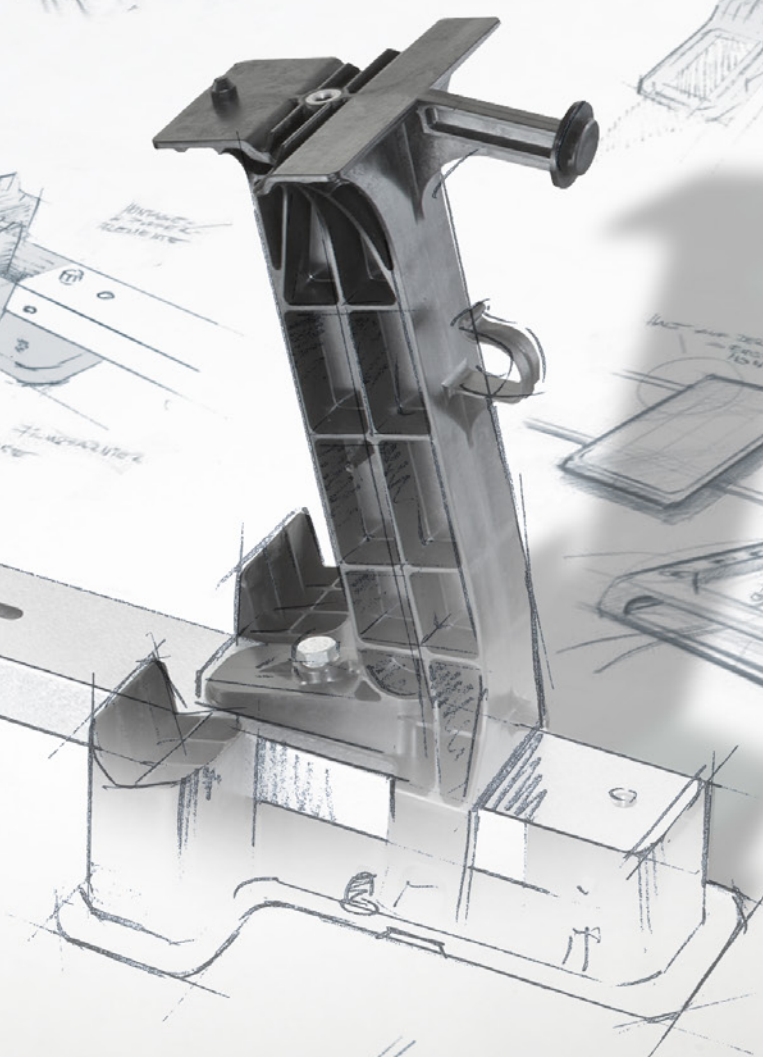


Ultramid® and Ultradur®

Engineering plastics for
photovoltaic mounting systems



Ultramid® and Ultradur® in the web:
www.plasticsportal.eu/solar

 **BASF**
We create chemistry

Engineering plastics ...

... are optimized for photovoltaic and solar thermal energy systems

With the engineering plastics Ultramid® (PA: polyamide) and Ultradur® (PBT: polybutylene terephthalate), which have proven their worth in construction and outdoor applications for many decades, BASF is now also able to offer materials for **photovoltaic applications and solar thermal energy installations**. They can be used for:

- structural components
- fastening elements
- frames
- substructures

The range of these PA and PBT grades is specifically **optimized for the requirements of the solar industry** and is noted for having the following properties:

- low creep tendency even at higher temperatures and loads
- good dimensional stability
- constant mechanical properties when subjected to weathering
- excellent combination of strength and resilience
- outstanding strength even at high constant-use temperatures

These properties give **durability, weather resistance and outstanding mechanics** to the various applications.

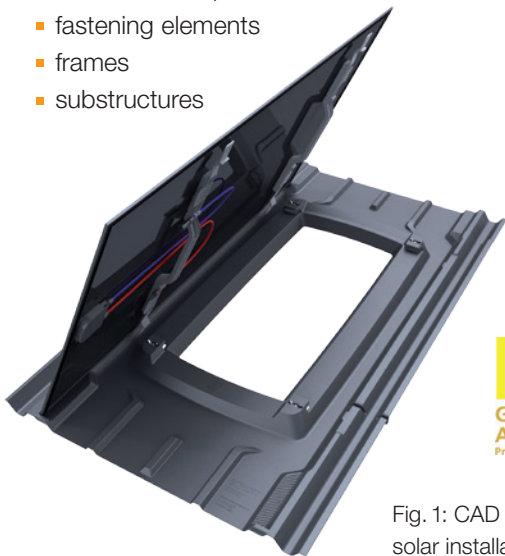


Fig. 1: CAD image of a panel frame for solar installations (size: 1.91m length, 1.12m width) made from Ultramid® High Speed



Fig. 2: CAD image of a mounting system made of Ultramid®
Design & construction:
Joma Polytec

Engineering plastics

Portfolio and services

Portfolio

For photovoltaic applications, the BASF product portfolio offers a broad innovation and application spectrum because of its versatile material properties. This is supplemented by different BASF services – from computer simulation with Ultrasim® via manufacturing support to tailor-made project support by BASF engineers, who specialize in plastics for alternative energies.

Services by BASF

- Part design and stability analysis with Ultrasim® (FEM, filling simulation, topology optimization)
- Manufacturing advice (injection molding)
- Material tests and analysis for determining product safety
- Material listing acc. to UL
- Support with approval processes
- Specialized engineers for alternative energies

Properties	Ultramid® (PA)	Ultradur® (PBT)	
Impact strength	++	○/+	++ = excellent + = good ○ = moderate - = not suitable
Rigidity/E-modulus	+	++	
Influence of water uptake	○/+	++	
Tendency to creep	+ / ++	++	
UV-weathering resistance	++	++	
Flame retardance (B2)	++	++	
Temperature resistance (-30 °C/80 °C)	++	++	
Chemical resistance			
- Plasticizers	++	++	
- Solvents	+	+	
- Acids	○	+	
- Alkaline solutions	+	-	

Table 1: Product properties

... are weather and plasticizer resistant

BASF has many decades of experience with engineering plastics which are used outdoors. Complex measurements have shown that the mechanical properties of special Ultramid® and Ultradur® grades scarcely change in different weather conditions over the years. Whereas the effect of weathering is often seen by a slight graying of the component surface, only a very small decline can be observed with respect to critical mechanical properties such as strength or resilience.

In direct contact to roof sheeting made of PVC Ultramid® and Ultradur® stand out for their excellent chemical resistance against plasticizers. The resistance is confirmed by extensive internal tests and investigations according to DIN EN ISO 177.

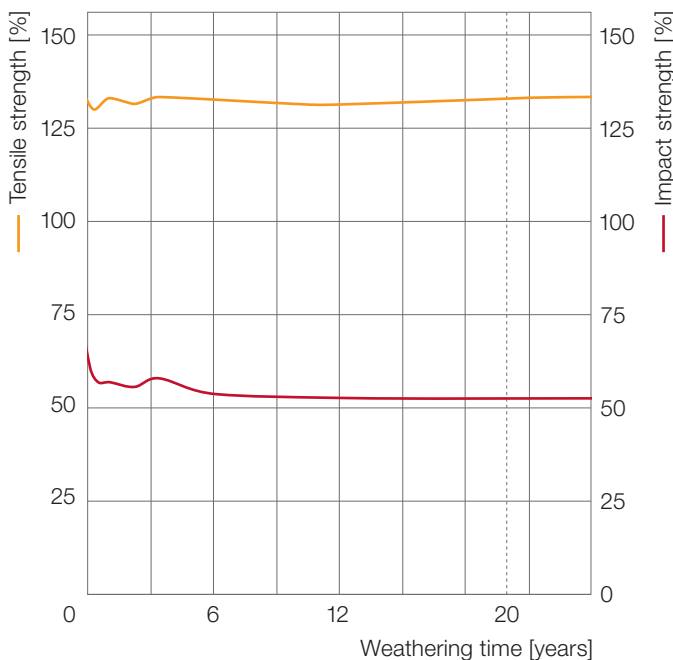


Fig. 3: Tensile strength and impact strength of Ultradur® after different times of exposure; weathering acc. to Xenon ISO 4892-2, cycle 1

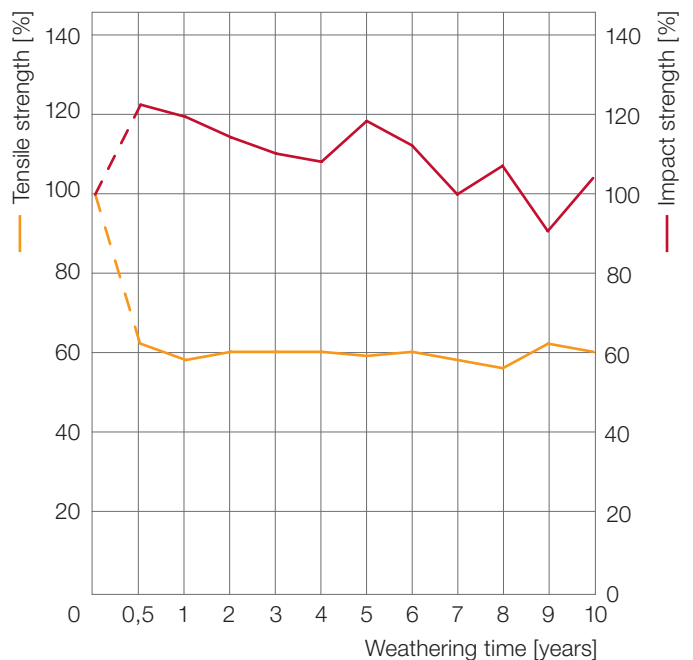


Fig. 4: Mechanical properties of Ultramid® after weathering: tensile strength and impact strength after different times of exposure to outdoor weathering. (The value changes between 0 and 0.5 years are typical of the material and must be attributed to the water uptake.)

... are highly loadable

Ultradur® displays particularly high stiffness even under relatively high loading. Ultramid® shows particularly high resilience after typical moisture absorption. Also at the higher temperatures which typically occur when mounting solar installations, both materials still show impressive mechanics. Even at low temperatures both materials feature excellent toughness and stiffness. So they can be installed in outdoor systems, thus contributing to their longevity. With fixing elements made of Ultramid® e.g. easy and time-saving installation is possible.



Fig. 5: Fixing element made of Ultramid® for trapeze roofs



Fig. 6: Mounting system made of Ultramid® for flat roofs

Selected Product Literature for Ultramid® and Ultradur®:

- Ultramid® – Product Brochure
- Ultramid® – Product Range
- Ultradur® – Product Brochure
- Ultradur® – Product Range
- Ultramid®, Ultradur® and Ultraform® – Resistance to Chemicals
- Ultramid® Structure

Note

The data contained in this publication are based on our current knowledge and experience. In view of many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. (May 2017)

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