

## 1. Scope

This material standard covers the requirements for rigid nonmetallic PVC conduit for underground electrical power wire and cable applications. Sizes, types and quantities of conduit shall be as specified in the Special Provision Sheet.

## 2. Material ID Numbers

This material standard applies to the PVC conduits identified by the following District Material ID Numbers:

Table 1: Conduit Sizes and Types

MID	Nominal Size (in)	Length (ft)	NEMA Standard	Type	Deep Socket Integral Bell End	Nominal Weight (lb/100 ft)	Max. Bundle Size (ft)
250027	1	20	TC-2	Sch 40	Yes, 1-End	34	-
1001852	2	20	TC-2	Sch 40	Yes, 1-End	73	2800
250043	2-1/2	20	TC-2	Sch 40	Yes, 1-End	124	930
1001900	3	20	TC-2	Sch 40	Yes, 1-End	163	1760
1001992	4	20	TC-2	Sch 40	Yes, 1-End	232	1140
1002213	6	20	TC-2	Sch 40	Yes, 1-End	409	520
250093	4	20	TC-6	DB-60	Yes, 1-End	133	1140
250126	6	20	TC-6	DB-60	Yes, 1-End	288	520
250035	1	10	TC-2	Sch 80	Yes, 1-End	44	2400
250069	2	10	TC-2	Sch 80	Yes, 1-End	101	1400
250085	3	10	TC-2	Sch 80	Yes, 1-End	210	880
250100	4	10	TC-2	Sch 80	Yes, 1-End	308	570
250118	6	10	TC-2	Sch 80	Yes, 1-End	588	260
240929	2	10	TC-2	Sch 40, Split	None	-	-
1002056	2-1/2	10	TC-2	Sch 40, Split	None	-	-
240937	3	10	TC-2	Sch 40, Split	None	-	-
240945	4	10	TC-2	Sch 40, Split	None	-	-
240961	6	10	TC-2	Sch 40, Split	None	-	-

### 3. Reference Standards

Except as modified herein, PVC conduit shall meet the applicable requirements of the latest revisions of the following standards:

**ASTM F-512** Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation

**NEMA TC-2** Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)

**NEMA TC-6** PVC and ABS Plastic Utilities Duct for Underground Installation

**UL 651** UL Standard for Safety Schedule 40 and 80 Rigid PVC Conduit and Fittings

### 4. Conduit Classification

This material standard covers the following types of PVC conduit:

**Type DB-60** Designed for direct burial and for concrete encased applications.

**Type EPC-40** Designed for normal-duty applications above ground, for all concrete encased applications and for direct burial. (Schedule 40 IPS)

**Type EPC-80** Designed for heavy-duty applications above ground, for all concrete encased applications and for direct burial. (Schedule 80 IPS)

### 5. Split Conduit

Conduit specified as “split” type is used to repair broken duct without the need to cut and splice conductors. Split conduit shall be halved longitudinally and each half shall feature an interlocking tongue-and-groove joint the entire length of the longitudinally cut edges.

### 6. PVC Conduit for Directional Bores

PVC conduit for horizontal directional drilling applications shall be Schedule 40 or Schedule 80 and feature mechanically restrained, waterproof joints. The conduit shall conform to NEMA TC-2 and UL651 requirements. Currently, only PVC conduits manufactured under the Bore-Gard®, Can>Loc™, or Certa-Com® trademarks are acceptable for directional bore use at the District.

### 7. Materials

Conduit shall be made from virgin PVC plastic compound conforming to the requirements of its respective standard. Reground material from the manufacturer’s own pipe products may be used by the manufacturer provided the end product is equal in quality to pipe from virgin material.

### 8. Color

Conduit shall be medium gray to dark gray in color.

### 9. Temperature

All conduit shall be rated for use with 90°C wire and cable.

## 10. Workmanship

Conduit shall be homogeneous throughout, and free from visible cracks, holes, burrs, foreign inclusions, or other defects that could damage cable or conductor. Conduit shall be as uniform as is commercially practical in color, opacity, density and other physical properties.

## 11. Dimensions

All conduit shall be manufactured in accordance with the dimensions, tolerances and stiffness values prescribed in its respective standards as referenced in Table 1 of this material standard, except as otherwise specified herein.

## 12. Ends

**12.1** With the exception of split conduit, for which both ends shall be non-belled (plain), conduit supplied under this material standard shall have one integral deep socket belled end and one plain end.

**12.2** The deep socket belled end socket depth shall be in accordance with the dimensions specified in Table 2:

Nominal Conduit Size (in)	Nominal Socket Depth (in)
1	1.750 - 2.250
2	3.250 - 3.500
2-1/2	3.250 - 3.500
3	3.875 - 4.000
4	4.625 - 4.750
6	6.250 - 6.375

## 13. Chamfer

Type EPC (Schedules 40 and 80) conduit shall be finished with a symmetrical chamfer inside the non-belled end in accordance with Figure 1 and Tables 3 and 4 below. Exceptions to this requirement are 1" and 2-1/2" Schedule 40, 1" Schedule 80 and all sizes of Schedule 40 split conduit; chamfering is acceptable, but is not required for these conduits.

**Figure 1**  
**Chamfer Detail**

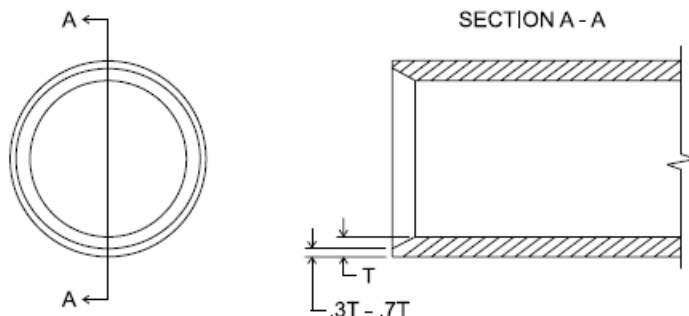


Table 3 - Schedule 40 PVC

Nominal Conduit Size (in)	Wall Thickness (in)		After Chamfer Cut			
			Min Wall (in)		Max Wall (in)	
	Min.	Max.	0.3T	0.7T	0.3T	0.7T
1	0.133	0.153	0.040	0.093	0.046	0.107
2	0.154	0.174	0.046	0.108	0.052	0.122
2-1/12	0.203	0.227	0.061	0.142	0.068	0.159
3	0.216	0.242	0.065	0.151	0.073	0.169
4	0.237	0.265	0.071	0.166	0.080	0.186
6	0.280	0.314	0.084	0.196	0.094	0.220

Table 4 - Schedule 80 PVC

Nominal Conduit Size (in)	Wall Thickness (in)		After Chamfer Cut			
			Min Wall (in)		Max Wall (in)	
	Min.	Max.	0.3T	0.7T	0.3T	0.7T
1	0.179	0.200	0.054	0.125	0.060	0.140
2	0.218	0.244	0.065	0.153	0.073	0.171
2-1/12	0.276	0.309	0.083	0.193	0.093	0.216
3	0.300	0.336	0.090	0.210	0.101	0.235
4	0.337	0.377	0.101	0.236	0.113	0.264
6	0.432	0.484	0.130	0.302	0.145	0.339

## 14. Inspection

The DISTRICT deserves the right to inspect all conduit either at the manufacturer’s plant or upon receipt. Damaged conduit or conduit not meeting this material standard will be rejected and returned at the supplier’s expense.

## 15. Packaging

**15.1** Conduit shall be packaged to protect it from damage during shipment, handling and subsequent storage.

**15.2** Conduit shall be packaged in units not to exceed 5 feet in width and no less than 1 foot nor greater than 4 feet in height. The packaging unit may be less than 1 foot in height for small quantities of 1" and 2-1/2" Schedule 40, 1" Schedule 80 and all sizes of Schedule 40 split conduit, as these conduits are sometimes purchased in small quantities. Packaged units shall have provisions for handling with fork lifting equipment.

**15.3** Conduit bundle sizes shall not exceed the sizes shown in Table 1 of this material standard.

**15.4** The two halves of each 10 ft length of split repair conduit section shall be temporarily fastened together for shipping.

## **16. Delivery**

Conduit shall be delivered on open, flatbed type trucks or trailers; it "shall not" be delivered in closed type vans or trailers. Exceptions to this requirement may be allowed for 1" and 2-1/2" Schedule 40, 1" Schedule 80 and all sizes of Schedule 40 split conduit, as these conduits are typically purchased in small quantities. Vendors interested in the acceptability of shipping specific orders of these "exception" conduits in enclosed vans or trailers shall check with the District's buyer on a case-by-case basis.

## **17. Marking**

All required markings shall be legible and so applied as to remain legible under normal handling and installation practices. Each length of conduit shall be marked with the following at intervals of 5 feet or less:

1. (1) Manufacturer's name or trademark
2. (2) Nominal size
3. (3) Material (PVC)
4. (4) Standard designation (for example, NEMA TC-2)
5. (5) Type (for example, Schedule 40)
6. (6) With the exception of split conduit, all conduit provided under this material standard shall be marked with the designation: "maximum 90°C wire," "max. 90°C wire" or equivalent phraseology.
7. (7) Any additional marking the manufacturer deems necessary is permitted.

## **18. General Bidding Conditions**

The attached General Bidding Conditions are made a part of this material standard.

## **19. Evaluation of Bids**

The following factors will be considered in the analysis and evaluation of bids and subsequent bid award:

1. (1) Past performance of bidder and product
2. (2) Completeness of bidder's data
3. (3) Conditions of warranty
4. (4) Proposed delivery
5. (5) Initial cost and escalations