



Revestimientos técnicos Sostenibles s.L.

DATA SHEET

Zeramic Extrem Titanium Plus Antibacterial

Interior-Exterior Antibacterial Thermal Insulation

DESCRIPTION

Zeramic Extrem Titanium Plus Antibacterial, is an elastic membrane, whose application confers the substrate insulating properties, Climalit effect, which turns rooms into a pleasant and sound place. **Zeramic Extrem Titanium Plus Antibacterial** is composed of hollow ceramic microspheres, hollow glass microspheres, silver ions, titanium dioxide and acrylic, elastic and photo cross-linkable emulsions.

Thermal, antibacterial, elastic, anti-crack, breathable and multi-stick product for vertical or horizontal surfaces for interior or exterior use.

Once applied, the result is a continuous, seamless, waterproof, breathable surface prepared to thermally insulate surfaces, either from cold or heat. And simultaneously having substrates protected against contamination produced by fungi, algae and bacteria. It may be applied using a brush, roller or airless spray gun.

The **Zeramic Extrem** product line is based on the technology developed by NASA to clad space shuttles, back in the 70s, to ensure that these shuttles could withstand extreme temperatures when going into space.

TECHNICAL CHARACTERISTICS OF THE PRODUCT

- **Finish:** Smooth matt and white or custom colours for RTS, NCS and Nova colour charts.
- **Density:** 0.866 kg./l.
- **Solids volume:** 72 ±2%.
- **Application temperature:** Between 1°C and 50°C.
- **Yield:** 0.35-0.4 Kg. /m²
- **Dilution and preparation:** dilution 10% water and stir mechanically 2-3 minutes.
- **Pot life:** After the water has been added, 7 days
- **Dry to touch:** approximately 180 minutes for temperatures between 18-20°C (depending on layer thickness).
- **Total drying:** From 72 to 96 hours for substrates with absorption.
- **Methods of application:**
 - **Airless spray gun:** Use conduit nozzle 416-417, remove gun, lung and machine filters and apply between 104 and 120 bars pressure, so as not to rupture the microsphere (adjust the pressure, until not creating application traces)
 - **Manual:** Short-haired roller

Revestimientos Técnicos Sostenibles S.L.

Poligono Ind. (Ind. Estate) El torno C/Alfareros nº9 41710 Utrera (Sevilla) Switchboard 955 27 01 07

www.rts-spain.com/ info@rts-spain.com

TECHNICAL CHARACTERISTICS

- **Temperature resistance:** -10° to 300°C.
- **Zeramic thermal conductivity coefficient:** 0.000125 W/m K
- **Thermodynamic solar opening:** 0.12
- **Solar reflection:** 85.5% $\pm 0,2$
- **Emissivity:** 0.76 ± 0.3
- **Index for convection coefficients as per ASTM E1980-11 Standard:**
 - Mean of the SRI test 105.26 ± 0.3
 - Mean of Ts K test 315.96
- **Surface temperatures under radiation as per UNE-EN ISO 12543-4: 2011 (metal substrate) Standard**
 - -8 Negative degrees (Each degree is equivalent to 6% energy savings)
 - Heat transfer: -60.76 W/m²
- **Reaction to fire as per UNE-EN ISO 11925-2:2011/ UNE-EN 13823:2012 Standard:** B-S1.d0 Fire-retardant.
- **Thermal Insulator:**
 - Reduces the air conditioning (hot-cold) costs by over 45% in interior applications. Prevents the oven effect in summer and thermally insulated from cold in winter, infrared rays reflective.
 - Reduces CO₂ emissions
 - Considerably reduces heating and air conditioning costs, as there are no thermal losses.
- **Accelerated ageing as per UNE-EN 11507 Standard:** Type 1, very light change, barely noticeable.
- **Direct traction adhesion as per UNE-EN 1542: 2000 Standard:**
 - Average 1.87 N/mm²
- **Liquid water permeability as per UNE-EN 1062-3: 2008 Standard:**
 - 0.0235 kg//m².h^{0.5}
- **Water vapour transmission as per UNE-EN ISO 7783: 2012: Standard:**
 - 16.65 V(g/m²x day) and 1.24 S_D(m)
- **Carbon dioxide permeability as per UNE-EN 1062-6: 2003 (Anticarbonation) Standard:** SD (m)=120 \pm 15

OTHER TECHNICAL CHARACTERISTICS

- **Ecological:** Very low VOC content
- **Antibacterial:** Product in aqueous dispersion of silver ion particles coated with titanium dioxide. From among its properties:
 - Eliminates 99% of the bacteria which may be on the interior surfaces
 - Eliminates, while preventing the growth of lichens, molds and fungi
 - Neutralises bad smells
- **Anti-condensation system:** product which eliminates the thermal bridge by increasing the substrate temperature, therefore, preventing condensation.
- **Waterproof:** 100% waterproof product.
- **Catalytic photo:** Accelerates photocatalysis and produces negative ions, beneficial for health, while reducing and decanting household dust.
- **Acoustic:** dampens impact noise produced by rainwater.

CERTIFICATES

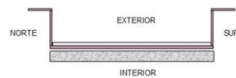


7. RESULTADOS.

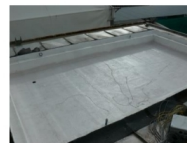
Cliente: Revestimientos Técnicos Sostenibles S.L.

Descripción de la muestra:

CUBIERTA BASE: Cubierta plana horizontal de 3,7 x 2,1 m formada por una losa de hormigón armado de 10 cm de espesor medio, protegida por una tela asfáltica impermeabilizante de aprox. 0,5 cm de espesor recubierta de pintura blanca. Aplicación sobre la cubierta base del revestimiento denominado Zeramic Extrem.



- 1 - Losa de hormigón armado de 10 cm de espesor medio
- 2 - Tela asfáltica de ≈0,5 cm de espesor + pintura blanca
- 3 - Revestimiento elástico solar Zeramic Extrem de 0,5 mm de espesor medio



Con los datos obtenidos el valor de la resistencia y de la capacidad térmica de la cubierta son:

	Revestimiento elástico Solar Zeramic Extrem
Conductividad térmica [W/(m.k)]	0,000125 ± 0,02
Apertura o absorción solar [-]	0,12 ± 0,02

* Valor de la transmitancia térmica de la solución como fachada exterior, según la expresión [6.1]
 ** La incertidumbre de las medidas se encuentra dentro del rango fijado por la normativa del ensayo PASLINK.



 En Vitoria-Gasteiz, a 12 de Junio de 2018
 CÉSAR ESCUDERO IVÁN FLORES

CERTIFICATES

Report No.: 066983-001-a	Receipt date: June 5 th of 2017
	Test end date: October 17 th of 2017
	Report emission date: October 23 th of 2017
Page 1 of 3	
Client:	REVESTIMIENTOS TÉCNICOS SOSTENIBLES, S.L.
Contact person:	Iván Walter
Address:	Polígono industrial el Torno, C/ Alfareros nº 9
Town:	41710 Utrera (Sevilla)

Theoretical performance: 116 g/m² per hand
 Application: 3 hands: 1st hand diluted to 10%
 2nd hand diluted to 5%
 3rd hand diluted to 5%

REFERENCE	STANDARD	TITLE	RESULT	SPECIFICATION ACCORDING TO UNE-EN 1504-2:2005
ZERAMIC EXTREM Microesferas ceramic líquida RF. 3105171	UNE-EN 1062-6:2003	Determination of carbon dioxide permeability	$i (g/m^2d) = 2.0916 \pm 0.284$ $S_D (m) = 120 \pm 15$ $\mu = 613925 \pm 82321$	$S_D > 50 m$

Nature of the substrate: Fiber cement of 10 mm of thickness
 Conditioning method: paragraph 4.3 of the standard UNE-EN 1062-11:2003
 Test method: A
 Average film thickness a: (196 ± 4) µm

REFERENCE	STANDARD	TITLE	SAMPLE	w kg/(m ² .h ^{0.5})	SPECIFICATION ACCORDING TO UNE-EN 1504-2:2005
ZERAMIC EXTREM Microesferas ceramic líquida RF. 3105171	UNE-EN 1062-3:2008	Determination of liquid water permeability	1	0.0264	$w < 0.1 Kg/m^2 \cdot h^{0.5}$
			2	0.0186	
			3	0.0262	
			Average	0.0235	
			Standard deviation	0.0044	

Nature of the substrate: calcium carbonate bricks

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	Page 2 of 3
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REFERENCE	STANDARD	TITLE	SAMPLE	σ (N/mm ²)	BREAKAGE TYPE	SPECIFICATION ACCORDING TO UNE-EN 1504-2:2005
ZERAMIC EXTREM Microesferas ceramic líquida RF. 3105171	UNE-EN 1542:2000	Measurement of bond strength by pull-off	1	1.91	20% substrate failure + 80% adhesive paint-holder	Rigid systems: ≥ 1.0 (0.7) ^b N/mm ² . (Without traffic loads) and: ≥ 2.0 (1,5) ^b N/mm ² (With traffic loads) Flexible systems: ≥ 0.8 (0,5) ^b N/mm ² (Without traffic loads) and ≥ 1.5 (1,0) ^b N/mm ² (With traffic loads)
			2	2.05	25% substrate failure + 75% adhesive paint-holder	
			3	1.65	15% substrate failure + 85% adhesive paint-holder	
			Average	1.87		
			Standard deviation	0.20		

^b: The value in parentheses is the smallest value accepted in any reading

Measuring Equipment used: Instron dynamometer model 5569

Load cell 50 KN

Steel pod: ϕ 50 mm

Thickness 30 mm

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Contact person:	Iván Walter
Address:	Polígono industrial el Torno, C/ Alfareros nº 9
Town:	41710 Utrera (Sevilla)

REFERENCE	STANDARD	TITLE	SAMPLE	WATER VAPOR TRANSMISSION SPEED V (g/m ² x day)	EQUIVALENT AIR LAYER THICKNESS s _D (m)	SPECIFICATION ACCORDING TO UNE-EN 1504-2:2005
ZERAMIC EXTREM Microesferas ceramic líquida RF. 3105171	UNE-EN ISO 7783:2012	Determination of water-vapour transmission properties, cup method	1	17.37	1.1744	Class I: s _D <5 m (water vapour permeable)
			2	14.43	1.4133	
			3	18.14	1.1247	
			Average	16.65	1.24	Class II 5m ≤ s _D ≤ 50m Class III s _D > 50m (water vapour impermeable)
			Standard deviation	1.95	0.15	

Nature of the substrate: Fiber cement
 Test method: wet capsule
 Average film thickness: (220 ± 3) µm
 Conditioning: 3 cycles: 24 hours in water at 23°C
 24 hours at 50°C in an oven
 Temperature and humidity during the test: (23 ± 2)°C, (50 ± 5) % h.r.



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Blanca Ruiz de Gauna
 Construction Materials Characterization
 Laboratory Manager
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- * The results of this report concern only and exclusively to the material tested.
- * The complete information related to the required tests is at client's disposal on request.
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CERTIFICATES

Laboratorio de Ensayos nº AND-L-002
Página 1 de 2

PILOT TEST CERTIFICATE Number 9624-2016

CUSTOMER: REVESTIMIENTOS TÉCNICOS SOSTENIBLES, S.L. (RTS)

ADDRESS: Polígono Industrial El Torno - C/ Alfareros 9. 41710 UTRERA (Sevilla)

TESTED MATERIAL:	ZERAMIC Extrem W
PROCEDURE:	Pilot Test to define the insulating capacity of material

DATE OF ISSUE OF CERTIFICATE:	20/07/2016
REFERENCE REPORT	7035-2016

It gives off a density applied from this pilot test for average of 467 microns of the product **ZERAMIC Extrem W** and the environmental conditions registered, it gets a reduction of inner temperature of the cover surface of an industrial warehouse from until **8,00 °C** in average and a decrease of heat profit from until **60,76 W/m²** on average for a cover of these characteristics.



Fdo.: Jaime Corraliza Solomando
Arquitecto Técnico (Coleg. Nº 7633)
Responsable Ensayo



Fdo.: Pablo Álvarez Troncoso
Lcdo. CC. Químicas (Coleg. Nº 3344)
Director Técnico



METHODOLOGY

As the pilot test was done, it's determined the average temperature "in situ" of the treated and untreated surfaces in the building using a themographic equipment in order to study its performance in the presence of temperature variations and incidence of the solar radiation. The determinations are carried out in the inner surface of the metallic cover (pre-lacquered steel of both sides) of an industrial warehouse where a zone has the applied product and the other one without applying to study the differential performance. The results have been analysed quantitatively to evaluate the effectiveness of lining.

The heat penetrates from outside the cover through two components: the heat radiating and the heat transferred by air convection:

$$Q_{tot} = Q_{rad} + Q_{conv} = 4\varepsilon\sigma T_m^3 \Delta T_r + h_c \Delta T_a$$

The parameters to calculate the heat flows are deducted in the above equation.

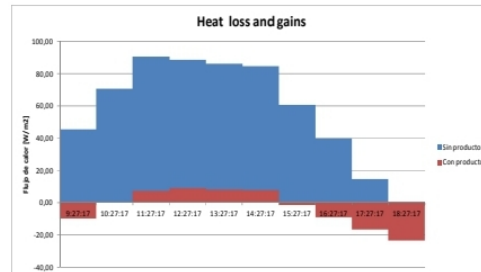
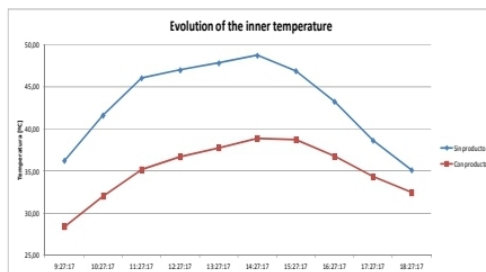


MAXIMUM & MINIMUM VALUES AND AVERAGES

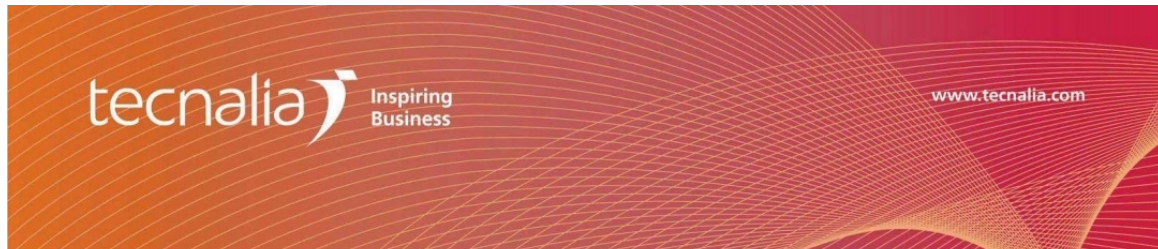
	Inner Temperature [°C]		
	without product	with product	Difference
Max.	48,72	38,91	9,81
Min.	35,14	28,43	6,71
Average	43,14	35,14	8,00

	HeatTransfer [W/m²]		
	without product	with product	Difference
Max.	90,80	8,90	81,90
Min.	-2,00	-23,60	21,60
Average	57,96	-2,80	60,76

Registro Mercantil de Sevilla, Inscripción 1ª, Folio 1, Tomo 3.667 – C.I.F.: B91262428



CERTIFICATES



REPORT No.	069286
CUSTOMER	REVESTIMIENTOS TÉCNICOS SOSTENIBLES S.L.
APPLICANT	IVAN WALTER
ADDRESS	POL. IND. EL TORNO C/ ALFAREROS Nº 13 41710 UTRERA (SEVILLA)
PURPOSE	SRI INDEX IN ACCORDANCE WITH ASTM E1980-11
SAMPLE TESTED	WHITE COATING REF. «ZERAMIC EXTREM W»
DATE OF RECEIPT	29.08.2017
TEST DATES	31.08.2017
DATE ISSUED	05.09.2017

Barón Social / FUNDACIÓN TECNALIA RESEARCH & INNOVATION, N.º F-699 Registro de Fundaciones del Gobierno Vasco CIF G48925787

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Susana Santamaría
Technical Consultant
Construction - Services

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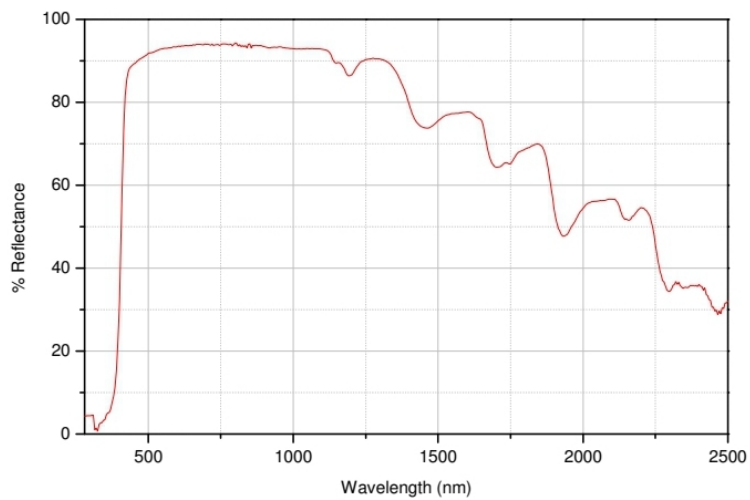
RESULTS

SOLAR REFLECTANCE

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

Solar reflectance (%)	85.5 ± 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 ± 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 _s (K)
Low (0-2 m/s)	104.5 ± 0.3	319.5
Medium(2-6 m/s)	105.3 ± 0.3	315.8
High (6-10 m/s)	106.0 ± 0.3	312.6



PACKAGING AND YIELD

Zeramic Extrem Titanium Plus Antibacterial is available in 15l and 4L packs., with maximum yields of 35 m² for 15 L drums and 10 m² for 4 L cans.

APPLICATIONS

Zeramic Extrem Titanium Plus Antibacterial is a coating with extraordinary qualities. It is composed of liquid ceramic microspheres and silver ions, the film, which once dry, allows for uniform, continuous and seamless surfaces. Other noteworthy applications include:

- Elastic, anti-cracking.
- Self-cleaning

APPLICATIONS

- Climate control of dwelling interiors, to reduce between 45-50% the energy costs as regards air conditioning and heating.
- Prevents the sensations of cold feet and hot head, by obtaining a more homogeneous heat distribution
- Create pleasant and sound environments for the health of its occupants.
- Recommended, for allergy sufferers or asthmatics, by not releasing any chemical substance or migrations.
- Ideal product, for nursing homes, nurseries, hospitals, animal farms ...
- Decorative product, can be manufactured in any colour
- Low cost and easy maintenance
- High durability, 10-year warranty (always by technical or project manager requirement)



WARRANTY

Zeramic Extrem Titanium Plus has a 10-year warranty depending on substrate and geographic location.

The **Zeramic Extrem Titanium Plus** warranty only applies to the product, so the application must be under warranty by the application company.

In order to request a product warranty, a requirement will be necessary.

PRECAUTIONS

Zeramic Extrem Titanium Plus must not be stored for longer than 1 year, provided that it has been correctly handled, avoiding direct exposure to sun, frost, humidity ...

Empty containers must be deposited at clean points or those prepared for waste. European environmental regulations must be complied with.