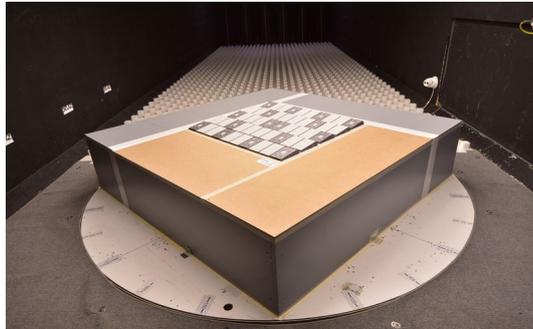


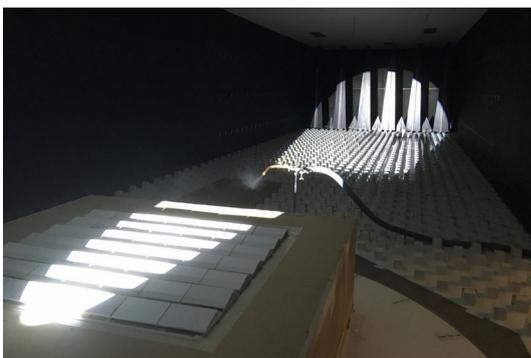
Certificate

subject: Esdec FlatFix Fusion Series - calculator 2023
date: October 24th, 2023
reference: MvU/MvU/W 15389-34E-NO
from: ir. G.M. van Uffelen
to: Esdec B.V. - Deventer

This certificate concerns an evaluation of the Esdec Calculator for ballast calculations for the Esdec FlatFix Fusion system-module positions landscape as well as portrait. The photographs show the systems and some of the scale models in our wind tunnel.



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 studies, specifically for this system, were carried out by Peutz bv in 2018 and 2023.



Based on mechanical lift tests carried out by Esdec with improved system connections in 2021 and 2023, conforming to NEN 7250:2021 appendix D.5, see the lower right photograph at the front page, the actual degree of interconnection of the systems was determined and processed by Peutz bv into the wind tunnel data.

These have been incorporated in the aforementioned calculator of Esdec. A pair of screendumps has been depicted down here, for the landscape and the portrait system-module positions.

ESDEC FlatFix Fusion

ROOF 1 OVERVIEW

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

ROOF: FLAT, BITUMEN INSULATED

HEIGHT: 10 m, ANGLE: 0, PARAPET HEIGHT: 200 mm

PANELS: JINKO CHEETAH MONO ZILVER FRAME

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

SUMMARY

WIND PRESSURE	731.99 Nm 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 CONFIGURATION

PRODUCT: FLATFIX FUSION

ARTICLES IN BLACK (WHEN AVAILABLE): NO ADDITIONAL GROUNDING/BONDING

YOUR ORDERLIST

NUMBERS	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

ESDEC FlatFix Fusion

LOCATE: NEDERLAND, WINDZONE II, TERRAINCATEGORIE II

ORIGINALE: 1, GEVOLGELASSE 1

REFERENTIEPERIODE: 15

DAK: FLAT, BITUMEN/DAK GEISOLEERD

HOOGTE: 5 m, PELLINGSHOEK: 0, HOOGTE DAKRAND: 0 mm

PANELEN: FUSION PORTRAIT

LENGTE: 1755 mm, BREEDTE: 1134 mm, Dikte: 35 mm, GEWICHT: 24 kg, PAKVERHOUDEN: 500 Wp

SAAMENVATTING

WINDBELASTING	560.17 Nm ²
NORMALE SNEELWAST	420.43 Nm ²
AANTAL PANELEN	82
TOTAAL ENERGIE	41.00 kWp
GEMIDDELD OMSLUITINGS SYSTEEMOPPERVLAKTE	25.41 kg/m ²
TOTAAL GEWICHT	5.112.14 kg

UW CONFIGURATIE

PRODUCT: FLATFIX FUSION

Balklast afschakelen: Aankloten in zwart (indien beschikbaar):

AARDEN EN/OF VEREFFENING: GEEN AANVULLENDE AARDING OF VEREFFENING

BALKLASTENNET: BETONLINKER (40G)

UW BESTELLIST

NUMBERS	PRODUCTNAAM	AANTAL
1000612	Montage schroef M6 x 12mm - Zwart	224
1000655	Montage schroef M6 x 55mm - Zwart	224
1003022	Universale middenklem met vereffening - Zwart	104
1004335	FlatFix Endklem 35mm Zwart	120
1000690	Kleefstrip Zwart	180
1007011	FlatFix Fusion Dakdraag adapter	51
1007012	FlatFix Fusion Dakdraag	342
1007022	FlatFix Fusion Lage Basis Portraat	112
1007037	FlatFix Fusion Hoge Basis Portraat	112
SUBTOTAL:		€10.892.54
DISCOUNT:		0 %
TOTAALPRIJS:		€10.892.54
NETTO KOSTPRIJS PER MODULE:		€132.83
NETTO KOSTPRIJS PER WP:		€0.2657



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: 2021
NEN-EN 1990: 2019
NEN-EN 1991-1-4: 2019

Mook,

This certificate contains 3 pages