Technical Data Sheet

PHARMALENE®
MS 20 PH BCA

Medical grade LLDPE
Linear low density polyethylene bio circular attributed

SUSTAINABILITY

The product Pharmalene MS 20 PH BCA 'Bio circular attributed' is a highly sustainable medical grade LLDPE produced using bionaphtha from renewable raw materials together with traditional raw materials. In order to attribute the sustainable feedstock component to the final product, Versalis applies the Mass Balance approach, a recognized methodology that allows to trace the flow of materials along the value chain and to assign the sustainability characteristic of the raw material to the final product on a documentary basis. Pharmalene MS 20 PH BCA provides the same chemical composition and physical-mechanical performance of the traditional grade, in addition is accompanied by a sustainability declaration that certifies the share of bio attributed product.
Pharmalene MS 20 PH BCA is a linear low density polyethylene (LLDPE) with antioxidants, obtained by medium pressure autoclave technology. It is produced in conformity to the good manufacturing practices (GMP) and is mainly used for Injection moulding.
The production of Pharmalene MS 20 PH BCA allows to contribute to the circular economy, since the bionaphtha used derives from waste from industrial processing of organic substances (e.g. used cooking oils). Pharmalene MS 20 PH BCA will be bio circular attributed for 90%. The exact amount of "bio circular attributed" product will be reported in the sustainability certificate issued upon delivery of the product.

MAIN PROPERTIES

Resin Properties	Value	Unit	Test method
Melt Flow Rate (190 °C/2,16 kg)	26	g/10min	ISO 1133
Melt Flow Rate (190 °C/5 kg)	-	g/10min	ISO 1133
Melt Flow Rate (190 °C/21,6 kg)	-	g/10min	ISO 1133
Density	0,921	g/cm^3	ISO 1183
Melting Point	116	°C	Internal Method
Brittleness temperature	<- 70	°C	ASTM D 746
Vicat softening point (1 kg)	88	°C	ISO 306/A

Mechanical Properties *	Value	Unit	Test method
Tensile stress at yield	9	MPa	ISO 527
Tensile stress at break	10	MPa	ISO 527
Elongation at break	> 400	%	ISO 527
Flexural modulus	150	MPa	ISO 178
Hardness Shore D	48	-	ISO 868 A

(*) Values are referred to injection moulded specimens. Actual properties are typical and may vary depending upon operating conditions.

Manufacturer website: https://www.versalis.eni.com/

PHARMALENE® LLDPE / Linear low density polyethylene bio circular attributed **MS 20 PH BCA**

MAIN APPLICATIONS

Pharmalene MS 20 PH BCA is intended for the use within pharmaceutical sector and is characterized by excellent low temperature properties and by a good flowability.
Pharmalene MS 20 PH BCA is suitable for the production of pharmaceutical containers, closures and pharmaceutical masterbatches.

PROCESSING NOTES

Pharmalene MS 20 PH BCA can be processed by conventional injection moulding equipments.

Typical processing conditions (*):
Temperature profile of the barrel (°C) 160 - 210
Temperature of the mould (°C) 10 - 40

(*) Processing conditions depend on several parameters: the shape of the part to be manufactured, the localisation of the injection point, the injection moulding machine and the cooling of the mould.

STORAGE AND HANDLING

Pharmalene MS 20 PH BCA is supplied in pellet form. This material may readily be conveyed and bulk fed through equipment designed for conventional pelletised polyethylene resin, provided the equipment is designed to prevent accumulation of fines and dust particles that are contained in all polyethylene resins. These fines and dust particles can, under certain conditions, pose an explosion hazard. We recommend that the conveying system used, is equipped with filters of adequate size, operated and maintained in such a manner to ensure that no leaks develop and earthed adequately. We further recommend, that good housekeeping should be practised throughout your facility.

Shelf Life: Polyethylene can be stored over a long period of time, as long as it is stored protected from solar irradiation, in a ventilated, dry and cool place, with a temperature kept below 50°C. Any exposure of the material to solar irradiation, reinforced by higher temperatures, has a detrimental impact on the product quality and can induce a degradation, which goes on subsequently.
We guarantee that Versalis Pharmalene® products keep complying with Versalis sales specification for 2 years after date of delivery under the recommended storage conditions. This statement does not prevent user performing MFR and density tests on the incoming material and every year for quality evaluation.

Ensuring a consistent material quality, we strongly recommend to follow the above mentioned handling and storage conditions for all Pharmalene® products. In case of non-respect of these storage precautions, Versalis cannot be held liable to any quality problem related to inappropriate handling and storage of the material and shelf-life can be altered.

Before using this product it is recommended to refer to the relevant Safety Data Sheet (SDS) for more detailed information.

AVAILABILITY

Contact the Versalis sales office nearest to you regarding availability and your specific application requirements.

FOOD CONTACT AND PHARMACOPOEIA STATUS

Pharmalene MS 20 PH BCA complies with the European Union (Reg. 10/2011) and the USA (FDA) rules, related to the use of plastic materials intended for contact with foodstuffs. The composition of our product is compliant to the relevant sections of the European Pharmacopoeia (10th ed.) and those of the U.S. Pharmacopoeia (USP 42). Certificates of compliance are available upon request.

TECHNICAL MANAGEMENT POLYETHYLENE PHARMALENE

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IMPORTANT: please consult the relevant safety data sheet for more detailed information. The information and data presented herein are to the best of our knowledge true and accurate but no warranty or guarantee, expressed or implied, is made nor is any liability accepted with respect to the use of such information and data. Versalis is available to provide the guaranteed values for each product on demand.

DISCLAIMER: It is the responsibility of the user to verify the technical suitability and the safe and regulatory compliant usage of this product in all medical and pharmaceutical applications. If a usage of this product in applications of the pharmaceutical and medical sector, such as Class I, IIa, IIb or III Medical Devices (U.S. FDA, Health Canada and/or EU Directive 2007/47/EC) and in applications involving permanent implantation into the human body, is intended, user must consult Versalis to receive prior written approval for each specific product and applications.

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