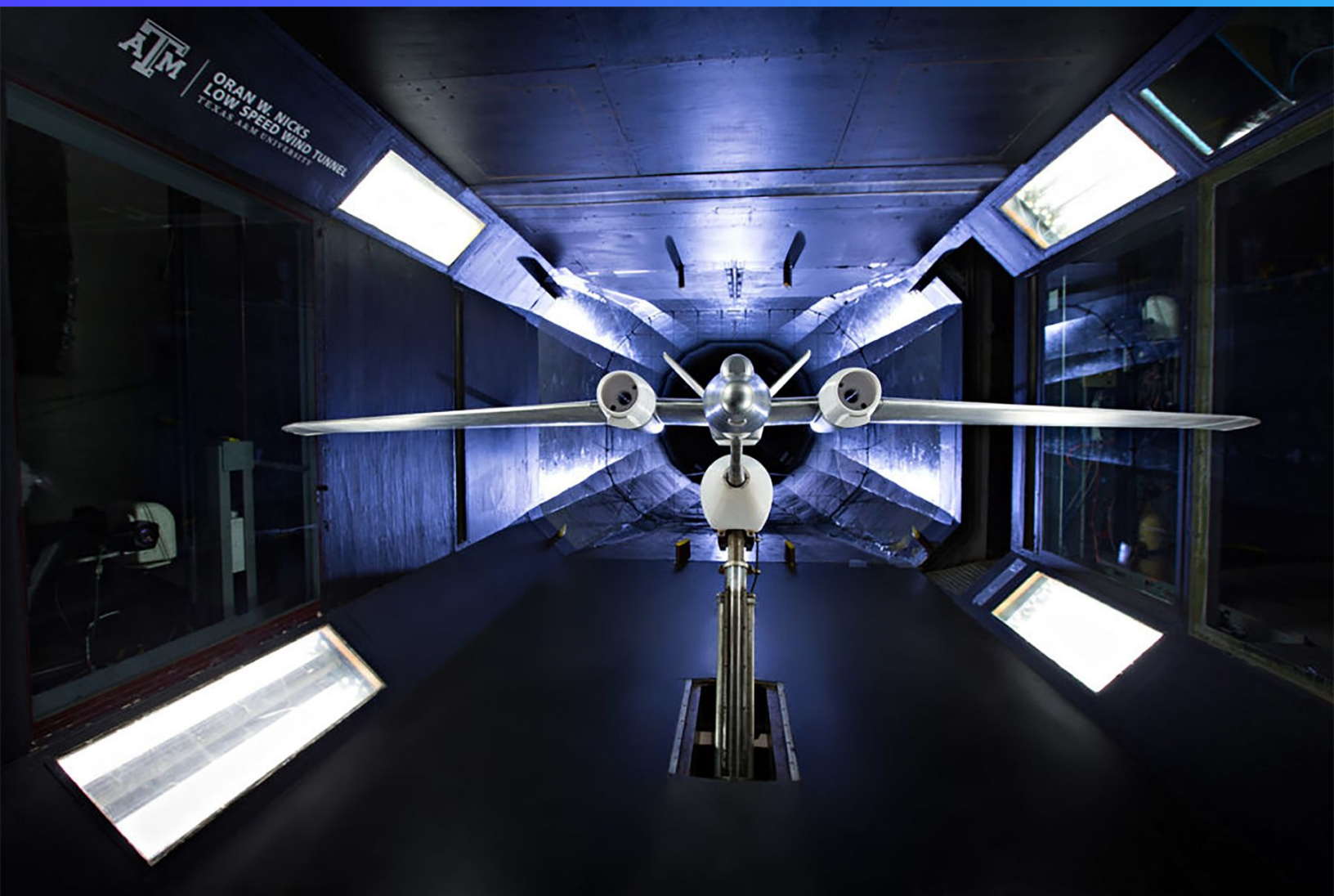
SPECTRA
PHOTOPOLYMERS

Ultra High Modulus (UHM) 2100



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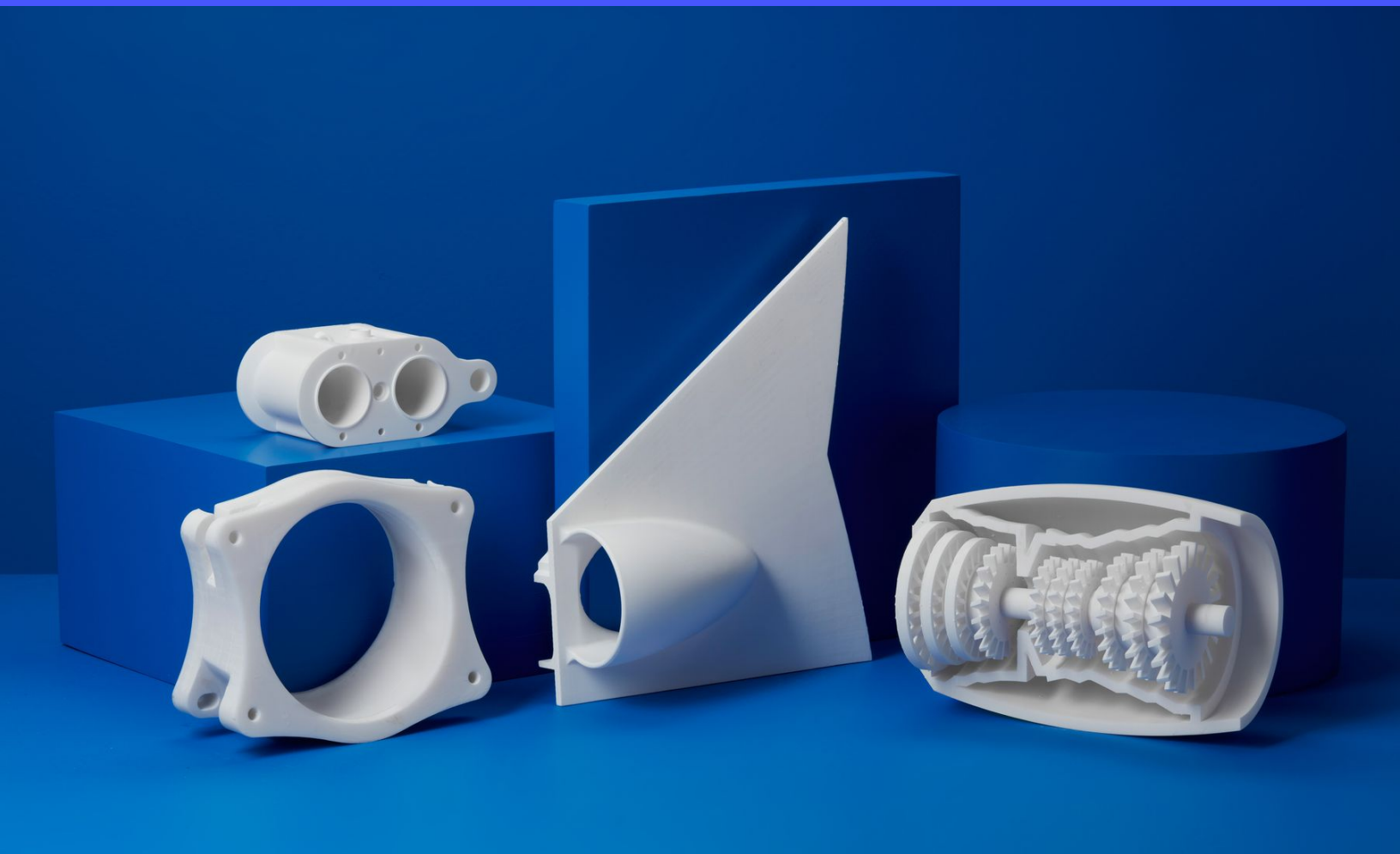
Ultra High Modulus (UHM) 2100

Resin for Rigid, Strong, Industrial-Grade Prototypes

This highly glass-filled resin is the stiffest material in our engineering portfolio. Choose UHM 2100 Resin for precise industrial parts that need to withstand significant load without bending. UHM 2100 Resin has a smooth matte finish and is highly resistant to heat and chemicals.

- Aerodynamic test models
- Short-run injection molds and inserts
- Heat resistant and fluid exposed components, jigs, and fixtures
- Simulates stiffness of glass and fiber-filled thermoplastics



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MATERIAL PROPERTIES DATA: **UHM2100 Resin**

	METRIC				METHOD
	Green	**UV Cure [1]**	**UV + Thermal Cure [2]**	**UV Cure + Media Blast**	
Tensile Properties					
Ultimate Tensile Strength	55 MPa	65 MPa	53 MPa	88 MPa	ASTM D638-14
Tensile Modulus	7.5 GPa	10 GPa	10 GPa	11 GPa	ASTM D638-14
Elongation at Break	2%	1%	1%	1.7%	ASTM D638-14
Flexural Properties					
Flexural Strength	84 MPa	126 MPa	103 MPa	158 MPa	ASTM D 790-15
Flexural Modulus	6 GPa	9 GPa	10 GPa	9.9 GPa	ASTM D 790-15
Impact Properties					
Notched Izod	16 J/m	16 J/m	18 J/m	20 J/m	ASTM D256-10
Unnotched Izod	41 J/m	47 J/m	41 J/m	130 J/m	ASTM D4812-11
Thermal Properties					
Heat Deflection Temp. @ 0.45 MPa	65 °C	163 °C	218 °C	238 °C	ASTM D 648-16
Heat Deflection Temp. @ 1.8 MPa	56 °C	82 °C	110 °C	92 °C	ASTM D 648-16
Thermal Expansion, 0-150 °C	48 µm/m/°C	47 µm/m/°C	46 µm/m/°C	41 µm/m/°C	ASTM E 831-13

	IMPERIAL				METHOD
	Green	**UV Cure [1]**	**UV + Thermal Cure [2]**	**UV Cure + Media Blast**	
Tensile Properties					
Ultimate Tensile Strength	7980 psi	9460 psi	7710 psi	12700 psi	ASTM D638-14
Tensile Modulus	1090 ksi	1480 ksi	1460 ksi	1600 ksi	ASTM D638-14
Elongation at Break	2%	1%	1%	1.70%	ASTM D638-14
Flexural Properties					
Flexural Strength	12200 psi	18200 psi	15000 psi	22900 psi	ASTM D 790-15
Flexural Modulus	905 ksi	1360 ksi	1500 ksi	1440 ksi	ASTM D 790-15
Impact Properties					
Notched Izod	0.3 ft-lbf/in	0.3 ft-lbf/in	0.3 ft-lbf/in	0.37 ft-lbf/in	ASTM D256-10
Unnotched Izod	0.8 ft-lbf/in	0.9 ft-lbf/in	0.7 ft-lbf/in	2.5 ft-lbf/in	ASTM D4812-11
Thermal Properties					
Heat Deflection Temp. @ 0.45 MPa	149 °F	325 °F	424 °F	460 °F	ASTM D 648-16
Heat Deflection Temp. @ 1.8 MPa	133 °F	180 °F	230 °F	198 °F	ASTM D 648-16
Thermal Expansion, 0-150 °C	27 µin/in/°F	26 µin/in/°F	26 µin/in/°F	23 µin/in/°F	ASTM E 831-13

MATERIAL PROPERTIES DATA: **UHM2100 Resin**

Toxic Gas Generation

Testing Standard BSS 7239 (comparable to NFPA No. 258)	Maximum allowed concentration per BSS 7239 (ppm)	Flaming Mode (ppm)	Non-Flaming Mode (ppm)
Hydrogen Cyanide (HCN)	150	1	0.5
Carbon Monoxide (CO)	3500	50	10
Nitrous Oxides (NOx)	100	< 2	< 2
Sulfur Dioxide (SO2)	100	< 1	< 1
Hydrogen Fluoride (HF)	200	< 1.5	< 1.5
Hydrogen Chloride (HCl)	500	1	< 1

Smoke Density — Specific Optical Density

Testing Standard	@ 90 sec	@ 4 min	Maximum
ASTM E662 Flaming Mode	2	95	132
ASTM E662 Non-Flaming Mode	0	1	63

Flammability

Testing Standard	Rating
UL 94 Section 7 (3 mm)	HB

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	24 hr weight gain, %	Solvent	24 hr weight gain, %
Acetic Acid 5%	< 0.1	Isooctane (aka gasoline)	0
Acetone	< 0.1	Mineral oil (light)	0.2
Isopropyl Alcohol	< 0.1	Mineral oil (Heavy)	< 0.1
Bleach ~5% NaOCl	0.1	Salt Water (3.5% NaCl)	0.1
Butyl Acetate	0.1	Sodium Hydroxide solution (0.025% PH 10)	0.1
Diesel Fuel	0.1	Water	< 0.1
Diethyl glycol Monomethyl Ether	0.4	Xylene	< 0.1
Hydraulic Oil	0.2	Strong Acid (HCl conc)	0.2
Skydrol 5	0.6	Tripropylene glycol monomethyl ether	0.4
Hydrogen peroxide (3%)	< 0.1		

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UHM2100 against the competition

Properties	**Accura Bluestone** (UV + Thermal Cure)	**Somos PerForm** (UV + Thermal Cure)	**UHM 2100** (UV Cure)	**UHM 2100** (UV + Thermal Cure)	**UHM 2100** (UV Cure + Media Blast)
UTS (MPa)	68	80	80	58	**88**
Tensile Modulus (GPa)	11.7	9.8	11	12	**11**
Tensile Elongation (%)	1.5	1.2	1.3	1	**2**
Flexural Modulus (GPa)	9.8	9.0	9.1	9.3	**9.9**
Flexural Strength (MPa)	154	146	126	103	**158**
Impact Strength (Notched IZOD, J/m)	17	20	17	16	**20**
HDT (.45 MPa)	267	268	163	218	**238**
HDT (1.82 MPa)	n/a	119	86	112	**92**


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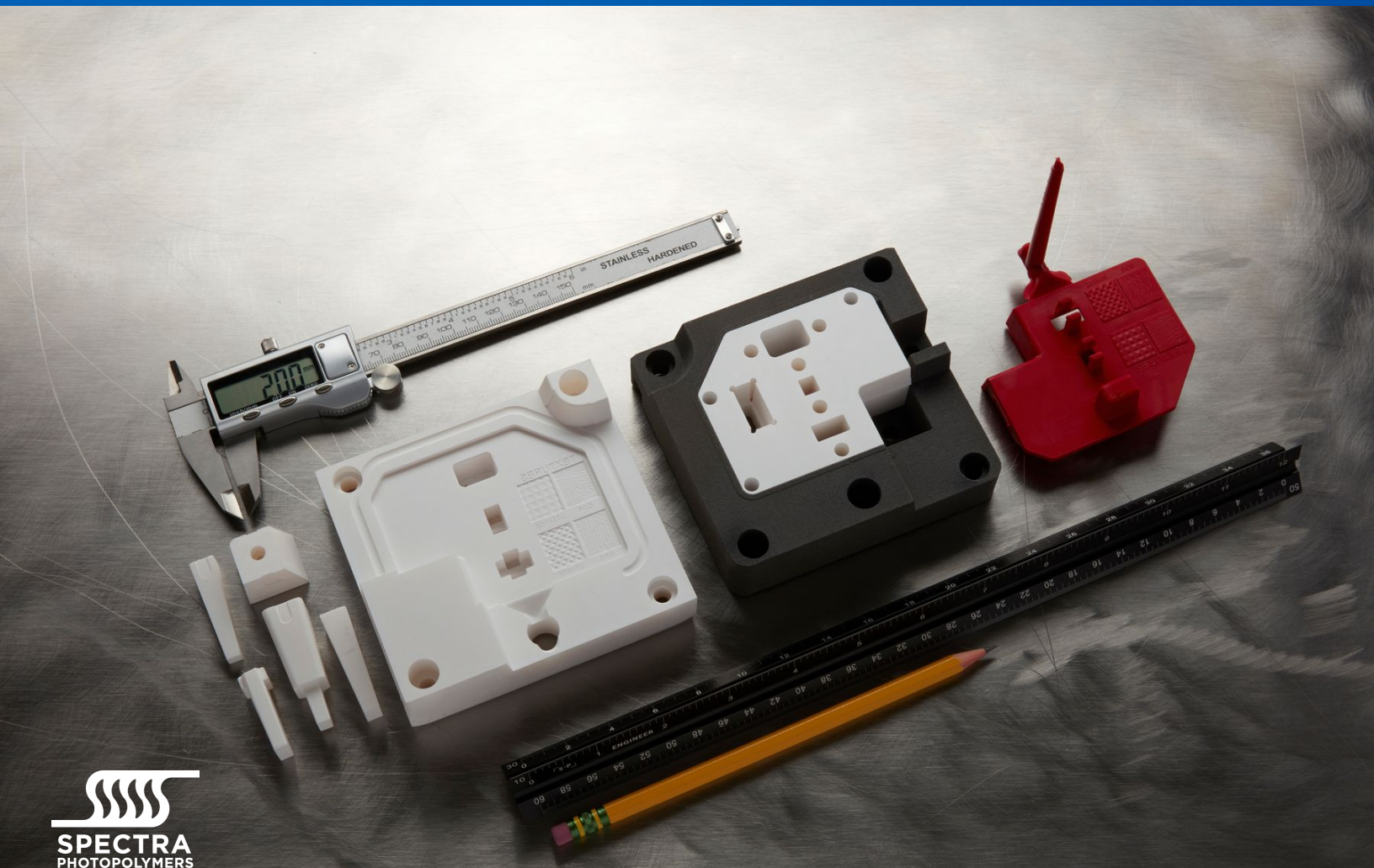
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