VisiJet® M2E-BK70

Elastic

ProJet MJP 2500

Elastomeric-like soft rubber-like plastic with opaque black color delivering a 70A Shore hardness

Harder than the 30 Shore A VisiJet M2-NT (yellow) and VisiJet M2-BK (black) materials, VisiJet M2E-BK70 is an elastomeric-like material with a 70 Shore A hardness. It is designed for general-purpose and engineering prototyping needs with hardness and mechanical capability very similar to Buna-N and Fluoroelastomers. For compressive sealing applications, it can take a good compression set with no brittle fracture and has good shape/memory spring-back performance. Even as a soft elastomer, it still achieves smooth and blemish free "molding quality" surface with high feature fidelity, sharp corners and edges. It is an excellent rapid prototyping material for functional seals and gaskets, and over molding of rigid plastic prototypes. Its flexibility and thermal properties allow it to be used to inject wax for investment casting patterns and it can be used as a direct-printed silicone or two-part polyurethane mold with moderate-to-complex overhangs that require substantial flexing and bending to release the part after curing.

APPLICATIONS

- General prototyping of Buna-N and Fluroelastomer rubbers
- Functional seals, gaskets and overmolding
- Consumer product flexible buttons and sensor pads
- Cable guides for internal components
- Accurate and flexible molds for investment casting patterns
- Accurate and flexible molds for two-part polyurethane part production

BENEFITS

- High fidelity fine features, sharp edges and high accuracy
- Exceptional smooth and consistent surface finish with the ability to create complex surface textures

FEATURES

- Shore D 70A
- Flexible and bendable
- 1-3% compression set with no brittle fracture
- Good shape/memory spring-back performance.
- Biocompatible USP Class VI

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

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.

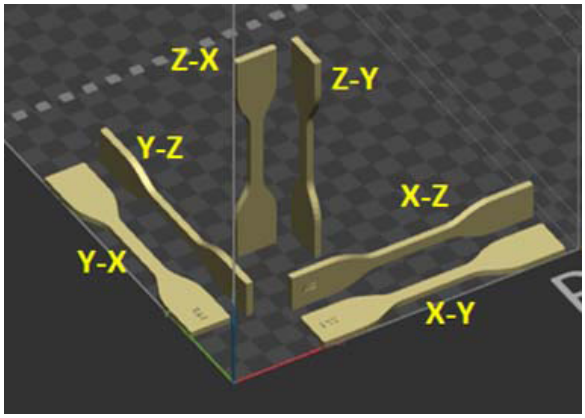
Solid material properties reported were printed along the vertical axis (ZX-orientation). As detailed in the Isotropic Properties section, material properties are relatively uniform across print orientations. Parts do not need to be oriented in a particular direction to exhibit these properties.

LIQUID MATERIAL						
Color			Black			
SOLID MATERIAL						
METRIC	**ASTM METHOD**	**METRIC**	**ENGLISH**	**ISO METHOD**	**METRIC**	**ENGLISH**
PHYSICAL				**PHYSICAL**		
Solid Density	ASTM D792	1.17 g/cm³	0.04 lb/in³	ISO 1183	1.17 g/cm³	0.04 lb/in³
24 Hour Water Absorption	ASTM D570	1.2 %	1.2 %	ISO 62	1.2 %	1.2 %
MECHANICAL				**MECHANICAL**		
Tensile Strength Ultimate	ASTM D638 Type IV	2.7 MPa	290 psi	ISO 527 -1/2	1.8 MPa	145 psi
Tensile Strength at Yield	ASTM D638 Type IV	N/A	N/A	ISO 527 -1/2	N/A	N/A
Tensile Modulus	ASTM D638 Type IV	7.2 MPa	1 ksi	ISO 527 -1/2	6.1 MPa	0.9 ksi
Elongation at Break	ASTM D638 Type IV	42 %	42 %	ISO 527 -1/2	31 %	31 %
Elongation at Yield	ASTM D638 Type IV	N/A	N/A	ISO 527 -1/2	N/A	N/A
Tensile Stress at 50% Elongation	ASTM D638 Type IV	N/A	N/A	ISO 527 -1/2	N/A	N/A
Tensile Stress at 100% Elongation	ASTM D638 Type IV	N/A	N/A	ISO 527 -1/2	N/A	N/A
Tear Strength	ASTM D624 Type C	6.3 kN/m	34 lbf/in	ISO 34-1	6.3 kN/m	34 lbf/in
Tear Strength	ASTM D624 Type T	0.8 kN/m	4.6 lbf/in	ISO 34-1	0.8 kN/m	4.6 lbf/in
Shore Hardness	ASTM D2240	72 A	72 A	ISO 7619	72 A	72 A
Compression Set (%) 23C	ASTM D395	0.4 %	0.4 %	ISO 815-B	0.4 %	0.4 %
Compression Set (%) 50C	ASTM D395	N/A	N/A	ISO 815-B	N/A	N/A
Bayshore Rebound	ASTM D2632	10 %	10 %			
THERMAL				**THERMAL**		
Tg (DMA, E")	ASTM E1640 (E"Peak)	-7 °C	19.4 °F	ISO 6721-1/11 (E" Peak)	-7 °C	19.4 °F
CTE -50 to -15C	ASTM E831	75 ppm/°C	42 ppm/°F	ISO 11359-2	75 ppm/K	42 ppm/°F
CTE 0 to 50C	ASTM E832	157 ppm/°C	87 ppm/°F	ISO 11359-2	157 ppm/K	87 ppm/°F
UL Flammability Rating	UL94	HB				
ELECTRICAL				**ELECTRICAL**		
Dielectric Strength (kV/mm) @ 3.0 mm thickness	ASTM D149	12				
Dielectric Constant @ 1 MHz	ASTM D150	4.49				
Dissipation Factor @ 1 MHz	ASTM D150	0.139				
Volume Resistivity (ohm-cm)	ASTM D257	6.28E+10				

ISOTROPIC PROPERTIES

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

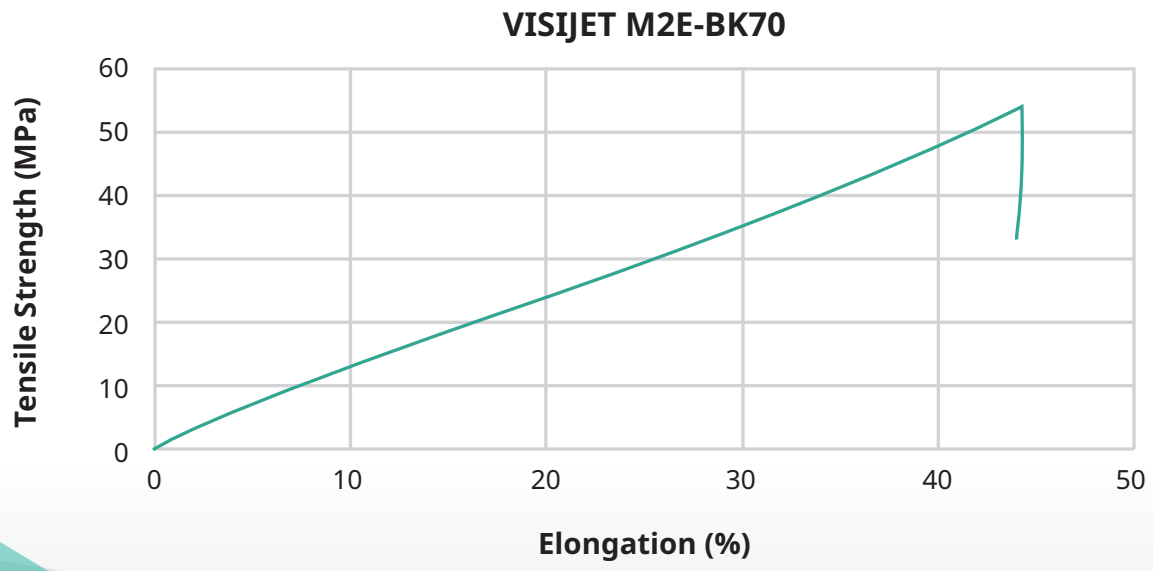
Parts do not need to be oriented to get the highest mechanical properties, further improving the degree of freedom for part orientation for mechanical properties.



SOLID MATERIAL								
METRIC	METHOD	METRIC						
MECHANICAL								
		XY	XZ	YX	YZ	Z45	ZX	ZY
Tensile Strength Ultimate	ASTM D638 Type IV	2.7 MPa	2.1 MPa	2.1 MPa	2 MPa	2.4 MPa	1.7 MPa	1.7 MPa
Tensile Strength at Yield	ASTM D638 Type IV	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tensile Modulus	ASTM D638 Type IV	7.2 MPa	5.8 MPa	5.7 MPa	5.9 MPa	5 MPa	5.5 MPa	5.8 MPa
Elongation at Break	ASTM D638 Type IV	42 %	35 %	37 %	30 %	41 %	31 %	28 %
Elongation at Yield	ASTM D638 Type IV	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shore Hardness	ASTM D2240	72 A	72 A	72 A	72 A	73 A	73 A	73 A
Tear Strength	ASTM D624 Type C	6.3 kN/m	6.3 kN/m	5.5 kN/m	5.6 kN/m	5.6 kN/m	4.5 kN/m	4.8 kN/m
Tear Strength	ASTM D624 Type T	0.8 kN/m	0.3 kN/m	0.5 kN/m	0.4 kN/m	0.3 kN/m	0.7 kN/m	0.8 kN/m

STRESS-STRAIN CURVE

The graph represents the stress-strain curve for VisiJet M2E-BK70 per ASTM D638 testing.

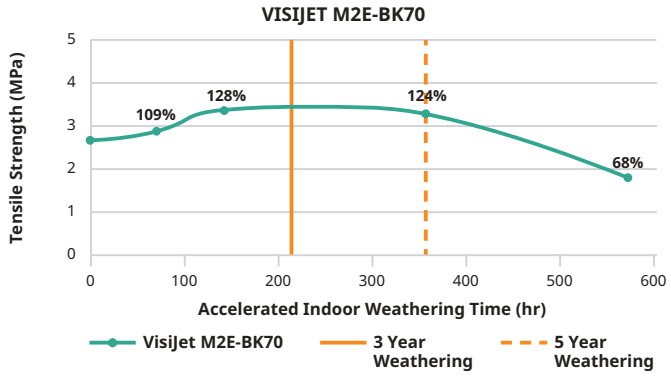


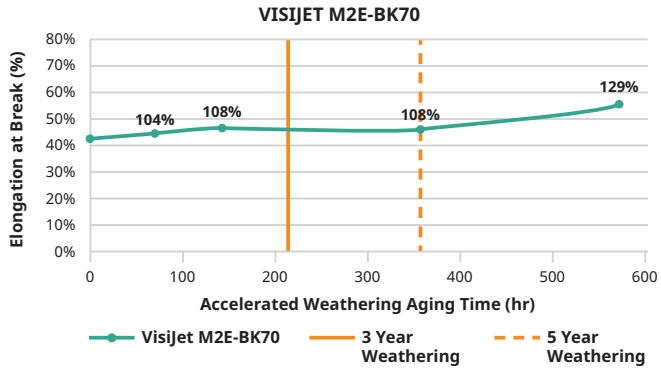
LONG TERM ENVIRONMENTAL STABILITY

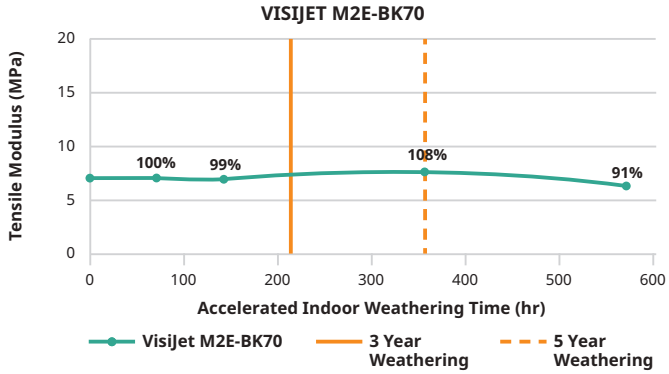
VisiJet M2E-BK is engineered to give long-term environmental UV and humidity stability. This means the material is tested for the ability to retain a high percent of the initial mechanical properties over a given period of time. This provides real design conditions to consider for the application or part. **Actual data value is on Y-axis, and data points are % of initial value.**

INDOOR STABILITY

INDOOR STABILITY: Tested per ASTM D4329 standard method.

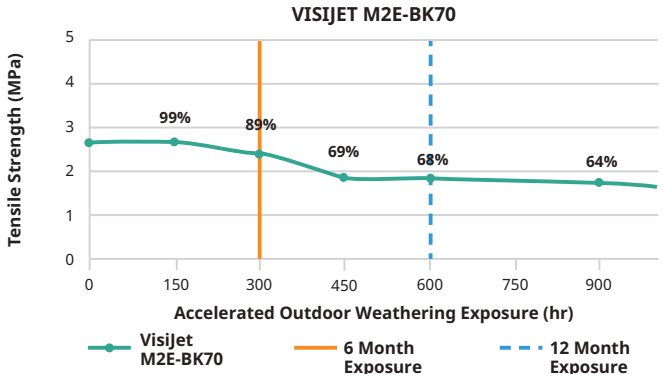


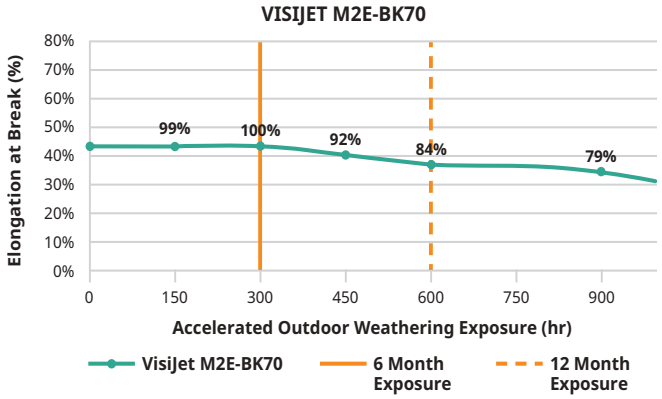


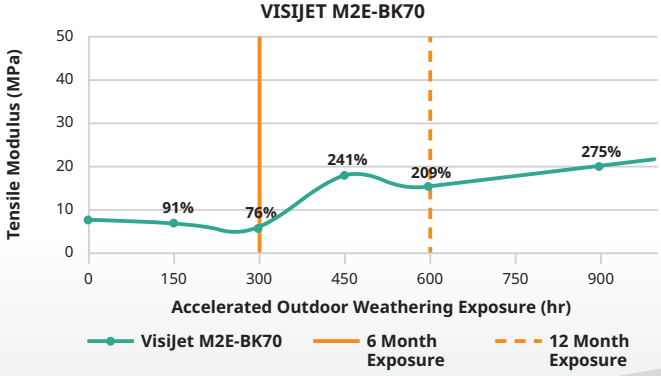


OUTDOOR STABILITY

OUTDOOR STABILITY: Tested per ASTM G154 standard method.







OUTLINE OF MJP BIOCOMPATIBLE CLEANING PROCEDURE

The full procedure should be referenced and followed.

MIXING INSTRUCTIONS

This material has a pigment that settles very slowly over time before printing. For best results mix material in the bottle:

- Remove wax support in an oven
- Clean with EZ Rinse-C or mineral oil
- Ethyl alcohol (ethanol) rinse with sonication
- Second fresh high purity ethanol rinse with sonication
- Air dry

More details can be found in the Post-Processing Section of the User Guide