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Authorised and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA



European Technical Assessment ETA-25/0054 of 2025/02/21

General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the
construction product:

NES solar fastener

Product family to which the
above construction product
belongs:

Fastening screws with welded or cold formed set
screws

Manufacturer:

ROSETER INFO TRADE CO. LTD
13F., No 213, Fu-Nong Road, Gu-Shan District
Kaohsiung City 80454
Taiwan R.O.C

Manufacturing plant:

ROSETER INFO TRADE CO. LTD
Plant 6

This European Technical
Assessment contains:

10 pages including 5 annexes which form an integral
part of the document

This European Technical
Assessment is issued in
accordance with Regulation
(EU) No 305/2011, on the
basis of:

EAD 220169-00-0402 – Fastening screws with welded
or cold formed set screws

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

1 Technical description of product

The NES solar fastener are fastening screws (self-drilling and self-tapping screws) with welded set screws for parallel or elevated solar and photovoltaic installations or support profiles of solar installations.

The solar fastener is completed with a bell gaskets or spherical cap made of stainless steel 1.4301 with an EPDM-sealing. The solar fastener is used for fastening solar substructures to timber substructures covered by trapezoidal sheeting

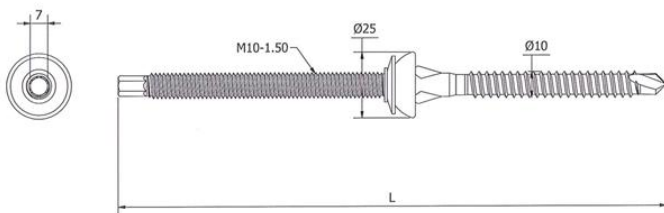


Figure 1 NES Solar fastener

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The NES solar fasteners are intended for the systematic load-transmitting connection of add-on parts (especially for elevated solar and photovoltaic installations or support profiles of solar installations) with supporting structures made from timber.

The solar fasteners are bolted through the crest of sheeting panels made from steel or aluminium.

The Solar Fasteners are subject to static and/or quasistatic loads in tension or compression, shear and a combination of tension or compression and shear.

The installation should be carried out according to the ETA holder's specifications, using the specific kit components, manufactured by suppliers of the ETA holder and carried out by appropriately qualified staff with supervision of the technical responsible of the site.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of at least 25 years, that the conditions lay down for the installation, packaging, transport and storage as well as appropriate use, maintenance and repair are met.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer but

3 Performance of the product and references to the methods used for its assessment.

Characteristic	Assessment of characteristic
3.1 Mechanical resistance and stability (BWR 1)	
Characteristic pull-through resistance, $N_{Rk,I}$	No performance assessed
Characteristic pull-out resistance, $N_{Rk,II}$	See annex 5
Bending capacity in case of thermal expansion of the outer face of sandwich panels, max u	No performance assessed
Characteristic bearing resistance, F_{Rk}	See annex 5
Characteristic yield moment, $M_{y,Rk}$	See annex 5
3.2 Safety in case of fire (BWR 2)	
Reaction to fire	The NES solar fasteners are classified as Euroclass A1 in accordance with EN 13501-1 and Commission delegated Regulation 2016/364 on the basis of EC Decision 96/603/EC (as amended) without the need for further testing.
3.3 Aspects of durability	
Durability	The screws are classified as CRC II in accordance with EN 1993-1-4 table A.3

3.8 Methods of verification

The product is assessed in accordance with EAD 220169-00-0402.

3.9 General aspects related to the fitness for use of the product.

The European Technical Assessment is issued for the product based on agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide if such changes affect the ETA and consequently the validity of the CE marking based on the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

The NES solar fasteners are manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base.

4.1 AVCP system

According to the decision 1998/214/ECEC of the European Commission, as amended by 2001/596/EC, the system(s) of assessment and verification of constancy of performance (see Annex III to Regulation (EU) No 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2025-02-21 by



Thomas Bruun
Managing Director, ETA-Danmark

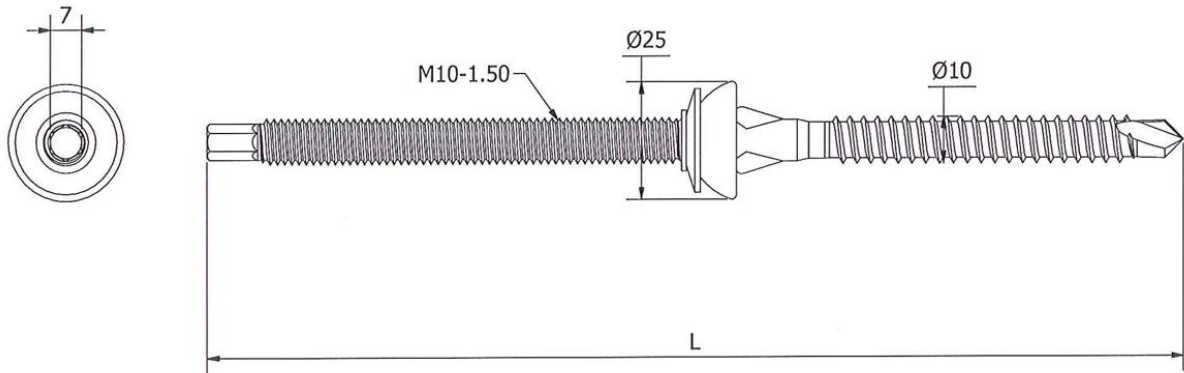


Figure 1: Solar fastener

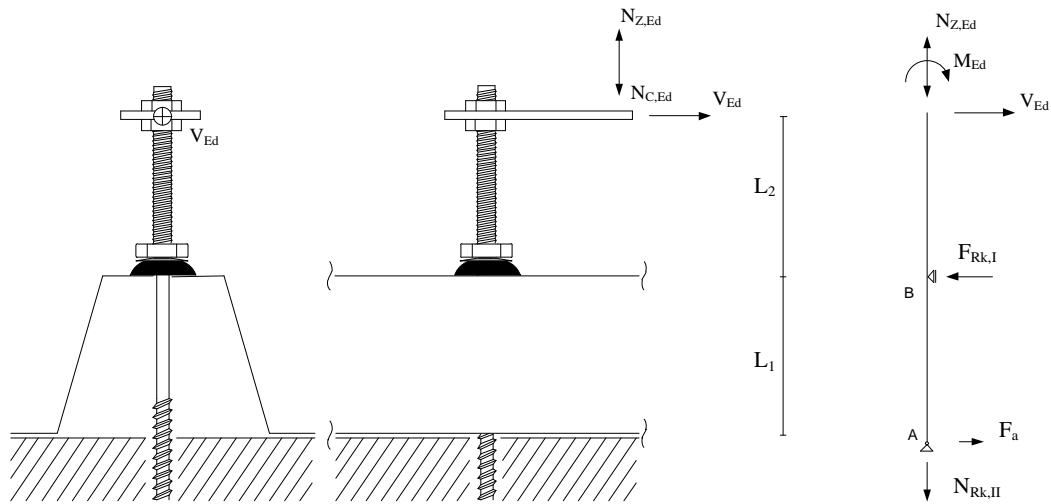


Figure 2: installation situation

- L_1 Distance between the substructure and the top chord
- L_2 Distance between the upper flange and the load application point
- $N_{Rk,II}$ Characteristic value of pull-out resistance from component II
- $F_{Rk,I}$ Characteristic value of the hole-bearing capacity of component I
- $M_{y,Rk}$ Characteristic value of the yield moment

NES solar fastener	Annex 1
Term and explanations	

Materials and boundary conditions

The solar fastener is made of stainless steel A2-80 according to EN ISO 3506.

Component I (sheeting): Material: steel with $R_m \geq 360 \text{ N/mm}^2$ (min. S280GD acc. EN 10346)
 Thickness: $0.40 \text{ mm} \leq t_l \leq 1.50 \text{ mm}$

 Material: aluminum with $R_m \geq 165 \text{ N/mm}^2$
 Thickness: $0.50 \text{ mm} \leq t_l \leq 1.00 \text{ mm}$

 Material: aluminum with $R_m \geq 215 \text{ N/mm}^2$
 Thickness: $0.50 \text{ mm} \leq t_l \leq 1.00 \text{ mm}$

Component II (substructure): Material: structural timber $\geq \text{C24}$ according EN 338
 Thickness: $t_{II} \geq 60.0 \text{ mm}$

NES solar fastener	Annex 2
Boundary conditions	

Design recommendation

The following recommendations apply for design:

$$\frac{F_{Ed} * \gamma_M}{F_{Rk,I}} \leq 1,0$$

$$\frac{F_{y,Ed}}{V_{y,Rd}} \leq 1,0$$

$$\frac{M_{b,Ed} * \gamma_{M0}}{M_{y,Rk}} \leq 1,0$$

$$\frac{N_{Z,Ed} * \gamma_M}{N_{Rk,II} * k_{mod}} \leq 1,0$$

$$\frac{N_{C,Ed} * \gamma_M}{N_{Rk,II} * k_{mod}} \leq 1,0$$

$$\frac{N_{C,Ed}}{N_{pl,Rd}} + \frac{\alpha * V_{Ed} * L_2}{M_{y,Rd}} + \frac{\alpha * N_{C,Ed} * L_2}{20 * M_{y,Rd}} \leq 1,0$$

with

F_{Ed}

Design value of the acting shear force at the upper flange.

$$F_{Ed} = \frac{(L_1 + L_2) * V_{Ed} + M_{Ed}}{L_1}$$

$F_{y,Ed}$

Design value of the acting shear force in the transverse direction of the upper flange.

$$F_{y,Ed} = \frac{(L_1 + L_2) * V_{y,Ed} + M_{y,Ed}}{L_1}$$

$M_{b,Ed}$

Design value of the acting moment in the area of the upper flange.

$$M_{b,Ed} = L_2 * V_{Ed} + M_{Ed}$$

M_{Ed}

Design value of the acting bending moment

V_{Ed}

Design value of the acting shear force.

$F_{Rk,I}$

Characteristic value of the hole-bearing capacity (see annex 5)

$M_{y,Rk}$

Characteristic value of the moment resistance of the fasteners (see annex 5)

$N_{Z,Ed}$

Design value of the acting tensile force.

$N_{C,Ed}$

Design value of the acting compressive force.

$N_{Rk,II}$

Characteristic value of the pull-out resistance of the fasteners (see annex 5).

$V_{y,Rd}$

Design resistance of the sheeting in y-Direction (see Annex 4)

$N_{pl,d}$

19.81 kN

α

$= 1 / (1 - N_{Druck,Ed} / N_{ki,d})$

$N_{ki,d}$

$= \pi^3 \cdot E \cdot d^4 \cdot / [64 \cdot (\beta_1 \cdot L_1)^2 \cdot \gamma_M]$

E

$= 190 \text{ kN/mm}^2 = 19000 \text{ kN/cm}^2$

β_1

$= 0.7 + 1.85 \cdot L_2 / L_1$

The recommended partial safety factor γ_M is 1.33 if no partial safety factor is specified in national regulations or national annexes to the Eurocode.

The recommended partial safety factor γ_{M0} is 1.10 if no partial safety factor is specified in national regulations or national annexes to the Eurocode.

NES solar fastener

Design recommendation

Annex 3

Design for shear forces $V_{y,Ed}$ (resistance of the sheeting)

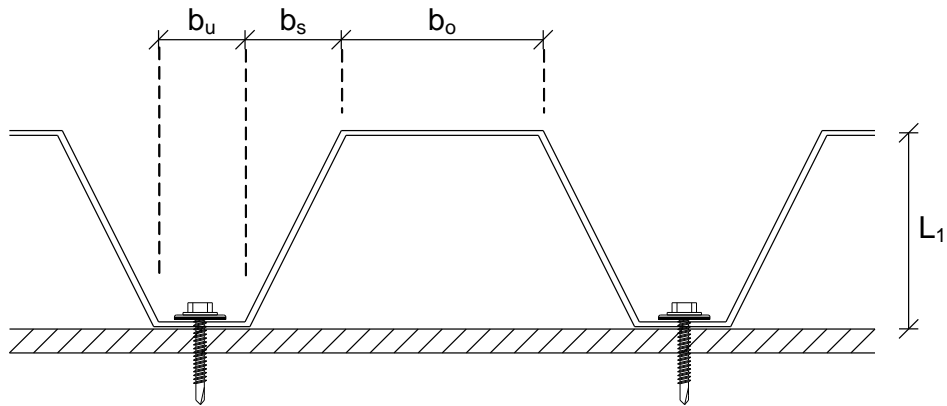


Figure 3: Dimension of sheeting

$$V_{y,Rd} = \frac{f_{y,k}}{\gamma_{M0}} * \frac{a * t_f^2 (b_u + 2 * b_s + b_o)}{3 * L_1 * b_o}$$

with:

a distance between solar fasteners in x-direction

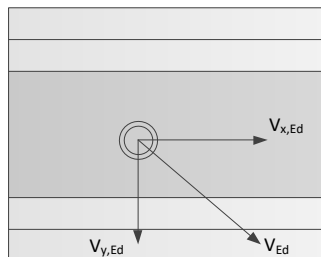


Figure 4: Load directions

If the solar fastener is loaded transverse to the profiled sheeting, the profiled sheeting shall be fastened to the supporting structure in the adjacent lower flange next to the solar fastener. The used fastenings shall be designed to transfer the resulting shear and axial forces into the supporting substructure.

It shall be ensured by the execution, that no contact corrosion can occur and that no compressive and tensile forces are introduced into the profile.

The Solar Fasteners shall be installed at right angle to the upper flange of the sheeting.

The design and the mounting of the solar fasteners shall be done by experienced personnel in this field and according to the specification of the manufacturer.

NES solar fastener	Annex 4
Design recommendation	

Characteristic bearing resistances $F_{Rk,I}$

Sheeting made of steel with $R_m \geq 360 \text{ N/mm}^2$						
Sheet thickness t_l [mm]	0.40	0.50	0.63	0.75	0.88	1.00
$F_{Rk,I}$ [kN]	0.63	0.71	1.55	2.32	2.50	2.66

Sheeting made of aluminum with $R_m \geq 165 \text{ N/mm}^2$						
Sheet thickness t_l [mm]	0.50	0.60	0.80	1.00	1.20	1.50
$F_{Rk,I}$ [kN]	0.24	0.38	0.65	1.09	1.67	2.55

Sheeting made of aluminum with $R_m \geq 215 \text{ N/mm}^2$						
Sheet thickness t_l [mm]	0.50	0.60	0.80	1.00	1.20	1.50
$F_{Rk,I}$ [kN]	0.31	0.49	0.85	1.41	2.17	3.32

Characteristic pull out resistance of the solar fastener $N_{Rk,II}$

$$f_{ax,k} = 11.84 \text{ N/mm}^2$$

with $d = 10.0 \text{ mm}$ and $l_{ef,min} = 60.0 \text{ mm}$ the characteristic pull out resistance $N_{Rk,II}$ is

$$N_{Rk,II} = 7.11 \text{ kN}$$

Characteristic yield moment $M_{y,Rk}$ of the solar fastener

$$M_{y,Rk} = 36.25 \text{ Nm}$$

NES solar fastener	Annex 5
Essential characteristics	