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METALEN APE-1

Functional activate polyethylene-based adhesive for steel pipe insulation by extrusion

Description

METALEN APE-1 is polyethylene manufactured from a blend of linear polyethylene and high-density polyethylene by reactive extrusion, containing grafted functional groups of maleic anhydride with nano-structuring by organo-modified montmorillonite on modern equipment, in cutting-edge process by METACLAY CJSC.

METALEN APE-1 has high adhesive activity to both polyethylene and epoxy layers in three-layer pipe coating. It is notable for its heating stability, high hot-water resistance and unique flexibility at low negative temperatures.

METALEN APE-1 meets the requirements of STO Gazprom 2-2.3-130-2007 and was qualified by Gazprom VNIIGAZ LLC (Conclusion No. 313239949-113-2011) for the insulation of steel pipes of any execution class with the temperature of up to +80 °C".

Application

METALEN APE-1 is recommended for the top coat of pipe insulation by side or circular (longitudinal) extrusion. The use of METALEN APE-1 ensures high application rates and thin layers, if required, are achieved with no problem. Thanks to nano-activation with modified montmorillonite, the adhesive extrusion ensures low screw drive loads and achieves high capacity high adhesion stability when applied on the initial gel state of the epoxy primer to provide interaction with the adhesive's anhydride groups.

Quality Parameters

Parameter	Value*	Unit	Test Method
Density (blend)	920–940	kg/cm ³	ISO 1183 / ISO 1872-2B



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Melt flow rate (190°/2.16 kg)	1.4–2.2	g/10 min	ISO 1133
Oxidation induction time at 210 °C	≥ 20	min	ISO 11357-6:2002
Ultimate strength (50 mm/min)	> 18	MPa	ASTM D 638
Elongation at break (50 mm/min)	> 600	%	ASTM D 638
Vicat softening temperature	≥ 90	°C	ISO 306 A-50
Brittleness temperature	< -70	°C	ASTM D 746
Melting temperature (DSC)	≥ 125	°C	ISO 3146

*The data are subject to agreement in the supply specifications.

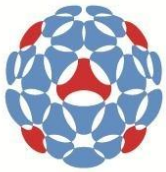
Processing Recommendations

METALEN APE-1 is recommended to be processed on extruders with a flat or circular die. METALEN APE 1 ensures good processability in wide temperature range.

The below conditions may be used when starting the extruder:

Barrel	190–230 °C
Head	190–230 °C
Die	220–225 °C
Melt temperature	220–225 °C

Definitive processing recommendations may only be given when the specific material application and the equipment type used are known.



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Recycling

The product is used for recycling using modern grinding and cleaning methods. The product wastes should be preserved clean to facilitate direct recycling.

Packing

METALEN PE-1 is supplied in 25 kg valve bags.

Storage

METALEN APE-1 should be stored in a dry, covered, fire-safe room protecting against moisture and direct sunlight, at the optimum temperature of 5 °C to 35 °C and relative humidity of 60 % or below, and, for winter period, in at least 1 m from heating appliances.

The shelf life, subject to the observation of the specified conditions and preserved package integrity, is 12 months from the date of manufacture. For prolonged storage, to avoid the risk of water accumulation, it is recommended to pre-dry the material before the extrusion, with the maximum heating and drying of 80 °C.

Precautions

When processing METALEN APE-1, small amounts of smoke may be released, therefore the workplace shall be equipped with ventilation.

METALEN APE-1 at room temperature does not release toxic substances to the environment. METALEN APE-1 is of low hazard in terms of the effect on human body: upon dust inhalation, skin and eye mucous membrane contact.

METALEN APE-1 is not combustible but measures must be provided for fire extinguishing in the surrounding territory.

The information contained herein is correct and accurate to the best of our knowledge. All the suggestions and recommendations are given with no guarantee, since the product use conditions in production conditions are beyond the manufacturer's control. Please, be also warned that patents may exist for some applications of the product.