

Test Report N. 91 /EL MI

Spett.le
GRES DE LA MANCHA INTERNACIONAL S.L.
CARRETERA CONSUEGRA KM 1.200
45470 LOS YEBENES - TOLEDO (ES)

Modena 05/02/2014

Receipt N.: 91/EL MI	Date of receipt : 13/01/14	Analysis start date: 13/01/14	Analysis end date: 03/02/14
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	KLINKER TECH ACTIVE+		
Sampling:	made by customer		
Date of sampling:	13/01/14		
	Test information: -treated specimens : 50 x 50 mm square, 10 mm thickness; -not-treated specimens : 50 x 50 mm square, 10 mm thickness; -conditions of pre-exposure : intensity light source: 1.0 mW/cm ² for 24 h; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis; -fluorescent UV lamp : mercury-vapor lamp 18 W (PHILIPS PL-L 18W/10/4P); -ultraviolet light radiometer : DELTA OHM model HD2102.2 - serial number 10008472 model probe : LP471 UVA; -UV irradiation intensity : 0.25mW/cm ² - time exposure : 8h; -test bacteria : Escherichia coli ATCC 8739 and Staphylococcus aureus ATCC 6538P; -inoculated test bacteria suspension : 0.15 ml; -adhesive film : polypropylene film 40 x 40 mm square - transparency rate = 85% for 340-380 nm range; -moisture preservation glass : borosilicate glass 1.1 mm thickness BOROFloat SHOTT		

Test	Method	UM	Result
Antibacterial activity of photocatalytic materials - E. coli ATCC 8739*	ISO 27447:2009 - Film adhesion method		
<i>N. bacteria inoculated*</i>		cells/ml	1.600.000
<i>A - average number of bacteria non-treated specimens after inoculation*</i>		cells/ml	230.000
<i>BL - average number of bacteria non-treated specimens, after UV irradiation*</i>		cells/ml	440.000
<i>CL - average number of bacteria photocatalytic treated specimens after UV irradiation*</i>		cells/ml	150.000
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		Log10	0,5

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Test	Method	UM	Result
<i>Reduction of bacteria from non-treated specimens after UV irradiation*</i>		%	65,29
<i>BD - average number of bacteria non-treated specimens after dark treatment*</i>		cells/ml	270.000
<i>CD - average number of bacteria photocatalytic treated specimens after dark treatment*</i>		cells/ml	220.000
<i>Delta R - photocatalytic antibacterial activity value with UV irradiation*</i>		Log10	0,4
Antibacterial activity photocatalytic materials - S. aureo ATCC 6538P*	ISO 27447:2009 - Film adhesion method		
<i>N. bacteria inoculated*</i>		cells/ml	1.300.000
<i>A - average number of bacteria non-treated specimen*</i>		cells/ml	185.000
<i>BL - average number of bacteria non-treated specimens, after UV irradiation*</i>		cells/ml	140.000
<i>CL - average number of bacteria photocatalytic treated specimens after UV irradiation*</i>		cells/ml	12.500
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		Log10	1,0
<i>Reduction of bacteria from non-treated specimens after UV irradiation*</i>		%	90,97
<i>BD - average number of bacteria non-treated specimens after dark treatment*</i>		cells/ml	250.000
<i>CD - average number of bacteria photocatalytic treated specimens after dark treatment*</i>		cells/ml	37.000

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Test	Method	UM	Result
<i>Delta R - photocatalytic antibacterial activity with UV irradiation*</i>		Log10	0,2

LABORATORY MANAGER

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Sez.A