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European Technical Assessment

**ETA 14/0196
of 07/07/2014**

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

I General Part

**Technical Assessment Body issuing the
ETA and designated according to Article
29 of the Regulation (EU) No 305/2011:
Trade name of the construction product**

Technical and Test Institute for
Construction Prague

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

Cement-bonded particleboard CETRIS®
Type: BASIC, PLUS, FINISH, PROFIL,
FINISH PROFIL, LASUR, LASUR PROFIL
EC PAC 9:

Kits for external wall claddings

CIDEM Hranice, a.s., division CETRIS
Skalní No. 1088, 753 01 Hranice I-Město
Czech Republic
www.cetris.cz

Manufacturing plant(s)

CIDEM Hranice, a.s., division CETRIS
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**This European Technical Assessment
contains**

17 pages including 3 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**

Annex 4 contains confidential information
and is/are not included in the European
Technical Assessment when that
assessment is publicly available.

ETAG 034, edition 2012, used as European
Assessment Document (EAD)

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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 external wall claddings CETRIS® and associated mechanical fixings intended to be used with a ventilated air space. Forming the kit are the cladding elements and their fixing devices (which fasten the cladding elements to the framework).

These kits for vertical exterior wall claddings, based on cement-bonded particleboard, are differentiated according to the type of placement of CETRIS® boards as follows:

- Facade system CETRIS® VARIO - boards with visible horizontal and vertical joint between the individual formats (Family A – Cladding kit consisting of cladding elements mechanically fastened to the subframe by through fixing (screws, rivets, hexagon head wood screw)).
- Facade system CETRIS® PLANK - boards with overlapped horizontal joint and visible vertical joint (Family E – Cladding kit consisting of cladding elements fixed to the subframe by mechanical fixings positioned on the top edge and masked by the edge of the upper plank).

The facade systems are showed in Annex 1.

The families are classified according to the ETA Guidance No. 034-1: Kits for external wall claddings. Part 1: Ventiladed cladding kits comprising cladding components and associated fixings.

These kits for ventilated external wall claddings consist of:

- Cladding element: cement-bonded particleboard CETRIS® type: BASIC, PLUS, PROFIL, FINISH, PROFIL FINISH, PROFIL PLUS, HOBBY PLANK, LASUR, DEKOR
- Cladding fixing device can be by screw or rivet. It depends on the type of the subframe (wooden subframe, subframe made of system profiles of aluminium or zinc-coated sheet metal or combined subframe – anchors, UNI joints, wooden planks). The possible subframe are not covered by this ETA.

The descriptions and properties of the types of cladding elements and cladding fixing devices are given in Annex 2 and Annex 3.

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

2.1 Intended use

The cement-bonded particleboards CETRIS® and the associated fixings are intended to be used for ventilated external wall claddings which can be fixed to the external walls of new or existing buildings.

The kit for ventilated external wall claddings is a non load-bearing construction system. It does not contribute to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effect of weathering.

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

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

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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.

2.2 Manufacturing

The European Technical Assessment is issued for the external wall cladding for ventilated facade on the basis of agreed data/information, deposited with the Technical and Test Institute for Construction Prague, which identifies the kit that has been assessed and judged. Changes to the kit or production process, which could result in this deposited data/information being incorrect, shall be notified to the Technical and Test Institute for Construction Prague before the changes are introduced. The Technical and Test Institute for Construction Prague will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

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 external wall cladding for ventilated facade are 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 034-1 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(s) to ensure that this information is made known to the concerned people.

2.5 Use, maintenance and repair

Maintenance of the external wall cladding for ventilated facade system or kit components includes inspections on site, taking into account the following aspects:

- Regarding the panels: Appearance of any damage such as cracking, delamination or detachment due to permanent and irreversible deformation
- Regarding metallic components: Presence of corrosion or water accumulation
- Necessary repairs should be done rapidly, using the same kit components and following the repair instructions given by ETA holder

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) 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

The identification tests and the assessment for the intended use of this kit for ventilated external wall claddings according to the Basic Requirements (BWR) were carried out in compliance with ETAG 034. The characteristic of the components shall correspond to the respective values laid down in the technical documentation of this ETA, checked by TZUS Praha, s.p.

3.0 The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes 1 - 3

3.1 Mechanical resistance and stability (BWR 1)

Requirements with respect to the mechanical resistance and stability of non-load bearing parts of the works are not included in this Essential Requirement but are treated under the Essential Requirement Safety in use (See section 3.4).

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire

The reaction to fire of systems VARIO and PLANK according to EN 13501-1:2007 + A1:2009, is Class A2-s1, d0.

This classification is valid for the following variations:

- cement-bonded particleboard CETRIS®:
 - thickness: 8 – 40 mm,
 - bulk density: 1150 - 1450 kg.m⁻³,
 - contain of individual components must not be changed: wood chips (60% by vol.), Portland cement (22% vol.), water (15% vol.), and hydration additives (3% vol.).
- thermal insulation (mineral wool):
 - mineral wool can have different thickness,
 - apparent density: min. 60 kg.m⁻³,
 - as insulation can be used only mineral wool with minimum class of reaction to fire A2-s1,d0.
- surface finish:
 - mass per surface area: 140 – 460 g.m⁻²,
 - heat combustion value: max. 5,3 M.J.m⁻².

The product can be used:

- in horizontal (without floor covering) and vertical position,
- with or without surface finish,
- with or without a core,
- with a subframe made of wood, wood-based materials and steel or other materials with the A1 class of reaction to fire

A European reference fire scenario has not been laid down for facades. In some Member States, the classification of external wall cladding kits according to EN 13501-1:2007 + A1:2009 might not be sufficient for the use in facades. 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, until the existing European classification system has been completed.

3.2.2 Fire resistance

The fire resistance requirement is applicable to the wall itself (made of masonry, concrete, timber or metal frame) and not on the claddings kits. The cladding kit alone does not meet any fire resistance requirement.

3.3 Hygiene, health and environment (BWR 3)

3.3.1 Watertightness of joins

Joints in facade system CETRIS® VARIO (Family A) and Facade system CETRIS® PLANK (Family E) are open, therefore they are not watertight.

3.3.2 Water permeability of claddings element

This performance is not relevant for claddings designed with ventilated air space.

3.3.3 Water vapour permeability

This performance is not relevant for claddings designed with ventilated air space.

3.3.4 Drainability

On the basis of the standard construction details (see Annex 1), the installation criteria of this kit and the technical knowledge and experience, it may be said that the water which penetrates into the air space or the condensation water can be drained out from the cladding without accumulation or moisture damage or leakage into the substrate or the wall cladding kit.

3.3.5 Release of dangerous substances

This performance has not been determined (NPD).

3.4 Safety in use (BWR 4)

3.4.1 Wind load resistance

3.4.1.1 Wind suction resistance

The test of wind suction resistance has been carried out according to ETAG 034 part 1, clause 5.4.1.1.

Description of test specimens:

Family A (VARIO): Cladding elements: 3 panels: (1250x413x8) mm
Fixing devices: 8 self-drilling screws with hexagon head (4,8x32) mm + washer with seal rubber EPDM for each panel
Perimeter screws vertical center distance: 370 mm
Perimeter screws horizontal center distance: 353 mm
Border screws distance: 30 mm
Corner screws distance: (30x70) mm
Subframe: zinc-coated metal profile OM50SP and OM80SP
Center distance between vertical zinc-coated metal profiles: 413 mm

Family E (PLANK): Cladding elements: 5 panels: (300x413x8) mm and (300x832x8) mm
Fixing devices: 3 and 2 frame head screws (4,2x45) mm
Perimeter screws vertical center distance: 250 mm
Perimeter screws horizontal center distance: 413 mm
Border screws distance: 30 mm
Corner screws distance: (30x40) mm
Subframe: zinc-coated metal profile OM50SP and OM80SP

Center distance between vertical zinc-coated metal profiles: 413 mm

The test results and calculated values for tested specimens are shown in Table 1.

Table 1: Wind suction test result

Test specimen	Maximum load Q [Pa]	Type of failure
Family A	3500	No failure
Family E	3500	No failure

3.4.1.2 Wind pressure resistance

This performance is not relevant.

The kit behaviour exposed to wind pressure is more favourable than when exposed to wind suction. Therefore, according to ETAG 034 part 1, clause 5.4.1.2, wind pressure test has been omitted and wind pressure resistance of kit can be considered as equal to wind suction resistance.

3.4.2 Mechanical test

3.4.2.1 Pull-through resistance of cladding element

The test of pull-through resistance of cladding element has been tested according to ETAG 034 part 1, clause 5.4.2.1.1. Tests have been carried out on panel of the thickness 8 mm with a fixing devices through the centre, corner and border using three diameters of supporting rings (180, 270 and 350 mm). The test results and calculated values are shown in Tables 2, 3 and 4.

3.4.2.1.1 Family A (Riveted system)

Description of test specimens:

- Corner rivet (4,8x22) mm distance (25x70) mm
- Rivet (4,8x22) in centre of panel
- Border rivet (4,8x22) mm distance 25 mm

Table 2: Pull-through resistance of cladding element test result – Family A (Riveted system)

Supporting ring \varnothing [mm]	Fixing position	Failure load F_i [N]	
		F_{im}	F_{ic}
180	Corner	237	106
	Centre	1203	966
	Border	648	512
270	Corner	557	444
	Centre	1098	741
	Border	637	484
350	Corner	486	270
	Centre	1053	966
	Border	706	465

Note: F_i – individual value, F_{im} – mean value, F_{ic} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 5 test specimens)

3.4.2.1.2 Family A (Screwed system)

Description of test specimens:

- Corner screw (4,5x45) mm + washer 15 mm distance (30x70) mm
- Screw in centre of panel
- Border screw (4,5x45) mm + washer 15 mm distance 30 mm

Table 3: Pull-through resistance of cladding element test result – Family A (Screwed system)

Supporting ring ø [mm]	Fixing position	Failure load F_I [N]	
		F_{Im}	F_{IC}
180	Corner	179	81
	Centre	1058	832
	Border	701	574
270	Corner	703	426
	Centre	1027	899
	Border	701	605
350	Corner	781	572
	Centre	906	779
	Border	580	495

Note: F_I – individual value, F_{Im} – mean value, F_{IC} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 5 test specimens)

3.4.2.1.3 Family E (Screwed system)

Description of test specimens:

- Corner screw (4,2x45) mm + washer 15 mm distance (30x40) mm
- Screw in centre of panel
- Border screw (4,2x45) mm distance 30 mm

Table 4: Pull-through resistance of cladding element test result – Family E (Screwed system)

Supporting ring ø [mm]	Fixing position	Failure load F_I [N]	
		F_{Im}	F_{IC}
180	Corner	276	192
	Centre	974	820
	Border	706	610
270	Corner	310	239
	Centre	906	653
	Border	485	412
350	Corner	452	306
	Centre	976	758
	Border	506	419

Note: F_I – individual value, F_{Im} – mean value, F_{IC} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 5 test specimens)

3.4.2.2 Pull-through resistance under shear loads

The test of pull-through resistance under shear loads has been tested according to ETAG 034 part 1, clause 5.4.2.1.2. Tests have been carried out on panel of the thickness 8 mm with a fixing devices through corner and middle by using three types of subframe. The test results and calculated values are shown in Tables 5, 6 and 7.

3.4.2.2.1 Family A (Riveted system)

Description of test specimens:

- Rivet (4,8x22) mm, subframe made of system profiles of aluminium
- Corner rivet distance (25x70) mm
- Border rivet distance 25 mm

Table 5: Pull-through resistance under shear loads – Family A (Riveted system)

Fixing position	Failure load F_S [N]	
	F_{Sm}	F_{Sc}
Corner	1906	1457
Border	1750	1078

Note: F_S – individual value, F_{Sm} – mean value, F_{Sc} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 7 test specimens)

3.4.2.2.2 Family A (Screwed system)

Description of test specimens:

- Screw (4,5x45) mm + washer 15 mm, subframe made of system profiles of zinc-coated sheet metal
- Corner screw distance (30x70) mm
- Border screw distance 30 mm

Table 6: Pull-through resistance under shear loads – Family A (Screwed system)

Fixing position	Failure load F_s [N]	
	F_{Sm}	F_{Sc}
Corner	1760	1315
Border	1960	1379

Note: F_s – individual value, F_{Sm} – mean value, F_{Sc} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 7 test specimens)

3.4.2.2.3 Family E (Screwed system)

Description of test specimens:

- Screw (4,2x45) mm, wooden subframe
- Corner screw distance (30x40) mm
- Border screw distance 30 mm

Table 7: Pull-through resistance under shear loads – Family E (Screwed system)

Fixing position	Failure load F_s [N]	
	F_{Sm}	F_{Sc}
Corner	2047	1429
Border	2088	1309

Note: F_{Sn} – individual value, F_{Sm} – mean value, F_{Sc} – characteristic value giving 75% confidence that 95% of the test results will be higher than this value (calculated with 7 test specimens)

3.4.3 Resistance to horizontal point loads

The test of resistance to horizontal point loads has been tested according to ETAG 034 part 1, clause 5.4.3. Tests have been carried out on panel of the thickness 8 mm. Both of the systems (VARIO and PLANK) have acceptable resistance to horizontal point loads. They are without visible permanent deformation to any component after test.

3.4.4 Impact resistance

This performance has not been determined (NPD).

3.4.5 Resistance to seismic actions

This performance has not been determined (NPD).

3.4.6 Hygrothermal behaviour

This performance has not been determined (NPD).

3.5 Protection against noise (BWR 5)

This performance has not been determined (NPD).

3.6 Energy economy and heat retention (BWR 6)

This performance is not relevant.

3.7 Sustainable use of natural resources (BWR 7)

This performance is not relevant.

3.8 Aspects of durability and serviceability

3.8.1 Pulsating load

This performance has not been determined (NPD).

3.8.2 Dimensional stability of external cladding

This performance has not been determined (NPD).

3.8.3 Immersion in water

This performance has not been determined (NPD).

3.8.4 Freeze-thaw

The test of resistance to freeze-thaw cycles has been tested in accordance with ETAG 034 part 1, clause 5.7 and following the standard: EN 1328. The test has been carried out on panel of the thickness 12 mm. The test results and calculated values are shown in Table 8.

Table 8: Frost resistance

Number of cycles	50	100
Frost resistance R_L	0,99	0,97

3.8.5 Chemical and biological resistance

This performance has not been determined (NPD).

3.8.6 Corrosion

This performance has not been determined (NPD).

3.8.7 UV radiation

This performance is not relevant.

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 AVPC system (further described in Annex V to Regulation (EU) No 305/2011) given in following table applies:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Cladding elements including fixing devices	Kit for external wall claddings	All / any	2+

The system 2+, referred above is described in Construction Products Regulation (EU) No 305/2011, Annex V, clause 1.3 as follows:

Declaration of performance of the essential characteristics of the construction product completed by the manufacturer is defined in the basis of the following items.

a) The manufacturer shall carry out:

- i) Determination of the product-type on the basis of type testing (including sampling) calculation, tabulated values of descriptive documentation of the product,
- ii) Factory production control,
- iii) Testing of samples taken at the manufacturing plant in accordance with a prescribed test plan.

b) The notified production control certification body shall issue the certificate of the factory production control on the basis of:

- i) Initial inspection of factory and of factory production control,
- ii) Continuous surveillance, assessment and evaluation of factory production control.

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:

- The ETA

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

- Basic manufacturing process

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

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

- 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.

- 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 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 for external wall claddings 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 for

external wall claddings 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 for external wall claddings manufacturer before acceptance.

In cases where the provisions of the European Technical Assessment and its Control Plan are no longer fulfilled, the Notified Body shall withdraw the certificate and inform Technical and Test Institute for Construction Prague without delay.

Issued in Prague on 07.07.2014



signed by

Ing. Václav Hadrava

Head of the department Technical Assessment Body

Annex 1: General configuration of the system

Facade system CETRIS® VARIO

Distance of cladding fixings devices

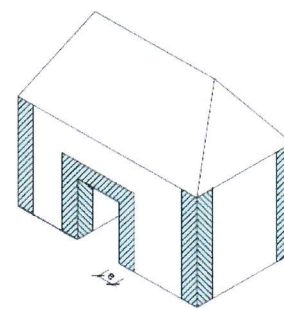
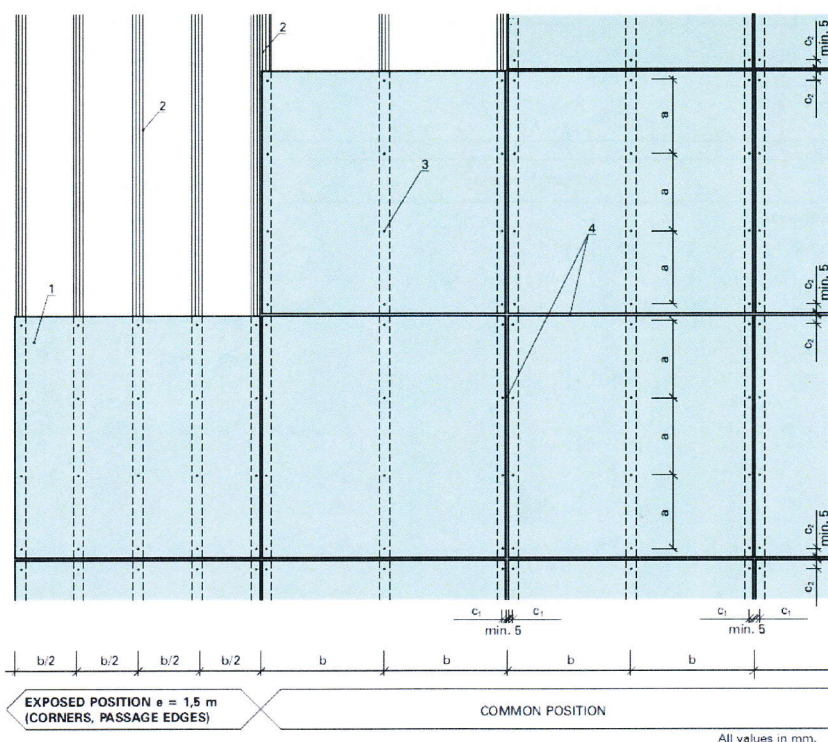
Table 9: Distance of cladding fixings devices

Board thickness [mm]	Screw (rivet) spans a [mm]	Support spacing b [mm]	Screw distance from vertical edge c_1 [mm]			Screw distance from horizontal edge c_2 [mm]
			wood	zinc coat*	aluminium	
8	< 400	< 420	> 25 < 50	> 30 < 50 > 50 < 70*	> 50 < 70	> 70 < 100
10	< 550	< 500				
12	< 500	< 625				
14	< 550	< 625				
16	< 550	< 700				

* Applicable to lengthwise laying of CETRIS® boards (width > 1,875 mm).

Note: The above values apply to a max. 30 m building height.

Diagram of CETRIS® board laying in the VARIO system



Exposed positions on building edges, openings, passages in buildings etc.

$e = 1,5 \text{ m}$

- 01 CETRIS® cement bonded particleboard
- 02 vertical supports - load-bearing construction
- 03 screws for CETRIS® chipboard fixation
- 04 joints between CETRIS® chipboards

Facade system CETRIS® PLANK

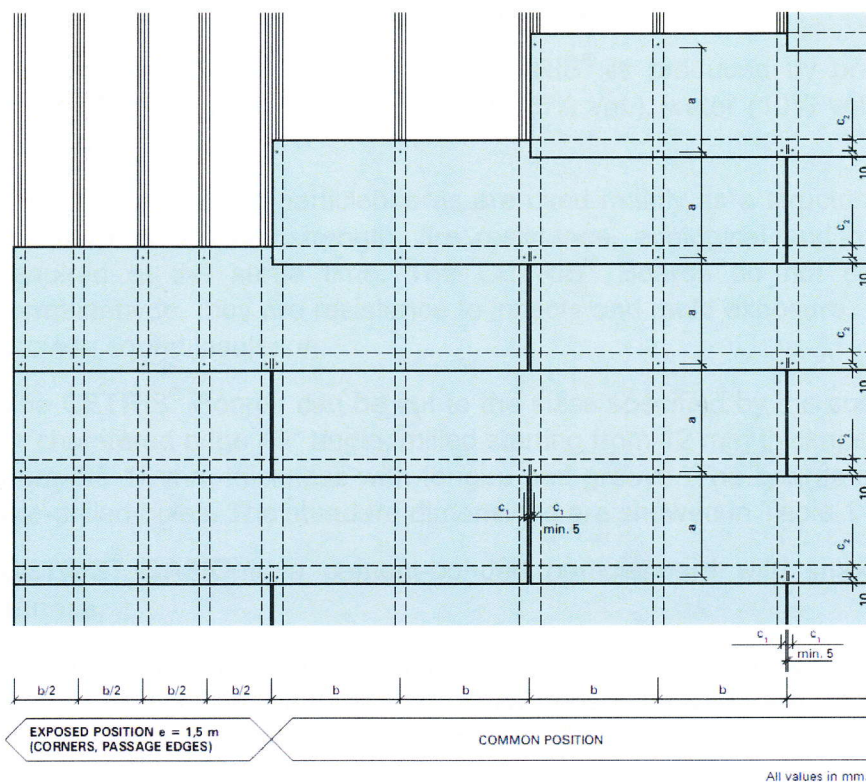
Distance of cladding fixings devices

Table 10: Distance of cladding fixings devices

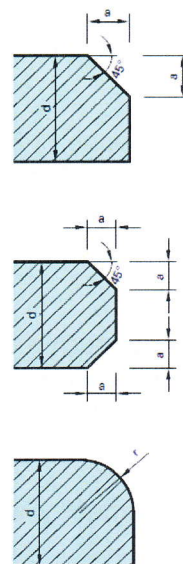
Board thickness [mm]	Screw spans a [mm]	Support spacing b [mm]	Screw distance from vertical edge c_1 [mm]			Screw distance from horizontal edge c_2 [mm]
			wood	zinc coat	aluminium	
8	< 400	< 420	> 35 < 50			40
10	< 450	< 500				
12	< 350	< 625				
14	< 500	< 625				
16	< 500	< 700				

Note: The above values apply to a max. 30 m building height.

Diagram of CETRIS[®] board laying in the PLANK system



Edge chamfering, edge rounding in the case of CETRIS[®] boards for the PLANK system



$a = \text{min. } 2 \text{ mm, max. } 5 \text{ mm}$
 $r = 3,2 \text{ mm}$
 $d = \text{thickness of CETRIS[®] cement bonded particleboard}$

Annex 2: Cladding element

Type of cladding element and its properties

The cement-bonded particleboard CETRIS® is produced by pressing a mixture of wood chips (63% by vol.), Portland cement (25% vol.), water (10% vol.), and hydration additives (2% vol.).

The cement-bonded particleboards are used mainly as a structural material in cases where moisture resistance, strength, fire resistance, ecological and hygienic harmlessness are required at the same time. The CETRIS® Boards do not contain either asbestos or formaldehyde, they are resistance to insects and mold exposure. They are fireproof and can provide sound insulation.

The CETRIS® Boards can be cut to the sizes specified by the customer, with rounded edge or chamfered edge 45° angle, milled starting from 12 mm thickness with half-groove, starting from the 16 mm thickness with tongue and groove. The boards may also be delivered with pre-drilled holes. The standard dimensions are showed in Table 11.

CETRIS® BASIC is a cement-bonded particleboard with smooth naturally cement-grey surface.

CETRIS® PROFIL is a cement-bonded particleboard with embossed surface imitating the texture of wood or slate. Thanks to its decorative look, the CETRIS® PROFIL boards are primary used as facade walling boards in exteriors and interiors.

CETRIS® PLUS is a cement-bonded particleboard with smooth surface treated with primer coat. Both sides and all edges are treated with white primer. The primer coat improves the bonding power between the board and the surface finish, reduces rate of absorption and consumption of the pain for final coat, it comes as both sides including the edge. The reverse side has a lower opacity and irregular structure.

CETRIS® PROFIL PLUS is a cement-bonded particleboard with embossed surface imitating the texture of wood or slate and it is primed. Both sides and all edges are treated with white primer. The primer coat improves the bonding power between the board and the surface finish, reduces rate of absorption and consumption of the pain for final coat, it comes as both sides including the edge. The reverse side has a lower opacity and irregular structure. Thanks to its decorative look, the CETRIS® PROFIL PLUS boards are primarily used as facade walling boards in exteriors and interiors.

CETRIS® FINISH is a cement-bonded particleboard with smooth surface treated with primer coat and surface finish. Hue can be chosen according to RAL and NCS colour charts. The CETRIS® FINISH boards primarily used as exterior facade sheathing boards. The back side of CETRIS® FINISH cement-bonded particleboard is treated with primer coat without a regular texture, look and sufficient covering power.

CETRIS® PROFIL FINISH is a cement-bonded particleboard with embossed surface imitating the texture of wood or slate and it is treated with a primer coat and surface finish. Hue can be chosen according to RAL and NCS colour charts. Thanks to its decorative look, the CETRIS® PROFIL FINISH boards are primarily used as facade walling boards in exteriors and interiors. The back side of CETRIS® PROFIL FINISH cement-bonded particleboard is treated with primer coat without a regular texture, look and sufficient covering power.

CETRIS® LASUR is a cement-bonded particleboard with smooth surface treated with pigmented primer paint and acrylic varnish glazing as the colour top coat. Hue is possible to

select according to the colour charts provided by the manufacturer of the CETRIS® boards. The glazing top coat provides a solid but non-uniform appearance. The CETRIS® LASUR boards are primarily used as exterior facade sheathing boards. The back side of CETRIS® LASUR cement-bonded particleboard is treated with primer coat without a regular texture, look and sufficient covering power.

Table 11: Dimensional properties of the cladding elements

Type of cladding element	Basic size [mm]	Board thickness [mm]
CETRIS® BASIC	3350x1250	8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, and upon agreement 34, 36, 38, 40
CETRIS® PROFIL		10, 12
CETRIS® PLUS		8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, and upon agreement 34, 36, 38, 40
CETRIS® PROFIL PLUS		10, 12
CETRIS® FINISH		10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, and upon agreement 34, 36, 38, 40
CETRIS® PROFIL FINISH		10, 12
CETRIS® LASUR		10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, and upon agreement 34, 36, 38, 40

Table 12: Dimensional tolerances of cladding elements

Property	Board thickness [mm]	Requirement [mm]
Thickness of uncut board	8	± 0,7
	10	± 0,7
	12	± 1,0
	14	± 1,0
	16	± 1,2
	18	± 1,2
	20-40	± 1,5
Length and width of the basic format		± 5,0
Precision of cutting the length and width		± 3,0
Edge straightness tolerance		1,5 mm/m
Rectangularity tolerance		2,0 mm/m

Table 13: Appearance of cladding elements

Parameter	I. Quality class
Deviation from the right angle	max. 2 mm/ 1 m of length
Permitted edge damage	max. to the depth of 3 mm
Protrusions on the surface	max. 1 mm., size 10 mm
Depressions	max. 1 mm., size 10 mm

Table 14: Physical and mechanical properties of cladding elements

Property	Requirement
Bulk density acc. to EN 323	min. 1,000 kg.m ⁻³
Bending tensile strength acc. to EN 310	min. 9,0 N.mm ⁻²
Modulus of elasticity acc. to EN 310	min. 4,500 N.mm ⁻²
Tensile strength perpendicular to the board plane acc. to EN 319	min. 0,5 N.mm ⁻²
Internal bond after cycling in a humid environment acc. to EN 321	min. 0,3 N.mm ⁻²
Reaction to fire acc. To EN 13501-1 +A1	A2-s1,d0
Index of flame propagation along the surface acc. to ČSN 73 0863	i = 0 mm.min ⁻¹
Thickness swelling when stored in water for 24 hours	max. 1,5 %
Thickness swelling after cycling in humid environment acc. to EN 321	max. 1,5 %
Linear expansion with changes in humidity from 35% to 85% at 23 °C acc. to EN 13 009	max. 0,122
Water absorption by the board when stored in water for 24 hours	max. 16 %
Thermal expansion coefficient acc. to EN 13 471	10 x 10 ⁻⁶ K ⁻¹
Coefficient of thermal conductivity acc. To EN 12 664, thickness 8 to 40 mm	0,200-0,287 W.m ⁻¹ K ⁻¹
Diffusion resistance factor acc. to EN ISO 12572, thickness 8 to 40 mm	52,8 – 69,2

Resistance to frost at 100 cycles acc. to EN 1328	$R_f > 0,7$
pH of the material	12,5
Mass activity Ra 226	$< 150 \text{ Bq.kg}^{-1}$
Mass activity index	$< I = 0,5$
Surface resistance to water and chemical de-icing agents acc. to ČSN 73 1326 (method A)	waste after 100 cycles max. 800 g.m^{-2}
Surface resistance to water and chemical de-icing agents acc. to ČSN 73 1326 (method C)	waste after 75 cycles max. 800 g.m^{-2}
Resistance to acc discharge of high voltage acc. to EN 61 621	thickness 10 mm, min. 143 sec
Shearing friction coefficient acc. to ČSN 74 4507	static $\mu_s = 0,73$ dynamic $\mu_d = 0,76$
Mass balanced humidity at 20 °C and a relative humidity of 50% acc. To EN 634-1	$9 \pm 3 \%$

Annex 3: Cladding fixing device

Type of cladding fixing device and its properties

Table 15: Type of cladding fixing device

Type of cladding fixing device	Producer / Supplier
Screws	
Self-cutting screw for anchoring of CETRIS 4,2 x 35 mm (CETRIS® board thickness 10 (12) mm)	VISIMPEX
EJOT screw Climadur-Dabo 4,8 x 35 mm (CETRIS® board thickness 10 (12) mm)	EJOT
EJOT screw Climadur-Dabo TKR 4,8 x 35 mm (CETRIS® board thickness 10 (12) mm)	EJOT
JT 3 – 2 – 4,9 x 35 - E14 (max. CETRIS® board thickness 12 mm)	EJOT
JT 4 – FR – 2 - 4,9 x 35 - E14 (max. CETRIS® board thickness 12 mm)	EJOT
JA 3 – LT - 4,9 x 38 - E14 (max. CETRIS® board thickness 14 mm)	EJOT
SFS TW – S - D12 - A14 - 4,8 x 38, semi-lens timber	SFS intec
Mage 7060 screw Topex 4,8 x 45 mm, timber hexagon (max. CETRIS® board thickness 12 mm)	MAGE
Mage 7341 screw Topex Ufo 4,8 x 45 mm, timber, semi-lens (max. CETRIS® board thickness 12 mm)	MAGE
Visimpex CIBDJ 4,8 x 35 mm	VISIMPEX
JT 2 - 3 - 4,8 x 25 (38) - V14	EJOT
SFS SX 3/15 - L12 - S16 - 5,5 x 38 mm - head IRIUS (max. CETRIS® board thickness 14 mm)	SFS intec
SFS SX 3/15 - S16 - 5,5 x 38 mm -hexagonal head (clamping length 15 mm)	SFS intec
Mage 7010 - self - cutting screw Topex Ufo 4,8 x 3,8 mm, to Al zinc-coated, semi-lens (max. CETRIS® board thickness 12 mm)	MAGE
Rivets	
SFS - AP 14 - 50180 - S (size 5,0 x 18,0 mm, head diameter 14 mm, clamping length 10,5 - 15,0 mm)	SFS intec
SFS - AP 16 - 50180 - S (size 5,0 x 18,0 mm, head diameter 16 mm, clamping length 10,5 - 15,0 mm)	SFS intec
EJOT - K14 - Al/E 5 x 18 mm (head diameter 14 mm, clamping thickness 12 - 14 mm)	EJOT
ETANCO rivet Aluminium/stainless open 4,8 x 18 mm (head diameter 16 mm, clamping thickness 12 - 14 mm)	ETANCO
BS 4,8 x 25 mm Aluminium/stainless A2, (head diameter 16 mm, clamping thickness 15 mm)	VISIMPEX