-1978.

2.2.3 Compound Heat Distortion

The minimum heat distortion temperature shall be 158°F (70°C) for PVC and 179.6°F (82°C) for ABS when tested in accordance with ASTM D 648.

NEMA Standard 7-12-1978.

2.3 NOMINAL SIZES

The nominal sizes of duct and fittings shall be 3½ and 4 inches.

NOTE—For other sizes with comparable performance characteristics, see the NEMA Standards Publication No. TC 8 (this note is classified as Authorized Engineering Information 9-25-1983).

NEMA Standard 9-25-1975.

2.4 DIMENSIONS

2.4.1 Measurement

Dimensions shall be measured in accordance with ASTM D 2122, unless otherwise specified.

2.4.2 Duct Dimensions

1. *Diameter, Out-of-roundness and Wall Thickness*—Dimensions shall be in accordance with Table 2-1.

   NEMA Standard 9-15-1983.

2. *Duct Length*—The laying length, excluding the belled end or coupling, shall be 20 ft. ±1 in. (609.6 ±25.4 mm) unless otherwise specified.

   NEMA Standard 9-15-1983.

3. *Average Outside Diameter*—The average outside diameter at any cross section on the length of the duct shall be determined by the use of a vernier circumferential wrap tape in accordance with Section 6.2.2 of ASTM D 2122.
4. *Out-of-roundness*—Out-of-roundness shall be computed by obtaining the minimum and maximum diameters of a cross section of the duct. The difference between the minimum and maximum measurements shall not exceed the tolerance shown in Table 2-1. The out-of-roundness tolerance in Table 2-1 shall apply only at the point of manufacture.
5. *Wall Thickness*—The wall thickness of duct shall be in accordance with the requirements of Table 2-1.

2.4.3 Belled End Dimensions

1. *Dimensions*—The dimensions of integral belled ends shall conform to the requirements of Table 2-2.
2. *Centering*—Belled ends shall be centered to provide a visible shoulder around the entire circumference of the duct.
3. *Wall Thickness*—The wall thickness of an integral bell shall be considered satisfactory if formed from duct that meets the requirements of these standards.

   NEMA Standard 7-12-1978.

2.4.4 Fitting Dimensions

1. Fitting dimensions shall be in conformance with the applicable table in this standard.
2. The belled ends on fabricated fittings shall conform to the requirements of Table 2-2.
3. Fabricated fittings, including bends and sweeps,

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shall be made from duct or sleeve stock that meets all of the dimensional and physical requirements of the specification.

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2.5 WORKMANSHIP

Duct and fittings shall be homogeneous throughout and free from visible cracks, holes, burrs, foreign inclusions, or other defects that could damage cables.

NEMA Standard 9-25-1975.

2.6 INSPECTION

Ducts and fittings shall be inspected at the point of manufacture for compliance with the dimensional and performance requirements of these standards and for freedom from defects as defined in 2.5.

NEMA Standard 9-25-1975.

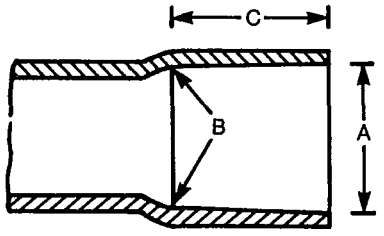
Table 2-1
DUCT DIMENSIONS

Nominal Duct Size	Outside Diameter			Minimum Wall Thickness*						Minimum Inside Diameter
	Average Diameter	Average Diameter Tolerance	Total Allowed Out-of-roundness	Type EB-30		Type EB-40		Type DB-120		
Inches	in (mm)	in (mm)	in (mm)	ABS in (mm)	PVC in (mm)	ABS in (mm)	PVC in (mm)	ABS in (mm)	PVC in (mm)	Inches
3½	3.830 (97.28)	±0.005 (±0.13)	0.050 (1.27)	0.089 (2.26)	0.079 (2.01)	0.099 (2.52)	0.088 (2.24)	0.145 (3.68)	0.129 (3.28)	3.450 (87.63)
4	4.350 (110.49)	±0.005 (±0.13)	0.050 (1.27)	0.102 (2.59)	0.091 (2.31)	0.114 (2.90)	0.101 (2.57)	0.166 (4.22)	0.145 (3.76)	3.930 (99.82)

NEMA Standard 9-15-1983.

*The relationship between these minimum wall thicknesses and performance is based on compounds having a modulus of elasticity of 500,000 psi (3447 MPa) for PVC, and 360,000 psi (2482 MPa) for ABS. Other compounds might require greater wall thicknesses to meet the performance requirements of these standards. (This note has been approved as Authorized Engineering Information.)

Table 2-2
BELLED END DIMENSIONS



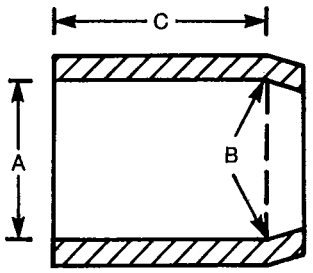
Nominal Duct Size, Inches	A Socket Entrance Inside Diameter			B Socket Bottom Inside Diameter			C Socket Depth
	Average Diameter in (mm)	Average Diameter Tolerance in (mm)	Total Out-of-roundness in (mm)	Average Diameter in (mm)	Average Diameter Tolerance in (mm)	Total Out-of-roundness in (mm)	in (mm)
3½	3.855 (97.92)	±0.005 (±0.13)	0.050 (1.27)	3.835 (97.41)	±0.005 (±0.13)	0.050 (1.27)	2.75 +0.25–0 (69.9 +6.4–0)
4	4.380 (111.25)	±0.005 (±0.13)	0.050 (1.27)	4.355 (110.62)	±0.005 (±0.13)	0.050 (1.27)	3.00 +0.25–0 (72.2 +6.4–0)

NEMA Standard 7-12-1978.

NOTE—Metal circular Go/No-Go plug gauges machined to the minimum and maximum inside diameters may be used to check dimensions A and B. These gauges are detailed in Appendix A. (This note has been approved as Authorized Engineering Information.)

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Table 2-3
FITTING SOCKETS

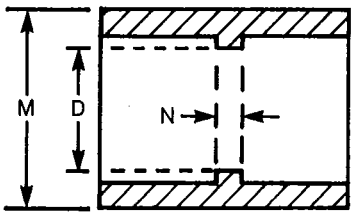


Nominal Duct Size, Inches	A Socket Entrance Inside Diameter		B Socket Bottom Inside Diameter		C Socket Depth
	Average Inside Diameter in (mm)	Out-of-roundness in (mm)	Average Inside Diameter in (mm)	Out-of-roundness in (mm)	in (mm)
3½	3.855±0.005 (97.92±0.13)	±0.050 (±1.27)	3.835±0.005 (97.41±0.13)	±0.050 (±1.27)	2.75 +0.250–0 (69.9 +6.4–0)
4	4.380±0.005 (111.25±0.13)	±0.050 (±1.27)	4.355±0.005 (110.62±0.13)	±0.050 (±1.27)	3.00 +0.250–0 (76.2 +6.4–0)

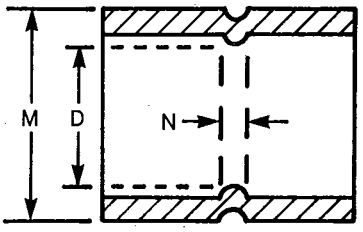
NOTE—All fitting sockets shall be in accordance with Table 2-3 unless otherwise specified.

NEMA Standard 7-12-1978.

Table 2-4
MOLDED AND FABRICATED COUPLINGS



MOLDED



FABRICATED

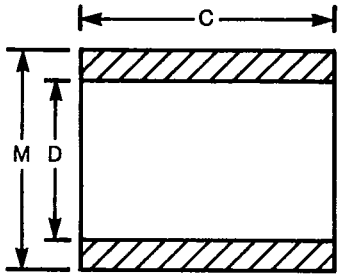
Dimensions			
Nominal Size, Inches	M, Maximum, in (mm)	D, Minimum, in (mm)	N, Minimum, in (mm)
3½	4¼ (108)	3.450 (87.63)	7/64 (2.8)
4	4¾ (121)	3.930 (99.82)	7/64 (2.8)

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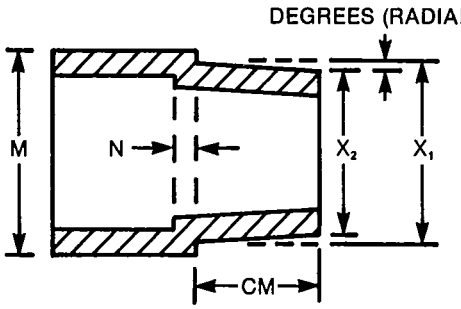
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Table 2-5
SLEEVE COUPLINGS



Dimensions			
Nominal Size, Inches	M, Maximum, in (mm)	C, in (mm)	D, in (mm)
3½	4¼ (108)	6±⅛ (152.4±3)	3.842±0.005 (97.59±0.13)
4	4¾ (121)	6±⅛ (152.4±3)	4.365±0.005 (110.87±0.13)

NEMA Standard 7-12-1978.



(THIS DRAWING APPLIES TO TABLES 2-6 AND 2-7)

Table 2-6
ADAPTER TO TYPE I FIBER CONDUIT COUPLING, 4 INCHES

Dimensions						
Nominal Size, Inches	M, Minimum in (mm)	N, Minimum in (mm)	CM, Nominal in (mm)	X_1, Nominal in (mm)	X_2, Nominal in (mm)	Degrees (Radians)
4	4¾ (121)	11/64 (4.4)	11 5/16 (49.2)	4¾ (121)	4½ (114)	2 (0.035)

NEMA Standard 7-12-1978.

Table 2-7
ADAPTER TO ASBESTOS-CEMENT CONDUIT COUPLING

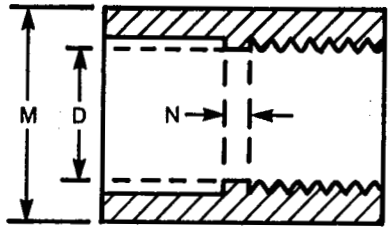
Dimensions					
Nominal Size, Inches	M, Maximum in (mm)	N, Minimum in (mm)	CM in (mm)	X_2 in (mm)	Degrees (Radians)
3½ EB a/c	4¼ (108)	11/64 (4.4)	1.12 (28.4)	3.90 (99)	1¾ (0.031)
4 EB a/c	4¾ (121)	11/64 (4.4)	1.25 (31.8)	4.40 (111)	1¾ (0.031)
3½ DB a/c	4¼ (108)	11/64 (4.4)	1.81 (46)	4.03 (102)	1¾ (0.031)
4 DB a/c	4¾ (121)	11/64 (4.4)	2.00 (50.8)	4.52 (114.8)	1¾ (0.031)

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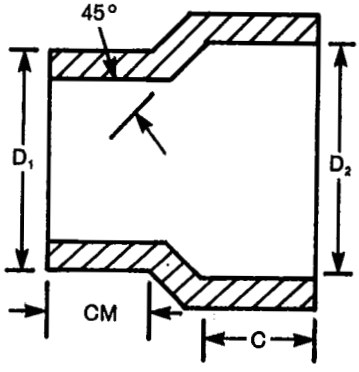
Table 2-8
FEMALE THREADED ADAPTERS



Dimensions				
Nominal Size, Inches	M, Maximum in (mm)	D, Minimum in (mm)	N, Minimum in (mm)	Minimum Number of Threads
3½	4½ (114)	3 7/16 (87.3)	⅛ (3)	5 Full
4	5⅛ (130)	3 15/16 (100)	⅛ (3)	5 Full

NEMA Standard 7-12-1978.

Table 2-9
CAST IRON "D" ADAPTER

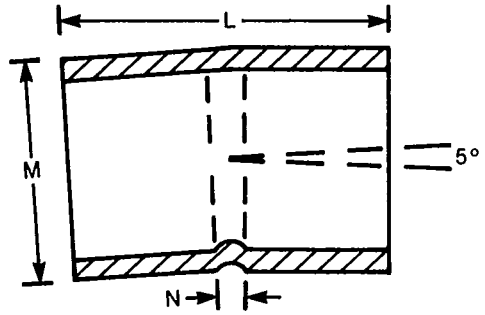


Dimensions				
Nominal Size, Inches	D_1 in (mm)	D_2 Nominal in (mm)	CM Nominal in (mm)	C in (mm)
4	4.350±0.005 (110.49±0.13)	5 15/32 (138.9)	3⅝ (92.1)	3±⅛ (76.2±3)

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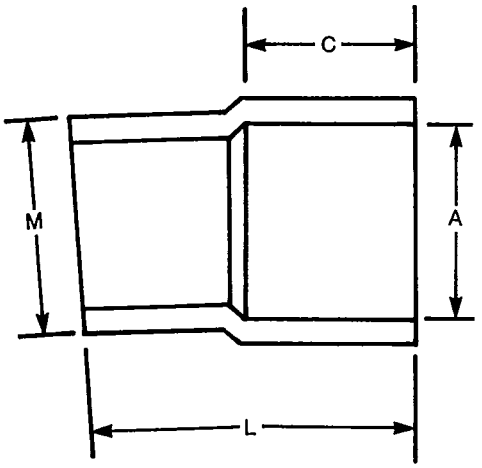
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Table 2-10
5° ANGLE COUPLINGS



Dimensions			
Fabricated Socket X Spigot			
Nominal Size, Inches	M, Maximum in (mm)	N, Minimum in (mm)	L, Minimum in (mm)
3½	4¼ (108)	7/64 (2.8)	6 (152.4)
4	4¾ (121)	7/64 (2.8)	6 (152.4)

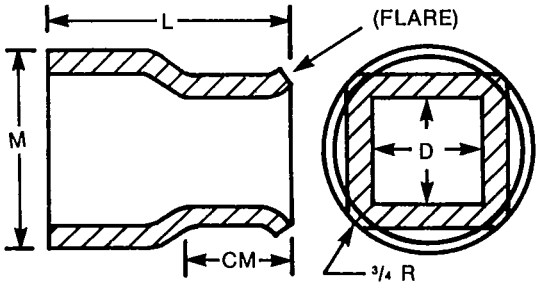
NEMA Standard 7-12-1978.



Dimensions				
Molded Socket X Spigot				
Nominal Size, Inches	A, Maximum, in (mm)	C, Minimum, in (mm)	L, Maximum, in (mm)	M, Maximum, in (mm)
4	4⅜ (111.1)	2 (50.8)	4½ (114.3)	4⅜ (111.1)

NEMA Standard 9-15-1983.

Table 2-11
SQUARE END BELL



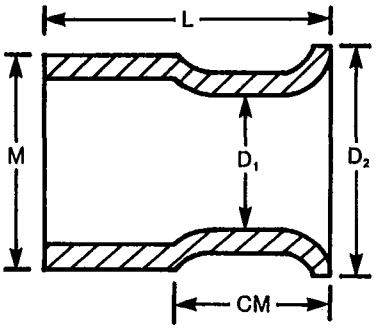
Dimensions				
Nominal Size, Inches	M, Maximum, in (mm)	L, Minimum, in (mm)	D, in (mm)	CM, Minimum, in (mm)
4	4⅞ (123.8)	6 (152.4)	4¼±⅛ (108.0±3)	2½ (64)

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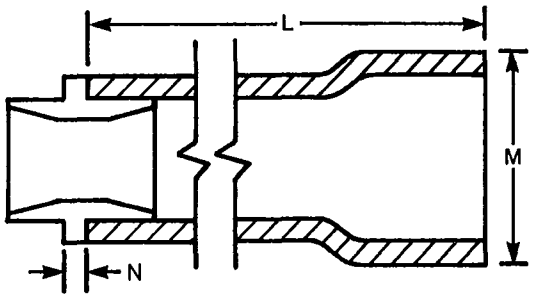
Table 2-12
ROUND END BELL



Dimensions					
Nominal Size, Inches	M, Maximum in (mm)	L, Minimum in (mm)	CM, Minimum in (mm)	D_1, Minimum in (mm)	D_2, Maximum in (mm)
4	4⅞ (123.8)	6 (152.4)	2½ (63.5)	3 15/16 (100)	5¾ (146)

NEMA Standard 9-15-1983.

Table 2-13
3½ × 4 INTERNAL ROUND BORE ADAPTER

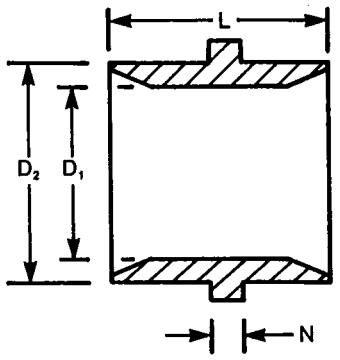


Dimensions			
Nominal Size, Inches	M, Maximum, in (mm)	L, Nominal, in (mm)	N, in (mm)
4	4¾ (121)	18 (457.2)	3/16 (4.8)

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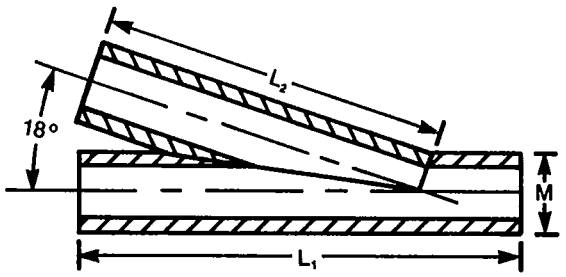
Table 2-14
INTERNAL JOINING COUPLING



Dimensions				
Nominal Size, Inches	D_1, Minimum, in (mm)	D_2, Nominal, in (mm)	N, in (mm)	L, Nominal, in (mm)
3½	3.25 (82.6)	3.50 (88.9)	3/16 (4.8)	2½ (63.5)
4	3.93 (99.8)	4.00 (101.6)	3/16 (4.8)	215/16 (74.6)

NEMA Standard 7-12-1978.

Table 2-15
WYE BRANCH



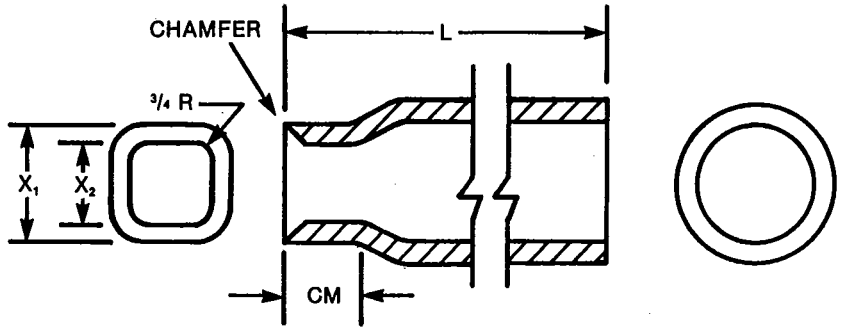
Dimensions			
Nominal Size, Inches	M, Maximum, in (mm)	L_1, Minimum, in (mm)	L_2, Minimum, in (mm)
3½	4¼ (108)	20 (508)	17 (432)
4	4¾ (121)	20 (508)	17 (432)

NOTE—Belled ends or couplings optional.

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Table 2-16
SQUARE CLAY ADAPTER

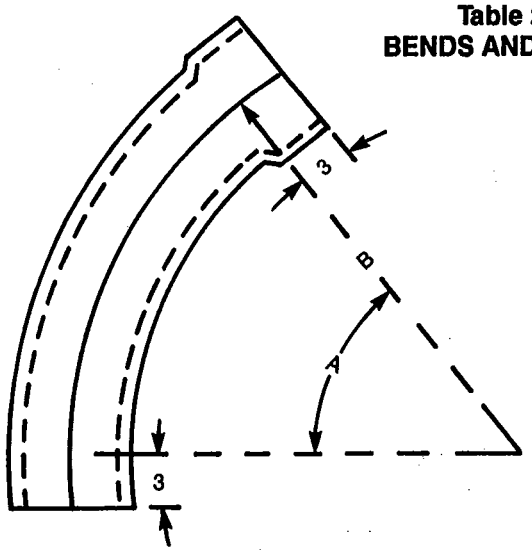


Dimensions					
Nominal Size, Inches	Clay Size, Inches	X_1, Maximum in (mm)	X_2, Minimum in (mm)	L, Nominal in (mm)	CM, Minimum in (mm)
3½	3¼	3.38 (85.9)	3 (76)	12, 18, 24 (305, 457, 610)	¾ (19)
3½	3½	3.65 (91.7)	3¼ (82.6)	12, 18, 24 (305, 457, 610)	¾ (19)
4	4	3.80 (96.5)	3⅜ (85.7)	12, 18, 24 (305, 457, 610)	¾ (19)

Alternate Construction—May have belled end or coupling attached.

NEMA Standard 7-12-1978.

Table 2-17
BENDS AND SWEEPS



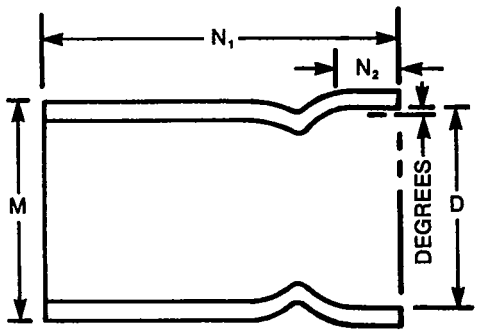
Dimensions		
Nominal Size, Inches	A Degree of Curvature (Radian)	B Radius of Curvature ft. (cm)
3½ and 4	5 (0.08)	4, 12 (120, 360)
3½ and 4	11 ¼ (0.196)	3, 4, 12½ (90, 120, 375)
3½ and 4	22 ½ (0.393)	2, 3, 4, 9, 12, 15 (60, 90, 120, 270, 360, 450)
3½ and 4	30 (0.524)	2, 3, 4, 6, 9, 10, 12, 15 (60, 90, 120, 180, 270, 300, 360, 450)
3½ and 4	445 (0.785)	2, 3, 4, 6, 9, 12½, 15 (60, 90, 120, 180, 270, 375, 450)
3½ and 4	90 (1.571)	1½,2,2½,3,4,6,9,10,15 (45,60,75,90,120,180,270,300,450)

NOTE—Bends and sweeps shall be constructed from either Type EB30, EB40, or DB stock.

NEMA Standard 7-12-1978.

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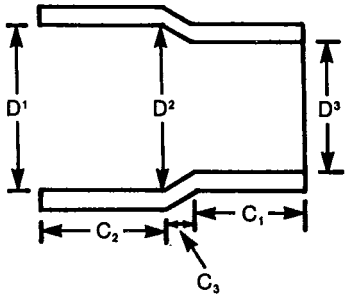
Table 2-18
(FABRICATED) ADAPTER TO ASBESTOS CEMENT CONDUIT SPIGOT END



Dimensions					
Nominal Size, Inches	M, Maximum in (mm)	N_2 in (mm)	N_1, Nominal in (mm)	D in (mm)	Degrees (Radians)
3½ EB a/c	4¼ (108)	1.12 (28.4)	5 (127)	3.94±0.005 (100.3±0.13)	1¾ (0.031)
4 EB a/c	4¾ (121)	1.25 (31.8)	6 (152.4)	4.45±0.005 (113±0.13)	1¾ (0.031)
3½ DB a/c	4¼ (108)	1.81 (46)	5 (127)	4.09±0.005 (103.9±0.13)	1¾ (0.031)
4 DB a/c	4¾ (121)	2.00 (50.8)	6 (152.4)	4.59±0.005 (116.6±0.13)	1¾ (0.031)

NEMA Standard 7-12-1978.

Table 2-19
3½ × 4 INCH EXTERNAL ENLARGING COUPLING



Dimensions							
C_1	C_2		C_3	D_1	D_2	D_3	D
Maximum in (mm)	Nominal in (mm)	Tolerance in (mm)	Nominal in (mm)	Nominal in (mm)	Nominal in (mm)	Nominal in (mm)	Tolerance in (mm)
3.00 (76.2)	3.00 (76.2)	+¼ (6.85) –0 (0.00)	¾ (19.05)	4.380 (111.25)	4.355 (110.62)	3.842 (97.59)	±0.005 (±0.13)

NEMA Standard 9-15-1983.

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Section 3
REQUIREMENTS AND TEST METHODS

3.1 CONDITIONING TEST SPECIMENS AND TEST CONDITIONS

3.1.1 Referee Tests

When conditioning is required, the test specimen shall be conditioned in accordance with Procedure A in ASTM D 618 at 73.4°±3.6°F (23±2°C) and 50±5 percent relative humidity for not less than 40 hours prior to test. The 32°F (0°C) drop weight impact specimens shall be conditioned for at least 4 hours in liquid maintained at 32° to 35°F (0° to 1.6°C) unless otherwise specified.

Tests shall be conducted at 73.4±3.6°F (23±2°C) and 50±5 percent relative humidity unless otherwise specified.

NEMA Standard 7-12-1978.

3.1.2 Quality Control

Specimens shall be conditioned for 3 hours in air, or 1 hour in liquid, at 73.4°±3.6°F (23±2°C). The 32°F (0°C) drop impact samples shall be conditioned for one half hour in liquid maintained at 32° to 35°F (0° to 1.6°C).

Specimens shall be tested at 73.4°±3.6°F (23±2°C) with no regard for relative humidity. The low temperature impact test equipment shall be at 73.4°±3.6°F (23±2°C) with no regard for relative humidity.

NEMA Standard 7-12-1978.

3.2 LEAKAGE AT JOINTS

Joints between conduit and tubing and their respective fittings made by methods recommended by the product manufacturer shall not leak when tested in accordance with 5.6 of TC 2. This is a qualification requirement and not a quality control test.

If water tight joints are needed, see TC-2-1990, Appendix A.1.3.4.

NEMA Standard 1-23-1990.

3.3 HYDROCARBON RESISTANCE

The hydrocarbon resistance of ABS ducts shall be considered adequate if the duct meets the load deflection requirements specified in 3.6 after being immersed for 48 hours in heptane in accordance with ASTM D 543.

NEMA Standard 9-25-1975.

3.4 DUCT IMPACT RESISTANCE

The minimum impact resistance values for Types EB and DB underground duct shall be as shown in Table 3-1 when tested* as follows:

Five specimens, each 6+¼–0 in. (152.4+6 –0 mm) long, shall be tested in accordance with Section 10 of ASTM D 2444, using a 20-pound Tup B and flat plate holder B. All samples shall pass. If one fails, another five specimens shall be tested. If 9 out of 10 specimens pass the test, the duct shall be considered to have met the requirements of this standard.

For the 32°F (0°C) impact test, no more than 15 seconds shall elapse from the time of removal of the specimen from the conditioning medium until completion of that test.

*This test is intended for use only as a quality control test, not as a simulated service test.

Table 3-1
MINIMUM IMPACT RESISTANCE—ALL SIZES

Test Temp.	Type EB-30 ft.-lb. (J)	Type EB-40 ft.-lb. (J)	Type DB-120 ft.-lb. (J)
73.4°F (23°C)	50 (68)	50 (68)	100 (135)
32°F (0°C)	25 (34)	25 (34)	50 (68)

NEMA Standard 9-15-1983.

3.5 DUCT STIFFNESS

The minimum duct stiffness values for Types EB and DB underground duct shall be as shown in Table 3-2 when tested as follows:

The duct stiffness (F/ΔY) shall be determined at 5 percent inside diameter deflection in accordance with ASTM D 2412.

Each specimen shall be placed so that the minimum wall thickness is uppermost (adjacent to the top bearing plate). The vertical inside diameter shall be measured before compressing the specimen.

Three specimens, each 6±⅛ in. (152.40±3.17 mm) long, shall be cut from each sample. The specimens shall be compressed at the rate of ½ in. (12.70 mm) per minute and the load recorded at the vertical deflection equivalent to 5 percent of the original inside diameter of the specimen.

The duct stiffness at 5 percent vertical deflection shall be determined as follows:

Duct Stiffness, Pounds/Inch/Inch = F/ΔY (Kilopascals)

Where:

F = Load in pounds per inch of length recorded at 5 percent vertical deflection in inches.

ΔY = Vertical deflection of inside diameter in inches.

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Table 3-2

Nominal Size, Inches	F/ΔY (kPa)		
	Type EB-30 psi (kPa)	Type EB-40 psi (kPa)	Type DB-120 psi (kPa)
All	30 (207)	40 (276)	120 (827)

NEMA Standard 9-15-1983.

3.6 MARKING

All required markings shall be legible and so applied as to remain legible under normal handling and installation practices.

Duct and fittings shall be clearly marked with the following:

1. Manufacturer's name or trademark;
2. Nominal size;
3. Material: ABS or PVC;
4. NEMA TC 10;
5. EB-30, EB-40, or DB-120; and
6. Any additional marking deemed necessary by the manufacturer.

Bends and sweeps shall, in addition, be marked to show the degree and radius of curvature.

NOTE—Abbreviations may be used where necessary. (This note has been approved as Authorized Engineering Information.)

NEMA Standard 9-15-1983.

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Appendix A
SOCKET BOTTOM AND SOCKET ENTRANCE GO/NO-GO GAUGE FOR BELLED END DIMENSIONS SHOWN IN TABLE 2-2

(Authorized Engineering Information 7-12-1978.)

A.1 SOCKET BOTTOM GO/NO-GO GAUGE

The socket bottom Go/No-Go gauge may be machined from ¼ inch (6 mm) thick steel into a full circle gauge according to the following dimensions:

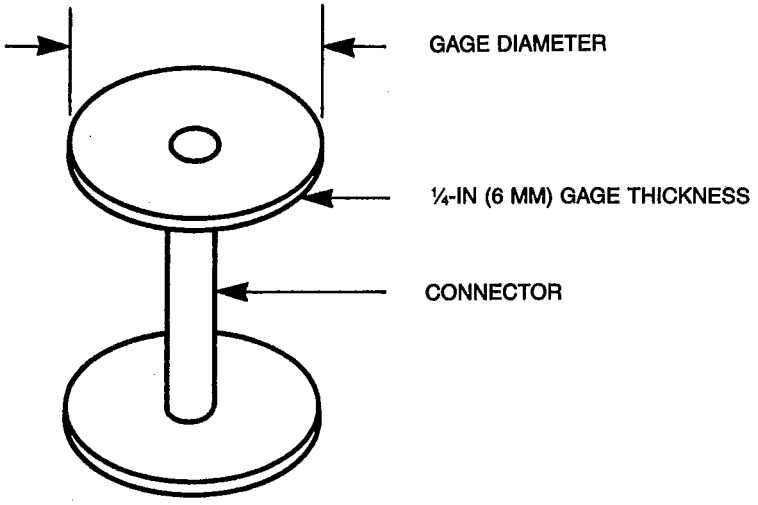
Table A-1

Total Length of Connector, Inches	Duct Size, Inches	Go Gauge		No-Go Gauge	
		Diameter in (mm)	Marking in (mm)	Diameter in (mm)	Marking in (mm)
5	3½	3.829–3.830 (97.26–97.28)	3.830 (97.28)	3.841–3.842 (97.56–97.59)	3.841 (97.56)
5	4	4.349–4.350 (110.46–110.49)	4.350 (110.49)	4.361–4.362 (110.77–110.79)	4.361 (110.77)

The gauge may be used on line by the operator to continually check the dimension at the bell end bottom. The Go end should go to the bottom of the socket. The No-Go end should not go to the bottom of the socket.

The Go end may be identified by green paint. The No-Go end may be identified by red paint.

The dimension of each gauge may be marked on the gauge.



A.2 SOCKET ENTRANCE GO/NO-GO GAUGE

The socket entrance Go/No-Go gauge may be machined from ¼ in (6mm) thick steel into a full circle gauge according to the following dimensions:

Total Length of Connector, Inches	Duct Size, Inches	Go Gauge		No-Go Gauge	
		Diameter in (mm)	Marking in (mm)	Diameter in (mm)	Marking in (mm)
5	3½	3.849–3.850 (97.76–97.79)	3.850 (97.79)	3.861–3.862 (98.07–98.09)	3.861 (98.07)
5	4	4.374–4.375 (111.10–111.12)	4.375 (111.12)	4.386–4.387 (111.40–111.43)	4.386 (111.40)

The gauge may be used on line by the operator to continually check the dimensions of the socket entrance inside diameter. The Go end should enter the socket entrance of the bell. The No-Go end should not enter the socket entrance of the bell. The Go end may be identified by green paint. The No-Go end may be identified by red paint.

The dimension of each gauge may be marked on the gauge.

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status, are set forth in certain clauses of the NEMA *Standardization Policies and Procedures* manual and are referenced below.

Purpose of Standards

National Electrical Manufacturers Association standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist purchasers in selecting and obtaining the proper product for their particular needs. Existence of a National Electrical Manufacturers Association standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard. *(Standardization Policies and Procedures, p. 1)*

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process, or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Standardization Policies and Procedures, p. 2)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the Standards Publication may be capable of otherwise equivalent performance.

(Standardization Policies and Procedures, p.8)

Categories of Standards

National Electrical Manufacturers Association Standards are of three classes:

1. NEMA Standard, which relates to a product, process, or procedure commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.
3. Adoptive Standard, which is adopted in whole or in part from the standards of another organization, either domestic, regional, or international.

(Standardization Policies and Procedures, pp. 7 & 16)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote on the standard.

(Standardization Policies and Procedures, pp. 7 & 16)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment, and/or approval, and which has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon.

(Standardization Policies and Procedures, pp. 7 & 16)

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

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