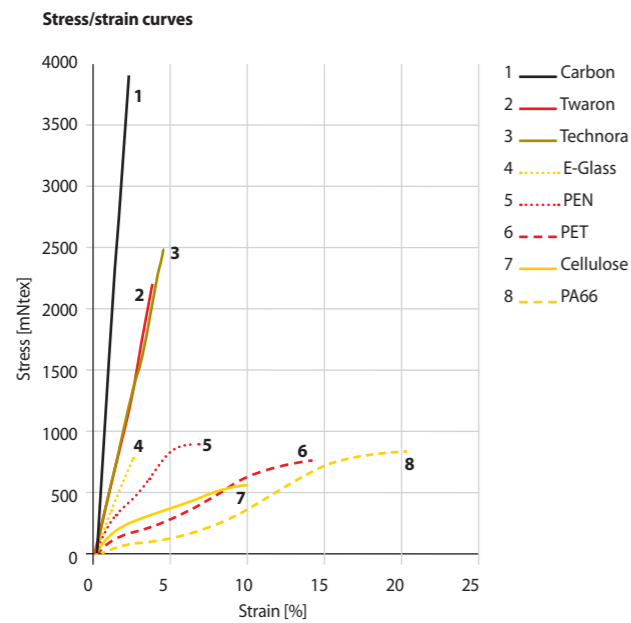


Twaron – a unique combination of properties

Mechanical properties

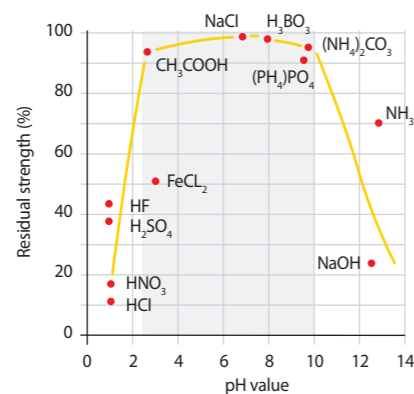
Twaron yarns are very strong, their tensile strength being two to three times higher than that of high-strength polyester and polyamide yarns and five times higher than that of steel (on weight basis). The table on page 7 shows the mechanical properties in detail.

The stress/strain curves are visualized in the graph below.



Chemical resistance

Twaron's high crystallinity and strong intermolecular interactions prevent chemicals from penetrating the polymer. Resistance to organic chemicals is good to excellent, while resistance to inorganic chemicals varies with their pH value. Highly acidic or alkaline chemicals may cause hydrolytic degradation.



Twaron resistance to chemical attack, exposure time: 3 months in water at room temperature.

Thermal properties

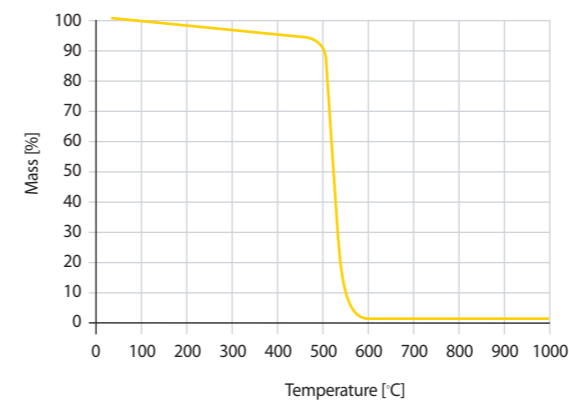
Twaron neither burns nor melts. The graphs below show that Twaron can survive brief exposure to temperatures up to 500°C (932°F) without any significant loss of mass. This is significantly better than the thermal properties of other synthetic fibers. When used as heat resistant material, however, it is not recommended to exceed 250°C. Twaron carbonizes in the absence of oxygen and approximately 30% of its mass is retained.

| Properties | Unit | Typical value |
|---|------------------------|-----------------------------------|
| Flammability (LOI) | % | 29 ¹ - 37 ² |
| Specific heat | $\frac{J}{kg \cdot K}$ | 1420 |
| Shrinkage in hot air (190°C / 374°F, 15 min.) | % | 0 |
| Decomposition temperature | °C/°F | 500/932 |
| Heat resistance (200°C / 392°F, 48 hrs.) | % | 90 |

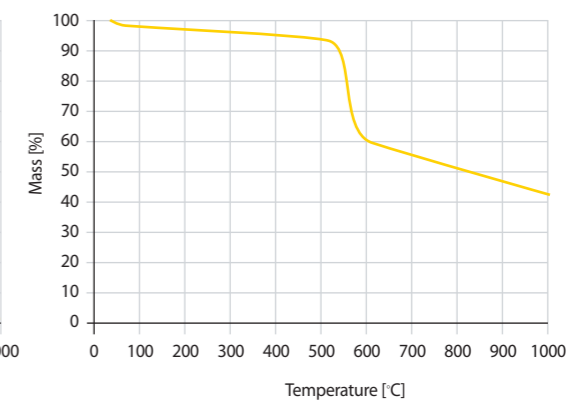
¹ fabric measurement ² filament yarn measurement

Thermogravimetric analysis of Twaron at a heating rate of 10°C/min.

In air



In nitrogen



UV resistance/weathering

Twaron is susceptible to UV light. It is recommended to protect aramid from exposure to direct sunlight.

Hydrolysis

Hydrolysis of aramid and other condensation polymers is sensitive to acids and bases.

If you're interested in more detailed information about Twaron properties or testing methods, please contact us.