



**Technical and Test Institute  
for Construction Prague**  
Prosecká 811/76a  
190 00 Praha  
Czech Republic  
eota@tzus.cz



## European Technical Assessment

**ETA 16/0589  
of 20/06/2017**

(English language translation, the original version in Czech language)

### *I General Part*

#### **Technical Assessment Body issuing the ETA:**

Technical and Test Institute for Construction Prague

#### **Trade name of the construction product**

**SCANROC**

#### **Product family to which the construction product belongs**

Kits for external wall claddings

#### **Manufacturer**

VKM Solutions, SE  
Hybernská 1271/32  
Nové Město, 110 00 Praha 1  
Czech Republic

#### **Manufacturing plant(s)**

- 1) VKM Solutions, SE  
Hybernská 1271/32  
Nové Město, 110 00 Praha 1  
Czech Republic
- 2) SCANROC LLC  
41 Volgogradskaya str.  
Kiev, 03141  
Ukraine

#### **This European Technical Assessment contains**

26 pages including 9 Annexes which form an integral part of this assessment.

Annex No. 10 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated.

#### **This European Technical Assessment is issued in accordance with regulation (EU) No. 305/2011 on the basis of**

ETAG 034, edition 2012, part 1 and part 2, used as European Assessment Document (EAD)

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

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body - Technical and Test Institute for Construction Prague. Any partial reproduction has to be identified as such.

## II Specific part

### 1 Technical description of the product

#### 1.1 Definition and composition of the kit

The subject of this European Technical Assessment (ETA) is a kit for external wall claddings consisting of cladding elements, fixing devices of the cladding elements, subframe, subframe fixings and a possible insulation layer.

The kit can be constructed in two variants with or without a ventilated air space. Only if ventilation openings are envisaged, as a minimum, at the building base point and at the roof edge with cross-sections of at least 50 cm<sup>2</sup> per linear meter, the system may be referred to as a ventilated system. This ETA is providing sufficient assessment of both variants.

The kit is classified as family C in accordance with ETAG 034 (2012), Part I, Cl. 2.2.1.

Composition of the kit

Table No. 1

	Components	Geometry/ characteristics
	<b>Family C according to ETAG 034 (2012), Part I, Cl. 2.2.1</b>	See annex no. 1
<b>Cladding</b>	<ul style="list-style-type: none"><li>• Cladding elements<ul style="list-style-type: none"><li>- <b>SCANROC</b></li><li>- extruded concrete cladding elements</li><li>- length 300 or 600 mm</li></ul></li></ul>	See annex no. 2
<b>Fixings</b>	<ul style="list-style-type: none"><li>• Subframe fixings<ul style="list-style-type: none"><li>- <b>Self-taping screw</b> <b>ISO 15480 – ST6.3 × 19</b></li><li>- screw to be used within the subframe</li><li>- fastening brackets with horizontal profiles</li><li>- <b>Self-taping screw</b> <b>ISO 15480 – ST4.8 × 13</b></li><li>- screw to be used in the subframe</li><li>- fastening vertical and horizontal profiles</li></ul></li></ul>	See annex no. 5  See annex no. 6
<b>Subframe</b>	<ul style="list-style-type: none"><li>• Subframe profiles<ul style="list-style-type: none"><li>- <b>Profile R – 3</b></li><li>- horizontal profiles of the subframe</li><li>- fixed to the profiles C – 1</li><li>- max. axial distance of the profiles: 600 mm</li><li>- <b>Profile C – 1</b></li><li>- vertical profiles of the subframe</li><li>- fixed to the R – 3</li><li>- max. axial distance of the profiles: 300 mm</li></ul></li></ul>	„L” shape plain surface 40 × 60 mm thick. 1.5 mm  See annex no. 3

	Components	Geometry/ characteristics
<b>Subframe brackets</b>	<ul style="list-style-type: none"> <li>• Brackets               <ul style="list-style-type: none"> <li>- <b>Console K – 1</b></li> <li>- loose wing length 150 – 190 mm</li> <li>- subframe bracket to fix subframe profiles to substrate wall</li> <li>- max. axial distance in between brackets:                   <ul style="list-style-type: none"> <li>horizontal: 1200 mm</li> <li>vertical: 600 mm</li> </ul> </li> </ul> </li> </ul>	See annex no. 4
<b>Insulation</b>	<ul style="list-style-type: none"> <li>• Insulation product MW:               <ul style="list-style-type: none"> <li>- <b>MW according to EN 13162</b></li> <li>- minimal distance between cladding element and insulation product (air space) is 20 mm</li> </ul> </li> </ul>	Thickness: 0 - 200  See annex no. 7
<b>Ancillary materials</b>	<p><b>Ancillary materials are not included in the kit.</b></p> <p><b>These materials also includes:</b></p> <ul style="list-style-type: none"> <li>• Subframe fixings to the substrate For fixings connecting the subframe to the wall (anchors) the mechanical characteristics (resistance to tension and shear loads) shall be given in the relevant ETA. Type, position and density of anchors shall be defined considering the characteristics of the substrate.</li> <li>• Insulation product fixings to substrate wall Type, position and number of anchors per square meter shall be defined considering the characteristics of the insulation product and substrate. Only anchors that are assessed in accordance with ETAG 014 or EAD 330196-00-0604 can be used.</li> <li>• Insulation gaskets To reduce thermal bridges occurring in the connection brackets substrate.</li> </ul>	

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

### **2.1 Intended use**

The facade system **SCANROC** is intended to be used for external wall cladding with or without a ventilated air space it can be fixed to external walls of new or existing buildings.

The kit of external wall cladding with or without a ventilated air space is a non-load bearing construction system. It does not contribute to stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from effect of weathering.

The kit is not intended to ensure air tightness of the building structure to which it is installed.

The provisions made in this European Technical Assessment are based on assumed working life of 25 years as minimum, provided that the cladding kit is subject to appropriate use and maintenance.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technological Assessment Body but are to be regarded only as means for choosing the right products in relation to the expected economically reasonable working life of the works.

### **2.2 Manufacturing**

The European Technical Assessment is issued for the facade system **SCANROC** on the basis of agreed data and information, deposited with the Technical and Test Institute for Construction Prague, which identifies the kit that has been assessed and judged.

### **2.3 Design and installation**

The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

Design, installation and execution of the facade system **SCANROC** is to be in conformity with national documents. Such documents and the level of their implementation in Member States' legislation are different. Therefore, the assessment and declaration of performance are done taking into account general assumptions introduced in the chapters 7.1 and 7.2 of ETAG 034 (April 2012) used as EAD, which summarizes how information introduced in the ETA and related documents is intended to be used in the construction process and gives advice to all parties interested when normative documents are missing.

## 2.4 Packaging, transport and storage

The information on packaging, transport and storage is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made known to the concerned people.

## 2.5 Use, maintenance and repair

Maintenance of the system **SCANROC** or kit components includes inspections on site, taking into account the following aspects:

- Regarding the cladding elements: appearance of any damage such as cracking, delamination or detachment, permanent and irreversible deformation
- Repairing of localized damaged areas due to accidents
- Regarding metal components: Presence of corrosion or water accumulation
- Necessary repairs should be performed as soon as the need has been identified, using the same kit components and following the repair instructions given by the ETA holder

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made known to the concerned people.

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

**Performance of the kit as described in this chapter is valid provided that the components of the kit comply with annexes 1 – 9.**

Characteristic values stated hereafter give 75 % confidence that 95 % of the test results will be higher than these values.

#### **3.1 Safety in case of fire (BWR 2)**

##### **3.1.1 Reaction to fire (ETAG 034 - clause 6.2.1, EN 13501-1+A1:2009)**

Reaction to fire is assessed using a declaration of the manufacturer stating clearly that all the components of the kit are assessed as A1 without testing according to Commission Decision 96/603/EC as amended.

Table No. 2

<b>Reaction to fire</b>	
<b>Euroclass according to EN 13501-1+A1:2009</b>	<b>A1</b>

An additional assessment of external wall cladding kits according to national provisions (e.g. on the basis of a large scale test) might be necessary to comply with Member State regulations.

## **3.2 Hygiene, health and environment (BWR 3)**

### **3.2.1 Watertightness of joints, protection against driven rain (ETAG 034 - clause 6.3.1)**

No performance assessed.

### **3.2.2 Water permeability of cladding element, resistance to water diffusion (ETAG 034 - clause 6.3.2)**

The water permeability characteristic of the **SCANROC** cladding is determined, by the means of EN 491:2011, Cl. 5.7.

**No water drops falling from the underside of the samples after 20 hours.**

### **3.2.3 Water vapour permeability (ETAG 034 - clause 6.3.3)**

The water vapour permeability of **SCANROC** cladding is determined, by means of water vapour permeability in accordance with EN 12572:2017, as  $\mu_{\varnothing} = 48.6 [-]$ .

Note: The correct selection of a cladding kit, based on water permeability results, will depend on the severity of the climate and the position of the kit relative to the supporting wall.

### **3.2.4 Drainability (ETAG 034 - clause 6.3.4)**

**Passed.**

### **3.2.5 Release of dangerous substances (ETAG 034 - clause 6.3.5, EOTA TR 034)**

Kit not assessed according to EOTA TR 034.

### 3.3 Safety in use (BWR 4)

#### 3.3.1 Wind load resistance (ETAG 034 - clause 6.4.1)

In accordance with ETAG 034 (April 2012), Part I, Cl. 5.4.1 the mechanically weakest design was assessed by the means of the wind suction resistance test.

##### 3.3.1.1 Wind suction resistance (ETAG 034 - clause 6.4.1.1)

Wind suction resistance of the kit was assessed in accordance with ETAG 034 (April 2012), Part I, Cl. 5.4.1.1 and 6.4.1.1.

See Annex No. 8 for deflection of each of the measurement points.

Test specimen description:

- Cladding element: **SCANROC**
- Subframe: **Profiles R – 3 and Profiles C – 1** in the maximal allowed distances  
Subframe fixed by  
**Self-taping screws ISO 15480 – ST6.3 × 19** and  
**Self-taping screws ISO 15480 – ST4.8 × 13**

Table No. 3

	Maximal load Q [Pa]	Maximal deflection [mm]	Type of failure
<b>SCANROC</b>	6600	13	Cladding separated from the vertical profiles

##### 3.3.1.2 Wind pressure resistance (ETAG 034 - clause 6.4.1.2)

Considering the geometry of the kit, according to ETAG 034 (April 2012), Part I, Cl. 5.4.1.2 the wind pressure resistance is assumed to be the same or higher than the wind suction resistance (see table no. 3 for results).



### 3.3.2 Mechanical resistance (ETAG 034 - clause 6.4.2)

#### 3.3.2.1 Resistance of grooved cladding element (ETAG 034 - clause 6.4.2.3.1)

Resistance of the grooved cladding element (family C) was assessed in accordance with ETAG 034 (April 2012), Part I, Cl. 5.4.2.3.1 and 6.4.2.3.1.

Values in vertical and horizontal load direction are stated.

Table No. 4

	Mean value [N]	Characteristic value [N]
Resistance to the vertical direction	1101	917
Resistance to the horizontal direction	454	379

#### 3.3.2.2 Resistance to vertical load (ETAG 034 - clause 6.4.2.3.3)

Resistance to vertical load (family C) was assessed in accordance with ETAG 034 (April 2012), Part I, Cl. 5.4.2.3.3 and 6.4.2.3.3.

No deflection measured at the end of the test.

**Passed.**

#### 3.3.2.3 Pull-through resistance of fixings from profiles (ETAG 034 - clause 6.4.2.3.4)

Pull through resistance of fixings from profiles (family C) was assessed in accordance with ETAG 034 (April 2012), Part I, Cl. 5.4.2.3.4 and 6.4.2.3.4.

Table No. 5

	Mean value [N]	Characteristic value [N]
Profile R – 3 + Self-taping screw ISO 15480 – ST6.3 × 19	1963	1766
Profile C – 1 + Self-taping screw ISO 15480 – ST4.8 × 13	1091	948

**3.3.2.4 Subframe: profiles  
(ETAG 034 - clause 6.4.2.2)**

Mechanical resistance of subframe profiles was assessed in accordance with ETAG 034 (April 2012), Part II, Cl.5.4.2.1.

Table No. 6

		Characteristics		
<b>Profile C – 1 Profile R – 3 Console K – 1</b>	<b>Standards related</b>	EN 1090-1:2009+A1:2011 EN 10346:2015		
	<b>Execution class</b>	EXC2		
	<b>Coating</b>	Hot dip zinc coating Z275		
	<b>Steel</b>	DX51D		
	<b>Material characteristics</b>	R <sub>e</sub>	R <sub>m</sub>	A <sub>80</sub>
		210 MPa	300 MPa	22%

**3.3.2.5 Subframe: fixings  
(ETAG 034 - clause 6.4.2)**

Mechanical resistance of subframe fixings was assessed in accordance with ETAG 034 (April 2012), Part II, Cl.5.4.2.1.

For geometry of fixings devices see Annex No. 9.

Table No. 7

		Characteristics
<b>Self-taping screw ISO 15480 – ST6.3 × 19</b>	Mechanical and functional properties in accordance with EN ISO 10666:1999 (see annex no. 5 and annex no. 6 for more)	
<b>Self-taping screw ISO 15480 – ST4.8 × 13</b>		

**3.3.2.6 Subframe: brackets  
(ETAG 034 - clause 6.4.2.2, Annex E, part II)**

Mechanical resistance of the subframe brackets was assessed in accordance with ETAG 034 (April 2012), Part II, Cl. 5.4.2.1.

Characteristics of the brackets were determined in accordance with ETAG 034 (April 2012), Part II, Annex E.

Key for the hereafter stated values:

- $R_{cr}$  Characteristic value of load that corresponds to displacement of:  
0.38 mm for loose wing length 190 mm
- $R_{cd1}$  Characteristic value of load that corresponds to 1 mm displacement
- $R_{cd2}$  Characteristic value of load that corresponds to 3 mm displacement
- $R_s$  Characteristic value of load that corresponds to failure
- $R_c$  Characteristic value of load that corresponds to 1 mm displacement
- $R_t$  Characteristic value of load that corresponds to failure

**Resistance to vertical load (weight)**

Table No. 8

	Length of the loose wing of a bracket [mm]	$R_{cr}$ [N]	$R_{cd1}$ [N]	$R_{cd2}$ [N]	$R_s$ [N]
Console K – 1	max. 190 mm	3	8	23	400

**Resistance to horizontal load (wind suction)**

Table No. 9

	$R_c$ [N]	$R_t$ [N]
Console K – 1	848	2211

**3.3.3 Resistance to horizontal point loads  
(ETAG 034 - clause 6.4.3)**

Resistance to horizontal point loads was assessed on a sample after hygrothermal behaviour test (ETAG 034, April 2012), Part 1, Cl. 5.4.6.

**Passed.**

**3.3.4 Impact resistance  
(ETAG 034 - clause 6.4.4)**

Resistance to impact resistance was assessed on a sample after hygrothermal behaviour test (ETAG 034, April 2012), Part 1, Cl. 5.4.6.

Table No. 10

	Use category	Description of the category
SCANROC	IV	A zone out of reach from ground level

**3.3.5 Resistance to seismic actions  
(ETAG 034 - clause 6.4.5)**

No performance assessed.

**3.3.6 Hygrothermal behaviour  
(ETAG 034, Part 2, clause 6.4.7)**

No visible deterioration of the system.

**Passed.**

**3.4 Protection against noise (BWR 5)**

No performance assessed.

**3.5 Energy economy and heat retention (BWR 6)**

**3.5.1 Thermal resistance  
(ETAG 034 - clause 6.6)**

Passed.

Value stated in the table no. 11 applies only if hereafter stated criterions are observed.

In case that particular chosen composition does not observe these criterions it is assessed as: This performance has not been assessed

Table No. 11

	Minimal thermal resistance [ $m^2 \cdot K/W$ ]	
SCANROC	Thickness of the insulation product:	$\geq 50 \text{ mm}$
	Thermal conductivity coefficient of the insulation product:	$\leq 0.031 \text{ W} \cdot m^{-1} \cdot K^{-1}$
	Density of the brackets:	$\leq 9 \text{ pcs}/m^2$ (mandatory use of insulating gasket)
	0.87	

### **3.6 Sustainable use of natural resources (BWR 7)**

No performance assessed.

### **3.7 Aspects of durability and serviceability (ETAG 034 - clause 6.7)**

#### **3.7.1 Pulsating load (ETAG 034 - clause 6.7.1)**

No performance assessed.

#### **3.7.2 Dimensional stability of external cladding element (ETAG 034 - clause 6.7.2)**

No performance assessed.

#### **3.7.3 Immersion in water (ETAG 034 - clause 6.7.3)**

No performance assessed.

#### **3.7.4 Freeze-thaw (ETAG 034 - clause 6.7.4)**

No performance assessed.

#### **3.7.5 Chemical and biological resistance (ETAG 034 - clause 6.7.5)**

No performance assessed.

#### **3.7.6 Corrosion (ETAG 034 - clause 6.7.6)**

No performance assessed.

#### **3.7.7 UV radiation (ETAG 034 - clause 6.7.7)**

No performance assessed.

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

According to the European Commission decision 2003/640/EC, the AVCP system (further described in Annex V to Regulation (EU) No 305/2011) given in following table applies:

Table No. 12

<b>Product(s)</b>	<b>Intended use(s)</b>	<b>Level(s) or class(es)</b>	<b>System(s)</b>
Kit for exterior wall claddings	External	-	2+

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

In order to help the Notified Body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information together with the requirements given in EC Guidance Paper B will generally form the basis on which the factory production control (FPC) is assessed by the Notified Body.

This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

1) ETA

Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.

2) Basic manufacturing process

The basic manufacturing process is described in sufficient detail to support the proposed FPC methods.

The different components of the kit are generally manufactured using conventional techniques. Any critical process or treatment of the components which affects performance are highlighted in the manufacturer's documentation.

3) Product and materials specifications

The manufacturer's documentation includes:

- detailed drawings (possibly including manufacturing tolerances),
- incoming (raw) materials specifications and declarations,
- references to European and/or international standards,
- technical data sheets.

4) Control Plan (as a part of FPC)

The manufacturer and the Technical and Test Institute for Construction Prague have agreed a Control Plan which is deposited with the Technical and Test Institute for Construction Prague in documentation which accompanies the ETA. The Control Plan specifies the type and frequency of checks/tests conducted during production and on the final product. This includes the checks conducted during manufacture on properties that cannot be inspected at a later stage and for checks on the final product.

Products not manufactured by the kit manufacturer shall also be tested according to the Control Plan. It must be demonstrated to the Notified Body that the FPC system contains elements securing that the kit manufacturer takes products conforming to the Control Plan from his supplier(s).

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then where appropriate they shall be subject to suitable checks/tests by the kit manufacturer referring to the Control Plan once again.

Issued in Prague on 20/06/2017

By

**Ing. Mária Schaan**

Head of the Technical Assessment Body (TAB)

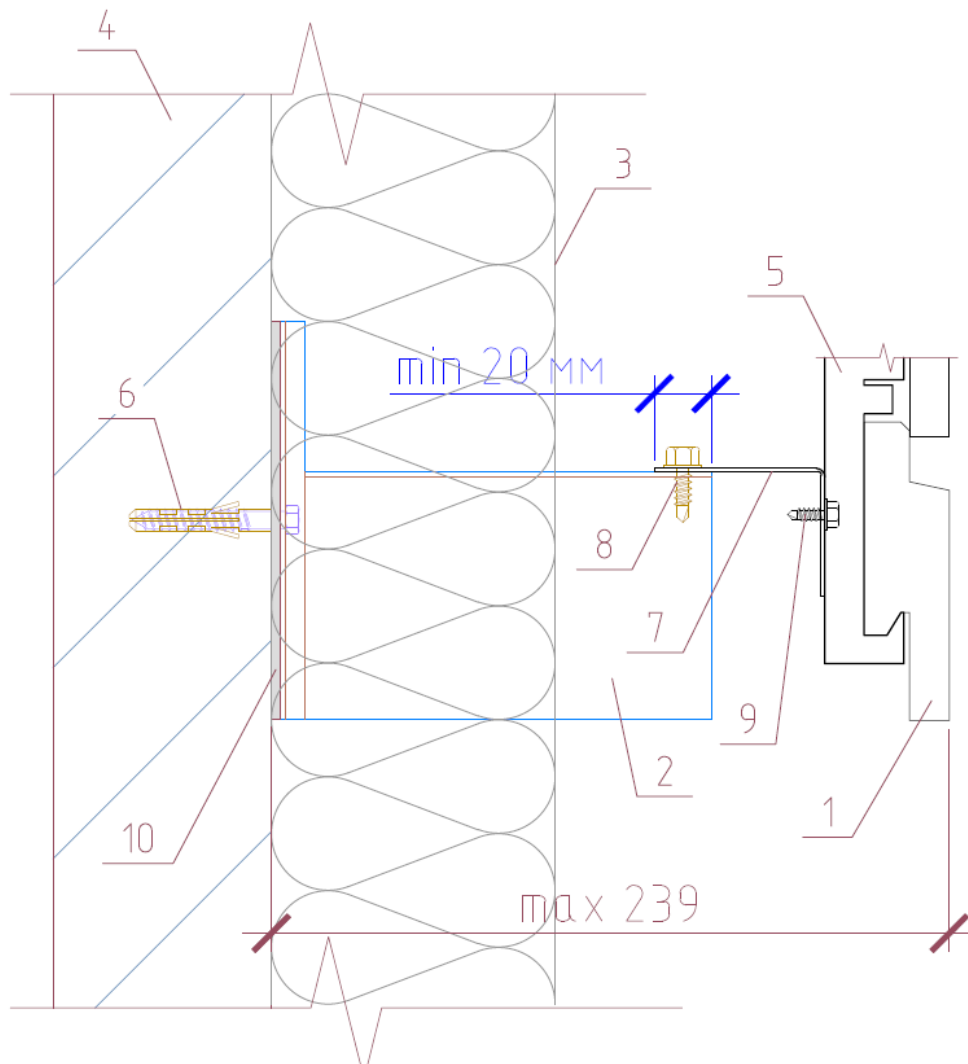
*Annexes:*

- |             |  |
|-------------|--|
| Annex No. 1 | Scheme of the SCANROC system             |
| Annex No. 2 | SCANROC                                  |
| Annex No. 3 | Profile C – 1                            |
| Annex No. 4 | Console K – 1                            |
| Annex No. 5 | Self-taping screw ISO 15480 – ST6.3 × 19 |
| Annex No. 6 | Self-taping screw ISO 15480 – ST4.8 × 13 |
| Annex No. 7 | Insulation product                       |
| Annex No. 8 | Wind suction test results                |
| Annex No. 9 | Detailed positions of fixings            |

## Annex No. 1 Scheme of the SCANROC system

Key:

- 1) Cladding tile: **SCANROC**
- 2) Bracket: **Console K - 1**
- 3) Insulation: in accordance with EN 13162, voluntary application
- 4) Substrate: masonry, concrete, timber or metal frame
- 5) Vertical subframe profile: **Profile C - 1**
- 6) Subframe fixing to the substrate: ancillary material
- 7) Horizontal subframe profile: **Profile R - 3**
- 8) Subframe fixing: **Self-taping screw ISO 15480 - ST6.3 × 19**
- 9) Subframe fixing: **Self-taping screw EN ISO 15480 4.8 × 13**
- 10) Insulating gasket: ancillary material, voluntary application

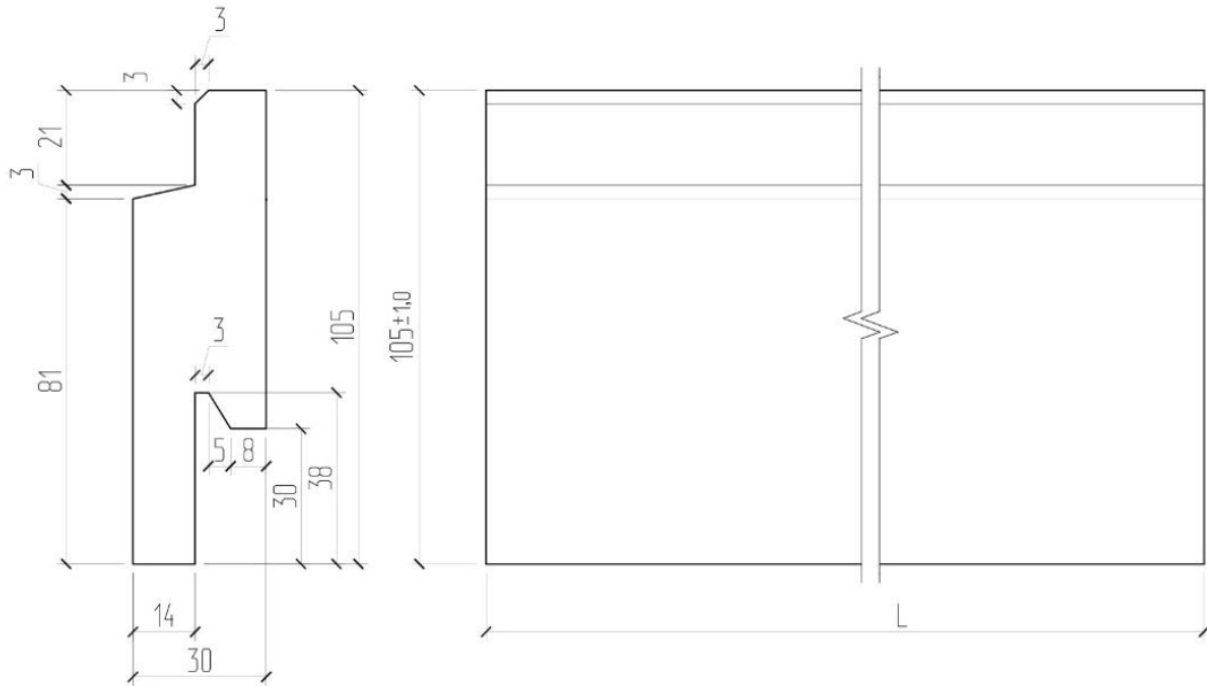




## Annex No. 2 SCANROC

Dimensions in millimetres

L is either 300 mm or 600 mm depending on the type of the cladding.



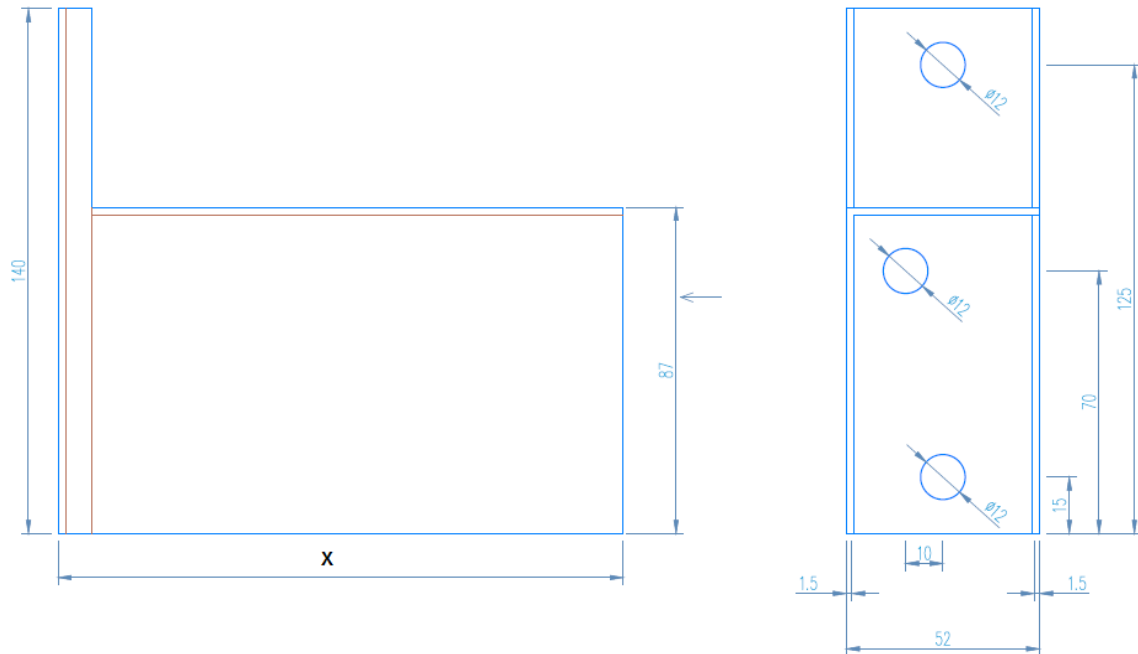
Characteristics	Value
General document for test procedures	EN 490:2011
Material	Extruded concrete
Mass (EN 491:2011)	2825 ± 50 g (tile of length 600 mm)
Squareness (EN 490:2011, EN 491:2011)	1 mm
Flatness (EN 491:2011)	≤ 3 mm
Minimum transverse strength (EN 491:2011)	≥ 930 N (also after 150 freeze-thaw cycles)
Water impermeability (EN 491:2011)	Within 20 h ± 5 min. no water drops occurred falling from the underside (including after 150 freeze-thaw cycles)
Water vapour resistance factor (EN ISO 12572) $\mu\phi$	≤ 50 [-]



## Annex No. 4 Console K – 1

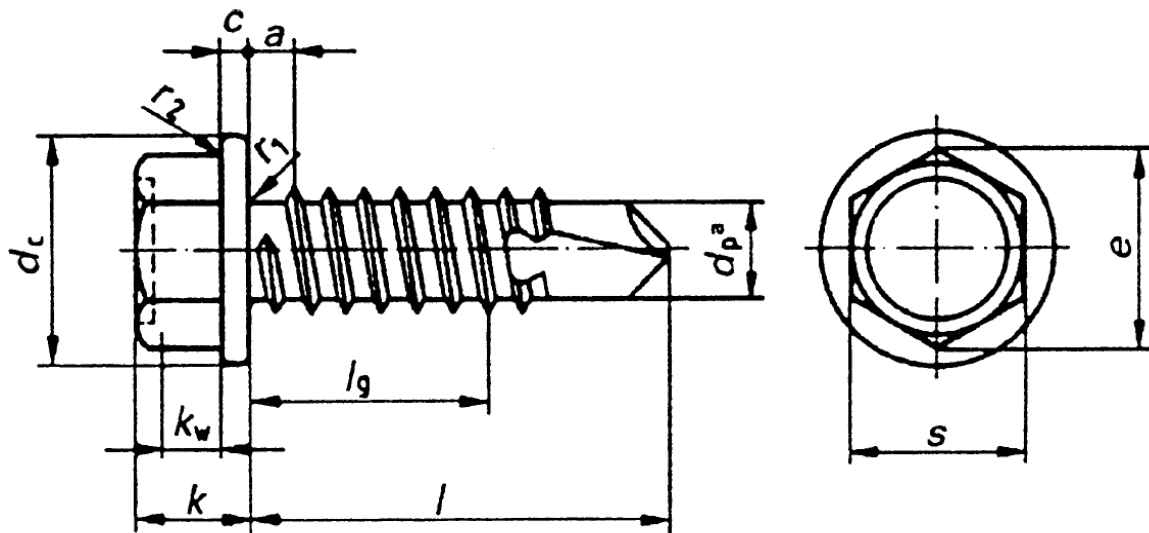
Dimensions in millimetres.

X dimension depends on the bracket type (loose length)



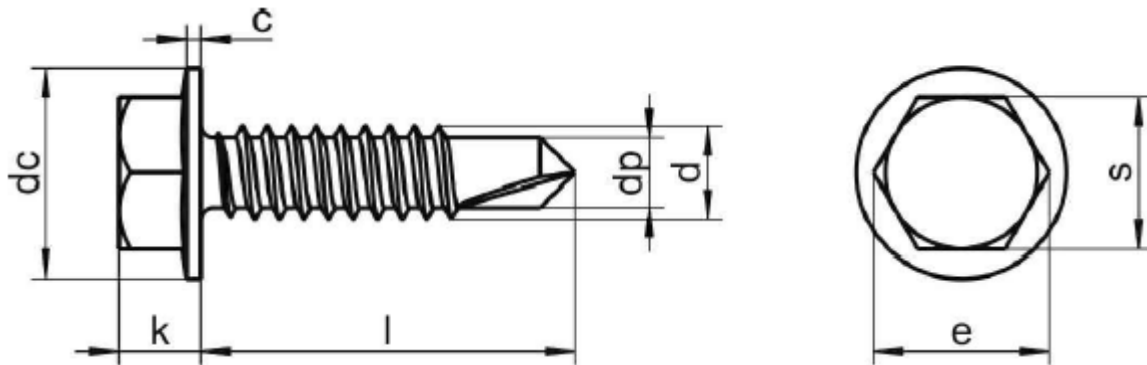
Characteristics	Value
Dimensions and shape	EN 1090 -2:2008+A1:2011
Material	Steel DX51D $R_e = 210 \text{ MPa}$ $R_m = 300 \text{ MPa}$ $A_{80} = 22 \%$

Annex No. 5 Self-tapping screw ISO 15480 – ST6.3 × 19



Fixing element characteristics			
General document	EN ISO 15480:1999		
Dimensions	in accordance with EN ISO 15480:1999	l (nominal)	19.0 mm
		k (nominal)	5.9 mm
		s (nominal)	10.0 mm
Mechanical properties of the steel	in accordance with EN 10084 and EN 10346		
Mechanical and functional properties	Tensile strength: $f_{u,k} = 1000 \text{ N/mm}^2$		Tensile strength: $f_{u,k} = 1000 \text{ N/mm}^2$

## Annex No. 6 Self-taping screw ISO 15480 – ST4.8 × 13



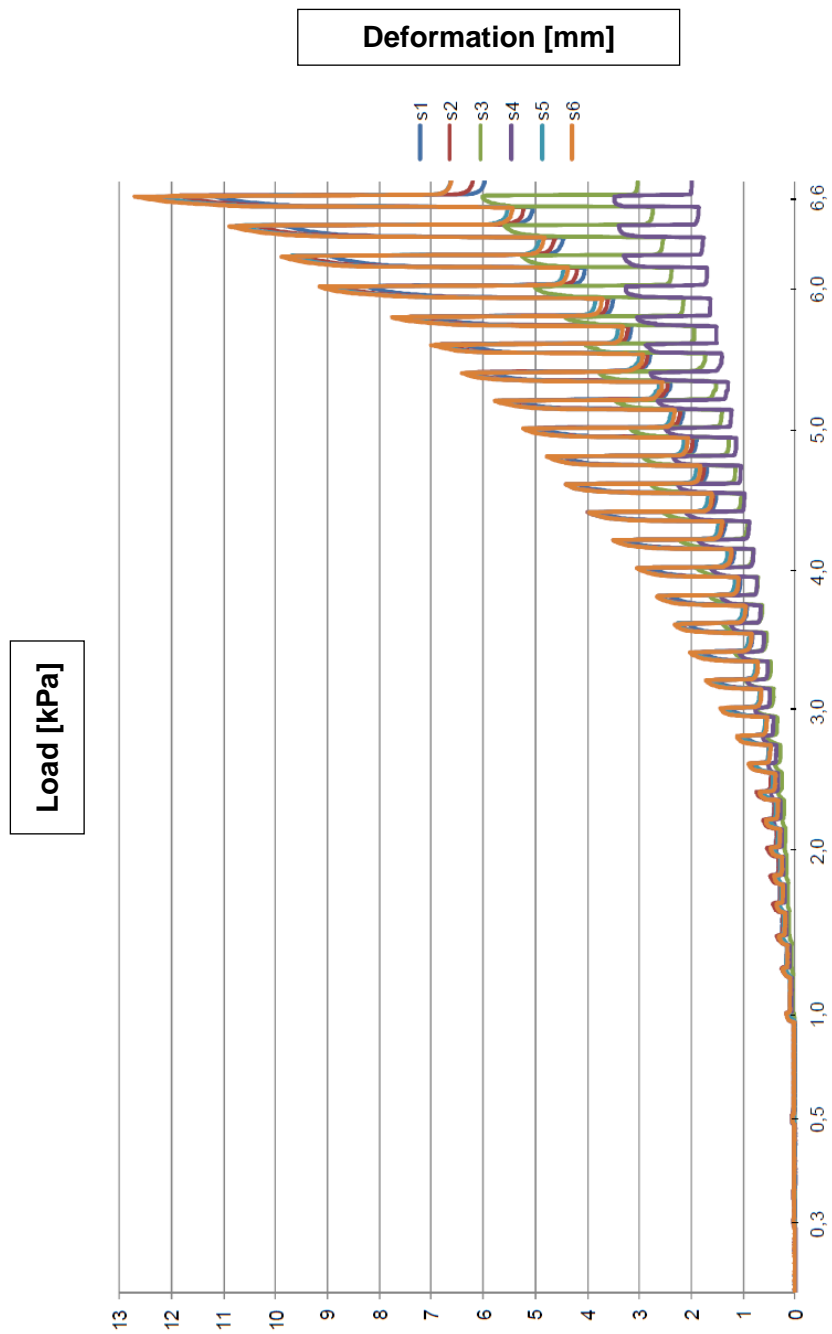
Fixing element characteristics			
General document	EN ISO 15480:1999		
Dimensions	in accordance with EN ISO 15480:1999	l (nominal)	13.0 mm
		k (nominal)	4.3 mm
		s (nominal)	8.0 mm
Mechanical properties of the steel	in accordance with EN 10084 and EN 10346		
Mechanical and functional properties	Tensile strength: $f_{u,k} = 1000 \text{ N/mm}^2$	Shear strength: $T_{u,k} = 600 \text{ N/mm}^2$	

## Annex No. 7 Insulation product

Trade name	Characteristics and requirements	
Insulation product's trade name	In accordance with EN 13162	
	Water vapour permeability, diffusion factor ( $\mu$ ) (EN 13162)	max. 1 [-]

## Annex No. 8 Wind suction test results

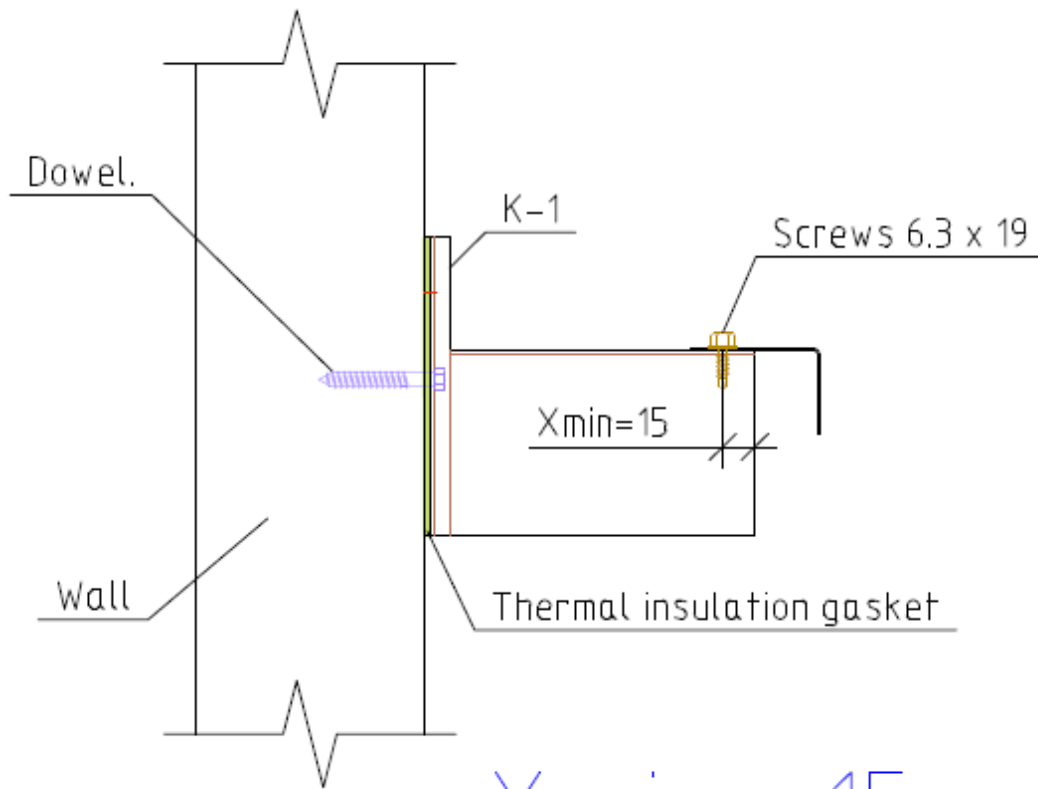
Values of maximal deflection:



Measurement points:

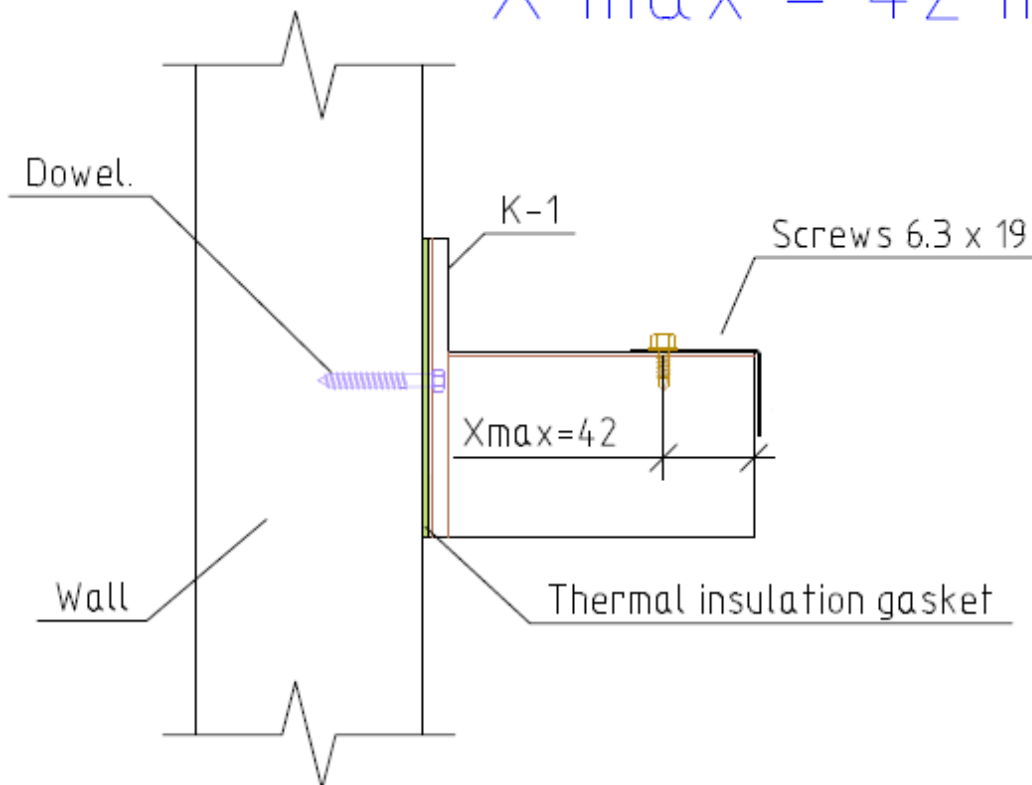


## Annex No. 9 Detailed positions of fixings

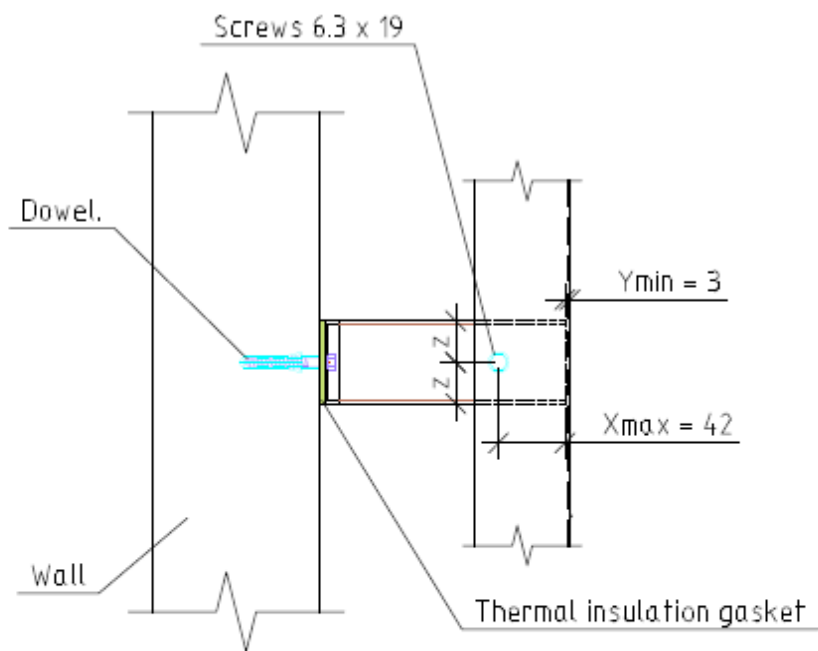
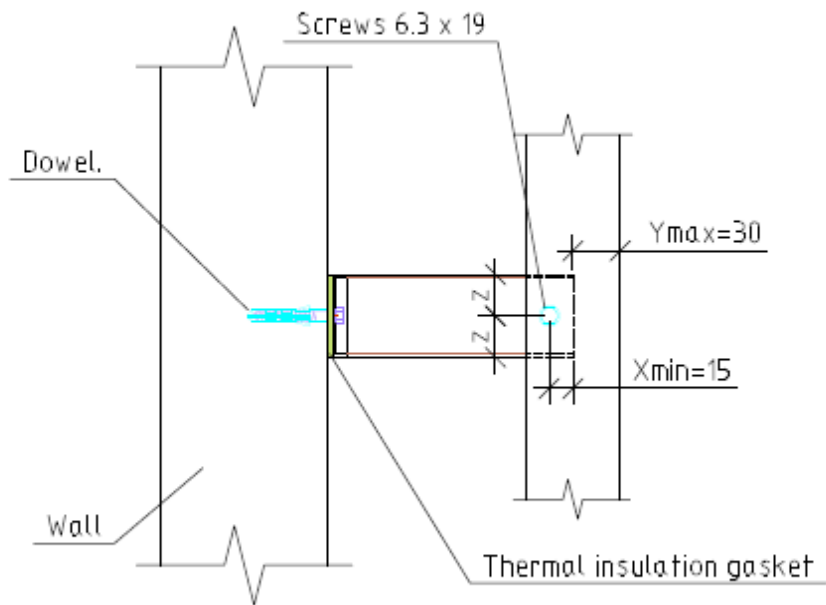


$X_{min} = 15 \text{ mm.}$

$X_{max} = 42 \text{ mm.}$







$Z_{\min} = 15 \text{ mm.}$   
 $Z_{\max} = 37 \text{ mm.}$   
 $X_{\min} = 15 \text{ mm.}$   
 $X_{\max} = 42 \text{ mm.}$   
 $Y_{\min} = 3 \text{ mm.}$   
 $Y_{\max} = 30 \text{ mm.}$

The scheme of fixation of the vertical profile C-1.

