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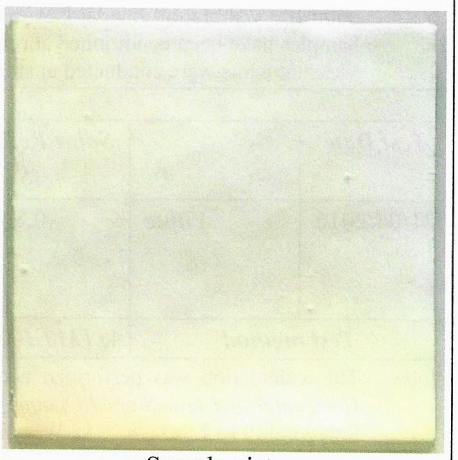
GENERAL INFORMATION

Subject:	Test report on testing activities to determine solar reflectance, infrared emittance and solar reflectance index (SRI).		
Client	A. T. Marmo Service srl Via Belvedere, 14 20017 Rho (Mi) Italy P iva 12060280158 fax: +39 029307167	***Client reference person***	Alessandro Torretta e-mail: alessandro.torretta@nanotechsurface.com cell: +39 3356156424
Commitment document	-	***Report release date***	19/05/2017

SAMPLE DATA

Receipt date	01/03/2016					
Sample id. sub.	-					
ECRC id	-					
Manufacturer	-					
Product name	EcoThermo Membrana Bianca					
Sampling	Supplied by the Client					
Short physical description*	Product type: Paint formulated with polyurethane resin, applied on bituminous membrane Substrate: bituminous membrane					
Sample thickness	4.1 mm		***Total sample size***		300 x 210 mm	
Surface coated	YES		***Coating thickness****		300 µm	
Surface state	***variegated***	NO	***aged***	NO	***cleaned***	NO
Information on history and ageing*	N.A.					
Optical properties	Diffusive reflecting	NO				
	Specular reflecting	NO				
	Intermediate reflecting	YES				
	Clear transmitting	NO				
	Translucent transmitting	NO				
	Opaque	YES				



Sample picture

Notes
* Information on surface coating, aging and cleaning provided by the Client where known.

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TEST RESULTS

Test Date		*Solar Reflectance (SR)*	*Standard Deviation*	*Measured Values*		
21/04/2016	*Value*	**0.863**	0.001	0.864	0.862	0.863
Test method		*ASTM C1549-09*				
Reference Solar Spectrum		ASTM E 891– 87 Direct normal				
Notes	This test was performed according to *ASTM C1549-09: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Reflectometer* with air mass 1.5. A solar spectrum reflectometer Devices and Services SSR-ER was used. Calibration standards with low (0.000) and high (0.864) solar reflectance were provided by the instrument manufacturer. Measurements were conducted at ambient temperature of 25 ± 1°C and relative humidity of 50% ± 3%.					

Test Date		*Infrared Emittance (IE)*	*Standard Deviation*	*Measured Values*				
21/04/2016	*Value*	**0.895**	0.010	0.905	0.907	0.888	0.886	0.891
Test method		*UNI EN 15976: 2011(Accredited except point 10)*						
Notes	This test was performed according to *UNI EN 15976: 2011: Flexible sheets for waterproofing. Determination of emissivity* (except point 10). Calibration standards with low (0.010) and high (0.964) emittance were provided by the instrument manufacturer. Samples have been conditioned at room temperature for 2 h before the test. Measurements were conducted at ambient temperature of 22 ± 1°C and relative humidity of 41 ± 3% in a time period of about 1 h.							

Test Date		*Solar Reflectance (SR)*	*Infrared Emittance (IE)*	*Solar Reflectance Index (SRI)*[%]		
				Low wind	*Medium wind*	*High Wind*
21/04/2016	*Value*	0.863	0.895	**109.8**	**109.0**	**108.5**
				Surface temperature (ST) [°C]		
				43.9	**41.2**	**39.0**
Test method		*ASTM E1980-11*				
Notes	This calculation was performed according to *ASTM E1980-11: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*. This utilizes the following values for the convection coefficient: h_c = 5 W/m²·K for low-wind (0 to 2 m/s), h_c = 12 W/m²K for medium-wind (2 to 6 m/s), and h_c = 30 W/m²K for high-wind (6 to 10 m/s).					

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Sample Id.	TEST REPORT N° ETR-17-0176	Page
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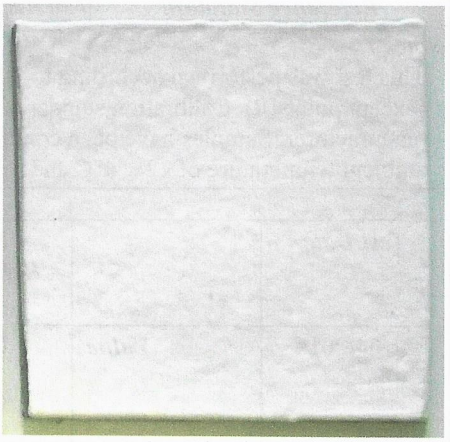
GENERAL INFORMATION

Subject:	Test report on testing activities to determine solar reflectance, infrared emittance and solar reflectance index (SRI).		
Client	A. T. Marmo Service srl Via Belvedere, 14 20017 Rho (Mi) Italy P iva 12060280158 fax: +39 029307167	***Client reference person***	Alessandro Torretta e-mail: alessandro.torretta@nanotechsurface.com cell: +39 3356156424
Commitment document	-	***Report release date***	19/05/2017

SAMPLE DATA

Receipt date	01/03/2016					
Sample id. sub.	-					
ECRC id	-					
Manufacturer	-					
Product name	EcoThermo Guaina Bianca					
Sampling	Supplied by the Client					
Short physical description*	Product type: elastomeric water based paint with heat reflecting properties Substrate: bituminous membrane					
Sample thickness	4.1 mm		***Total sample size***		300 x 210 mm	
Surface coated	YES		***Coating thickness***		N.A.	
Surface state	***variegated***	NO	***aged***	NO	***cleaned***	NO
Information on history and ageing*	N.A.					
Optical properties	Diffusive reflecting	NO				
	Specular reflecting	NO				
	Intermediate reflecting	YES				
	Clear transmitting	NO				
	Translucent transmitting	NO				
	Opaque	YES				



Sample picture

Notes
Information on surface coating, aging and cleaning provided by the Client where known.

Sample Id.	TEST REPORT N° ETR-17-0176	Page
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TEST RESULTS

Test Date		*Solar Reflectance (SR)*	*Standard Deviation*	*Measured Values*		
7/03/2016	*Value*	**0.859**	0.002	0.857	0.859	0.861
Reference Standard		*ASTM C1549-09*				
Reference Solar Spectrum		ASTM E 891– 87 Direct normal				

Notes

This test was performed according to *ASTM C1549-09: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Reflectometer with air mass 1.5.* A solar spectrum reflectometer Devices and Services SSR-ER was used. Calibration standards with low (0.000) and high (0.864) solar reflectance were provided by the instrument manufacturer. Measurements were conducted at ambient temperature of 25 ± 1°C and relative humidity of 50% ± 3%.

Test Date		*Infrared Emittance (IE)*	*Standard Deviation*	*Measured Values*				
21/04/2016	*Value*	**0.890**	0.002	0.891	0.892	0.889	0.889	0.890
Reference Standard		*Not Accredited Slide Method- Not Accredited EN 15976*						

Notes

This test was performed according to UNI EN 15976: 2011: Flexible sheets for waterproofing. Determination of emissivity (except point 10). Calibration standards with low (0.010) and high (0.964) emittance were provided by the instrument manufacturer. Samples have been conditioned at room temperature for 2 h before the test. Measurements were conducted at ambient temperature of 22 ± 4°C and relative humidity of 41% ± 10% in a time period of about 1 h.

Test Date		*Solar Reflectance (SR)*	*Infrared Emittance (IE)*	*Solar Reflectance Index (SRI)*[%]		
				Low wind	*Medium wind*	*High Wind*
21/04/2016	*Value*	0.859	0.890	**109.1**	**108.3**	**107.9**
				Surface temperature (ST) [°C]		
				44.3	**41.5**	**39.2**
Reference Standard		*ASTM E1980-11*				

Notes

This calculation was performed according to *ASTM E1980-11: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*. This utilizes the following values for the convection coefficient: h_c = 5 W/m^2·K for low-wind (0 to 2 m/s), h_c = 12 W/m^{2}K for medium-wind (2 to 6 m/s), and h_c = 30 W/m^{2}K for high-wind (6 to 10 m/s).

The Responsible of EELab Laboratory
Prof. Alberto Muscio

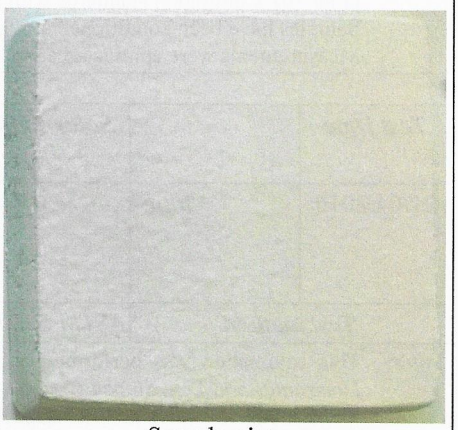
Sample Id.	TEST REPORT N° ETR-17-0177	Page
0115_01032016		1/2

GENERAL INFORMATION

Subject:	Test report on testing activities to determine solar reflectance, infrared emittance and solar reflectance index (SRI).		
Client	A. T. Marmo Service srl Via Belvedere, 14 20017 Rho (Mi) Italy P iva 12060280158 fax: +39 029307167	***Client reference person***	Alessandro Torretta e-mail: alessandro.torretta@nanotechsurface.com cell: +39 3356156424
Commitment document	-	***Report release date***	19/05/2017

SAMPLE DATA

Receipt date	01/03/2016					
Sample id. sub.	-					
ECRC id	-					
Manufacturer	-					
Product name	EcoThermo Paint Air Esterni Bianca					
Sampling	Supplied by the Client					
Short physical description*	Product type: acrylic-siloxane paint, applied on building surface (plasterboard) Substrate: plasterboard					
Sample thickness	13.1 mm		***Total sample size***		300 x 300 mm	
Surface coated	YES		***Coating thickness****		N.A.	
Surface state	***variegated***	NO	***aged***	NO	***cleaned***	NO
Information on history and ageing*	N.A.					
Optical properties	Diffusive reflecting	NO				
	Specular reflecting	NO				
	Intermediate reflecting	YES				
	Clear transmitting	NO				
	Translucent transmitting	NO				
	Opaque	YES				



Sample picture

Notes
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Sample Id.	TEST REPORT N° ETR-17-0177	Page
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TEST RESULTS

Test Date		*Solar Reflectance (SR)*	*Standard Deviation*	*Measured Values*		
21/04/2016	*Value*	**0.837**	0.001	0.836	0.837	0.837
Test method		*ASTM C1549-09*				
Reference Solar Spectrum		ASTM E 891– 87 Direct normal				
Notes	This test was performed according to *ASTM C1549-09: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Reflectometer* with air mass 1.5. A solar spectrum reflectometer Devices and Services SSR-ER was used. Calibration standards with low (0.000) and high (0.864) solar reflectance were provided by the instrument manufacturer. Measurements were conducted at ambient temperature of 25 ± 1°C and relative humidity of 50% ± 3%.					

Test Date		*Infrared Emittance (IE)*	*Standard Deviation*	*Measured Values*				
21/04/2016	*Value*	**0.893**	0.005	0.899	0.889	0.893	0.891	0.893
Test method		*UNI EN 15976: 2011(Accredited except point 10)*						
Notes	This test was performed according to *UNI EN 15976: 2011: Flexible sheets for waterproofing. Determination of emissivity* (except point 10). Calibration standards with low (0.010) and high (0.964) emittance were provided by the instrument manufacturer. Samples have been conditioned at room temperature for 2 h before the test. Measurements were conducted at ambient temperature of 22 ± 1°C and relative humidity of 41 ± 3% in a time period of about 1 h.							

Test Date		*Solar Reflectance (SR)*	*Infrared Emittance (IE)*	*Solar Reflectance Index (SRI)* [%]		
				Low wind	*Medium wind*	*High Wind*
21/04/2016	*Value*	0.837	0.893	**105.6**	**105.2**	**104.9**
				Surface temperature (ST) [°C]		
				46.2	**42.6**	**39.8**
Test method		*ASTM E1980-11*				
Notes	This calculation was performed according to *ASTM E1980-11: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*. This utilizes the following values for the convection coefficient: h_c = 5 W/m²·K for low-wind (0 to 2 m/s), h_c = 12 W/m²K for medium-wind (2 to 6 m/s), and h_c = 30 W/m²K for high-wind (6 to 10 m/s).					

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