



CLEARFLEX® H&T CLH 196 BA

LLDPE
Linear low-density polyethylene bio-attributed



SUSTAINABILITY

The "bio attributed" product Clearflex H&T CLH 196 BA is a highly sustainable LLDPE produced using bionafta 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. Clearflex H&T CLH 196 BA 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. It is a linear low-density polyethylene, hexene comonomer (C6-LLDPE), added with antioxidants and suitable for cast film technology. The production of Clearflex H&T CLH 196 BA allows to contribute to the circular economy, since the bionafta used derives from renewable sources (e.g. vegetable oils). Clearflex H&T CLH 196 BA will be bio attributed for 85%. The exact amount of "bio attributed" product will be reported in the sustainability certificate issued upon the delivery of the product.

MAIN PROPERTIES

| Resin Properties | Value | Unit | Test method |
|--|--------|-------------------|-----------------|
| Melt Flow Rate (190 °C/2.16 kg) | 2.5 | 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 | 0.916 | g/cm ³ | ISO 1183 |
| Melting Point | 123 | °C | Internal Method |
| Brittleness temperature | <-70 | °C | ASTM D 746 |
| Vicat softening point (1 kg) | 95 | °C | ISO 306/A |
| Film Properties * | Value | Unit | Test method |
| Tensile stress at yield MD | 8 | MPa | ISO 527-3 |
| Tensile stress at yield TD | 9 | MPa | ISO 527-3 |
| Tensile stress at break MD | 38 | MPa | ISO 527-3 |
| Tensile stress at break TD | 30 | MPa | ISO 527-3 |
| Elongation at break MD | 600 | % | ISO 527-3 |
| Elongation at break TD | 800 | % | ISO 527-3 |
| 1% Secant modulus MD | 140 | MPa | ISO 527-3 |
| 1% Secant modulus TD | 140 | MPa | ISO 527-3 |
| Elmendorf tear resistance MD | 140 | N/mm | ISO 6383-2 |
| Elmendorf tear resistance TD | 250 | N/mm | ISO 6383-2 |
| Impact resistance F50 (Dart Drop Test) | 300 | g | ISO 7765-1/A |
| Dynamic coefficient of friction (COF) | >0.5 | - | ISO 8295 |
| Haze | 2.5 | % | ISO 14782 |
| Gloss, 45° | 92 | % | ASTM D 2457 |
| Recommended film thickness | 8 ± 50 | micron | - |

(*) Typical value for a cast film extruded between 220°-270°C, line speed between 150-300 m/min and thickness 23 µm. Actual properties are typical and may vary depending upon operating conditions and additive package.



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MAIN APPLICATIONS

Stretch films manufactured with Clearflex H&T CLH 196 BA have outstanding fracture mechanical properties, mainly Elmendorf tear strength along machine direction (MD) and puncture resistance. Moreover, the holding force is the key property of these films when used in automatic wrapping machines. Clearflex H&T CLH 196 BA is recommended for production of super-power stretch films. Its properties, especially in terms of holding force and puncture resistance, make Clearflex H&T CLH 196 BA the ideal choice for packaging goods of irregular shape and for applications requiring a superior mechanical strength.

PROCESSING NOTES

Clearflex H&T CLH 196 BA is easily processable using cast film technology. Melt temperature should be between 220°C and 270°C. Clearflex H&T CLH 196 BA can be extruded at thickness below 15 µm.

STORAGE AND HANDLING

Clearflex H&T CLH 196 BA is supplied in pellet form. This material may readily be conveyed and bulk fed through equipment designed for conventional pelletized polyethylene resin, provided the equipment is designed to prevent accumulation of the 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 be 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 practiced throughout your facility. The product should be stored in dry conditions at temperatures below 50°C and protected from sunlight. Improper storage can initiate degradation which results in odor generation, color changes and can have negative effects on the physical properties of the product. Before using this product, it is recommended to read and understand the relevant Safety Data Sheet.

AVAILABILITY

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

FOOD CONTACT STATUS

Clearflex H&T CLH 196 BA complies with the rules and regulations of the European Union, as well as other countries, regarding the use of plastic materials in food contact applications. Certificates of compliance are available upon request.

TECHNICAL MANAGEMENT POLYETHYLENE

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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 sole responsibility of the end-user to determine the safety, the regulatory compliance as well as the technical suitability of the product for the intended application. The product is not intended for use in medical devices and pharmaceutical applications; Versalis declines all responsibility and cannot be held liable in case of use in the above-mentioned applications.