



TUFLIN™ HSE-1003 NT 7

The Dow Chemical Company - Linear Low Density Polyethylene Resin

Tuesday, November 5, 2019

General Information

Product Description

- Industrial pallet wrap stretch film applications
- Premium film packaging applications
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.1a
- Consult the regulations for complete details.

TUFLIN™ HSE-1003 NT 7 Linear Low Density Polyethylene Resin is an ethylene-hexene-1 copolymer designed for cast stretch film applications such as industrial pallet wrap. Films containing HSE-1003 offer outstanding puncture, toughness and load holding properties.

General

Material Status	• Commercial: Active
Availability	• North America
Additive	• Antiblock: No • Processing Aid: No • Slip: No
Agency Ratings	• FDA 21 CFR 177.1520(c) 3.1a
Forms	• Pellets
Processing Method	• Cast Film

ASTM & ISO Properties ¹

Physical	Nominal Value	Unit	Test Method
Density / Specific Gravity	0.920		ASTM D792
Melt Mass-Flow Rate (190°C/2.16 kg)	2.5	g/10 min	ASTM D1238
Films	Nominal Value	Unit	Test Method
Film Puncture Energy			Internal Method
0.80 mil	34.0	in·lb	
2.0 mil	73.0	in·lb	
Film Puncture Force			Internal Method
0.80 mil	9.00	lbf	
2.0 mil	19.0	lbf	
Film Puncture Resistance			Internal Method
0.80 mil	319	ft·lb/in ³	
2.0 mil	252	ft·lb/in ³	
Film Toughness - MD			ASTM D882
0.80 mil	2520	ft·lb/in ³	
2.0 mil	3080	ft·lb/in ³	
Film Toughness - TD			ASTM D882
0.80 mil	3250	ft·lb/in ³	
2.0 mil	4040	ft·lb/in ³	
Secant Modulus - 2% Secant, MD			ASTM D882
0.80 mil	21400	psi	
2.0 mil	20600	psi	
Secant Modulus - 2% Secant, TD			ASTM D882
0.80 mil	22600	psi	
2.0 mil	20500	psi	

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Films	Nominal Value	Unit	Test Method
Tensile Strength - MD			ASTM D882
Yield, 0.80 mil	1630	psi	
Yield, 2.0 mil	1480	psi	
Tensile Strength - TD			ASTM D882
Yield, 0.80 mil	1530	psi	
Yield, 2.0 mil	1450	psi	
Tensile Strength - MD			ASTM D882
Break, 0.80 mil	7220	psi	
Break, 2.0 mil	5560	psi	
Tensile Strength - TD			ASTM D882
Break, 0.80 mil	5240	psi	
Break, 2.0 mil	6410	psi	
Tensile Elongation - MD			ASTM D882
Break, 0.80 mil	520	%	
Break, 2.0 mil	720	%	
Tensile Elongation - TD			ASTM D882
Break, 0.80 mil	830	%	
Break, 2.0 mil	900	%	
Dart Drop Impact			
0.80 mil	130	g	ASTM D1709A
0.80 mil	< 100	g	ASTM D1709B
2.0 mil	270	g	ASTM D1709A
2.0 mil	170	g	ASTM D1709B
Elmendorf Tear Strength - MD ²			ASTM D1922
0.80 mil	180	g	
2.0 mil	780	g	
Elmendorf Tear Strength - TD ²			ASTM D1922
0.80 mil	620	g	
2.0 mil	1100	g	
Ultimate Stretch ³			Internal Method
0.8 mil	330	%	
2.0 mil	520	%	
Unstretched Cling			ASTM D5458
0.8 mil	210	g	
2.0 mil	280	g	
Thermal	Nominal Value	Unit	Test Method
Vicat Softening Temperature	210	°F	ASTM D1525
Melting Temperature (DSC)	255	°F	Internal Method
Optical	Nominal Value	Unit	Test Method
Gloss			ASTM D2457
20°, 0.800 mil	156		
20°, 2.00 mil	146		
45°, 0.800 mil	95		
45°, 2.00 mil	91		
Haze			ASTM D1003
0.800 mil	1.00	%	
2.00 mil	4.00	%	

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Processing Information

Extrusion	Nominal Value	Unit
Melt Temperature	525	°F

Extrusion Notes

Fabrication Conditions For Cast Film:

- EGAN/Davis-Standard 5 layer cast line
- Melt Temperature: 525 °F (274 °C)
- Chill Roll (primary/secondary) Temperature: 70 °F (21 °C)
- Line Speed: 0.8 mil = 600 fpm (183 m/min); 2.0 mil = 200 fpm (61 m/min)
- Output: 0.8 mil = 416 lb/hr; 2.0 mil = 341 lb/hr
- Die width: 36in. (914 mm)
- Die gap: 25 mil (0.65 mm)
- Air gap: 3 in. (76 mm)

Notes

¹ Typical properties: these are not to be construed as specifications.

² Method B

³ On-Pallet Testing; Highlight Industries Inc. test method.