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EUROPEAN PATENTS

EP2443076
EP3277634

ISO CERTIFICATIONS

ISO 10678: 2010
ISO 27448-1: 2008
ISO 27447: 2009
ISO 22196: 2011
ISO 22197: 2016
ISO 21702: 2019
ISO 18061: 2014

UNI CERTIFICATIONS

UNI EN 15457:2014
UNI 11484:2013
UNI 11021:2002
UNI 9805/91

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Relazione finale: Attività antivirale di campioni Calacatta Active Surfaces esposti a luce UV

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SCOPO

Lo scopo dello studio è stato quello di verificare l'attività antivirale di campioni di "gres porcellanato" forniti da IRIS CERAMICA GROUP (Nome del prodotto: Calacatta Active Surfaces SL 300x150, 6 mm) trattati con "AgNPs-TiO₂" ed esposti a luce UV intensità 0.1 mW/cm² per 4 ore.

In breve, SARS-CoV-2, responsabile di COVID 19, è stato aggiunto ai campioni e l'infettività residua del virus è stata valutata mediante metodo Plaque Assay.

RISULTATI

L'effetto antivirale dei campioni Calacatta Active Surfaces SL 300x150, 6 mm, è stato verificato contro SARS-CoV-2, responsabile di COVID-19.

Tabella 1: Risultati del test anti SARS-CoV-2 su campioni di "gres porcellanato" Calacatta Active Surfaces esposti a luce UV intensità 0.1 mW/cm² per 4 ore

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ore Vetro Ut	N* (PFU/cm2) Log N T=4 ore Active Surface At	Attività antivirale Ut-At	% Inibizione virale
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N è l'infettività del virus recuperato per cm² di campione. I dati sono espressi come media e deviazione standard, tra parentesi.

Tabella 2: Risultati del test anti SARS-CoV-2 su campioni di "gres porcellanato" Calacatta Active Surfaces al buio per 4 ore

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ore Vetro Ut	N* (PFU/cm2) Log N T=4 ore Active Surface At	Attività antivirale Ut-At	% Inibizione virale
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N è l'infettività del virus recuperato per cm² di campione. I dati sono espressi come media e deviazione standard, tra parentesi.



Tabella 3: Risultati dei test di citotossicità e di sensibilità delle cellule al SARS-CoV-2

	Citotossicità	Sensibilità al SARS-CoV-2		
	Metodo MTT	S (Log PFU/ml)	Criteri di accettazione	Risultato
Controllo negativo	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , accettato)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , accettato)

*Valori di densità ottica (OD) del test MTT. I dati rappresentano la media e la deviazione standard, tra parentesi, ottenuti da tre campioni.

CONCLUSIONI

Nelle condizioni sperimentali utilizzate, in seguito a 4 ore di esposizione a luce UV intensità 0.1 mW/cm², i campioni Calacatta Active Surfaces hanno mostrato attività antivirale contro SARS-CoV-2.

Nel dettaglio, i campioni Calacatta Active Surfaces hanno mostrato un'efficacia del 94.04 % nella riduzione della carica virale



Final Report: Antiviral activity of UV irradiated “Calacatta Active Surface” samples

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AIM

The aim of this study was to verify the antiviral activity of low porosity surfaces provided by IRIS CERAMICA GROUP (Product Name: Calacatta Active Surfaces SL 300x150, 6 mm), after 4 hours of UV irradiation, at 0.1 mW/cm².

Briefly, SARS-CoV-2, responsible for COVID-19, was added to the samples and the residual infectivity of the virus was assessed by Plaque Assay method.

RESULTS

The antiviral activity of “Calacatta Active Surfaces SL 300x150, 6 mm” samples was evaluated against SARS-CoV-2, responsible for COVID-19.

The results of antiviral tests are summarized below.

Table 1: Results of the antiSARS-CoV-2 test on Calacatta Active Surfaces samples after 4 hours of UV exposure, at 0.1 mW/cm².

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 hours Glass Ut	N* (PFU/cm2) Log N T=4 hours Active Surface At	Antiviral activity Ut-At	% Viral reduction
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N is the infectivity titer of virus recovered per cm² of test specimen. Data are expressed as mean and standard deviation, in brackets

Table 2: Results of the antiSARS-CoV-2 test on Calacatta Active Surfaces samples after 4 hours of dark conditions

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 hours Glass Ut	N* (PFU/cm2) Log N T=4 hours Active Surface At	Antiviral activity Ut-At	% Viral reduction
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N is the infectivity titer of virus recovered per cm² of test specimen. Data are expressed as mean and standard deviation, in brackets



Table 3: Results of cytotoxicity and cells sensitivity to SARS-CoV-2

	Cytotoxicity	Sensitivity to SARS-CoV-2		
	MTT method	S (Log PFU/ml)	Validation criteria	Results
Negative control	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ S_n - S_u \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surface	1.209 (0.074)	2.441	$ S_n - S_t \leq 0.5$	0.177 (≤ 0.5 , pass)

*OD values from MTT assay. Data are the mean and standard deviation from three replicates.

CONCLUSIONS

Under the used experimental conditions, the test “Calacatta Active Surfaces” samples showed antiviral effect against SARS-CoV-2, after 4 hours of contact time and UV irradiation, at 0.1 mW/cm².

Specifically, the test “Calacatta Active Surfaces” samples induced 94.04 % of viral reduction.



Informe final: Actividad antiviral de muestras Calacatta Active Surfaces expuestas a luz UV

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OBJETIVO

El objetivo del estudio fue verificar la actividad antiviral de las muestras de “gres porcelánico” suministradas por IRIS CERAMICA GROUP (Nombre del producto: Calacatta Active Surfaces SL 300x150, 6 mm) tratadas con “AgNPs–TiO₂” y expuestas a una intensidad de luz ultravioleta de 0.1 mW/cm² por 4 horas.

En resumen, SARS-CoV-2, responsable de COVID 19, fue añadido a las muestras y la infectividad del virus residual fue evaluada mediante el método Plaque Assay.

RESULTADOS

El efecto antiviral de las muestras Calacatta Active Surfaces SL 300x150, 6 mm fue verificado contra SARS-CoV-2, responsable de COVID-19.

Tabla 1: Resultados de la prueba anti-SARS-Cov-2 sobre muestras de “gres porcelánico” Calacatta Active Surfaces expuestas a una intensidad de luz ultravioleta de 0.1mW/cm² por 4 horas.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 horas Vidrio Ut	N* (PFU/cm2) Log N T=4 horas Active Surface At	Actividad antiviral Ut-At	% Inhibición viral
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N es la infectividad del virus recuperado por cm² de muestra. Los datos se expresan como promedio, y entre paréntesis la desviación estándar.

Tabla 2: Resultados de la prueba anti-SARS-Cov-2 sobre muestras de “gres porcelánico” Calacatta Active Surfaces en la oscuridad por 4 horas.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 horas Vidrio Ut	N* (PFU/cm2) Log N T=4 horas Active Surface At	Actividad antiviral Ut-At	% Inhibición viral
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N es la infectividad del virus recuperado por cm² de muestra. Los datos se expresan como promedio, y entre paréntesis la desviación estándar.



Tabla 3: Resultados de citotoxicidad y sensibilidad celular al SARS-Cov-2.

	Citotoxicidad	Sensibilidad al virus		
	Método MTT	S (Log PFU/ml)	Criterios de aceptación	Resultado
Control negativo	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ S_n - S_u \leq 0.5$	0.157 (≤ 0.5 , aceptado)
Active Surfaces	1.209 (0.074)	2.441	$ S_n - S_t \leq 0.5$	0.177 (≤ 0.5 , aceptado)

*Valores de densidad óptica (D.O) de la prueba MTT. Los datos representan el promedio, y entre paréntesis la desviación estándar, obtenidos de las tres muestras.

CONCLUSIONES

En las condiciones experimentales utilizadas, después de 4 horas de exposición a una intensidad de luz ultravioleta de 0.1 mW/cm^2 , las muestras Calacatta Active Surfaces mostraron actividad antiviral contra SARS-CoV-2.

En detalle, las muestras Calacatta Active Surface mostraron una eficacia del 94.04% en la reducción de la carga viral.



**Abschlussbericht: Antivirale Wirksamkeit
von „Calacatta Active Surfaces“ - Proben unter der Einwirkung von UV Licht**

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ZIEL

Ziel dieser Studie war es, die antivirale Wirksamkeit von Feinsteinzeugproben der IRIS CERAMICA GROUP (Produktbezeichnung: Calacatta Active Surfaces SL 300x150, 6 mm), behandelt mit AgNPs-TiO₂, unter 4-stündiger Einwirkung von UV-Licht bei 0,1 mW/cm², zu überprüfen.

Kurz gesagt wurde SARS-CoV-2, verantwortlich für COVID-19, den FS Proben hinzugefügt, und die verbleibende Infektiosität des Virus durch das Plaque Assay-Verfahren bewertet.

ERGEBNISSE

Die antivirale Wirksamkeit von “Calacatta Active Surfaces SL 300x150, 6 mm”-Proben wurde bewertet gegen SARS-CoV-2, verantwortlich für COVID-19.

Nachstehend sind die Ergebnisse der antiviralen Tests zusammengefasst:

Tabelle 1: Ergebnisse des Anti-SARS-Cov-2-Tests auf Calacatta Active Surfaces-Proben nach 4-stündiger UV-Bestrahlung, bei 0,1 mW/cm².

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 Stunden Glas Ut	N* (PFU/cm2) Log N T=4 Stunden Active Surfaces At	Antivirale Wirkung Ut-At	% Virusreduktion
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N bezeichnet den Infektiositätstiter des pro cm² Testprobe gewonnenen Virus.

Die Daten sind als Mittelwert und (in Klammern) als Standardabweichung angegeben.

Tabelle 2: Ergebnisse des Anti-SARS-Cov-2-Tests auf Calacatta Active Surfaces-Proben nach 4 Stunden bei Dunkelheit

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 Stunden Glas Ut	N* (PFU/cm2) Log N T=4 Stunden Active Surfaces At	Antivirale Wirkung Ut-At	% Virusreduktion
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N bezeichnet den Infektiositätstiter des pro cm² Testprobe gewonnenen Virus.

Die Daten sind als Mittelwert und (in Klammern) als Standardabweichung angegeben.



Tabelle 3: Ergebnisse der Zytotoxizität und Zellempfindlichkeit gegenüber SARS-Cov-2

	Zytotoxizität	Empfindlichkeit gegenüber SARS-Cov_2		
	MTT-Methode	S (Log PFU/ml)	Validierungskriterien	Ergebnisse
Negativkontrolle	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ S_n - S_u \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ S_n - S_t \leq 0.5$	0.177 (≤ 0.5 , pass)

*OD-Werte aus dem MTT-Test. Die Daten stellen den Mittelwert und die Standardabweichung bei drei Wiederholungen dar.

SCHLUSSFOLGERUNGEN

Unter den applizierten Versuchsbedingungen zeigten die “Calacatta Active Surfaces”-Proben nach 4- stündiger Einwirkung von UV-Licht bei $0,1 \text{ mW/cm}^2$ eine antivirale Wirkung gegen SARS-CoV-2.

Im Detail; zeigen die Testproben “Calacatta Active Surfaces” eine Virusreduktion in Höhe von 94.04 %.

Rapport final : Activité antivirale des échantillons de “Calacatta Active Surfaces” exposés à lumière UV

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Objectif :

L’objectif de cette étude était de vérifier l’activité antivirale d’échantillons de « grès cérame » fournis par IRIS CERAMICA GROUP (Nom du produit : Calacatta Active Surfaces SL 300x150, 6 mm), traités avec “AgNPs–TiO₂” et exposés à lumière UV intensité 0.1 mW/cm² pendant 4 heures.

En bref, le SARS-CoV-2, responsable de COVID-19, a été ajouté aux échantillons et l’infectivité résiduelle du virus a été évaluée par la méthode Plaque Assay.

Résultats

L’activité antivirale des échantillons “Calacatta Active Surfaces SL 300x150, 6 mm” a été vérifiée contre le SARS-CoV-2, responsable du COVID-19.



Les résultats des tests antiviraux sont résumés ci-dessous

Tableau 1 : Résultats du test antiSARS-Cov-2 sur des échantillons de « grès cérame » Calacatta Active Surfaces après 4 heures d'exposition aux UV, à 0,1 mW / cm².

N* (PFU/cm ²) T=0 U0	N* (PFU/cm ²) Log N T=4 heures Verre Ut	N* (PFU/cm ²) Log N T=4 heures Active Surfaces At	Activité antivirale Ut-At	% Réduction virale
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N est le titre d'infectivité du virus récupéré par cm² d'échantillon testé. Les données sont exprimées en moyenne et en écart type, entre parenthèses

Tableau 2 : Résultats du test antiSARS-Cov-2 sur des échantillons de « grès cérame » Calacatta Active Surfaces après 4 heures d'obscurité

N* (PFU/cm ²) T=0 U0	N* (PFU/cm ²) Log N T=4 heures Verre Ut	N* (PFU/cm ²) Log N T=4 heures Active Surfaces At	Activité antivirale Ut-At	% Réduction virale
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N est le titre d'infectivité du virus récupéré par cm² d'échantillon testé. Les données sont exprimées en moyenne et en écart type, entre parenthèses

Tableau 3 : Résultats de la cytotoxicité et de la sensibilité des cellules au SRAS-Cov-2

	Cytotoxicité	Sensibilité au SARS-Cov_2		
	MTT Méthode	S (Log PFU/ml)	Critères de validation	Résultats
Contrôle négatif	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ \text{Sn-Su} \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ \text{Sn-St} \leq 0.5$	0.177 (≤ 0.5 , pass)

* OD Valeurs du test MTT. Les données représentent la moyenne et l'écart type, entre parenthèses, obtenus sur trois échantillons.

Conclusions

Dans les conditions expérimentales utilisées, après 4 heures d'exposition à lumière UV, intensité 0.1 mW/cm², les échantillons “Calacatta Active Surfaces” ont montré un effet antiviral contre le SARS-CoV-2.

Dans le détail, les échantillons “Calacatta Active Surfaces” ont montré une efficacité de 94.04% dans la réduction de la charge virale.



Final Report: Antiviral activity of UV irradiated “Calacatta Active Surfaces” samples

最终报告：紫外线照射下 “Calacatta Active Surfaces” 样品的抗病毒活性

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10.03.2021
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Report date: February 22nd, 2021

报告日期：2021 年 2 月 22 日



AIM

研究目的

The aim of this study was to verify the antiviral activity of porcelain gres provided by IRIS CERAMICA GROUP (Product Name: Calacatta Active Surfaces SL 300x150, 6 mm), after 4 hours of UV irradiation, at 0.1 mW/cm².

本研究的目的是验证在 4 小时紫外线照射，照度 0.1Mw/ cm² 的条件下，由 IRIS CERAMICA GROUP 所提供的瓷砖样品（产品品名：Calacatta Active Surfaces SL 300x150, 厚度 6 mm）的抗病毒活性。

Briefly, SARS-CoV-2, responsible for COVID-19, was added to the samples and the residual infectivity of the virus was assessed by Plaque Assay method.

简言之，实验把 SARS-CoV-2（即 COVID-19 新冠病毒）的毒株加入到样品中并通过菌斑分析法（Plaque Assay）检测样品中的病毒留存度。

RESULTS

研究结果

The antiviral activity of “Calacatta Active Surfaces SL 300x150, 6 mm” samples was evaluated against SARS-CoV-2, responsible for COVID-19.

对样品 “Calacatta Active Surfaces SL 300x150, 厚度 6 mm” 针对 SARS-CoV-2（即 COVID-19 新冠病毒）的抗病毒活性做了检测。

The results of antiviral tests are summarized below

抗病毒测试的结果汇总如下：

Table 1: Results of the antiSARS-Cov-2 test on Calacatta Active Surfaces samples under 4 hours of UV exposure, at 0.1 mW/cm².

表 1：在 4 小时紫外线照射，照度 0.1 mW/cm² 条件下，Calacatta Active Surfaces 样品抗 SARS-Cov-2 病毒的检测结果。

N* (PFU/cm2) T=0 时长=0 U0	N* (PFU/cm2) Log N T=4 hours 时长=4 小时 Glass 玻璃 Ut	N* (PFU/cm2) Log N T=4 hours 时长=4 小时 Active Surfaces Active 样板 At	Antiviral activity 抗病毒活性值 Ut-At	% Viral reduction 病毒数减少率
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N is the infectivity titer of virus recovered per cm2 of test specimen. Data are expressed as mean and standard deviation, in brackets

*N 为测试样本每平方厘米收集的病毒传染性滴度数值。数值用括号内的平均值和标准差表示。



Table 2: Results of the antiSARS-Cov-2 test on Calacatta Active Surfaces samples after 4 hours of dark conditions

表 2: 在 4 小时无光照条件下, Calacatta Active Surfaces 样品抗 SARS-Cov-2 病毒的检测结果。

N* (PFU/cm2) T=0 时长=0 U0	N* (PFU/cm2) Log N T=4 hours 时长=4 小时 Glass/玻璃 Ut	N* (PFU/cm2) Log N T=4 hours 时长=4 小时 Active Surfaces Active 样板 At	Antiviral activity 抗病毒活性值 Ut-At	% Viral reduction 病毒数减少率
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N is the infectivity titer of virus recovered per cm2 of test specimen. Data are expressed as mean and standard deviation, in brackets

*N 为测试样本每平方厘米收集的病毒传染性滴度数值。数值用括号内的平均值和标准差表示。

Table 3: Results of cytotoxicity and cells sensitivity to SARS-Cov-2

表 3: 细胞毒性和细胞对 SARS-Cov-2 的敏感性的结果

	Cytotoxicity 细胞毒性	Sensitivity to SARS-Cov_2 对 SARS-Cov-2 的敏感性		
	MTT Method MTT 比色法	S (Log PFU/ml)	Validation criteria 检验标准	Results 结果
Negative Control 阴性对照组	1.151 (0.151)*	2.618		
No Active 非 Active 样板	1.293 (0.075)	2.461	$ Sn - Su \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces Active 样板	1.209 (0.074)	2.441	$ Sn - St \leq 0.5$	0.177 (≤ 0.5 , pass)

*OD values from MTT assay. Data are the mean and standard deviation from three replicates.

OD 值基于 MTT 比色法的检测。数据为三次重复测量的平均值和标准差。

CONCLUSIONI

结论:

Under the used experimental conditions, the “Calacatta Active Surfaces” samples showed antiviral effect against SARS-CoV-2, after 4 hours of contact time and UV irradiation, at 0.1 mW/cm².

在所使用的实验条件下, “Calacatta Active Surfaces”样品在经过 4 小时病毒接触和紫外线照射 (照度 0.1 mW/cm²) 后, 展现出对 SARS-CoV-2 的抗病毒作用。

Specifically, the test “Calacatta Active Surfaces” samples induced 94.04 % of viral reduction.

具体来说, 测试样品 “Calacatta Active Surfaces” 能够使病毒数减少 94.04%。



Final Report: Antiviral activity of UV irradiated “Calacatta Active Surfaces” samples

最終報告書：紫外線照射による“Calacatta Active Surfaces” サンプルの抗ウイルス効果

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AIM

目的

The aim of this study was to verify the antiviral activity of porcelain gres provided by IRIS CERAMICA GROUP (Product Name: Calacatta Active Surfaces SL 300x150, 6 mm), after 4 hours of UV irradiation, at 0.1 mW/cm².

Briefly, SARS-CoV-2, responsible for COVID-19, was added to the samples and the residual infectivity of the virus was assessed by Plaque Assay method.

本研究の目的は IRIS CERAMICA（商品名：Calacatta Active Surfaces SL 300x150, 6 mm）の磁器質タイルに 0.1mW/cm²の紫外線照射を 4 時間行った後に抗ウイルス効果を検証することです。簡潔に言えば、COVID-19 の構成要素である SARS-CoV-2 をサンプルに添加し、Plaque Assay 法によりウイルスの残留感染性を分析しました。

RESULTS

結果

The antiviral activity of “Calacatta Active Surfaces SL 300x150, 6 mm” samples was evaluated against SARS-CoV-2, responsible for COVID-19.

The results of antiviral tests are summarized below

“Calacatta Active Surfaces SL 300x150, 6 mm”の、COVID-19 の構成要素である SARS-CoV-2 に対する抗ウイルス性を認めました。抗ウイルス試験の結果を以下にまとめます。

Table 1: Results of the antiSARS-Cov-2 test on Calacatta Active Surfaces samples under 4 hours of UV exposure, at 0.1 mW/cm².

表 1

0.1mW/cm²の 4 時間の紫外線照射後の Calacatta Active Surfaces の抗 SARS-Cov-2 試験の結果

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 hours 時間 Glass ガラス Ut	N* (PFU/cm2) Log N T=4 hours 時間 Active Surfaces At	Antiviral activity 抗ウイルス効果 Ut-At	% Viral reduction ウイルスの減少
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N is the infectivity titer of virus recovered per cm² of test specimen. Data are expressed as mean and standard deviation, in brackets



※N は試験片 1 cm²あたりのウイルスの感染力値。データは平均値と標準偏差をカッコ内に表示しています

Table 2: Results of the antiSARS-Cov-2 test on samples after 4 hours of dark conditions

表 2: 暗い環境下での 4 時間後の Calacatta Active Surfaces の抗 SARS-Cov-2 試験の結果

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 hours 時間 Glass ガラス Ut	N* (PFU/cm2) Log N T=4 hours 時間 Active Surfaces At	Antiviral activity 抗ウイルス効果 Ut-At	% Viral reduction ウイルスの減少
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N is the infectivity titer of virus recovered per cm² of test specimen. Data are expressed as mean and standard deviation, in brackets

※N は試験片 1 cm²あたりのウイルスの感染力値。データは平均値と標準偏差をカッコ内に表示しています。

Table 3: Results of cytotoxicity and cells sensitivity to SARS-Cov-2

表 3 : SARS-Cov-2 に対する細胞毒性と細胞の感受性の結果

	Cytotoxicity 細胞毒性	Sensitivity to SARS-Cov_2 SARS-Cov_2 への感受性		
	MTT Method 方法	S (Log PFU/ml)	Validation criteria 検証基準	Results 結果
Negative Control	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , pass)

*OD values from MTT assay. Data are the mean and standard deviation from three replicates.

※MTT assay からの OD 値。データは 3 回の複製測定の前平均値と標準偏差です。

CONCLUSIONS

結論

Under the used experimental conditions, the “Calacatta Active Surfaces” samples showed antiviral effect against SARS-CoV-2, after 4 hours of contact time and UV irradiation, at 0.1 mW/cm².



Specifically, the test “Calacatta Active Surfaces” samples induced 94.04 % of viral reduction.

今回の実験条件では、“Calacatta Active Surfaces”のサンプルは $0.1\text{mW}/\text{cm}^2$ の紫外線照射を 4 時間行った後、SARS-CoV-2 に対して抗ウイルス効果を発揮したことが示されました。

具体的には、“Calacatta Active Surfaces”のサンプルは 94.04% のウイルスを減少させました。



최종 리포트: UV 작용된 “Calacatta Active Surfaces” 샘플의 항 바이러스 활성

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리포트 날짜: 2021 년 2 월 22 일



목적

이 연구의 목적은 IRIS CERAMICA GROUP의 포세린 타일의 항 바이러스 활성을 확인하는 것입니다. (제품명: Calacatta Active Surfaces SL 300x150, 6 mm), 4 시간의 0.1 mW/cm^2 강도의 UV 작용 이후. 간단하게, COVID-19의 원인인 SARS-CoV-2 균을 샘플에 적용하였고 바이러스의 잔류량은 Plaque Assay 방법으로 연구하였습니다.

결과

“Calacatta Active Surfaces SL 300x150, 6 mm” 샘플의 항 바이러스 활성도는 COVID-19의 원인균인 SARS-CoV-2를 적용하여 연구하였습니다.

항 바이러스 검사 결과는 다음과 같습니다.

1 표: 0.1 mW/cm^2 강도의 UV 노출 4 시간하에 Calacatta Active Surfaces 샘플에 대한 antiSARS-Cov-2 테스트 결과.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 시간 Glass Ut	N* (PFU/cm2) Log N T=4 시간 Active Surfaces At	항 바이러스 활성 Ut-At	% 바이러스 감소
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N은 시험 표본 cm^2 당 회복된 바이러스의 감염성 농도입니다. 데이터는 괄호 안에 평균 및 표준 편차로 표현됩니다



2 표: 4 시간 동안 어두운 조건에서 Calacatta Active Surfaces 샘플에 대한 antiSARS-Cov-2 테스트 결과

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 시간 Glass Ut	N* (PFU/cm2) Log N T=4 시간 Active Surfaces At	항 바이러스 활성 Ut-At	% 바이러스 감소
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N 은 시험 표본 cm2 당 회복 된 바이러스의 감염성 농도 입니다. 데이터는 괄호 안에 평균 및 표준 편차로 표현됩니다

3 표: SARS-Cov-2 에 대한 세포 독성 및 세포 민감성 결과

	세포 독성	SARS-Cov_2 에 대한 민감성		
	MTT 방법	S (Log PFU/ml)	검증 기준	결과
부정 제어	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , pass)

* MTT 분석의 OD 값. 데이터는 3 회 반복 실험의 평균 및 표준 편차입니다.

결론

실험된 조건에서 "Calacatta Active Surfaces" 샘플은 0.1mW / cm2 강도의 UV 에 4 시간의 접촉 후 SARS-CoV-2 에 대한 항 바이러스 효과를 나타 냈습니다.

구체적으로, "Calacatta Active Surfaces" 샘플은 94.04 % 의 바이러스 감소율을 보였습니다.

التقرير النهائي: النشاط المضاد للفيروسات لعينات Calacatta Active Surfaces تحت الأشعة فوق البنفسجية

الباحثون



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تاريخ التقرير: 22 فبراير 2021

الهدف

الهدف من هذه الدراسة هو التحقق من النشاط المضاد للفيروسات للخزف الحجري المقدم من IRIS CERAMICA GROUP (اسم المنتج: Calacatta Active Surfaces SL 300x150، 6 مم)، بعد 4 ساعات من الإشعاع فوق البنفسجي، عند 0.1 ميغاواط / سم².

باختصار، تمت إضافة SARS-CoV-2، المسؤول عن COVID-19، إلى العينات وتم تقييم العدوى المتبقية للفيروس بواسطة طريقة Plaque Assay.

النتائج

تم تقييم النشاط المضاد للفيروسات لعينات "Calacatta Active Surfaces SL 300x150، 6 مم" ضد SARS-CoV-2 المسؤول عن COVID-19.

تم تلخيص نتائج الاختبارات المضادة للفيروسات أدناه

الجدول 1: نتائج اختبار antiSARS-Cov-2 على عينات Calacatta Active Surfaces بعد 4 ساعات تحت الأشعة فوق البنفسجية، عند 0.1 ميجاوات / سم².

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ساعات زجاج Ut	N* (PFU/cm2) Log N T=4 ساعات Active Surfaces At	نشاط مضاد للفيروسات Ut-At	% إزالة الفيروس
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

N* هو عيار العدوى للفيروس المسترد لكل سم² من عينة الاختبار. يتم التعبير عن البيانات على أنها متوسط وانحراف معياري، بين قوسين.

الجدول 2: نتائج اختبار antiSARS-Cov-2 على عينات Calacatta Active Surfaces بعد 4 ساعات في الظلام.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ساعات زجاج Ut	N* (PFU/cm2) Log N T=4 ساعات Active Surfaces At	نشاط مضاد للفيروسات Ut-At	% إزالة الفيروس
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

N* هو عيار العدوى للفيروس المسترد لكل سم² من عينة الاختبار. يتم التعبير عن البيانات على أنها متوسط وانحراف معياري، بين قوسين.

الجدول 3: نتائج السمية الخلوية وحساسية الخلايا لـ SARS-Cov-2

	السمية الخلوية	SARS-Cov_2 الحساسية تجاه		
		S (Log PFU/ml)	معايير التحقق من الصحة	النتائج
تحكم سلبي	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , pass)

* قيم OD من مقايصة MTT. البيانات هي المتوسط والانحراف المعياري مقيمة من ثلاث اختبارات.

خاتمة

في ظل الظروف التجريبية المستخدمة، أظهرت عينات "Calacatta Active Surfaces" تأثير مضاد للفيروسات ضد SARS-CoV-2، بعد 4 ساعات من وقت التلامس والإشعاع فوق البنفسجي، عند 0.1 ميغاواط / سم².

على وجه التحديد ، أدت عينات اختبار "Calacatta Active Surfaces" إلى إزالة الفيروس بنسبة 94.04٪.



**Τελική Έκθεση: Αντιική δραστηριότητα δειγμάτων “Calacatta Active Surfaces”
ακτινοβολημένων με UV**

Ερευνητές:

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Ημερομηνία Έκθεσης: 22 Φεβρουαρίου 2021



ΣΚΟΠΟΣ

Ο σκοπός αυτής της έρευνας ήταν να επαληθεύσει την αντιική δραστηριότητα των πορσελανών που παρέχονται από την IRIS CERAMICA GROUP (Όμοια προϊόντος: Calacatta Active Surfaces SL 300x150, 6 mm), μετά από 4 ώρες ακτινοβολήσης με UV, στα 0.1 mW/cm². Συνοπτικά, ο SARS-CoV-2, υπεύθυνος για τον COVID-19, προστέθηκε στα δείγματα και η υπολειμματική μολυσματικότητα του ιού αξιολογήθηκε με τη μέθοδο Plaque Assay.

ΑΠΟΤΕΛΕΣΜΑΤΑ

Η αντιική δραστηριότητα των δειγμάτων “Calacatta Active Surfaces SL 300x150, 6 mm” αξιολογήθηκε κατά του SARS-CoV-2, υπεύθυνου για τον COVID-19. Τα αποτελέσματα των αντιικών δοκιμών συνοψίζονται παρακάτω.

Πίνακας 1: Αποτελέσματα του τεστ κατά του SARS-Cov-2 στα δείγματα Calacatta Active Surfaces μετά από 4 ώρες έκθεσης σε UV, στα 0.1 mW/cm².

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ώρες Γυαλί Ut	N* (PFU/cm2) Log N T=4 ώρες Active Surfaces At	Αντιική δραστηριότητα Ut-At	% Ιική μείωση
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N είναι ο τίτλος μολυσματικότητας του ιού που ανακτάται ανά cm² του δείγματος δοκιμής. Τα δεδομένα εκφράζονται ως μέση και τυπική απόκλιση, σε παρένθεση

Πίνακας 2: Αποτελέσματα του τεστ κατά του SARS-Cov-2 στα δείγματα Calacatta Active Surfaces μετά από 4 ώρες σε σκοτεινές συνθήκες.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 ώρες Γυαλί Ut	N* (PFU/cm2) Log N T=4 ώρες Active Surfaces At	Αντιική δραστηριότητα Ut-At	% Ιική μείωση
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N είναι ο τίτλος μολυσματικότητας του ιού που ανακτάται ανά cm² του δείγματος δοκιμής. Τα δεδομένα εκφράζονται ως μέση και τυπική απόκλιση, σε παρένθεση



Πίνακας 3: Αποτελέσματα Αποτελέσματα κυτταροτοξικότητας και ευαισθησίας των κυττάρων στον SARS-Cov-2

	Κυτταροτοξικότητα	Ευαισθησία στον SARS-Cov_2		
	Μέθοδος MTT	S (Log PFU/ml)	Κριτήρια επικύρωσης	Αποτελέσματα
Έλεγχος αρνητικής τιμής	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , pass)

*OD τιμές από τον προσδιορισμό MTT. Τα δεδομένα είναι η μέση και τυπική απόκλιση από τρία αντίγραφα.

ΣΥΜΠΕΡΑΣΜΑΤΑ

Υπό τις χρησιμοποιούμενες πειραματικές συνθήκες, τα δείγματα «Calacatta Active Surfaces» έδειξαν αντιστατική δράση κατά του SARS-CoV-2, μετά από 4 ώρες χρόνου επαφής και ακτινοβολίας UV, στα 0,1 mW / cm².

Συγκεκριμένα, η δοκιμή των δειγμάτων "Calacatta Active Surfaces" προκάλεσε 94,04% μείωση του ιού.



Relatório final: Atividade antiviral das amostras Calacatta Active Surfaces expostas à luz UV

Pesquisadores:

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Data do relatório: 22 de fevereiro de 2021



PROPÓSITO

O objetivo do estudo foi verificar a atividade antiviral de amostras de porcelanato fornecidas por IRIS CERAMICA GROUP (Nome do produto: Calacatta Active Surfaces SL 300x150, 6 mm) tratadas com “AgNPs–TiO₂” e expostas à luz UV de intensidade 0.1 mW/cm² por 4 horas. Em breve, SARS-CoV-2, responsável pelo COVID 19, foi adicionado às amostras e a infectividade residual do vírus foi avaliada pelo método Plaque Assay.

RESULTADOS

O efeito antiviral das amostras Calacatta Active Surfaces SL 300x150, 6 mm foi testado contra SARS-CoV-2, responsável pelo COVID-19.

Tabela 1: Resultados do teste anti-SARS-Cov-2 em amostras de porcelanato Calacatta Active Surfaces expostas à intensidade de luz UV 0,1 mW / cm² por 4 horas

N* (PFU/cm ²) T=0 U0	N* (PFU/cm ²) Log N T=4 horas Vidro Ut	N* (PFU/cm ²) Log N T=4 horas Active Surface At	Atividade antiviral Ut-At	% Inibição viral
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N é a infecciosidade do vírus recuperado por cm² de amostra. Os dados estão expressos em média e desvio padrão, entre parênteses.

Tabela 2: Resultados do teste anti-SARS-Cov-2 em amostras de porcelanato Calacatta Active Surfaces no escuro por 4 horas

N* (PFU/cm ²) T=0 U0	N* (PFU/cm ²) Log N T=4 horas Vidro Ut	N* (PFU/cm ²) Log N T=4 horas Active Surface At	Atividade antiviral Ut-At	% Inibição viral
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N é a infecciosidade do vírus recuperado por cm² de amostra. Os dados estão expressos em média e desvio padrão, entre parênteses.



Tabela 3: Resultados de citotoxicidade e sensibilidade celular ao SARS-Cov-2

	Citotoxicidade	Sensibilidade ao vírus		
	Método MTT	S (Log PFU/ml)	Crítérios de aceitação	Resultado
Controle negativo	1.151 (0.151)*	2.618		
Não Active	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , accettato)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , accettato)

* Valores de densidade óptica (OD) do teste MTT. Os dados representam a média e o desvio padrão, entre parênteses, obtidos de três amostras.

CONCLUSÕES

Nas condições experimentais utilizadas, após 4 horas de exposição à luz UV de intensidade 0,1 mW / cm², as amostras do Calacatta Active Surfaces apresentaram atividade antiviral contra SARS-CoV-2.

Em detalhe, as amostras do Calacatta Active Surfaces mostraram 94,04% de eficácia na redução da carga viral.



Финальный отчет: Антивирусное действие образцов “Calacatta Active Surfaces” с использованием UV- излучения

Научные исследователи:

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Дата: 22 февраля 2021г.



ЦЕЛЬ

Цель настоящего исследования – проверка антивирусных свойств образцов керамического гранита, предоставленного компанией IRIS CERAMICA GROUP (Наименование продукта: Calacatta Active Surfaces SL 300x150, 6 mm), после 4 часов UV излучения мощностью 0.1 mW/cm².

Кратко, SARS-CoV-2, являющийся причиной COVID-19, был соединен с образцами, и остаточная инфекция была оценена методом Plaque Assay.

РЕЗУЛЬТАТЫ

Антивирусное действие образцов “Calacatta Active Surfaces SL 300x150, 6 mm” было оценено против SARS-CoV-2, являющегося причиной COVID-19.

Суммарные результаты противовирусных испытаний приведены ниже:

Таблица 1: Результаты испытаний против SARS-Cov-2, полученные на образцах Calacatta Active Surfaces после 4 часов UV воздействия мощностью 0.1 mW/cm²:

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 часа Стекло Ut	N* (PFU/cm2) Log N T=4 часа Active Surfaces At	Антивирусное действие Ut-At	% Сокращение вируса
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

*N – инфекционный титр вируса, выделяемый на см² исследуемого образца. Данные представлены как средняя и стандартная величина отклонения (в скобках)

Таблица 2:

Результаты испытаний против: SARS-Cov-2, полученные на образцах Calacatta Active Surfaces после 4 часов в темноте:

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 часа Стекло Ut	N* (PFU/cm2) Log N T=4 часа Active Surfaces At	Антивирусное действие Ut-At	% Сокращение вируса
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

*N – инфекционный титр вируса, выделяемый на см² исследуемого образца. Данные представлены как средняя и стандартная величина отклонения (в скобках)



Таблица 3: Результаты цитотоксичности и чувствительности клеток к SARS-CoV-2

	Цитотоксичность	Чувствительность к SARS-CoV_2		
	MTT метод	S (Log PFU/ml)	Критерии проверки	Результаты
Отрицательный контроль	1.151 (0.151)*	2.618		
Без Active	1.293 (0.075)	2.461	$ S_n - S_u \leq 0.5$	0.157 (≤ 0.5 , pass)
Active Surfaces	1.209 (0.074)	2.441	$ S_n - S_t \leq 0.5$	0.177 (≤ 0.5 , pass)

*Значения OD из анализа MTT. Данные представляют собой стандартное отклонение (в скобках) на трех образцах.

ЗАКЛЮЧЕНИЕ

В приведенных экспериментальных условиях образцы “Calacatta Active Surfaces” показали антивирусный эффект к SARS-CoV-2, после 4 часов контакта и UV излучения мощностью 0.1 mW/cm².

Конкретно тестируемые образцы “Calacatta Active Surfaces” индуцировали сокращение вируса на 94.04 %.



Konacno izvijesce: Antivirusna aktivnost uzoraka: Calacatta Active Surfaces izlozenih UV svjetlu

Istrazivaci:

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Datum izvijesca: 22 veljace 2021



SVRHA

Svrha studija bila je provjeriti antivirusnu aktivnost uzoraka materijala “gres porcellanato” isporučenih od strane IRIS CERAMICA GROUP (Naziv proizvoda: Calacatta Active Surfaces SL 300x150, 6 mm) tretiranih sa “AgNPs–TiO₂” i izloženih svjetlosti UV intenziteta 0.1 mW/cm² tijekom 4 sata. Ukratko, uzročima je dodan SARS-CoV-2, odgovoran za COVID 19, a preostala zaraznost virusa procijenjena je metodom Plaque Assay.

REZULTATI

Protuvirusni učinak uzoraka Calacatta Active Surfaces SL 300x150, 6 mm potvrđen je protiv SARS-CoV-2, odgovornog za COVID-19.

Tablica 1: Rezultati testa anti-SARS-Cov-2 na uzorcima “gres porcellanato” Calacatta Active Surfaces izloženih UV svjetlosti intenziteta 0.1 mW/cm² tijekom 4 sata.

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 sata Staklo Ut	N* (PFU/cm2) Log N T=4 sata Active Surface At	Antivirusno djelovanje Ut-At	% Inhibicija virusa
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	94.04 %

* N je zaraznost virusa primijenjenog po cm2 uzorka.. Podaci su izraženi kao srednja vrijednost i standardna devijacija, u zagradama.

Tablica 2: Rezultati testa anti-SARS-Cov-2 na uzorcima “gres porcellanato” Calacatta Active Surfaces u mraku tijekom 4 sata

N* (PFU/cm2) T=0 U0	N* (PFU/cm2) Log N T=4 sata Staklo Ut	N* (PFU/cm2) Log N T=4 sata Active Surface At	Antivirusno djelovanje Ut-At	% Inhibicija virusa
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	75.48 %

* N je zaraznost virusa primijenjenog po cm2 uzorka.. Podaci su izraženi kao srednja vrijednost i standardna devijacija, u zagradama.

Tablica 3: Rezultati citotoksičnosti i osjetljivosti stanica na SARS-Cov-2



	Citotossicità	Sensibilità al virus		
	Metodo MTT	S (Log PFU/ml)	Criteri di accettabilità	Risultato
Negativa controllo	1.151 (0.151)*	2.618		
No Active	1.293 (0.075)	2.461	$ S_n - S_u \leq 0.5$	0.157 (≤ 0.5 , accettato)
Active Surfaces	1.209 (0.074)	2.441	$ S_n - S_t \leq 0.5$	0.177 (≤ 0.5 , accettato)

*Valore ottico (OD) del test MTT. I dati rappresentano la media e la deviazione standard, ottenute da tre repliche.

ZAKLJUCAK

U korištenim eksperimentalnim uvjetima, nakon 4 sata izlaganja UV svjetlosti intenziteta 0,1 mW / cm², uzorci Calacatta Active Surfaces pokazali su antivirusno djelovanje protiv SARS-CoV-2.

Detaljno, uzorci Calacatta Active Surfaces pokazali su 94,04% učinkovitosti u smanjenju virusne prenosivosti.

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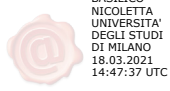
MILANO ÜNİVERSİTESİ

TIP VE CERRAHI FAKÜLTESİ

SONUÇ RAPORU: Üzerine UV ışık uygulanan "Calacatta Active Surface" numunelerin Antiviral aktivitesi

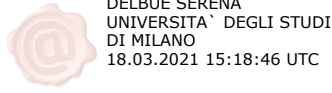
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Rapor tarihi: 22 Şubat 2021

AMAÇ

Bu çalışmanın amacı, 0.1 mW/cm² yoğunlukta 4 saat UV ışınlarına maruz bırakılma sonrasında IRIS CERAMICA GROUP tarafından verilen, AgNPs-TiO₂ ile işlem görmüş “granit seramik” numunelerin (Ürün adı: Calacatta Active Yüzey yarı mat, 300x150, 6 mm) antiviral etkinliğini kanıtlamaktır.

Kısacası, COVID-19’a sebep olan SARS-CoV-2 numunenin üzerine konulmuş ve Plak test metodu ile virüs kalıntılarının etkisizliği ölçülmüştür.

SONUÇLAR

COVID-19’a sebep olan SARS CoV-2’ye karşı Calacatta Active Surfaces yarımat 300x150, 6 mm numunelerin antiviral etkisi test edilmiştir.

Tablo 1: 4 saat boyunca 0.1mW/cm² yoğunlukta UV ışığa maruz kalan Calacatta Active Surfaces “granit seramik” numunelerin üzerinde yapılan anti SARS-CoV-2 testlerinin sonuçları

N*(PFU/cm2 T=0 U0	N*(PFU/cm2 Log N T=4 saat Cam Ut	N* (PFU/cm2) Log N T=4 saat Active Surface At	Antiviral aktivite Ut-At	Virüs azaltması %
84401 (14797) Log=4.926	4987 (2011) Log=3.673	283 (48) Log=2.448	1.225	%94.04

*N, numunenin her cm2’sinde kalmış virüslerin etkisizliğini gösterir. Parantez içinde verilen veriler ortalama ve standart sapmalar olarak belirtilmiştir.

Tablo 2: 4 saat karanlıkta kalan Calacatta Active Surfaces “granit seramik” numuneler üzerinde yapılan anti SARS-CoV-2 test sonuçları

N*(PFU/cm2 T=0 U0	N*(PFU/cm2 Log N T=4 saat Cam Ut	N* (PFU/cm2) Log N T=4 saat Active Surface At	Antiviral aktivite Ut-At	Virüs azaltması %
84401 (14797) Log=4.926	27727 (14047) Log=4.394	8963 (5971) Log=3.784	0.611	%75.48

*N, numunenin her cm2’sinde kalmış virüslerin etkisizliğini gösterir. Parantez içinde verilen veriler ortalama ve standart sapmalar olarak belirtilmiştir.

Tablo 3: SARS-CoV-2'ye karşı hücrelerin sitotoksosite ve hassasiyeti test sonuçları

	Sitotoksosite	SARS-CoV-2'ye hassasiyet		
	MTT metodu	S (Log PFU/ml)	Gecerlilik kriteri	Sonuç
Negatif Kontrol	1.151 (o.151)*	2.618		
Active olmayan	1.293 (0.075)	2.461	$ Sn-Su \leq 0.5$	0.157 (≤ 0.5 , gecerli)
Active Surfaces	1.209 (0.074)	2.441	$ Sn-St \leq 0.5$	0.177 (≤ 0.5 , gecerli)

*MTT testinin gözle görünür yoğunluk testi değerleri. Parantez içinde, üç numuneden toplanan veriler ortalama ve standart sapmayı temsil etmektedir.

KANAAT:

Kullanılan deneysel koşullarda, 0.1 mW/cm² yoğunlukta UV ışınlarına 4 saat maruz kaldıktan sonra Calacatta Active Surfaces numuneleri SARS-CoV-2'ye karşı antiviral aktiflik göstermişlerdir.

Detaylı olarak, Calacatta Active Surfaces canlı virüslerin azaltılmasında %94.04 bir etkinlik göstermiştir.



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分 析 检 测 报 告

REPORT FOR ANALYSIS

报 告 编 号

Report №.

2020FM24809R02D

样 品 名 称

Name of Sample

光催化陶瓷

photocatalytic ceramic

委 托 单 位

Applicant

IRIS CERAMICA GROUP

检 测 类 型

Test Type

委托检测

Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

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分 析 检 测 报 告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM24809R02D 校验码 (Verification Code): 95736208

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地 址 Address	Sede operativa: Via Ghiarola Nuova 119 41042 Fiorano Modenese (MO) ITALY
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	40 片 40 pcs
样品规格和批号 Spec and Lot No of Sample	ICG、50×50×6mm	样品状态和特性 State and Characteristic	白色,片状 White, Flaky
接样日期 Sample Received Date	2020-08-31	检测完成日期 Completion Date	2020-09-24
检测依据和方法 Test Standard and Method	ISO 18061-2014		
检测项目 Item Tested	抗病毒性能 Antiviral property		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-09-28 Issue Date (机构盖章 Official Seal)		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP。(由委托方提供) Manufacturer: IRIS CERAMICA GROUP.(provided by the applicant)		

制 表: 吴秋茹
Editor

审 核: 李素娟
Verifier

批 准: 陈保
Approver



广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

1. 测试要求: 光照强度为 $0.01\text{mW}/\text{cm}^2$ 。Test requirement: Illumination intensity was $0.01\text{mW}/\text{cm}^2$

1.1 试验结果 Test results

实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{PCS}$	平均病毒总数 Average infectivity titre value $\text{TCID}_{50}/\text{PCS}$
甲型流感病毒 H3N2 宿主名称: MDCK 细胞 Influenza A virus H3N2 Host cell: MDCK	0h	对照组 1 Control group 1	5.75	5.74	6.74	5.54×10^6
		对照组 2 Control group 2	5.80			
		对照组 3 Control group 3	5.67			
	暗条件 Dark condition 6h	对照组 1 Control group 1	5.29	5.34	6.34	2.22×10^6
		对照组 2 Control group 2	5.33			
		对照组 3 Control group 3	5.41			
		试验组 1 Test group 1	< 1.50	< 1.50	< 2.50	$< 3.16 \times 10^2$
		试验组 2 Test group 2	< 1.50			
		试验组 3 Test group 3	< 1.50			

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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

(接上页 Continued)						
实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre value TCID ₅₀ /PCS
甲型流感病毒 H3N2 宿主名称: MDCK 细胞 Influenza A virus H3N2 Host cell: MDCK	光条件 Light condition 6h	对照组 1 Control group 1	4.75	4.74	5.74	5.54×10 ⁵
		对照组 2 Control group 2	4.80			
		对照组 3 Control group 3	4.67			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	<3.16×10 ²
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			
抗病毒活性 Antiviral activity			>3.24	百分率 Percent (%)		>99.94
光催化材料在 UVA 照射下的抗病毒活性值 The antiviral activity of photocatalytic materials under UVA irradiation			0	百分率 Percent (%)		0
非光催化剂抗病毒活性贡献值 Contribution of antiviral activity of non-photocatalyst			>3.84	百分率 Percent (%)		>99.98
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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

2. 测试要求: 光照强度为 $0.01\text{mW}/\text{cm}^2$ 。Test requirement: Illumination intensity was $0.01\text{mW}/\text{cm}^2$

2.1 试验结果 Test results

实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{PCS}$	平均病毒总数 Average infectivity titre value $\text{TCID}_{50}/\text{PCS}$
脊髓灰质炎 病毒-I 型 疫苗株 宿主名称: Vero 细胞 Poliovirus- I vaccine strain Host cell: Vero	0h	对照组 1 Control group 1	5.67	5.64	6.64	4.36×10^6
		对照组 2 Control group 2	5.67			
		对照组 3 Control group 3	5.57			
	暗条件 Dark condition 6h	对照组 1 Control group 1	5.41	5.36	6.36	2.28×10^6
		对照组 2 Control group 2	5.33			
		对照组 3 Control group 3	5.33			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	$<3.16 \times 10^2$
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			

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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

(接上页 Continued)						
实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre value TCID ₅₀ /PCS
脊髓灰质炎 病毒-I 型 疫苗株 宿主名称: Vero 细胞 Poliovirus- I vaccine strain Host cell: Vero	光条件 Light condition 6h	对照组 1 Control group 1	4.80	4.90	5.90	8.08×10 ⁵
		对照组 2 Control group 2	5.00			
		对照组 3 Control group 3	4.90			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	<3.16×10 ²
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			
抗病毒活性 Antiviral activity			>3.40	百分率 Percent (%)		>99.96
光催化材料在 UVA 照射下的抗病毒活性值 The antiviral activity of photocatalytic materials under UVA irradiation			0	百分率 Percent (%)		0
非光催化剂抗病毒活性贡献值 Contribution of antiviral activity of non-photocatalyst			>3.86	百分率 Percent (%)		>99.98
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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

3. 测试要求: 光照强度为 $0.25\text{mW}/\text{cm}^2$ 。Test requirement: Illumination intensity was $0.25\text{mW}/\text{cm}^2$

3.1 试验结果 Test results

实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{mL}$	平均病毒 滴度对数值 Average logarithm of infectivity titre value $\lg\text{TCID}_{50}/\text{PCS}$	平均病毒总数 Average infectivity titre value $\text{TCID}_{50}/\text{PCS}$
甲型流感 病毒 H1N1 (A/PR/8/34) MDCK 细胞 <i>Influenza A</i> <i>virus</i> H1N1 (A/PR/8/34) Host cell: MDCK	0h	对照组 1 Control group 1	5.67	5.68	6.68	4.90×10^6
		对照组 2 Control group 2	5.80			
		对照组 3 Control group 3	5.57			
	暗条件 Dark condition 2h	对照组 1 Control group 1	5.43	5.42	6.42	2.65×10^6
		对照组 2 Control group 2	5.41			
		对照组 3 Control group 3	5.43			
		试验组 1 Test group 1	2.67	2.76	3.76	5.77×10^3
		试验组 2 Test group 2	2.80			
		试验组 3 Test group 3	2.80			

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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R02D

(接上页 Continued)						
实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验 组别 Group	病毒滴度 对数值 Logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre value TCID ₅₀ /PCS
甲型流感 病毒 H1N1 (A/PR/8/34) MDCK 细胞 Influenza A virus H1N1 (A/PR/8/34) Host cell: MDCK	光条件 Light condition 2h	对照组 1 Control group 1	4.67	4.76	5.76	5.77×10 ⁵
		对照组 2 Control group 2	4.80			
		对照组 3 Control group 3	4.80			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	<3.16×10 ²
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			
抗病毒活性 Antiviral activity			>3.26	百分率 Percent (%)		>99.95
光催化材料在 UVA 照射下的抗病毒活性值 The antiviral activity of photocatalytic materials under UVA irradiation			>0.60	百分率 Percent (%)		>74.88
非光催化剂抗病毒活性贡献值 Contribution of antiviral activity of non-photocatalyst			2.66	百分率 Percent (%)		99.78
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报告编号 (Report No.): 2020FM24809R02D

注意事项 Notice Items

1. 检测报告无本单位检验检测专用章、骑缝章无效。

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The Test report is invalid without signature of verifier and approver.

3. 检测报告涂改增删无效。

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Unless otherwise stated, the results shown in this test report refer only to the sample(s) submitted.

6. 对检测报告有异议的, 应于收到报告之日起十五日内提出, 逾期不予受理。

Any dispute of the report must be raised to the testing body within 15 days after the report is received, exceeding which the dispute will not be accepted.

7. 对送检样品, 样品信息由委托方提供, 本单位不对其真实性负责。

For the tested sample(s) submitted by the applicant, the sample information in the test report is provided by the applicant and the laboratory is not responsible for its authenticity.

8. 本检测报告仅供委托方参考, 不具有对社会证明作用。

This test report is for reference only to the applicant and does not have a proof of effect for others.



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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 报 告

REPORT FOR ANALYSIS

报 告 编 号

Report №.

2020FM24809R01D

样 品 名 称

Name of Sample

光催化陶瓷

photocatalytic ceramic

委 托 单 位

Applicant

IRIS CERAMICA GROUP

检 测 类 型

Test Type

委托检测

Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

Address: Building 66, No.100 Central Xian Lie Road, Guangzhou, China

邮政编码: 510070

Postcode:

电话号码: (020)87137666

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网 址: www.gddcm.com

Website:



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Gmicro Testing

广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测报告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM24809R01D 校验码 (Verification Code): 51876234

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地址 Address	Sede operativa: Via Ghiarola Nuova 119 41042 Fiorano Modenese (MO) ITALY
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	40 片 40 pcs
样品规格和批号 Spec and Lot No of Sample	ICG、50×50×6mm	样品状态和特性 State and Characteristic	白色,片状 White, Flaky
接样日期 Sample Received Date	2020-08-31	检测完成日期 Completion Date	2020-09-24
检测依据和方法 Test Standard and Method	ISO 21702:2019		
检测项目 Item Tested	抗病毒活性试验 Antiviral activity test		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-09-28 Issue Date (机构盖章 Official Seal)		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP。(由委托方提供) Manufacturer: IRIS CERAMICA GROUP.(provided by the applicant)		

制表: 吴秋芳
Editor

审核: 李惠娟
Verifier

批准: 陈保
Approver



广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R01D

实验病毒及宿主 Virus and host cell	实验 序号 No.	对照样未经抗病毒 处理试样接种 0h 后 病毒滴度 Infectivity titre value immediate after inoculation of the reference specimen	对照样未经抗病毒 处理试样接种 24h 后 病毒滴度 Infectivity titre value after 24h contacting with the reference specimen	试验样经抗病毒 处理试样接种 24h 后 病毒滴度 Infectivity titre value after 24h contacting with the test specimen
甲型流感病毒 H3N2 宿主名称:MDCK 细胞 Influenza A virus H3N2 Host cell: MDCK	1	5.90	4.67	<1.50
	2	6.00	4.67	<1.50
	3	5.80	4.80	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL		5.90	4.71	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /cm ²		5.70	4.51	<1.30
平均病毒总数 Average infectivity titre value TCID ₅₀ /cm ²		5.05×10 ⁵	3.26×10 ⁴	<19.8
抗病毒活性值 Antiviral activity value		>3.21		
抗病毒活性率（%） Antiviral activity rate（%）		>99.94		
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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R01D

实验病毒及宿主 Virus and host cell	实验 序号 No.	对照样未经抗病毒 处理试样接种 0h 后 病毒滴度 Infectivity titre value immediate after inoculation of the reference specimen	对照样未经抗病毒 处理试样接种 24h 后 病毒滴度 Infectivity titre value after 24h contacting with the reference specimen	试验样经抗病毒 处理试样接种 24h 后 病毒滴度 Infectivity titre value after 24h contacting with the test specimen
脊髓灰质炎病毒- I 型疫苗株 宿主名称: Vero 细胞 Poliovirus- I vaccine strain Host cell: Vero	1	5.75	4.67	<1.50
	2	5.80	4.57	<1.50
	3	5.67	4.67	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL		5.74	4.64	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /cm ²		5.54	4.44	<1.30
平均病毒总数 Average infectivity titre value TCID ₅₀ /cm ²		3.46×10 ⁵	2.72×10 ⁴	<19.8
抗病毒活性值 Antiviral activity value		>3.14		
抗病毒活性率（%） Antiviral activity rate（%）		>99.93		
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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM24809R01D

实验病毒及宿主 Virus and host cell	实验 序号 No.	对照样未经抗病毒 处理试样接种 0h 后 病毒滴度 Infectivity titre value immediate after inoculation of the reference specimen	对照样未经抗病毒 处理试样接种 6h 后 病毒滴度 Infectivity titre value after 6h contacting with the reference specimen	试验样经抗病毒 处理试样接种 6h 后 病毒滴度 Infectivity titre value after 6h contacting with the test specimen
甲型流感病毒 H1N1（A/PR/8/34） MDCK 细胞 Influenza A virus H1N1（A/PR/8/34） Host cell: MDCK	1	5.80	5.50	<1.50
	2	5.90	5.43	<1.50
	3	5.80	5.41	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL		5.83	5.45	<1.50
平均病毒滴度对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /cm ²		5.63	5.25	<1.30
平均病毒总数 Average infectivity titre value TCID ₅₀ /cm ²		4.28×10 ⁵	1.76×10 ⁵	<19.8
抗病毒活性值 Antiviral activity value		>3.95		
抗病毒活性率（%） Antiviral activity rate（%）		>99.98		
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报告编号 (Report No.): 2020FM24809R01D

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7. 对送检样品, 样品信息由委托方提供, 本单位不对其真实性负责。

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分 析 检 测 报 告

REPORT FOR ANALYSIS

报 告 编 号

Report №.

2020FM15307R04D

样 品 名 称

Name of Sample

光催化陶瓷

photocatalytic ceramic

委 托 单 位

Applicant

IRIS CERAMICA GROUP

检 测 类 型

Test Type

委托检测

Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

Address: Building 66, No.100 Central Xian Le Road, Guangzhou, China

邮政编码: 510070

Postcode:

电话号码: (020)87137666

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网 址: www.gddcm.com

Website:



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分 析 检 测 报 告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM15307R04D 校验码 (Verification Code): 18653290

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地 址 Address	Sede operativa: Via Ghiarola Nuova 119
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	30 片 30 pcs
样品规格和批号 Spec and Lot No of Sample	—	样品状态和特性 State and Characteristic	片状 Flaky
接样日期 Sample Received Date	2020-05-26	检测完成日期 Completion Date	2020-07-06
检测依据和方法 Test Standard and Method	参照 ISO 18061-2014 Refer to ISO 18061-2014		
检测项目 Item Tested	抗病毒性能 Antiviral property		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-07-08 Issue Date: 11/5 机构盖章 Official Seal 检验检测专用章		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP。(由委托方提供) Manufacturer: IRIS CERAMICA GROUP. (provided by the applicant)		

制 表:
Editor

陈颖婷

审 核:
Verifier

孙延丽

批 准:
Approver

林保



广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R04D

1.测试要求: 光照强度为 0.01mW/cm²。Test requirement: Illumination intensity was 0.01mW/cm²

2.试验结果 Test results:

实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验组别 Group	病毒滴度 对数值 Logarithm of infectivity titre of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre of virus TCID ₅₀ /PCS
甲型流感 病毒 H1N1 (A/PR/8/34) 宿主名称: MDCK 细胞 H1N1 Influenza A virus (A/PR/8/34) Host cell: MDCK	0h	对照组 1 Control group 1	5.67	5.76	6.76	5.77×10 ⁶
		对照组 2 Control group 2	5.80			
		对照组 3 Control group 3	5.80			
	暗条件 Dark condition 8h	对照组 1 Control group 1	5.41	5.34	6.34	2.22×10 ⁶
		对照组 2 Control group 2	5.33			
		对照组 3 Control group 3	5.29			
		试验组 1 Test group 1	4.43	4.45	5.45	2.85×10 ⁵
		试验组 2 Test group 2	4.43			
		试验组 3 Test group 3	4.50			

(接下页 Continued on the next page)



广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R04D

(接上页 Continued)						
实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验组别 Group	病毒滴度 对数值 Logarithm of infectivity titre of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre of virus TCID ₅₀ /PCS
甲型流感 病毒 H1N1 (A/PR/8/34) 宿主名称: MDCK 细胞 H1N1 <i>Influenza</i> <i>A virus</i> (A/PR/8/34) Host cell: MDCK	光条件 Light condition 8h	对照组 1 Control group 1	4.50	4.55	5.55	3.59×10 ⁴
		对照组 2 Control group 2	4.57			
		对照组 3 Control group 3	4.59			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	<3.16×10 ²
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			
抗病毒活性 Antiviral activity			>3.05 (>99.91%)			
光催化材料在 UVA 照射下的抗病毒活性值 The antiviral activity of photocatalytic materials under UVA irradiation			>2.16 (>99.31%)			
非光催化剂抗病毒活性贡献值 Contribution of antiviral activity of non-photocatalyst			0.89 (87.17%)			
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报告编号 (Report No.): 2020FM15307R04D

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分 析 检 测 报 告

REPORT FOR ANALYSIS

报 告 编 号

Report №.

2020FM15307R01D

样 品 名 称

Name of Sample

光催化陶瓷

photocatalytic ceramic

委 托 单 位

Applicant

IRIS CERAMICA GROUP

检 测 类 型

Test Type

委托检测
Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

Address: Building 66, No.100 Central Xianle Road, Guangzhou, China

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Postcode:

电话号码: (020)87137666

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Gmicro Testing

广东省微生物分析检测中心

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分 析 检 测 报 告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM15307R01D 校验码 (Verification Code): 43971652

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地 址 Address	Sede operativa: Via Ghiarola Nuova 119
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	30 片 30 pcs
样品规格和批号 Spec and Lot No of Sample	—	样品状态和特性 State and Characteristic	片状 Flaky
接样日期 Sample Received Date	2020-05-26	检测完成日期 Completion Date	2020-07-04
检测依据和方法 Test Standard and Method	ISO 21702:2019		
检测项目 Item Tested	抗病毒活性试验 Antiviral activity test		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-07-10 Issue Date: 2020-07-10 机构盖章 Official Seal 检验检测专用章		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP. (由委托方提供) Manufacturer: IRIS CERAMICA GROUP. (provided by the applicant)		

制 表:
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Gmicro Testing

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GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分 析 检 测 结 果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R01D

病毒名称 Virus	实验 序号 No.	对照样未经抗病毒 处理试样接种 0h 后病毒滴度 The infectivity titre value immediate after inoculation of the reference specimen	对照样未经抗病毒 处理试样接种 24h 后病毒滴度 The infectivity titre value after 24h contacting with the reference specimen	试验样经抗病毒 处理试样接种 24h 后病毒滴度 The infectivity titre value after 24h contacting with the test specimen
甲型流感病毒 H1N1（A/PR/8/34） MDCK 细胞 Influenza A virus H1N1（A/PR/8/34） Host cell: MDCK	1	6.33	4.57	2.50
	2	6.20	4.67	2.50
	3	6.20	4.50	2.57
平均病毒滴度的对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL		6.24	4.58	2.52
平均病毒滴度的对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /cm ²		6.04	4.43	2.32
平均病毒总数 Average virus count TCID ₅₀ /cm ²		1.11×10 ⁶	2.41×10 ⁴	2.09×10 ²
抗病毒活性值 Logarithm of antiviral activity		2.06		
抗病毒活性率（%） Antiviral activity rate（%）		99.13		
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GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测报告

REPORT FOR ANALYSIS

报告编号

2020FM15307R03D

Report №.

样品名称

光催化陶瓷

Name of Sample

photocatalytic ceramic

委托单位

IRIS CERAMICA GROUP

Applicant

检测类型

委托检测

Test Type

Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

Address: Building 66, No.100 Central Xianle Road, Guangzhou, China

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分 析 检 测 报 告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM15307R03D 校验码 (Verification Code): 59462170

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地 址 Address	Sede operativa: Via Ghiarola Nuova 119
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	30 片 30 pcs
样品规格和批号 Spec and Lot No of Sample	—	样品状态和特性 State and Characteristic	片状 Flaky
接样日期 Sample Received Date	2020-05-26	检测完成日期 Completion Date	2020-07-06
检测依据和方法 Test Standard and Method	参照 ISO 18061-2014 Refer to ISO 18061-2014		
检测项目 Item Tested	抗病毒性能 Antiviral property		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-07-08 Issue Date: 2020-07-08 机构盖章 Official Seal 检验检测专用章		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP. (由委托方提供) Manufacturer: IRIS CERAMICA GROUP. (provided by the applicant)		

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审 核:
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Approver

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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R03D

1.测试要求: 光照强度为 0.01mW/cm²。Test requirement: Illumination intensity was 0.01mW/cm²

2.试验结果 Test results

实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验组别 Group	病毒滴度 对数值 Logarithm of infectivity titre of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre of virus TCID ₅₀ /PCS
肠道病毒 71 型 宿主名称: Vero 细胞 Human enterovirus 71 Host cell: Vero	0h	对照组 1 Control group 1	5.80	5.93	6.93	8.77×10 ⁶
		对照组 2 Control group 2	6.00			
		对照组 3 Control group 3	6.00			
	暗条件 Dark condition 8h	对照组 1 Control group 1	5.57	5.50	6.50	3.19×10 ⁵
		对照组 2 Control group 2	5.50			
		对照组 3 Control group 3	5.43			
		试验组 1 Test group 1	5.33	5.40	6.40	2.51×10 ⁶
		试验组 2 Test group 2	5.43			
		试验组 3 Test group 3	5.43			

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广东省微生物分析检测中心

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R03D

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实验病毒 及宿主 Virus and host cell	作用时间 Action time	试验组别 Group	病毒滴度 对数值 Logarithm of infectivity titre of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /mL	平均病毒 滴度对数值 Average titre infectivity of virus lgTCID ₅₀ /PCS	平均病毒总数 Average infectivity titre of virus TCID ₅₀ /PCS
肠道病毒 71 型 宿主名称: Vero 细胞 Human enterovirus 71 Host cell: Vero	光条件 Light condition 8h	对照组 1 Control group 1	4.57	4.58	5.58	3.85×10 ⁵
		对照组 2 Control group 2	4.67			
		对照组 3 Control group 3	4.50			
		试验组 1 Test group 1	<1.50	<1.50	<2.50	<3.16×10 ²
		试验组 2 Test group 2	<1.50			
		试验组 3 Test group 3	<1.50			
抗病毒活性 Antiviral activity			>3.08 (>99.92%)			
光催化材料在 UVA 照射下的抗病毒活性值 The antiviral activity of photocatalytic materials under UVA irradiation			>2.98 (>99.89%)			
非光催化剂抗病毒活性贡献值 Contribution of antiviral activity of non-photocatalyst			0.10 (21.40%)			
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报告编号 (Report No.): 2020FM15307R03D

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GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测报告

REPORT FOR ANALYSIS

报告编号

Report №.

2020FM15307R02D

样品名称

Name of Sample

光催化陶瓷

photocatalytic ceramic

委托单位

Applicant

IRIS CERAMICA GROUP

检测类型

Test Type

委托检测
Entrustment Test

单位地址: 广州市先烈中路 100 号大院 66 号楼

Address: Building 66, No.100 Central Xianle Road, Guangzhou, China

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传真号码: (020)87137668

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网 址: www.gddcm.com

Website:



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Gmicro Testing

广东省微生物分析检测中心

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分 析 检 测 报 告

REPORT FOR ANALYSIS



报告编号 (Report No.) 2020FM15307R02D 校验码 (Verification Code): 45092873

样品名称 Name of Sample	光催化陶瓷 photocatalytic ceramic	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	IRIS CERAMICA GROUP	地 址 Address	Sede operativa: Via Ghiarola Nuova 119
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	30 片 30 pcs
样品规格和批号 Spec and Lot No of Sample	—	样品状态和特性 State and Characteristic	片状 Flaky
接样日期 Sample Received Date	2020-05-26	检测完成日期 Completion Date	2020-07-04
检测依据和方法 Test Standard and Method	ISO 21702:2019		
检测项目 Item Tested	抗病毒活性试验 Antiviral activity test		
检测结论 Test Conclusion	该样品所检项目的实测数据见本检测报告续页。 The test data of the sample(s) is attached to the page(s) of this report. 签发日期: 2020-07-08 Issue Date: 2020-07-08 机构盖章 Official Seal 检验检测专用章		
备注 Remarks	生产厂家: IRIS CERAMICA GROUP. (由委托方提供) Manufacturer: IRIS CERAMICA GROUP. (provided by the applicant)		

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GUANGDONG DETECTION CENTER OF MICROBIOLOGY

分析检测结果

ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM15307R02D

病毒名称 Virus	实验 序号 No.	对照样未经抗病毒 处理试样接种 0h 后病毒滴度 The infectivity titre value immediate after inoculation of the reference specimen	对照样未经抗病毒 处理试样接种 24h 后病毒滴度 The infectivity titre value after 24h contacting with the reference specimen	试验样经抗病毒 处理试样接种 24h 后病毒滴度 The infectivity titre value after 24h contacting with the test specimen
肠道病毒 71 型 宿主名称： Vero 细胞 Human enterovirus 71 Host cell: Vero	1	6.12	4.50	4.12
	2	6.00	4.57	4.20
	3	6.12	4.50	4.00
平均病毒滴度的对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /mL		6.08	4.52	4.11
平均病毒滴度的对数值 Average logarithm of infectivity titre value lgTCID ₅₀ /cm ²		5.88	4.32	3.90
平均病毒总数 Average virus count TCID ₅₀ /cm ²		7.58×10 ⁵	2.09×10 ⁴	8.13×10 ³
抗病毒活性值 Logarithm of antiviral activity		0.42		
抗病毒活性率（%） Antiviural activity rate（%）		61.12		
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Test Report N. 2587 /EL MI21

Spett.le
IRIS CERAMICA GROUP SPA
VIA CANALINO 16
41121 MODENA (MO)

Modena 29/06/2021

Receipt N.: 2.587/EL MI	Date of receipt : 12/05/21	Analysis start date: 21/06/21	Analysis end date: 28/06/21
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm - G32 Sample code not-treated specimens: CALCATTA TQ -treated specimens: 50 x 50 mm square, 6 mm thickness; -not-treated specimens: 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis; -cover film : polypropylene film 40 x 40 mm square - 0.10 mm thickness -volume of test inoculum : 150 ul -test bacteria : Escherichia coli ATCC 8739 -deviation from test method: contact time 30 minutes at 37°C		
Sampling:	made by customer		
Date of sampling:	12/05/21		

Test	Method	UM	Result
Antibacterial activity E. coli ATCC 8739*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,20
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,20
<i>Average number of bacteria non treated specimen after inoc*</i>		Log(cells/cm2)	4,20
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	4,19
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	1,02
<i>Antibacterial activity R*</i>		Log10	3,2

Test Report N. 2587 /EL MI21**Spett.le****IRIS CERAMICA GROUP SPA****Receipt N.: 2.587/EL MI****Date of receipt : 12/05/21****Analysis start date: 21/06/21****Analysis end date: 28/06/21**

Test	Method	UM	Result
Antibacterial activity R%*		%	99,93

NOTE:

the test assesses the survival of bacteria type Escherichia coli ATCC 8739 on the surface of CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6 mm at 37°C for 30 mins. Under test condition specified in the description sample, the bacterial reduction is equal to 99.93%

LABORATORY MANAGER

Dr.ssa Alessandra Carletti Ordine
Nazionale dei Biologi Albo professionale
n. AA_034638



U: expanded uncertainty associated with single measurement ($P = 95\%$ - $K = 2$) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ: Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer.

PNN: internal method - ["] Subcontracted test - If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.

Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) the reported expanded measurement uncertainty has been estimated in accordance with ISO 19036:2019 and is based on a standard uncertainty multiplied by a coverage factor of $K=2$, providing a level of confidence of approximately 95%; coagulase-positive staphylococci are counted at 37°C; presumptive Bacillus cereus are counted at 30°C. Waters : ISO 8199:2018; (results expressed with $< 4\text{ ufc/ml}$ and $< 40\text{ ufc/g}$ indicate that microorganisms are present but less than the value expressed ; for values between $4\text{--}10\text{ cfu/ml}$, $3\text{--}10\text{ ufc/100ml}$, $40\text{--}100\text{ cfu/g}$ the number of microorganisms is estimated)

Declarations of conformity and decision-making rule: take into account the measurement uncertainty as indicated by the laws and regulations in force or by specific customer requests, applying the rules relating to the rounding of the numbers; if not provided for by laws and regulations in force or by specific customer requests, the measurement uncertainty of the test is not considered to express the opinion of conformity.

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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

END OF TEST REPORT

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Test Report N. 4513 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.
VIA RADICI NORD 112
42014 CASTELLARANO (MO)

Modena 11/12/2017

Receipt N.: 4.513/EL MI	Date of receipt : 08/11/17	Analysis start date: 08/11/17	Analysis end date: 22/11/17
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL 300 x 250 cm ACTIVE 2.0		
	Test information:		
	-treated specimen: 50 x 50 mm square, 6 mm thickness;		
	-not-treated specimens: glass 50 x 50 mm square, 6 mm thickness;		
	-all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis;		
	-cover film: polypropylene film 40 x 40 mm square - 0.10 mm thickness;		
	-test bacteria: Escherichia coli ATCC 8739;		
	-volume of test inoculum: 150ul.		
Sampling:	made by customer		
Date of sampling:	08/11/17		

Test	Method	UM	Result
Antibacterial activity E. coli ATCC 8739*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,32
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,28
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	2,98
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	<1
<i>Antibacterial activity R*</i>		Log10	3,2

Test Report N. 4513 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.

Receipt N.: 4.513/EL MI Date of receipt : 08/11/17 Analysis start date: 08/11/17 Analysis end date: 22/11/17

Test	Method	UM	Result
Antibacterial activity R%*		%	99,94

NOTE :

the test assesses the survival of bacteria type E. coli ATCC 8739 on the surface of CALACATTA SL 300 X 150 cm ACTIVE 2.0 at 37°C for 24h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.94%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 34638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ : Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer . PNN : internal method - ["] Subcontracted test
Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions)
waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated)
Results of tests with the legal limits are evaluated taking into account the value of the uncertainty and the rules relating to rounding .
Results of tests with the reference values defined by the Customer shall be assessed taking into account the value of the uncertainty only if requested by the Customer. Non-compliant results are given if requested by the Customer.
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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

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Test Report N. 3416 /EL MI20

Spett.le

IRIS CERAMICA GROUP SPA

VIA CANALINO 16

41121 MODENA (MO)

Modena 28/12/2020

Receipt N.: 3.416/EL MI	Date of receipt : 22/09/20	Analysis start date: 15/12/20	Analysis end date: 23/12/20
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE Surfaces - 300 x 150 cm - 6mm Test information: -treated specimen: 50 x 50 mm square, 6 mm thickness; -not-treated specimens: 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis; -cover film: polypropylene film 40 x 40 mm square - 0.10 mm thickness; -test bacteria: Citrobacter Koserii ATCC 27156; -volume of test inoculum: 150ul; -deviation from test method: test bacteria Citrobacter Koserii ATCC 27156		
Sampling:	made by customer		
Date of sampling:	22/09/20		

Test	Method	UM	Result
Antibacterial activity Citrobacter koserii ATCC 27156*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,11
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,33
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	5,94
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	2,44
<i>Antibacterial activity R*</i>		Log10	3,5

Test Report N. 3416 /EL MI20

Spett.le

IRIS CERAMICA GROUP SPA

Receipt N.: 3.416/EL MI

Date of receipt : 22/09/20

Analysis start date: 15/12/20

Analysis end date: 23/12/20

Test	Method	UM	Result
Antibacterial activity R%*		%	99,97

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti Ordine
Nazionale dei Biologi Albo professionale
n. AA_034638

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U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ: Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer.

PNN: internal method - ["] Subcontracted test - If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.

Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2018; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 3-10 ufc/100ml, 40-100 cfu / g the number of microorganisms is estimated)

Declarations of conformity and decision-making rule: take into account the measurement uncertainty as indicated by the laws and regulations in force or by specific customer requests, applying the rules relating to the rounding of the numbers; if not provided for by laws and regulations in force or by specific customer requests, the measurement uncertainty of the test is not considered to express the opinion of conformity.

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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

END OF TEST REPORT

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Test Report N. 3415 /EL MI20

Spett.le

IRIS CERAMICA GROUP SPA

VIA CANALINO 16

41121 MODENA (MO)

Modena 09/10/2020

Receipt N.: 3.415/EL MI	Date of receipt : 22/09/20	Analysis start date: 30/09/20	Analysis end date: 06/10/20
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm Test information: -treated specimen: 50 x 50 mm square, 6 mm thickness; -not-treated specimens: 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis; -cover film: polypropylene film 40 x 40 mm square - 0.10 mm thickness; -test bacteria: Salmonella enterica subsp. enterica ATCC 13076; -volume of test inoculum: 150ul; -deviation from test method: test bacteria.		
Sampling:	made by customer		
Date of sampling:	22/09/20		

Test	Method	UM	Result
Antibacterial activity Salmonella enterica subsp. enterica ATCC 13076*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,18
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,09
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	5,54
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	0,25
<i>Antibacterial activity R*</i>		Log10	5,3

Test Report N. 3415 /EL MI20

Spett.le
IRIS CERAMICA GROUP SPA

Receipt N.: 3.415/EL MI

Date of receipt : 22/09/20

Analysis start date: 30/09/20

Analysis end date: 06/10/20

Test	Method	UM	Result
Antibacterial activity R%*		%	99,99

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti Ordine
Nazionale dei Biologi Albo professionale
n. AA_034638

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U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ: Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer.

PNN: internal method - [""] Subcontracted test - If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.

Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2018; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 3-10 ufc/100ml, 40-100 cfu / g the number of microorganisms is estimated)

Declarations of conformity and decision-making rule: take into account the measurement uncertainty as indicated by the laws and regulations in force or by specific customer requests, applying the rules relating to the rounding of the numbers; if not provided for by laws and regulations in force or by specific customer requests, the measurement uncertainty of the test is not considered to express the opinion of conformity.

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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

END OF TEST REPORT

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Test Report N. 4453 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA
VIA CANALINO 16
41121 MODENA (MO)

Modena 27/11/2018

Receipt N.: 4.453/EL MI	Date of receipt : 06/11/18	Analysis start date: 19/11/18	Analysis end date: 26/11/18
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm Test information: -treated specimen: 50 x 50 mm square, 6 mm thickness; -not-treated specimens: 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis; -cover film: polypropylene film 40 x 40 mm square - 0.10 mm thickness; -test bacteria: Serratia marcescens ATCC 13880; -volume of test inoculum: 150ul; -deviation from test method: test bacteria.		
Sampling:	made by customer		
Date of sampling:	06/11/18		

Test	Method	UM	Result
Antibacterial activity Serratia marcescens ATCC 13880*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,20
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,09
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	4,86
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	<1.0
<i>Antibacterial activity R*</i>		Log10	5,10

Test Report N. 4453 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA

Receipt N.: 4.453/EL MI Date of receipt : 06/11/18 Analysis start date: 19/11/18 Analysis end date: 26/11/18

Test	Method	UM	Result
Antibacterial activity R%*		%	99,99

NOTE:

the test assesses the survival of bacteria type *Serratia marcescens* ATCC 13880 on the surface of CALACATTA SL ACTIVE 2.0 - 300 X 150 cm at 37°C for 24h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.99%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 94638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ : Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer .

[*] Testing non-accredited ACCREDIA - PNN : internal method - ["] Subcontracted test - Temporary test report: test report in which some test are not completed, issued for internal use by the Customer, to be replaced with the official test report, just available. If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.

Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated) .

Declarations of conformity: take into account the measurement uncertainty as indicated by the laws and regulations in force, by applying the rules relating to rounding of the figures

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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

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Test Report N. 4475 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.
VIA RADICI NORD 112
42014 CASTELLARANO (MO)

Modena 11/12/2017

Receipt N.: 4.475/EL MI	Date of receipt : 08/11/17	Analysis start date: 08/11/17	Analysis end date: 22/11/17
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL 300 x 150 cm ACTIVE 2.0		
	Test information:		
	-treated specimen: 50 x 50 mm square, 6 mm thickness;		
	-not-treated specimens: glass 50 x 50 mm square, 6 mm thickness;		
	-all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the analysis;		
	-cover film: polypropylene film 40 x 40 mm square - 0.10 mm thickness;		
	-test bacteria: Staphylococcus aureus ATCC 43300 meticillino-resistant (MRSA);		
	-volume of test inoculum: 150ul.		
Sampling:	made by customer		
Date of sampling:	08/11/17		

Test	Method	UM	Result
Antibacterial activity S. aureo ATCC 43300*	ISO 22196:2011		
<i>N. bacteria inoculated*</i>		Log (cells/ml)	6,00
<i>Average number of bacteria non treated specimen after inoculation t=0h U0*</i>		Log(cells/cm2)	4,28
<i>Average number of bacteria non treated specimen after 24h Ut*</i>		Log(cells/cm2)	2,20
<i>Average number of bacteria treated specimen after 24h At*</i>		Log(cells/cm2)	<1
<i>Antibacterial activity R*</i>		Log10	2,4

Test Report N. 4475 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.

Receipt N.: 4.475/EL MI Date of receipt : 08/11/17 Analysis start date: 08/11/17 Analysis end date: 22/11/17

Test	Method	UM	Result
Antibacterial activity R%*		%	99,61

NOTE :

the test assesses the survival of bacteria type *Staphylococcus aureus* ATCC 43300 meticillino-resistant (MRSA) on the surface of CALACATTA SL 300 X 150 cm ACTIVE 2.0 at 37°C for 24h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.61%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 34638
Sez.A

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Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions)
waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated)
Results of tests with the legal limits are evaluated taking into account the value of the uncertainty and the rules relating to rounding .
Results of tests with the reference values defined by the Customer shall be assessed taking into account the value of the uncertainty only if requested by the Customer. Non-compliant results are given if requested by the Customer.
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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

Test Report N. 4015 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA
VIA CANALINO 16
41121 MODENA (MO)

Modena 12/11/2018

Receipt N.: 4.015/EL MI	Date of receipt : 15/10/18	Analysis start date: 23/10/18	Analysis end date: 29/10/18
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm Test information: -treated specimens : 50 x 50 mm square, 6 mm thickness; -not-treated specimens : 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the test; -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/cm2 - time exposure : 8h; -test bacteria : Serratia marcescens ATCC 13880; -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		
Sampling:	made by customer		
Date of sampling:	15/10/18		

Test	Method	UM	Result
Photocatalytic antibacterial activity - Serratia marcescens ATCC 13880*	ISO 27447:2009 - Film adhesion method		
<i>N. bacteria inoculated*</i>		cells/ml	1.500.000
<i>A - average number of bacteria non-treated specimens*</i>		cells/ml	190.000
<i>BL - average number of bacteria non treated after UV irradiation*</i>		cells/ml	89.000
<i>CL - average number of bacteria photocatalytic treated specimens after UV irradiation*</i>		cells/ml	<10
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		Log10	4,0
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		%	99,99

Test Report N. 4015 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA

Receipt N.: 4.015/EL MI Date of receipt : 15/10/18 Analysis start date: 23/10/18 Analysis end date: 29/10/18

Test	Method	UM	Result
BD - average number of bacteria non-treated specimens after dark treatment*		cells/ml	77.000
CD - Average number of bacteria photocatalytic specimens after dark treatment*		cells/ml	<10
Delta R - photocatalytic antibacterial activity value with UV irradiation*		Log10	0,1

NOTE :

the test assesses the survival of bacteria type *Serratia marcescens* ATCC 13880, on the surface of CALACATTA SL 300 X 150 cm ACTIVE 2.0, subjected to UV radiation for 8h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.99%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 34638
Sez.A

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[*] Testing non-accredited ACCREDIA - PNN : internal method - ["] Subcontracted test - Temporary test report: test report in which some test are not completed, issued for internal use by the Customer, to be replaced with the official test report, just available. If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.

Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated) .

Declarations of conformity: take into account the measurement uncertainty as indicated by the laws and regulations in force, by applying the rules relating to rounding of the figures

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REGIONE EMILIA ROMAGNA - AUTORIZZAZIONE AUTOCONTROLLO N° 008/MO/024.

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Test Report N. 4512 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.
VIA RADICI NORD 112
42014 CASTELLARANO (MO)

Modena 11/12/2017

Receipt N.: 4.512/EL MI	Date of receipt : 08/11/17	Analysis start date: 08/11/17	Analysis end date: 22/11/17
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL 300 x 150 cm ACTIVE 2.0 Test information: -treated specimens : 50 x 50 mm square, 6 mm thickness; -not-treated specimens : 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the test; -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/cm2 - time exposure : 8h; -test bacteria : Escherichia coli ATCC 8739 ; -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		
Sampling:	made by customer		
Date of sampling:	08/11/17		

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	1.500.000
<i>A - average number of bacteria non-treated specimens after inoculation*</i>		cells/ml	240.000
<i>BL - average number of bacteria non-treated specimens, after UV irradiation*</i>		cells/ml	250.000
<i>CL - average number of bacteria photocatalytic treated specimens after UV irradiation*</i>		cells/ml	10
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		Log10	4,4

Test Report N. 4512 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.

Receipt N.: 4.512/EL MI Date of receipt : 08/11/17 Analysis start date: 08/11/17 Analysis end date: 22/11/17

Test	Method	UM	Result
Reduction of bacteria from non-treated specimens after UV irradiation*		%	99,99
BD - average number of bacteria non-treated specimens after dark treatment*		cells/ml	260.000
CD - average number of bacteria photocatalytic treated specimens after dark treatment*		cells/ml	10
Delta R - photocatalytic antibacterial activity value with UV irradiation*		Log10	0,0

NOTE :

the test assesses the survival of bacteria type Escherichia coli ATCC 8739, on the surface of CALACATTA SL 300 X 150 cm ACTIVE 2.0, subjected to UV radiation for 8h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.99%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n° 34638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ : Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer . PNN : internal method - ["] Subcontracted test
Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated)
Results of tests with the legal limits are evaluated taking into account the value of the uncertainty and the rules relating to rounding .
Results of tests with the reference values defined by the Customer shall be assessed taking into account the value of the uncertainty only if requested by the Customer. Non-compliant results are given if requested by the Customer.
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Test Report N. 4474 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.
VIA RADICI NORD 112
42014 CASTELLARANO (MO)

Modena 11/12/2017

Receipt N.: 4.474/EL MI	Date of receipt : 08/11/17	Analysis start date: 08/11/17	Analysis end date: 22/11/17
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL 300 x 150 cm ACTIVE 2.0 Test information: -treated specimens : 50 x 50 mm square, 6 mm thickness; -not-treated specimens : 50 x 50 mm square, 6 mm thickness; -all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the test; -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/cm2 - time exposure : 8h; -test bacteria : Staphylococcus aureus ATCC 43300 methicillin resistant (MRSA); -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		
Sampling:	made by customer		
Date of sampling:	08/11/17		

Test	Method	UM	Result
Antibacterial activity photocatalytic materials - S. aureo ATCC 43300*	ISO 27447:2009 - Film adhesion method		
<i>N. bacteria inoculated*</i>		cells/ml	1.500.000
<i>A - average number of bacteria non-treated specimens after inoculation*</i>		cells/ml	260.000
<i>BL - average number of bacteria non-treated specimens after UV irradiation*</i>		cells/ml	44.000
<i>CL - average number of bacteria photocatalytic treated specimens after UV irradiation*</i>		cells/ml	10
<i>RL - photocatalytic antibacterial activity after UV irradiation*</i>		Log10	3,6

Test Report N. 4474 /EL MI17

Spett.le
GRANITI FIANDRE S.p.A.

Receipt N.: 4.474/EL MI

Date of receipt : 08/11/17

Analysis start date: 08/11/17 Analysis end date: 22/11/17

Test	Method	UM	Result
Reduction of bacteria from non-treated specimens after UV irradiation*		%	99,98
BD - Average number of bacteria non-treated specimens after dark treatment*		cells/ml	61.000
CD - Average number of bacteria photocatalytic specimens after dark treatment*		cells/ml	20
Delta R - photocatalytic antibacterial activity value with UV irradiation*		Log10	0,1

NOTE :

the test assesses the survival of bacteria type *Staphylococcus aureus* ATCC 43300 meticillino-resistant (MRSA), on the surface of CALACATTA SL 300 X 150 cm ACTIVE 2.0, subjected to UV radiation for 8h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.98%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n° 34638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ: Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer . PNN : internal method - ["] Subcontracted test
Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated)
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Test Report N. 1127 /EL MI18

Spett.le

IRIS CERAMICA GROUP

Sede operativa VIA GHIAROLA NUOVA, 119
41042 FIORANO MODENESE (MO)

Modena 02/05/2018

Receipt N.: 1.127/EL MI	Date of receipt : 15/03/18	Analysis start date: 03/04/18	Analysis end date: 10/04/18
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150cm - 6mm Test information: - the method PNN -100 is in conformity with ISO 27447:2009 excluding point 7.5: characteristics of light source - treated specimens : 50 x 50 mm square, 6 mm thickness - not-treated specimens : 50 x 50 mm square, 6 mm thickness - all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the test - characteristics of light source : LED LAMP OOSL S02-C36095 - round plate 22V - 11W - 144 led 4000K - OSRAM - radiometer DELTA OHM - model HD2102.2 - serial number : 10008472 - model probe: LP471 PHOT - time exposure: 8h - irradiation intensity: 1000 LUX - inoculated test bacteria suspension : 0.15 ul - test bacteria : Escherichia coli ATCC 8739 - adhesive film : polypropylene film 40 x 40 mm square - transparency rate = 85% for visible range		
Sampling:	made by customer		
Date of sampling:	15/03/18		

Test	Method	UM	Result
Photocatalytic antibacterial activity - E. coli ATCC 8739*	PNN-100 2010 Rev.0 (Ref. ISO 27447:2009 excluding point 7.5 : characteristics of light source)		
N. bacteria inoculated*		cells/ml	2.500.000
A - average number of bacteria non-treated specimens*		cells/ml	400.000
BL - average number of bacteria non-treated specimens after LED light irradiation*		cells/ml	2.600.000
CL - average number of bacteria photocatalytic treated specimens after LED light irradiation*		cells/ml	10

Test Report N. 1127 /EL MI18

Spett.le
IRIS CERAMICA GROUP

Receipt N.: 1.127/EL MI

Date of receipt : 15/03/18

Analysis start date: 03/04/18 Analysis end date: 10/04/18

Test	Method	UM	Result
RL - photocatalytic antibacterial activity after LED light irradiation*		Log10	5,4
RL - photocatalytic antibacterial activity after LED light irradiation*		%	99,99
BD - Average number of bacteria non treated specimens after dark treatment*		cells/ml	1.100.000
CD - Average number of bacteria photocatalytic specimens after dark treatment*		cells/ml	10
Delta R - Difference between photocatalytic specimens after irradiation and dark treatment*		Log10	0,4

NOTE :

the test assesses the survival of bacteria type Escherichia coli ATCC 8739, on the surface of CALACATTA SL ACTIVE 2.0 300 x 150cm - 6mm subjected to LED light 1000 LUX radiation for 8h. Under test condition specified in the description sample, the bacterial reduction is equal to 99.99%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 34638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ : Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer . PNN : internal method - ["] Subcontracted test
Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions)
waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated)
Results of tests with the legal limits are evaluated taking into account the value of the uncertainty and the rules relating to rounding .
Results of tests with the reference values defined by the Customer shall be assessed taking into account the value of the uncertainty only if requested by the Customer. Non-compliant results are given if requested by the Customer.
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Test Report N. 4450 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA
VIA CANALINO 16
41121 MODENA (MO)

Modena 23/11/2018

Receipt N.: 4.450/EL MI	Date of receipt : 06/11/18	Analysis start date: 16/11/18	Analysis end date: 20/11/18
Material:	Ceramics materials		
Product:	Ceramic tile		
Sample:	CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm Test information: - the method PNN -100 is in conformity with ISO 27447:2009 excluding point 7.5: characteristics of light source - treated specimens : 50 x 50 mm square, 6 mm thickness - not-treated specimens : 50 x 50 mm square, 6 mm thickness - all specimens are rinsed with distilled water and autoclaved at 121°C for 30 minutes before the test - characteristics of light source : LED LAMP OOSL S02-C36095 - round plate 22V - 11W - 144 led 4000K - OSRAM - radiometer DELTA OHM - model HD2102.2 - serial number : 10008472 - model probe: LP471 PHOT - time exposure: 8h - irradiation intensity: 1000 LUX - inoculated test bacteria suspension : 0.15 ul - test bacteria : Serratia marcescens ATCC 13880 - adhesive film : polypropylene film 40 x 40 mm square - transparency rate = 85% for visible Range		
Sampling:	made by customer		
Date of sampling:	06/11/18		

Test	Method	UM	Result
Antibacterial activity of photocatalytic materials - Serratia marcescens ATCC 13880*	PNN-100 2010 Rev.0 (Ref. ISO 27447:2009 excluding point 7.5 : characteristics of light source)		
<i>N. bacteria inoculated*</i>		cells/ml	1.900.000
<i>A - average number of bacteria non-treated specimens*</i>		cells/ml	250.000
<i>BL - average number of bacteria non-treated specimens after LED light irradiation*</i>		cells/ml	280.000
<i>CL - average number of bacteria photocatalytic treated specimens after LED light irradiation*</i>		cells/ml	<10
<i>RL - photocatalytic antibacterial activity after LED light irradiation*</i>		Log10	4,5

Test Report N. 4450 /EL MI18

Spett.le
IRIS CERAMICA GROUP SPA

Receipt N.: 4.450/EL MI **Date of receipt :** 06/11/18 **Analysis start date:** 16/11/18 **Analysis end date:** 20/11/18

Test	Method	UM	Result
RL - photocatalytic antibacterial activity after LED light irradiation*		%	99,99
BD - Average number of bacteria non treated specimens after dark treatment*		cells/ml	320.000
CD - average number of bacteria non-treated specimens after dark treatment*		cells/ml	<10
CD - average number of bacteria photocatalytic specimens after dark treatment*		cells/ml	<10
Delta R - Difference between photocatalytic specimens after irradiation and dark treatment*		Log10	0,0

NOTE :

the test assesses the survival of bacteria type *Serratia marcescens* ATCC 13880, on the surface of CALACATTA SL ACTIVE 2.0 - 300 x 150 cm - 6mm subjected to LED light 1000 LUX radiation for 8h.
Under test condition specified in the description sample, the bacterial reduction is equal to 99.99%.

TECHNICAL MANAGER

Dr.ssa Alessandra Carletti
Ordine Nazionale dei Biologi
Albo professionale n. 34638
Sez.A

U: expanded uncertainty associated with single measurement (P = 95 % - K = 2) - LD: Detection limit (the lowest concentration of analyte detectable) - LQ : Limit of Quantification (the lowest concentration of analyte detected with acceptable precision and accuracy) - R% Recovery % . U - R% - LQ - LD are indicated if required by the Customer .
[*] Testing non-accredited ACCREDIA - PNN : internal method - [*] Subcontracted test - Temporary test report: test report in which some test are not completed, issued for internal use by the Customer, to be replaced with the official test report, just available. If the test report is digitally signed, the integrity of the document can be confirmed by checking the validity of the digital signature within the file.
Reference standards for microbiological food : UNI EN ISO 7218:2013/Cor.1:2014 (counting in single dish and two consecutive dilutions) waters : ISO 8199:2005; (results expressed with < 4ufc/ml and < 40ufc / g indicate that microorganisms are present but less than the value expressed ; for values between 4-10 cfu / ml , 4-10 ufc/100ml , 40-100 cfu / g the number of microorganisms is estimated) .
Declarations of conformity: take into account the measurement uncertainty as indicated by the laws and regulations in force, by applying the rules relating to rounding of the figures
. Notes provided are not subject to accreditation.
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Dipartimento di Scienze e Tecnologie Alimentari
per una filiera agro-alimentare Sostenibile - DISTAS

Area di Tecnologie alimentari, enologia e ambiente

UNIVERSITÀ CATTOLICA DEL S. CUORE
DIPARTIMENTO DISTAS
FACOLTÀ DI SCIENZE AGRARIE, ALIMENTARI E AMBIENTALI

IRIS Ceramica Group
Via Ghiarola Nuova, 119
41042 Fiorano Modenese (MO)

Piacenza, 18th February, 2020

TEST REPORT N° 6A/2020

Sample: CALACATTA SL. ACTIVE 2.0. 300x150 cm

TEST RESULTS

As requested by the Company IRIS Ceramica Group the product **CALACATTA SL. ACTIVE 2.0. 300x150 cm** has been tested for resistance to fungal growth according to UNI 11021:2002 "Paints and varnishes – Coating material and coatings systems for indoor environments with the presence of foodstuff. – Requirements and test methods".

The test samples were prepared and provided by the company.

Evaluation of fungal resistance efficacy

The UNI 11021:2002 norm indicates the laboratory method for testing the resistance of paints, varnishes and similar products against fungal growth.

Before testing, the sample specimens were sterilized in autoclave at 120°C for 20 min. The sterilised specimens were placed centrally (with the surface to be tested face up) onto Petri plates containing Malt Agar as culture media. The specimens were then inoculated with a fixed volume of a fungal spore suspension of *Aspergillus niger*,



TEST REPORT N° 6A/2020

Penicillium sp., *Paecilomyces fulvum* in order to deposit 10^5 CFU. For each fungus three Petri plates were prepared.

At the same time, a trial in high humidity conditions was carried out. In this case the specimens were placed in Petri plates containing sterilised distilled water, always with the surface to be tested face up and on a support in order to be kept above the water level. The specimens were then inoculated with a fixed volume of a fungal spore suspension of *Aspergillus niger*, *Penicillium sp.*, *Paecilomyces fulvum* in order to deposit 10^5 CFU. For each fungus three Petri plates were prepared.

The inoculated Petri plates were incubated at $23 \pm 2^\circ\text{C}$ for 25 days. At the end of the incubation time, fungal growth was assessed visually macroscopically and rated according to the UNI 11021:2002 assessment scale:

- 0 = no mycelium growth is observed
- 1 = very weak mycelium growth
- 2 = weak mycelium growth: percentage of specimen surface covered $\leq 25\%$
- 3 = discrete mycelium growth: percentage of specimen surface covered $\leq 50\%$
- 4 = strong mycelium growth: percentage of specimen surface covered $> 50\%$

The efficacy of the sample against fungal growth is demonstrated if the specimens are rated ≤ 1 .

The obtained results are reported in the table below.

Sample	Rating of mycelium growth in culture media (Malt Agar) and in high humidity conditions
	Average of ratings in the two conditions
CALACATTA SL. ACTIVE 2.0. 300x150 cm	1



TEST REPORT N° 6A/2020

Therefore, according to the UNI 11021:2002 norm:

- the product **CALACATTA SL. ACTIVE 2.0. 300x150 cm** is resistant to fungal growth since a very weak mycelium growth was observed onto the surface of the specimens.

This test report contains results that refer only to the analysed sample and can only reproduced in full, without any change.

The analyst
(Dr. Roberta Galli)

Scientific Referent

(Prof. Giorgia Spigno)

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IRIS Ceramica Group
Via Ghiarola Nuova, 119
41042 Fiorano Modenese (MO)

Piacenza, 18th February, 2020

TEST REPORT N° 7A/2020

Sample: CALACATTA SL. ACTIVE 2.0. 300x150 cm

TEST RESULTS

As requested by the Company IRIS Ceramica Group, the product **CALACATTA SL. ACTIVE 2.0. 300x150 cm** has been tested for resistance to fungal growth according to UNI EN 15457:2014. The sample specimens were prepared and provided by the company.

Evaluation of fungal resistance efficacy

The UNI EN 15457:2014 norm indicates the laboratory method for testing the efficacy of film preservatives in a wall coating against fungi.

Before testing, the sample specimens were sterilized in autoclave at 120°C for 20 min. The sterilised specimens were placed centrally (with the surface to be tested face up) onto Petri plates containing Malt Agar as culture media. The specimens were then



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TEST REPORT N° 7A/2020

inoculated with a mixed fungal spore suspension of *Aspergillus niger*, *Cladosporium cladosporoides*, *Alternaria alternata*, *Penicillium purpurogenum* (10^6 cell/mL).

The inoculated Petri plates were incubated at $24 \pm 2^\circ\text{C}$ for 21 days. At the end of the incubation time, fungal growth was assessed visually macroscopically.

The UNI EN 15457:2014 norm uses the following assessment scale.

Fungal growth scale	Percentage of the surface of the specimen covered by mycelium growth
0	0
1	≤ 10
2	10 - 30
3	30 - 50
4	50 - 100

The efficacy of the sample against fungal growth is demonstrated if the specimens are rated less than 4.

The obtained results are reported in the table below.

Mixed fungal spore suspension	Fungal growth assessment according to the UNI EN 15457:2014 norm		
	Sample	Result	Specified value for demonstrated efficacy against fungal growth
<i>Aspergillus niger</i> <i>Cladosporium cladosporoides</i> <i>Alternaria alternata</i> <i>Penicillium purpurogenum</i>	CALACATTA SL. ACTIVE 2.0. 300x150 cm	0	< 4



TEST REPORT N° 7A/2020

The product **CALACATTA SL. ACTIVE 2.0. 300x150 cm** can be considered efficient against fungal growth since the mycelium growth onto the specimen surface was rated less than the specified value in the assessment scale proposed by the UNI EN 15457:2014 norm.

This test report contains results that refer only to the analysed sample and can only reproduced in full, without any change.

The analyst
(Dr. Roberta Galli)

Scientific Referent
(Prof. Giorgia Spigno)

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IRIS Ceramica Group
Via Ghiarola Nuova, 119
41042 Fiorano Modenese (MO)

Piacenza, 18th February, 2020

TEST REPORT N° 8A/2020

Sample: CALACATTA SL. ACTIVE 2.0. 300x150 cm

TEST RESULTS

As requested by the Company IRIS Ceramica Group the product **CALACATTA SL. ACTIVE 2.0. 300x150 cm** has been tested for resistance to mold growth according to UNI 9805/91 "Paints products. Evaluation of the resistance to mold by paints".

The test samples were prepared and provided by the company.

Evaluation of mold resistance efficacy

The UNI 9805/91 norm indicates the laboratory method for testing the resistance of a wall paint against the growth of molds which are naturally present on a wall.

The specimens were placed centrally (with the surface to be tested face up) onto Petri plates containing Malt Agar as culture media. The specimens were then inoculated with a 10^6 CFU/mL spore suspension of *Aspergillus niger*, *Penicillium ochrochloron*, *Pullularia pullulans*. For each strain, three Petri plates were prepared.



TEST REPORT N° 8A/2020

The inoculated Petri plates were incubated at $28 \pm 2^{\circ}\text{C}$ for 3 days. At the end of the incubation time, mold growth was assessed visually macroscopically.

The observation of plates revealed for all strains no mold development on the surface of the specimens.

Therefore, according to UNI 9805/91 the product is suitable for preventing the development of mold of the species used for the test.

This test report contains results that refer only to the analysed sample and can only reproduced in full, without any change.

The analyst
(Dr. Roberta Galli)

Scientific Referent

(Prof. Giorgia Spigno)

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Iris Ceramica Group
Operational headquarters
Via Ghiarola Nuova 119
41042 Fiorano Modenese (MO)

Test report N. 1/18

Test: degradation of NO on **Calacatta SL Active 2.0 large slab** using norm ISO 22197-1

ISO 22197-1 Fine ceramics (advanced ceramics, advanced technical ceramics) -- Test method for air-purification performance of semiconducting photocatalytic materials -- Part 1: Removal of nitric oxide

Milan, 28/09/2018

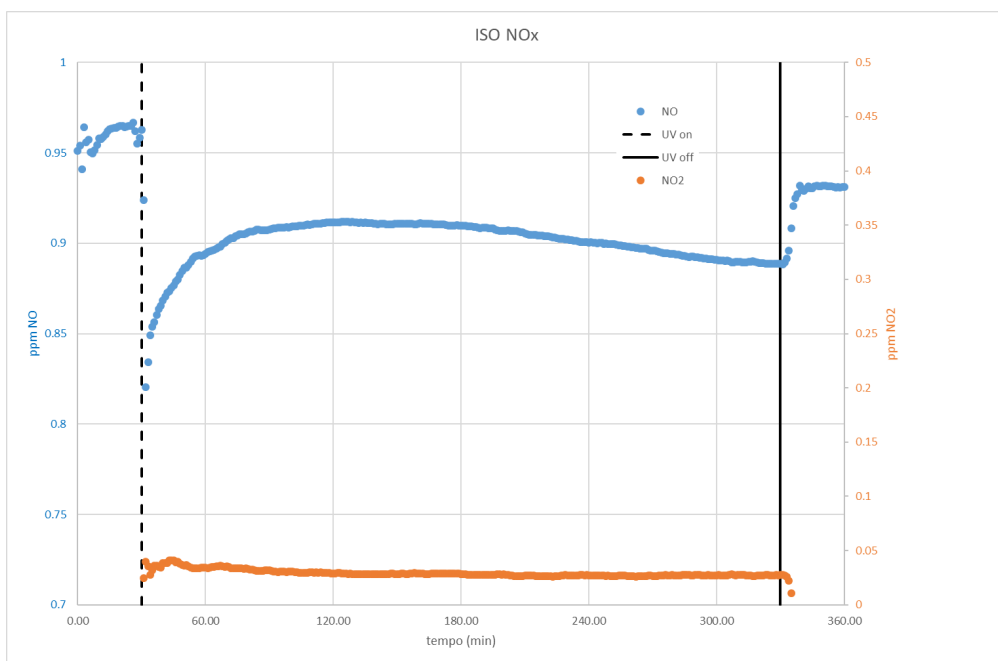
Date of receipt	17/07/2018
Analysis start date	18/07/2018
Analysis end date	20/07/2018
Material	Ceramic Materials
Product	Ceramic slabs in porcelain gres
Sample	Calacatta SL Active 2.0 - 6mm - 300x150 cm
Test information	• Determination of the photocatalytic activity with the continuous flow method – removal of nitric oxide (NO) ISO 22197-1. • Tested sample: collected and cut in a 5x10 cm sample from an original slab, intact in all its parts, randomly chosen from a production batch. • Pre-treatment methods: in accordance with ISO 22197-1, the sample was UV-A irradiated for 6 hours and then immersion in deionized water for 2 hours. • Light source: UV-A Jelosil 500, intensity 1.0 mW/cm². • Exposure time: 6 h. • Initial concentration of NOx: 1000 ± 5 ppb in synthetic air. • Radiometer: HD2102.02 Delta Ohm. • Analytical method: chemiluminescence



(SERINUS 40, Ecotech, ID Serial N° 14 - 0325).

- Reactor: as requested.
- Fan: EBMPAPST – 612JH; nominal power: 12V; nominal speed: 11700 rpm.
- Gas Flow $F=3 \text{ dm}^3\text{min}^{-1}$
- Internal temperature: 25°C
- Humidity: 50%
- Time between the UV lamp ignition and the start of concentration recording: 0" (immediate reading in real time).

Result:



Considering the results obtained, it is possible to calculate, by numerical integration, that **the Calacatta SL Active 2.0 - 300x150 cm sample degrades 2.4 mg of NO per square meter of material** for each hour of work.

The sample did not absorb or desorb NO or NO₂ during the test, so the above value refers to the amount of pollutant actually degraded.

The scientific manager

Prof. Claudia Letizia Bianchi



Test Report N. GF/1.2018 - ENG

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Via Radici Nord, 112
42014 Castellarano (RE)
Italia

Test: testing of degradation of NO_x in air on Calacatta SL Active 2.0 - 6mm.
Simulation in real conditions with LED lights.

Milan 08/02/2018

Date of receipt	31/01/2018
Analysis start date	01/02/2018
Analysis end date	07/02/2018
Material	Ceramic Materials
Product	Ceramic slabs in porcelain gres
Sample	Calacatta SL Active 2.0 - 6mm
Test information	• Test of photodegradation of NO_x in air. • Tested sample: collected and cut in a 2x20 cm sample from an original slab, intact in all its parts, randomly chosen from a production batch. • Pre-treatment methods: in accordance with ISO 22197-1, the sample was UV-A irradiated for 6 hours and then immersion in deionized water for 2 hours. • Light source: flat lamp LED 4000K Sample lighting: 1000 lux. • Exposure time: 6 h. • Initial concentration of NO_x: 100 ± 10 ppb, equal to 190 µg/m³, in synthetic air (WHO considers NO₂ values under 40 µg/m³ as pure air). • Type of reactor: for research purposes. Results published in international scientific journals ^{1,2,3,4}.

¹ J. Phys. Chem. C 111 (2007) 13222

² Nanoscale Research Letters 4 (2009) p.97

³ Cement and Concrete Composites, 36 (2013) 116-120

⁴ Chemical Eng J, 261, (2015) 76-82



	- Analytical method: chemiluminescence (SERINUS 40). - Reproducibility: the measurement was repeated on no. 5 samples, cut and randomly chosen from # 5 different slabs.
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Results and conclusions

Test were performed in laboratory simulating real conditions in confined environments, and considering a strong pollution equal to $190 \mu\text{g}/\text{m}^3$ of nitric oxides and a LED lighting equal 1000 lux.

In these conditions, the slab of porcelain grès **Calacatta SL Active 2.0 - 6mm** is **active in the photocatalytic degradation of NOx in air under LED lighting**. In reference to the experimental data obtained after 6 hours of testing, the percentage of degradation of NOx is equal to **47%**.

The Scientific Director

Prof. Claudia Letizia Bianchi

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Certificates and Scientific validation

SCIENTIFIC VALIDATION:

Selected Scientific Literature

- Oxidative Inactivation of SARS-CoV-2 on Photoactive AgNPs@TiO₂ Ceramic Tiles
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Environmental Science and Pollution Research, 2019, 26(36), pp. 36117–36123.
- Micro-TiO₂ coated glass surfaces safely abate drugs in surface water.
Cerrato, G., Bianchi, C.L., Galli, F., ...Morandi, S., Capucci, V.
Journal of Hazardous Materials, 2019, 363, pp. 328–334.
- Micro-sized TiO₂ as photoactive catalyst coated on industrial porcelain grés tiles to photodegrade drugs in water
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- Aspirin and paracetamol removal using a commercial micro-sized TiO₂ catalyst in deionized and tap water.
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- Pigmentary TiO₂: A challenge for its use as photocatalyst in NO_x air purification.
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- Nano and micro-TiO₂ for the photodegradation of ethanol: experimental data and kinetic modelling.
Bianchi, C.L., Pirola, C., Galli, F., ...Cerrato, G., Capucci, V.
RSC Advances, 2015, 5(66), pp. 53419–53425.
- Surface decoration of commercial micro-sized TiO₂ by means of high energy ultrasound: A way to enhance its photocatalytic activity under visible light.
Stucchi, M., Bianchi, C.L., Pirola, C., ...Sakkas, P.M., Capucci, V.
Applied Catalysis B: Environmental, 2014, 178, pp. 124–132.
- Photocatalytic TiO₂ : From Airless Jet Spray Technology to Digital Inkjet Printing.
Bianchi, C.L., Pirola, C., Stucchi, G.C., ... Capucci, V.
Titanium Dioxide: Material for a Sustainable Environment, 2018, 14, pp. 261–279
- Micro-sized TiO₂ catalyst in powder form and as coating on porcelain grés tile for the photodegradation of phenol as model pollutant for water phase.
Bianchi, C.L., Pirola, C., Stucchi, G.C., ... Capucci, V.
Advanced Materials Science, 2017, 2(2). pp. 1–6

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SCIENTIFIC VALIDATION:

Selected Scientific Literature

- A New Frontier of Photocatalysis Employing Micro-Sized TiO₂ : Air/Water Pollution Abatement and Self-Cleaning/ Antibacterial Applications.
Bianchi, C.L., Pirola, C., Stucchi, G.C., ... Capucci, V.
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INTERNATIONAL SCIENTIFIC CONGRESS

- International Sustainable Built Environment Conference (ISBE). Doha, Qatar. January 28-30, 2014.
- PhotopAQ. Lione, France. April 15-17, 2014.
- Annual International Conference on Architecture and Civil engineering. Singapore. April 25-26, 2016.
- Design & Health World Congress & Exhibition. Wien, Austria. July 12-16, 2017.

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INTERNATIONAL PATENTS:

- EP2443076B1 published on 2010, December 23: use of micrometric size particles of Titanium Dioxide.
- EP3277634B1 published on 2020, February 5: combination of Titanium Dioxide and Silver.

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Notes



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