

## FRIALIT F99,7 hf

2021.06.29

Material Type: Aluminium oxide ( $\alpha$ -Al<sub>2</sub>O<sub>3</sub>)

### MECHANICAL & PHYSICAL CHARACTERISTICS (TYP.)

|  |                         |                      |
|--|-------------------------|----------------------|
| Purity                                   | [wt.-%]                 | >99.5                |
| Density                                  | [g/cm <sup>3</sup> ]    | ≥3.90                |
| Open porosity                            | [vol.-%]                | 0                    |
| Average size of crystallites             | [µm]                    | 20                   |
| Bending strength $\sigma_m$ DIN EN 843-1 | [MPa]                   | 350                  |
| Weibulls modulus                         | [-]                     | ≥10                  |
| Toughness $K_{Ic}$ SEVNB                 | [MPa*m <sup>0.5</sup> ] | 3.5                  |
| Compressive strength                     | [MPa]                   | 3500                 |
| Young's modulus (static)                 | [GPa]                   | 380                  |
| Poisson's ratio                          | [-]                     | 0.22                 |
| Hardness HV1                             | [-]                     | 1640                 |
| Maximum service temperature in air       | [°C]                    | 1950                 |
| Linear coefficient of expansion          | -100 - 20 °C            | 5.5                  |
|  | 20 - 500 °C             | 7.3                  |
|  | 20 - 1000°C             | 8.2                  |
| Specific heat 20 °C                      | [J/(kg*K)]              | 900                  |
| Thermal conductivity                     | 20 °C                   | 34.9                 |
|  | 1000 °C                 | 6.8                  |
|  | 1500° C                 | 5.3                  |
| Resistivity                              | 20 °C                   | 10 <sup>14</sup>     |
|  | 1000 °C                 | 10 <sup>7</sup>      |
| Dielectric strength                      | [kV/mm]                 | >30                  |
| Relative permittivity                    | 70 MHz                  | 9.8                  |
|  | 180 MHz                 | 9.8                  |
|  | 30 - 40 GHz             | 9.8                  |
| Dielectric loss tangent                  | 70 MHz                  | 3.8*10 <sup>-4</sup> |
|  | 180 MHz                 | 2.5*10 <sup>-4</sup> |
|  | 30 - 40 GHz             | 1.4*10 <sup>-4</sup> |
| Typical colour                           | [-]                     | ivory                |

The data indicated on this table are in line with the introductory German Industrial Standard DIN 60672-2 are relate to test specimens from which they were obtained. They are not unconditionally applicable to other forms if the same material. The data must be regarded as indicative only. All data refer to a temperature of 20 °C, unless otherwise specified.