

Visijet® M2R-WT

Production Rigid

Rigid general-purpose plastic with opaque white finish delivering a balance of strength and elongation with a moderate HDT

Projet MJP 2500

Similar to Visijet M2R-CL (clear) and Visijet M2R-GRY (gray), Visijet M2R-WT is a rigid material that is good for a broad range of concept models and functional prototypes. It is bright white in color (non-yellow) and has high-feature fidelity, sharp corners and edges and smooth surface finish. It is a general-purpose material with high accuracy suitable for prototypes, printed assemblies, medical/dental applications and some end-use parts.



Note: Not all products and materials are available in all countries — please consult your local sales representative for availability.

APPLICATIONS

- Opaque functional prototypes and some end-use parts
- Rapid prototyping of plastic injection molded thermoplastic parts
- Able to be drilled, tapped and machined and can create moderate functional snap fits
- Functional printed assemblies and injection molded screw bosses
- Functional printed screw-threads and thin walls
- Medical/dental applications
- Dye-tinted applications
- Painted business/marketing collateral, prototypes and mockups
- Excellent for painting or molding applications

BENEFITS

- High fidelity fine features, sharp edges and high accuracy
- Exceptional smooth and consistent surface finish
- No surface cure inhibition of paints or silicones; no sanding required

FEATURES

- Moderate strength and stiffness, 20-30% elongation
- Able to make extremely small and complex structures
- High accuracy and watertight
- Biocompatible USP Class VI & ISO 10993

MATERIAL PROPERTIES

The full suite of mechanical properties is given per ASTM and ISO standards where applicable. Properties like flammability, dielectric properties and 24-hour water absorption are also provided for better understanding of material capabilities to help design decisions using the material. All parts are conditioned per ASTM recommended standards for a minimum of 40 hrs at 23°C, 50% RH.

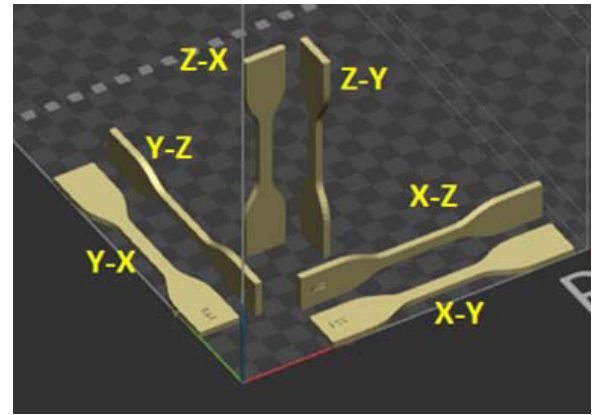
Solid material properties reported were printed along the vertical axis (ZX-orientation). As detailed in the Isotropic Properties section, material properties are relatively uniform across print orientations. Parts do not need to be oriented in a particular direction to exhibit these properties.

LIQUID MATERIAL						
Color					White	
SOLID MATERIAL						
METRIC	ASTM METHOD	METRIC	ENGLISH	ISO METHOD	METRIC	ENGLISH
PHYSICAL			PHYSICAL			
Solid Density	ASTM D792	1.16 g/cm ³	0.04 lb/in ³	ISO 1183	1.16 g/cm ³	0.04 lb/in ³
24 Hour Water Absorption	ASTM D570	≤0.5 %	≤0.5 %	ISO 62	≤0.5 %	≤0.5 %
MECHANICAL			MECHANICAL			
Tensile Strength Ultimate	ASTM D638	39 MPa	5700 psi	ISO 527 -1/2	46 MPa	6700 psi
Tensile Strength at Yield	ASTM D638	39 MPa	5656 psi	ISO 527 -1/2	46 MPa	6700 psi
Tensile Modulus	ASTM D638	2000 MPa	2.9 ksi	ISO 527 -1/2	2000 MPa	285 ksi
Elongation at Break	ASTM D638	20 %	20 %	ISO 527 -1/2	18.4 %	18.4 %
Elongation at Yield	ASTM D638	4.2 %	4.2 %	ISO 527 -1/2	4 %	4 %
Flex Strength	ASTM D790	54 MPa	7800 psi	ISO 178	60 MPa	9100 psi
Flex Modulus	ASTM D790	1500 MPa	2.2 ksi	ISO 178	2600 MPa	380 ksi
Izod Notched Impact	ASTM D256	17 J/m	0.3 ft-lb/in	ISO 180-A	1.9 kJ/m ²	0.9 ft-lb/in ²
Izod Unnotched Impact	ASTM D4812	160 J/m	3 ft-lb/in	ISO 180-U		
Shore Hardness	ASTM D2240	79 D	79 D	ISO 7619	79 D	79 D
THERMAL			THERMAL			
Tg (DMA, E'')	ASTM E1640 (E''at 1C/min)	42 °C	107.6 °F	ISO 6721-1/11 (E''at 1C/min)	42 °C	107.6 °F
HDT @ 0.455 MPa/66 PSI	ASTM D648	50 °C	120 °F	ISO 75- 1/2 B	40 °C	110 °F
HDT @ 1.82 MPa/264 PSI	ASTM D648	44 °C	111 °F	ISO 75-1/2 A	38 °C	101 °F
CTE below Tg	ASTM E831	90 ppm/°C	50 ppm/°F	ISO 11359-2	90 ppm/K	50 ppm/F
CTE above Tg	ASTM E831	182 ppm/°C	101 ppm/°F	ISO 11359-2	182 ppm/K	101 ppm/F
UL Flammability	UL94	HB	HB			
ELECTRICAL			ELECTRICAL			
Dielectric Strength (kV/mm) @ 3.0 mm thickness	ASTM D149	363				
Dielectric Constant @ 1 MHz	ASTM D150	3.07				
Dissipation Factor @ 1 MHz	ASTM D150	0.024				
Volume Resistivity (ohm-cm)	ASTM D257	6.11E+15				

ISOTROPIC PROPERTIES

MJP technology prints parts that are generally isotropic in mechanical properties meaning the parts printed along either the XYZ axis will give similar results.

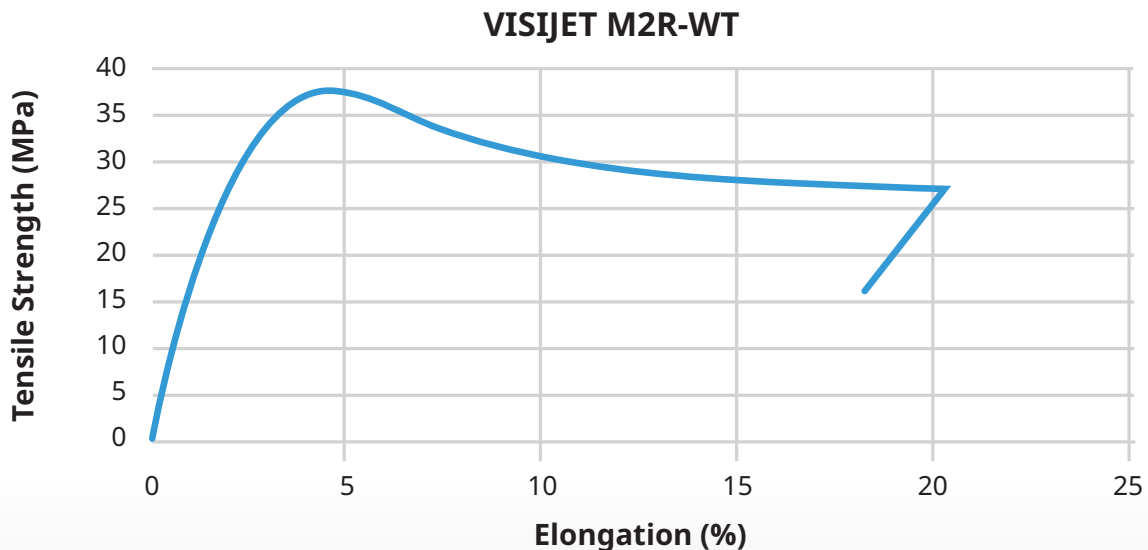
Parts do not need to be oriented to get the highest mechanical properties, further improving the degree of freedom for part orientation for mechanical properties.



SOLID MATERIAL								
METRIC	METHOD	METRIC						
MECHANICAL								
		XY	XZ	YX	YZ	Z45	ZX	ZY
Tensile Strength Ultimate	ASTM D638 Type IV	39 MPa	41 MPa	40 MPa	39 MPa	44 MPa	38 MPa	39 MPa
Tensile Strength at Yield	ASTM D638 Type IV	39 MPa	41 MPa	41 MPa	39 MPa	44 MPa	38 MPa	39 MPa
Tensile Modulus	ASTM D638 Type IV	2000 MPa	1900 MPa	2000 MPa	1900 MPa	1500 MPa	1800 MPa	1800 MPa
Elongation at Break	ASTM D638 Type IV	20 %	22 %	8 %	10 %	17 %	10 %	14 %
Elongation at Yield	ASTM D638 Type IV	4.2 %	4.2 %	4.1 %	4.2 %	4.5 %	4.3 %	4.4 %
Flex Strength	ASTM D790	54 MPa	48 MPa	53 MPa	41 MPa	50 MPa	43 MPa	41 MPa
Flex Modulus	ASTM D790	1500 MPa	1200 MPa	1400 MPa	900 MPa	1300 MPa	1200 MPa	1000 MPa
Izod Notched Impact	ASTM D256	17 J/m	16 J/m	17 J/m	16 J/m	12 J/m	17 J/m	15 J/m
Shore Hardness	ASTM D2240	79 D	75 D	75 D	76 D	77 D	75 D	76 D

STRESS-STRAIN CURVE

The graph represents the stress-strain curve for Visijet M2R-WT per ASTM D638 testing.

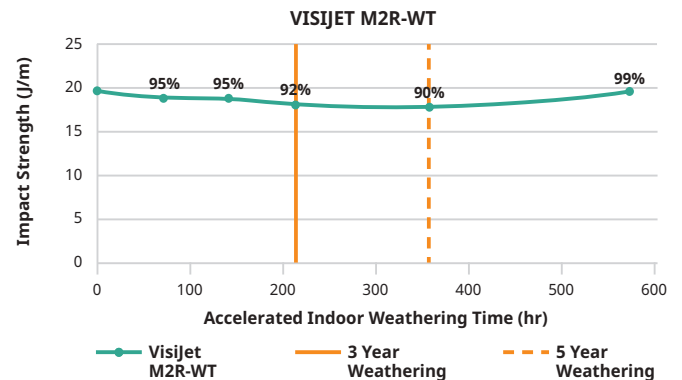
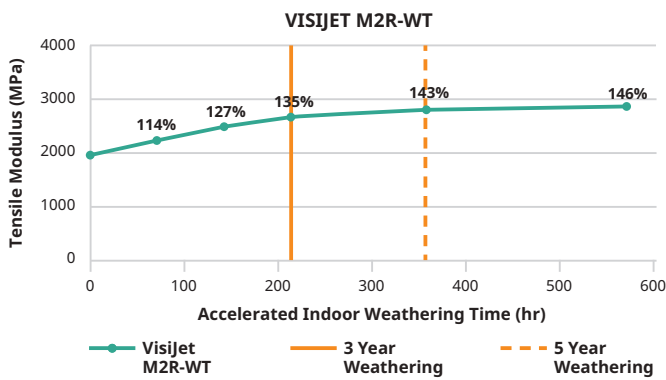
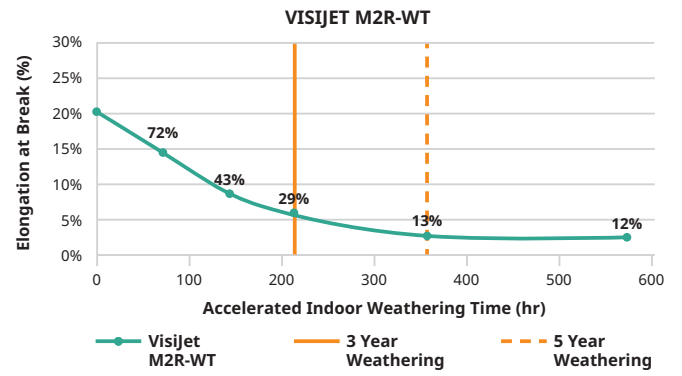
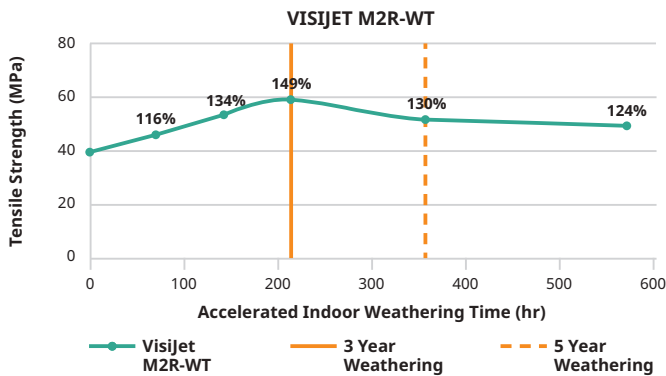


LONG-TERM ENVIRONMENTAL STABILITY

Visijet M2R-WT is engineered to give long-term environmental UV and humidity stability. This means the material is tested for the ability to retain a high percent of the initial mechanical properties over a given period of time. **Actual data value is on Y-axis, and data points are % of initial value.**

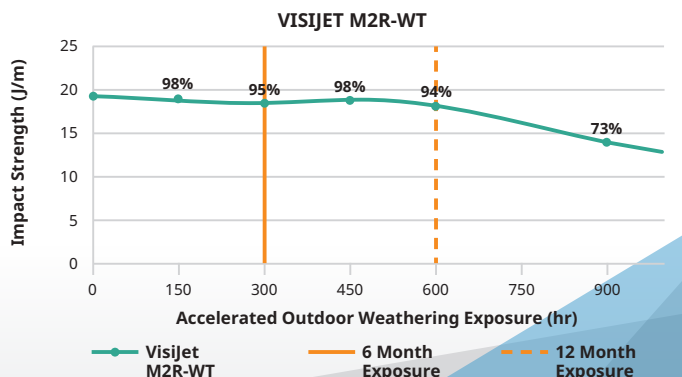
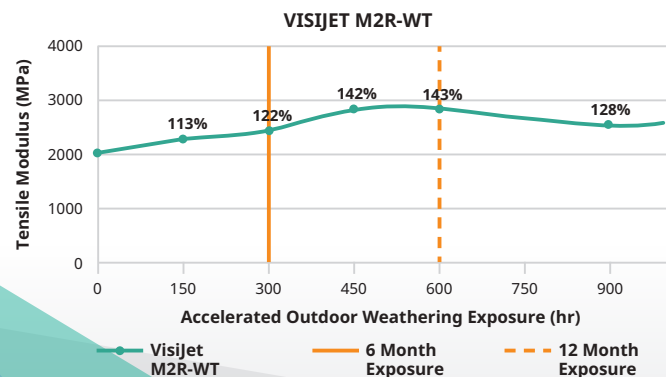
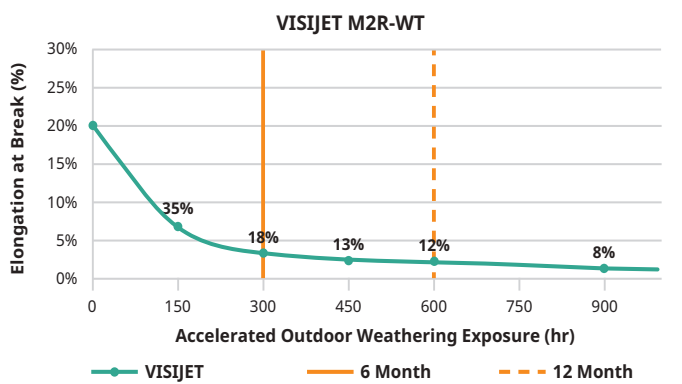
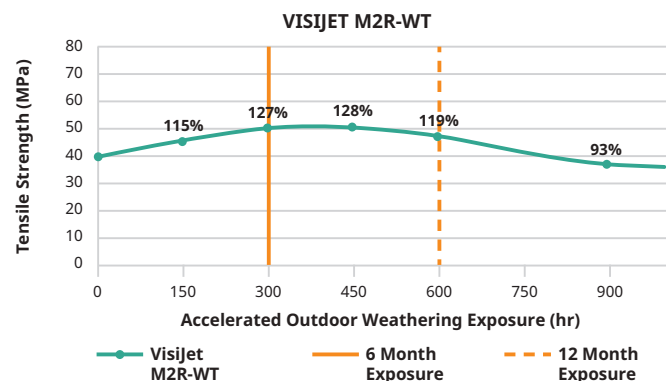
INDOOR STABILITY: Tested per ASTM D4329 standard method.

INDOOR STABILITY



OUTDOOR STABILITY: Tested per ASTM G154 standard method.

OUTDOOR STABILITY



AUTOMOTIVE FLUID COMPATIBILITY

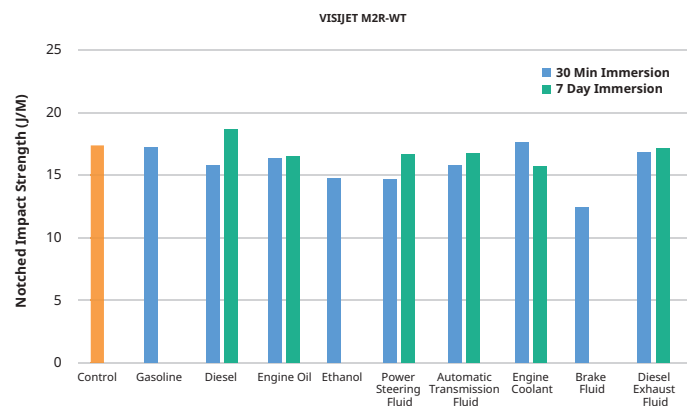
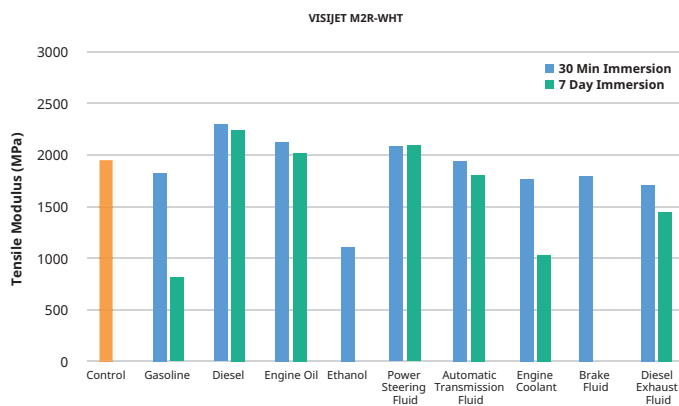
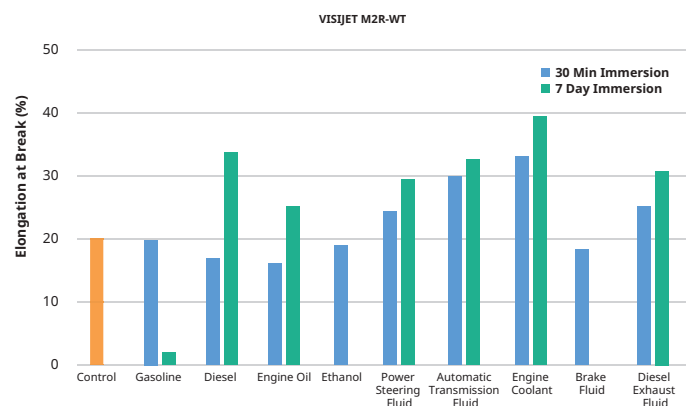
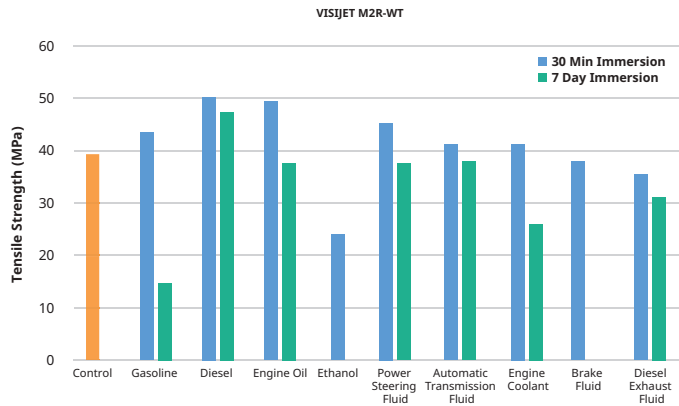
The compatibility of a material with hydrocarbons and cleaning chemicals is critical to part application. Visijet M2R-WT parts were tested for sealed and surface contact compatibility per USCAR2 test conditions. The fluids below were tested in two different ways per the specs:

- Immersed for 7-days, followed by mechanical property comparison.
- Immersed for 30-minutes, followed by mechanical property comparison to 7-day data.

Data reflects the measured value of properties over that period of time.

AUTOMOTIVE FLUIDS		
FLUID	SPECIFICATION	TEST TEMP °C
Gasoline	ISO 1817, liquid C	23 ± 5
Diesel Fuel	905 ISO 1817, Oil No. 3 + 10% p-xylene*	23 ± 5
Engine Oil	ISO 1817, Oil No. 2	50 ± 3
Ethanol	85% Ethanol + 15% ISO 1817 liquid C*	23 ± 5
Power Steering Fluid	ISO 1917, Oil No. 3	50 ± 3
Automotive Transmission Fluid	Dexron VI (North American specific material)	50 ± 3
Engine Coolant	50% ethylene glycol + 50% distilled water*	50 ± 3
Brake Fluid	SAE RM66xx (Use latest available fluid for xx)	50 ± 3
Diesel Exhaust Fluid (DEF)	API certified per ISO 22241	23 ± 5

*Solutions are determined as percent by volume



CHEMICAL COMPATIBILITY

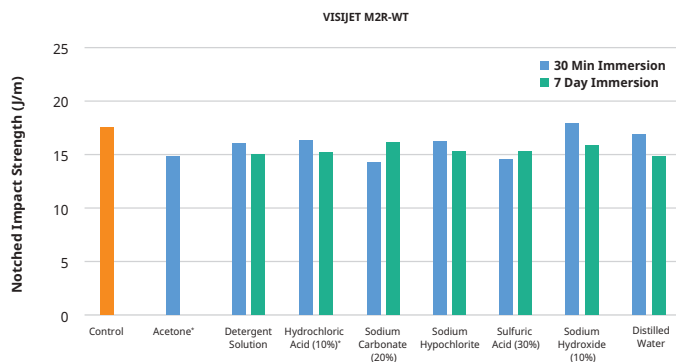
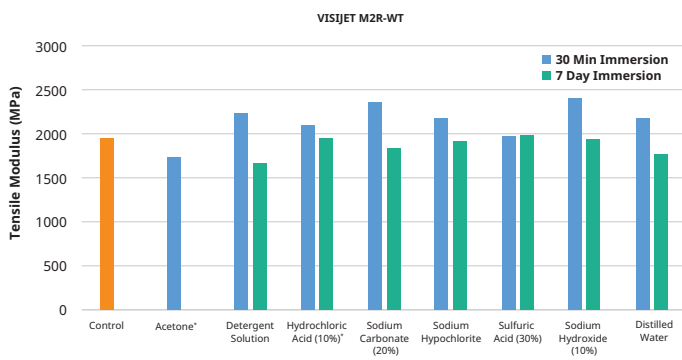
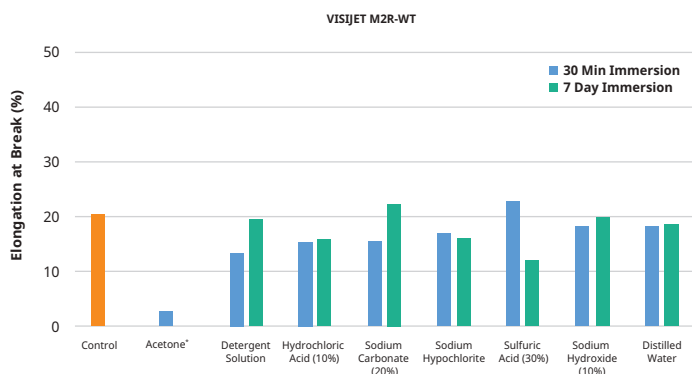
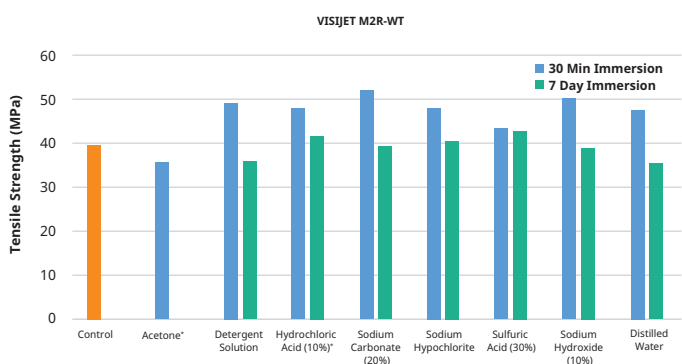
The compatibility of a material with cleaning chemicals is critical to part application. Visijet M2R-WT parts were tested for sealed and surface contact compatibility per ASTM D543 test conditions. The fluids below were tested in two different ways per the specs:

- Immersed for 7-days, followed by mechanical property comparison.
- Immersed for 30-minutes, followed by mechanical property comparison to 7-day data.

Data reflects the measured value of properties over that period of time.

*Denotes materials did not go through 7-day soak conditioning.

CHEMICAL COMPATIBILITY
6.3.3 Acetone
6.3.12 Detergent Solution, Heavy Duty
6.3.23 Hydrochloric Acid (10%)
6.3.38 Sodium Carbonate Solution (20%)
6.3.44 Sodium Hypochlorite Solution
6.3.46 Sulfuric Acid (30%)
6.3.42 Sodium Hydroxide Solution (10%)
6.3.15 Distilled Water



BIOCOMPATIBILITY STATEMENT

Visijet M2R-WT test coupons printed and processed according to the post-processing instructions below were provided to an external biological testing laboratory for evaluation in accordance with *ISO 10993-5, Biological evaluation of medical devices - Part 5: Tests for in vitro cytotoxicity*. The test results indicate that Visijet M2R-WT has passed the requirements for biocompatibility according to the above test.

It is the responsibility of each customer to determine that its use of Visijet M2R-WT material is safe, lawful and technically suitable to the customer's intended applications. Customers should conduct their own testing to ensure that this is the case. Because of possible changes in the law and in regulations, as well as possible changes in these materials, 3D Systems cannot guarantee that the status of these materials will remain unchanged or that it will qualify as biocompatible in any particular use. Therefore, 3D Systems recommends that customers continuing to use these materials verify their status on a periodic basis.