



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

Client: K2 Systems GmbH, Renningen, Deutschland

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Wind loads on the „S-Dome” 10° rooftop mounting system for PV plants of K2 Systems GmbH

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:

Dipl.-Ing. (FH) J. Paul

(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
Founded by:
Prof. Dr.-Ing. H.J. Gerhardt, Prof. Dr.-Ing. C. Kramer

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

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Wind tunnel data was analyzed to determine the design wind loads on the „S-Dome” 10° ballasted rooftop mounting system for PV plants of K2 Systems GmbH. 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 accordance with the test procedures described in the German Standards DIN EN 1991-1-4:2010-12 and DIN EN 1991-1-4/NA:2010-12 and with the wind tunnel guideline of the German Wind Engineering Association, WTG.

The array assembly of the „S-Dome” 10° ballasted rooftop mounting system for PV plants is depicted in Figure 1.



Figure 1: Array assembly of the “S-Dome” ballasted rooftop mounting system for PV plants with module tilt angles of 10°

Force and pressure coefficients were provided for effective wind areas of varying size, three roof zones and six array zones and are valid for roofs having a slope (α) of $-5^\circ < \alpha < +5^\circ$ with heights up to 20m. Structural calculations and ballast design may be performed based on these aerodynamic coefficients and on the peak velocity pressure, q_p , determined depending on the wind zone, the terrain category and the roof height in accordance with EN 1991-1-4 and the National Annexes to EN 1991-1-4. Design wind loads may also be calculated taking into account national wind loading standards.

Detailed design specifications are given in reports KSR02-1-2, KSR02-2 and KSR02-3.