

POLYETHYLENE

Borcoat™ HE3450

HIGH DENSITY POLYETHYLENE FOR STEEL PIPE COATING

DESCRIPTION

Borcoat HE3450 is a black, high density polyethylene produced with the advanced Borstar® Technology, providing the material with especially good melt strength and extrudability. Also its mechanical and heat deformation properties as well as ESCR are very good. It contains very well dispersed, fine particle sized carbon black in order to ensure excellent weathering resistance.

Borcoat HE3450 fulfils the requirements in ISO 21809-1, NF A 49710, DIN 30670, CAN/CSA-Z245.21 and prEN 10285 when used in combination with the grafted adhesives ME0420 or ME0433 and a compatible powder epoxy and applied under sound processing conditions.

APPLICATIONS

Borcoat HE3450 is recommended for top-coat in steel pipe coating and is suitable for severe laying conditions even at elevated ambient temperatures. With this material, high running speeds and relatively thin layers are obtained without problems. **Borcoat HE3450** can be used up to 80°C design temperature of the pipeline when combined with the grafted adhesives ME0410, ME0420 or ME0433.

PHYSICAL PROPERTIES

Property	Test Method	Unit	Typical Value*
Density (Compound)	ISO 1183-1 Method A / ASTM D792	kg/m ³	952
Melt Flow Rate (190°C/2.16 kg)	ISO 1133	g/10 min	0.5
Tensile Stress at Yield (50mm/min)	ISO 527-2 / ASTM D638	MPa	> 20
Tensile Stress at Break (50mm/min)	ISO 527-2 / ASTM D638	MPa	> 26
Tensile Strain at Break (50mm/min)	ISO 572-2 / ASTM D638	%	> 600
Carbon Black Content	ISO 6964 / ASTM D1603	%	≥ 2
Carbon Black Dispersion	ISO 18553	-	≤ 3
Water Content	ISO 15512	ppm	< 300
Oxidation Induction Time (210°C Al pan)	ISO 11357-6	minutes	≥ 30
Melting Temperature (DSC)	ISO 11357-3	°C	128
Hardness, Shore D	ASTM D2240	-	60
Vicat Softening Temperature	ISO 306	°C	115
ESCR (Igepal 10%, F20)	ASTM D1693-A	hr	> 5000
Brittleness Temperature	ASTM D746	°C	< -80
DC Volume Resistivity	ASTM D257	Ω.cm	> 10 ¹⁶
Coating Resistivity at 23±2°C	DIN 30670	Ω.m ²	> 10 ⁹
Dielectric Strength	ASTM D149 / IEC 243	kV/mm	> 30
Heat and Light Ageing	ISO 21809-1 / DIN 30670	%ΔMFR	< 35

* Data should not be used for specification work

PROCESSING GUIDELINES

Pre-drying

Due to hygroscopic behaviour of carbon black and such a compound will be sensitive to moisture. Even as low moisture as 0.04% can give the pipe a bad surface. Despite the fact that the type of the carbon black used in Borcoat HE3450 is of less sensitive type, storage for a long time or under unfavourable conditions can increase the moisture content. We therefore recommend drying before extrusion.

For normal conditions and applications we suggest preheating and drying for minimum 90 minutes with a preheat temperature of 90°C.

Extrusion

Borcoat HE3450 can be applied either by using flat die or crosshead technique and provides good surface finish over a broad range of conditions. The actual extrusion conditions will depend on the type of equipment used and the size of the pipe. The following conditions may be used as a guide when starting up the extruder.

Cylinder	190 – 210°C
Head	190 – 210°C
Die	190 – 210°C
Melt temperature	220 – 240°C
Max recommended melt temperature	<250°C

Specific recommendations for processing can be determined only when comprehensive knowledge is available on epoxy and adhesive materials used and type of equipment. Please contact your local Borouge representative for such particulars.

STORAGE AND HANDLING

Borcoat HE3450 should be stored in dry conditions at temperatures below 50°C and protected from UV-light.

Improper storage can initiate degradation, which results in odour generation and colour changes and can have negative effects on the physical properties of the product.

Shelf life at proper storage is at least 2 years from production date, but in case of a long storage time potential moisture pick-up needs to be eliminated by drying before extrusion.

SAFETY

Borcoat HE3450 is not classified as dangerous preparation.

Dust and fines from the product carry a risk of dust explosion. All equipment should be properly earthed. Inhalation of dust should be avoided as it may cause irritation of the respiratory system. Small amounts of fumes are generated during processing of the product. Proper ventilation is therefore required.

RECYCLING

The product is suitable for recycling using modern methods of shredding and cleaning. In-house production waste should be kept clean to facilitate direct recycling.

A Safety Information Sheet is available on request. Please contact your Borouge representative for more details on various aspects of safety, recovery and disposal of the product.

RELATED DOCUMENTS

The following related documents are available on request, and represent various aspects on the usability, safety, recovery and disposal of the product:

Recovery and disposal of Polyolefins
Information on Emissions from Processing and Fires
Safety Information Sheet, SIS

DISCLAIMER

The product(s) mentioned herein are not intended to be used for medical, pharmaceutical or healthcare applications and we do not support their use for such applications.

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability whatsoever for the accuracy and completeness of such information.

Borouge makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.

It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

No liability can be accepted in respect of the use of Borouge products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

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