NYLON SOLUTIONS

Aegis® PIR-H100MP Nylon 6 Extrusion Grade Homopolymer

Description

Aegis® PIR-H100MP resin from AdvanSix contains 100% post-industrial recycled (PIR) raw materials[1] while providing the same top performance and processability as Aegis® H100MP, its standard, non-recycled counterpart.

Aegis® PIR-H100MP is a lubricated and nucleated medium viscosity nylon 6 extrusion grade homopolymer for cast or blown film applications. It conforms to FDA requirements of 21 CFR 177.1500 as well as EU Directive 2011/10/EC. Aegis® PIR-H100MP homopolymer possesses the combination of strength, toughness and thermoforming properties associated with nylon 6 as well as excellent heat, chemical and abrasion resistance.

Typical Properties	Test Method	Unit	Value
Parameter			
Viscosity, FAV	ASTM D-789		100
RV @ 96% Sulfuric Acid			3.35
Extractable Content	SOP-702-307	%	Max. 0.8
Density	ASTM D-792	g/cm³	1.13
Melt Flow Rate, 235°C/1.0 kg (455°F/1.0 kg)	ASTM D-1238	g/10 min	2.6
Moisture			
Moisture Content	ASTM D-6869	%	Max. 0.08
Moisture (24 Hour)	ASTM D-570	%	1.6
Moisture (50% RH)	ASTM D-570	%	2.7
Moisture (Saturation)	ASTM D-570	%	9.5
Thermal			
Melting Point	ASTM D-3418	°C (°F)	220°C (428°F)

Film Properties	Test Method	Unit	Value
Gas Barrier @ 23°C (73°F)/0% RH			
Oxygen Permeability	D-3958	cc/m²/day	40.3
Water Vapor Permeability @ 38°C (100°F)/100% RH	F-1249	gm-mil/m²/day	992
Nitrogen Permeability		cc/m²/day	14.0
Carbon Dioxide Permeability		cc/m²/day	72.8

Film properties continued on page 2.

[1] *Using an industry-accepted mass balance method, AdvanSix allocates recycled material into 100% PIR Aegis® resins. PIR grades are certified by an independent third-party organization (SCS Global Services) for recycled content, with annual audits.*

The values presented in this data sheet are typical values and are not to be interpreted as product specifications.

Film Properties (continued)	**Test Method**	**Unit**	**Value (MD)***	**Value (TD)***
Mechanical				
Tensile Modulus, 23°C (73°F)	ASTM D-882	MPa	700	590
Tensile Yield, 23°C (73°F)	ASTM D-882	MPa	30	30
Tensile Strength, 23°C (73°F)	ASTM D-882	MPa	90	80
Elongation, 23°C (73°F)	ASTM D-882	%	340	340
Graves Tear, 23°C (73°F)	ASTM D-1004	N	2140	2070
Elmendorf Tear Strength, 23°C (73°F)	ASTM D-1922	N	880	950
Puncture Strength, 23°C (73°F)	ASTM D-5478	grams	960	-
Puncture Index, 23°C (73°F)	ASTM D-5478	gm/mil	470	-

**Note: MD = Machine Direction and TD = Traverse Direction. Test samples obtained from 2-mil thick unoriented cast film.*

Molded Properties	**Test Method**	**Unit**	**Value (MD)***
Mechanical			
Tensile Modulus, 23°C (73°F)	ASTM D-882	MPa	3,240
Tensile Strength, 23°C (73°F)	ASTM D-882	MPa	80
Yield Elongation, 23°C (73°F)	ASTM D-882	%	3.8
Flexural Modulus, 23°C (73°F)	ASTM D-790	MPa	2,650
Flexural Strength, 23°C (73°F)	ASTM D-790	MPa	110
Notched Izod, 23°C (73°F)	ASTM D-256	J/m	60
Heat Deflection Temperature, 23°C (73°F)	ASTM D-648	ºC (ºF)	61 (142)

Processing conditions for test specimens: melt temperature = 240ºC (464ºF); mold temperature = 80ºC (176ºF).

Processing Guidelines

Material Handling

Aegis® PIR-H100MP is supplied in sealed containers and drying prior to processing is not required. However, higher moisture is the primary cause of processing issues. If drying becomes necessary, a dehumidifying or desiccant dryer operating at 80°C (176°F) is recommended. Drying time is dependent on moisture level. More information about safe handling procedures can be obtained by requesting the Safety Data Sheet on AdvanSix.com.

Extrusion Guidelines

Melt Viscosity vs. Temperature

Melt Temperature: 220°C (428°F)
Melt Temperature Range: 232°C (450°F) to 271°C (520°F).
Two key factors affect the melt viscosity (stiffness or fluidity of the melt):

1. The molecular weight (Mw) of the resin: Higher Mw resins will have a higher melt viscosity than lower Mw resins.
2. Temperature of the melt for any given Mw resin: Higher process temperatures will provide a more fluid melt viscosity than lower process temperatures.

Typical Barrel Profile for Cast Films

Barrel: 230-260°C (446-500°F)
Adapter: 260-266°C (500-510°F)
Die: 260°C (500°F)
Process Melt Temperature: 260-270°C (500-518°F)

Typical Barrel Profile for Tubular (Blown) Films

Barrel: 246-254°C (474-490°F)
Adapter: 260°C (500°F)
Die: 254°C (490°F)
Process Melt Temperature: 254-260°C (490-500°F)

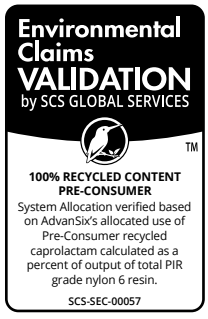
Screw Parameters

Metering Section: 40%
Transition Section: 3 to 4 flights
Feed Section: Balance of screw length
Compression Ratio: 3.5:1 to 4.0:1
L/D Ratio: 24:1

Metering Section Flight Depth

Screw Diameter	Recommended Depth
1"	0.055"
1.5"	0.060"
2"	0.070"
2.5"	0.080"
3.5"	0.100"
4.5"	0.115"
6"	0.135"

Note: The values in this data sheet are for natural color resins only. Colorants or other additives may alter some or all of these properties. The data listed here fall within the normal range of product properties, but should not be used to establish specification limits nor used alone as the basis of design.



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Contact AdvanSix
To learn more about the benefits of Aegis® Nylon Resins, visit **AdvanSix.com/NylonSolutions** or call:
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