xPP405-Black

Basic Properties

Measurement	Unit	Test Method	2x30min in XiP Cure, 1x60min in xCure 2x10min 50% in xCure Desktop
Tensile Properties			
Young's Modulus	MPa	ASTM D638	1300
Ultimate Tensile Strength	MPa	ASTM D638	35
Elongation at Break	%	ASTM D638	100
General Properties			
Viscosity at 25°C (77°F)	cP	ASTM D7867	2200-2400
Liquid Density	g/cm^3	ASTM D1475	1.046
Solid Density	g/cm^3	ASTM D1475	1.121

Henkel Extended Properties

Measurement	Unit	Test Method	Post Processed
Flexural Property			
Flexural Modulus	MPa	ASTM D790	1383
Impact Property			
IZOD Impact (Notched)	J/m	ASTM D256	51
Additional Thermal Properties			
HDT at 1.82 Mpa	°C	ASTM D648	43.4
HDT at 0.45 Mpa	°C	ASTM D648	52.8
Thermal Conductivity	W/(m·K)	ASTM D5930	0.19
Heat Capacity	J/(g·K)	ASTM D5930	0.70
CTE (10°C to 60°C)	µm/(m·K)	ASTM E831	98.47
Tg	°C	ASTM E1640	97.8
FST Property			
Flammability		UL94	HB (2mm)
Electrical Properties			
Volume Resistivity	Ω·cm	ASTM D257	2.75E+15
Surface Resistivity	Ω	ASTM D257	7.79E+15
Electric Strength	kV/mm	ASTM D149	24.9
AC Relative Permittivity (Dielectric Constant)			
at 50 Hz (XY)		ASTM D150	4.7
at 1 kHz (XY)		ASTM D150	4.2
at 1 MHz (XY)		ASTM D150	3.6
AC Loss Characteristic (Dissipation Factor)			
at 50 Hz (XY)		ASTM D150	0.017
at 1 kHz (XY)		ASTM D150	0.014
at 1 MHz (XY)		ASTM D150	0.150

Other Properties			
Water Absorption (24hr)	%	ASTM D570	1.0
Shore Hardness	D	ASTM D2240	76
Biocompatibility			
Cytotoxicity		ISO10993-5	Pass
Irritation		ISO10993-23	Pass

Printing Process

The material should be processed at room temperature. Before usage, the material should be shaken well. Pour it slowly into the vat and wait a couple of minutes, until a smooth, bubble-free surface is obtained before starting the print job.

The 3D printer examples and settings stated above are only for general guidance. The fully optimized settings should always be determined by the users themselves, according to their specific needs. Please always refer to the user manual of the employed 3D printer for instructions on printer settings and handling.

Remove the parts carefully from the build platform with a suitable tool, for more information, refer to the user manual of the used 3D printer.

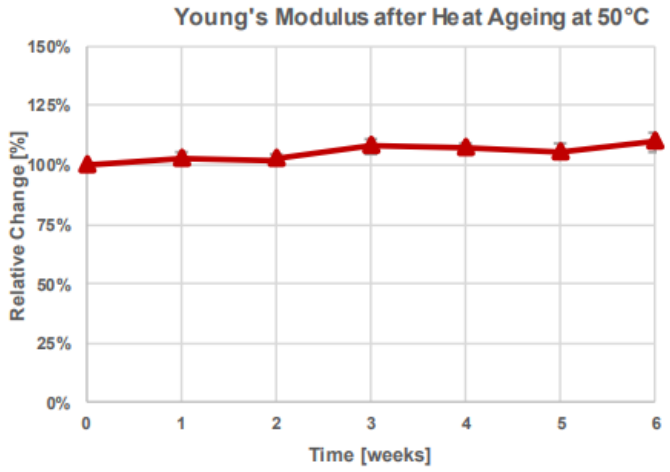
Washing

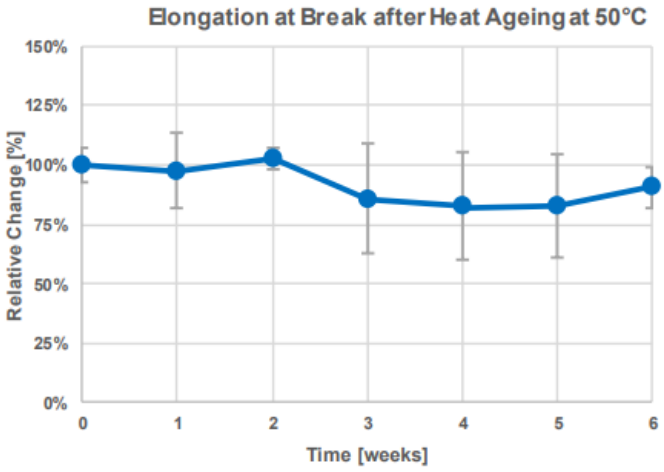
xPP405-Black requires post processing to achieve specified properties. Prior to post curing, the part should be washed. Nexa3D recommends using xClean followed by IPA as standard cleaning procedure. Parts should not be submerged in xClean for longer than 2 minutes or in IPA for longer than 5 minutes to avoid any impact on performance.

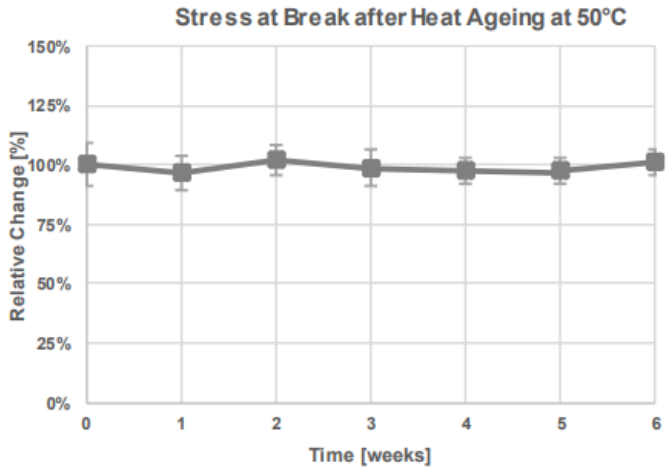
Heat Ageing

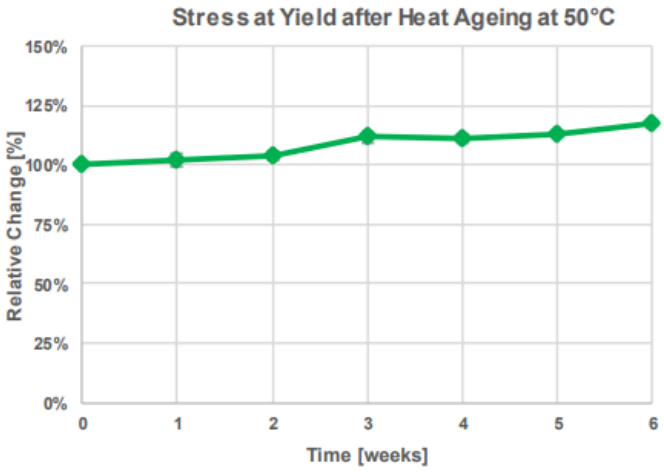
The samples were heat aged without load according to ASTM D3045. Test samples were exposed for a defined time at 50°C and conditioned for 24 hours at 22°C before mechanical testing. Control samples were stored at a constant 22°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D638 at standard lab conditions (22°C). "0 weeks" represents non-aged samples stored at 22°C and tested 24 hours after post-processing.

Based on temperature dependence of reaction rates a test time of 6 weeks at 50°C can be interpreted as approximately 12 months at ambient temperature.





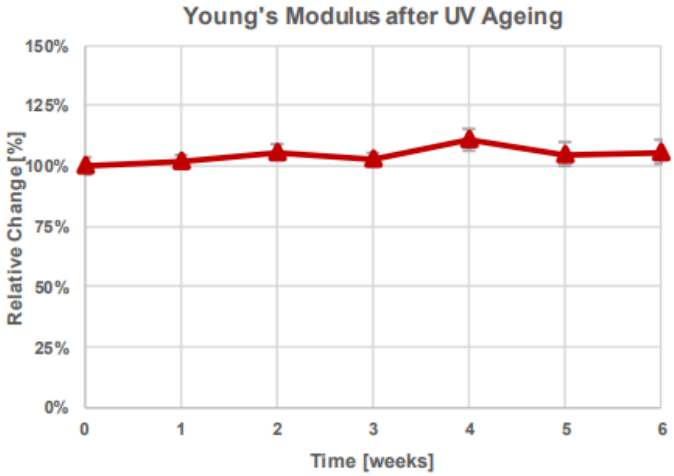


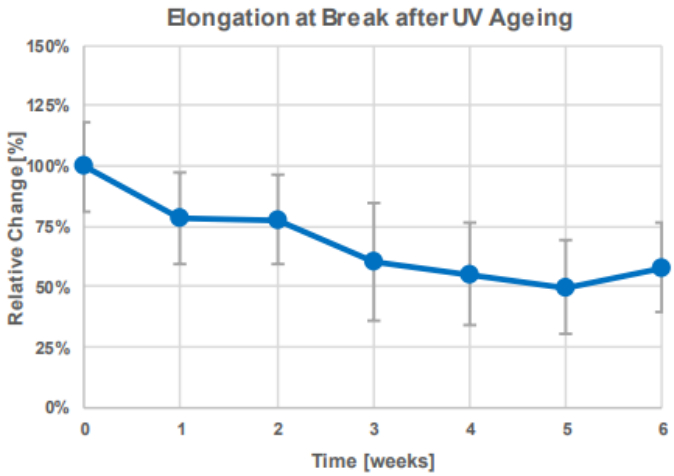


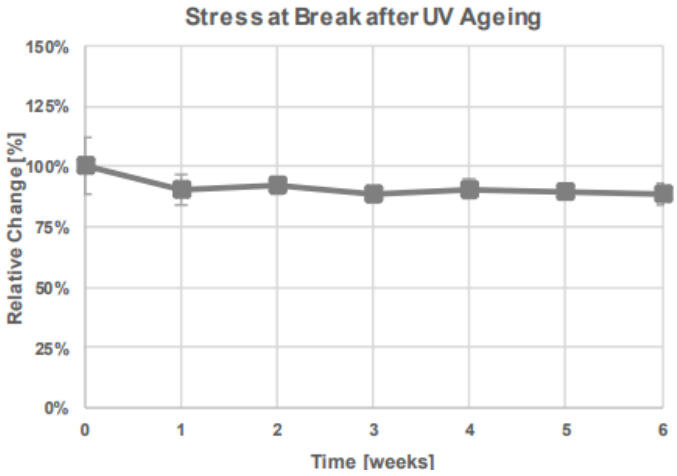
UV Ageing

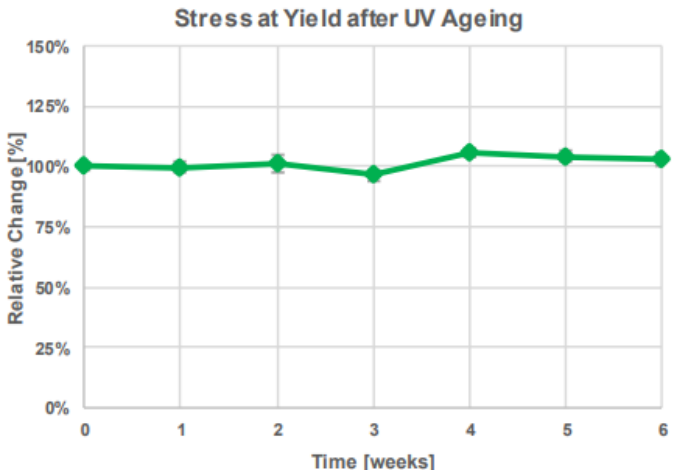
The samples were tested after accelerated outdoor weathering according to ASTM D4329 (Cycle A). Test samples were exposed to defined conditions of heat, water condensation and UV light. Exposed samples were conditioned for 24 hours at 22°C before mechanical testing. Control samples were stored at a constant 22°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D638 at standard lab conditions (22°C). "0 weeks" represents non-aged samples stored at 22°C and tested 24 hours after post-processing.

Please note, accelerated weathering testing can never fully represent real outdoor conditions and complexity. It is therefore recommended to conduct additional (outdoor) testing relevant for your specific application needs.





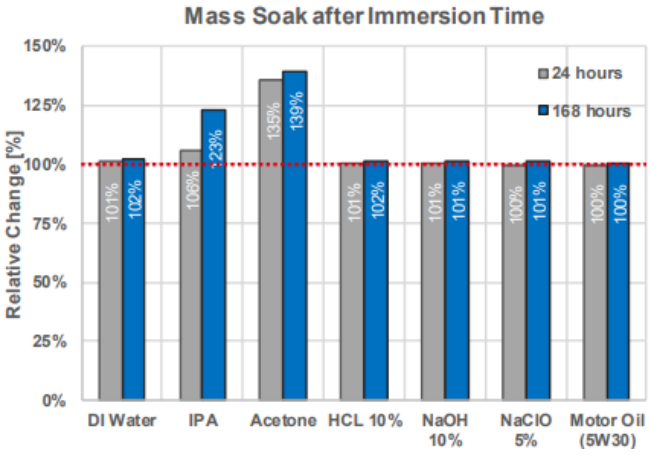




Industrial Chemical Resistance

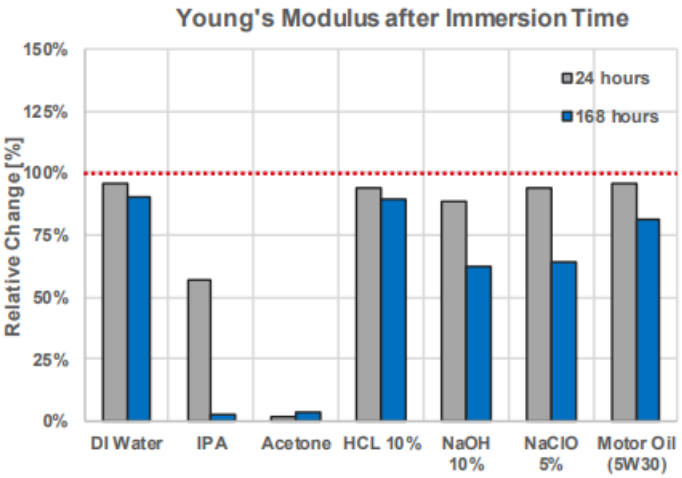
Weight Measurement

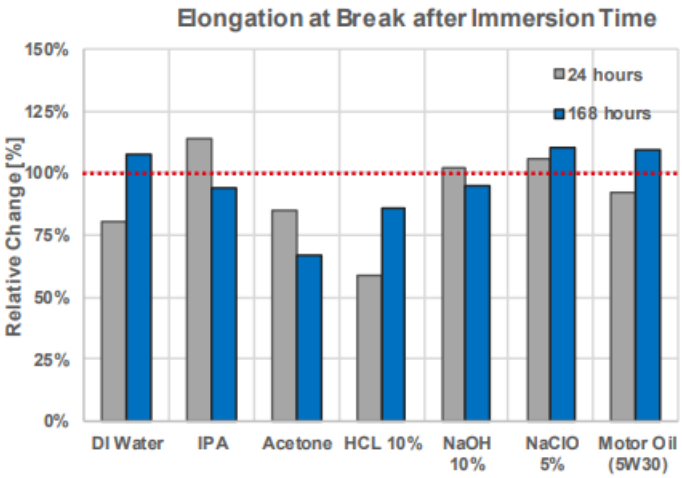
The test was conducted after chemical ageing according to ASTM D543. The influence of chemicals was tested by measuring the mass change after different test times (Immersion test for 24 and 168 hours). Exposed samples were stored in containers and fully immersed in different chemicals. Samples were stirred every 24 hours using a shaker. After removal exposed samples were washed, dried and immediately weighed. All samples were printed using a validated workflow. "100%" represents the initial weight 24 hours after post-processing.

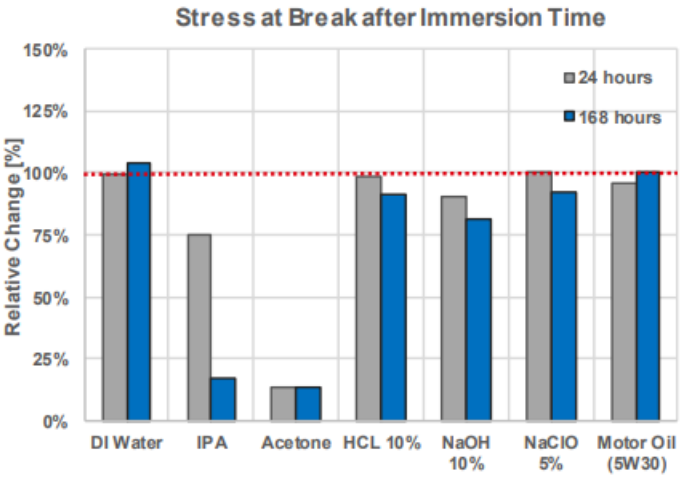


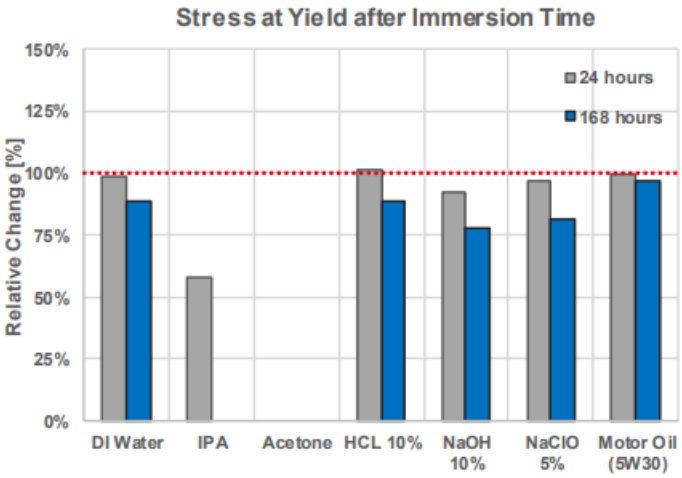
Mechanical Testing

The test was conducted after chemical ageing according to ASTM D543. The influence of chemicals was tested by measuring mechanical properties after different test times (Immersion test for 24 and 168 hours). Exposed samples were stored in containers and fully immersed in different chemicals. Samples were stirred every 24 hours using a shaker. After removal, exposed samples were washed and conditioned for 24 hours at 22°C before mechanical testing. All samples were printed using a validated workflow. Mechanical testing was conducted according to ASTM D638 at standard lab conditions (22°C). "100%" represents non-aged samples stored at 22°C and tested 24 hours after post-processing.



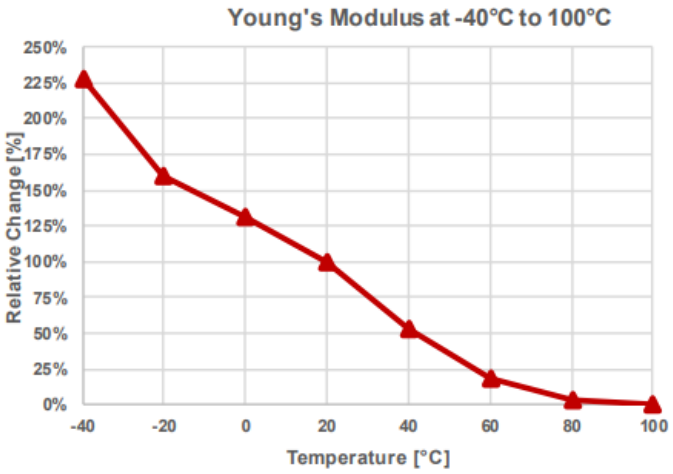


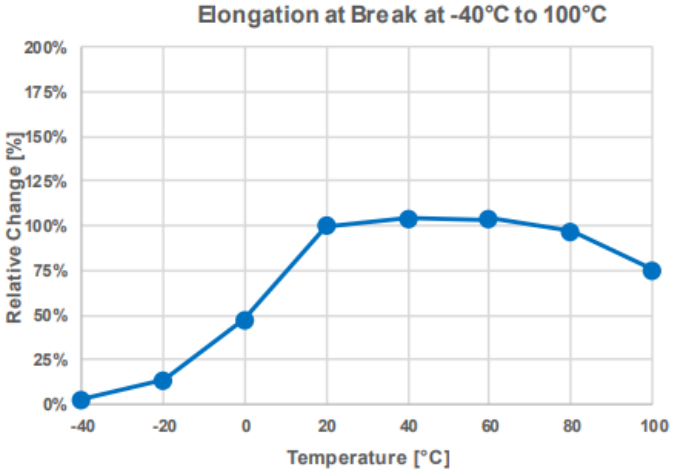


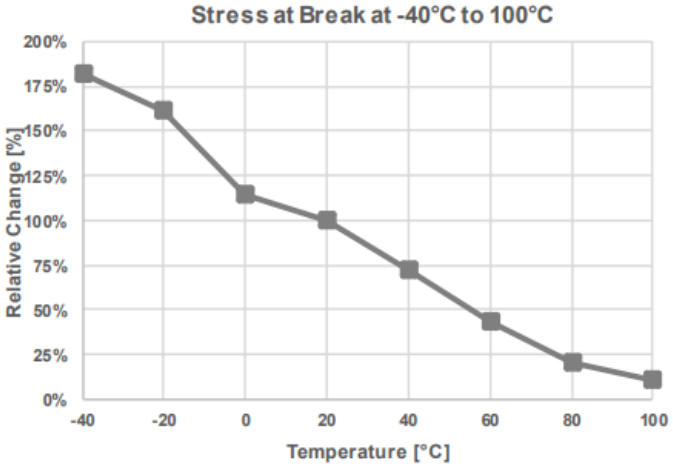


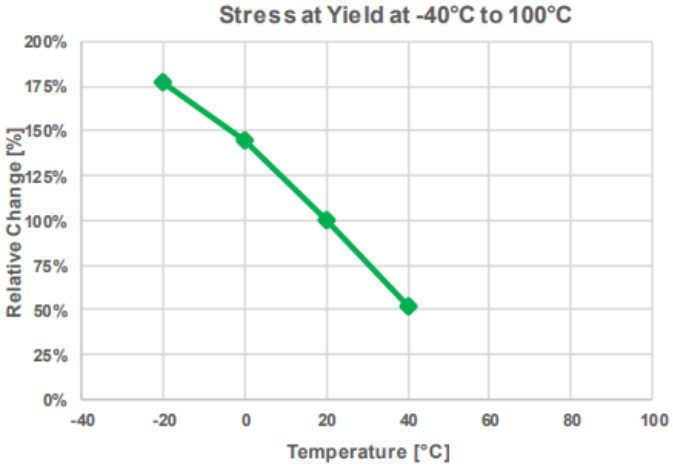
Temperature Dependence of Mechanical Properties

The test was conducted according to ASTM D638 at varied environmental temperatures, from -40°C to 100°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D638. Before each test series samples were conditioned for 60 minutes at the specific test temperature.









Note: The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Nexa3D is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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