



Recycling marine plastics into 3D printer filament

Extended Technical Data Sheet

(1st May 2022)

Product Name - 0rCA®

Material - 90% Recycled PA6 10% Recycled CF

Description

0rCA® is a blend of semi-crystalline PA6 that has high tensile strength and good impact resistance, with a 10% recycled carbon fibre cut strand fill.

Both the PA6 and carbon fibre are recycled making this the lowest carbon impact material in its class. Our current estimate made on the basis of combined results from LCAs on the PA6 and CF is a 90% reduction in emissions attributable to 0rCA® when compared to virgin equivalents.

Its mechanical properties make an especially interesting material for use in applications where exceptional strength and stiffness are useful e.g. mobility, high speed components.

0rCA® is a technical, engineering grade material and is not recommended for novice users. It requires professional grade systems and processes to maximise its performance.

As with most nylon based materials, 0rCA® is susceptible to absorption of moisture both before and after forming, though less so than an unfilled PA6.

0rCA® should be dried prior to use and kept in a controlled environment between uses. Insufficient drying prior to use may result in warping, poor surface quality and an increased probability of failure.

Typical drying parameters are 5 hours at 80°C at a controlled humidity of 10% H₂O or lower. Effective drying cannot be achieved reliably at temperatures below 70°C.

0rCA® is an abrasive material in the molten phase due to the carbon fibre fill and a hardened nozzle is essential.

Typical Printing Parameters

Bed Temperature 50-80°C
Nozzle Temperature 250-280 °C
Cooling 0%



Test	Test Standard	SI Unit	Measured Value	Standard Deviation
Density	ISO 1183	kg/m ³	1184	1
Water Absorption	40°C for 28 Days	%		
Wear Resistance	Taber Abrasion H22/3000 cycles	%	0.04	0

Resistance to UV -28 Days

Tensile Strength @ Break	ISO 527-2	Mpa		
Elongation @ Break	ISO 527-2	%		
Tensile Modulus	ISO 527-2	Mpa		

DISCLAIMER

Properties reported here are average of typical batches examined by an independent ISO certified laboratory. Any technical information or assistance provided herein is given and accepted at your own risk, and neither Fishy Filaments nor its affiliates make any warranty relating to it or because of it. Neither Fishy Filaments nor its affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made regarding the merchantability or fitness of any product; and nothing herein waives any of Fishy Filaments's conditions of sale.

Test	Test Standard	SI Unit	Measured Value at 23C	Standard Deviation	Measured Value at 60C	Measured Value at 90C	Measured Value at 120C	Measured Value at 150C
Tensile Strength								
Tensile Strength @ Break	ISO 527-2	Mpa	72.2	1.5	47.7	37.7	30.0	24
Elongation @ Break	ISO 527-2	%	16	7	58	58	52	66
Tensile Strength @ Yield	ISO 527-2	Mpa						
Elongation @ Yield	ISO 527-2	%						
Tensile Modulus	ISO 527-2	Mpa	3639	102	776	437	389	337
Flex (3 Point)								
Flexural Stress	ISO 178	Mpa						
Flexural Modulus	ISO 178	Mpa	2572					
Charpy Impact								
Charpy Impact at -20C	ISO180	kJ/m ²	2.86	0.51				
Charpy Impact at +23C	ISO180	kJ/m ²	4.58	0.95				
Heat & Flammability								
VICAT	ISO306/B120	C	196.8	0.4				
Heat Distortion temperature	ISO 75/A/ 1.8MPa	C	108.3	0.4				
Melting Temperature	ISO 11357-3	C	218					
Thermal Expansion	ISO 11359	µm/m°C	93.5					
Flammability	UL94 Vertical test	V0,1 or 2	V0					

