

# Novodur HD M203FC

Acrylonitrile Butadiene Styrene (ABS)

## TECHNICAL DATASHEET

### DESCRIPTION

Novodur® HD M203FC is an injection molding grade especially suitable for medical applications providing high flowability.

### FEATURES

- HD service package
- High flowability
- Sterilizable

### APPLICATIONS

- Medical appliances
- Inhaler housings
- Insuline pens

| Property, Test Condition                               | Standard    | Unit                    | Values |
|--------------------------------------------------------|-------------|-------------------------|--------|
| <b>Rheological Properties</b>                          |             |                         |        |
| Melt Volume Rate 220 °C/10 kg                          | ISO 1133    | cm <sup>3</sup> /10 min | 31     |
| <b>Mechanical Properties</b>                           |             |                         |        |
| Izod Notched Impact Strength, 23 °C                    | ISO 180/A   | kJ/m <sup>2</sup>       | 16     |
| Izod Notched Impact Strength, -30 °C                   | ISO 180/A   | kJ/m <sup>2</sup>       | 7      |
| Charpy Notched Impact Strength, 23° C                  | ISO 179/1eA | kJ/m <sup>2</sup>       | 16     |
| Charpy Notched Impact Strength, -30 °C                 | ISO 179/1eA | kJ/m <sup>2</sup>       | 7      |
| Charpy Unnotched, 23 °C                                | ISO 179/1eU | kJ/m <sup>2</sup>       | 110    |
| Charpy Unnotched, -30 °C                               | ISO 179/1eU | kJ/m <sup>2</sup>       | 90     |
| Tensile Stress at Yield, 23 °C                         | ISO 527     | MPa                     | 46     |
| Tensile Strain at Yield, 23 °C                         | ISO 527     | %                       | 2.6    |
| Tensile Modulus                                        | ISO 527     | MPa                     | 2400   |
| Flexural Strength, 23 °C                               | ISO 178     | MPa                     | 70     |
| Flexural Modulus, 23 °C                                | ISO 178     | MPa                     | 2400   |
| Hardness, Ball Indentation                             | ISO 2039-1  | MPa                     | 107    |
| Tensile Strain at Break, 23 °C                         | ISO 527     | %                       | > 15   |
| <b>Thermal Properties</b>                              |             |                         |        |
| Vicat Softening Temperature, VST/B/120 (50N, 120 °C/h) | ISO 306     | °C                      | 101    |
| Vicat Softening Temperature VST/B/50 (50N, 50 °C/h)    | ISO 306     | °C                      | 99     |

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| Property, Test Condition                                      | Standard        | Unit                 | Values            |
|---------------------------------------------------------------|-----------------|----------------------|-------------------|
| Vicat Softening Temperature, VST/A/50 (10N, 50 °C/h)          | ISO 306         | °C                   | 102               |
| Heat Deflection Temperature A; (annealed 4 h/80 °C; 1.8 MPa)  | ISO 75          | °C                   | 94                |
| Heat Deflection Temperature B; (annealed 4 h/80 °C; 0.45 MPa) | ISO 75          | °C                   | 98                |
| Coefficient of Linear Thermal Expansion                       | ISO 11359       | 10 <sup>-6</sup> /°C | 90                |
| <b>Electrical Properties</b>                                  |                 |                      |                   |
| Dissipation Factor (100 Hz)                                   | IEC 62631-2-1   | 10 <sup>-4</sup>     | 50                |
| Dissipation Factor (1 MHz)                                    | IEC 62631-2-1   | 10 <sup>-4</sup>     | 90                |
| Dielectric Strength, Short Time, 1.5 mm                       | IEC 60243-1     | kV/mm                | 35                |
| Relative Permittivity (100 Hz)                                | IEC 62631-2-1   | -                    | 3                 |
| Relative Permittivity (1 MHz)                                 | IEC 62631-2-1   | -                    | 2.9               |
| Comparative Tracking Index                                    | IEC 60112       | V                    | 600               |
| Volume Resistivity                                            | IEC 62631-3-1   | Ohm*m                | >10 <sup>13</sup> |
| Surface Resistivity                                           | IEC 62631-3-1   | Ohm                  | >10 <sup>15</sup> |
| <b>Other Properties</b>                                       |                 |                      |                   |
| Density                                                       | ISO 1183        | kg/m <sup>3</sup>    | 1050              |
| Water Absorption, Saturated at 23 °C                          | ISO 62          | %                    | 0.95              |
| UL94 rating at 1.5 mm thickness                               | IEC 60695-11-10 | -                    | HB                |
| Burning rate (US-FMVSS), 2.0 mm                               | ISO 3795        | mm/min               | 60                |
| <b>Processing</b>                                             |                 |                      |                   |
| Linear Mold Shrinkage                                         | ISO 294-4       | %                    | 0.4 - 0.7         |
| Melt Temperature Range                                        | ISO 294         | °C                   | 230 - 260         |
| Mold Temperature Range                                        | ISO 294         | °C                   | 60 - 80           |
| Injection Velocity                                            | ISO 294         | mm/s                 | 240               |
| Drying Temperature                                            | -               | °C                   | 80                |
| Drying Time                                                   | -               | h                    | 2 - 4             |

Typical values for uncolored products

Please note that all processing data stated are only indicative and may vary depending on the individual processing complexities.

Please consult our local sales or technical representatives for details.

Contact us:  
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### SUPPLY FORM

Novodur® is delivered in the form of cylindrical or spherical pellets. The bulk density of the pellets is from 0.55 to 0.65 g/cm<sup>3</sup>. Values may differ for special grades. Standard Packaging unit: 25 kg PE-bag on palette, shrunk or wrapped with PE film. In addition, delivery in larger units of up to 1000 kg (IBC = Intermediate Bulk Container) or silo trucks can be arranged. In dry areas with normal temperature control, Novodur pellets can be stored for relatively long periods of time without any change in mechanical properties. With unstable colors, however, storage over a number of years can give rise to some change in color. Under poor storage conditions, Novodur absorbs moisture, but this can be removed by drying.

### PRODUCT SAFETY

No adverse effects on the health of processing personnel have been observed where the products are correctly processed and the production areas are suitably ventilated. For styrene, alpha-methylstyrene, acrylonitrile, and butyl acrylate the maximum allowable workplace concentrations must be observed according to the pertaining national regulations. In Germany, the following limit values are valid TRGS 900 (Aug. 2004): styrene, MAK-value: 20 ml/m<sup>3</sup>; alpha-methylstyrene, MAK-value: 100 ml/m<sup>3</sup>; acrylonitrile, TRK-value: 3 ml/m<sup>3</sup>, and butyl acrylate, MAK-value: 2 ml/m<sup>3</sup> (1.7.2004). According to EU directive 67/548/EEC, Annex I (2001), acrylonitrile is classified as carcinogenic, category 2 ('substances which should be regarded as if they are carcinogenic to man'). Experience has shown that when Novodur® is processed correctly with appropriate ventilation, the levels are far below the limits mentioned above. Inhalation of the vapors of degradation products which can arise on severe overheating of the materials or during purging out should be avoided. Further information can be found in the Novodur safety data sheets.

### DISCLAIMER

The above mentioned data are accurate to the best of our knowledge. They are based upon reputable labs and industry standard testing methods. These are only typical values and actual product specification may deviate at industrial range. Therefore, no data in this technical data sheet shall constitute a warranty or representation regarding product features, fitness of the product for a specific purpose or application or its processability. INEOS Styrolution disclaims all liability in connection therewith. The customer himself is required to verify whether or not the product is suitable for the further processing or application intended and whether or not the product complies with the relevant statutory requirements. Unless explicitly and individually otherwise agreed in writing, INEOS Styrolution's sole and exclusive liability with respect to its products is set forth in INEOS Styrolution's General Terms and Conditions for Sale.