

## DATA SHEET

# Silicon Nitride

### Hot Isostatic Pressed Silicon Nitride, low additive

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#### Material

Material description

Hot e.g. Hot Isostatic pressed silicon nitride Al/Y

#### Microstructure

|                |                      |      |
|----------------|----------------------|------|
| Bulk density   | [g/cm <sup>3</sup> ] | 3,20 |
| Open Porosity  | [%]                  | 0    |
| Grain spectrum | [µm]                 | 1-10 |

#### Mechanical Properties

|                             |     |                        |       |
|-----------------------------|-----|------------------------|-------|
| Hardness                    | [2] | [HV1]                  | 1.650 |
| Compressive strength        |     | [MPa]                  | 3.000 |
| Bending Strength            | [3] | [MPa]                  | 850   |
| Weibull-Modulus             |     | m                      | 15    |
| Fracture toughness $K_{IC}$ |     | [MPam <sup>1/2</sup> ] | 6     |
| Youngs Modulus E            |     | [GPa]                  | 320   |
| Poisson ratio               |     |                        | 0,28  |

#### Thermal Properties

|  |     |                                     |        |
|--|-----|-------------------------------------|--------|
| Max. Working temperature               |     |                                     |        |
| - inert gas                            |     | [°C]                                | 1.500  |
| - air                                  |     | [°C]                                | 1.350  |
| Thermal conductivity (20°C)            |     | [W/mK]                              | 30     |
| Thermal expansion RT- 1000°C           |     | [10 <sup>-6</sup> K <sup>-1</sup> ] | 3,2    |
| RT- 250°C                              |     | [10 <sup>-6</sup> K <sup>-1</sup> ] | 1,6    |
| Specific heat                          |     | J/kgK                               | 720    |
| Thermal shock parameter R <sub>1</sub> | [4] | [K]                                 | 598    |
| Thermal shock parameter R <sub>2</sub> | [5] | [W/m]                               | 17.930 |

#### Chemical Composition

|  |  |     |    |
|--|--|-----|----|
| - Si <sub>3</sub> N <sub>4</sub>   |  | [%] | 96 |
| Sintering additives: Al <sub>2</sub> O <sub>3</sub> /Y <sub>2</sub> O <sub>3</sub> mixture |  | [%] | 4  |

Please note that all values quoted are based on test pieces and may vary according to component design. These values are not guaranteed in any way whatsoever and should only be treated as indicative and for guidance only.