

NYLON SOLUTIONS

Aegis® BarrierPro₂™ Barrier Resin

Description

Aegis® BarrierPro₂™ is an oxygen-scavenging polyamide resin formulated specifically for use in hot-fill and other high-performance packaging applications where high oxygen barrier is required. This product is useful in injection and extrusion molding applications, particularly in the PET co-injection stretch blow molding processes. Aegis® BarrierPro₂™ resin offers high oxygen barrier even at high humidity, outstanding delamination and whitening resistance, clarity and easy processing.

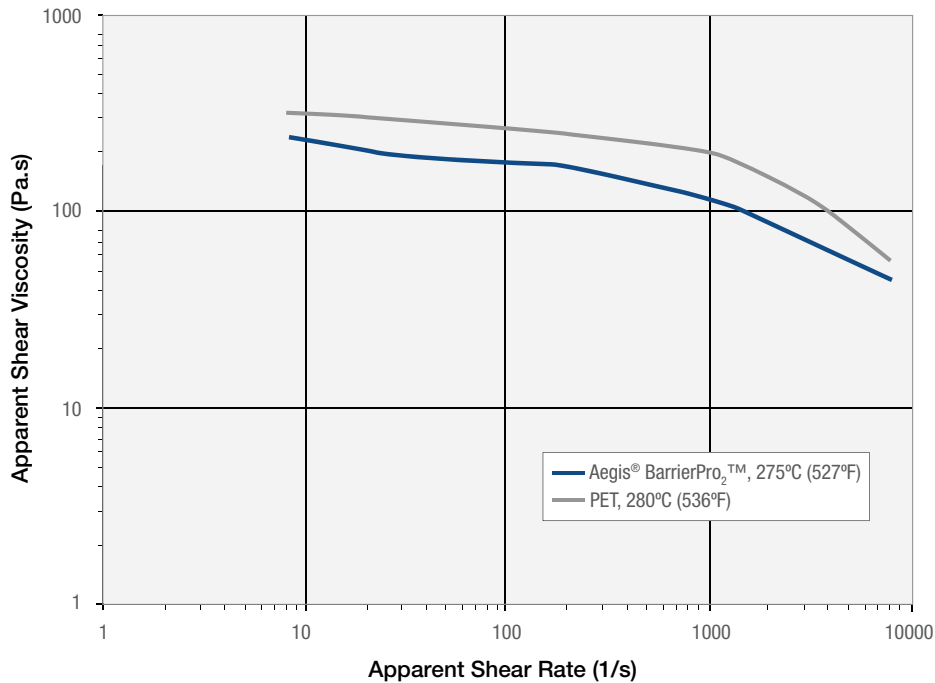
Typical Properties	Typical Values		Test Method
	English	Metric	
Physical Properties			
Density, g/cm ³	72.4 lb/ft ³	1.16 g/cm ³	ASTM D-1505
Bulk Density	45.6 lb/ft ³	0.73 g/cm ³	ISO 60
Moisture	<1200 ppm (0.12% by weight)		
Thermal Properties			
Melt Index @ 280°C (536°F)/2.16 kg		37 g/10 minutes	ISO 1133
Melt Index @ 260°C (500°F)/2.16 kg		17 g/10 minutes	ISO 1133
Melting Temperature (T _m)	423°F	217.4°C	(ISO 11357) DSC
Glass Transition Temperature (T _g)	161°F	71.8°C	(ISO 11357) DSC
Gas Barrier Performance Properties (Cast Film)			
Oxygen Permeability* @ 23°C (73°F), 80% RH	Initiation (Flat Film Sample) in 20-30 hrs		
	< 0.002 cc.mil/(100 in ² .atm.day)	< 0.031 cc.25 μm/(m ² .atm.day)	
Oxygen Absorbing Capacity (based on Aegis® BarrierPro ₂ ™ mass used)	>40 cc/g		Measured at 80% RH

*During scavenging period. After scavenger is consumed, oxygen permeability is approximately 0.5-1 cc/100 in².atm.day.

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

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Aegis® BarrierPro₂™ Barrier Resin Melt Rheology



Product Testing Guidelines

Aegis® BarrierPro₂™ resin is specifically formulated for use as the barrier layer in multilayer co-injection stretch blow molded bottles. A loading of 3% to 8% Aegis® BarrierPro₂™ resin is recommended for most applications.

Package Testing

Oxygen Transmission/Ingress Testing

Oxygen transmission testing of multilayer bottles containing Aegis® BarrierPro₂™ resin should be conducted at conditions of 100% RH air outside of bottle and 50% RH nitrogen inside bottle. Bottle testing should be done in accordance with the guidelines set forth by the test equipment manufacturer. A 100% RH air environment can be achieved with a plastic liner filled with moistened sponge material. For oxygen ingress testing for total package oxygen, testing of multilayer bottles containing Aegis® BarrierPro₂™ resin should be performed at conditions of 100% RH air inside of bottle (fill bottles with de-oxygenated water) and ambient (or higher/lower) RH outside of bottle.

Product Processing Guidelines

Aegis® BarrierPro₂™ resin is specifically formulated to process in injection or co-injection systems, including systems that utilize a ram or plunger process to deliver the melt.

Screw Design

A general purpose screw with feed, transition and metering sections, a 20:1 L/D (flight length of screw/outside diameter of screw) and a compression ratio of 3:1- 4:1 (depth of feed section/depth of metering section) is recommended.

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Material Handling

All Aegis® BarrierPro₂™ resins are pre-dried and shipped in foil-lined containers. It is recommended to discard all material that is: (1) in damaged/broken packages, (2) stored unsealed in ambient conditions for an extended period of time or (3) more than six months older than the manufacturing date (which is printed on the lot number label found on the liner inside the box).

Material Drying

It is recommended to load Aegis® BarrierPro₂™ resin into a desiccant hopper dryer to eliminate moisture pickup during processing. A hopper dryer temperature of 70°C (158°F) - 80°C (176°F) should be used. Hopper dryer temperatures should not exceed 85°C (185°F). Temperatures above 85°C (185°F) may cause material to soften or may cause yellowing of resin. If material is stored in the hopper dryer overnight or for long periods of time, a hopper dryer temperature of 50°C (122°F) is suggested.

It is recommended to check the moisture level of Aegis® BarrierPro₂™ resin prior to processing. Moisture levels can be measured by titration or thermal (weight loss) analysis. For thermal analysis, a 25 g sample, a test temperature of 160°C (320°F) and a test time of seven minutes are recommended.

Processing Conditions for Aegis® BarrierPro₂™

A typical processing temperature profile for Aegis® BarrierPro₂™ resin is provided below.

Processing Temperature Profile

Location	Temperature Setting °C / °F
Feed	35 (95)
Zone 1	245 (473)
Zone 2	250 (482)
Zone 3	265 (509)
Zone 4	265-275 (509-527)
Zone 5	265-275 (509-527)
Nozzle	265-275 (509-527)
Manifold	280-290 (536-554) (depends on PET)

During startup, allow the barrels, nozzle and manifold to reach recommended temperatures before processing. If purging is required, PET can be used for the barrel and manifold.

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Contact AdvanSix

To learn more about the benefits of Aegis® Nylon Resins, visit AdvanSix.com/NylonSolutions or call: **1-844-890-8949** (toll free, U.S./Can.) **+1-973-526-1800** (international)

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