



Revestimientos técnicos Sostenibles s.L.

DATA SHEET

ZERAMIC EXTREM W VERTICAL SUBSTRATES

Thermal-Elastic Coating for Exterior Substrates

DESCRIPTION

Zeramic Extrem W Vertical Substrates, is an elastic coating, whose application confers the substrate insulating properties, Climalit effect. **Zeramic Extrem W Vertical Substrates** is composed of hollow ceramic microspheres, aerogel, titanium dioxide and acrylic, elastic and photo cross-linkable emulsions.

Elastic, anti-crack, breathable and multi-stick product for vertical facings 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

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The **Zeramic Extrem W** 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 matte finish or custom colours for RTS Pocket Color, NCS and Nova colour charts.
- **Density:** 0.77 kg./l.
- **Solids volume:** 88 ±2%.
- **Application temperature:** Between 1°C and 50°C.
- **Yield:** 0.35-0.4 Kg. /m²
- **Dilution and preparation:** 10% dilution 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 thickness)
- **Total drying:** From 72 to 96 hours for substrates with absorption, maximum hardness 21 days
- **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

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Poligono Ind. (Ind. Estate) El torno C/Alfareros nº9 41710 Utrera (Sevilla) Ph. 955 27 01 07 - 639 68 68 87
www.rts-spain.com/ info@rts-spain.com

TECHNICAL CHARACTERISTICS

- **Temperature resistance:** -60° to 300°C.
- **Zeramic thermal conductivity coefficient:** 0.000125 W/m K
- **Recommended thickness:** 400 micron
- **Thermal resistance:** R=3.33 m²k/W
- **Specific heat:** 97°C
- **Thermodynamic solar opening:** 0.12
- **Solar reflection:** 85.5% ±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
- **Melting degrees:** 840°C
- **Reaction to fire as per UNE-EN ISO 11925-2:2011/ UNE-EN 13823:2012 Standard:** B-S1.d0 Fire-retardant.
- **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
- **Thermal Insulator:**
 - Prevents the oven effect in summer and thermally insulates from the cold in winter, while reflecting infrared rays and reducing CO₂ emissions
 - Reduces heating and cooling costs by more than 30% by reducing 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±15

OTHER TECHNICAL CHARACTERISTICS

- **Ecological:** Very low VOC content
- **Anti-condensation system:** product which eliminates the thermal bridge by increasing the substrate temperature, therefore, preventing condensation.
- **Waterproof:** 100% waterproof product.
- **Soundinsulating:** Product which has a sound-dampening effect.
- **Catalytic photo:** Accelerates photocatalysis and produces negative ions, beneficial for health.
- **Antibacterial:** Product which offers protection for virtually all microorganisms that can be produced by contamination, suitable for the food industry, agro-food industry, wineries ...

CERTIFICATES

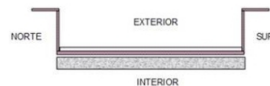


7. RESULTADOS.

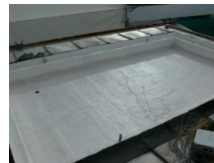
Ciente: Revestimientos Técnicos Sostenibles S.L.

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.



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

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 ² d) = 2.0916 ± 0.284 S_D (m) = 120 ± 15 μ = 613925 ± 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 · 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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Contact person:	Iván Walter
Address:	Polígono industrial el Torno, C/ Alfareros nº 9
Town:	41710 Utrera (Sevilla)

Razón Social / FUNDACIÓN TECNALIA RESEARCH & INNOVATION Nº F-69. Registro de Fundaciones del Gobierno Vasco CIF: 048975767

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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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	Class II 5m≤ s _D ≤50m Class III s _D >50m (water vapour impermeable)
			Average	16.65	1.24	
			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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Fecha y hora: 23.10.2017 12:43:49

Blanca Ruiz de Gauna
Construction Materials Characterization
Laboratory Manager
Technological Services Division

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

Laboratorio de Ensayos de Control de Calidad de la construcción y de la obra pública de Andalucía según Decreto 67/2011, de 5 de abril, inscrito en el Registro de Laboratorios de Ensayos con el nº AND-L-002.
Ensayos de edificación: Áreas: EA, EFA, EH, EM, GT, PS, VS
Ensayos de ingeniería civil: Áreas OL-A, AL-B, OL-C, OL-D

tlf.: 955.674.108
fax: 955.675.541e-mail: laensa@laensa.com
www.laensa.comLAENSA
C/Apolo, 4
41701 Dos Hermanas (Sevilla)



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:

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



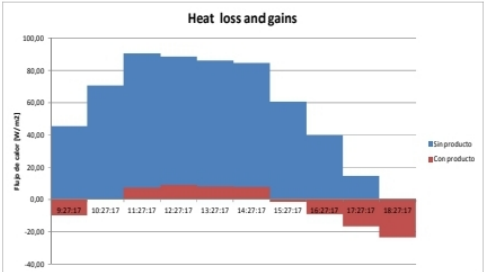
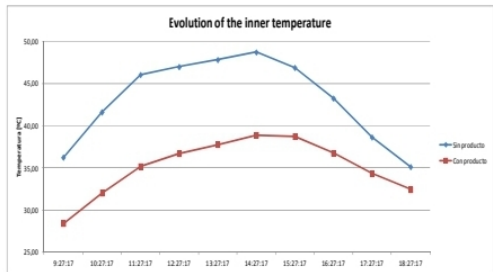
The parameters to calculate the heat flows are deduced in the above equation.

MAXIMUM & MINIMUM VALUES AND AVERAGES

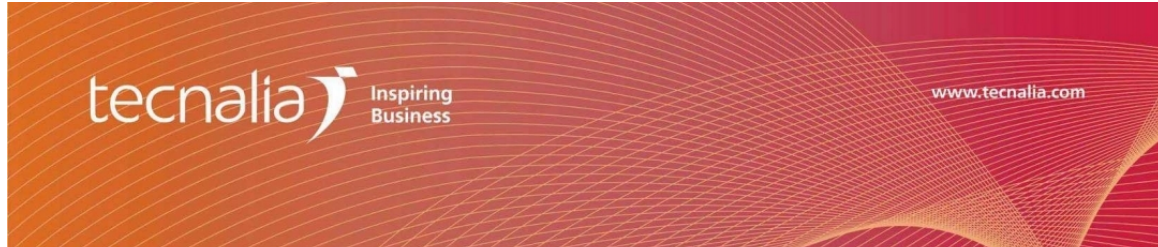
	Inner Temperature [°C]		
	without product	with product	Difference
Max.	48,72	38,91	9,81
Min.	35,14	28,43	6,71
Average	43,14	35,14	8,00

	Heat Transfer [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

Razón Social / FUNDACIÓN TECNALIA RESEARCH & INNOVATION Nº F-60 Registro de Fundaciones del Gobierno Vasco CIF G48975787

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SANTAMARIA
FERNANDEZ
Fecha y hora:
05.09.2017 16:12:11

Susana Santamaría
Technical Consultant
Construction - Services

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TECNALIA RESEARCH & INNOVATION
Área anardi, 5
E-20730 Azpeitia (Gipuzkoa)

T 902 760 000
T +34 946 430 850 (International calls)

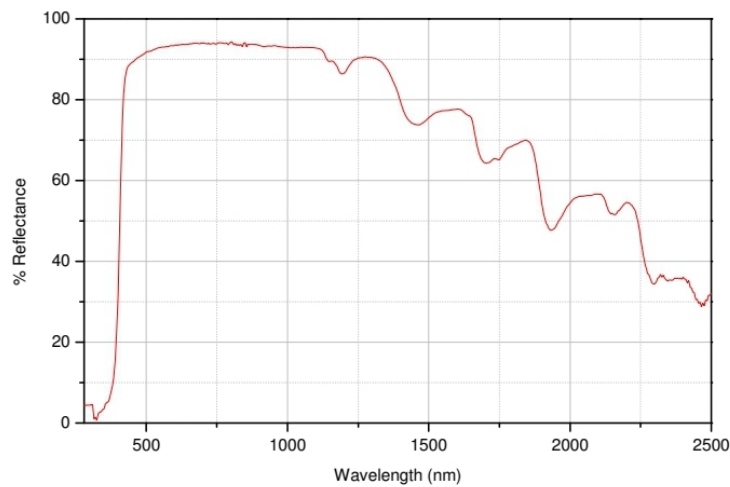
RESULTS

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 W Vertical Substrates 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 W Vertical Substrates is a coating with extraordinary qualities. It is composed of liquid ceramic microspheres, which once dry, allows for uniform, continuous and seamless surfaces. Other noteworthy applications include:

- Refurbishment of façades, to improve building casings.
- Protection against ultraviolet rays
- Protection against climatological agents, sea breezes ...
- Elastic, anti-cracking product.
- Climate control of the interiors of dwellings, to reduce between 30-36% the energy costs as regards air conditioning and heating
- Regulates the humidity in dwelling interiors.
- Recommended, for allergy sufferers or asthmatics, by not releasing any chemical substance or migrations.
- Decorative product, can be manufactured in any colour
- Low cost and easy maintenance
- Anti-condensation
- Self-cleaning
- High durability, 10-year warranty (always by technical or project manager requirement)



DIRECTIONS FOR USE

SURFACE PREPARATION

- On new substrates or painted substrates in good condition and state of repair, the surfaces must be cleaned or the facings blasted to eliminate any dust residue, contamination or other anomaly. Only if the facings are made from concrete, these will have to be set using a fine particle acrylic fixative, called **Fixative-100**.

If there are cracks or chipping pathologies, these will be sealed using thermal putty, if possible, a multi-stick putty called **ReveCork Exterior Thermal Putty**.

Once the substrate has repaired, the **Zeramic Extrem W Horizontal Substrates**, will be applied, until the necessary thickness is obtained. Minimum 3 coats of product.

- In defective or very damaged substrates, the substrate must be blasted with pressurised water (150 bar), and once dry it will be repaired using with **R4 or R2** type structural mortars type or using a type of multi-stick exterior putty **ReveCork Thermal Exterior Putty**.

Once the substrate has been repaired, a solvent-based fixative called **Fixative 250** will be applied.

Then, the **Zeramic Extrem Rubber Anti-cracking** will be applied, until the necessary thickness is obtained. Minimum 3 coats of product.

In both cases, drying times must be adhered to

WARRANTY

Zeramic Extrem W Vertical Substrates has a 10-year warranty depending on substrate and geographic location.

The **Zeramic Extrem W Vertical Substrates** 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 W Vertical Substrates 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.