



# Standard Specification for Extruded Crosslinked and Thermoplastic Semi-Conducting, Conductor and Insulation Shielding Materials<sup>1</sup>

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## 1. Scope

1.1 This specification covers extruded crosslinked and thermoplastic semi-conducting, conductor and insulation shielding materials for electrical wires and cables.

1.2 The materials covered are not compatible with hydrocarbon derivatives of a swelling or deteriorating nature.

1.3 Whenever two sets of values are presented, in different units, the values in the first set are the standard, while those in parentheses are for information only.

1.4 In many instances, the electrical properties of the shielding material are strongly dependent on processing conditions. For this reason, in this specification the material is sampled from cable. Therefore, tests are done on shielded wire in this standard solely to determine the relevant property of the shielding material and not to test the conductor or completed cable.

## 2. Referenced Documents

### 2.1 ASTM Standards:

- D 1711 Terminology Relating to Electrical Insulation<sup>2</sup>
- D 1928 Practice for Preparation of Compression-Molded Polyethylene Test Sheets and Test Specimens<sup>3</sup>
- D 2647 Specification for Crosslinkable Ethylene Plastics<sup>4</sup>
- D 3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets<sup>5</sup>
- D 3183 Practice for Rubber—Preparation of Pieces for Test Purposes from Products<sup>5</sup>
- D 4496 Test Method for DC Resistance or Conductance of Moderately Conductive Materials<sup>6</sup>

<sup>1</sup>This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.18 on Solid Insulations, Non-Metallic Shieldings, and Coverings for Electrical and Telecommunication Wires and Cables.

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<sup>2</sup>Annual Book of ASTM Standards, Vol 10.01.

<sup>3</sup>Discontinued; see 2001 Annual Book of ASTM Standards, Vol 08.03.

<sup>4</sup>Annual Book of ASTM Standards, Vol 08.02.

<sup>5</sup>Annual Book of ASTM Standards, Vol 09.01.

<sup>6</sup>Annual Book of ASTM Standards, Vol 10.02.

D 6095 Test Method for Volume Resistivity for Extruded Crosslinked and Thermoplastic Semi-Conducting, Conductor and Insulation Shielding Materials<sup>6</sup>

## 3. Terminology

3.1 *Definitions:* For definitions of terms used in this specification, refer to Terminology D 1711.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aging (act of), n*—the exposure of materials to an environment for an interval of time.

3.2.2 *semi-conducting, adj*—moderately conductive; see Terminology D 1711 and Test Method D 4496.

## 4. Physical Properties

4.1 The shielding material, when processed into molded slabs, in accordance with Practice D 1928 Procedure C, the Sampling Section of Specification D 2647, and Practices D 3182 and D 3183, depending on the type of material being tested, shall conform to the requirements for physical properties specified in Table 1.

## 5. Electrical Requirements

5.1 *Volume Resistivity*—When the extruded conductor and insulation shielding is sampled and tested in accordance with Test Method D 6095, the volume resistivity at the rated temperature of the insulation shall be not greater than 100 000  $\Omega\cdot\text{cm}$  for conductor shielding and 50 000  $\Omega\cdot\text{cm}$  for insulation shielding.

## 6. Sampling

6.1 Sample the semi-conducting materials in accordance with 4.1.

## 7. Test Methods

7.1 Test the semi-conducting materials in accordance with 4.1 and Test Method D 6095.

## 8. Keywords

8.1 conductor shielding material; insulation shielding material; semi-conducting shielding material; volume resistivity

**TABLE 1 Physical Properties for Semi-conducting Shielding Materials**

Brittle point (Test Method A)	-10°C, max
Aging requirements: <sup>A</sup>	
Elongation at rupture, min, %	100

<sup>A</sup> Thermoplastic materials, aged 48 h at 100 ± 1°C. Crosslinked materials, aged 168 h at 121 ± 1°C.

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