CARACOL

At the Forefront of Additive Manufacturing, Enabling Your Next Move

Materials Data Sheets

Resins

Our Resins

DRAFT RESIN

Draft resin guarantees a **smooth finish** and **high accuracy**. Being an easy and fast material to print it is ideal for first prototypes and rapid iterations, to help our clients **bring their products faster to the market.**

APPLICATIONS

- CONSUMER GOODS
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

DRAFT RESIN	GREEN	POST-CURED AT ROOM TEMP.	POST-CURED AT 60°C	METHOD
Ultimate Tensile Strength	24 MPa	36 MPa	52 MPa	ASTM D 638-14
Tensile Modulus	0.8 GPa	1.7 GPa	2.3 GPa	ASTM D 638-14
Elongation at Break	14%	5%	4%	ASTM D 638-14
Flexural Modulus	0.6 GPa	1.8 GPa	2.3 GPa	ASTM D 790-17
Notched IZOD	26 J/m	29 J/m	26 J/m	ASTM D 256-10
Heat Deflection Temp. at 1.8 MPa	37 °C	44 °C	57 °C	ASTM D 648-18
Heat Deflection Temp. at 0.45 MPa	43 °C	53 °C	74 °C	ASTM D 648-18

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	0.18 %	Mineral oil (Heavy)	< 0.10 %
Acetone	4.24 %	Mineral oil (Light)	< 0.10 %
Bleach ~5% NaOCl	0.14 %	Salt Water (3.5% NaCl)	0.34 %
Butyl Acetate	0.11 %	Skydrol 5	0.31 %
Diesel Fuel	0.10 %	Sodium Hydroxide solution (0.025% PH 10)	0.28 %
Diethyl glycol Monomethyl Ether	0.77 %		
Hydraulic Oil	< 0.10 %	Strong Acid (HCl conc)	< 0.10 %
Hydrogen peroxide (3%)	0.23 %	TPM	0.29 %
Isooctane (aka gasoline)	< 0.10 %	Water	< 0.10 %
Isopropyl Alcohol	< 0.10 %	Xylene	< 0.10 %

CARACOL

ELASTIC 50A

A **soft** resin with **50A Shore** durometer, suitable to **replace silicone**. It is perfect for parts that will bend, stretch, compress, and hold up to repeated cycles without tearing.

APPLICATIONS

- CONSUMER GOODS
- FASHION
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

ELASTIC 50A	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	1.61 MPa	3.23 MPa	ASTM D 412-06 (A)
Stress at 50% Elongation	0.92 MPa	0.94 MPa	ASTM D 412-06 (A)
Stress at 100% Elongation	1.54 MPa	1.59 MPa	ASTM D 412-06 (A)
Elongation at Failure	100%	160%	ASTM D 412-06 (A)
Compression set at 23 ˚C for 22h	2%	2%	ASTM D 395-03 (B)
Compression set at 70 ˚C for 22h	3%	9%	ASTM D 395-03 (B)
Tear strength	8.9 kN/m	19.1 kN/m	ASTM D 624-00
Shore Hardness	40A	50A	ASTM 2240

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H SIZE GAIN	24H WEIGHT GAIN
Acetic Acid 5%	< 1 %	2.8 %
Acetone	19.3 %	37.3 %
Bleach ~5% NaOCl	< 1 %	2 %
Butyl Acetate	18.2 %	39.6 %
Diesel Fuel	1.2 %	4.2 %
Diethyl glycol Monomethyl Ether	12 %	28.6 %
Hydrolic Oil	< 1%	2.1%
Hydrogen peroxide (3%)	< 1%	2.2%
Isooctane (aka gasoline)	< 1%	3.5%
Isopropyl Alcohol	13.3%	25.6%

SOLVENT	24H SIZE GAIN	24H WEIGHT GAIN
Mineral oil (Heavy)	< 1 %	< 1 %
Mineral oil (Light)	< 1 %	< 1 %
Salt Water (3.5% NaCl)	< 1 %	1.7 %
Skydrol 5	9.9 %	21.7 %
Sodium Hydroxide solution (0.025% PH 10)	< 1 %	2 %
Strong Acid (HCl conc)	14.2 %	39.4 %
Water	< 1 %	2.3 %
Xylene	20.4 %	46.6 %

CARACOL

DURABLE RESIN

Durable Resin is a perfect choice for **squeezable parts and low-friction** assemblies. This material is one of the most **pliable, impact resistant, and lubricious** resins.

APPLICATIONS

- CONSUMER GOODS
- FASHION
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

DURABLE RESIN	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	13 MPa	28 MPa	ASTM D 638-14
Tensile Modulus	0.24 GPa	1.0 GPa	ASTM D 638-14
Elongation at Break	75%	55%	ASTM D 638-14
Flexural Stress at 5% Strain	1.0 MPa	24 MPa	ASTM D 790-17, Procedure A
Flexural Modulus	0.04 GPa	0.66 GPa	ASTM D 790-17, Procedure A
Notched IZOD	127 J/m	114 J/m	ASTM D 256-10 (2018), Test Method A
Unnotched IZOD	972 J/m	710 J/m	ASTM D 4812-11
Heat Deflection Temp. at 0.45 MPa	< 30 °C	41 °C	ASTM D 648-18, Method B
Thermal Expansion	124 µm/m/°C	106 µm/m/°C	ASTM E 831-14

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	1.3 %	Mineral oil (Heavy)	< 1 %
Acetone	sample cracked	Mineral oil (Light)	< 1 %
Bleach ~5% NaOCl	<1 %	Salt Water (3.5% NaCl)	<1 %
Butyl Acetate	7.9 %	Skydrol 5	1.3 %
Diesel Fuel	<1 %	Sodium Hydroxide solution (0.025% PH 10)	<1 %
Diethyl glycol Monomethyl Ether	7.8 %		
Hydrolic Oil	<1 %	Strong Acid (HCl conc)	distorted
Hydrogen peroxide (3%)	1 %	Water	<1 %
Isooctane (aka gasoline)	<1 %	Xylene	6.5 %
Isopropyl Alcohol	5.1 %		

CARACOL

FLEXIBLE 80A

Flexible 80A Resin a **stiff soft-touch material** with an **80A Shore** durometer, similar to the flexibility of rubber or TPU.

Balancing **softness with strength** it can withstand bending, flexing, and compression, even through repeated cycles..

APPLICATIONS

- CONSUMER GOODS
- FASHION
- ELECTRONICS
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

FLEXIBLE 80A	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	3.7 MPa	8.9 MPa	ASTM D 412-06 (A)
Stress at 50% Elongation	1.5 MPa	3.1 MPa	ASTM D 412-06 (A)
Stress at 100% Elongation	3.5 MPa	6.3 MPa	ASTM D 412-06 (A)
Elongation at Break	100%	120%	ASTM D 412-06 (A)
Shore Hardness	70A	80A	ASTM 2240
Compression Set (23°C for 22 hrs)	Not tested	3%	ASTM D 624 - 00
Compression Set (70°C for 22 hrs)	Not tested	5%	ASTM D 395-03 (B)
Tear Strength	11 kN/m	24 kN/m	ASTM D 395-03 (B)
Ross Flex fatigue at 23°C	Not tested	> 200.000 cycles	ASTM D 1052, notched, 60° bending, 100cycles/min
Ross Flex fatigue at -10°C	Not tested	> 50.000 cycles	ASTM D 1052, notched, 60° bending, 100cycles/min
Bayshore Resilience	Not tested	28%	ASTM D 2632
Glass transition temperature	Not tested	27 °C	DMA

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	0.9 %	Mineral oil (Heavy)	<0.1 %
Acetone	37.4 %	Mineral oil (Light)	0.1 %
Bleach ~5% NaOCl	0.6 %	Salt Water (3.5% NaCl)	0.5 %
Butyl Acetate	51.4 %	Skydrol 5	10.7 %
Diesel Fuel	2.3 %	Sodium Hydroxide solution (0.025% PH 10)	0.6 %
Diethyl glycol Monomethyl Ether	19.3 %	Strong Acid (HCl conc)	28.6 %
Hydrolic Oil	1.0 %	Tripropylene Glycol Methyl Ether	13.6 %
Hydrogen peroxide (3%)	0.7 %	Water	0.7 %
Isooctane (aka gasoline)	1.6 %	Xylene	64.1 %
Isopropyl Alcohol	11.7 %		

CARACOL

GREY PRO

Grey Pro Resin has **high precision, moderate elongation and resistance to deformation** over time: a versatile material suitable for a vide range of engineering applications.

APPLICATIONS

- ENGINEERING
- ELECTRONICS
- GOODS
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

GREY PRO	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	35 MPa	61 MPa	ASTM D 638-14
Tensile Modulus	1.4 GPa	2.6 GPa	ASTM D 638-14
Elongation	32.5 %	13%	ASTM D 638-14
Flexural Stress at 5% strain	39 MPa	86 MPa	ASTM D 790-15
Flexural Modulus	0.94 GPa	2.2 GPa	ASTM D 790-15
Notched IZOD	Not tested	18.7 J/m	ASTM D 256-10
Heat Deflection Temp. at 1.8 MPa	Not tested	62.4 °C	ASTM D 648-16
Heat Deflection Temp. at 0.45 Mpa	Not tested	77.5 °C	ASTM D 648-16
Thermal Expansion (-30 to 30 °C)	Not tested	78.5 um/m/C	ASTM E 831-13

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	0.75 %	Mineral oil (Heavy)	0.27 %
Acetone	10.77 %	Mineral oil (Light)	0.35 %
Bleach ~5% NaOCl	0.65 %	Salt Water (3.5% NaCl)	0.64 %
Butyl Acetate	0.84 %	Skydrol 5	0.54 %
Diesel Fuel	0.08 %	Sodium Hydroxide solution (0.025% PH 10)	0.72 %
Diethyl glycol Monomethyl Ether	2.38 %		
Hydrolic Oil	0.16 %	Strong Acid (HCl conc)	8.21 %
Hydrogen peroxide (3%)	0.75 %	Water	0.83 %
Isooctane (aka gasoline)	0.02 %	Xylene	0.42 %
Isopropyl Alcohol	1.56 %		

CARACOL

HIGH TEMP

The High Temp resin shows exceptional **resistance to heat**. This material is optimal for applications that need to resist **up to 238°C**, manufacturing objects that are both resistant and **highly precise**.

APPLICATIONS

- CONSUMER GOODS
- FASHION
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

HIGH TEMP	GREEN	POST-CURED AT ROOM TEMP.	POST-CURED + THERMALLY POST-CURED	METHOD
Heat Deflection Temp. at 1.8 MPa	43.6 °C	99.2 °C	101 °C	ASTM D 648-16
Heat Deflection Temp. at 0.45 MPa	49.3 °C	142 °C	238 °C	ASTM D 648-16
Ultimate Tensile Strength	20.9 MPa	58.3 MPa	51.1 MPa	ASTM D 638-14
Elongation at Break	14 %	3.3%	2.4 %	ASTM D 638-14
Tensile Modulus	0.75 GPa	2.75 GPa	2.9 GPa	ASTM D 638-14
Flexural Strength at break	24.1 MPa	94.5 Mpa	93.8 MPa	ASTM D 790-15
Flexural Modulus	0.69 GPa	2.62 GPa	2.62 GPa	ASTM D 790-15
Notched IZOD	32.8 J/m	18.2 J/m	24.2 J/m	ASTM D 256-10
Thermal Expansion (0-150°C)	118.1 µm/m/°C	79.6 µm/m/°C	74 µm/m/°C	ASTM E 831-13

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H SIZE GAIN	24H WEIGHT GAIN
Acetic Acid 5%	< 1 %	< 1 %
Acetone	< 1 %	< 1 %
Bleach ~5% NaOCl	< 1 %	< 1 %
Butyl Acetate	< 1 %	< 1 %
Diesel Fuel	< 1 %	< 1 %
Diethyl glycol Monomethyl Ether	< 1 %	< 1 %
Hydrolic Oil	< 1 %	< 1 %
Hydrogen peroxide (3%)	< 1 %	< 1 %
Isooctane (aka gasoline)	< 1 %	< 1 %
Isopropyl Alcohol	< 1 %	< 1 %

SOLVENT	24H SIZE GAIN	24H WEIGHT GAIN
Mineral oil (Heavy)	< 1 %	< 1 %
Mineral oil (Light)	< 1 %	< 1 %
Salt Water (3.5% NaCl)	< 1 %	< 1 %
Skydrol 5	< 1 %	< 1 %
Sodium Hydroxide solution (0.025% PH 10)	< 1 %	< 1 %
Strong Acid (HCl conc)	1.2 %	< 1 %
Water	< 1 %	< 1 %
Xylene	< 1 %	< 1 %

CARACOL

RIGID 4000

This glass-filled Resin allows for prints to withstand **minimal deflection** thanks to its high **strength and stiffness**. Perfect for general load-bearing application, this material also guarantees highly polished finishes.

APPLICATIONS

- ENGINEERING
- ELECTRONICS
- GOODS
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

RIGID 4000	GREEN	UV	METHOD
Ultimate Tensile Strength	33 MPa	69 MPa	ASTM D 638-14
Tensile Modulus	2.1 GPa	4.1 GPa	ASTM D 638-14
Elongation at Break	23 %	5.3 %	ASTM D 638-14
Flexural Strength	43 MPa	105 MPa	ASTM D 790-15
Flexural Modulus	1.4 GPa	3.4 GPa	ASTM D 790-15
Notched IZOD	16 J/m	23 J/m	ASTM D 256-10
Heat Deflection Temp. at 1.8 MPa	41° C	60 °C	ASTM D 648-16
Heat Deflection Temp. at 0.45 Mpa	48° C	77 °C	ASTM D 648-16
Thermal Expansion (0-150 °C)	64 µm/m/°C	63 µm/m/°C	ASTM E 831-13

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	0.8 %	Mineral oil (Heavy)	0.22 %
Acetone	3.3 %	Mineral oil (Light)	0.15 %
Bleach ~5% NaOCl	0.69 %	Salt Water (3.5% NaCl)	0.71 %
Butyl Acetate	<0.1 %	Skydrol 5	1.1 %
Diesel Fuel	<0.1 %	Sodium Hydroxide solution (0.025% PH 10)	0.68 %
Diethyl glycol Monomethyl Ether	1.4 %		
Hydraulic Oil	0.17 %	Strong Acid (HCl conc)	5.3 %
Hydrogen peroxide (3%)	0.87 %	Water	0.70 %
Isooctane (aka gasoline)	<0.1 %	Xylene	<0.1 %
Isopropyl Alcohol	<0.38 %		

CARACOL

STANDARD

This resin is suitable for demanding applications that require **high accuracy** and smooth finishes. The material proves also **good strength**, being a perfect choice for the manufacturing of robust parts.

APPLICATIONS

- ENGINEERING
- ELECTRONICS
- GOODS
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

STANDARD	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	38 MPa	65 MPa	ASTM D 638-10
Tensile Modulus	1.6 GPa	2.8 GPa	ASTM D 638-10
Elongation at Failure	12 %	6.2 %	ASTM D 638-10
Flexural Modulus	1.25 GPa	2.2 GPa	ASTM D 790-10
Notched IZOD	16 J/m	25 J/m	ASTM D 256-10
Heat Deflection Temp. at 1.8 MPa	42.7 °C	58.4 °C	ASTM D 648-07
Heat Deflection Temp. at 0.45 MPa	49.7 °C	73.1 °C	ASTM D 648-07

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	< 1 %	Mineral oil (Heavy)	< 1 %
Acetone	sample cracked	Mineral oil (Light)	< 1 %
Bleach ~5% NaOCl	< 1 %	Salt Water (3.5% NaCl)	< 1 %
Butyl Acetate	< 1 %	Skydrol 5	1 %
Diesel Fuel	< 1 %	Sodium Hydroxide solution (0.025% PH 10)	< 1 %
Diethyl glycol Monomethyl Ether	1.7 %		
Hydrolic Oil	< 1 %	Strong Acid (HCl conc)	distorted
Hydrogen peroxide (3%)	< 1 %	Water	< 1 %
Isooctane (aka gasoline)	< 1 %	Xylene	< 1 %
Isopropyl Alcohol	< 1 %		

TOUGH 2000

This material is one of the **strongest and stiffest** resins printable. A perfect solution to manufacture or prototype strong and **sturdy** parts that should not bend easily.

APPLICATIONS

- ENGINEERING
- ELECTRONICS
- GOODS
- MEDICAL
- PROTOTYPING

CASE STUDY

TBD

CHARACTERISTICS

TOUGH 2000	GREEN	POST-CURED	METHOD
Ultimate Tensile Strength	29 MPa	46 MPa	ASTM D 638-14
Tensile Modulus	1.2 GPa	2.2 GPa	ASTM D 638-14
Elongation at Break	74 %	48 %	ASTM D 638-14
Flexural Strength	17 MPa	65 MPa	ASTM D 790-15
Flexural Modulus	0.45 GPa	1.9 GPa	ASTM D 790-15
Notched IZOD	79 J/m	40 J/m	ASTM D 256-10
Unnotched IZOD	208 J/m	715 J/m	ASTM D 256-10
Heat Deflection Temp. at 1.8 MPa	42 °C	53 °C	ASTM D 648-16
Heat Deflection Temp. at 0.45 Mpa	48 °C	63 °C	ASTM D 648-16
Coefficient of Thermal Expansion	107 µm/m/°C	91 µm/m/°C	ASTM E 831-13

SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

SOLVENT	24H WEIGHT GAIN	SOLVENT	24H WEIGHT GAIN
Acetic Acid 5%	0.71 %	Mineral oil (Heavy)	0.17 %
Acetone	18.82 %	Mineral oil (Light)	0.13 %
Bleach ~5% NaOCl	0.56 %	Salt Water (3.5% NaCl)	0.56 %
Butyl Acetate	6.19 %	Skydrol 5	0.87 %
Diesel Fuel	0.06 %	Sodium Hydroxide solution (0.025% PH 10)	0.61%
Diethyl glycol Monomethyl Ether	5.32 %		
Hydrolic Oil	0.08 %	Strong Acid (HCl conc)	3.01%
Hydrogen peroxide (3%)	0.63 %	Water	0.61%
Isooctane (aka gasoline)	0.03 %	Xylene	4.1 %
Isopropyl Alcohol	3.7 %		

CARACOL
info@caracol-am.com
www.caracol-am.com
+39 02 332 99531
+39 351 0358966

ITA: Headquarter
Via del Seprio, 42, 22074 Lomazzo (CO)
Tel: +39 02.3329.9531

US: Entrepreneurs Roundtable Accelerator
415 Madison Ave, 4th floor
New York, NY 10017