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Silver Knight Resilient Vinyl Sheet Flooring with Photocatalytic Disinfecting Surface

Furlong Flooring is currently selling heterogeneous sheet vinyl flooring products in Ireland. We are constantly offering the most up-to-date technologies which offer new possibilities for healthcare facilities, schools, hospitality venues and commercial buildings.

Through our patented technology called TECHSurface we invented Grabo Silver Knight resilient sheet flooring to answer the healthcare industries' most pressing issue - infection control. Silver Knight flooring is much more than just a floorcovering product - it is an effective asset in the fight against hospital-acquired infections.

These hospital acquired infections are caused by viral, bacterial and fungal pathogens and result in approximately 800 deaths per year and an added expenditure to the HSE in excess of €23m in Ireland annually.

Grabo Silver Knight is a resilient vinyl sheet flooring with a photocatalytic disinfecting surface, perfect for today's demanding healthcare industry. Its' disinfecting activity is achieved by a unique double-defense-line of NanoSilver and NanoTiO₂ particles



Main features of Grabo Silver Knight resilient flooring distributed by Furlong Flooring

Disinfecting surface with a double-defense-line against harmful bacteria

1st line of defense: NanoSilver

The antimicrobial properties of silver have been known for more than 3,000 years. The use of silver tableware and cutlery is a good example. Physicians have also used silver as a disinfectant since the end of the 19th century. The antibacterial effect of silver results from the ongoing slow diffusion of silver ions. The very high surface area to volume ratio of the nanoparticles means that the ions can be emitted more easily and therefore eliminate harmful bacteria more effectively. Bacteria have no chance of survival as the ions quickly hinder the process of cell division, secondly destabilize the cell membrane, walls or plasma and thirdly interrupt the enzyme's transport of nutrients. In this way, bacteria can be **eradicated without the use of chemicals**.

2nd line of defense: Nano TiO₂

Titanium dioxide is a photocatalyst, acting similar to chlorophyllian photosynthesis, which helps to transform harmful organic and inorganic substances into harmless compounds through a chemical oxidation process. For the function to work, only UV light, oxygen and air humidity are required. The level of UV light present in normal daylight is sufficient to activate the photocatalytic reaction. In Grabo Silver Knight the nanoscalar dimension of TiO₂ Grabo Silver Knight is a resilient vinyl sheet flooring with a photocatalytic disinfecting surface, perfect for today's demanding healthcare industry. Its' disinfecting activity is achieved by a unique double-defense-line of NanoSilver and NanoTiO₂ particles makes the whole surface a highly reactive catalyst, speeding up the decomposition process of harmful bacteria and organic dirt rapidly, for a long lasting effect.

Titanium dioxide is a broadly used photocatalyst in industries such as cosmetics, paint and coatings, etc. Grabo Silver Knight is the first vinyl sheet flooring in the world utilizing this catalysator answering the challenges of a healthcare facility in the 21st century.

Independent laboratory testing has certified the effectiveness of Grabo Silver Knight sheet vinyl flooring against the most pervasive types of bacteria in today's healthcare environments (see enclosed certifications):

Bacteria	Standard	Reduction in number of viable bacteria in 8 hours
MRSA (Methicillin-resistant Staphylococcus Aureus)	ISO 27447:2009	>99%
VRE (Vancomycin Resistant Enterococcus)	ISO 27447:2009	>99%
ESBL (Extended-spectrum β -lactamas producing enterobacter species)	ISO 27447:2009	>99%
E-coli	ISO 846:1997	>99%

“Self-cleaning“ properties for more economical maintenance

Self-cleaning surfaces based on photocatalytic reactions are a new phenomenon in the world which goes beyond the standard easy-cleaning properties. Nanoscale TiO₂ gives hydrophilic properties to Grabo Silver Knight floorings. Due to its increased surface energy the dirt adheres less to the surface making it easier to remove. When washing the floor, water runs off in a film rather than droplets, taking with it any dirt. Additionally, through the photocatalytic reaction any organic dirt will be oxidized by the surface. This self-cleaning technology does not mean that the surface does not need to be cleaned at all. Instead, it means that the interval between cleaning cycles can be extended significantly, and fewer detergents are required, resulting in less environmental pollution. Reduced cleaning cycles lead to saving personnel costs and the fact that the dirt adheres less means easier cleaning. Grabo Silver Knight flooring with its' photocatalytic self-cleaning feature is a low-maintenance and trouble-free flooring solution.

Air-purifying function for well-being

Grabo Silver Knight flooring helps to improve indoor air quality through oxidation of air pollutants and odors during the photocatalytic reaction. Grabo Silver Knight flooring can be used to counteract the **sick building syndrome**.

How and why Grabo Silver Knight flooring is an innovative facilities management solution in the "Product Performance Solution" category?

Hospital-acquired infections (HAIs) are getting more and more in focus lately as the fight against them causes huge extra costs for healthcare facilities. In the US the incidence of HAIs is around 5% for all hospitalized patients. The most common and dangerous infections today are caused by Methicillin Resistant Staphylococcus Aureus (MRSA) which is known as one of the “superbugs” due to its ability to survive on surfaces in spore form. The fight against superbugs is difficult and expensive. Grabo Silver Knight flooring with its innovative surface technology can help facilities to reduce risk of HAIs. Silver Knights' photocatalytic surface containing Silver and Titanium Dioxide nanoparticles is in continuous battle under daylight conditions to oxidize all types of harmful bacteria, viruses, fungi and even normal dirt. Independent test results certify that Grabo Silver Knight floorings will eliminate more than 99% of various types of viable bacteria creating a safer and cleaner healthcare environment.

The photocatalytic reaction on the surface provides a “**self-cleaning**” floor, as it makes dirt more difficult to adhere to the surface and can be more easily removed than a standard flooring product. To summarize,

Silver Knight Technology will:

- significantly extended cleaning cycles
- reduce personnel costs due to fewer cleaning cycles
- less detergents are required to maintain creating less grey water
- results in less environmental pollution
- less wear and tear on the flooring materials from cleaning
- extended life cycle of floor making it sustainable

Specifications of Grabo Silver Knight resilient sheet vinyl flooring:

Technical parameters	Units	Standards	Silver Knight on Diamond
Description			Tech Construction
Construction			<i>compact heterogeneous</i>
Total thickness	mm	EN 428 2,0	2,0
Wear layer thickness	mm	EN 429 0,7	0,7
Width of roll	m	EN 426 2	2
Length of rolls	lm	EN 426 20	20
Total weight	g/m ²	EN 430 2800	2800
Classification			
Classification	class	EN 985	34/43
Performance			
Abrasion group		MSZ EN 660-1	T
Residual indentation	max. mm	EN 433	0,1
Dimensional stability	max.%	EN 434	0,2
Fire resistance	Class	EN 13501-1	Bfl-s1
		ASTM E 648/ 662	1/pass
		Gost 30402-94	G1
Slip resistance		DIN 51130	R10
		ASTM D2047-99	dry:0,88/ wet:0,86

<i>Abrasion resistance</i>		<i>g/1000 circle</i>	
<i>(H-18 wheel)</i>		<i>ASTM D3884-01</i>	<i>-0,2</i>
<i>Abrasion resistance</i>	<i>g/100 000 c.</i>	<i>ASTM D3884-01</i>	<i>-0,65</i>
<i>Electrical resistance</i>	<i>KV</i>	<i>EN 1815</i>	<i>< 2</i>
	Ω	<i>EN 1081</i>	≤ 109
<i>Chemical resistance</i>		<i>EN 423</i>	
		<i>ASTM F925-02</i>	
<i>Bacterial resistance</i>		<i>EN ISO 846:1999</i>	
<i>Antimicrobial activity</i>	<i>%</i>	<i>ISO 27 47</i>	<i>>99</i>
<i>Light fastness</i>	<i>grade</i>	<i>EN 20105 B02</i>	<i>6</i>
<i>Castor chair resistance</i>		<i>EN 425</i>	
<i>Surface treatment</i>			<i>TECHSurface</i>
<i>Anti-bacterial and fungicide treatment</i>			<i>Silver Knight</i>
<i>Seaming method</i>			<i>heat or cold weld</i>
<i>VOC emissions</i>		<i>prEN 15052</i>	<i>low/pass</i>