

**Product Information Ultrason® E**

2010 MR SW 10111

09/2013

**PESU****Product description**

Unreinforced, medium viscosity standard injection moulding grade, demolding optimized.  
Abbreviated designation according to ISO 1043-1: PESU

**Physical form and storage**

Ultrason® pellets are supplied in bags and/or octabins. The bulk density ranges between 700 and 800 g/l. Provided the packaging remains undamaged, Ultrason® can be stored indefinitely. Ultrason® pellets absorb moisture very rapidly. Therefore, the pellets need to be dried at least 4h at 130 °C to 150 °C in a vacuum or dry air drier prior to processing.

**Product safety**

From our experience and information, proper treatment and reasonable use of the product will not have any health hazardous effects.  
In view of the high temperatures involved in processing Ultrason®, great care must be exercised -even more than for other thermoplastics- in handling the machinery, molds, moldings and residual melts. If there are concerns or doubts on the thermal capacity and limits, the machinery manufacturer should be consulted.  
Any product that has decomposed during injection molding must be removed from the barrel by injection into the atmosphere and simultaneous reduction of the barrel temperature. Noxious odors that could form during this procedure can be reduced by rapid cooling of the degraded material, e.g. in a water bath. If the degraded material is not pumped out of the barrel, gas pressure may build up, particularly if nozzle shutoff devices are used. The built-up pressure could then release violently around the nozzle or hopper areas, and explosions would therefore be expected in the course of pumping.  
If the normal precautions are taken and the upper temperature limit, i.e. 390°C, is not exceeded, no health hazardous vapors are formed while Ultrason® is being processed. In common with all other thermoplastics, Ultrason® decomposes on exposure to excessive heat, for instance if the melt temperature is too high and/or the residence time in the plasticizing unit is too long or if residues are burned off during cleaning of the machinery. The figures laid down for the maximum allowable dust concentrations (e.g. MAK value in Germany) must be met in further processing.  
The work place must be well ventilated, preferably by means of an extraction system installed above the barrel unit. Irrespective of this, all precautions relating to accident prevention must strictly be taken. Under no circumstances may the plasticizing units be dismantled after a breakdown while they are still hot.

**Note**

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. In order to check the availability of products please contact us or our sales agency.

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67056 Ludwigshafen, Germany

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## Product Information

| Typical values for uncoloured product at 23 °C <sup>1)</sup>         | Test method <sup>2)</sup> | Unit                   | Values <sup>3)</sup> |
|----------------------------------------------------------------------|---------------------------|------------------------|----------------------|
| <b>Properties</b>                                                    |                           |                        |                      |
| Polymer abbreviation                                                 | -                         | -                      | <b>PESU</b>          |
| Density                                                              | ISO 1183                  | kg/m <sup>3</sup>      | <b>1370</b>          |
| Viscosity number (in 0,01 g/ml Phenol/1,2, ortho-Dichlorbenzol, 1:1) | ISO 307, 1157, 1628       | cm <sup>3</sup> /g     | <b>56</b>            |
| Water absorption, equilibrium in water at 23°C                       | similar to ISO 62         | %                      | <b>2.2</b>           |
| Moisture absorption, equilibrium 23°C/50% r.h.                       | similar to ISO 62         | %                      | <b>0.80</b>          |
| Glass transition temperature, DSC (10°C/min)                         | ISO 11357-1/-2            | °C                     | <b>225</b>           |
| <b>Processing</b>                                                    |                           |                        |                      |
| Processing: Injection moulding (M), Extrusion (E), Blow moulding (B) | -                         | -                      | <b>M, E, B</b>       |
| Melt volume-flow rate MVR 360 °C/10 kg                               | ISO 1133                  | cm <sup>3</sup> /10min | <b>70</b>            |
| Melt temperature, injection moulding/extrusion                       | -                         | °C                     | <b>340 - 390</b>     |
| Mould temperature, injection moulding                                | -                         | °C                     | <b>140 - 180</b>     |
| Molding shrinkage, parallel                                          | ISO 2577, 294-4           | %                      | <b>0.82</b>          |
| Molding shrinkage, normal                                            | ISO 2577, 294-4           | %                      | <b>0.86</b>          |
| <b>Flammability</b>                                                  |                           |                        |                      |
| UL94 rating at thickness d = 1.6 mm                                  | IEC 60695-11-10           | class                  | <b>V-0</b>           |
| UL94 rating at thickness d = 3 mm                                    | IEC 60695-11-10           | class                  | <b>V-0</b>           |
| <b>Mechanical properties</b>                                         |                           |                        |                      |
| Tensile modulus                                                      | ISO 527-1/-2              | MPa                    | <b>2650</b>          |
| Yield stress, 50 mm/min                                              | ISO 527-1/-2              | MPa                    | <b>85</b>            |
| Yield strain, 50 mm/min                                              | ISO 527-1/-2              | %                      | <b>6.9</b>           |
| Tensile creep modulus, 1000 h, strain ≤ 0,5%, 23°C                   | ISO 899-1                 | MPa                    | <b>2700</b>          |
| Charpy unnotched impact strength (23°C)                              | ISO 179/1eU               | kJ/m <sup>2</sup>      | <b>N</b>             |
| Charpy unnotched impact strength (-30°C)                             | ISO 179/1eU               | kJ/m <sup>2</sup>      | <b>N</b>             |
| Charpy notched impact strength (23°C)                                | ISO 179/1eA               | kJ/m <sup>2</sup>      | <b>6.5</b>           |
| Charpy notched impact strength (-30°C)                               | ISO 179/1eA               | kJ/m <sup>2</sup>      | <b>7</b>             |
| Izod notched impact strength (23°C)                                  | ISO 180/A                 | kJ/m <sup>2</sup>      | <b>6.5</b>           |
| Izod notched impact strength (-30°C)                                 | ISO 180/A                 | kJ/m <sup>2</sup>      | <b>7</b>             |
| Ball indentation hardness at 358 N/30 s                              | ISO 2039-1                | MPa                    | <b>154</b>           |
| <b>Thermal properties</b>                                            |                           |                        |                      |
| HDT A (1.80 MPa)                                                     | ISO 75-1/-2               | °C                     | <b>205</b>           |
| Max. service temperature (short cycle operation)                     | -                         | °C                     | <b>220</b>           |
| Coefficient of linear thermal expansion, longitudinal (23-80°C)      | ISO 11359-1/-2            | E-6/K                  | <b>52</b>            |
| Coefficient of linear thermal expansion, longitudinal (180°C)        | DIN 53752                 | E-6/K                  | <b>59</b>            |
| <b>Electrical properties</b>                                         |                           |                        |                      |
| Relative permittivity (100Hz)                                        | IEC 60250                 | -                      | <b>3.9</b>           |
| Relative permittivity (1 MHz)                                        | IEC 60250                 | -                      | <b>3.8</b>           |
| Dissipation factor (100 Hz)                                          | IEC 60250                 | E-4                    | <b>17</b>            |
| Dissipation factor (1 MHz)                                           | IEC 60250                 | E-4                    | <b>140</b>           |
| Electric strength K20/K20                                            | IEC 60243-1               | kV/mm                  | <b>37</b>            |
| Comparative tracking index, CTI, test liquid A                       | IEC 60112                 | -                      | <b>100</b>           |
| Comparative tracking index, CTI, test liquid B                       | IEC 60112                 | -                      | <b>100</b>           |
| Volume resistivity                                                   | IEC 60093                 | Ohm*m                  | <b>&gt;1E13</b>      |

### Footnotes

- 1) If product name or properties don't state otherwise.  
2) Specimens according to CAMPUS.  
3) The asterisk symbol "\*" signifies inapplicable properties.

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