Technical Information

Dow ENDURANCE™ DHDA-7708 BK

Semiconductive Linear Low Density Polyethylene Compound for Cable Jacketing

Overview

DOW ENDURANCE™ DHDA-7708 BK is a thermoplastic semiconductive compound specifically designed for jacketing over medium, high, and extra-high voltage power cables. It combines the excellent physical properties and low moisture vapor transmission normally associated with Dow insulating jacket materials with the conductivity of thermoplastic semiconductive insulation shielding compounds. In medium voltage cable applications, a semiconductive jacket provides cable endurance and prolongs cable life by reducing neutral-to-ground impulse voltage. The semiconductive jacket enables on-reel cable diagnostic analysis in high and extra-high voltage applications.

Compared to conventional thermoplastic semiconductive materials, DOW ENDURANCE™ DHDA-7708 BK offers:

- Improved environmental stress-crack resistance
- Improved low-temperature properties
- Improved thermomechanical properties
- Reduced adhesion to strippable insulation shields
- Improved cut-through and abrasion resistance
- Reduced moisture vapor transmission

Details are shown in Figures 1 to 4

Specifications

Cables jacketed with DOW ENDURANCE™ DHDA-7708 BK, prepared using sound commercial fabrication practice, would be expected to meet the following specifications:

- AEIC: CS8, CS9
- ICEA: S-94-649 Type 1, S-108-720 Type 1
- IEC: 60502, 60840, 62067

Additive

- Antiblock: No
- Slip: No
- Processing Aid: No

Physical	Nominal Value (English)		Nominal Value (SI)		Test Method
Density	0.980	g/cm³	0.980	g/cm³	ASTM D1505
Environmental Stress-Cracking Resistance (ESCR)					ASTM D1693
10% Igepal, F0	> 500	hr	> 500	hr	
Mechanical	**Nominal Value (English)**		**Nominal Value (SI)**		**Test Method**
Tensile Modulus - Secant	50000	psi	345	MPa	ASTM D638
Tensile Strength	1700	psi	11.7	MPa	ASTM D638
Tensile Elongation (Break)	450	%	450	%	ASTM D638
Films	**Nominal Value (English)**		**Nominal Value (SI)**		**Test Method**
Water Vapor Transmission Rate					ASTM F1249
100°F (38°C), 90% RH	0.097	g/100 in²/24 hr	1.5	g/m²/24 hr	
Hardness	**Nominal Value (English)**		**Nominal Value (SI)**		**Test Method**
Durometer Hardness (Shore D)	55		55		ASTM D2240
Thermal	**Nominal Value (English)**		**Nominal Value (SI)**		**Test Method**
Brittleness Temperature					ASTM D746
-- [1]	-94.0	°F	-70.0	°C	
-- [2]	-58.0	°F	-50.0	°C	
Heat Distortion (ICEA) [3] (194°F (90°C))	1.0	%	1.0	%	ASTM D2632
Aging	**Nominal Value (English)**		**Nominal Value (SI)**		**Test Method**
Retention of Tensile Elongation - 1 week					ASTM D638
212°F (100°C)	75	%	75	%	
Retention of Tensile Strength - 1 week					ASTM D638
212°F (100°C)	75	%	75	%	

Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Volume Resistivity			ASTM D991
73°F (23°C)	25 ohms·cm	25 ohms·cm	
194°F (90°C)	50 ohms·cm	50 ohms·cm	

Additional Information

Nominal property values above represent tests on molded, stress-relieved slabs. Cure times were 15 minutes at 175°C.

Figure 1: Low-Temperature Properties - Notched LTB (50% Failure)

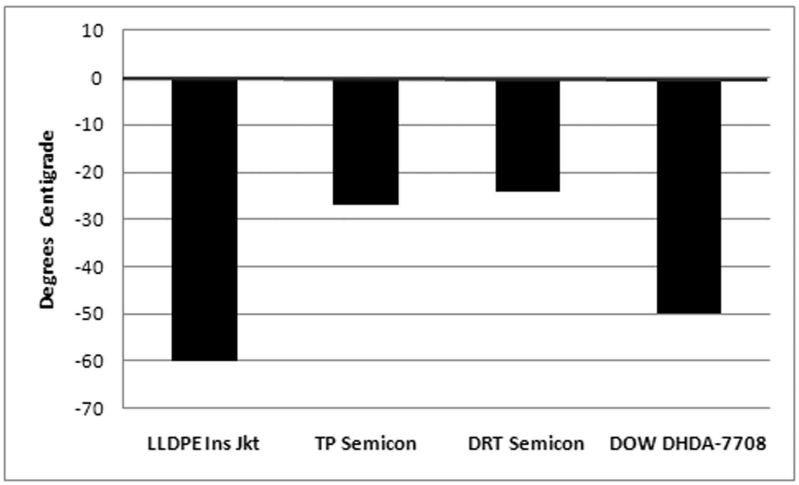


Figure 2: Moisture Vapor Transmission - ASTM E 96 (100°F [38°C], 90% RH)

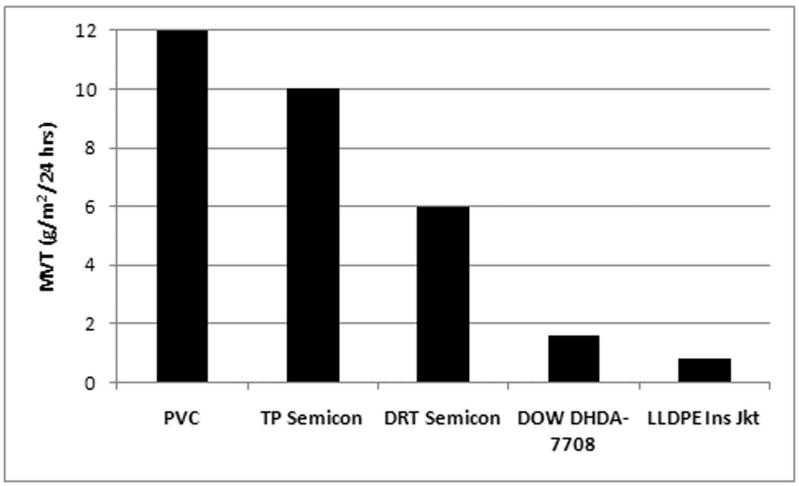


Figure 3: Abrasion Resistance - ASTM 1242 (% Weight Loss/500 Cycles)

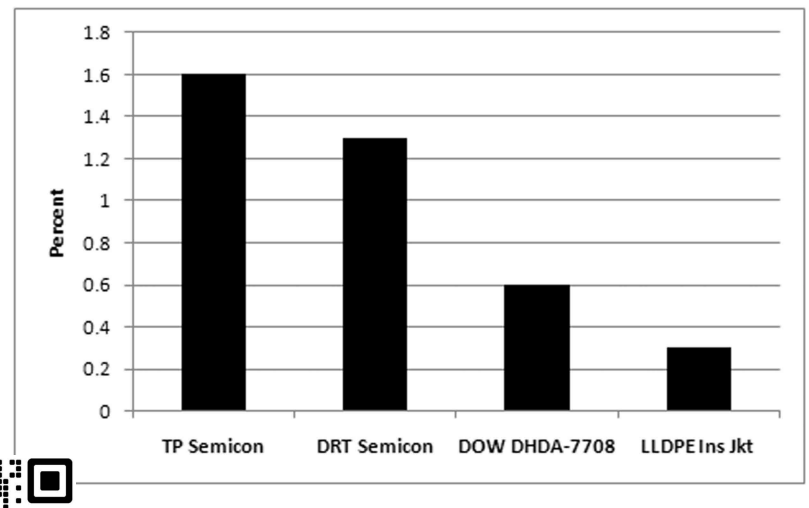
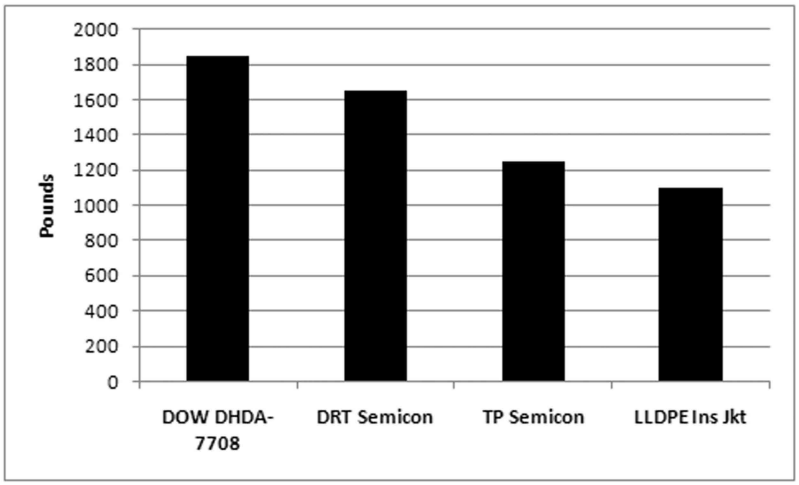


Figure 4: Cut-Through Resistance



Extrusion	Nominal Value (English)		Nominal Value (SI)	
Drying Temperature	154 to 176	°F	68 to 80	°C
Drying Time	2.0 to 4.0	hr	2.0 to 4.0	hr
Melt Temperature	424 to 475	°F	218 to 246	°C

Extrusion Notes

For optimum extrusion results with DOW ENDURANCE™ DHDA-7708 BK, use melt extrusion temperatures in the 425 to 475°F (218 to 246°C) range. Optimum radial resistivity results have been obtained by maximizing the air gap (distance from extrusion die to cooling water). Specific processing conditions can be determined only by trial on individual equipment. Pre-extrusion dehumidified hopper drying for 2 to 4 hours in the range of 155 to 175°F (68 to 80°C) to remove moisture is recommended.

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

[1] F50

[2] Notched

[3] plaque