

Hochschule Aachen

I.F.I. Institut
für Industrieaerodynamik GmbH
Institute at Aachen University of
Applied Sciences

Welkenrather Straße 120
52074 Aachen, Germany

Phone: +49 (0) 241/879708-0
Fax: +49 (0) 241/879708-10
Email: info@ifi-aachen.de
Website: www.ifi-aachen.de

Client: ISOTEC Enerji Ltd. Şti., Istanbul, Turkey

Report No.: IEI01-4

Date: 09/17/2019

Wind loads on the „ISOFLAT D13” solar ballasted roof mount system of ISOTEC Enerji Ltd. Şti.

Design wind loads for uplift and sliding according to EN 1991-1-4

Reviewed by:

Dr.-Ing. Th. Kray

*(Head of department of
PV wind loading)*

Prepared by:

Daniel Markus, M.Sc.

(Consultant for wind loading)

Management:
Dipl.-Ing. B. Konrath, Dr.-Ing. R.-D. Lieb
Scientific Advisory Board:
Prof. Dr.-Ing. R. Grundmann, Prof. Dr.-Ing. H. Funke,
Prof. Dr.-Ing. Th. Heynen
Established by:
Prof. Dr.-Ing. H.J. Gerhardt, Prof. Dr.-Ing. C. Kramer

Sparkasse Aachen
IBAN: DE26 3905 0000 0047 4400 03
BIC: AACSD33
Local Court Aachen (Amtsgericht Aachen)
HRB 4518
VAT No.: DE121682741

Accredited Test and Certification Body
European Notified Product Certification
Body 1368 according to CPR
LADBS approved laboratory for wind tunnel
testing of buildings and structures, Testing
Agency License Number TA 24830

Wind tunnel data was analyzed to determine the design wind loads on the “ISOFLAT D13” solar ballasted roof mount system. The analysis was performed by I.F.I. Institut für Industrieaerodynamik GmbH (Institute for Industrial Aerodynamics), Institute at the Aachen University of Applied Sciences in compliance with DIN EN 1991-1-4/NA:2010-12, EN 1991-1-4:2005, section 1.5 and with the wind tunnel guideline of the German Wind Engineering Association, WTG.

The “ISOFLAT D13” solar ballasted roof mount system consists of solar PV panels which are tilted east-west at 13deg and is depicted in Figure 1 and Figure 2. Solar modules are in landscape orientation with chord lengths ranging between approximately 950 mm to 1050 mm. The system may be equipped with additional side wind deflectors.

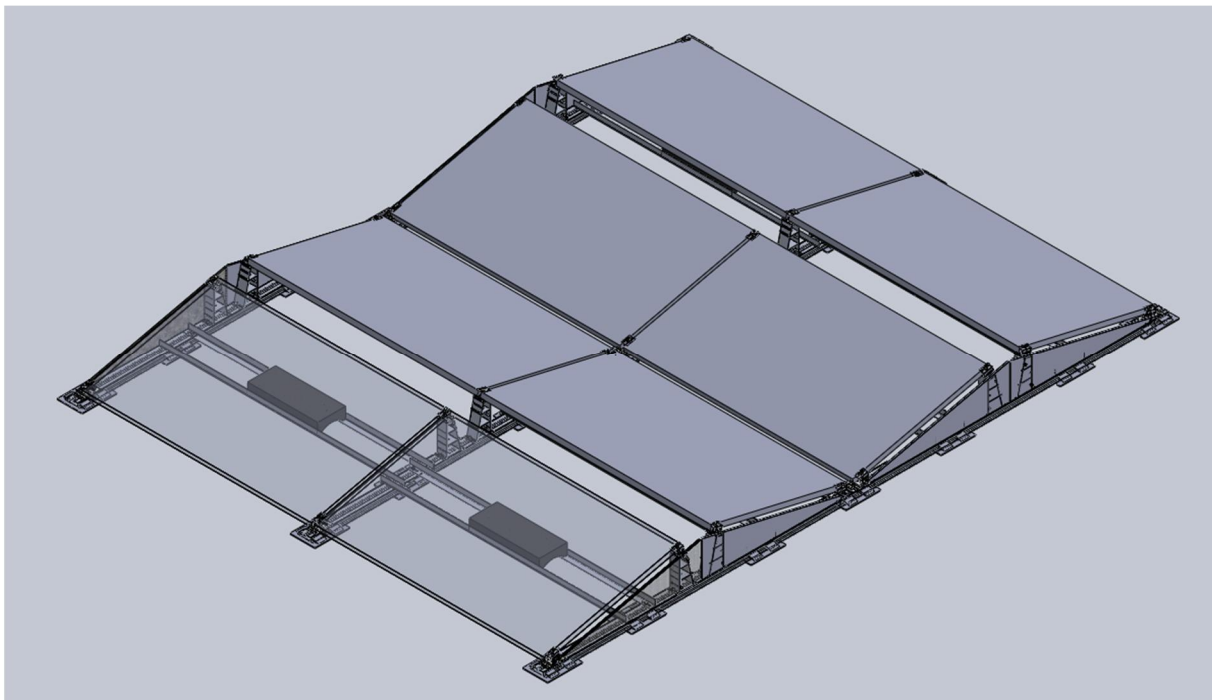


Figure 1: Array assembly of the “ISOFLAT D13” solar ballasted roof mount system with a module tilt angle of 13°

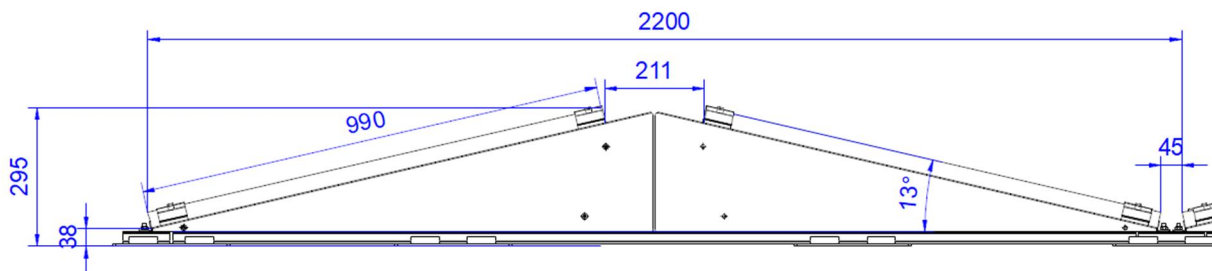


Figure 2: Geometric dimensions of the “ISOFLAT D13” solar ballasted roof mount system with a module tilt angle of 13°

Pressure coefficients were provided for effective wind areas of varying size, several roof and array zones and are valid for roofs having a slope of up to 10° with heights up to 50m. Structural calculations and ballast design may be performed based on these aerodynamic coefficients and on the peak velocity pressure, q_p , based on EN 1991-1-4 and corresponding National Annexes. Design wind loads may also be calculated taking into account national wind loading standards. Detailed design specifications are given in report IEI01-3.