

2. Solarthermie-Technologiekonferenz
26./27. Januar 2010, Berlin

Geeignete Polymere für Innovationen in der Solarthermie

Kunststoffe für Absorber

Vorteile:

- **Gewichtsreduzierung von ca. 30%, Montage-Erleichterung**
- **Einfache Produktionsprozesse bei hohen Stückzahlen und einfachere Integration von Zusatzfunktionen**

=> Kostenersparnis

- **Evaluierung vorhandener Kunststoffe hinsichtlich:**
 - **Wärmealterungsbeständigkeit im Wärmeträger**
 - **kritischen Betriebszuständen bei z.b. Wärmestau (ca. 200°C) oder Druckspitzen (ca. 10 bar)**
- **Demonstration der Machbarkeit durch reale Bauteile um die ökonomische und technische Machbarkeit zu demonstrieren**

2009 Ultramid® A (PA66) Lagerung in 130 °C Wasser

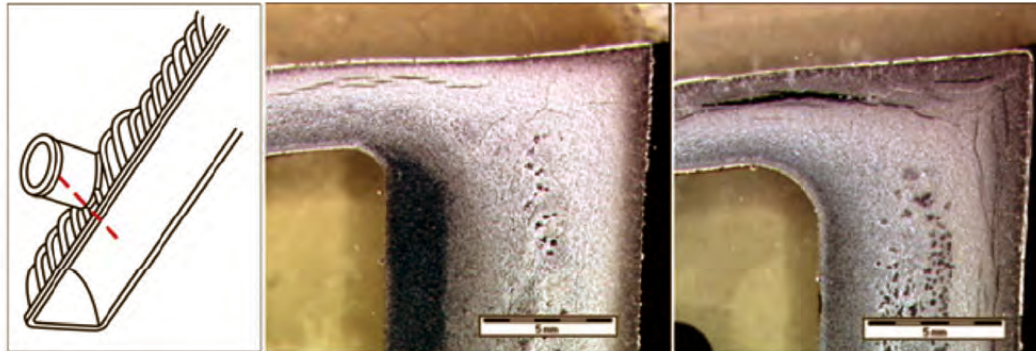
■ Even when the water boils

Recently, BASF has added two new hydrolysis-resistant polyamides (PA 66) to its product range. These plastic grades are called Ultramid® A3WG6 HRX and A3WG7 HRX and are reinforced with 30% and 35% glass fibers, respectively. The products were developed for applications in coolant circuits. Additionally, they also exhibit outstanding heat-ageing resistance in hot air.

Today, such components also need to be resistant to hot water and glycol. Tests were conducted with all of the standard water-glycol mixtures.

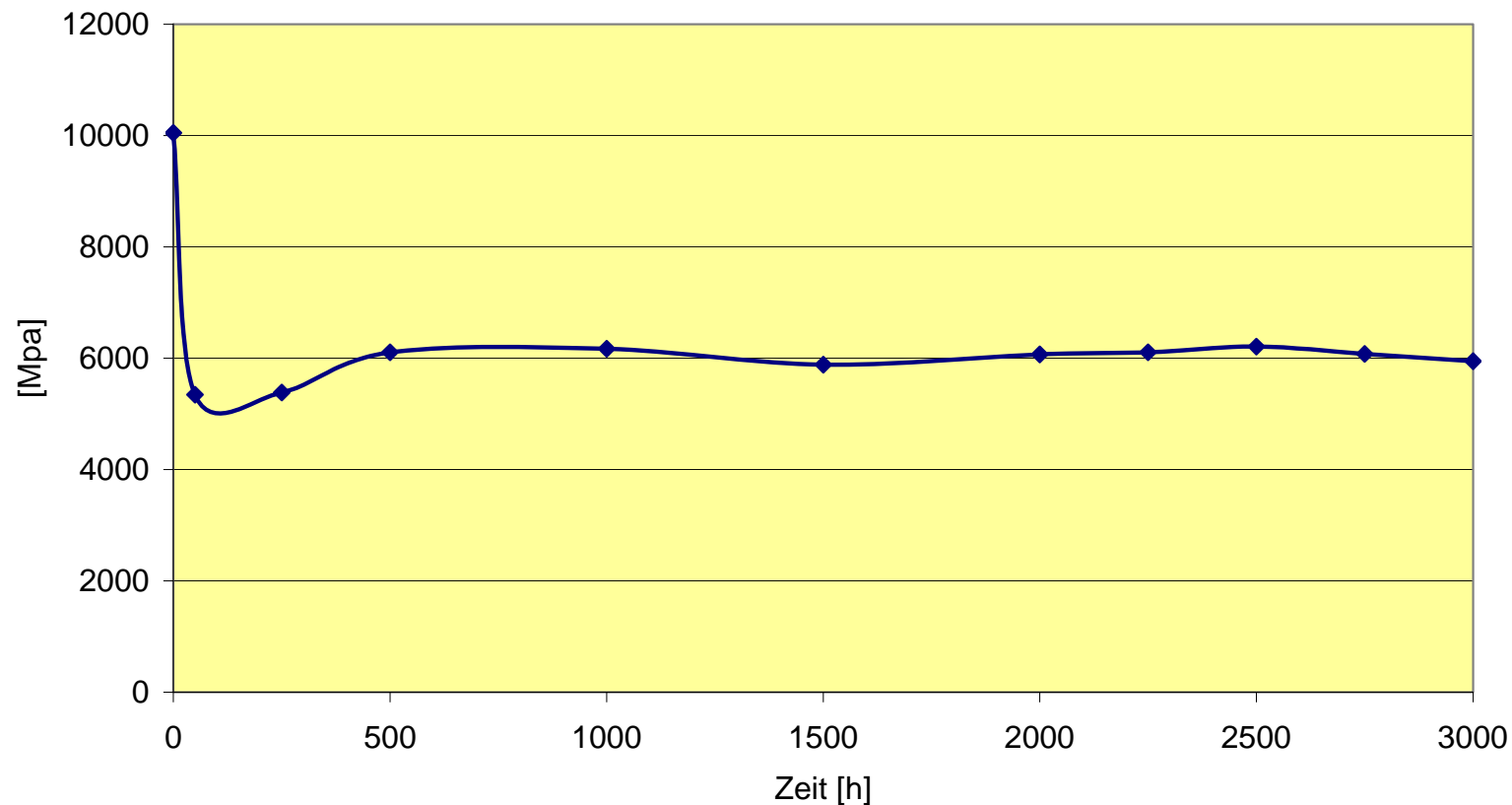
Tested in hot cooling water: weld line strength and crack formation

BASF developers had a real close look at the weld line strength: the weld line of tanks and caps made of the new A3WG7 HRX grades is much stronger than that of commercially available reference plastics. Tests were carried out on welded containers that had been exposed on one side and on both sides to hot coolant at a temperature of 130°C [266°F]. The new Ultramid grades are considerably less prone to crack formation. This lower tendency to form cracks – a very advantageous aspect for components with weld lines – was also confirmed in the swelling test in pure glycol at high temperatures.



Ultramid®S (PA6/10) bei 130°C in Wärmeträgerflüssigkeit

Zug-E-Modul



2009

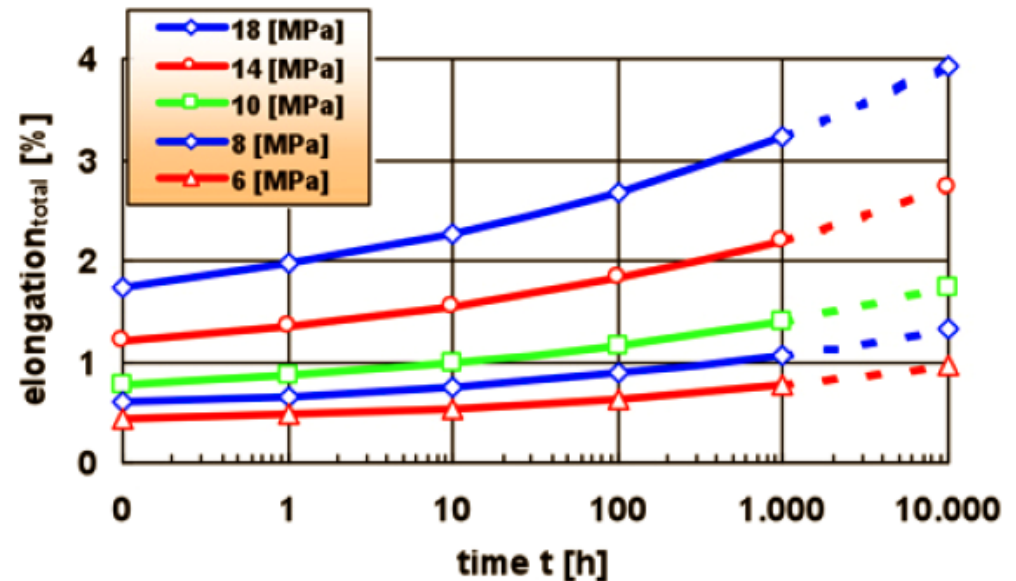
Ultrason[®] Lagerung in 95°C Wasser

BASF
The Chemical Company

■ Ultrason[®] P (PPSU): A polymer with excellent hydrolysis resistance

Without special equipment like thermo tropic layers or other technical measures, the absorber material has to withstand high peak temperatures. Together with long lifetime requirements high-temperature polymeric materials with excellent hot water resistance are a possible solution. PPSU is an amorphous high temperature material with outstanding impact behaviour. For processing all standard technologies like injection moulding or extrusion are suitable. Post-processing like welding or thermoforming of semi-finished products are further possible processing stages.

The excellent hydrolysis resistance even under load can be shown by tensile creep tests. Even in contact with hot water (95 °C) the material can withstand under long-term conditions stresses up to 18 MPa. During this test tensile bars are immersed into hot water plus mechanical load during the entire test duration.



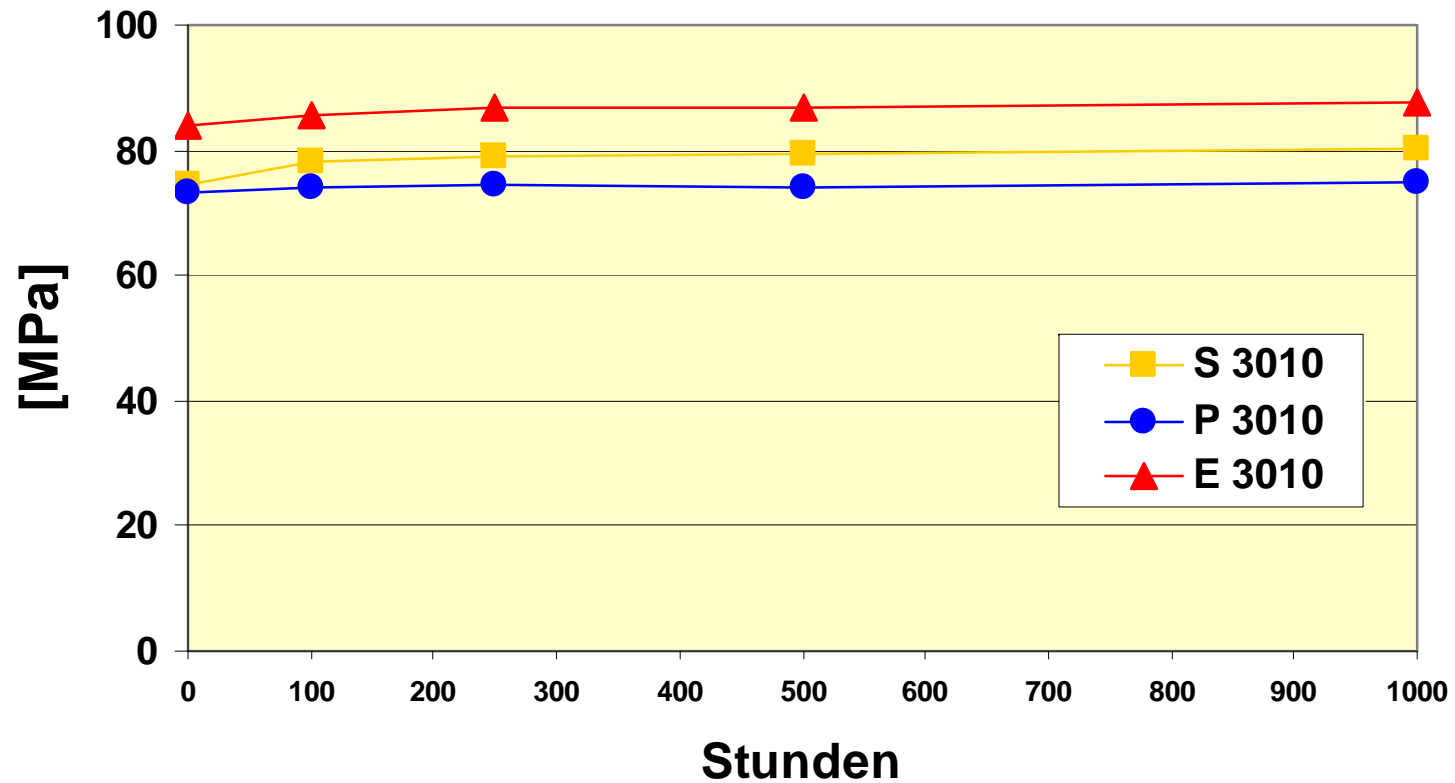
Rüdiger Bluhm, BASF, Germany; ruediger.bluhm@basf.com

Ultrason® Lagerung in Tyfocor® LS

Wärmeträgeröl auf Basis 1,2 Propylenglykol



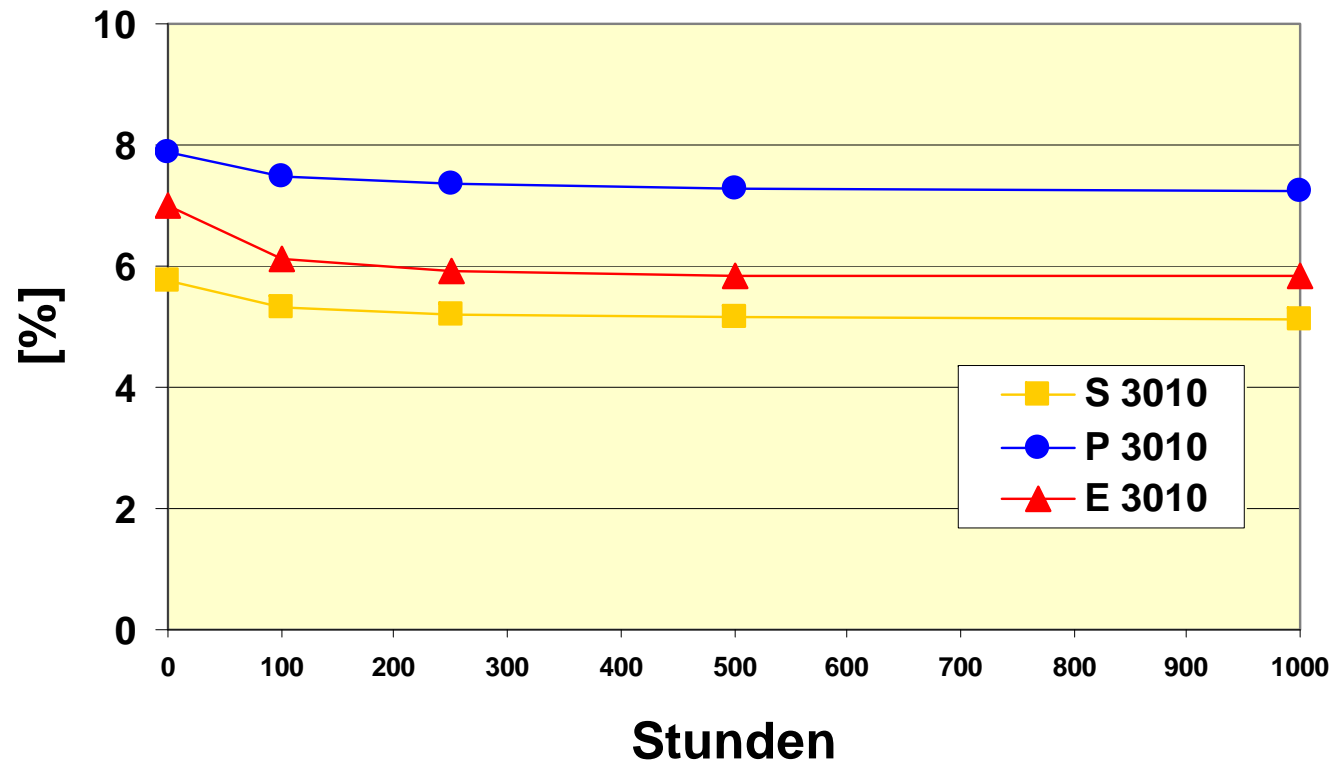
Streckspannung - Ultrason®



Ultrason[®] Lagerung in Tyfocor[®] LS

Wärmeträgeröl auf Basis 1,2 Propylenglykol

Streckdehnung - Ultrason[®]



Ultramid Balance und Ultrason bieten neue Möglichkeiten Absorber deutlich leichter und preiswerter herzustellen als es dem heutigem Stand der Technik entspricht