



European Technical Assessment

**ETA-23/0373
of 10.09.2024**

General Part

Technical Assessment Body issuing the European Technical Assessment:
LUXEMBOURG INSTITUTE FOR BUILDING AND TECHNOLOGY

Trade name of the construction product

Self drilling screw 0681 4,8xL and 6,0xL

Product family to which the construction product belongs

Self drilling screw for metal members and sheeting

Manufacturer

IPEX Group
P.O. Box 82, 7468 ZH ENTER
Voderweg 14, 7468 DC ENTER
Netherlands

Manufacturing plant(s)

Plant 1
Plant 2

This European Technical Assessment contains

11 pages including 8 annexes which form an integral part of this assessment

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

EAD 330046-01-0602
Fastening screws for metal members and sheeting

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

1. Technical description of the product

The self drilling screws are made of stainless steel A2 according to EN 3506-1:2020-08. The screws are used either with or without sealing washer. The washers are made of stainless steel A2 according to EN ISO 3506:2020 with an 2,0 mm EPDM sealing.

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

The fastening screws are intended to be used for fastening metal sheeting to metal substructures. The sheeting can either be used as wall or roof cladding or as load bearing wall and roof element. The fastening screws can also be used for the fastening of any other thin gauge metal members. The intended use comprises fastening screws and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with $\geq C2$ corrosion according to the standard EN ISO 12944-2 are made of stainless steel. Furthermore the intended use comprises connections with predominantly static loads (e.g. wind loads, dead loads). The fastening screws are not intended for re-use.

The performances given in Section 3 are only valid if the fastening screws are used in compliance with the specifications and conditions given in the Annexs.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fastening screws of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

| Mechanical resistance and stability (BWR1) | |
|---|-------------------------|
| Essential characteristic | Performance |
| Shear resistance of the connection | See Annex of this ETA |
| Tension resistance of the connection | See Annex of this ETA |
| Design resistance in combination of tension and shear forces (interaction) | See Annex of this ETA |
| Check of deformation capacity in case of constraining forces due to temperature | No performance assessed |
| Durability | NPD |

| Safety in case of fire (BWR2) | |
|--------------------------------------|--|
| Essential characteristics | Performance |
| Reaction to fire | Performance Class A1 in accordance with EC decision 96/603/EC (as amended) |

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

In accordance with EAD 330046-01-0602, the applicable European legal act is:

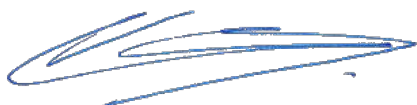
Commission Decision 1998/214/EC, amended by 2001/596/EC.

The AVCP-system to be applied is: 2+

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

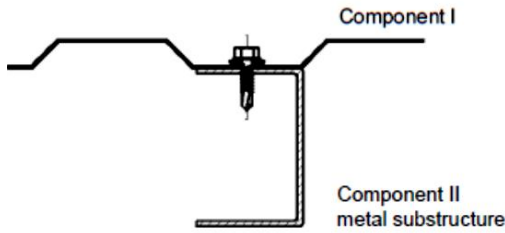
Technical details necessary for the implementation of the AVCP-system are laid down in the control plan deposited with LUXIB.

Issued in Luxembourg on 10.09.2024 by Luxembourg Institute for Building and Technology



Thierry Kohlen
General Manager

Examples of execution of a connection



Terms for materials

- Fastener Fastening screw
- Washer Sealing washer
- Component I Metal member or sheeting
- Component II Substructure

Terms for dimensions

- t_I Thickness of metal member or sheeting
- t_{II} Thickness of metal substructure
- $\Sigma(t_i)$ Sum of the thicknesses of all components
- l_{ef} Effective screw-in length in timber substructure (without drill point)
- d_{dp} Pre-drill diameter of metal member or sheeting and substructure
- $d_{dp,I}$ Pre-drill diameter of metal member or sheeting

Terms for performances

- $V_{R,k}$ Characteristic value of shear resistance of the connection
- $N_{R,k}$ Characteristic value of tension resistance of the connection
- $V_{R,I,k}$ Characteristic value of shear resistance of metal member or sheeting
- $N_{R,I,k}$ Characteristic value of tension resistance (pull-through) of metal member or sheeting
- $N_{R,II,k}$ Characteristic value of tension resistance (pull-out) of the substructure

| | |
|---|----------------|
| Self drilling screw | Annex 1 |
| Description of the product Terms and symbols | |

Recommendations for design

The design values of tension and shear resistance shall be determined as follows:

$$N_{R,d} = \frac{N_{R,k}}{\gamma_M} \qquad V_{R,d} = \frac{V_{R,k}}{\gamma_M}$$

The characteristic values $N_{R,k}$ and $V_{R,k}$ are given in the Annexes. For intermediate dimension of metal member or sheeting or substructure the characteristic value of the thinner dimension is used.

The recommended partial safety factor $\gamma_M = 1,33$ is used, provided no partial safety factor is given in national regulations or national Annexes to Eurocode 3.

For asymmetric metal substructures with thickness $t_{II} < 5$ mm (for instance Z- or C-shaped profiles), the characteristic value $N_{R,k}$ given in the Annexes has to be reduced to 70%.

In case of combined tension and shear forces the following interaction equation is taken into account:

$$\frac{N_{S,d}}{N_{R,d}} + \frac{V_{S,d}}{V_{R,d}} \leq 1,0$$

$N_{S,d}$ and $V_{S,d}$ indicates the design values of applied tension and shear forces.

Installation conditions

The installation is carried out according to the manufacturer's instructions.

The fastening screws are screwed-in with electric screw driver. The use of impact wrenches is not allowed.

The fastening screws are fixed rectangular to the surface of the metal member or sheeting.

The metal member or sheeting and substructure are in contact to each other.

The thickness (or minimum thickness) of metal substructure needs to be covered by the clamping length of the fastening screw.

| | |
|---|----------------|
| Self drilling screw | Annex 2 |
| Design recommendations Installation conditions | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: S280GD, S320GD or S350GD - EN 10346

Component II: S235 - EN 10025-1
S280GD, S320GD or S350GD - EN 10346

Drilling capacity $\Sigma t_i \leq 2,00 \text{ mm}$

Timber substructures

for timber substructures no performance determined

| t _i [mm] | t _{ii} [mm] | | | | | | |
|--------------------------|----------------------|------|------|------|------|------|------|
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 |
| V _{R,k} [kN] | 0.40 | 1.15 | 1.15 | 1.15 | 1.15 | 1.15 | 1.15 |
| | 0.50 | 1.15 | 1.52 | 1.52 | 1.52 | 1.52 | 1.52 |
| | 0.55 | 1.15 | 1.52 | 1.75 | 1.75 | 1.75 | 1.75 |
| | 0.63 | 1.15 | 1.52 | 1.75 | 2.11 | 2.11 | 2.11 |
| | 0.75 | 1.15 | 1.52 | 1.75 | 2.11 | 2.66 | 2.66 |
| | 0.88 | 1.15 | 1.52 | 1.75 | 2.11 | 2.66 | 3.09 |
| | 1.00 | 1.15 | 1.52 | 1.75 | 2.11 | 2.66 | 3.09 |
| N _{R,k} [kN] | 0.40 | 0.51 | 0.70 | 0.84 | 1.05 | 1.27 | 1.27 |
| | 0.50 | 0.51 | 0.70 | 0.84 | 1.05 | 1.35 | 1.35 |
| | 0.55 | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 |
| | 0.63 | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 |
| | 0.75 | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 |
| | 0.88 | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 |
| | 1.00 | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 |
| N _{R,II,k} [kN] | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 | 1.83 |

If both components I and II are made of S320GD or S350GD, the values may be increased by 8,3%.

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 3 |
| 0681 4.8 x 25 with washer Ø14.0 mm | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: aluminum alloy – EN 573

Component II: aluminum alloy – EN 573

Drilling capacity $\Sigma t_i \leq 2,00$ mm

Timber substructures

for timber substructures no performance determined

| Component I & II: Aluminum alloy with $R_m \geq 165$ N/mm ² | | | | | | | | |
|--|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.50 | 0.60 | 0.70 | 0.80 | 1.00 | 1.20 | 1.50 | |
| $V_{R,k}$ [kN] | 0.50 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 |
| | 0.60 | 0.61 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| | 0.70 | 0.61 | 0.80 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| | 0.80 | 0.61 | 0.80 | 0.99 | 1.18 | 1.18 | 1.18 | 1.18 |
| | 1.00 | 0.61 | 0.80 | 0.99 | 1.18 | 1.61 | 1.61 | 1.61 |
| | 1.20 | 0.61 | 0.80 | 0.99 | 1.18 | 1.61 | 1.76 | 1.76 |
| | 1.50 | 0.61 | 0.80 | 0.99 | 1.18 | 1.61 | 1.76 | 1.99 |
| $N_{R,II,k}$ [kN] | | 0.31 | 0.41 | 0.51 | 0.61 | 0.84 | 1.06 | 1.38 |

| Component I & II: Aluminum alloy with $R_m \geq 215$ N/mm ² | | | | | | | | |
|--|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.50 | 0.60 | 0.70 | 0.80 | 1.00 | 1.20 | 1.50 | |
| $V_{R,k}$ [kN] | 0.50 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| | 0.60 | 0.80 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| | 0.70 | 0.80 | 1.04 | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 |
| | 0.80 | 0.80 | 1.04 | 1.29 | 1.53 | 1.53 | 1.53 | 1.53 |
| | 1.00 | 0.80 | 1.04 | 1.29 | 1.53 | 2.09 | 2.09 | 2.09 |
| | 1.20 | 0.80 | 1.04 | 1.29 | 1.53 | 2.09 | 2.29 | 2.29 |
| | 1.50 | 0.80 | 1.04 | 1.29 | 1.53 | 2.09 | 2.29 | 2.60 |
| $N_{R,II,k}$ [kN] | | 0.40 | 0.53 | 0.66 | 0.79 | 1.10 | 1.38 | 1.80 |

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 4 |
| 0681 4.8 x 25 with washer Ø14.0 mm | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: aluminum alloy – EN 573

Component II: S235 - EN 10025-1
S280GD, S320GD or S350GD - EN 10346

Drilling capacity $\Sigma t_i \leq 2,00$ mm

Timber substructures

for timber substructures no performance determined

| Component I: Aluminum alloy with $R_m \geq 165$ N/mm ² Component II: S280GD to S350GD. S235 | | | | | | | | |
|---|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 | |
| $V_{R,k}$ [kN] | 0.50 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 |
| | 0.60 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| | 0.70 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| | 0.80 | 1.15 | 1.18 | 1.18 | 1.18 | 1.18 | 1.18 | 1.18 |
| | 1.00 | 1.15 | 1.52 | 1.61 | 1.61 | 1.61 | 1.61 | 1.61 |
| | 1.20 | 1.15 | 1.52 | 1.75 | 1.76 | 1.76 | 1.76 | 1.76 |
| $N_{R,II,k}$ [kN] | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 | 1.83 | |

| Component I: Aluminum alloy with $R_m \geq 215$ N/mm ² Component II: S280GD to S350GD. S235 | | | | | | | | |
|---|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 | |
| $V_{R,k}$ [kN] | 0.50 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| | 0.60 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| | 0.70 | 1.15 | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 |
| | 0.80 | 1.15 | 1.52 | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 |
| | 1.00 | 1.15 | 1.52 | 1.75 | 2.09 | 2.09 | 2.09 | 2.09 |
| | 1.20 | 1.15 | 1.52 | 1.75 | 2.11 | 2.29 | 2.29 | 2.29 |
| $N_{R,II,k}$ [kN] | 0.51 | 0.70 | 0.84 | 1.05 | 1.38 | 1.61 | 1.83 | |

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 5 |
| 0681 4.8 x 25 with washer Ø14.0 mm | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: S280GD, S320GD or S350GD - EN 10346

Component II: S235 - EN 10025-1
S280GD, S320GD or S350GD - EN 10346

Drilling capacity $\Sigma t_i \leq 2,00 \text{ mm}$

Timber substructures

for timber substructures no performance determined

| t _i [mm] | t _{ii} [mm] | | | | | | |
|--------------------------|----------------------|------|------|------|------|------|------|
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 |
| V _{R,k} [kN] | 0.40 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 |
| | 0.50 | 1.09 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| | 0.55 | 1.09 | 1.11 | 1.50 | 1.50 | 1.50 | 1.50 |
| | 0.63 | 1.09 | 1.11 | 1.50 | 2.13 | 2.13 | 2.13 |
| | 0.75 | 1.09 | 1.11 | 1.50 | 2.13 | 3.08 | 3.08 |
| | 0.88 | 1.09 | 1.11 | 1.50 | 2.13 | 3.08 | 3.38 |
| | 1.00 | 1.09 | 1.11 | 1.50 | 2.13 | 3.08 | 3.38 |
| N _{R,k} [kN] | 0.40 | 0.69 | 0.87 | 1.05 | 1.32 | 1.32 | 1.32 |
| | 0.50 | 0.69 | 0.87 | 1.05 | 1.34 | 1.52 | 1.52 |
| | 0.55 | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 1.99 |
| | 0.63 | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 |
| | 0.75 | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 |
| | 0.88 | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 |
| | 1.00 | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 |
| N _{R,II,k} [kN] | 0,69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 | 2.37 |

If both components I and II are made of S320GD or S350GD, the values may be increased by 8,3%.

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 6 |
| 0681 6.0 x 25 with washer Ø16.0 mm | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: aluminum alloy – EN 573

Component II: aluminum alloy – EN 573

Drilling capacity $\Sigma t_i \leq 2,00$ mm

Timber substructures

for timber substructures no performance determined

| Component I & II: Aluminum alloy with $R_m \geq 165$ N/mm ² | | | | | | | | |
|--|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.50 | 0.60 | 0.70 | 0.80 | 1.00 | 1.20 | 1.50 | |
| $V_{R,k}$ [kN] | 0.50 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| | 0.60 | 0.26 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| | 0.70 | 0.26 | 0.55 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| | 0.80 | 0.26 | 0.55 | 0.85 | 1.14 | 1.14 | 1.14 | 1.14 |
| | 1.00 | 0.26 | 0.55 | 0.85 | 1.14 | 2.13 | 2.13 | 2.13 |
| | 1.20 | 0.26 | 0.55 | 0.85 | 1.14 | 2.13 | 2.24 | 2.24 |
| $N_{R,II,k}$ [kN] | 0,36 | 0.49 | 0.63 | 0.76 | 1.11 | 1.32 | 1.63 | |

| Component I & II: Aluminum alloy with $R_m \geq 215$ N/mm ² | | | | | | | | |
|--|---------------|------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | | |
| | 0.50 | 0.60 | 0.70 | 0.80 | 1.00 | 1.20 | 1.50 | |
| $V_{R,k}$ [kN] | 0.50 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| | 0.60 | 0.34 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| | 0.70 | 0.34 | 0.72 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| | 0.80 | 0.34 | 0.72 | 1.11 | 1.49 | 1.49 | 1.49 | 1.49 |
| | 1.00 | 0.34 | 0.72 | 1.11 | 1.49 | 2.78 | 2.78 | 2.78 |
| | 1.20 | 0.34 | 0.72 | 1.11 | 1.49 | 2.78 | 2.92 | 2.92 |
| $N_{R,II,k}$ [kN] | 0,46 | 0.64 | 0.81 | 0.99 | 1.44 | 1.71 | 2.12 | |

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 7 |
| 0681 6.0 x 25 with washer Ø16.0 mm | |

Materials

Fastener: stainless steel A2 - EN ISO 3506

Washer: stainless steel A2 - EN ISO 3506

Component I: aluminum alloy – EN 573

Component II: S235 - EN 10025-1
S280GD, S320GD or S350GD - EN 10346

Drilling capacity $\Sigma t_i \leq 2,00 \text{ mm}$

Timber substructures

for timber substructures no performance determined

| Component I: Aluminum alloy with $R_m \geq 165 \text{ N/mm}^2$ Component II: S280GD to S350GD. S235 | | | | | | | |
|--|---------------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | |
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 |
| $V_{R,k}$ [kN] | 0.50 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| | 0.60 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| | 0.70 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| | 0.80 | 1.09 | 1.11 | 1.14 | 1.14 | 1.14 | 1.14 |
| | 1.00 | 1.09 | 1.11 | 1.50 | 2.13 | 2.13 | 2.13 |
| | 1.20 | 1.09 | 1.11 | 1.50 | 2.13 | 2.24 | 2.24 |
| $N_{R,II,k}$ [kN] | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 | 2.37 |

| Component I: Aluminum alloy with $R_m \geq 215 \text{ N/mm}^2$ Component II: S280GD to S350GD. S235 | | | | | | | |
|--|---------------|------|------|------|------|------|------|
| t_i [mm] | t_{II} [mm] | | | | | | |
| | 0.40 | 0.50 | 0.55 | 0.63 | 0.75 | 0.88 | 1.00 |
| $V_{R,k}$ [kN] | 0.50 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| | 0.60 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| | 0.70 | 1.09 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| | 0.80 | 1.09 | 1.11 | 1.49 | 1.49 | 1.49 | 1.49 |
| | 1.00 | 1.09 | 1.11 | 1.50 | 2.13 | 2.78 | 2.78 |
| | 1.20 | 1.09 | 1.11 | 1.50 | 2.13 | 2.92 | 2.92 |
| $N_{R,II,k}$ [kN] | 0.69 | 0.87 | 1.05 | 1.34 | 1.78 | 2.09 | 2.37 |

| | |
|------------------------------------|----------------|
| self drilling screw | Annex 8 |
| 0681 6.0 x 25 with washer Ø16.0 mm | |