

## Ultramid® A3EG7 FC Aqua UN PA66-GF35

BASF

Ultramid® A3EG7FC Aqua UN is optimized for plastic parts, mandatory requiring material approvals for drinking water or direct food contact.

The product is approved according to

- 21 CFR FDA § 177.1500 "Nylon resins". (for repeated use applications only)
- European Food Contact European Food Contact Commission Regulation (EU) 10/2011
- GMP (EC) n°2023/2006

and provides the approvals for drinking water regulations of

- KTW
- DVGW W270
- WRAS
- ACS (disclosure of ingredients)
- NSF (disclosure of ingredients)

For questions regarding the compliance with further regulations, and certificates, please contact your local BASF representative or Plastics Safety (E-Mail: [plastics.safety@basf.com](mailto:plastics.safety@basf.com)).

| Rheological properties      | dry / cond | Unit      | Test Standard   |
|-----------------------------|------------|-----------|-----------------|
| <b>ISO Data</b>             |            |           |                 |
| Melt volume-flow rate, MVR  | 35 / *     | cm³/10min | ISO 1133        |
| Temperature                 | 275 / *    | °C        | -               |
| Load                        | 5 / *      | kg        | -               |
| Molding shrinkage, parallel | 0.5 / *    | %         | ISO 294-4, 2577 |
| Molding shrinkage, normal   | 1.0 / *    | %         | ISO 294-4, 2577 |

| Mechanical Properties                   | dry / cond   | Unit  | Test Standard |
|-----------------------------------------|--------------|-------|---------------|
| <b>ISO Data</b>                         |              |       |               |
| Tensile Modulus                         | 11500 / 8500 | MPa   | ISO 527       |
| Stress at Break                         | 210 / 150    | MPa   | ISO 527       |
| Strain at Break                         | 3 / 5        | %     | ISO 527       |
| Tensile Creep Modulus, 1000h            | * / 6650     | MPa   | ISO 899-1     |
| Impact Strength (Charpy), +23°C         | 95 / 105     | kJ/m² | ISO 179/1eU   |
| Impact Strength (Charpy), -30°C         | 75 / -       | kJ/m² | ISO 179/1eU   |
| Notched Impact Strength (Charpy), +23°C | 14 / 22      | kJ/m² | ISO 179/1eA   |
| Notched Impact Strength (Charpy), -30°C | 12 / -       | kJ/m² | ISO 179/1eA   |
| Notched Impact Strength (Izod), 23°C    | 14 / 18      | kJ/m² | ISO 180/1A    |

| Thermal Properties                          | dry / cond | Unit  | Test Standard  |
|---------------------------------------------|------------|-------|----------------|
| <b>ISO Data</b>                             |            |       |                |
| Melting Temperature (10°C/min)              | 260 / *    | °C    | ISO 11357-1/-3 |
| Temp. of deflection under load (1.80 MPa)   | 250 / *    | °C    | ISO 75-1/-2    |
| Temp. of deflection under load (0.45 MPa)   | 250 / *    | °C    | ISO 75-1/-2    |
| Vicat softening temperature, 50°C/h 50N     | 250 / *    | °C    | ISO 306        |
| Coeff. of Linear Therm. Expansion, parallel | 22 / *     | E-6/K | ISO 11359-1/-2 |
| Coeff. of Linear Therm. Expansion, normal   | 93 / *     | E-6/K | ISO 11359-1/-2 |
| Burning Behav. at 1.5 mm Nom. Thickn.       | HB / *     | class | UL 94          |
| Thickness tested                            | 1.6 / *    | mm    | -              |
| UL recognition                              | yes / *    | -     | -              |
| Burning Behav. at thickness h               | HB / *     | class | UL 94          |
| Thickness tested                            | 0.8 / *    | mm    | -              |
| UL recognition                              | yes / *    | -     | -              |
| Oxygen index                                | 24 / *     | %     | ISO 4589-1/-2  |

| Electrical Properties       | dry / cond   | Unit  | Test Standard |
|-----------------------------|--------------|-------|---------------|
| <b>ISO Data</b>             |              |       |               |
| Relative permittivity, 1MHz | 3.5 / 5.7    | -     | IEC 62631-2-1 |
| Dissipation Factor, 100Hz   | 200 / 3000   | E-4   | IEC 62631-2-1 |
| Dissipation Factor, 1MHz    | 200 / 1500   | E-4   | IEC 62631-2-1 |
| Volume Resistivity          | >1E13 / 1E11 | Ohm*m | IEC 62631-3-1 |
| Surface Resistivity         | * / 1E10     | Ohm   | IEC 62631-3-2 |
| Electric Strength           | 40 / 37      | kV/mm | IEC 60243-1   |
| Comparative tracking index  | - / 550      | -     | IEC 60112     |

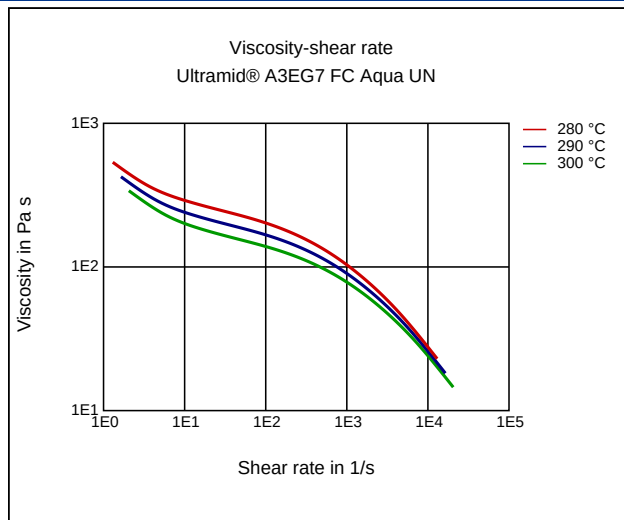
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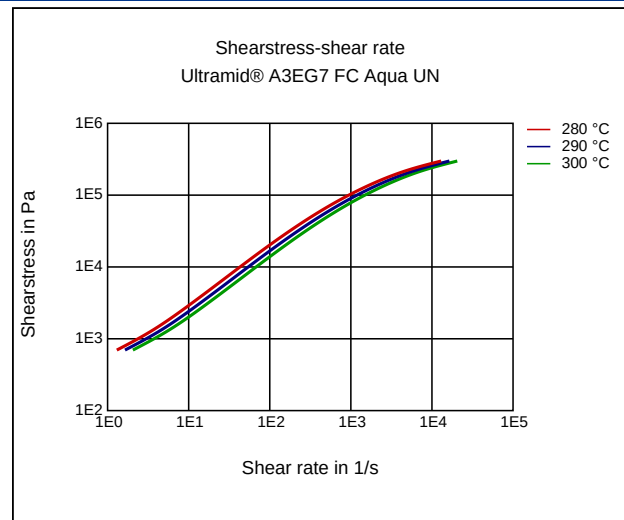
| Other Properties                                   | dry / cond | Unit  | Test Standard       |
|----------------------------------------------------|------------|-------|---------------------|
| <b>ISO Data</b>                                    |            |       |                     |
| Water Absorption                                   | 5 / *      | %     | Sim. to ISO 62      |
| Humidity absorption                                | 1.6 / *    | %     | Sim. to ISO 62      |
| Density                                            | 1410 / -   | kg/m³ | ISO 1183            |
| Bulk density                                       | 700        | kg/m³ | -                   |
| <b>Material Specific Properties</b>                |            |       |                     |
| <b>ISO Data</b>                                    |            |       |                     |
| Viscosity number                                   | 145 / *    | cm³/g | ISO 307, 1157, 1628 |
| <b>Rheological calculation properties</b>          |            |       |                     |
| <b>ISO Data</b>                                    |            |       |                     |
| Ejection temperature                               | 195        | °C    | -                   |
| <b>Test specimen production</b>                    |            |       |                     |
| <b>ISO Data</b>                                    |            |       |                     |
| Injection Molding, melt temperature                | 290        | °C    | ISO 294             |
| Injection Molding, mold temperature                | 80         | °C    | ISO 294             |
| Injection Molding, injection velocity              | 200        | mm/s  | ISO 294             |
| <b>Processing Recommendation Injection Molding</b> |            |       |                     |
| Pre-drying - Temperature                           | 80         | °C    | -                   |
| Pre-drying - Time                                  | 4          | h     | -                   |
| Processing humidity                                | ≤0.15      | %     | -                   |
| Melt temperature                                   | 280 - 300  | °C    | -                   |
| Mold temperature                                   | 80 - 90    | °C    | -                   |

## Diagrams

### Viscosity-shear rate



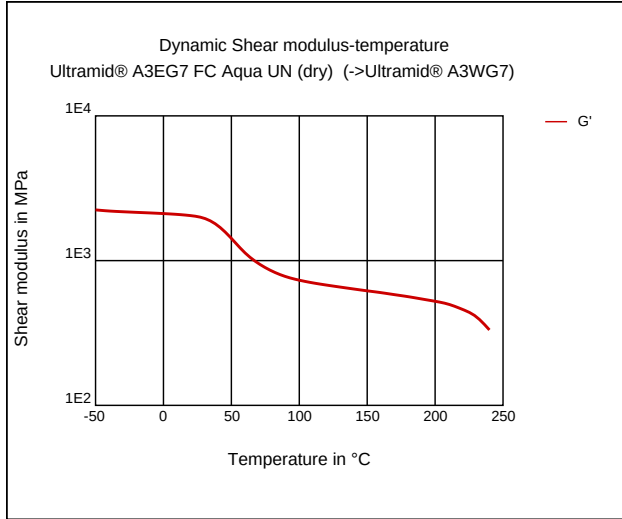
### Shearstress-shear rate



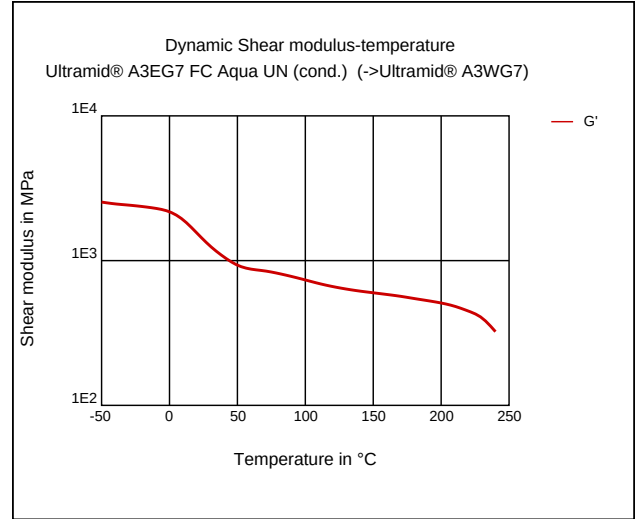
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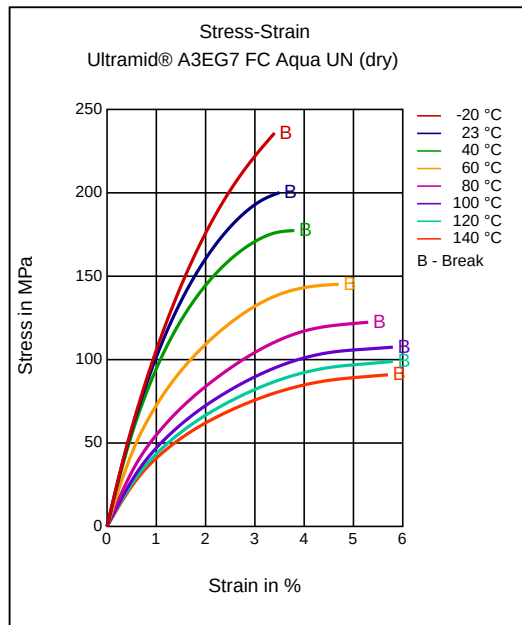
**Dynamic Shear modulus-temperature**



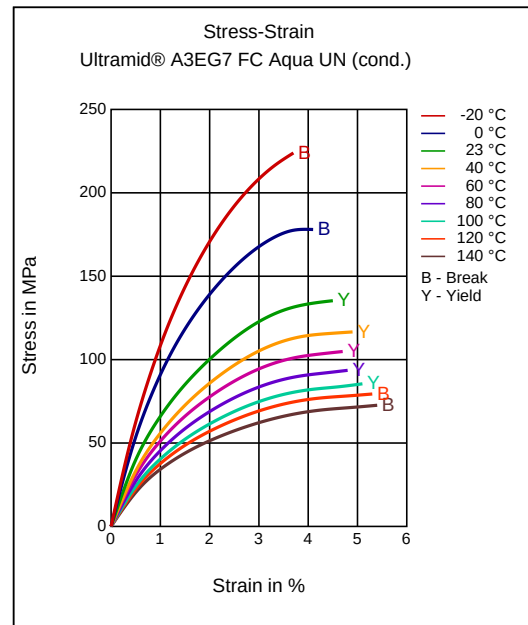
**Dynamic Shear modulus-temperature**



**Stress-strain**



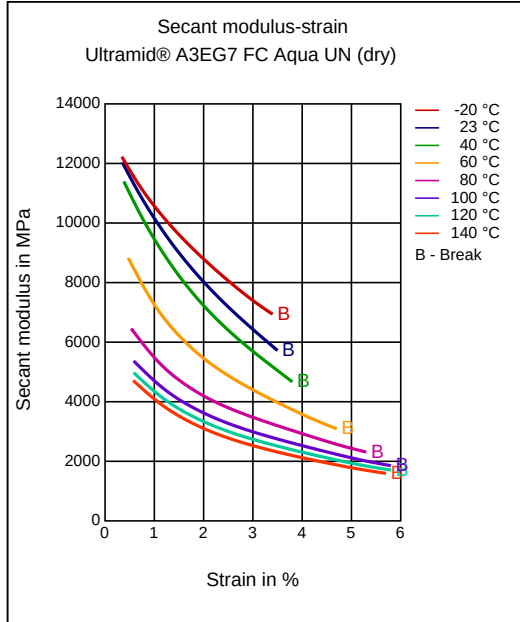
**Stress-strain**



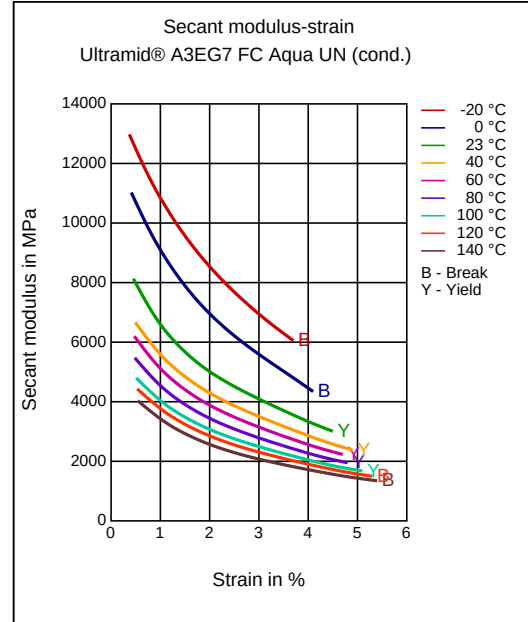
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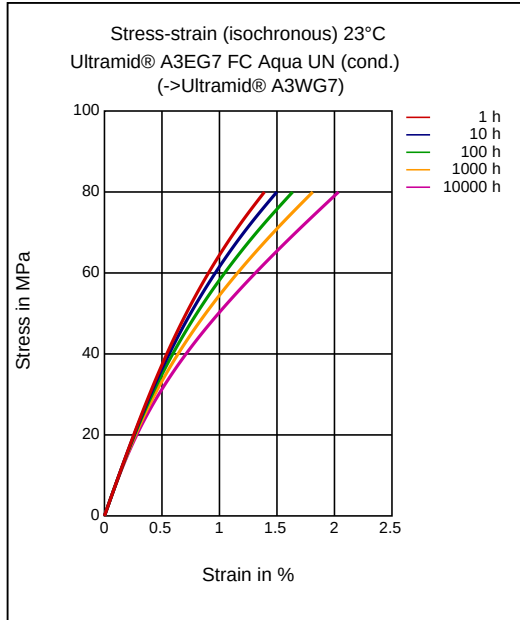
**Secant modulus-strain**



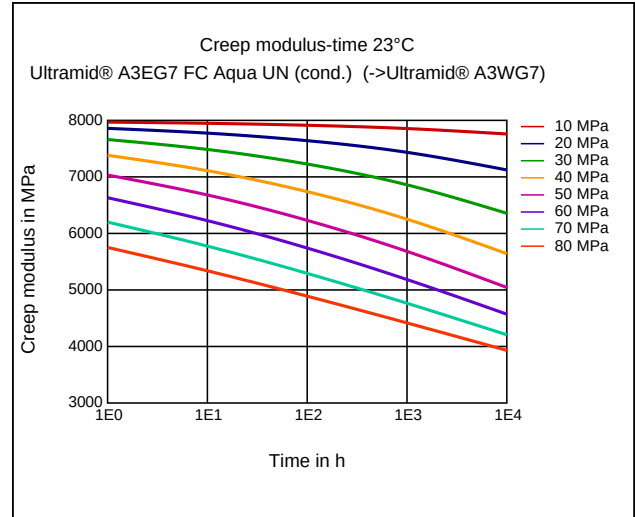
**Secant modulus-strain**



**Stress-strain (isochronous) 23 °C**



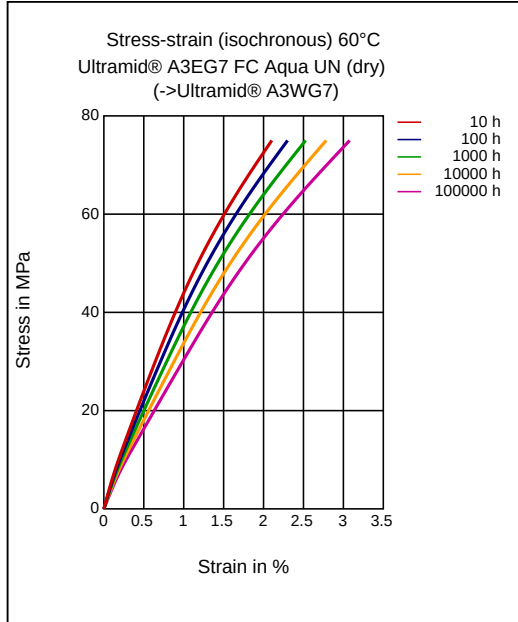
**Creep modulus-time 23 °C**



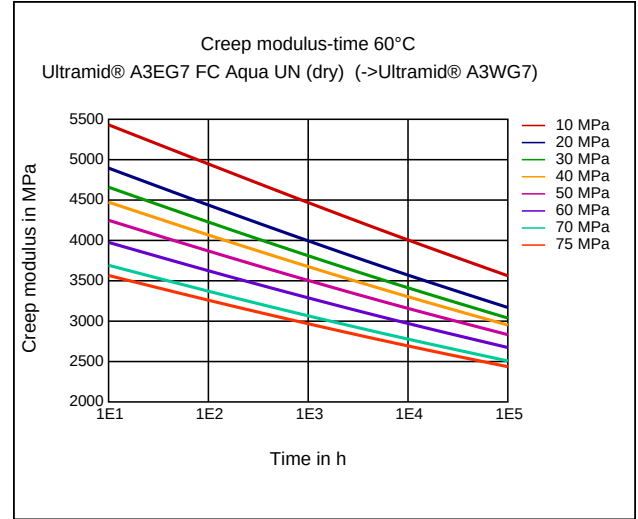
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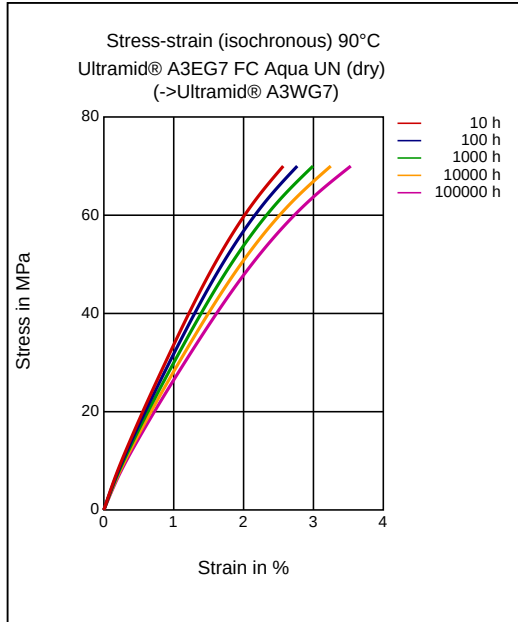
**Stress-strain (isochronous) 60°C**



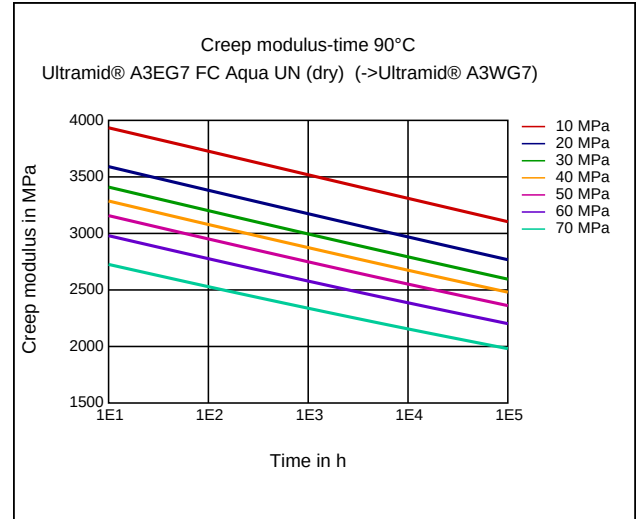
**Creep modulus-time 60°C**



**Stress-strain (isochronous) 90°C**



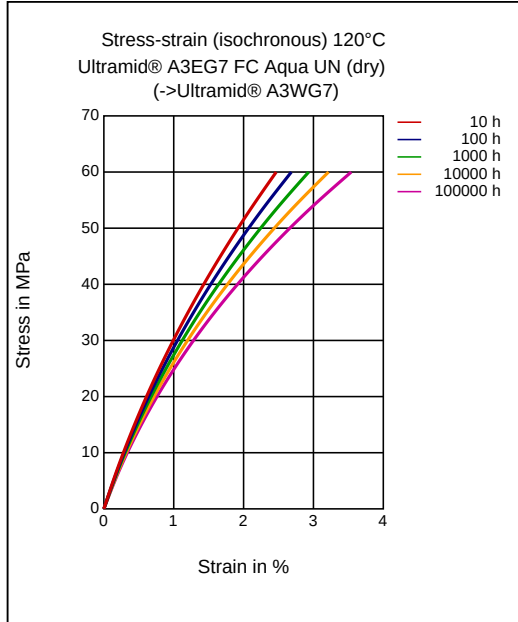
**Creep modulus-time 90°C**



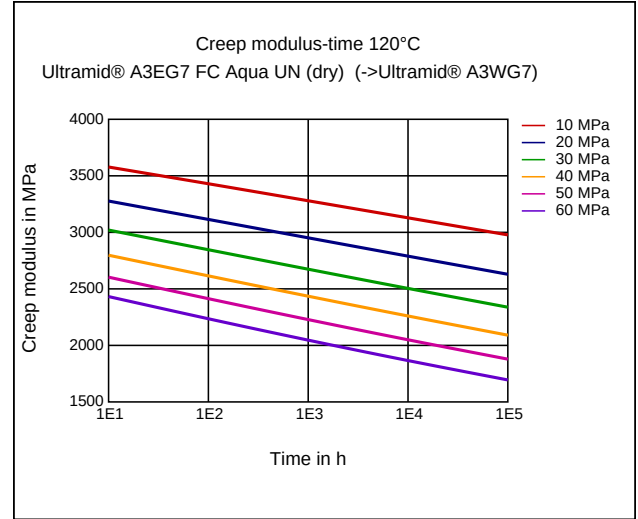
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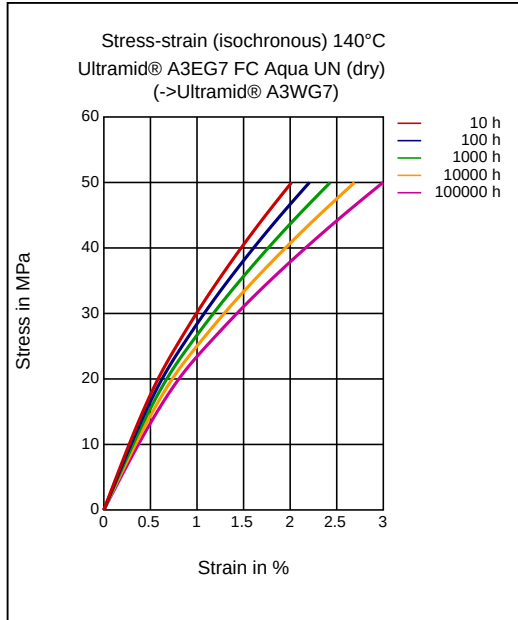
**Stress-strain (isochronous) 120°C**



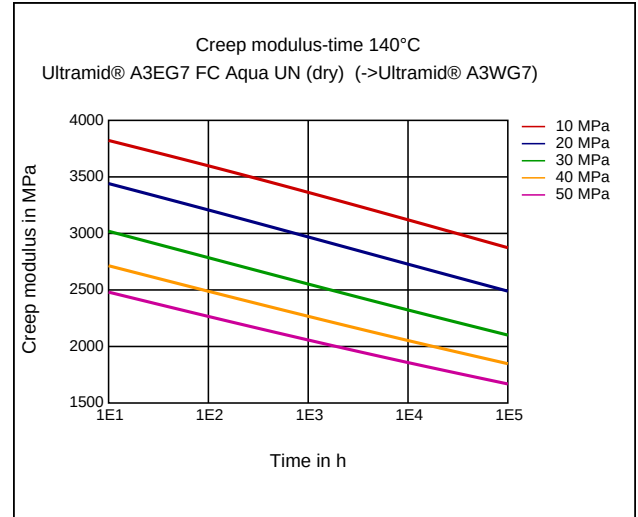
**Creep modulus-time 120°C**



**Stress-strain (isochronous) 140°C**



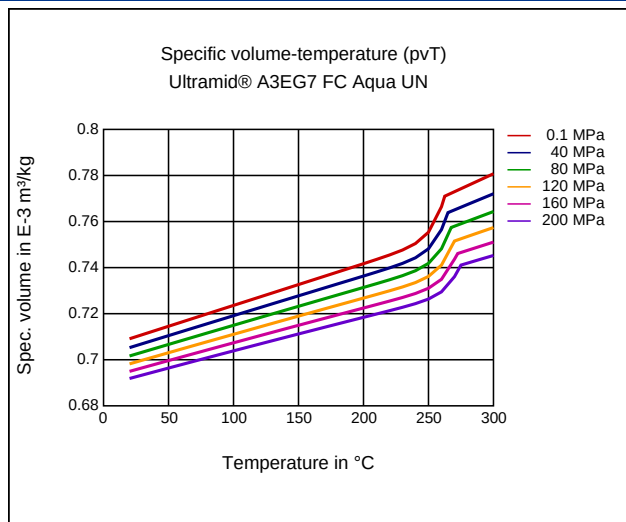
**Creep modulus-time 140°C**



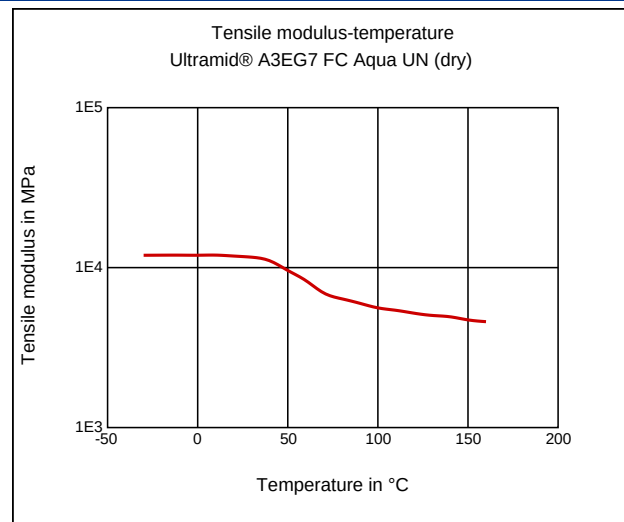
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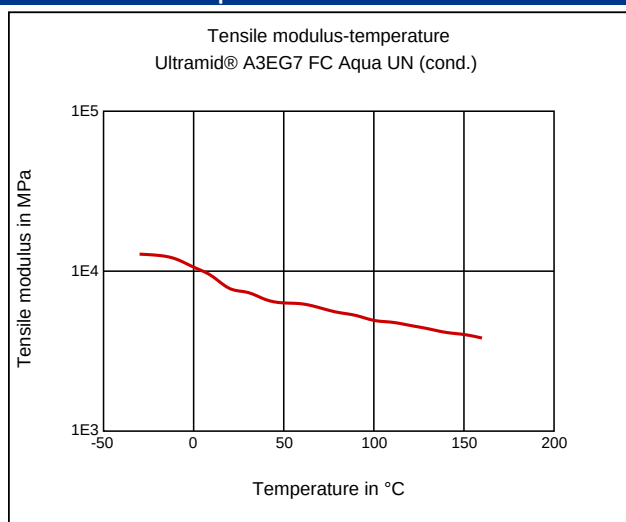
### Specific volume-temperature (pvT)



### Tensile Modulus-Temperature



### Tensile Modulus-Temperature



### Characteristics

#### Processing

Injection Molding, Other Extrusion

#### Delivery form

Pellets, Natural Color

#### Additives

Lubricants, Release agent

#### Special Characteristics

Heat aging stabilized

#### Certifications

Food approval, Food approval 10/2011, Food Contact (FDA), Water contact, Water contact KTW, Water contact DVGW W270, NSF Approval

#### Applications

Automotive

### Injection Molding

#### PREPROCESSING

Pre/Post-processing, max. allowed water content: .15 %

Pre/Post-processing, Pre-drying, Temperature: 80 °C

Pre/Post-processing, Pre-drying, Time: 4 h

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**PROCESSING**

injection molding, Melt temperature, range: 280 - 300 °C

injection molding, Melt temperature, recommended: 290 °C

injection molding, Mold temperature, range: 80 - 90 °C

injection molding, Mold temperature, recommended: 80 °C

injection molding, Dwell time, thermoplastics: 10 min