

# toughTrough®

## Photovoltaic System Engineering



**toughTrough GmbH developed a special penetration-free and low-ballast system for photovoltaic installations on flat roofs. Carefully performed analyses of conventional setup designs for photovoltaic modules revealed a great optimization potential, especially regarding mounting systems. Additional wind tunnel tests, simulating environmental conditions, provided detailed data about the aerodynamic characteristics, such as the impact of wind loads on the modules.**

### Easy Assembly

The obtained measurements provide the assessment basis for our mounting system design, which benefits from appearing wind forces in order to keep the solar panels on the roof. To achieve this, neither mechanical fixing nor further ballast to weigh the modules down is required, which keeps the roof cladding intact. Thus, the penetration-free mounting system is the ideal solution for large halls with small load-carrying capacities and can easily be installed on insulated roofs on factory buildings.

### Advantages

toughTrough's mounting system consists of weather-proof, corrosion-resistant KTL

coated steel and aluminum, which guarantees long durability and high efficiency. The customizable design is adaptable to its future operating environment and respects the building's architecture and aesthetical aspects. Furthermore, toughTrough's PV system is expandable at any time.

### Full-Service Package

toughTrough offers a full service package for photovoltaic power systems: Starting with the development of power plant concepts, engineering of solar modules and our special mounting system to the setup and maintenance of the final PV plants – we take care of everything you need for efficiently generating solar power on your roof. For further information or individual inquiries, please contact us!

### References

toughTrough GmbH designed and installed a PV system for Brügger GmbH, one of Europe's leading manufacturers of swap body systems for commercial vehicles.

On both company locations – Herzlake and Lübtheen – the large production halls have been covered with photovoltaic power plants producing a total output of more than 2 MW.

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