

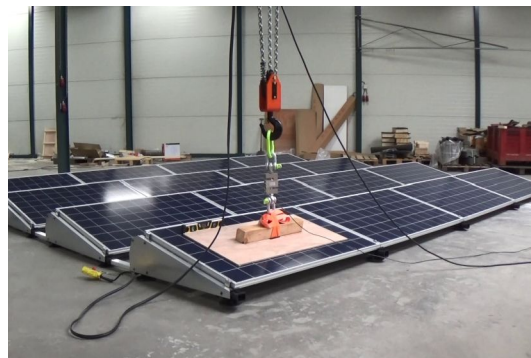
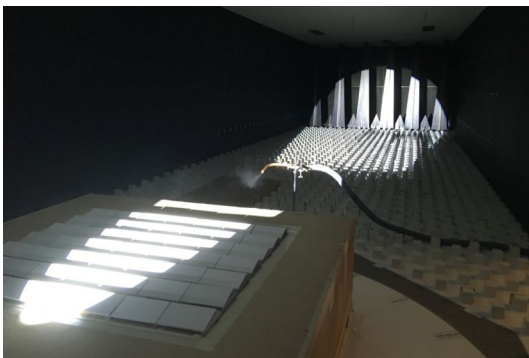
Certificate

subject: ESDEC Calculator FlatFix Fusion 2021
date: September 27th, 2021
reference: MvU/MvU/W 15389-26-NO
from: ir. G.M. van Uffelen
to: Esdec B.V.

This certificate concerns an evaluation of the ESDEC Calculator for ballast calculations for the FlatFix Fusion system, that is depicted in the photographs down here.



This is based on the specific wind tunnel research conducted by Peutz bv into the wind load on the Esdec FlatFix Fusion mounting system for flat roofs. This dedicated wind tunnel study, specifically for this system, was carried out by us in 2018. The lower left photograph shows the scale model in our wind tunnel.



Based on mechanical lift tests carried out by Esdec with improved system connections in the summer of 2021, see right photograph up here, the actual degree of interconnection of the systems was determined and processed by us into the wind tunnel data. These have been

incorporated in the aforementioned calculator of Esdec. A screendump has been depicted down here.

The screenshot displays the Esdec FlatFix Fusion software interface. The main window shows a grid of solar panels on a roof. The interface includes several panels for configuration and a summary table.

LOCATION: THE NETHERLANDS, WIND ZONE II, TERRAIN CATEGORY II

ROOF: FLAT, BITUMEN INSULATED

HEIGHT: 10 m, ANGLE: 0°

PARAMET HEIGHT: 200 mm, ROOF ORIENTATION: FROM NORTH

PANELS: JINKO CHEETAH MONO SILVER FRAME

WIDTH: 1002 mm, **LENGTH:** 1684 mm, **WEIGHT:** 18.7 kg, **THICKNESS:** 35 mm, **PEAK POWER:** 340 Wp

SUMMARY:

WIND PRESSURE	731.99 N/m ²
PANEL COUNT	360
TOTAL POWER	122.40 kWp
AVERAGE ROOF LOAD OVER SYSTEM AREA	16.17 kg/m ²
TOTAL WEIGHT	12.926.73 kg

YOUR ORDERLIST:

NUMBER	PRODUCT NAME	QTY
1000612	Mounting screw M6 x 12mm	780
1000655	Mounting screw M6 x 55mm	780
1003022	Universal mid clamp with bonding	660
1004335	FlatFix end clamp 35mm	120
1007011	FlatFix Fusion base	26
SUBTOTAL:		€19,810.12
DISCOUNT:		0 %
TOTAL PRICE:		€19,810.12

We hereby declare, after studying and testing the calculator, that Esdec does indeed use the wind tunnel measurements of FlatFix Fusion, which have been combined with the mechanical lift tests into the wind tunnel data, and that the results have been correctly and safely processed in the Esdec calculator. The approach and method used by Esdec when applying this calculator have been tested and approved by us in several reference projects.

Conformity: CUR Recommendation 103: 2005
 NEN 7250: 2014
 NEN-EN 1990: 2011
 NEN-EN 1991-1-4: 2011

Mook,

This certificate contains 2 pages