

# WINDFORM® GF 2.0

**CLASS OF MATERIAL:** Polyamide composite material

**TECHNOLOGY:** Selective Laser Sintering

Windform® GF 2.0 is the evolutionary substitute for Windform GF, our first generation material. Windform® GF 2.0 is a composite material made of polyamide filled with glass and aluminium, which presents an improvement in both the thermal and mechanical properties, and the aesthetics of the product. In terms of performance, Windform® GF 2.0 shows a significant improvement in the HDT (almost +8%), that is, the heat deflection temperature as well as an increase in the values of tensile strength and elongation strength, therefore offering greater ductility than the previous version, appreciable in various racing applications and functions subject to greater vibrations.

Excellent mechanical properties per unit of density, thanks to its lighter weight.

Windform® GF 2.0, furthermore, shows less moisture absorption than the other Windform products.

On an aesthetic level, Windform® GF 2.0 maintains and enhances the light grey colour and glossy metallic appearance, appreciated in many design and wind tunnel applications, offering an even brighter look.

Moreover, of great importance, is the improvement in detail reproduction, which makes Windform® GF 2.0 particularly suitable for applications which require accurate and superior surface definition and excellent reproduction of even the finest details.

Excellent value for money.

## **APPLICATIONS:**

Objects of design and functional aesthetic reproduction, intake manifolds (intake and cooling ducts, air inlet systems), hydraulic ducts (fluid temperature further elevated up to 134°C), fuel systems and household appliances.

These applications indicated are just an example. The versatility of the product combined with the technology used allows for endless possibilities.

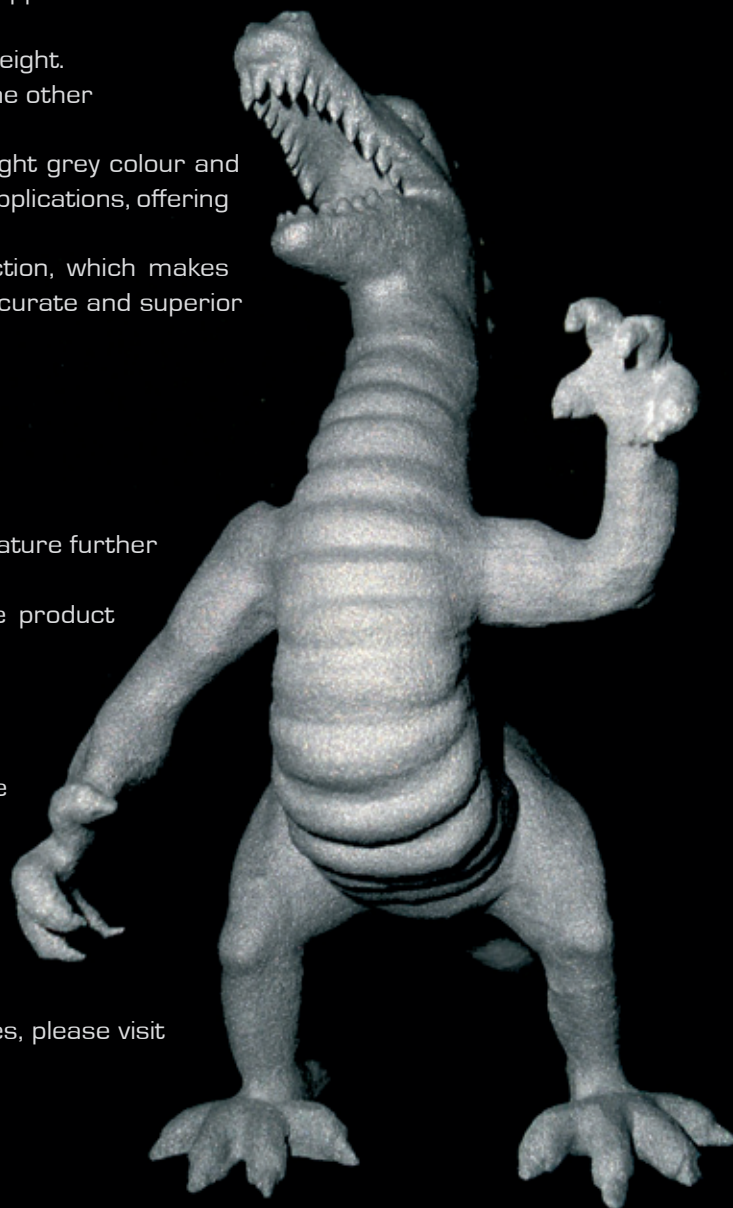
## **WHERE TO FIND WINDFORM® PRODUCTS**

CRP Technology produces items in Windform® GF 2.0 and distributes the material in Europe, USA and Japan, offering a customized service for time and mode of delivery of the product, depending on the customers' needs, anywhere in the world.

## **HOW TO GET WINDFORM® PRODUCTS**

For further information, a request for quotation or to check delivery times, please visit our website [www.windform.eu](http://www.windform.eu) or send an enquiry to [info@crp.eu](mailto:info@crp.eu).

We will be in contact with you to answer all your enquiries.



# WINDFORM<sup>®</sup> GF 2.0

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WINDFORM <sup>®</sup> GF 2.0	Test Method	SI Unity	Windform <sup>®</sup> GF 2.0
<b>GENERAL PROPERTIES</b>			
Density (20° C)		g/cc	1,41
Colour			ALUMINIUM
<b>THERMAL PROPERTIES</b>			
Melting point	ISO 11357-2	°C	179,60
HDT, 1.82 Mpa	ASTM D 648 TYPE B	°C	134,30
Vicat 10N	ASTM D1525-09	°C	168,70
<b>MECHANICAL PROPERTIES</b>			
Tensile Strength	UNI EN ISO 527-1:1997	Mpa	50,60
Tensile Modulus	UNI EN ISO 527-1:1997	Mpa	4304
Elongation at break	UNI EN ISO 527-1:1997	%	4,60
Flexural Strength	UNI EN ISO 14125:2000	Mpa	80,20
Flexural Modulus	UNI EN ISO 14125:2000	Mpa	3430
Impact Strength Unnotched (Charpy 23°C)	UNI EN ISO 179-1:2007	KJ/m <sup>2</sup>	21,85
Impact Strength Notched (Charpy 23°C)	UNI EN ISO 179-1:2007	KJ/m <sup>2</sup>	4,72
<b>ELECTRICAL PROPERTIES</b>			
Resistivity, Volume	ASTM D257:1993	ohm * cm	1,0 x 10 <sup>13</sup>
Resistivity, Surface	ASTM D257:1993	ohm	9,1 x 10 <sup>13</sup>
<b>SURFACE FINISH</b>			
After SLS Process		Ra µm	6,0
After finishing		Ra µm	1,8
<b>PROPERTIES PER DENSITY UNIT</b>			
UTS per density unit		Mpa/(g/cc)	35,89
Tensile Modulus per density unit		Mpa/(g/cc)	3052,48
Flexural Strength per density unit		Mpa/(g/cc)	56,88
Flexural Modulus per density unit		Mpa/(g/cc)	2432,62

**Note: these are all indicative values.** Data were generated from the testing of parts produced with Windform<sup>®</sup> GF 2.0 material under optimal processing conditions.

**Standard Technical Details for Accuracy versus Tolerance:**

For parts up to 6" (150 mm) the standard tolerance is: +/- 0.012 inch (0,3 mm)

For parts more then 6" (150 mm) the standard tolerance is: +/- 0.002 inch per inch (0,05 mm per 25 mm)