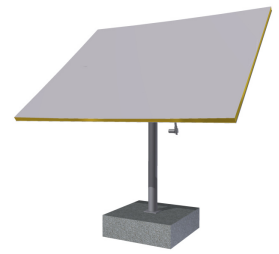


toughtrough®

Innovative Solar Mirror Technology



Company

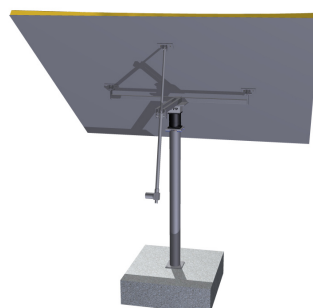
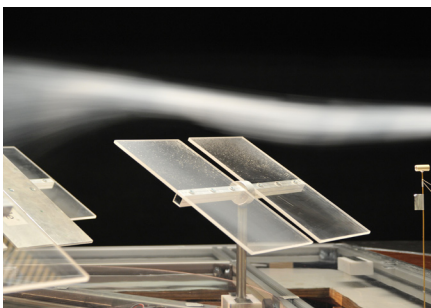
German toughTrough GmbH is a joint venture of machtTechnik AG and Brüggem GmbH, focusing on the development, engineering, and production of highly efficient solar mirrors for parabolic troughs, Fresnel plants as well as heliostat systems and dishes.

Taking benefit of the parent companies' competencies in the field of renewable energy and aerospace, toughTrough provides research and development, engineering, and extended industrial manufacturing of mirror and collector systems in the field of solar power. For mirror components as well as complete mirrors and collector systems, tests for environmental impact, mechanical and system qualification tests are performed.

With fundamental investigations of the design base by wind and water tunnel experiments, completed by design and optimization as well as the setup of prototype systems, toughTrough's service provides innovative and sophisticated concepts and constructions. Extended production capabilities allow further significant cost savings within the project realization while ensuring high quality standards.

The light-weight optimized toughTrough® solar mirrors and composite components are available as retrofit for existing systems or as OEM mirrors.

Please ask us for an individual offer!



www.toughtrough.com

Mirror Technology

The sophisticated composite structure using thin glass, consisting of AGC Thin Glass Mirror as front layer, a polyurethane foam core, and an adapted back layer leads to high optical precision, reliability, longevity, and low maintenance.

In conjunction with the supply chain and our customers, the existing concept for CSP plants

has been reconsidered and refined successfully by using the enriching synergistic effects. The high reflectivity of thin glass combined with improved stiffness and high resistance against environmental conditions, such as sand and dust abrasion or even hailstorms, mark the mirrors out as an innovative and highly efficient product.

Technical Specifications – Heliostat Mirror Facet

toughTrough® – Solar Mirrors

Main Characteristics

Energy reflectivity (%)	ISO 9050 AM1.5	> 95.5 ± 0.5
Minimum focal length (m)	customized	> 20
Specific weight (kg/m ²)	based on 30 mm PU foam core	< 7.5

Geometry/Dimensions

Mirror length (m)	typ.	3.21
Mirror width (m)	typ.	2.5
Mirror construction	front core back	thin glass PU foam core steel/GFK
detailed specifications available on request		

Please contact us for further information and to discuss your requirements.

toughTrough GmbH
Robert-Hooke-Str. 6
28359 Bremen
Germany

Phone +49 (0)421 408 991 – 0
Fax +49 (0)421 408 991 – 11
E-mail info@toughtrough.com
Web www.toughtrough.com

