

## REPORT No. 069286

<b>CUSTOMER</b>	REVESTIMIENTOS TÉCNICOS SOSTENIBLES S.L.
<b>APPLICANT</b>	IVAN WALTER
<b>ADDRESS</b>	POL. IND. EL TORNO C/ ALFAREROS Nº 13 41710 UTRERA (SEVILLA)
<b>PURPOSE</b>	SRI INDEX IN ACCORDANCE WITH ASTM E1980-11
<b>SAMPLE TESTED</b>	WHITE COATING REF. «ZERAMIC EXTREM W»
<b>DATE OF RECEIPT</b>	29.08.2017
<b>TEST DATES</b>	31.08.2017
<b>DATE ISSUED</b>	05.09.2017

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- \* The results of this report solely and exclusively concern the material tested at the time and under the conditions in which the measurements were taken.
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## CHARACTERISTICS OF THE SAMPLES

On 29<sup>th</sup> August 2017, TECNALIA received from the company REVESTIMIENTOS TÉCNICOS SOSTENIBLES S.L., a white coating applied over a substrate measuring (100 x 100) mm and referred to as:

«ZERAMIC EXTREM W»



The annex includes the technical data sheet for the product tested supplied by the customer.

## CALCULATION REQUESTED

The calculation requested is the determination of the **SRI index** of the test specimen received in accordance with **ASTM E1980-11** «Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces».

Two tests must be done prior to the determination of the SRI index;

- Determination of the **solar reflectance** in accordance with **ASTM E903-12** «Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres».
- Determination of the **emissivity** in accordance with **ASTM C1371-15** «Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers».

## TESTS CARRIED OUT

### SOLAR REFLECTANCE

The determination of the reflectance between 280 and 2,500 nm was carried out using a Perkin-Elmer Spectrometer Lambda 900 UV/VIS/NIR spectrophotometer with an integrating sphere of 150 mm in diameter and white standard.

The test was carried out under laboratory conditions at  $(23\pm 2)$  °C and a relative humidity of under 70%. The test specimens were conditioned for 24 hours under the laboratory conditions described above.

The method used has the following characteristics:

- Wavelength interval: 5 nm
- Scan speed: 284.6 nm/min
- Slit UV/VIS:1
- Detector gain NIR:4

Four measurements were taken on one of the test specimen received and the average was calculated.

Based on the reflectance average value of the test specimen, solar reflectance has been calculated using the selected ordinate method set out in Section 8.3.4.. Ordinates have been selected from the values of direct normal solar irradiance specified in Table X2.3 of the ASTM E903-12 «50 Selected Ordinates for G173 Direct Normal Irradiance AM 1.5».

## EMISSIVITY

The measuring equipment used was an emissometer model AE manufactured by Device & Services Company for low and high emissivity.

The test was carried out under laboratory conditions at  $(23\pm 2)$  °C and a relative humidity of under 70%. The test specimens and test device (Emissometer Model AE) were conditioned for 24 hours under the laboratory conditions described above.

Emissivity values are determined by comparing the minimum standard value estimated at 0.03 using a silver and copper alloy disc and the maximum standard value estimated at 0.76 using a black disc close to perfect black with a value of 1, made of galvanized aluminium and coated with Teflon. The values of these materials of reference are described in technical note 78-2 provided by the Device & Services Company, which explains how these standard emissivity values have been reached.

The values obtained have an estimated deviation of  $\pm 0.02$ .

Ten measurements were taken on the test specimens received and the average was calculated.

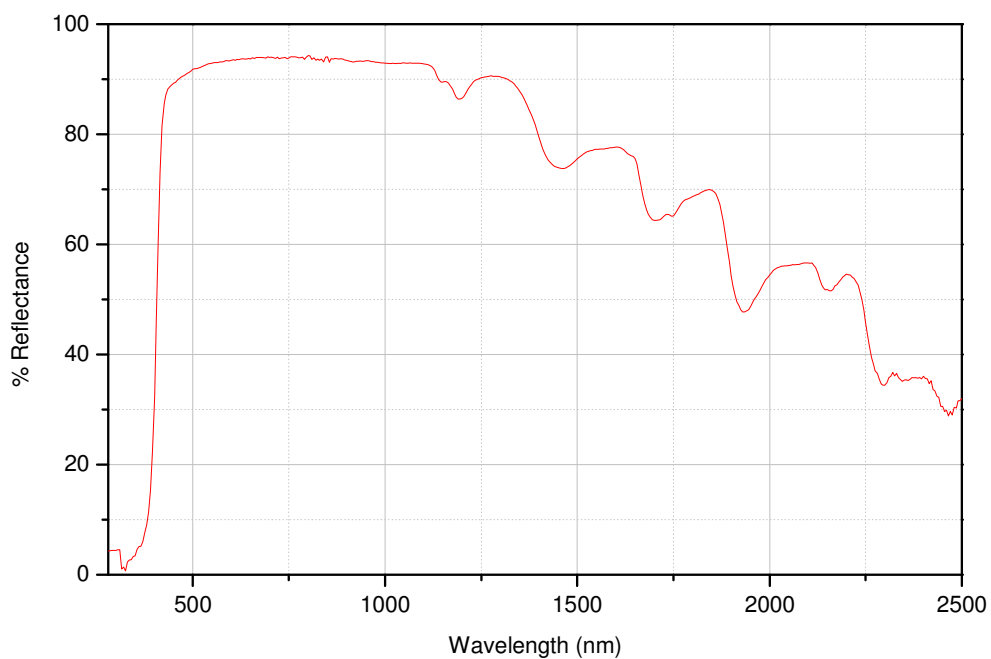
## RESULTS

### SOLAR REFLECTANCE

The result of solar reflectance of the test specimen referenced as «**ZERAMIC EXTREM W**» is:

Solar reflectance (%)	$85.5 \pm 0.2$
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The following graph shows the data of the spectral reflectance of the test specimen.



## EMISSIVITY

The results of emissivity are:

Measurement	1	2	3	4	5	6	7	8	9	10
Emissivity	0.76	0.75	0.75	0.76	0.76	0.77	0.76	0.75	0.75	0.76

Therefore, the mean emissivity value of the test specimen referenced as «**ZERAMIC EXTREM W**» is:

Emissivity	$0.76 \pm 0.03$
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## SRI

Using the solar reflectance and emissivity values obtained, the following **SRI index** and **surface temperature** values are obtained, in accordance with the ASTM E1980-11 Standard for different convection coefficients:

Convective coefficient	SRI	T <sub>s</sub> (K)
Low (0-2 m/s)	$104.5 \pm 0.3$	319.5
Medium(2-6 m/s)	$105.3 \pm 0.3$	315.8
High (6-10 m/s)	$106.0 \pm 0.3$	312.6

# ANNEX



**Revestimientos técnicos Sostenibles s.L.**

**TECHNICAL**

## **ZERAMIC Extrem W**

### **THERMO-ELASTIC COATING FOR VERTICAL SUPPORTS**

#### **DESCRIPTION**

**Zeramic Extrem W Vertical support**, is an elastic coating which gives the support insulating properties and a Climalit effect. **Zeramic Extrem W Vertical support** is manufactured from hollow ceramic Microspheres, titanium dioxide and acrylic, rubbery and photocrosslinkable emulsions.

This is an elastic product, anti-fissure, breathable and multi adherent for vertical indoor or outdoor surfaces.

Once applied, we will have a homogeneous surface without joints, waterproof, breathable and prepared for thermally insulate surfaces, either from the cold or heat.

It can be applied by brush, roller or airless.

The range of products **Zeramic Extrem W** is based on technology developed by NASA in order to coat space shuttles back in the 70s, so that they could withstand the extreme temperatures in space.

#### **PROPERTIES**

-**ENVIRONMENTALLY-FRIENDLY:** Low level of VOC

-**REACTION TO FIRE:** M-1, does not propagate fire

-**THERMAL INSULATION:** It controls high temperatures in summer and insulates surfaces from the cold in winter, reflects infra-red rays.

-**ANTICONDENSATION:** It prevents breakages of the thermal bridge

- **WEATHERPROOF:** This product is 100% waterproof, breathable and highly elastic (190%)

- **MULTIADHERENT:** It can be applied on any kind of constructive support, including metal, galvanized steel, aluminium ...

-**ACOUSTIC:** It acoustically lowers the DB, correcting echoes and reverberation

-**COST SAVING:** It significantly reduces the costs of heating and cooling as there is no thermal loss.

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**TECHNICAL**

### **PROPERTIES**

-**ANTIBACTERIAL:** Product in aqueous dispersion of silver ion particles coated with titanium dioxide.

-**PHOTOCATALYTIC:** It accelerates photocatalysis and produces negative ions which produces health benefits.

### **TECHNICAL FEATURES**

**Finish:** Smooth matte.

**Colour:** White or custom colours.

**Relative weight:** 0.77 kg./l.

**Volume in solid state:** 72 ±

**2% Solvent:** Water

**Drying at 23 ° C:** To the touch 4 hours, full drying 72 hours.

**Pot life:** Does not have

**Dilution:** Use only if it is applied with airless, it will be diluted by 5% with water

**Performance:** 0,350 grams. X m<sup>2</sup> (according absorption)

**TRACTION RESISTANT ACCORDING TO NORM UNE-EN ISO 547**

**WATER PERMEABILITY ACCORDING TO NORM UNE-EN 1062-3: 2008**

**STEAM PERMEABILITY ACCORDING TO NORM UNE-EN 7783-2: 1999**

**CO<sub>2</sub> PERMEABILITY ACCORDING TO UNE-EN 1062-6:2003**

### **PACKAGING**

**ZERAMIC Extrem W Vertical supports** is available in 15l, and 4L containers.

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**TECHNICAL**

## **APPLICATIONS**

**ZERAMIC Extrem W Vertical support** is a coating with unusual qualities. It consists of liquid ceramic microspheres, which when dry creates a uniform and continuous surface without joints. Among other applications we can include:

- \* Façade renovations to improve the protective coating of the building. It also acts as a UV protector and offers weather protection against severe weather conditions, sea breezes...
- \* Elastic, anti-fissures.
- \*Self-cleaning surface
- \* It conditions the interiors of homes, to reduce energy costs due to cold or heat by 30-35%.
- \*Avoids the cold feet and hot head effect, to achieve a more even heat distribution
- \*Regulates moisture inside households.
- \*Recommended for allergic or asthmatic people, as it does not release any chemical substance or migration.
- \*Decorative product, it can be manufactured in any colour.
- \*Low cost and easy maintenance
- \*High durability, 10 year warranty (provided by technical or professional prescription)

## **HOW TO USE THE PRODUCT**

### **PREPARING THE SURFACE**

\* In natural supports or painted supports in good condition, the surface should be cleaned and rinsed to eliminate any trace of dust, pollution or any other foreign agent. If the

surfaces were made of concrete, the user will need an acrylic fine particle fixative called **Fixative-100**.

If there were cracks or dents, these shall be covered with a fibrated putty for outdoor surfaces, possible multi-adherent called **Reve-Elast Fibra**.

Once the support has been cleaned, **ZERAMIC Extreme W Vertical support**, can be applied to achieve the required thickness. It needs a minimum of 2 coats.

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**TECHNICAL**

### **HOW TO USE THE PRODUCT**

\* For defective or badly damaged supports, the support should be cleaned with pressured water (150 bar), and once dry the support should be repaired with structural mortars such as **REPARATEC R4** or **REPARATEC R2** or with a multi-adherent fibrated putty for outdoor surfaces such as **Reve-Elast Fibra**.

Once the support has been cleaned, a solvent based fixative needs to be applied - called **Fixative-250**.

After this the user must apply **ZERAMIC Extreme W Vertical support**, until the required thickness is obtained. It needs a minimum of 2 coats.

**In both cases the drying times needs to be respected**

### **WARRANTY**

**ZERAMIC Extrem W Vertical support** has a warranty for 10 years maximum depending on the support and the location.

The warranty offered by **ZERAMIC Extrem W Vertical supports** is always the product, therefore its application will need to be guaranteed by the company which applies it.

To request a guarantee of the product a prescription is required.

### **PRECAUTIONS**

**ZERAMIC EXTREM W Vertical Supports** should not be kept for more than one year, provided that it has been treated properly, avoiding direct exposure to the sun, frost, humidity ...

Empty containers should be placed in clean or suitable locations. It must respect the European environmental regulations.

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