

HT COMPOSITE S-950 AND S-950Z

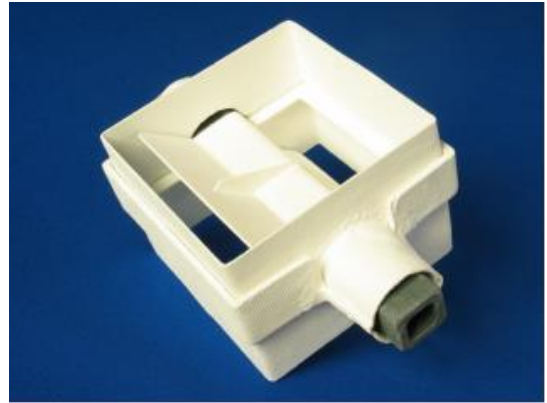
HT Composite S-950 and **HT Composite S-950Z** are oxide fiber ceramic matrix composites, composed out of high-temperature resistant SiO_2 fabrics woven out of endless filament yarns, a $\text{SiO}_2 - \text{Al}_2\text{O}_3$ binding system and $\text{SiO}_2 - \text{Al}_2\text{O}_3$ powders.

Furthermore the **HT Composite S-950Z** shapes and sheets are coated on both sides with an Yttria Stabilized Zirconia (3YSZSA) coating for a harder and erosion resistant surface. Besides all kind of 3 dimensional shapes like launders for aluminium transport, protection caps, profiles etc., flat sheets are available in this HT Composite quality.

With **HT Composite S-950** and **HT Composite S-950Z**, the positive properties of classical monolithic ceramics, like temperature resistance, corrosion resistance and hardness, are combined with the well-known good properties of (heat resistant) metals like: damage tolerance and thermal shock resistance.

The manufacturing of components, shapes and sheets is done with similar laminating processes known from fiber-reinforced plastics. With comparable forms, processes and special technical equipment it is possible to produce plates, tubes and complex, thin-walled lightweight structures. Shapes and plates are produced in a "green" stage, dried, fired (sintered), coated and fired again to obtain their specific properties.

HT Composite S-950 and **HT Composite S-950Z** are composite materials which unites the theoretical reflections of fiber-reinforced composites. It is the function of those fibers to keep the monolithic ceramic matrices together, which are porous and have a lot of micro cracks. The force will be diverted at the matrix-fiber interface.

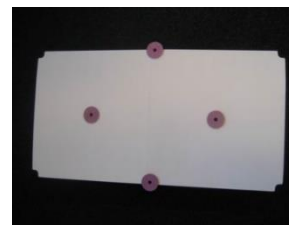


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This means that structures, whose outermost matrix layer will be destroyed, can work further at lower mechanical load. Energy absorbing mechanisms like fiber pull-out and crack diversion are responsible for this effect. This has a positive influence on damage tolerance and thermal shock resistance.

HT Composite S-950 and **HT Composite S-950Z** is temperature and thermal shock resistant, damage tolerant, corrosion resistant, weather (frost) resistant and thin-walled. It is known as the only “flexible ceramic”.

Sheets can be water-cut to customer to customer requirements. But also provided with moles or slots for fixing on steel frames or structures.



High temperature composite Type (HT-C)	S-950	S-950Z
Fibre / fabric type	Silica	Silica
Fabric thickness	0,75 mm	0,75 mm
Matrix	75% Al ₂ O ₃ 25% SiO ₂	75% Al ₂ O ₃ 25% SiO ₂
Bending strength [MPa]		
- at room temperature	20	20
- at service temperature	20	20
Coating		Ytria stabilized Zirconia, water based suspension (3YSZSA)
Modulus of elasticity in flexure at room temperature [GPa]	-	-
Tensile strength at room temperature [MPa]	-	-
Modulus of elasticity in tensile at room temperature [GPa]	-	-
Compressive resistance at room temperature [MPa]	-	-
Modulus of elasticity in compressive at room temperature [GPa]	-	-
Shearing resistance (ISLR) at room temperature [MPa]	-	-
Thermal extension coefficient [10 ⁻⁶ 1K]	2	2
Thermal conductivity [W/m·K]	<1	<1
Continuous service temperature without mechanical load [°C]	< 950	<950
Continuous service temperature with mechanical load [°C]	< 900	<900