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NEMA STANDARDS PUBLICATION

TC 3

PVC FITTINGS FOR USE WITH RIGID PVC CONDUIT AND TUBING

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TC-3

PVC Fittings for Use with Rigid PVC Conduit and Tubing

Published by:

National Electrical Manufacturers Association
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FOREWORD

The purpose of this Standards Publication for electrical polyvinyl chloride (PVC) fittings for use with rigid PVC conduit and tubing for above-ground and below-ground use is:

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

User needs have been considered throughout the development and revision of these standards.

The Polymer Raceway Products 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, Plastic Pipe and Fittings Association, Committee on Solvent Cement Environmental Issues, appropriate government agencies, Underwriters Laboratories, Inc., 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
1300 North 17th Street, Suite 1847
Rosslyn, Virginia 22209

Publication No. TC 3-1996 revises and supersedes the NEMA Standards Publication "PVC Fittings for Use with Rigid PVC Conduit and Tubing," Publication No. TC 3-1990. Prior to publication, the NEMA Standards, Suggested Standards for Future Design, and Authorized Engineering Information that appear in this publication unchanged since their appearance in TC 3-1990 were reaffirmed.

This Standards Publication was developed by the Polymer Raceway Section. Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Group/Section was composed of the following members:

CANTEX, Inc.—Mineral Wells, TX
Lamson & Sessions—Cleveland, OH
Pacific Western Extruded Plastics—Eugene, OR
Thomas & Betts—Memphis, TN

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Section 1
GENERAL

1.1 SCOPE

These standards cover polyvinyl chloride (PVC) fittings intended to be joined in the field by means of a solvent cement system to PVC rigid conduit, tubing, and other fittings, based on the outside diameters given in NEMA Standards Publication No. TC 2-1998.

Included in this publication are requirements for materials, workmanship, dimensions, physical properties, couplings, female adapters, male terminal adapters, junction box adapters, reducers, caps, and end-bells. Methods of marking, inspection, and practices for indicating compliance with these standards are also given. Junction boxes and access fittings are not included.

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

1.2 REFERENCED STANDARDS

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

American National Standards Institute
11 West 42nd Street
New York, NY 10036

ANSI/ASME B 1.20.1-1983	*General Purpose Pipe Threads (Inch)*

American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

D 618-90e1	*Standard Methods of Conditioning Plastics and Electrical Insulating Materials for Testing*
D 1784-92	*Standard Specifications for Rigid Poly (Vinyl chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compound*
D 2855-93	*Practice for Making Solvent-Cemented Joints w/Poly (Vinyl Chloride) (PVC) Pipe and Fittings*
D 1600-94	*Standard Abbreviations of Terms Relating to Plastics*
F 412-94a	*Standard Definitions of Terms Relating to Plastic Piping Systems*

Government Services Administration
Specification Section
7th & D Streets, S.W., Room 6654
Washington, DC 20407

H28, Part II (1978)	*Screw-Thread Standards for Federal Service*

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TC 2-1998	*Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)*
UL-514B-1992	*Fittings for Conduit and Outlet Boxes*
TC 6-1996	*PVC Plastic Utilities Duct for Underground Installations*
TC 8-1996	*Extra Strength PVC Plastic Utilize Duct for Underground Installation*

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Section 2
DEFINITIONS AND ABBREVIATIONS

2.1 DEFINITIONS AND ABBREVIATIONS

Definitions of terms used in this standard shall be in accordance with ASTM F 412 or ASTM D 883, or both. Abbreviations shall be in accordance with ASTM D 1600, unless otherwise specified. The abbreviation for electrical polyvinyl chloride (PVC) tubing is EPT and for electrical plastic conduit is EPC. In this standard, the word "conduit" is used to apply to both conduit and tubing.

2.1.1 Conduit Fitting

An accessory that serves to complete a conduit system.

2.1.2 Conduit Coupling

A fitting intended for joining:

a. Two lengths of rigid PVC conduit,
b. A length of rigid PVC conduit to a rigid PVC elbow or other bend, or
c. A length of rigid PVC conduit, a rigid PVC elbow, or other bend to a box (in conjunction with a junction-box adapter).

2.1.3 Junction Box Adapter

An adapter intended for connecting a length of rigid PVC conduit, or a rigid PVC elbow or bend, to a junction box.

2.1.4 Female Adapter

A fitting intended for joining a length of rigid PVC conduit, a rigid PVC elbow, or other bend to threaded metallic conduit or other male threaded devices.

2.1.5 Male Terminal Adapter

A fitting intended for joining a length of rigid PVC conduit, a rigid PVC elbow, or other bend to a box through a knockout using a locknut, to a threaded hub on a metal box, or to any other junction box or other threaded devices.

2.1.6 Reducer

A fitting intended for joining lengths of two different sizes of rigid PVC conduit, rigid PVC elbow, or other bend.

2.1.7 Cap

A fitting intended for closing the ends of unused lengths of rigid PVC conduit.

2.1.8 End Bell

A fitting intended to provide a bushed opening at the open end of a length of rigid PVC conduit.

2.1.9 Sweep

A fitting intended to provide a smooth change in direction of a conduit.

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Section 3
GENERAL REQUIREMENTS

3.1 MATERIALS

Fittings shall be fabricated from extruded stock or shall be molded. Molded fittings shall be made from rigid polyvinyl chloride (PVC) compound which meets the minimum cell classification of PVC 12233C or 12154B (with tensile strength of 4000 psi) as defined in ASTM D1784. Extruded stock shall meet the requirements of NEMA standard TC 2, *Electrical Polyvinyl Chloride (PVC) Tubing And Conduit.*

3.2 DIMENSIONS

3.2.1 Fittings

Dimensions of molded fittings shall meet the requirements of Table 3-1 when determined in accordance with 5.2 and Figure 3-1.

3.2.2 Compression Formed Couplings—EPC-40

Dimensions of compression formed EPC-40 couplings shall meet the requirements of Table 3-4 when determined in accordance with 5.2 and Figure 3-2.

3.2.3 Compression Formed Couplings—EPC-80

Dimensions of compression formed EPC-80 couplings shall meet the requirements of Table 3-4 when determined in accordance with 5.2 and Figure 3-2.

3.2.4 Elbows

Dimensions of EPC-40 and EPC-80 elbows shall meet the requirements of Table 3-4 for integral socket dimensions and Table 3-5 for other dimensions when determined in accordance with 5.2 Figure 3-3.

3.3 DEPTH OF PENETRATION

Fittings shall be provided with a stop at the socket bottom to limit the depth of penetration of the conduit and, in the case of female adapters, to limit the depth of penetration of threaded rigid metallic conduit.

3.4 THREADS

External and internal tapered threads shall meet the requirements of Table 3-2 when measured in accordance with 5.3.

External and internal straight threads shall meet the requirements of Table 3-3 when measured in accordance with 5.3.

Internal molded threads at the face of the fittings and the entering ends of external threads shall have a *Blunt Start* produced by making the width of the thread at the start approximately 50 to 75 percent of the full thread to provide for easy entrance in making a joint and for protection of the thread. The *Blunt Start* shall be included in the measurement of the thread length.

The entrance to machined threads shall be a 45-degree chamfer at least one thread deep.

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Table 3-1
SIZES AND DIMENSIONS OF PVC FITTINGS*

		A			B			C	D	E	EW	EX	EZ	N	F	
		Socket Entrance Diameter			Socket Bottom Diameter			Minimum Dimensions							Throat Diameters in Male and Female Adapters	
Trade Size	Metric Designator	Average	± Tolerances on Average	Max. Total Out-of-Roundness Tolerances	Average	± Tolerances on Average	Max. Total Out-of-Roundness Tolerances	Socket Depth	Inside Diameter	Wall Thickness	Wall Thickness at Entrance			Stop End Thick-ness	Max.	Min.
U.S. CUSTOMARY UNITS																
1/2	16	0.852	0.004	0.016	0.836	0.004	0.016	0.652	0.630	0.095	1/32	1/32	1/32	3/32	0.622	0.560
3/4	21	1.064	0.004	0.020	1.046	0.004	0.020	0.719	0.834	0.095	1/32	1/32	1/32	3/32	0.824	0.742
1	27	1.330	0.005	0.020	1.310	0.005	0.020	0.875	1.059	0.100	1/16	1/16	1/16	3/32	1.049	0.944
1 1/4	35	1.677	0.005	0.024	1.655	0.005	0.024	0.938	1.392	0.120	1/16	1/16	1/16	3/32	1.380	1.242
1 1/2	41	1.918	0.006	0.024	1.894	0.006	0.024	1.062	1.622	0.120	1/16	1/16	1/16	3/32	1.610	1.449
2	53	2.393	0.006	0.024	2.369	0.006	0.024	1.125	2.079	0.130	1/16	1/16	1/16	3/32	2.067	1.860
2 1/2	63	2.890	0.007	0.030	2.868	0.007	0.030	1.469	2.484	0.165	3/32	1/8	1/8	3/16	2.469	2.222
3	78	3.515	0.008	0.030	3.492	0.008	0.030	1.594	3.083	0.216	3/32	1/8	1/8	3/16	3.068	2.761
3 1/2	91	4.015	0.008	0.030	3.992	0.008	0.030	1.687	3.598	0.226	3/32	1/8	1/8	3/16	3.548	3.193
4	103	4.515	0.009	0.030	4.491	0.009	0.030	1.750	4.076	0.237	3/32	1/8	1/8	3/16	4.026	3.623
5	129	5.593	0.110	0.060	5.553	0.010	0.060	19.37	5.097	0.258	3/32	1/8	1/8	3/16	5.047	4.542
6	155	6.658	0.110	0.060	6.614	0.011	0.060	2.125	6.115	0.280	1/8	3/16	3/16	1/4	6.065	5.458
*8	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
METRIC UNITS																
1/2	16	21.64	0.010	0.41	21.23	0.010	0.41	16.56	16.00	2.41	0.79	0.79	0.79	2.38	15.80	14.22
3/4	21	27.03	0.010	0.51	26.57	0.010	0.51	18.26	21.18	2.41	0.79	0.79	0.79	2.38	20.93	18.85
1	27	33.78	0.013	0.51	33.27	0.013	0.51	22.22	26.90	2.54	1.59	1.59	1.59	2.38	26.64	23.98
1 1/4	35	42.60	0.013	0.61	42.04	0.013	0.61	23.83	35.36	3.05	1.59	1.59	1.59	2.38	35.05	31.55
1 1/2	41	48.72	0.015	0.61	48.11	0.015	0.61	26.97	41.20	3.05	1.59	1.59	1.59	2.38	40.89	36.80
2	53	60.78	0.015	0.61	60.17	0.015	0.61	28.58	52.81	3.30	1.59	1.59	1.59	2.38	52.50	47.24
2 1/2	63	70.41	0.018	0.76	72.85	0.018	0.76	37.31	36.09	4.19	2.38	3.18	3.18	4.76	62.71	56.44
3	78	89.28	0.020	0.76	88.70	0.020	0.76	40.49	78.31	5.49	2.38	3.18	3.18	4.76	77.92	70.13
3 1/2	91	101.98	0.020	0.76	101.40	0.020	0.76	42.85	91.39	5.74	2.38	3.18	3.18	4.76	90.12	81.10
4	103	114.68	0.023	0.76	114.07	0.023	0.76	44.45	103.53	6.02	2.38	3.18	3.18	4.76	102.26	92.02
5	129	142.06	0.025	1.52	141.05	0.025	1.52	49.20	129.46	6.55	2.38	3.18	3.18	4.76	128.19	115.37
6	155	169.11	0.028	1.52	168.00	0.028	1.52	53.98	155.32	7.11	3.18	4.76	4.76	6.35	154.05	138.63
*8	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**Dimensions specified by the manufacturer.

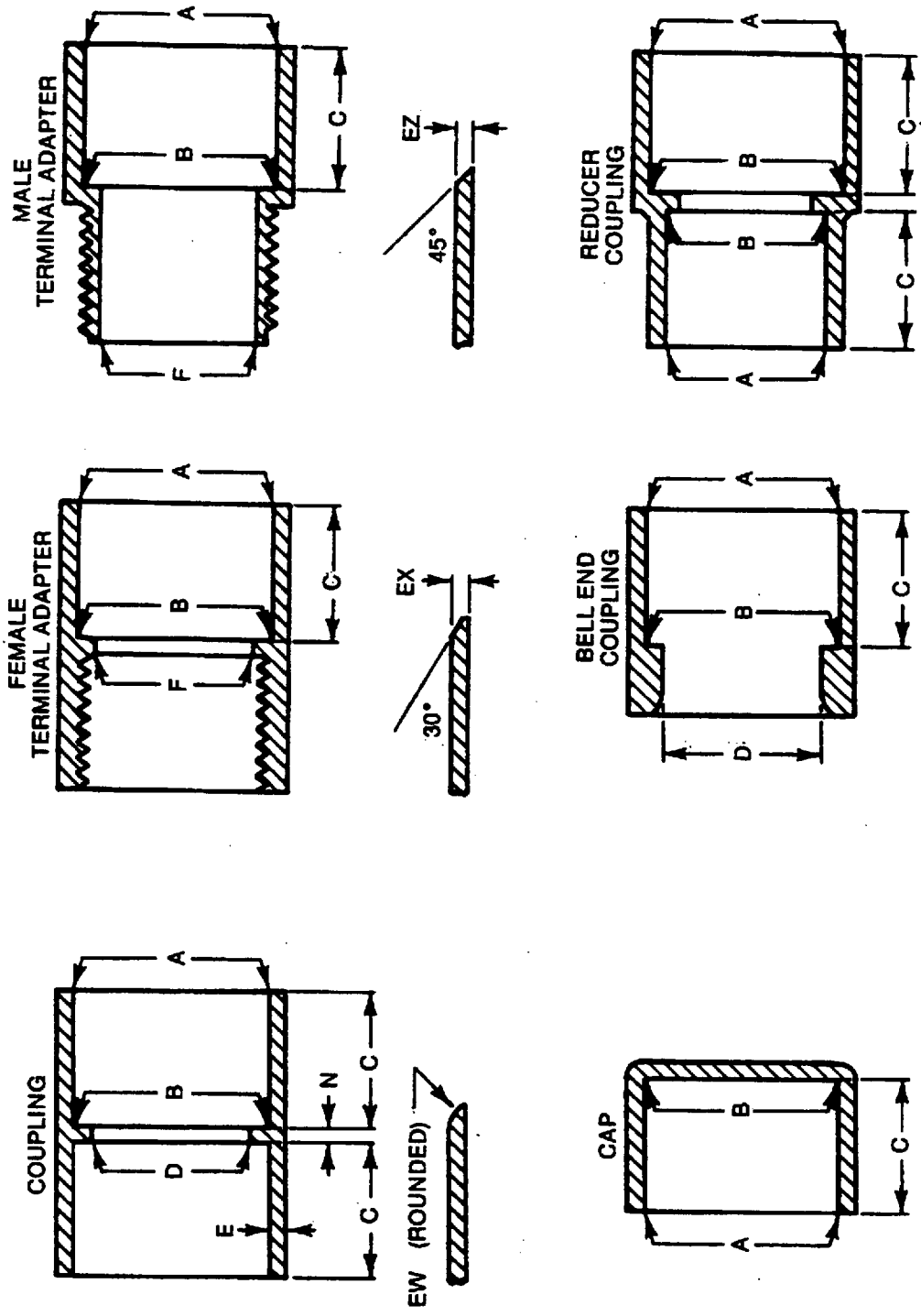

Figure 3-1
FITTINGS

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Table 3-2
EXTERNAL AND INTERNAL TAPERED THREADS

			External Threads			Internal Threads	
			Pitch Diameter* at End of Fitting, Inches	Length of Thread, Inches		American National Pipe Taper (NPT) Thread That Gauge Will Enter	
Trade Size	Metric Designator	Threads per inch	Taper ¾ Inch per Foot	Effective L_2	Overall L_4*	Maximum Turns	Minimum Turns
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
½	16	14	0.7584	0.53	0.78	9	6
¾	21	14	0.9677	0.55	0.79	9	6
1	27	11 ½	1.2136	0.68	0.98	9	6
1 ¼	35	11 ½	1.5571	0.71	1.01	10	6
1 ½	41	11 ½	1.7961	0.72	1.03	10	6
2	53	11 ½	2.2690	0.76	1.06	20	6
2 ½	63	8	2.7195	1.14	1.57	20	6
3	78	8	3.3406	1.20	1.63	20	6
3 ½	91	8	3.8375	1.25	1.68	11	7
4	103	8	4.3344	1.30	1.73	11	7
5	129	8	5.3907	1.41	1.84	11	7
6	155	8	6.4461	1.51	1.95	11	7
***8	200	---	—	---	—	---	—

* The applicable tolerances are:

Thread Length (L_4): ± one thread.
Pitch Diameter: ± one turn is the maximum variation permitted from gauging face of the working thread gauges. This is equivalent to ± 1 ½ turns from basic dimensions since a variation of ± ½ turn from basic dimensions is permitted in working gauges. The above pitch diameter for external threads with a taper of ¾ inch per foot is identical with the specifications in ANSI/ASME B1.20.1 and the NBS (National Bureau of Standards) Handbook H28.

**See ANSI B.2.1.
NOTES
1—At least five full threads shall be provided unless otherwise specified.
2—Metric conversion units are not applicable to these American National Thread dimensions.

***Dimensions specified by the manufacturer.

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Table 3-3
EXTERNAL AND INTERNAL STRAIGHT THREADS

Trade Size	Metric Designator	Threads per Inch	External Threads—Pitch Diameter, Inches		Internal Threads—Pitch Diameter, Inches, of Straight Internal Threads for			
					Bushings & Other Fittings		Locknuts	
			Maximum	Minimum	Minimum	Maximum	Minimum	Maximum
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
½	16	14	0.776	0.770	0.781	0.788	0.801	0.808
¾	21	14	0.987	0.981	0.992	0.999	1.011	1.018
1	27	11 ½	1.236	1.228	1.244	1.252	1.266	1.274
1 ¼	35	11 ½	1.581	1.573	1.588	1.596	1.611	1.619
1 ½	41	11 ½	1.820	1.812	1.827	1.835	1.850	1.858
2	53	11 ½	2.294	2.286	2.301	2.309	2.323	2.332
2 ½	63	8	2.758	2.748	2.769	2.781	2.801	2.813
3	78	8	3.385	3.375	3.396	3.408	3.428	3.439
3 ½	91	8	3.885	3.875	3.896	3.908	3.928	3.940
4	103	8	4.383	4.373	4.394	4.406	4.426	4.438
5	129	8	5.445	5.435	5.456	5.468	5.488	5.500
6	155	8	6.502	6.492	6.513	6.525	6.545	6.557
*8	200	—	—	—	—	—	—	—

NOTES
1—All dimensions are rounded off to the nearest third place decimal.
2—Metric conversion units are not applicable to these American National Thread dimensions.
*Dimensions specified by the manufacturer.

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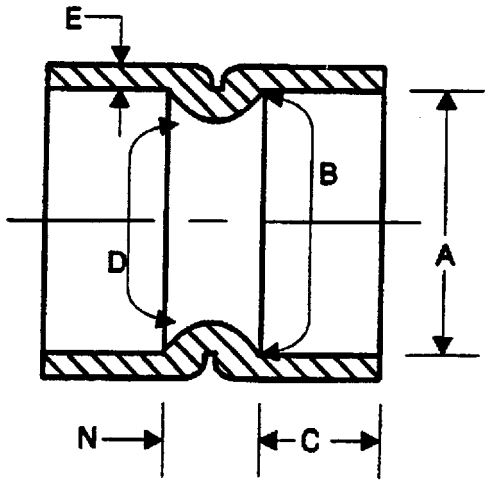

Figure 3-2
COMPRESSION-FORMED COUPLINGS EPC-40 AND EPC-80

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Table 3-4
DIMENSIONS FOR COMPRESSION-FORMED PVC EPC-40 AND EPC-80 COUPLINGS

Trade Size	Metric Designator	A Socket Diameters At Entrance Maximum	A Socket Diameters At Entrance Minimum	A Socket Diameters At Entrance Average	B Socket Diameters At Bottom Maximum	B Socket Diameters At Bottom Minimum	B Socket Diameters At Bottom Average	C Socket Depth Maximum	C Socket Depth Minimum	D Throat Diameter Minimum	E Minimum Wall Thickness EPC-40	E Minimum Wall Thickness EPC-80	N Minimum
U. S. CUSTOMARY UNITS													
½	16	0.860	0.844	0.852 ± 0.004	0.844	0.828	0.836 ± 0.004	1.500	0.652	0.630	0.095	0.129	3/32
¾	21	1.074	1.054	1.064 ± 0.004	1.056	1.036	1.046 ± 0.004	1.500	0.179	0.834	0.095	0.136	3/32
1	27	1.340	1.320	1.330 ± 0.005	1.320	1.300	1.310 ± 0.005	1.875	0.875	1.059	0.100	0.158	3/32
1 ¼	35	1.689	1.665	1.667 ± 0.005	1.667	1.643	1.655 ± 0.005	2.000	0.938	1.392	0.120	0.168	3/32
1 ½	41	1.930	1.906	1.918 ± 0.006	1.906	1.882	1.894 ± 0.006	2.000	1.062	1.622	0.120	0.168	3/32
2	53	2.405	2.381	2.393 ± 0.006	2.381	2.357	2.369 ± 0.006	2.000	1.125	2.079	0.130	0.181	3/32
2 ½	63	2.905	2.875	2.890 ± 0.007	2.883	2.853	2.868 ± 0.007	3.000	1.469	2.484	0.165	0.229	3/16
3	78	3.530	3.500	3.515 ± 0.008	3.507	3.477	3.492 ± 0.008	3.125	1.594	3.083	0.179	0.249	3/16
3 ½	91	4.065	3.965	4.015 ± 0.008	4.007	3.977	3.992 ± 0.008	3.250	1.687	3.598	0.188	0.264	3/16
4	103	4.565	4.465	4.515 ± 0.009	4.506	4.476	4.491 ± 0.009	3.375	1.750	4.076	0.197	0.280	3/16
5	129	5.643	5.543	5.593 ± 0.010	5.583	5.523	5.553 ± 0.010	3.625	1.937	5.097	0.214	0.311	3/16
6	135	6.708	6.608	6.658 ± 0.011	6.644	6.584	6.614 ± 0.011	3.750	2.125	6.115	0.232	0.359	1/4
*8	200	---	---	---	---	---	---	---	---	---	---	---	---
METRIC UNITS													
½	16	21.85	21.44	21.64 ± 0.10	21.44	21.03	21.23 ± 0.10	38.10	16.56	16.00	2.41	3.28	2.38
¾	21	27.28	26.77	27.03 ± 0.10	26.82	26.31	26.57 ± 0.10	38.10	18.26	21.15	2.41	3.45	2.38
1	27	34.04	33.53	33.78 ± 0.13	33.53	33.02	33.27 ± 0.13	47.63	22.23	26.90	2.54	4.01	2.38
1 ¼	35	42.90	42.29	42.60 ± 0.13	42.34	41.73	42.04 ± 0.13	50.80	23.83	35.36	3.05	4.26	2.38
1 ½	41	49.02	48.41	48.72 ± 0.15	48.41	47.80	48.11 ± 0.15	50.80	26.97	41.20	3.05	4.22	2.38
2	53	61.09	60.48	60.78 ± 0.15	60.48	59.87	60.17 ± 0.15	50.80	28.58	52.81	3.30	4.60	2.38
2 ½	63	73.79	73.03	73.41 ± 0.18	73.23	72.47	72.85 ± 0.18	76.20	37.31	63.09	4.19	5.82	4.76
3	78	89.66	88.90	89.28 ± 0.20	89.08	88.32	88.70 ± 0.20	79.38	40.49	78.31	4.55	6.32	4.76
3 ½	91	103.25	100.71	101.98 ± 0.20	101.78	100.20	101.40 ± 0.20	82.55	42.85	91.39	4.78	6.71	4.76
4	103	115.95	113.41	114.68 ± 0.23	114.45	112.90	114.07 ± 0.23	85.73	44.45	103.53	5.00	7.11	4.76
5	129	143.33	140.79	142.06 ± 0.25	141.81	140.28	141.05 ± 0.25	92.05	49.20	129.46	5.44	7.90	4.76
6	155	170.38	167.84	169.11 ± 0.28	168.76	167.23	168.00 ± 0.28	95.25	53.98	159.32	5.89	9.12	6.35
*8	200	---	---	---	---	---	---	---	---	---	---	---	---

*Dimensions supplied by the manufacturer.

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Table 3-5
DIMENSIONS FOR INTEGRAL BELL PVC EPC 40 AND EPC 80 ELBOWS

Trade Size	Metric Designator	A* Radius Minimum	B* Tangent Minimum
		U. S. CUSTOMARY UNITS	
1/2	16	4.00	1.500
3/4	21	4.50	1.500
1	27	5.75	1.875
1-1/4	35	7.25	2.000
1-1/2	41	8.25	2.000
2	53	9.50	2.000
2-1/2	63	10.50	3.000
3	78	13.00	3.125
3-1/2	91	15.00	3.250
4	103	16.00	3.375
5	129	24.00	3.625
6	155	30.00	3.750
8	200	—	—
		METRIC UNITS	
1/2	16	101.60	38.10
3/4	21	114.30	38.10
1	27	146.05	47.63
1-1/4	35	184.15	50.80
1-1/2	41	209.55	50.80
2	53	241.30	50.80
2-1/2	63	266.70	76.20
3	78	330.20	79.38
3-1/2	91	381.00	82.55
4	103	406.40	85.73
5	129	609.60	92.08
6	155	762.00	95.25
8	200	—	—

Dimensions specified by the manufacturer.

*Also apply for plain-end, one-end expanded, 90-degree, 45-degree, and two-ends expanded elbows.

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Section 4
PERFORMANCE REQUIREMENTS

4.1 QUALIFICATION TESTS

4.1.1 Definition

A qualification test is a non-repetitive evaluation conducted on an existing, altered, or new product to determine acceptability.

4.2.1 Bending

A PVC conduit coupling, or reducer, or an assembled male-female terminal adapter combination shall not be damaged or separated from the conduit when tested in accordance with 5.4.

4.2.2 Axial Pull Test on Joints

Each method of joining length of electrical plastic conduit to the appropriate fittings shall result in a connection that is not damaged or separated by the test described in 5.5. If failure of the fitting or conduit occurs prior to failure at the joint, the performance of the joint shall be considered to meet the requirements of this standard.

4.2 QUALITY CONTROL TESTS

4.2.1 Definition

A quality control test is an in-plant test that is conducted on a given test frequency to determine whether a product is in accordance with the specification requirements.

4.2.2 Workmanship

Fittings shall be homogenous throughout and free from visible cracks, holes, or foreign inclusions, or other injurious defects.

4.2.3 Dimensions

Dimensions of fittings shall meet the requirements of 3.2, when measured in accordance with 5.2.

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Section 5
TEST METHODS

5.1 CONDITIONING, TEST CONDITIONS, AND SAMPLING

5.1.1 Conditioning Test Specimens

When conditioning is required, the test specimens shall be conditioned in accordance with Procedures A in ASTM D 618 at 73.4 ± 3.6 °F (23 ± 2°C) for not less than 48 hours prior to test.

5.1.2 Test Conditions

Tests shall be conducted at 73.4 ± 3.6 °F (23 ± 2 °C) unless otherwise specified.

5.1.3 Sampling

Samples shall be selected at random.

5.2 DIMENSIONS

External dimensions shall be measured with micrometers or vernier calipers accurate to at least ±0.001 inch (±0.02 mm). Internal dimensions shall be measured with internal micrometers or telescoping gauges accurate to at least ±0.001 inch (±0.02mm). Lengths shall be measured with a good quality commercial scale calibrated in 1/32-inch (1mm) increments.

Average diameters (outside diameters, inside diameters, and socket diameters) shall be determined by obtaining the minimum diameter and the maximum diameter by actual measurements and averaging them using the formula:

Average diameter = 1/2 (maximum diameter + minimum diameter)

The maximum total out-of-roundness tolerances given for socket diameters in Table 3-1 apply to the average diameter of the socket as determined in accordance with the preceding paragraph. For example, if the average diameter of 1-inch (nominal size) fittings is 1.326 inch (33.68 mm), then the measured diameters of the socket due to ovality can be 1.336 inch (33.93 mm) maximum and 1.316 inch (33.43 mm) minimum.

5.3 THREADS

Threads shall be measured in accordance with the following methods of gauging, using gauges having the dimensions given in ANSI/ASME B 1.20.1.

5.3.1 Gauging External Tapered Threads

The ring gauge shall be screwed tight by hand on the external thread. The thread is within the permissible tolerance when the gauging facing the working ring gauge is not more than 1-½ turns from being flush with the face of the fitting, after correction has been made for any variation in the gauge from basic dimensions.

5.3.2 Gauging Internal Tapered Threads

The plug gauge shall be screwed tight by hand into the fitting. The thread is within the permissible tolerance when the gauging notch of the work plug gauge is not more than 1-½ turns from being flush with the end of the thread, after correction has been made for any variation in the gauge from basic dimensions.

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5.3.3 Gauging Chamfered, Countersunk, or Recessed Threads

When the internal thread is chamfered, countersunk, or recessed, the notch shall be flush with the bottom of the chamfer, which shall be considered as being the intersection of the chamfer cone and the pitch cone of the thread.

NOTE—Usually this depth is equal to ½ thread from the face of the fitting. (This note has been approved as Authorized Engineering Information.)

5.3.4 Gauging of Straight Threads

Types of Gauges—Gauges to properly control the production of straight threads shall be either straight "GO" or "NO GO" gauges or taper plug gauges (see ANSI/ASME B 1.20.1).

Gauge Dimensions—The straight "GO" and "NO GO" plug and ring gauges used for checking mechanical joint threads (see Tables 6 and 7 in ANSI B 2.1) shall be made to the pitch diameter limits specified in those tables in accordance with standard practice for straight thread gauges.

Use of Straight and Taper Gauges—Straight "GO" and "NO GO" gauges shall be used for all types of threaded joints where both the external and internal threads are straight. Taper plug gauges shall be used for the internal threads of all types of mechanical joints where the external thread is tapered and the internal thread is straight.

5.4 BENDING

Samples of PVC conduit fittings shall be solvent cemented to 18 inch (457 mm) lengths of PVC electrical conduit, per ASTM D2855, and shall be tested no sooner than 24 hours after assembly.

For testing the assembly with the coupling at the center, the assembly shall be placed on supports that are 30 inches (762 mm) apart as illustrated in Figure 5-1. The load indicated in Table 5-1 shall be suspended from the center of the coupling for 60 seconds, during which time the entire assembly shall be rotated through one complete revolution about its major axis.

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Table 5-1
BENDING LOAD

Trade Size	Metric Designator	Bending Load Pound (kg)
½	16	20 (9)
¾	21	35 (16)
1	27	50 (23)
1 ¼	35	75 (34)
1 ½	41	85 (39)
2	53	110 (50)
2 ½	63	110 (50)
3	78	110 (50)
3 ½	91	110 (50)
4	103	110 (50)
5	129	110 (50)
6	155	110 (50)
8	200	110 (50)

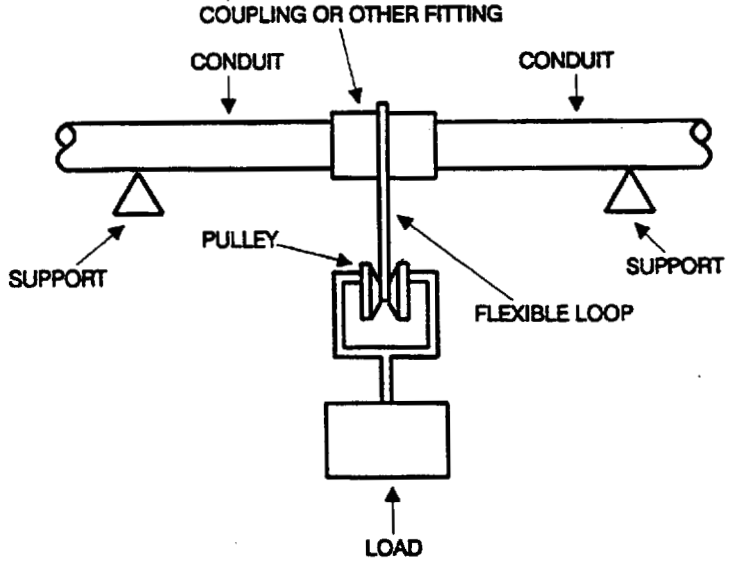

Figure 5-1
BENDING TEST ARRANGEMENT

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5.5 AXIAL PULL TEST ON JOINTS

Two 18-inch (457 mm) lengths of each size of PVC electrical conduit shall be joined by each of the methods recommended by the manufacturer. Each assembly shall be tested separately with cylindrical plugs inserted in its ends to prevent collapse of the conduit. Each plug shall fit snugly for its entire length. Each assembly shall be secured in the jaws of a power-driven testing machine on which the grips, when loaded, separate at a rate of ½-inch (13 mm) per minute. The load applied to the assembly by the machine shall be increased to the level indicated in Table 5-2 and then held for 1 minute.

Table 5-2
AXIAL LOAD FOR PULL TEST ON JOINTS

Trade Size	Metric Designator	Bending Load, Pounds (kg)
½	16	300 (136)
¾	21	450 (204)
1	27	600 (272)
1 ¼	35	700 (318)
1 ½	41	800 (363)
2	53	1000 (454)
2 ½	63	1000 (454)
3	78	1000 (454)
3 ½	91	1000 (454)
4	103	1000 (454)
5	129	1000 (454)
6	155	1000 (454)
8	200	1000 (454)

5.6 RETESTS

In case of failure under any of the foregoing tests, the test or tests under which the fitting failed shall be repeated twice, and the fitting shall be regarded as conforming to these standards if the results of the two additional tests are satisfactory. The fitting shall be regarded as not conforming to these standards if the results of either of the two additional tests are unsatisfactory.

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Section 6
MARKINGS

6.1 MARKINGS

Fittings shall be marked with the following:

a. Manufacturers' name or trademark;
b. Material designation;
c. Trade size or trade size and metric designator; and
d. Catalog number or equivalent, where practicable.

Where the size of the fitting does not permit complete marking, markings shall be permitted to be omitted in the following sequence: catalog number, trade size or trade size and metric designator, and material designation.

Markings shall be molded, hot stamped, or applied to fittings by any other suitable method, such as printing.

Where markings are recessed, they shall not cause cracks or reduce the wall thickness below the minimum specified in Table 3-1.

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