DRINKING WATER APPLICATIONS UP TO 85°C

NORYL™ RESIN AS A ROBUST ALTERNATIVE TO PA 6.6

The new mandatory German drinking water evaluation criteria KTW-BWGL is effective as of March 2021. End-use parts and components in contact with potable water and sold in German market will need to comply with the new regulations.
Meeting new KTW-BWGL has become challenging for various materials commonly used in hot water applications (up to 85°C) , such as glass filled polyamide 6.6 (GF PA 6.6).

OUR POTENTIAL SOLUTION

Our **NORYL global potable water resins** portfolio provides a robust alternative which is not only **compliant with KTW-BWGL** but also can provide **additional benefits** such as more parts per kilogram and long-term property retention at elevated temperatures and chemical exposure.
Our team of experts is ready to assist you during the transition process to our GF resins with tooling and processing support, and our advanced design and simulation capabilities to optimize parts so they can address your performance requirements.

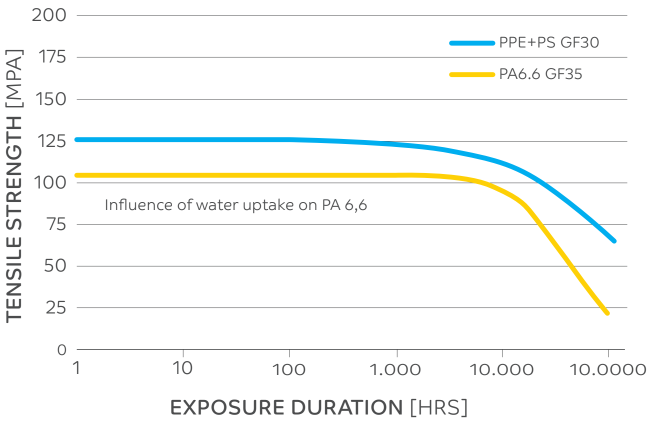
PROPERTY RETENTION

NORYL glass filled (GF) resins show excellent **dimensional stability** when exposed to water at elevated temperature, as result of **very low water uptake**.
NORYL GF resins have less than 0.3% water uptake when exposed to 90°C water compared to 5.3% for 35%GF PA 6.6.
High water uptake is something that **can negatively influence** material properties and need to be carefully considered during design stage.

Long-term **hydrolytic stability** and **good property retention** when exposed to elevated temperature is another key benefit for NORYL GF resins.

Excellent **resistance against chlorine** at elevated temperatures is another benefit for NORYL GF resins which help ensure long-term property retention.

TENSILE RETENTION CURVES* @60°C, WITHOUT KNITLINE



35% GLASS-FILLED POLYAMIDE 6.6 RESIN

Before chlorine exposure

After 1.100 hours of chlorine exposure at 90°C

30% GLASS-FILLED NORYL RESIN

Before chlorine exposure

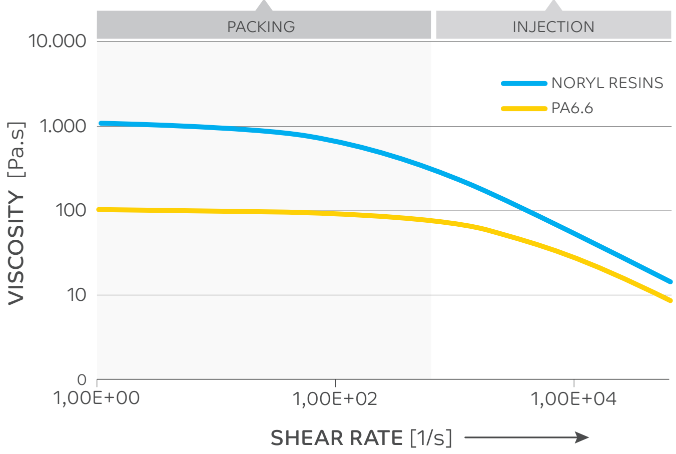
After 1.100 hours of chlorine exposure at 90°C

PROCESSING AND TOOLING CONSIDERATIONS

Key aspects to consider when using NORYL™ GF resin in existing PA 6.6 mold are:

- Melt and mold temperature are in **the same range** for GF NORYL and PA 6, 6
- Materials, such as NORYL resins, have **higher viscosity** than semi crystalline materials (e.g. PA 6.6). To compensate for it, runner and gate section need to be increased. This change will help to keep the injection pressure, material shearing and packing efficiency at similar level than with PA 6.6.
- Differences in **molding shrinkage** should be considered for part dimensions. Indicative mold shrinkage for 30% GF PA6,6 would be 0.2 to 0.5% for flow and 0.9 to 2% for cross flow direction, and NORYL resin would be 0.1 to 0.3% and 0.2 to 0.5%, respectively. (all measurements based on SABIC internal method that is derived from ISO294-4)

35% GF PA6.6 VS. 30%GF NORYL VISCOSITY @ [300°C]



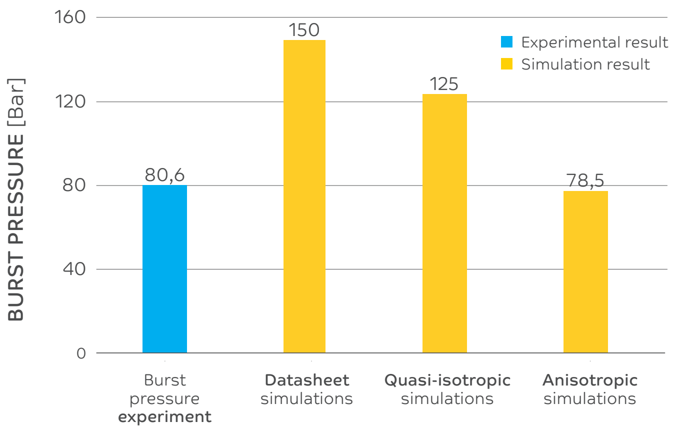
ADVANCED DESIGN AND SIMULATION SERVICES

Local design modification are needed to reach equal performance with NORYL resins. Typical critical areas are **weld lines, bolt connections** and stress **hot spots** under continuous load. SABIC has developed **anisotropic predictive engineering** service to **accurately predict** part performance under various loads and temperatures.

Datasheet stiffness & strength values are best case scenario due to the favorable fiber alignment in direction to the load.

Quasi-isotropic material data are closer to the reality but do not take into account the local variation of properties induced by the fiber orientation.

Anisotropic material models account for **local fiber orientation** and accurately predict the part performance taking into consideration temperature and stress levels. This approach can help optimizing cost and part performance.



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