

SPECIFIED PRODUCT PROPERTIES

| Parameter | Value | Unit | Method |
|-------------------------------|----------|------|-------------------------|
| Shot content >63 µm | Max 0.5 | wt% | TV316 (internal method) |
| Fibre length weighted average | 230 ± 50 | µm | TV305 (internal method) |
| Moisture content | Max 0.1 | wt% | TV302 (internal method) |
| Ignition loss | Max 0.3 | wt% | TV302 (internal method) |

TYPICAL CHEMICAL PRODUCT PROPERTIES

| Chemistry | SiO ₂ | Al ₂ O ₃ | TiO ₂ | Fe ₂ O ₃ | CaO | MgO | Na ₂ O | K ₂ O | P ₂ O ₅ | MnO |
|-----------|------------------|--------------------------------|------------------|--------------------------------|------|-----|-------------------|------------------|-------------------------------|-----|
| wt% | 42.7 | 18.5 | 1.3 | 7.7 | 20.6 | 6.0 | 2.2 | 0.6 | 0.2 | 0.2 |

Test Method: XRF

| Trace elements | Chromium* (CrVI) | Thallium (Tl) | Arsenic (As) | Barium (Ba) | Beryllium (Be) | Cadmium (Cd) | Cobalt (Co) |
|----------------|------------------|---------------|--------------|-------------|----------------|--------------|---------------|
| | ppm | <0.50 | <5.0 | <5.0 | 140 | <1.0 | <0.40 |
| ppm | Mercury (Hg) | Copper (Cu) | Nickel (Ni) | Lead (Pb) | Selenium (Se) | Vanadium (V) | Antimony (Sb) |
| | <0.10 | 15 | 15 | <10 | <2.0 | 56 | <0.10 |

Test Method: NEN-EN-ISO17294-2 / * NEN-EN15192

TYPICAL PRODUCT PROPERTIES

| Parameter | Value | Unit | Method |
|----------------------------------|---------------|-------------------|-------------------------|
| Shot content >45 µm | 0.5 | wt% | TV316 (internal method) |
| Shot content >63 µm | 0.1 | wt% | TV316 (internal method) |
| Shot content >125 µm | <0.1 | wt% | TV316 (internal method) |
| Shot content >250 µm | <0.1 | wt% | TV316 (internal method) |
| Shot content >600 µm | <0.1 | wt% | TV316 (internal method) |
| Fibre diameter numerical average | 5.5 | µm | TV165 (internal method) |
| Fibre diameter numerical D10 | 1 | µm | TV719 (internal method) |
| Fibre diameter numerical D50 | 4 | µm | TV719 (internal method) |
| Fibre diameter numerical D90 | 8 | µm | TV719 (internal method) |
| Specific surface area | 0.20 | m ² /g | TV165 (internal method) |
| Fibre length distribution | Log-normal | | |
| Aspect ratio | 40 | l/d | Theoretical calculation |
| Colour | Grey-green | | Visual appearance |
| Colour | 65 - 0.8 - 11 | CIE L*a*b* | TV711 (internal method) |
| Hardness | 6 | moh | ASTM E2546-07 |

TYPICAL PRODUCT PROPERTIES

| Parameter | Value | Unit | Method |
|------------------------------------|--------------|-------------------|-------------------------------|
| Extract pH | 9.8 | | ISO787-9:1995 |
| Acid resistance (pH) | ≥3 | | HCl 20°C (internal method) |
| Alkaline resistance (pH) | ≤12 | | NaOH 20°C (internal method) |
| Water solubility cold | 0.2 | wt% | ISO787-8-2001 |
| Water solubility hot | 0.1 | wt% | ISO787-3-2001 |
| Melting point (full liquification) | >1200 | °C | DSC |
| Crystallization temperature | 881 | °C | DSC |
| Dimensional stability | >1100 | °C | TV315 (internal method) |
| Softening point | 833 | °C | Littleton |
| Glass transition temperature | 683 | °C | DSC |
| Specific density | 2.75 | g/cm ³ | Chemical calculation |
| Elastic modulus | 100 | Gpa | 20°C- 50%RH (internal method) |
| Tensile strength | 800 | Mpa | 20°C- 50%RH (internal method) |
| Surface treatment | Amino-silane | | |
| Storage conditions | dry, <50°C | | |

All Lapinus products are certified biosoluble and safe for human and environment.

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Content and interpretation of the Lapinus PDS

With the new PDS, we want to give as much relevant information on our products as we can, which can better serve your needs in application development.

With the increased amount of information on the PDS, we have made a split in 'Specified', 'Chemical' and 'Typical' product properties.

The 'Specified' product properties are the properties which are controlled on a regular interval and are our specification of the product.

The 'Chemical' product properties show the chemical proprietary composition of our stone wool products. This composition guarantees that the fibres are safe to use.

The 'Typical' product properties are a list of various product properties that are known from the Lapinus® material. The list is based on past inquiries from customers in various applications. Not all properties will be relevant for all applications. The list is included in the PDS for your reference. The values of the 'Typical' product properties do not form part of the specification of the products.