



xFLEX475-Black

Basic Properties

| Measurement | Unit | Test Method | 2x30min in XiP Cure, 1x60min in xCure, 2x10min 100% in xCure Desktop |
|--------------------------------|-------------------|-------------|--|
| Elastomer Properties | | | |
| Young's Modulus | MPa | ASTM D638 | 1.8 |
| Ultimate Tensile Strength | MPa | ASTM D638 | 2.2 |
| Elongation at Break | % | ASTM D638 | 162 |
| Stress at 50% strain | MPa | ASTM D412 | 0.56 |
| Stress at 100% strain | MPa | ASTM D412 | 1.1 |
| Stress at Break | Mpa | ASTM D412 | 2.4 |
| Strain at Break | % | ASTM D412 | 157 |
| Tear Strength | kN/m | ASTM D624 | 6.07 |
| Resilience by Vertical Rebound | % | ASTM D2632 | 40 |
| Shore Hardness (1s) | A | ASTM D2240 | 40 |
| Shore Hardness (5s) | A | ASTM D2240 | 38 |
| General Properties | | | |
| Viscosity at 25°C (77°F) | cP | ASTM D7867 | 1500 |
| Liquid Density | g/cm ³ | ASTM D1475 | 1.01 |
| Solid Density | g/cm ³ | ASTM D792 | 1.04 |

Henkel Extended Properties

| Measurement | Unit | Test Method | Post Processed |
|---|---------|-------------|----------------|
| Compression Property | | | |
| Compression Set (22hr) | % | ASTM D395 | 25.4 |
| Additional Thermal Properties | | | |
| Thermal Conductivity | W/(m·K) | ASTM D5930 | 0.17 |
| Heat Capacity | J/(g·K) | ASTM D5930 | 0.38 |
| Electrical Properties | | | |
| Volume Resistivity | Ω·cm | ASTM D257 | 5.79E11 |
| Surface Resistivity | Ω | ASTM D257 | 1.43E13 |
| Electric Strength | kV/mm | ASTM D149 | 27.9 |
| AC Relative Permittivity (Dielectric Constant) | | | |
| at 50 Hz (XY) | | ASTM D150 | 7.2 |
| at 1 kHz (XY) | | ASTM D150 | 5.7 |
| at 1 MHz (XY) | | ASTM D150 | 4.2 |
| AC Loss Characteristic (Dissipation Factor) | | | |
| at 50 Hz (XY) | | ASTM D150 | 0.067 |
| at 1 kHz (XY) | | ASTM D150 | 0.090 |
| at 1 MHz (XY) | | ASTM D150 | 0.193 |

| Other Properties | | | |
|-------------------------|---|-----------|-----|
| Water Absorption (24hr) | % | ASTM D570 | 3.2 |
| Water Absorption (72hr) | % | ASTM D570 | 5.4 |

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

xFLEX475-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 IPA for longer than 5 minutes to avoid any impact on performance.

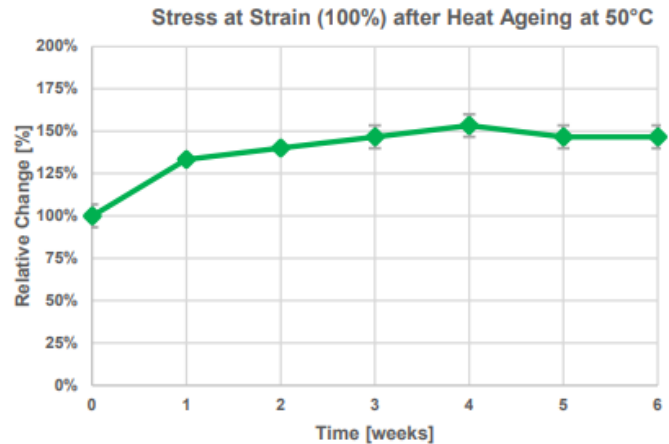
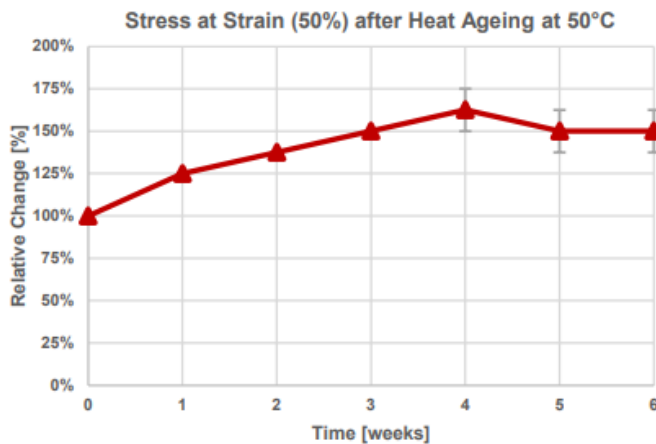
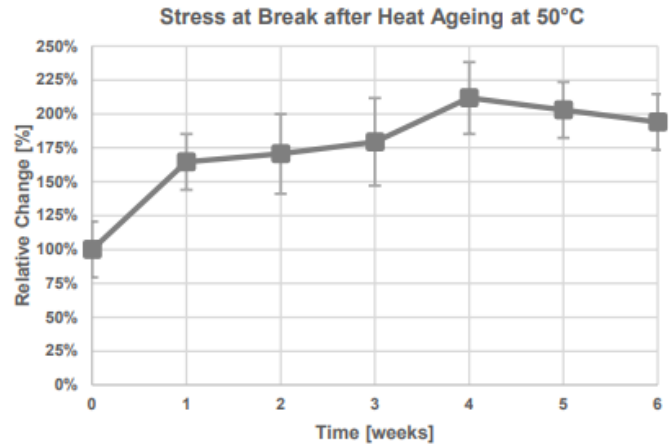
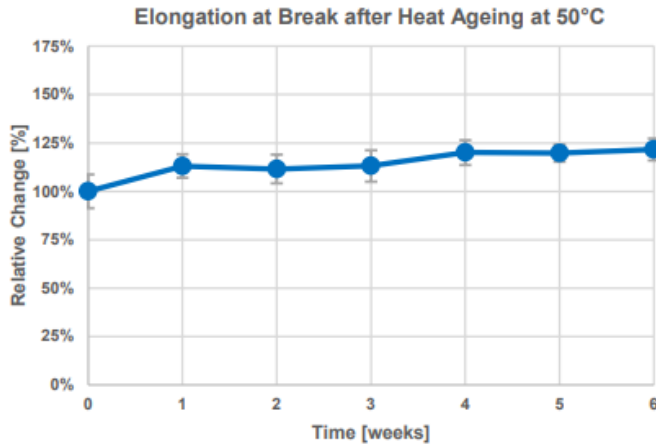
Post Cure

xFLEX475-Black requires post curing **in water** to achieve specified properties. It is recommended to apply a **mold release** on the parts before submerged in a transparent water container.

Heat Ageing

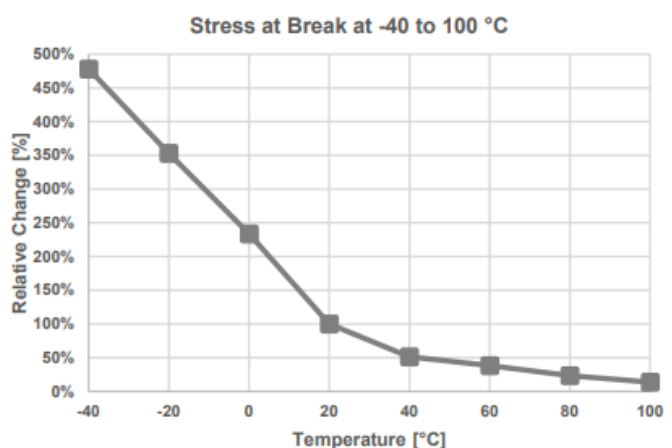
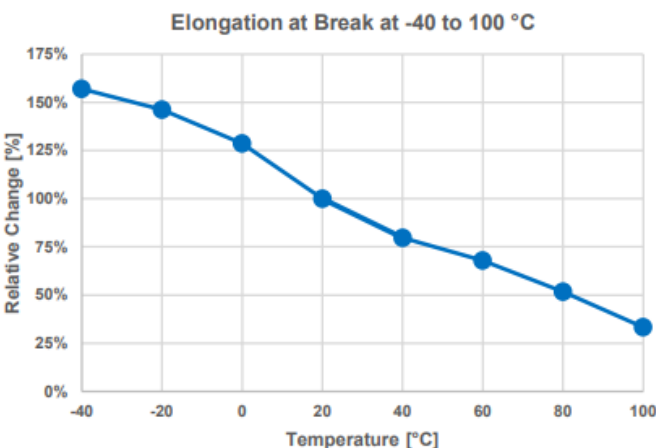
The samples were heat aged without load according to ASTM D3045. Test samples were exposed for a defined time at 50°C and conditioned for 24 hours at 22°C before mechanical testing. Control samples were stored at a constant 22°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D412 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.



Temperature Dependence of Mechanical Properties

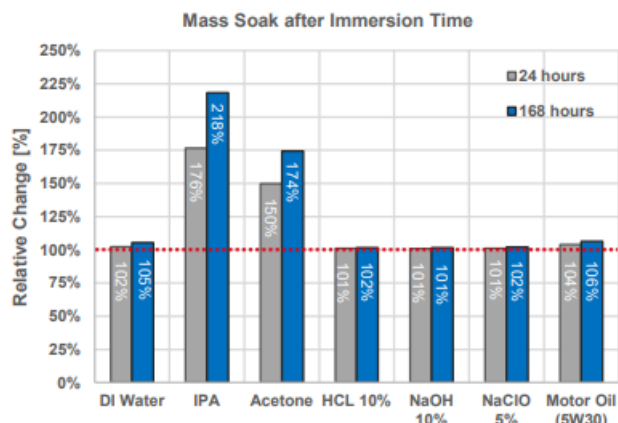
The test was conducted according to ASTM D412 at varied environmental temperatures, from -40°C to 100°C. All samples were printed in the same print job using a validated workflow. Mechanical testing was conducted according to ASTM D412. Before each test series samples were conditioned for 60 minutes at the specific test temperature.



Industrial Chemical Resistance

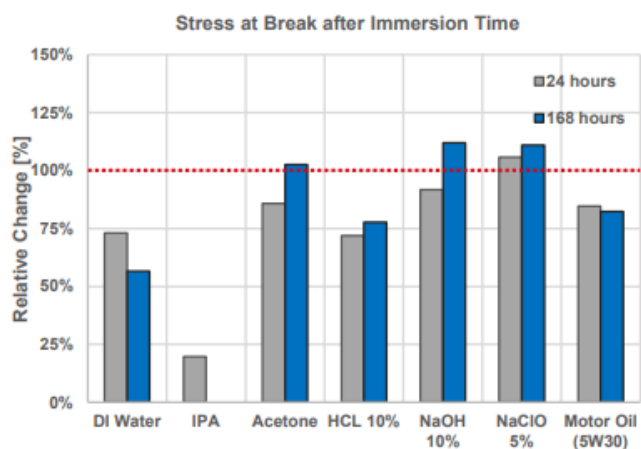
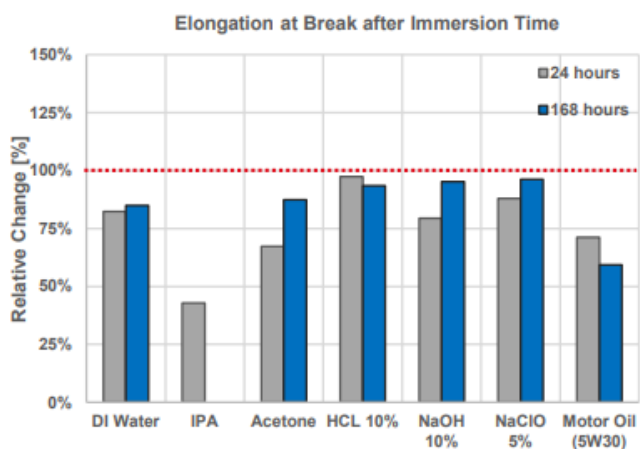
Weight Measurement

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 D412 at standard lab conditions (22°C). "100%" represents non-aged samples stored at 22°C and tested 24 hours after post-processing.



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