



## xPEEK147

### Basic Properties

Measurement	Unit	Test Method	2x30min in XiP Cure, 1x60min in xCure,	2x10min 100% in xCure Desktop	UV + 3hrs @170°C
<b>Tensile Properties</b>					
Young's Modulus	MPa	ASTM D638	2436	3220	2820
Ultimate Tensile Strength	MPa	ASTM D638	53	80	65
Elongation at Break	%	ASTM D638	3.3	3.2	2.9
<b>Flexural Property</b>					
Flexural Modulus	MPa	ASTM D790	2845	3553	3491
Flexural Stress	°C	ASTM D790	111	127	134
Flexural Strain	W/(m·K)	ASTM D790	4.2	4.2	3.8
<b>Thermal Properties</b>					
HDT at 1.82 Mpa	°C	ASTM D648	68	114	184
HDT at 0.45 Mpa	°C	ASTM D648	222	-	230
<b>General Properties</b>					
Viscosity at 25°C (77°F)	cP	ASTM D7867	1900-2300		
Liquid Density	g/cm <sup>3</sup>	ASTM D1475	1.07		
Solid Density	g/cm <sup>3</sup>	ASTM D792	1.26		

### Henkel Extended Properties

Measurement	Unit	Test Method	Post Processed
<b>Impact Property</b>			
IZOD Impact (Notched)	J/m	ASTM D256	14.6
<b>Additional Thermal Properties</b>			
Thermal Conductivity	W/(m·K)	ASTM D5930	0.2
Heat Capacity	J/(g·K)	ASTM D5930	1.3
CTE (25°C to 200°C)	µm/(m·K)	ASTM E831	114
<b>Electrical Properties</b>			
Volume Resistivity	Ω·cm	ASTM D257	3.6E16
Surface Resistivity	Ω	ASTM D257	3.4E16
Electric Strength	kV/mm	ASTM D149	29
<b>AC Relative Permittivity (Dielectric Constant)</b>			
at 50 Hz (XY)		ASTM D150	3
at 1 kHz (XY)		ASTM D150	3
at 1 MHz (XY)		ASTM D150	2.8
<b>AC Loss Characteristic (Dissipation Factor)</b>			
at 50 Hz (XY)		ASTM D150	-0.002
at 1 kHz (XY)		ASTM D150	0.008
at 1 MHz (XY)		ASTM D150	0.016

Other Properties			
Water Absorption (24hr)	%	ASTM D570	0.24
Water Absorption (48hr)	%	ASTM D570	0.39
Water Absorption (168hr)	%	ASTM D570	0.78
Shore Hardness	D	ASTM D2240	94

## Storage

Store xPEEK147 in the unopened container in a dry location. Optimal storage: 20°C to 30°C, storage below 20°C or greater than 30°C can adversely affect products properties. More specific information is given in the Safety Data Sheet.

If xPEEK147 is exposed to temperature below 20°C compounds in the resin might crystallize. If crystals are observed during storage, place the closed bottle in a 60°C oven for 24 hours, then remove from the oven and shake the bottle vigorously. Allow the bottle and resin to cool to ambient temperature before usage.

Material removed from container may be contaminated during use. For this reason, filter used resin with 190µm mesh filter before placing back into proper storage container.

## Preheating

xPEEK147 requires pre-heated before use. It is recommended to heat it in the provided 1kg or 5kg containers at 60°C for 24 hours in the container. Let the bottle and resin cool down to ambient temperature and shake container well before pouring resin into the resin tray. The pre-heated material should be used within 2 weeks for best results. Be advised the container should not be exposed to temperature above 65°C as higher temperature exposure could weaken the HDPE container.

## 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

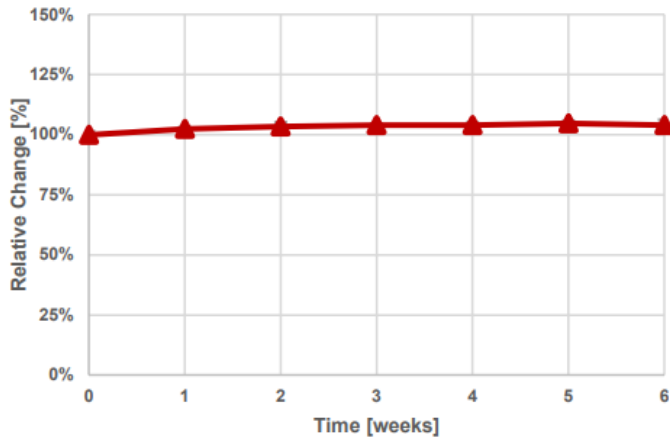
xPEEK147 requires post processing to achieve specified properties. Prior to post curing, the part should be washed. Nexa3D recommends using xClean followed by IPA as standard cleaning procedure. Parts should not be submerged in xClean for longer than 2 minutes or in IPA for longer than 5 minutes to avoid any impact on performance.

## Heat Ageing

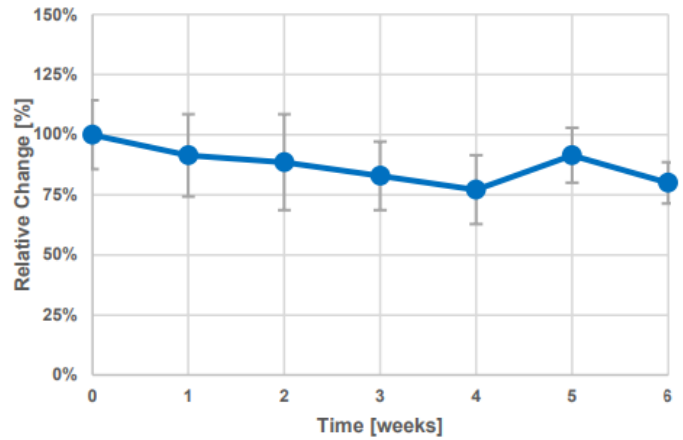
The samples were heat aged without load according to ASTM D3045. Test samples were exposed for a defined time at 50°C and conditioned for 24 hours at 22°C before mechanical testing. Control samples were stored at a constant 22°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D790 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.

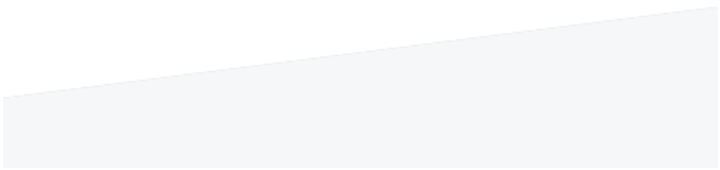
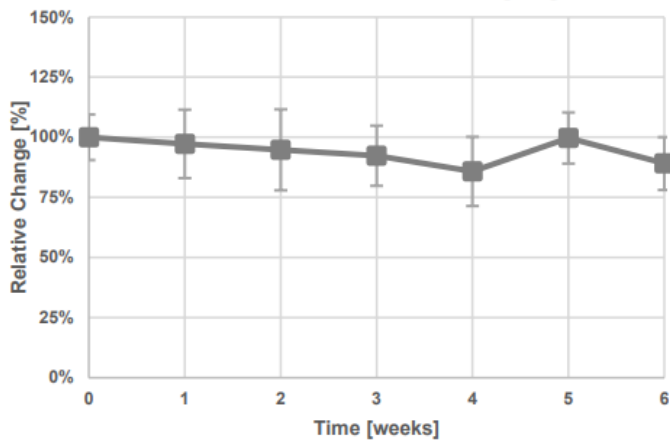
Flexural Modulus after Heat Ageing at 50°C



Flexural Elongation at Break after Heat Ageing at 50°C



Flexural Stress at Break after Heat Ageing at 50°C

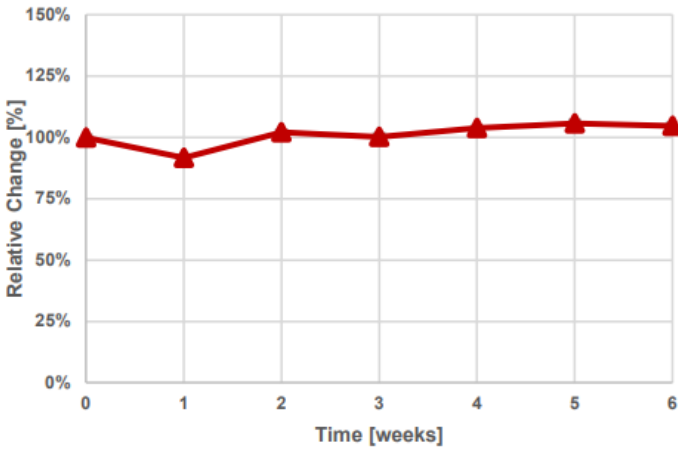


## UV Ageing

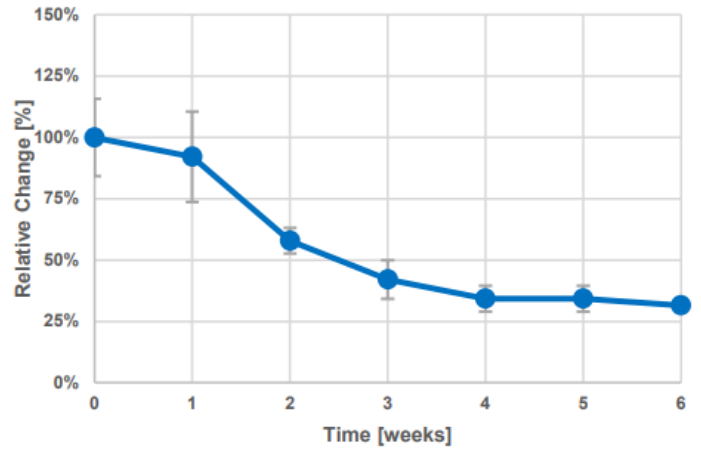
The samples were tested after accelerated outdoor weathering according to ASTM D4329 (Cycle A). Test samples were exposed to defined conditions of heat, water condensation and UV light. Exposed samples were conditioned for 24 hours at 22°C before mechanical testing. Control samples were stored at a constant 22°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D790 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.

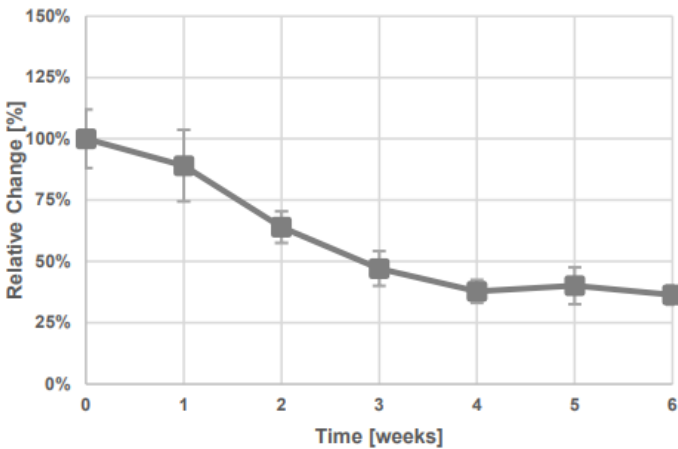
**Flexural Modulus after UV Ageing**



**Flexural Elongation at Break after UV Ageing**



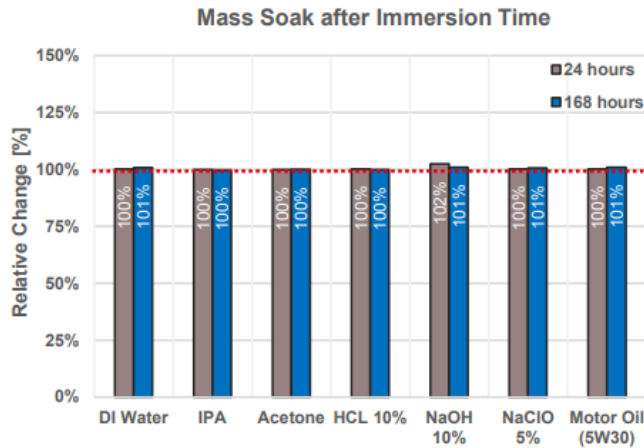
**Flexural Stress at Break after UV Ageing**



# Industrial Chemical Resistance

## Weight Measurement

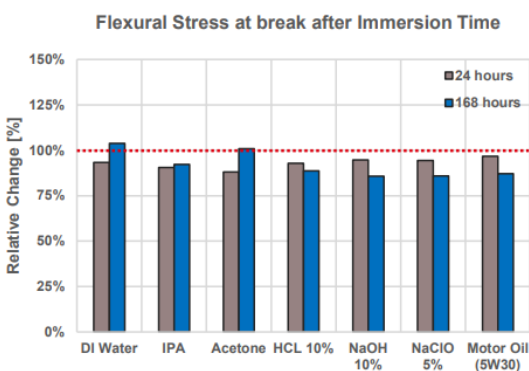
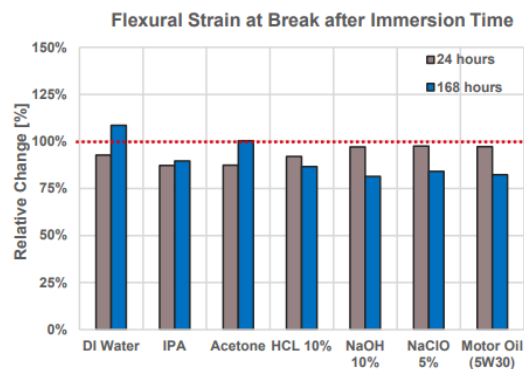
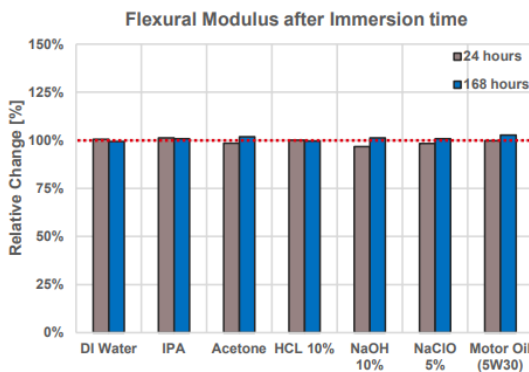
The samples were tested after chemical ageing according to ASTM D543. The influence of chemicals was tested by measuring the mass change after different test times (Immersion test for 24 and 168 hours). Exposed samples were stored in containers and fully immersed in different chemicals. Samples were 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 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 D790 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.



**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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