

DEPARTEMENT FOR MATERIALS

Laboratory for Polymers

Notified testing laboratory No. 1404 CPR  
EU Regulation No. 305/2011

Ljubljana, 20 March 2019

**REPORT  
No. 1155/18-460-1**on the performance type determination (PTD) of the  
liquid ceramic heat insulation coating**COSMO ISOL**according to the provision of  
SIST EN 15824:2017

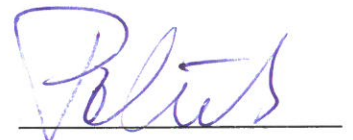
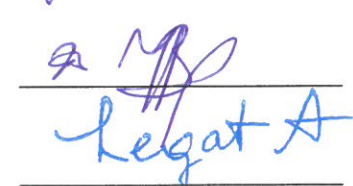
Orderer: **EURO-S 2000 d.o.o.**  
**Vukomerečka cesta 78/2**  
**HR-10000 Zagreb**

Order/contract: **18-012-000059 / 26.7.2018**

Responsible investigator: **Gorazd Polšak, B.Sc.**

Head of laboratory: **Andrijana Sever Škapin, Ph.D.**

Director: **Assoc. Prof. Dr. Andraž Legat**

  
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## Introduction

The applicant delivered test sample of the liquid ceramic heat insulation coating COSMO ISOL.

Internal sample designation: ZAG D18-117  
Date of receipt of samples: 5.12.2018  
Start of testing: 10.12.2018  
End of testing: 15.3.2019

At the request of the applicant the performance type determination (PTD) of the coating was determined in accordance with the requirements of the SIST EN 15824:2017 (Specifications for external renders and internal plasters based on organic binders).

According to the SIST EN 15824:2017, the following characteristics of the liquid ceramic heat insulation coverage were determined:

1. Water vapour permeability / SIST EN ISO 7783:2018
2. Capillary water absorption / SIST EN 1062-3:2008
3. Adhesion strength to a concrete (Pull-off test) / SIST EN 1542:2000
4. Thermal conductivity / SIST EN 12664:2002

## Testing procedures and results

### A.) Preparation of test specimens

All test specimens except for thermal conductivity were prepared by customer on the test substrate.

Test specimen for conductivity was prepared on a PTFE plate (Teflon) in two applications with a combined layer thickness of approximately 6 mm and a total dimensions of 380 × 350 mm. Prior to the test the test specimen was carefully removed from the PTFE plate.

### B.) Storage and ageing of test specimens

Prior to testing, all specimens were stored at least 28 days at the temperature of 23°C and 50% relative air humidity.

Test specimens for the determination of water vapour permeability and capillary water absorption were aged before testing. The ageing was carried out in three cycles with the following programme: immersion in water for 24 hours and drying at 50°C for 24 hours. After the end of ageing, test specimens were conditioned for further 7 days at normal conditions (23°C, 50% relative humidity).



## 1. WATER-VAPOUR PERMEABILITY

The test was performed in accordance with the requirements of the SIST EN ISO 7783:2018. Polyethylene platelets of the thickness of 6 mm were chosen for the test substrate. Water-vapour permeability was determined on five specimens. Test surface of specimens was encircled by means of ring templates of 104 mm diameter using wax as a sealant. Water vapour permeability of specimens was measured gravimetrically as the quantity of water permeating a specimen at 23°C in a unit of time from a measuring dish filled with the saturated solution of ammonium dihydrogen phosphate -  $(\text{NH}_4)_2\text{HPO}_4$  into a conditioned chamber with 50 % relative air humidity. The side with finishing coat was exposed to lower relative air humidity.

### RESULTS:

Measured values (unit)				
Diffusion-equivalent air layer thickness $s_d$ (m)		Diffusion resistance factor $\mu$ (l)		Average thickness of render (mm)
individual values	mean value	individual values	mean value	individual values
0.108	<b>0,113</b>	360	<b>377</b>	0.30
0.118		393		0.30
0.105		350		0.30
0.128		427		0.30
0.107		357		0.30
Classification according to SIST EN 15824		<b>class V<sub>1</sub></b> ( $S_d < 0,14$ m) high water-vapour transmission rate		

## 2. CAPILLARY WATER ABSORPTION

The test was performed in accordance with the requirements of the SIST EN 1062-3:2008. Silicate platelets of the thickness of 3 cm were chosen for the test substrate. The edges were protected against penetration of water with epoxy resin. Capillary water absorption was determined on three specimens. The platelets were immersed in water facing down. Quantity of water absorbed in 24 hours was measured gravimetrically.

### RESULTS:

Measured values (unit)	
(kg/m <sup>2</sup> h <sup>0.5</sup> )	
Individual values	Mean value
0,02 0,02 0,02	<b>0,02</b>
Classification according to SIST EN 15824	<b>class W<sub>3</sub></b> ( $w_{24\text{hours}} \leq 0,1$ kg/m <sup>2</sup> h <sup>0.5</sup> ) low liquid water permeability rate

**3. ADHESION – MEASUREMENT OF BOND STRENGTH BY PULL-OFF**

Adhesion strength to a concrete was performed in accordance with the requirements of the SIST EN 1542:2000. Metal circular dollies with a diameter 50 mm were used.

**RESULTS:**

<b>Bond strength (MPa)</b>						
Individual values / average	2,6	2,7	2,6	2,9	2,6 /	<b>2,7</b>
Nature of failure	A/B	A/B	A/B	A/B	A/B /	<b>A/B</b>
Requirements according to SIST EN 15824	≥ 0.3 MPa					

A/B ... adhesion failure between coating and concrete

**4. THERMAL CONDUCTIVITY**

See Annex 1 (Test Report No. 1155/18-520-1).

Test report prepared by:

Gorazd Polšak, B.Sc. (Chem. Technol.)

Annex:

Report No. 1155/18-520-1 on measurement of thermal conductivity of the liquid ceramic heat insulation coating COSMO ISOL according to standard SIST EN 12664:2002



DEPARTEMENT FOR BUILDING PHYSICS

Laboratory for Thermal Performance and Acoustics

Notified testing laboratory No. 1404 CPR

EU Regulation No. 305/2011

Ljubljana, 19. 03. 2019

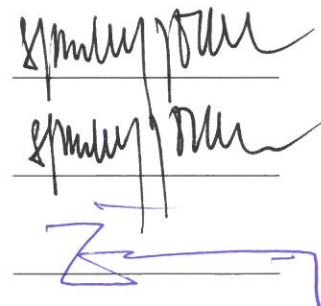
SLOVENIAN  
NATIONAL BUILDING  
AND CIVIL ENGINEERING  
INSTITUTEDimičeva ulica 12  
1000 Ljubljana  
Slovenijainfo@zag.si  
www.zag.si**REPORT**  
**No. 1155/18-520-1**on measurement of thermal conductivity of the  
liquid ceramic heat insulation coating

COSMO ISOL

according to standard SIST EN 12664:2002

Orderer: **EURO-S 2000 d.o.o.**  
**Vukomeračka cesta 78/2**  
**HR-1000 ZAGREB**

Order: **18-012-000059/26.07.2018**

Responsible investigator: **Sabina Jordan, Ph. D.**Head of laboratory: **Sabina Jordan, Ph. D.**Director: **Assoc. Prof. Dr Andraž Legat**

## 1. Introduction

The applicant (EURO-S 2000 d.o.o.) has delivered test specimen to ZAG for determination of material properties according to procedure defined in standard SIST EN 12664:2002.

### *Description of the specimen:*

Specimen number:	T 14 / 19
Specimen name:	liquid ceramic heat insulation coating COSMO ISOL
Manufacturer:	-
Specimen type:	liquid ceramic heat insulation coating
Production code:	not specified
Number of specimens:	1 plate made in laboratory for polymers
Specimen packaging:	not packaged
Form of delivered specimens:	Plate without packaging
Nominal dimensions of specimen (width × length × thickness):	350 mm × 350 mm × 5 mm
Mode of specimen sampling and delivery:	Specimen was delivered to the laboratory on February 1 <sup>st</sup> 2019
Production date:	-

## 2. Testing according to standard SIST EN 12664:2002

Number of specimens:	1. measurement in single plate apparatus (SIST EN 12664:2002)
Surface treatment of specimen:	unmodified specimen (no surface treatment)



Laboratory conditions during test – temperature	– 23°C ± 5°C
Laboratory conditions during test – humidity	50 %rH ± 20 % rH
Product standard:	SIT EN 15824:2017
Product standard used for sampling:	-
Product standard used for specimen preparation	-
Mode of specimen conditioning:	Specimen stored in laboratory conditions for more than 24 hours
Standard error of measurement:	Below 15 %
Dimension of specimen:	0.375 m × 0.345 m × 0.00584 m
Specimen name:	liquid ceramic heat insulation coating COSMO ISOL
Specimen description:	liquid ceramic heat insulation coating
Mass change during conditioning:	-
Mass change during drying:	1.2%
Relative mass change during measurement:	-0.4%
Change of thickness during measurement:	-
Change of volume during measurement:	-

Measurements were performed according to SIST EN 12664:2002. Temperature difference between cold and warm surface of the specimen was measured using T type thermocouples pressed against the specimen with soft rubber and electronic DAQ system Agilent 34970A. Heat flux was measured with the same instrument using two heat flow sensors (on warm and cold side).

### 3. Test results

Thickness of specimen during measurement, d:	5.8 mm
Apparent density of specimen during measurement, $\rho$ :	175 kg/m <sup>3</sup>

Table 1: Test results

Date of measurement	Mean temperature of specimen [°C]	Temperature difference across specimen [K]	Heat flow density through specimen [W / m <sup>2</sup> ]	Thermal resistance of specimen [m <sup>2</sup> K/W]	Thermal conductivity of specimen [W/mK]
March 12 <sup>th</sup> 2019	15.2	10.0	80.2	0.125	0.047

Test report prepared by:

Primož Plešec

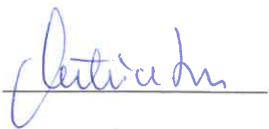




DEPARTEMENT FOR BUILDING PHYSICS

Fire Laboratory and Fire Engineering

Požarni laboratorij, Sr. Gameljne 41, Ljubljana Šmartno

Member of egolf- European Group of Organisations for  
Fire Testing, Inspection and CertificationsSLOVENIAN  
NATIONAL BUILDING  
AND CIVIL ENGINEERING  
INSTITUTEDimičeva ulica 12  
1000 Ljubljana  
Slovenijainfo@zag.si  
www.zag.siLjubljana, 26<sup>th</sup> June 2019**CLASSIFICATION REPORT****No. 343/19–530–2**Classification of reaction to fire in accordance with  
Commission delegated Regulation (EU) 2016/364  
and with SIST EN 13501-1:2019  
for a thermal insulation coating **COSMO ISOL**Orderer: **EURO-S 2000 d.o.o.,  
Vukomerečka cesta 78/2, 10000 Zagreb, Croatia**Order/contract: **E-mail, April 3<sup>rd</sup> 2019**Responsible investigator: **Nataša Knez, Ph. D.**Head of laboratory: **Friderik Knez, B. Sc.**Director: **Assist. Prof. Dr. Aleš Žnidarič**The results of the tests refer only to the tested specimens. This report may only be reproduced as a whole.  
Complaints will be considered only if received within 15 days from the date of issue of this report.  
Total number of pages: 3; total number of annexes: /; total number of supplements: ./

## 1. Introduction

This classification report defines the classification assigned to a thermal insulation coating **COSMO ISOL** in accordance with the procedures given in Commission delegated Regulation (EU) 2016/364 and in SIST EN 13501-1:2019 (identical to EN 13501-1:2018).

## 2. Details of classified product:

### 2.1 General:

COSMO ISOL is liquid ceramic thermal insulation coating, it is made of hollow ceramic balls, acryl polymers and inorganic pigments.

The product is used as thermal insulation coating for external and internal surfaces.

### 2.2 Product description:

Nominal thickness: -

Tested thickness: approx. 1 mm

Nominal density: 380-590 kg/m<sup>3</sup>

Colour of the product is white.

## 3. Test reports and test results in support of classification:

### 3.1 Test reports:

Laboratory	Name of sponsor	Report No.	Test method
ZAG Ljubljana	EURO-S 2000 d.o.o.	343/19-530-1	SIST EN ISO 11925-2:2011 /AC:2011

### 3.2 Test results:

Test method flame application time	Exposure condition parameter	No. of tests	Results	
			Continuous parameter mean	Compliance with parameter
SIST EN ISO 11925-2: 2011/AC:2011 Flame: 15 seconds exposed	Surface: $F_s \leq 150$ mm	6	75	Yes
	Edge: $F_s \leq 150$ mm	6	65	Yes
	Ignition of the paper		No ignition	-

## 4. Classification and field of application:

### 4.1 Reference:

This classification has been carried out in accordance with Commission delegated Regulation (EU) 2016/364 and SIST EN 13501-1:2019.

Standard SIST EN 13501-1:2019 is identical to EN 13501-1:2018.



## 4.2 Classification:

### 4.2.1 The format of the reaction to fire classification is:

The thermal insulation coating **COSMO ISOL** in relation to its reaction to fire behaviour is classified: **E**.

Fire behaviour	Smoke production			,	Flaming droplets	
	-	-	-		-	-
<b>E</b>	-	-	-	,	-	-

**Reaction to fire classification: E**

## 4.3 Field of application:



This classification is valid for thermal insulation product COSMO ISOL as described under section 2 with following application of test results:

thickness: for tested thickness or lower.

For A1 and A2 substrates including steel substrates.

## Warning

This document does not represent type approval or certification of the product.

	Name	Signature	Date
Person undertaking classification:	Robert Umek		26.6.2019
Person authorising this report:	Nataša Knez, Ph.D.		26.6.2019



**Broj / No.: 01/2019**  
**u skladu s dodatkom III Uredbe o građevnim proizvodima (305/2011/EU) i**  
**Uredbe (EU) No. 574/2014**

/According to CPR 305/2011 and Regulation No. 274/2014/

**za građevni proizvod: Tekući keramički termoizolacijski premaz**  
/Liquid ceramic thermal insulation coating/

1. **Oznaka tipa proizvoda**      **COSMO ISOL**  
/Unique identification code of the product-type/
2. **Namjena** /Intended Use/:      Toplinska izolacija vanjskih i unutarnjih površina /Thermal insulation coating for external and internal surfaces/
3. **Proizvođač** /Manufacturer/:      **EURO-S 2000 d.o.o**  
Vukomerečka cesta 78/2  
10 000 Zagreb
4. **Ovlašteni zastupnik**  
/Authorised representative/:
5. **Sustav ocjenjivanja i provjere stalnosti svojstava**      3  
/System of AVCP/
6. **Harmonizirana norma**      **EN 15824:2017**  
/Harmonised standard/:  
**Prijavljeno tijelo** /Notified body/      NB 1404  
ZAG - ZAVOD ZA GRADBENISTVO SLOVENIJE  
Dimiceva 12  
1000 LJUBLJANA
7. **Objavljena svojstva** /Declared performances/:

<b>Glavne značajke</b> /Essential characteristics/	<b>Svojstvo</b> /Performance/	<b>Harmonizirana norma</b> /Harmonised standard/
Paropropusnost /Water vapour permeability/	V1 (visoko paropropusna) S <sub>d</sub> <0,14m high water vapour transmission rate	EN 15824:2017
Vodoupojnost /Water absorption/	Class W3	EN 1062-3:2008
Prionjivost /Adhesion/	≥0,3 MPa	EN 1542:1999
Postojanost /Durability/	bez utvrđenog svojstva / not declared/	EN 15824:2017
Toplinska provodljivost /Thermal conductivity/	0.047W/mK	EN 12664:2001
Reakcija na požar /Reaction to fire/	Class E	EN ISO 11925-2:2010

8. Izvedbi proizvoda opisanog u točkama 1. i 2. odgovaraju svojstva iz točke 7. Izjava o svojstvima je izdana u skladu s Uredbom 305/2011/EU. Odgovornost za izdavanje izjave o svojstvima snosi proizvođač naveden u točki 3.  
/The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above/.

Signed for and on behalf of the manufacturer by:      [name] At [place] on [date of issue]

[signature]



**EURO-S 2000 d.o.o**

Vukomerečka cesta 78/2  
10 000 Zagreb

Tip proizvoda: COSMO ISOL

Tekući keramički termoizolacijski premaz  
za toplinsku izolaciju vanjskih i unutarnjih površina

**EN 15824:2017**

Paropropusnost /Water vapour permeability/	V1 (visoko paropropusna) S <sub>d</sub> <0,14m high water vapour transmission rate
Vodoupojnost /Water absorption/	Class W3
Prionjivost /Adhesion/	≥0,3 MPa
Postojanost /Durability/	bez utvrdenog svojstva / not declared/
Toplinska provodljivost /Thermal conductivity/	0.047W/mK
Reakcija na požar /Reaction to fire/	Class E

Inicijalna ispitivanja provedena u  
ZAG - ZAVOD ZA GRADBENISTVO SLOVENIJE

DEPARTEMENT FOR BUILDING PHYSICS

Fire Laboratory and Fire Engineering

Požarni laboratorij, Sr. Gameljne 41, Ljubljana Šmartno

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Fire Testing, Inspection and CertificationsSLOVENIAN  
NATIONAL BUILDING  
AND CIVIL ENGINEERING  
INSTITUTEDimičeva ulica 12  
1000 Ljubljana  
Slovenijainfo@zag.si  
www.zag.siLjubljana, 26<sup>th</sup> June 2019**TEST REPORT  
No. 343/19-530-1**Reaction to fire test according to  
SIST EN ISO 11925-2:2011/AC:2011  
for a product thermal insulation coating  
**COSMO ISOL**Orderer: **EURO-S 2000 d.o.o.,**  
Vukomerečka cesta 78/2, 10000 Zagreb, CroatiaOrder/contract: **E-mail, April 3<sup>rd</sup> 2019**Responsible investigator: **Nataša Knez, Ph. D.**Head of laboratory: **Friderik Knez, B. Sc.**Director: **Assist. Prof. Dr. Aleš Žnidarič**The results of the tests refer only to the tested specimens. This report may only be reproduced as a whole.  
Complaints will be considered only if received within 15 days from the date of issue of this report.  
Total number of pages: 4; total number of annexes: /; total number of supplements: /.

## 1. General

Product: Cosmo Isol – liquid ceramic thermal insulation coating

Supplier: EURO-S 2000 d.o.o., Vukomerečka cesta 78/2, 10000 Zagreb, Croatia

Manufacturer: INFO VIT LTD, Ukraine, Kharkov, 61058, St. Kultura 9 APT 1

## 2. Sampling

Place: -

Date of sampling: -

Quantity of sample: a board of 1000 mm × 1000 mm, applied with test specimen

Marking of the sample: -

Date of production: -

Sample No.: P 19/029

Specimen was prepared at Laboratory for Polymers by representative of applicant. The sample was delivered to Fire laboratory on 18<sup>th</sup> April 2019 from Laboratory for Polymers by representative of Fire laboratory. Fire laboratory was not involved in sampling procedure.

## 3. Description of the product

Cosmo Isol is liquid ceramic thermal insulation coating. It is made of hollow ceramic balls, acryl polymers and inorganic pigments.

The product is used as thermal insulation coating for external and internal surfaces.

Nominal thickness: -

Tested thickness: approx. 1 mm

Nominal density: 380-590 kg/m<sup>3</sup>

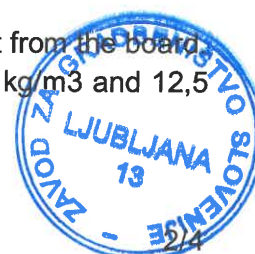
Colour of the product was white.

## 4. Details of conditioning

Specimen was conditioned at (23 ± 2) °C and (50 ± 5) % relative humidity for 33 days.

## 5. Construction of test specimens

At Fire laboratory 12 test specimens of dimension 90 mm × 250 mm were cut from the board. Test material was applied on standard gypsum plasterboard, density of 700 kg/m<sup>3</sup> and 12,5 mm thick. Thickness of applied testing material was approx. 1 mm.



## 6. Test method

SIST EN ISO 11925-2:2011/AC:2011 Reaction to fire tests – Ignitability of products subjected to direct impingement of flame – Part 2: Single-flame source test (ISO 11925-2:2010/Cor 1:2011)

Standard SIST EN ISO 11925-2:2011/AC:2011 is identical to EN ISO 11925-2:2010/AC:2011.

## 7. Date of test

21<sup>st</sup> May 2019

## 8. Flame application time

15 seconds

## 9. Observations made during the test

*Testing on the surface:*

At surface exposure specimens ignited in first 5 seconds. The flames reached about 8 centimetres. The flame ceased at removal of the burner.

*Testing on the lower edge:*

At lower edge exposure specimens ignited in first 1 second. The flames reached about 7 centimetres. The flame does not ceased during test time.

## 10. Test results

Testing on the surface:

SURFACE EXPOSURE	SPECIMEN					
	1	2	3	4	5	6
Did ignition occur?	yes	yes	yes	yes	yes	yes
At time [s]	5	6	5	5	6	5
Did the flame tip reach 150 mm?	no	no	no	no	no	no
At time [s]	-	-	-	-	-	-
Did the flaming stop?	yes	yes	yes	yes	yes	yes
At time [s]	15	15	15	15	15	15
Maximum height of the flame [cm]	8	7	7	7	8	8
At time [s]	15	15	15	15	15	15
Ignition of the paper?	no	no	no	no	no	no





Testing on the lower edge:

LOWER EDGE EXPOSURE	SPECIMEN					
	1	2	3	4	5	6
Did ignition occur?	yes	yes	yes	yes	yes	yes
At time [s]	1	1	1	1	1	1
Did the flame tip reach 150 mm?	no	no	no	no	no	no
At time [s]	-	-	-	-	-	-
Did the flaming stop?	no	no	no	no	no	no
At time [s]	-	-	-	-	-	-
Maximum height of the flame [cm]	7	6	7	7	6	7
At time [s]	15	15	15	15	15	15
Ignition of the paper?	no	no	no	no	no	no

## 11. Intended application of the product

The product is used as declared thermal insulation.

### Statement

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Report was prepared by: Robert Umek

