

**THERMOPLASTIC POLYOLEFIN ELASTOMER (TEO)
HIGH COLD IMPACT EXTRUSION MOLDING COMPOUND**

WSK-M4D777-A7

1. SCOPE

The material defined by this specification is a rigid thermoplastic polyolefin elastomer (TEO) extrusion molding compound with high cold impact resistance and low burn rates.

2. APPLICATION

This specification was released originally for material used for wiring cover tubes.

3. REQUIREMENTS**3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS**

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.1.1 All requirements of this specification, identified by symbol(s), shall be met with data representing 3 sigma values.

3.4 MOLDING COMPOUND

(s) 3.4.1 Melt Flow Rate 1.5 - 3.5 g/10 minutes
(ISO 1133, 230 °C, 5.00 kg)

3.5 MOLDED TEST SPECIMEN**3.5.1 Preparation of Test Specimens**

Unless otherwise specified all tests shall be carried out on injection molded one-end gated test specimens.

The following dimensions are required:

- A. 150 min x 10 x 4.0 +/- 0.2 mm (Tensile Bar, ISO 3167)
B. 120 x 10 x 4.0 +/- 0.2 mm

Specimens with shorter dimensions shall be cut from the center portion of the test specimen A and/or B. The specimens shall be prepared according to ISO 294. No annealing allowed.

3.5.2 Density 0.885 - 0.91 g/cm³
(ISO 1183, Method A)

3.5.3 Hardness, Durometer D 45 - 55
(ISO 868, 15 s dwell)

Date	Action	Revisions
2006 02 15	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.8, 3.9, 4
1995 03 01	Released	EPOOE10460362000



Documents

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|-----|---------|--|---------------|
| (s) | 3.5.4 | Tensile Strength at Yield, min
(ISO R 527, 150 minimum x
10 x 4.0 +/- 0.2 mm specimen,
50 mm/min test speed) | 10 MPa |
| (s) | 3.5.4.1 | Elongation at Yield, min
(Test Method according
to para 3.5.4) | 20% |
| (s) | 3.5.5 | Flexural Modulus, min
(ISO 178, 80 x 10 x 4.0 +/- 0.2 mm
specimen, 2 mm/min test speed,
64 mm support span) | 400 MPa |
| | 3.5.6 | Shear Modulus at 23 °C
(ASTM D 4065, forced constant
amplitude, fixed frequency of 1 Hz
+/- 15%, strain level below 1%.
Specimen approx. 60 x 10 x 4.0 +/-
0.2 mm cut from the center of specimen A.
Specimen length between clamps 35-40 mm.
Soak time at each temperature interval -
3 minutes minimum). | 180 - 270 MPa |

Additionally, a Shear Modulus versus Temperature curve shall be plotted for -50 to +140 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 5.

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|-----|---------|---|----------------------|
| (s) | 3.5.7 | Impact Strength, Izod, min
(ISO 180/1A, 80 x 10 x 4.0
+/- 0.2 mm specimen, 10 specimens
for each test) | |
| | 3.5.7.1 | At 23 +/- 2 °C | 50 kJ/m ² |
| | 3.5.7.2 | At -40 +/- 1 °C | 40 kJ/m ² |
| | 3.5.7.3 | At 0 +/- 2 °C | 4 kJ/m ² |

The test specimens must be conditioned for minimum of 6 h at the above specified temperature prior to impact test. Low temperature testing shall be done within the cold box.

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|-----|---------|---|-------|
| (s) | 3.5.8 | Heat Deflection Temperature, min
(ISO 75, 120 x 10 x 4.0
+/- 0.2 mm specimen, edgewise,
0.32 +/- 0.01 mm deflection) | |
| | 3.5.8.1 | At 1.80 MPa | 36 °C |
| | 3.5.8.2 | At 0.45 MPa | 50 °C |

All specimens dry as molded. If not tested immediately after molding, specimens must be stored in a sealed, moisture-proof container filled with silica gel.

