

# ISiComp®

## The Ceramic Matrix Composite for Aerospace application

Operating temperature up to **1500°C** in inert atmosphere



ISiComp® is a carbon fiber reinforced CMC (Ceramic Matrix Composite) developed for a variety of applications which require both lightness and good mechanical properties. Both planar and complex shapes can be manufactured, depending on the specific needs. The standard product withstands up to 1500°C in inert atmosphere or vacuum. A protective ceramic coating was devised for this material which makes it suitable for higher temperatures applications (up to 1650°C) in low-oxygen atmospheres.

|   | Standard      | Temperature | Unit                                | Average Value |
|---|---------------|-------------|-------------------------------------|---------------|
| Density                                     | ASTM C-20     | 20°C        | g/cc                                | 1,9           |
| Open porosity                               |               | 20°C        | %                                   | 4             |
| Bending strength                            | ASTM C1341    | 20°C        | MPa                                 | 230           |
| Bending modulus                             |               | 20°C        | GPa                                 | 60            |
| Tensile strength                            | ASTM C1275    | 20°C        | MPa                                 | 170           |
| Tensile modulus                             |               | 20°C        | GPa                                 | 80            |
| Compressive Strength                        | ASTM C1358    | 20°C        | MPa                                 | 260           |
| Compressive Modulus                         |               | 20°C        | GPa                                 | 80            |
| ILSS  | ASTM C1292-10 | 20°C        | MPa                                 | 25            |
| Thermal conductivity (T.T.T*)               | ASTM E1461    | 400°C       | W/(m·K)                             | 8 – 9         |
| Thermal conductivity (in plane)             |               |             |                                     | 15 – 16       |
| Thermal conductivity (T.T.T*)               |               | 600°C       | W/(m·K)                             | 8 – 9         |
| Thermal conductivity (in plane)             |               |             |                                     | 16 – 18       |
| Specific heat                               | ASTM E1461    | 400°C       | J/(g·K)                             | 1,15 – 1,30   |
|   |               | 600°C       |                                     | 1,40 – 1,50   |
| Coefficient of thermal expansion (in plane) | I.P.**        | 20-500°C    | 10 <sup>-6</sup> · °C <sup>-1</sup> | 0,40 - 0,50   |
| Coefficient of thermal expansion (in plane) | I.P.**        | 20-1000°C   | 10 <sup>-6</sup> · °C <sup>-1</sup> | 0,81 – 0,93   |
| Silicon Carbide (SiC)                       | I.P.**        | --          | Wt %                                | 31 – 37       |
| Silicon (Si)                                |               |             |                                     | 1 – 4         |
| Carbon (C)                                  |               |             |                                     | 61 - 67       |

All values are referred to a 0-90° lay-up. Sample were tested in the 0° direction

\* T.T.T. = Through The Thickness

\*\* I.P. = Internal procedure

[info@cira.it](mailto:info@cira.it)

[info@petroc ceramics.com](mailto:info@petroc ceramics.com)