



Recycling marine plastics into 3D printer filament

Extended Technical Data Sheet (updated 20th March 2020)

Product Name - Porthcurno

Material - Recycled Nylon 6, Polyamide 6, PA 6

Description

Porthcurno is a semi-crystalline nylon blend with high tensile strength, good impact resistance and low surface friction.

Its properties after atmospheric curing or overnight soaking in water make an especially interesting material for use in applications where moderate flexibility and high strength are useful e.g. in-production fittings, wearables and live hinges.

Nylon is a technical, engineering grade material and is not recommended for novice users.

As with most nylons, Porthcurno is susceptible to absorption of moisture both before and after forming.

Porthcurno should be dried prior to use and kept in a controlled environment between uses. Insufficient drying prior to use will 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.

We expect most conventional masterbatch already validated for use with nylons to be suitable for compounding

| Test | Test Standard | SI Unit | Measured Value | Standard Deviation |
|------------------|--------------------------------|-------------------|----------------|--------------------|
| Density | ISO 1183 | kg/m ³ | 1127 | 7 |
| Water Absorption | 40°C for 28 Days | % | 9.12 | |
| Wear Resistance | Taber Abrasion H22/3000 cycles | % | 0.02 | 0.01 |

Resistance to UV -28 Days

| | | | | |
|--------------------------|-----------|-----|------|-----|
| Tensile Strength @ Break | ISO 527-2 | Mpa | 42 | 4 |
| Elongation @ Break | ISO 527-2 | % | 22 | 10 |
| Tensile Modus | ISO 527-2 | Mpa | 1280 | 379 |

DISCLAIMER

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Typical IM Parameters

| | |
|-----------------------|---------------------|
| Mold Temperature | 50-80°C |
| Injection Temperature | 250-280 °C |
| New Polymer | 5% (95% Porthcurno) |

| 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 | 48 | 6 | 40 | 29 | 26 | 23 |
| Elongation @ Break | ISO 527-2 | % | 3.6 | 1.2 | 58 | - | - | - |
| Tensile Strength @ Yield | ISO 527-2 | Mpa | 59 | 2 | | | | |
| Elongation @ Yield | ISO 527-2 | % | 41 | 18 | | | | |
| Tensile Modulus | ISO 527-2 | Mpa | 2262 | 208 | 638 | 559 | 368 | 279 |
| Flex (3 Point) | | | | | | | | |
| Flexural Stress | ISO 178 | Mpa | 70 | 2 | | | | |
| Flexural Modulus | ISO 178 | Mpa | 2126 | 184 | | | | |
| Charpy Impact | | | | | | | | |
| Charpy Impact at -20C | ISO180 | kJ/m ² | 2.76 | 0.54 | | | | |
| Charpy Impact at +23C | ISO180 | kJ/m ² | 5.15 | 0.72 | | | | |
| Heat & Flammability | | | | | | | | |
| VICAT | ISO306/B120 | C | 195.4 | 0.2 | | | | |
| Heat Distortion temperature | ISO 75/A/1.8MPa | C | 53.4 | 0.1 | | | | |
| Melting Temperature | ISO 11357-3 | C | 220 | | | | | |
| Thermal Expansion | ISO 11359 | µm/m°C | 105.3 | | | | | |
| Flammability | UL94 Vertical test | V0,1 or 2 | V0 | | | | | |