Zavod za gradbeništvo Slovenije
Slovenian National Building and Civil Engineering Institute
Dimičeva 12,
1000 Ljubljana, Slovenija
Tel.: +386 (0)1-280 42 50
Fax: +386 (0)1-436 74 49
e-mail: **info.ta@zag.si**
http://www.zag.si

imenovan in priglašen skladno z 10. členom direktive Sveta z dne 21. decembra 1988 o približevanju zakonov, podzakonskih predpisov in drugih upravnih aktov držav članic,ki se nanašajo na gradbene proizvode (89/106/EGS)

član EOTA
Member of EOTA

European Technical Approval ETA-08/0122

[English translation prepared by ZAG Ljubljana – Original version in Slovenian language]

Komercialno ime *Trade name*	**SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav**
Imetnik soglasja *Holder of approval*	**HELIOS Tovarna barv, lakov in umetnih smol Količevo, d.o.o. Količevo 65 SI-1230 Domžale Slovenija**
Tip gradbenega proizvoda in njegova predvidena uporaba *Generic type and use of construction product*	**Zunanji toplotnoizolacijski sestavljeni sistemi z ometom (ETICS) namenjeni za izolacijo zunanjih zidov zgradb** *External Thermal Insulation Composite Systems with rendering for the use as external insulation to the walls of buildings*
Veljavnost od / do *Validity from /to*	**07. 03. 2008 07. 03. 2013**
Proizvodni obrat *Manufacturing plant*	**Chromos boje i lakovi d.d. Radnička cesta 173 D 10 000 Zagreb Hrvatska**
To Evropsko tehnično soglasje vsebuje *This European Technical Approval contains*	18 strani vključno z 1 prilogo, ki je sestavni del tega soglasja *18 pages including 1 annex which form an integral part of the document.*

I LEGAL BASES AND GENERAL CONDITIONS,

1. This European Technical Approval is issued by the Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana) in accordance with:

   - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by the Council Directive 93/68/EEC[2] and regulation (EC) N°1882/2003 of the European Parliament and of the Council[3],
   - Zakon o gradbenih proizvodih (ZGPro)[4],
   - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[5],
   - Guideline for European Technical Approval of "External Thermal Insulation Composite Systems with rendering", ETAG 004, edition March 2000.

2. The Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana) is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products with the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1; or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4. This European Technical Approval may be withdrawn by the Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana), in particular pursuant to information by the Commission according to Article 5(1) of the Council Directive 89/106/EEC.

5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana). In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6. The European Technical Approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

---

1 Official Journal of the European Communities N° L 40, 11.2.1989, p.12
2 Official Journal of the European Communities N° L 220, 30.8.1993, p.1
3 Official Journal of the European Union N° L 284, 31.10.2003, p.1
4 Official Gazette of the Republic of Slovenia, N° 52/00 and N° 110/02
5 Official Journal of the European Communities N° L 17, 20.1.1994, p.34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

The External Thermal Insulation Composite System, "**SPEKTRA toplotno izolativni sistem – EPS"** with alternative commercial name **"FASADEX EPS fasadni sustav**" called ETICS in the following text, is designed and installed in accordance with the ETA-holder's design and installation instructions, deposited with ZAG Ljubljana. The ETICS comprises the following components, which are factory-produced by the ETA-holder or a supplier. The ETA-holder is ultimately responsible for the ETICS.

This ETICS can be sold under the trade name "**SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav**", with associated different trade names for same component. The Annex 1 gives the correspondence to trade names.

1.1 Definition of product

	Components (see § 2.2 for further description, characteristics and performances of the components)	**Coverage (kg/m²)**	**Thickness (mm)**
Insulation materials with associated methods of fixing	**Bonded ETICS** • **Insulation product** EPS-EN 13163-T2-L2-W2-S2-P4-DS(N)2-DS(70,-)1-TR150-BS100 • **Adhesive** "**SPEKTRA lepilo za stiropor**" or "**Chromoterm S**" – dry mix cement based adhesive requiring addition of ~24 % water (6 l water /25 kg powder)	/ 2.5 – 3.5 (powder)	50 to 200
	Bonded ETICS with supplementary mechanical fixings • **Insulation product** EPS-EN 13163-T2-L2-W2-S2-P4-DS(N)2-DS(70,-)1-TR150-BS100 • **Adhesive** "**SPEKTRA lepilo za stiropor**" or "**Chromoterm S**" – dry mix cement based adhesive requiring addition of ~24 % water (6 l water /25 kg powder) • **Anchors** - EJOT **Ejoterm ST U, Ejoterm STR-U, SDM-T plus, SDF-K plus, Ejoterm NT-U, Ejoterm NK-U, Ejoterm NTK-U** - Hilti **SX-FV**, **SD-FV 8**, **XI-FV**, **D-FV** and **D-FV T** - Fischer **Termoz 8U, 8N, KS8** - Leskovec **Plastično pritrdilo PP** and **Pritrdilno sidro PSK** Anchors are used only where necessary to provide stability until adhesive has dried.	/ 2.5 – 3.5 (powder)	50 to 200
	Mechanically fixed ETICS with anchors and supplementary adhesive (see § 2.1.8.3) for possible association EPS/anchors): • **Insulation product** EPS-EN 13163-T2-L2-W2-S2-P4-DS(N)2-DS(70,-)1-TR150-BS100 • **Adhesive** "**SPEKTRA lepilo za stiropor**" or "**Chromoterm S**" – dry mix cement based adhesive requiring addition of ~24 % water (6 l water /25 kg powder) • **Anchors** - EJOT **Ejoterm ST U *, Ejoterm STR-U***, SDM-T plus*, SDF-K plus*, Ejoterm NT-U*, Ejoterm NK-U*, Ejoterm NTK-U*** - Hilti **SX-FV***, **SD-FV 8****, **XI-FV***, **D-FV *** and **D-FV T*** - Fischer **Termoz 8U**** , **Termoz 8N**, Termoz KS8**** - Leskovec **Plastično pritrdilo PP**** and **Pritrdilno sidro PSK****	/ 2.5 – 3.5 (powder) * to be used with EPS ≥ 60 mm **to be used with EPS ≥ 50 mm **to be used with EPS ≥ 80 mm	50 to 200

Base coat	"**SPEKTRA lepilo za stiropor**" or "**Chromoterm S**" – dry mix cement based base coat powder requiring addition of ~ 24 % water (6 l water /25 kg powder) "**SPEKTRA lepilo za stiropor**" or "**Chromoterm S**" consists of aggregates, cement, polymer binders, special additives.	5 – 6 (powder)	maximal (dry): 5 minimal (dry): 3
Glass fibre mesh	**SPEKTRA GLASS FIBRE MESH** **Standard meshes** (glass fibres meshes with mesh size between **3.5** and **4.7** mm)		
Key coat	**»SPEKTRA osnovni univerzalni premaz«** or **»FASADEX grund univerzalni« -** addition of max. 20 % water	about 0.2	/
Finishing coats	• Ready to use paste – "**SPEKTRA silikonski omet" or "FASADEX silikonska žbuka" 1.5/2.0/2.5** - based on silicone and acrylic binder, aggregates, additives • Ready to use paste – "**SPEKTRA akrilatnii omet" or "FASADEX akrilatna žbuka" 1.5/2.0/2.5** - based on acrylic binder, aggregates, additives	2.7 to 3.5 (paste) 2.7 to 3.5 (paste)	Regulated by particles size
Ancillary materials	Descriptions in accordance with § 3.2.2.5 of the ETAG. Remain under the ETA-holder responsibilities.		

1.2 Intended use

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones …) or concrete (cast on site or as prefabricated panels) with a reaction to fire classification A1 or A2-s1,d0 according to SIST EN 13501-1 and a minimum density of 820 kg/m^3 or A1 according to the EC decision 96/603/EC as amended. The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation.

The ETICS is made of non load-bearing construction elements. It does not contribute directly 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 ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

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

The choice of the method of fixing depends on the characteristics of the substrate, which could need preparation (see § 7.2.1 of the ETAG no. 004) and shall be done in accordance with the national instructions.

The provisions made in this European Technical Approval (ETA) are based on an assumed intended working life of at least 25 years, provided that the installed ETICS is subjected to an appropriate use and maintenance. The indications given as to the working life cannot be interpreted as a guarantee given by the manufacturer or the Approval Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

2 Characteristics of product and methods of verification

2.0 General

The identification tests and the assessment of the fitness for use of this ETICS according to the Essential Requirements were carried out in compliance with the "ETA Guideline no.

004" concerning External Thermal Insulation Composite Systems with rendering (called ETAG no. 004 in this ETA).

The ETA is issued for the ETICS on the basis of agreed data, deposited with ZAG Ljubljana, which identifies the ETICS that has been assessed and judged. Changes to the ETICS production process or the ETICS, which could result in this deposited data being incorrect, should be notified to ZAG Ljubljana before the changes are introduced. ZAG Ljubljana 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, and /or alteration to the ETA, shall be necessary.

The characteristics (of the components as well as of the ETICS), not mentioned in this ETA nor in the annexes shall correspond to the respective values laid down in the technical documentation of this ETA, checked by ZAG Ljubljana.

2.1 ETICS characteristics

2.1.1 Reaction to fire

Configuration	Maximum declared organic content of the rendering system	Declared flame retardant content of the rendering system	Thickness (mm)	Reaction to fire class acc. to SIST EN 13501-1
ETICS SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav - all finishing coats described in Clause 1.1	**≤ 10 %**	**0 %**	**≤ 80**	**B – s1, d0**
	-	**-**	**> 80**	**F**

***Mounting and fixing (*for all end use applications given in clause 1.2 of the ETA)**

The assessment of reaction to fire is based on tests with insulation layer thickness of SBI /80 mm and at insulation material (EPS) apparent density (declared value15-17 kg/m^3), while tests according to SIST EN ISO 11925-2 are done on app. 60 mm thick sample (including rendering), and at EPS apparent density (declared value15-17 kg/m^3). Selected rendering system is the one including finishing coat with maximum organic content.

For the SBI test this ETICS is mounted directly to a calcium silicate substrate (A2-s1,d0) with a minimum density of 820 kg/m^3.

The installation of the ETICS was carried out by the approval holder following the manufacturer's specifications (instruction sheet) using a single layer of the glass fibre mesh all over the test specimen (no overlapping glass fibre mesh).

The test specimens were prefabricated and did not include any joints. The panel edges were rendered. Anchors were not included in the tested ETICS as they have no influence on the test result.

Extended application

The test results covers arrangements with insulation material (EPS) of a lower thickness and density as well as render systems (binder types) with lower organic content (i.e. all render systems, mentioned in this ETA).

2.1.2 **Water absorption** (capillarity test)

- Base coat **SPEKTRA lepilo za stiropor / Chromoterm S**:
  - Water absorption after 1 hour < 1 kg/m²
  - Water absorption after 24 hours < 0.5 kg/m²

- Rendering systems:

		Water absorption after 1 hour		**Water absorption after 24 hours**	
		< 1 kg/m²	**≥ 1 kg/m²**	**< 0.5 kg/m²**	**≥ 0.5 kg/m²**
Base coat **SPEKTRA lepilo za stiropor / Chromoterm S** + finishing coat indicated here after (including key coat acc. to clause 1.1):	**SPEKTRA silikonski omet / FASADEX silikonska žbuka,**	**X**		**X**	
	SPEKTRA akrilatni omet / FASADEX akrilatna žbuka	**X**		**X**	

2.1.3 Hygrothermal behaviour

Hygrothermal cycles have been performed on a rig in hygrothermal chamber. None of the following defects occur during the testing:

- blistering or peeling of any finishing,
- failure or cracking associated with joints between insulation product boards or profiles fitted with system,
- detachment of render,
- cracking allowing water penetration to the insulation layer.

The ETICS **is so assessed resistant to hygrothermal cycles**.

2.1.4 Freeze / thaw behaviour

For rendering systems with all finishing coats, mentioned in this ETA the water absorption of both base coat and the rendering systems are less than 0.5 kg/m² after 24 hours and **so the corresponding configuration(s) of the ETICS are assessed as freeze/thaw resistant.**

2.1.5 Impact resistance

The resistance to hard body impacts (3 Joules and 10 Joules) and resistance to perforation (20 mm, 12 mm and 6 mm) lead to the following use categories:

		Single standard mesh
Rendering systems: base coat **SPEKTRA lepilo za stiropor / Chromoterm S** + finishing coat indicated hereafter (including key coat acc. to clause 1.1)	**SPEKTRA silikonski omet / FASADEX silikonska žbuka**	**Category II**
	SPEKTRA akrilatni omet / FASADEX akrilatna žbuka	**Category II**

2.1.6 Water vapour permeability

		Equivalent air thickness s_d (m)
Rendering systems: base coat **SPEKTRA lepilo za stiropor / Chromoterm S** + finishing coat indicated hereafter (including key coat acc. to clause 1.1):	**SPEKTRA silikonski omet / FASADEX silikonska žbuka**	**≤ 2.0** (Test result obtained with finishing coat SPEKTRA silikonski omet / FASADEX silikonska žbuka, particle size 2 mm: **0.10**)
	SPEKTRA akrilatni omet / FASADEX akrilatna žbuka	**≤ 2.0** (Test result obtained with finishing coat SPEKTRA akrilatni omet / FASADEX akrilatna žbuka, particle size 2 mm: **0.26**)

2.1.7 Dangerous substances

The external thermal insulation composite system complies with the provisions of Guidance Paper H ("A harmonized approach related to dangerous substances under the construction products directive-Revision August 2002").

A declaration of conformity in this respect was made by the manufacturer.

In addition to the specific clauses relating to dangerous substances contained in this ETA, there may be other requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Product Directive, these requirements need also to be complied with, when and where they apply.

2.1.8 Safety in use

2.1.8.1 Bond strength

- Base coat **SPEKTRA lepilo za stiropor / Chromoterm S** onto expanded polystyrene:

Conditionings		
Initial state	**Samples taken from the rig after the hygrothermal cycles**	**Samples after the freeze/thaw test**
≥ 0.08 MPa	≥ 0.08 MPa	Test not required because freeze/thaw cycles not necessary

- Adhesive **SPEKTRA lepilo za stiropor / Chromoterm S** onto substrate and expanded polystyrene (safety in use of the bonded ETICS)

	Initial state	**48 h immersion in water + 2 h 23°C/50% RH**	**48 h immersion in water + 7 days 23°C/50% RH**
Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
Expanded polystyrene	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 MPa

The ETICS can be bonded with application of the adhesive on a **minimal surface of 30%**.

2.1.8.2 Fixing strength (displacement test)

Test not required because the ETICS fulfils the following criteria: E·d < 50000 N/mm.

(E: modulus of elasticity of the base coat - d: mean dried thickness of the base coat).

2.1.8.3 Wind load resistance

Safety in use of mechanically fixed ETICS **using anchors**.

The following values only apply for the combination (anchor's trade name) / (EPS panel's characteristics) mentioned in the first and second lines of each table.

The test results given in the below table apply for the following anchors:

- EJOT Schraubdübel Ejotherm ST U (**ETA-02/0018**),
- EJOT SDM-T plus (**ETA - 04/0064**),
- EJOT SDF-K plus (**ETA - 04/0064**),
- EJOT Ejoterm NT-U (**ETA - 05/0009**),
- EJOT Ejoterm NK-U (**ETA - 05/0009**),
- EJOT Ejoterm NTK-U (**ETA - 07/0026**),
- Hilti SX-FV (**ETA-03/0005**),
- Hilti Dämmstoffdübel SD-FV 8 (**ETA-03/0028**),
- Hilti Dämmstoff-Befestigungselement XI-FV (**ETA-03/0004**),
- Hilti WDVS-Schlagdübel D-FV, (**ETA-05/0039)**,
- Hilti WDVS-Schlagdübel D-FV T (**ETA-05/0039**).

Anchors for which the following failure loads apply		Plate diameter	60 mm or more*
Characteristics of the EPS panels for which the following failure loads apply		Thickness (mm)	≥ 60
		Tensile strength perpendicular to the face (kPa)	≥ 100
Failure loads (kN)	Anchors not placed at the panel joints *(static foam block test)*	R_{panel}	minimal: 0.51 average: 0.52
	Anchors placed at the panel joints *(pull through test)*	R_{joint}	minimal: 0.40 average: 0.43

The test results given in the below table apply for the following anchors:

- Fischer Schlagdübel TERMOZ 8 N (**ETA-03/0019**),
- Fischer TERMOZ 8 U (**ETA-02/0019**),
- Fischer TERMOZ KS 8 (**ETA-04/0114**).

Anchors for which the following failure loads apply		Plate diameter	60 mm or more*
Characteristics of the EPS panels for which the following failure loads apply		Thickness (mm)	≥ 50
		Tensile strength perpendicular to the face (kPa)	≥ 150
Failure loads (kN)	Anchors not placed at the panel joints *(static foam block test)*	R_{panel}	minimal: 0.44 average: 0.46
	Anchors placed at the panel joints *(pull through test)*	R_{joint}	minimal: 0.40 average: 0.41

The test results given in the below table apply for the anchor:

- Leskovec PLASTIČNO PRITRDILO PP (**ETA-05/0149**).

Anchors for which the following failure loads apply		Plate diameter		60 mm or more*
Characteristics of the EPS panels for which the following failure loads apply		Thickness (mm)		≥ 50
		Tensile strength perpendicular to the face (kPa)		≥ 150
Failure loads (kN)	Anchors not placed at the panel joints *(pull through test)*		R_{panel}	Minimal : 0.45 Average: 0.47
	Anchors placed at the panel joints *(pull through test)*		R_{joint}	Minimal: 0.38 Average: 0.40

The test results given in the below table apply for the anchor:

- Leskovec PRITRDILNO SIDRO PSK (**ETA-05/0148**).

Anchors for which the following failure loads apply		Plate diameter		60 mm or more*
Characteristics of the EPS panels for which the following failure loads apply		Thickness (mm)		≥ 50
		Tensile strength perpendicular to the face (kPa)		≥ 150
Failure loads (kN)	Anchors not placed at the panel joints *(pull through test)*		R_{panel}	Minimal: 0.56 Average: 0.59
	Anchors placed at the panel joints *(pull through test)*		R_{joint}	Minimal: 0.49 Average: 0.52

The test results given in the below table apply for the anchor:

- EJOT Ejoterm STR-U (**ETA - 04/0023**).

Anchors for which the following failure loads apply		Plate diameter		60 mm or more*
Characteristics of the EPS panels for which the following failure loads apply		Thickness (mm)		≥ 80
		Tensile strength perpendicular to the face (kPa)		≥ 100
Failure loads (kN)	Anchors not placed at the panel joints *(pull-through)*		R_{panel}	Minimal: 0.55 Average: 0.56
	Anchors placed at the panel joints *(pull-through)*		R_{joint}	Minimal: 0.48 Average: 0.50

**Note: according to results of various research activities head plate diameter is the most influential parameter (assuming similar plate stiffness). Failure loads for larger plates are therefore expected to be higher, thus the given values are on the "safe side".*

For calculation the following formula shall be used:

$$R_d = \frac{R_{panel} \times n_{panel} + R_{joint} \times n_{joint}}{\gamma}$$

n_{panel}: number (per m²) of anchors not placed at the panel joints
n_{joint}: number (per m²) of anchors placed at the panel joint
γ: safety factor

2.1.9 Thermal resistance

The thermal transmittance of the substrate wall covered by the ETICS is calculated in accordance with SIST EN ISO 6946:

$U = U_c + \chi_p.n$, where:

$\chi_p.n$ has only to be taken into account if it is greater than 0.04 W/(m².K)

U: global thermal transmittance of the covered wall (W/ (m².K))

n: number of anchors (through insulation product) per m²

χ_p: local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:

= 0.002 W/K for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw ($\chi_p.n$ negligible for n < 20)

= 0.004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p.n$ negligible for n < 10)

= negligible for anchors with plastic nails (reinforced or not with glass fibres)

U_C: thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/ (m².K)) determined as follows:

$$U_c = \frac{1}{R_i + R_{render} + R_{substrate} + R_{se} + R_{si}}$$

Where:
R_i: thermal resistance of the insulation product - see CE marking in reference to EPS SIST EN 13163 ((m².K)/W)
R_{render}: thermal resistance of the render (about 0.02 (m².K)/W)
$R_{substrate}$: thermal resistance of the substrate of the building (concrete, brick …) ((m².K)/W)
R_{se}: external superficial thermal resistance ((m².K)/W)
R_{si}: internal superficial thermal resistance ((m².K)/W)

2.1.10 Aspect of durability and serviceability

2.1.10.1 Bond strength after ageing

		Acceptance criteria
Rendering systems: base coat **SPEKTRA lepilo za stiropor / Chromoterm S** + finishing coat indicated hereafter (including key coat acc. to clause 1.1):	**SPEKTRA silikonski omet / FASADEX silikonska žbuka**	≥ 0.08 MPa
	SPEKTRA akrilatni omet / FASADEX akrilatna žbuka	≥ 0.08 MPa

The ETICS fulfils the above given acceptance criteria

2.2 Components' characteristics

2.2.1 Insulation product

For bonded or mechanically fixed ETICS, uncoated slabs, made of expanded polystyrene (EPS) according to SIST EN 13163 are used and having the description and characteristics defined in the table below.

Description and characteristics		EPS panels
Reaction to fire / SIST EN 13501-1		**E**
Thermal resistance ((m².K)/W)		Defined in reference to EN 13163
Thickness (mm) / SIST EN 823		EPS-EN 13163 - **T2**
Length (mm) / SIST EN 822		EPS-EN 13163 – **L2**
Width (mm) / SIST EN 822		EPS-EN 13163 – **W2**
Squareness (mm) / SIST EN 824		EPS-EN 13163 - **S2**
Flatness (mm) / SIST EN 825		EPS-EN 13163 - **P4**
Dimen-sional stability under:	specified temperature and humidity / SIST EN 1604	EPS-EN 13163-**DS (70,-)1**
	laboratory condition / SIST EN 1603	EPS-EN 13163-**DS(N)2**
Water absorption (partial immersion) / SIST EN 1609		approx. **0.1 kg/m²**
Water vapour diffusion resistance factor (μ) / SIST EN 12086 – SIST EN 13163		**< 60**
Tensile strength perpendicular to the faces in dry conditions / SIST EN 1607		**≥ 150 kPa;** EPS-EN 13163 - **TR 150**
Shear strength (N/mm²) / SIST EN 12090		**≥ 0.02**
Shear modulus (N/mm²) / SIST EN 12090		**≥ 1.0**
Bending strength / SIST EN 12089		**≥ 100 kPa;** EPS-EN 13163 – **BS 100**

2.2.2 Anchors

PVC anchors (used as an ancillary component without contribution to resistance to windload resistance or as a fixing device in mechanically fixed systems):

Trade name	Plate diameter (mm)	Characteristic pull-out strength of anchor
EJOT Schraubdübel **Ejoterm ST U**	60	See ETA - 02/0018
EJOT **Ejoterm STR-U**	60	See ETA - 04/0023
EJOT **SDM-T plus** and **SDF-K plus**	60	See ETA - 04/0064
EJOT **Ejoterm NT-U** and **Ejoterm NK-U**	60	See ETA - 05/0009
EJOT **Ejoterm NTK-U**	60	See ETA - 07/0026
Hilti **SX-FV**	60	See ETA - 03/0005
Hilti Dämmstoffdübel **SD-FV 8**	60	See ETA - 03/0028
Hilti Dämmstoff-befestigungselement **XI-FV**	60	See ETA - 03/0004
Hilti WDVS-Schraubdübel **D-FV** and **D-FV T**	60	See ETA - 05/0039
Fischer Schlagdübel **TERMOZ 8 N**	60	See ETA - 03/0019
Fischer **TERMOZ 8 U**	60	See ETA - 02/0019
Fischer **TERMOZ KS 8**	60	See ETA - 04/0114
Leskovec Plastično pritrdilo **PP**	60	See ETA - 05/0149
Leskovec Pritrdilno sidro **PSK**	60	See ETA - 05/0148

2.2.3 Render

The mean value of the width of multiple cracks of the base coat with the glass fibres mesh **in warp and weft direction** was between **0.1 and 0.2 mm.**

2.2.4 Glass fibre mesh

Glass fibre mesh with 3.5 mm to 4.7 mm wide grid of fibres.

	Alkalis resistance	
	SPEKTRA GLASS FIBRE MESH	
	Warp	Weft
Residual strength after ageing (N/mm) - mean value	**≥ 20**	**≥ 20**
Relative residual resistance after ageing of the strength in the as delivered state (%)	**≥ 50**	**≥ 50**

3 Evaluation and Attestation of Conformity and CE marking

3.1 System of Attestation of conformity

Considering the Euroclass B for the reaction to fire, the system of attestation of conformity specified by the European Commission is, for components for which there is no clearly identifiable stage in production to improve reaction to fire, system **2+** regarded fire behaviour. This system **2+** is described in the Council Directive 89/106/EEC Annex III, 2 (i), and described as follows:

Certification of the conformity of the ETICS by a Notified certification Body on the basis of:

(a) Tasks of the manufacturer:

1. Initial type-testing of the ETICS and the components,
2. Factory production control,
3. Further testing of samples taken at the factory by the manufacturer in accordance with a Control Plan;

(b) Tasks of the notified body:

4. Certification of factory production control based on:
   - Initial inspection of factory and of factory production control,
   - Continuous surveillance, assessment and approval of factory production control.

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Initial type testing (System 2+)

For initial type testing, the results of the tests performed as part of the assessment for the European Technical Approval can be used unless there are changes in the production line or plant. In such cases, the necessary initial type testing has to be agreed between ZAG Ljubljana and the Notified Bodies involved.

These tests could be taken over by the manufacturer for Declaration of Conformity.

3.2.1.2 Factory production control

The ETA-holder has a factory production control system in its plant (manufacturing of the adhesives, the base coat, the key coat and the finishing coats) and exercises permanent internal control of production, including testing of samples in accordance with a control plan[6].

For the components of the ETICS which the ETA-holder does not manufacture by himself, he makes sure that factory production controls carried out by the other manufacturers gives the guaranty of the components compliance with the European Technical Approval. In this aim:

- he relies on national certification bodies,

and

- has contracted with its suppliers regarding the awaiting characteristics and controls.

The Control Plan and the provisions taken by the ETA-holder for components not produced by himself has been agreed and deposited with ZAG Ljubljana. This Control plan will be given to the Notified Body chosen by the ETA-holder to perform the foreseen tasks on attestation of conformity.

The manufacturer only uses raw materials supplied with the relevant inspection documents as laid down in the Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

---

[6] The “Control Plan” is a confidential part of the technical documentation of this European technical approval, but not published together with the ETA, and handed over only to the approved body or bodies involved in the procedure of attestation of conformity. See section 3.2.2.

All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the ETICS and the components are in conformity with the European Technical Approval.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- designation of the product, raw material and components;
- type of control or testing;
- date of the product's manufacture and date of testing of the product or raw materials and components;
- results of controls and testing and, if appropriate, comparison with requirements;
- signature of person responsible for factory production control.

The records shall be presented to the inspection body during the continuous surveillance. On request, they shall be presented to ZAG Ljubljana.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the Control Plan, which is part of the technical documentation of this European Technical Approval.

3.2.2 Tasks of the Notified Bodies

3.2.2.1 Initial inspection of factory and factory production control

The Notified Body shall ascertain that, in accordance with the control plan, the factory (in particular the employees and the equipment) and the factory production control are suitable to ensure continuous and orderly manufacturing of the components according to the specifications mentioned in clause 2 of this ETA.

3.2.2.2 Continuous surveillance, assessment and approval of factory production control

The Notified Body shall visit the factory:

- at least twice a year for surveillance

or

- at least once a year for surveillance of this manufacturer having a FPC system complying with SIST EN ISO 9001 covering the manufacturing of the ETICS components.

It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking into account the control plan.

Continuous surveillance and assessment of factory production control have to be performed according to the control plan.

During each visit, the Notified Body shall examine:

- the control register of raw materials, products in course of manufacture and finished products,
- the document attesting the application of the control frequencies,
- the conformity of the products subjected to this ETA.

The results of continuous surveillance shall be made available on demand by inspection body, to ZAG Ljubljana. In cases where the provisions of the European Technical Approval and the Control Plan are no longer fulfilled, the EC conformity certificate of the Factory Production Control shall be withdrawn.

3.3 CE marking

The CE marking shall be affixed on product itself, on a label attached on it, its packaging or on the commercial documents accompanying the components of the ETICS. The symbol «CE» shall be followed by the identification number of the Notified Body involved and shall be accompanied by the following information:

- name and address or identifying mark of the ETA-holder,
- the last two digits of the year in which the CE marking was affixed,
- number of the EC certificate of conformity of Factory Production Control,
- number of the European Technical Approval,
- ETICS trade name,
- number of the ETAG.

Example of CE marking and accompanying information for ETICS “SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav”.

CE *xxxx*	**“CE” symbol** *Identification number of approved certification body*
HELIOS Tovarna barv, lakov in umetnih smol Količevo, d.o.o. *Količevo 65* *SI-1230 Domžale* *Slovenija*	Name and the address of the manufacturer
08	*Two last digits of the year of affixing the CE marking*
xxxx-CPD-yyyy	*Number of the EC certificate of conformity for factory production control*
ETA-08/0122	Number of European Technical Approval
ETAG 004	Number of Guideline for European Technical Approvals
SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav	ETICS trade name

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The components of the ETICS shall correspond as far as their composition and manufacturing process are concerned to the products subject to the approval tests. Manufacturing process is deposited with ZAG Ljubljana.

4.2 Installation

4.2.1 General

It is the responsibility of the ETA-holder to guarantee that the information about design and installation of the ETICS are effectively communicated to the concerned people. These information can be given using reproductions of the respective parts of the European Technical Approval. Besides, all the data concerning the execution shall be clearly indicated on the packaging and/or the enclosed instruction sheets using one or several illustrations.

In any case, it is suitable to comply with the national regulations and particularly concerning fire and wind load resistance.

Only the components described in clause 1.1 with characteristics according to clause 2 of this ETA can be used for the ETICS.

The requirements given in ETAG 004, chapter 7, have to be considered.

4.2.2 Design

- To bond the ETICS, the minimal bonded surface and the method of bonding shall comply with characteristics of the ETICS (see § 2.1.8.1 of this ETA) as well as the national regulations. In any case, the minimal bonded surface shall at least be 30%.
- To mechanically fixed the ETICS, the choice and the rate of the fixings shall be determined considering:
  - the design wind load suction and the national regulations (taking into account the national safety factors, the design rules, …),
  - the characteristic resistance of the anchors into the considered substrate (see installation parameters – effective anchorage, characteristic resistance ... – in the ETA of the anchor
  - the safety in use of the ETICS (cf. § 2.1.8), according to the method of fixing.

4.2.3 Execution

The recognition and preparation of the substrate as well as the generalities about the execution of the ETICS shall be carried out in compliance with:

- chapter 7 of the ETAG no. 004,
- national regulations in effect.

The particularities in execution linked to the different methods of fixing and the application of the rendering system shall be handled in accordance with ETA-holder prescriptions. In particular it is suitable to comply with the quantities of rendering applied, the thickness regularity and the drying periods between different layers.

5 Recommendations

5.1 Packaging, transport and storage

Packaging of the components has to be such that the products are protected from moisture during transport and storage, unless other measures are foreseen by the manufacturer for this purpose.

The components have to be protected against damage.

5.2 Maintenance and repair of the works

It is accepted that the finishing coat shall normally be maintained in order to fully preserve the ETICS's performances.

Maintenance includes:

- the repairing of localised damaged areas due to accidents,
- the application of various products or paints, possibly after washing or ad hoc preparation.

Necessary repairs should be done rapidly.

It is important to be able to carry out maintenance as far as possible using readily available products and equipment, without spoiling appearance.

Comment: Care should be taken to use products which are compatible with the ETICS.

The original version is signed by:

Leading expert:	Head of Service for Technical Approvals:
Andrijana Sever Škapin, Ph.D.	Franc Capuder, M.Sc.

Use ETICS
Adhesive SPEKTRA lepilo za stiropor / Chromoterm S
EPS See Clause 1.1
Base coat SPEKTRA lepilo za stiropor / Chromoterm S
Glass fibre mesh SPEKTRA GLASS FIBRE MESH
Keycoat + Finishing coat SPEKTRA osnovni univerzalni premaz / FASADEX grund univerzalni + SPEKTRA silikonski omet / FASADEX silikonska žbuka 1.5 / 2.0 / 2.5 SPEKTRA osnovni univerzalni premaz / FASADEX grund univerzalni + SPEKTRA akrilatni omet / FASADEX akrilatna žbuka 1.5 / 2.0 / 2.5
Anchors EJOT EJOTERM ST U, STR-U, NT-U, NK-U, NTK-U, SDM-T plus, SDF-K plus or HILTI SX-FV, SD-FV 8, XI-FV, D-FV AND D-FV T or FISCHER TERMOZ 8 U, 8 N, KS 8 or LESKOVEC PLASTIČNO PRITRDILO PP, PRITRDILNO SIDRO PSK

ETICS **SPEKTRA toplotno izolativni sistem – EPS / FASADEX EPS fasadni sustav**	**Annex 1** of the European Technical Approval **ETA–08/0122**
Trade names of the components	