



Dow Packaging & Specialty Plastics

Product Data Sheet

DOW™ HPF 1000

Resin

General Information

Product Description	DOW™ HPF 1000 is an ionomer of ethylene acid acrylate terpolymer. This polymeric material can be processed in conventional extrusion and injection equipment designed to process polyethylene and ethylene copolymer type resins, to create various shapes and sheeting.
---------------------	--

Status

Material Status	Commercial: Active
-----------------	--------------------

Typical Characteristics

Features	DOW™ HPF 1000 is based on a new technology platform. It is extremely versatile and can be used to manufacture all layers of the golf ball. DOW™ HPF 1000 offers a combination of high resilience and low compression never before available. This polymer is a highly amorphous material.
Characteristics / Benefits	Shore Hardness (D Scale) -----ASTM D2240D ----- 52 Flex Modulus -----ASTM D790 ----- 31 Kpsi (220 MPa) Tensile Strength -----ASTM D638 ----- 2.6 Kpsi (18 MPa) Elongation % -----ASTM D638 ----- 430
Applications	Golf Ball constructions.

Typical Properties

Physical	Nominal Values	Test Method(s)	
*Density ()	0.96 g/cm ³	ASTM D792	ISO 1183
*Melt Flow Index (190°C/2.16kg)	0.65 g/10 min	ASTM D1238	ISO 1133
Thermal	Nominal Values	Test Method(s)	
*Melting Point(DSC)	78 °C (172.4 °F)	ASTM D3418	ISO 3146
Vicat Softening Point ()	59 °C (138.2 °F)	ASTM D1525	ISO 306

Processing Information

*Maximum Processing Temperature	285 °C (545 °F)
General Processing Information	This material is readily processible in conventional molding equipment. Typical melt temperatures for injection molding are 410°F (210C) to 500°F (260C). Actual processing temperatures will usually be determined by either the specific equipment or other polymers in a blend or coextrusion. Drying DOW™ HPF 1000 is shipped dry, (<1000 ppm moisture), in moisture-resistant bags or in moisture-resistant liners in boxes, and can be used as received. However, DOW™ HPF 1000 does absorb moisture from the air, and should be kept sealed in a moisture-resistant container whenever possible. DOW™ HPF 1000 may be dried using regenerative-type desiccant bed dryers capable of producing dry air with a dew point of -20 to -40°C (-4 to -40°F). Typical drying conditions for this particular ionomer grade are 24 hours at a temperature below 50°C (122°F). If moisture levels have reached greater than 2000 ppm, it may be necessary to employ vacuum as well as heat to remove moisture. Materials of construction used in the processing of this resin preferably 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.

After processing DOW™ HPF 1000, purge the material out using a polyethylene resin, preferably with a lower melt flow rate than the DOW™ HPF 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 Dow Sales Representative.

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

Regulatory Information

For information on regulatory compliance within or outside of the U.S.A., consult your local Dow representative.

Safety & Handling

For information on appropriate Handling & Storage of this polymeric resin, please refer to the material Safety Data Sheet.

A Product Safety Bulletin, material Safety Data Sheet, and/or more detailed information on extrusion processing and/or compounding of this polymeric resin for specific applications are available from your Dow representative.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

Medical Applications Policy

Any and all medical application use of Dow materials, whether a device, a component, or any type of primary or secondary packaging of a medically related object or substance, needs to be reviewed and approved by Dow before any Dow material can be tested in such application.

Dow requests that customers considering use of Dow products in medical applications notify Dow so that appropriate assessments may be conducted. Dow does not endorse or claim suitability of its products for specific medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the Dow product is safe, lawful, and technically suitable for the intended use. **DOW MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF ANY DOW PRODUCT FOR USE IN MEDICAL APPLICATIONS.**

For further information contact your Dow sales or technical representative to request a Medical Application Review Request Form.

Additional details of Dow's Medical Applications Policy are available at:

<https://www.dow.com/en-us/support/product-safety.html>

Tobacco and Marijuana Policy

Dow does not support or intend for its products to be used, directly or indirectly, in the production of tobacco, the manufacture of tobacco products, the manufacture and use of electronic cigarettes (including vaping devices), the production of marijuana, or the manufacture of marijuana products intended for human consumption, where the Dow product (or its residues) may be present in the finished product or be alleged to facilitate the delivery of nicotine, other tobacco components, marijuana, or marijuana components.

Harmful Applications Policy

Dow does not intend for its products to be used in applications specifically intended to harm humans.

Disclaimer

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, the Customer is responsible for determining whether products and the information in this document are appropriate for the Customer's use and for ensuring that the Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligation or liability for the information in this document. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

NOTICE: If products are described as "experimental" or "developmental": (1) product specifications may not be fully determined; (2) analysis of hazards and caution in handling and use are required; (3) there is greater potential for Dow to change specifications and/or discontinue production; and (4) although Dow may from time to time provide samples of such products, Dow is not obligated to supply or otherwise commercialize such products for any use or application whatsoever.

For additional information, not covered by the content of this document, contact us via our web site

http://www.dow.com/products_services

Revision Date: 26-February-2021
P&SP Disclaimer

Additional Information

To contact Dow via Toll-Free or Local Toll phone numbers in specific countries, please see the following webpage:
<https://www.dow.com/en-us/support/contact-representative.html>

<http://www.dow.com>

Updated February 2021

© 2019 The Dow Chemical Company

Version: 122.0
Last modified at 4/27/2021 10:36 AM