

DuPont™ Nucrel® 0403

Nucrel® resins Product Data Sheet

Description

Product Description Nucrel® 0403 is a copolymer of ethylene and methacrylic acid, made with nominally 4 wt% methacrylic acid. The resin is available for use in conventional blown and cast film extrusion and coextrusion equipment designed to process polyethylene resins.

Restrictions

Material Status ● Commercial: Active

Typical Characteristics

Uses ● Adhesives
Packaging
Sealants

Composition 4% By Weight Methacrylic Acid

Typical Properties

Physical	Nominal Values	Test Method (s)	
Density ()	0.93 g/cm ³	ASTM D792	ISO 1183
Melt Flow Rate (190°C/2.16kg)	3 g/10 min	ASTM D1238	ISO 1133
Thermal	Nominal Values	Test Method (s)	
Melting Point (DSC)	104°C (219°F)	ASTM D3418	ISO 3146
Freezing Point (DSC)	92°C (198°F)	ASTM D3418	
Vicat Softening Point ()	95°C (203°F)	ASTM D1525	ISO 306

Processing Information

General

Maximum Processing Temperature 310°C (590°F)

General Processing Information Nucrel® 0403 normally is processed at melt temperatures ranging from 160°C - 235°C (320°F - 455°F) in blown film or cast film equipment. A typical blown film extruder temperature profile is given below. Actual processing temperatures will be determined by either the specific equipment or one of the other polymers in a coextrusion. Nucrel® 0403 can also be used in cast extrusions and coextrusions.

Materials of construction used in the processing of this resin should be corrosion resistant. Stainless steels of the types 316, 15-5PH, and 17-4PH are excellent, as is quality chrome or nickel plating, and in particular duplex chrome plating. Type 410 stainless steel is satisfactory, but needs to be tempered at a minimum temperature of 600°C (1112°F) to avoid hydrogen-assisted stress corrosion cracking. Alloy steels such as 4140 are borderline in performance. Carbon steels are not satisfactory. While stainless steels can provide adequate corrosion protection, in some cases severe purging difficulties have been encountered. Nickel plating has been satisfactory, but experiments have shown that chrome surfaces have the least adhesion to acid based polymers. In recent years, the quality of chrome plating has been deteriorating due to environmental pressures, and the corrosion protection has not always been adequate. Chrome over top of

stainless steel seems to provide the best combination for corrosion protection and ease of purging.

If surface properties of the extruded resin require modification (such as, lower C.o.F. for packaging machine processing), refer to the Conpol™ Processing Additive Resins product information guide.

After processing Nucrel, purge the material out using a polyethylene resin, preferably with a lower melt flow rate than the Nucrel resin in use. The "Disco Purge Method" is suggested as the preferred purging method, as this method usually results in a more effective purging process. Information on the Disco Purge Method can be obtained via your DuPont Sales Representative.

Never shut down the extrusion system with Nucrel in the extruder and die. Properly purge out the Nucrel with a polyethylene, and shut down the line with polyethylene or polypropylene in the system.

Blown Film Processing	Nominal Values
Blown Film Processing Information	A suggested extruder set points temperature profile.
Feed Zone	135°C (275°F)
Second Zone	160°C (320°F)
Third Zone	185°C (365°F)
Fourth Zone	185°C (365°F)
Fifth Zone	185°C (365°F)
Adapter Zone	185°C (365°F)
Die Zone	185°C (365°F)

Cast Film / Sheet Processing	Nominal Values
Cast Film Processing Information	A suggested extruder set points temperature profile.
Feed Zone	160°C (320°F)
Second Zone	185°C (365°F)
Third Zone	210°C (410°F)
Fourth Zone	235°C (455°F)
Fifth Zone	235°C (455°F)
Adapter Zone	235°C (455°F)
Die Zone	235°C (455°F)

FDA Status Information

Nucrel® 0403 conforms to the U.S. Code of Federal Regulations, Title 21, Paragraph 177.1330, covering its use as a food contact surface subject to the extractives limitations on the finished food contact article as described in the regulation.

Safety & Handling

Nucrel® methacrylic acid copolymer resins as supplied by DuPont are not considered hazardous materials. As with any hot material, care should be taken to protect the hands and other exposed parts of the body when handling molten polymer. At recommended processing temperatures, small amounts of fumes may evolve from the resins. When resins are overheated, more extensive decomposition may occur. Adequate ventilation should be provided to remove fumes from the work area. Disposal of scrap presents no special problems and can be by landfill or incineration in a properly operated incinerator. Disposal should comply with local, state, and federal regulations. Resin pellets can be a slipping hazard. Loose pellets should be swept up promptly to prevent falls. For more detailed information on the safe handling and disposal of DuPont resins, a Material Safety Data Sheet can be obtained from the DuPont Packaging and Industrial Polymers website or by contacting your sales representative.

Read and Understand the Material Safety Data Sheet (MSDS) before using this product

Regional Centres

DuPont operates in more than 70 countries. For help finding a local representative, please contact one of the

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