Technical Data Sheet

# PHARMALENE®
# BC 82 PH BCA

Medical grade HDPE
High density polyethylene bio circular attributed

## SUSTAINABILITY

The product Pharmalene BC 82 PH BCA 'Bio circular attributed' is a highly sustainable medical grade HDPE 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 BC 82 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 BC 82 PH BCA is a high density polyethylene (HDPE, C-6 comonomers) with antioxidants, obtained by gas phase technology. It is produced in conformity to the good manufacturing practices (GMP) and is mainly used for extrusion and extrusion blow moulding. The production of Pharmalene BC 82 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 BC 82 PH BCA will be bio circular attributed for 95%. 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) | 0,25 | g/10min | ISO 1133 |
| Melt Flow Rate (190 °C/5 kg) | 0,9 | g/10min | ISO 1133 |
| Melt Flow Rate (190 °C/21,6 kg) | 23 | g/10min | ISO 1133 |
| Density | 0,954 | g/cm$^3$ | ISO 1183 |
| Melting Point | 132 | °C | Internal Method |
| Brittleness temperature | <- 60 | °C | ASTM D 746 |
| Vicat softening point (1 kg) | 125 | °C | ISO 306/A |

| Mechanical Properties * | Value | Unit | Test method |
|---|---|---|---|
| Tensile stress at yield | 27 | MPa | ISO 527 |
| Tensile stress at break | 30 | MPa | ISO 527 |
| Elongation at break | > 600 | % | ISO 527 |
| Flexural modulus | 1200 | MPa | ISO 178 |
| Hardness Shore D | 64 | - | ISO 868 A |
| Izod Impact Strength, notched | 180 | J/m | ISO 180/A |
| ESCR ** | > 60 | h | ASTM 1693/B |

(*) Values are referred to compression moulded specimens. Actual properties are typical and may vary depending upon operating conditions and additive package.
(**) 100% surface-active agent - Condition B.



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**PHARMALENE®** HDPE / High density polyethylene bio circular attributed **BC 82 PH BCA**

## MAIN APPLICATIONS

Pharmalene BC 82 PH BCA is intended for the use within pharmaceutical sector and is characterized by excellent processability and a good balance between ESCR and top load.
Pharmalene BC 82 PH BCA is suitable for the production of blow molded bottles, flacons and monodoses.

## PROCESSING NOTES

Pharmalene BC 82 PH BCA can be processed with the highest production rates on blow moulding machinery.

Typical processing conditions:

| | |
|---|---|
| Set temperature, extruder zone 1 | (°C) 170-180 |
| Set temperature, extruder zone 2 | (°C) 185-195 |
| Set temperature, extruder head zone | (°C) 185-190 |
| Melt temperature | (°C) 195-205 |

## STORAGE AND HANDLING

Pharmalene BC 82 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 BC 82 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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