SOFTRONG

SAFEPLAN

SPOFLEX

SAFEMARINE

SAFEGUARD

NEW COLLECTION

LS FLOORING SYSTEMS





3D ideas for 2D

Greenflor is under your feet at work, where you labor ever so strenuously all day long.

It is also in the subway that takes you home and the playroom where your daughter frolics with her friends.

Greenflor can be in the locker room that your son who likes soccer uses or even in the ship your family cruised on last spring.

ou spend so much time in 3D spaces, yet nothing is closer to you than the flooring.

Greenflor is not just a simple outstanding flooring material.

Greenflor aspires to create a happy everyday life for the people who live upon it.

Enjoy your life on Greenflor. Greenflor dreams of a more beautiful world that will unfold before you.

LS GREENFLOR NEW COLLECTION

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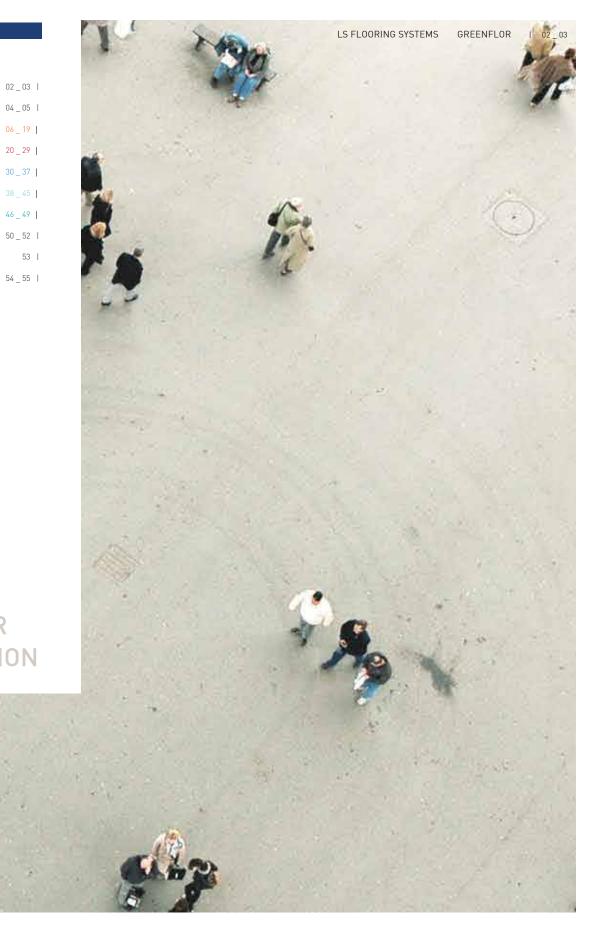
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GREENFLOR

Technology that embraces the world is also close to the heart

LS Flooring's technology is hidden under the busy footsteps that awaken buildings and the pattering feet of children laughing cheerfully. Our technology lies beneath your feet, but our ideas always come from the heart. With advanced technology, LS Flooring is creating ever more pleasant and comfortable living, while ensuring the safety of people by preventing injuries resulting from slips and falls.

Noise reduction | Not only the carpet tile, but also the rubber flooring materials reduce walking noise down to 12dB in sound absorption tests. Non-slip | Along with the carpet tile that prevents slips and falls, LS Flooring's rubber flooring products have obtained R9 grade in slipping tests. **Environment-friendly** | Greenflor products are harmless to human body, since they are made of eco-friendly materials. **Unique design** | The unique and finely crafted design enhances the beauty of interiors.

LS FLOORING SYSTEM



LS FLOORING SYSTEMS GREENFLOR

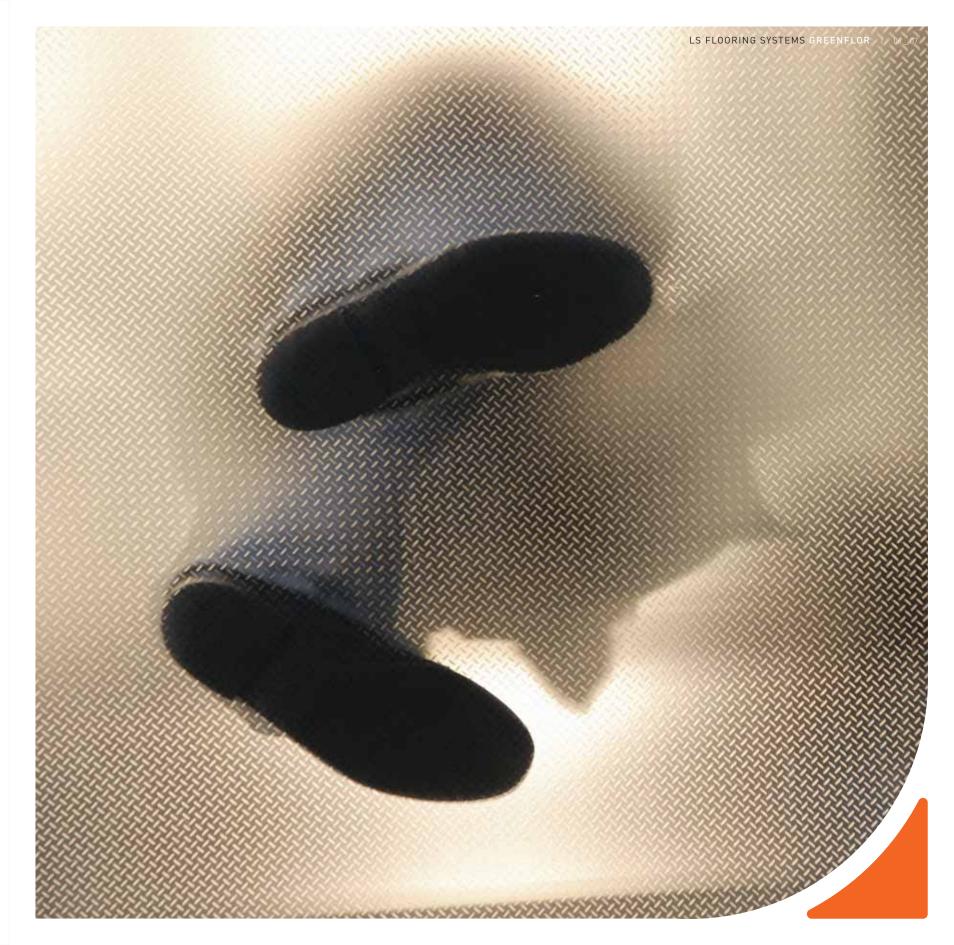
LS conducts strict safety and durability tests. To prepare against all possible hazards, LS products are subject to a comprehensive battery of safety and durability tests because LS is well aware that this is the only way to ensure that you will enjoy a pleasant space without the slightest doubt about safety. If you opt for being gentle in appearance, but sturdy in spirit, your choice certainly is SOFTRONG.

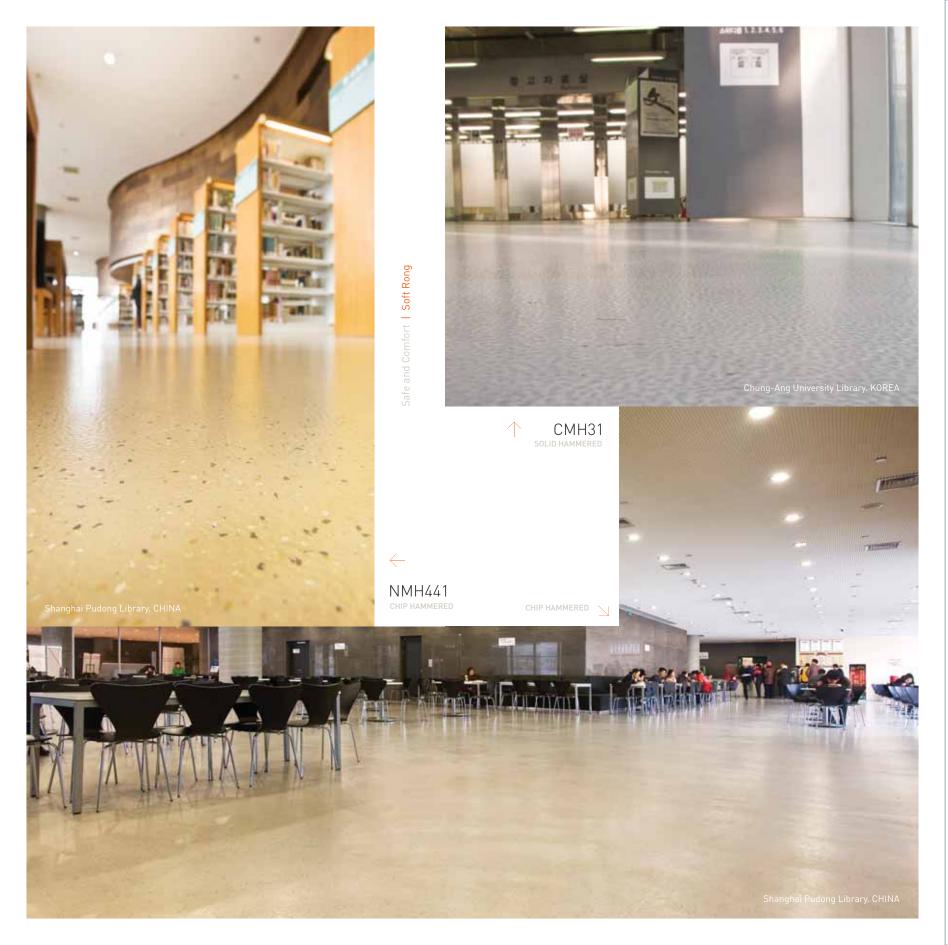
SOFIG RONG

As a representative product of Greenflor, SOFTRONG with its outstanding durability, safety and unique design not only is practical, but also creates a sophisticated ambience.

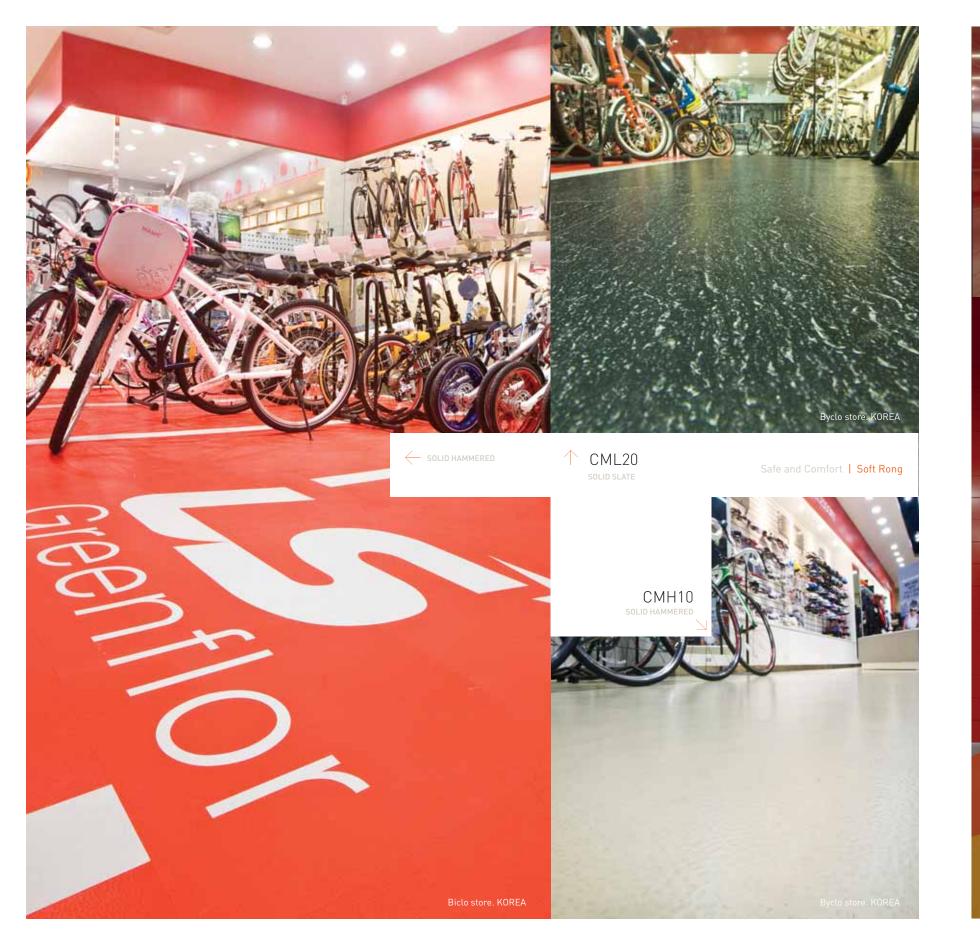
SOLID ROUND | CHIP ROUND | SOLID HAMMERED | CHIP HAMMERED | CHIP STONE | CHIP SLATE | CHIP CORK | STAIR







Classification		Requirements	Results	Method	Test Description
	Color Fastness to artificial light	6 minimum on blue wool scale 3 on grey scale	Fulfilled	BS EN ISO 105 B02:1992	Color changes easured in response to changes in lighting
	Residual Indentation	Nominal thickness < 2.5mm Average value 0.2mm	Fulfilled	BS EN 433:1994	Product indentation measured from loads
	Flexibility Diameter of mandrel 20mm	No cracking at 20mm	Fulfilled	BS EN 435:1994	Product indentation damage after bending
General	Stubbed Cigarette	Method A rating 4	Fulfilled	BS EN	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
Properties	Burning Cigarette	Method B rating 3		1399:1998	
	Abrasion resistance Method A, Vertical load (5±0.1)N	250mm3	155mm3	ISO 4649:1985	Measurement of product surface abrasion
	Hardness	75 Shore A		ISO 7619:1986	Measurement of product hardness
	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
Other Properties	Chemical Resistance		Fulfilled	BS EN 423	External changes measured after exposing samples to chemicals for determined amounts of time and then washing
	Slip resistance – ramp test		R 9	DIN 51130:1992	Slip resistance measured by directly walking on differently sloping ramps
Flame Resistance	Smoke Density	Ds 450	Fulfilled ——	ASTM E662	Density of smoke resulting from burning of product measured
	Surface Flammability	0.45W/cm2		ASTM E648	Radiant heat value required for ignition of product measured to gauge surface flammability properties









Solid Round 3T / 4T

>>



SOFTRONG _ tile type rubber flooring with multifunction

PRODUCT FEATURES

good slip-containing products can be removed easily excellent footfall sound absorption halogen free-non-toxic gas low VOC emission-environment friendly excellent wear-resistance-long lifetime

APPLICATION

airport, school, art hall, museum, library, subway station, industrial facility, power plant

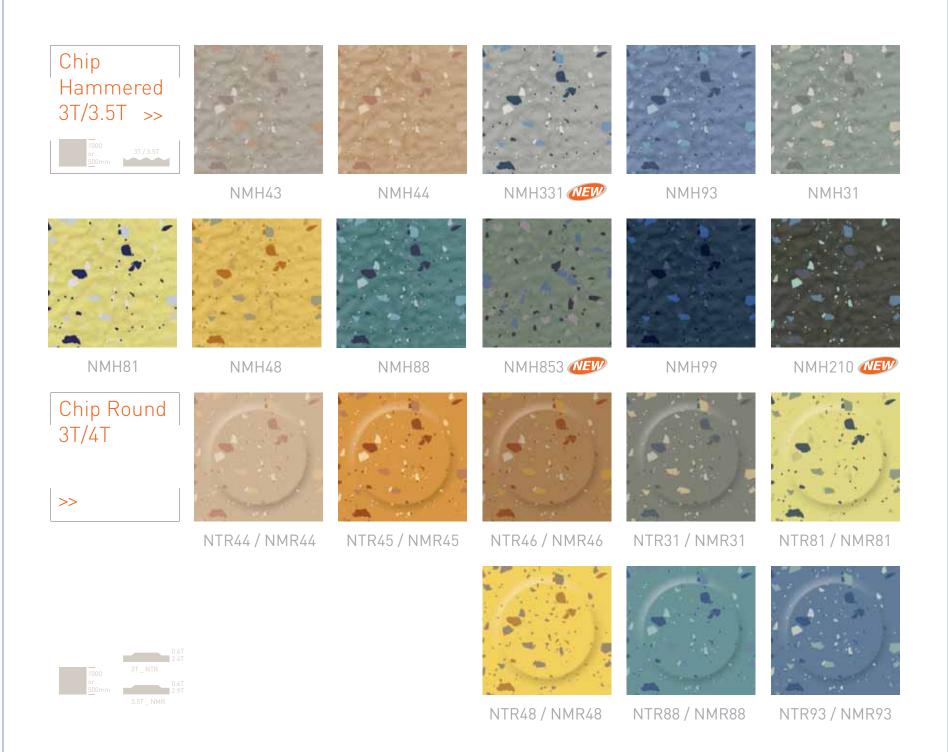


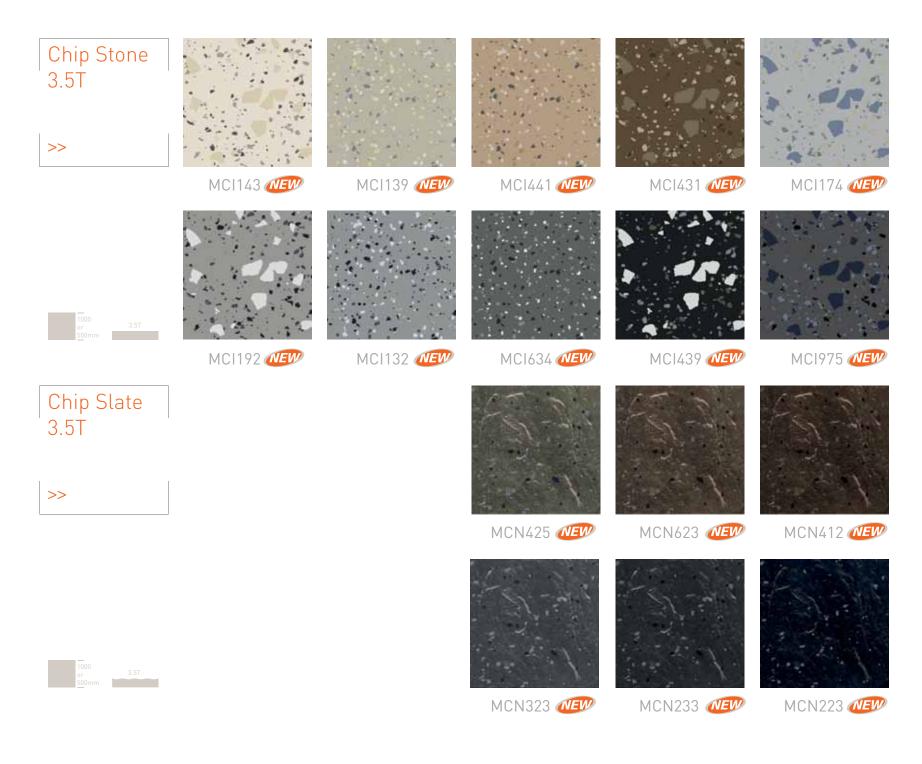


Solid Hammered 3T

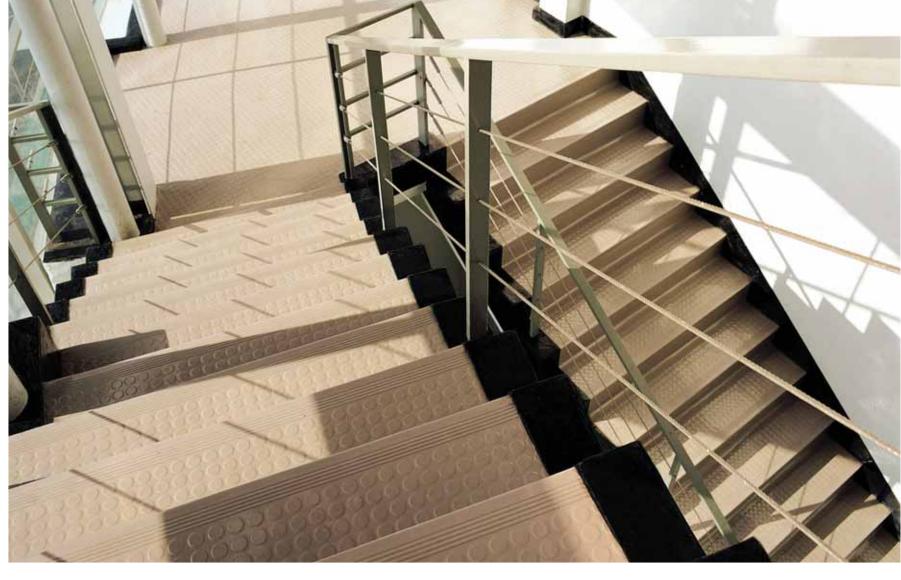
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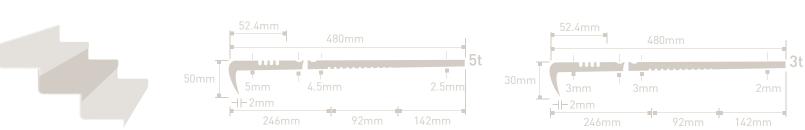


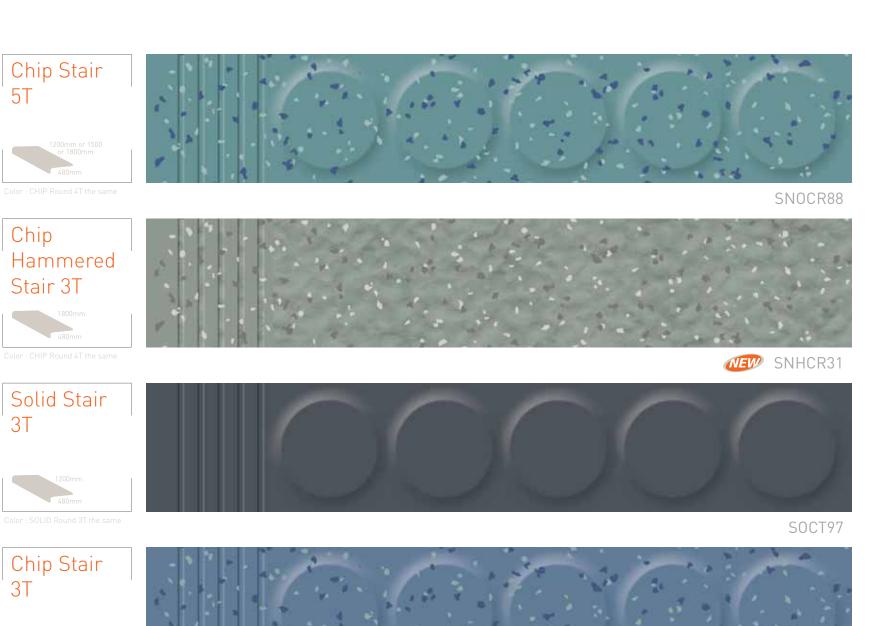












SNOCT93

SOLID ROUND | CHIP ROUND | SOLID HAMMERED | CHIP HAMMERED | CHIP STONE | CHIP SLATE | CHIP CORK | STAIR

Chip

If you are aware of the numerous roles that rubber roll flooring plays, you are certain to insist on SAFEPLAN for you and your precious children. SAFEPLAN is the only option if you desire a hygienic, fresh and sensible space.

SAFE

Available in a wide range of colors for enhanced ambience as well as anti-bacterial and hygienic functions, SAFEPLAN is widely used in schools and hospitals due to its reputation for safety and cleanliness.

ROLL SOLID | ROLL CHIP | ROLL NEO CHIP



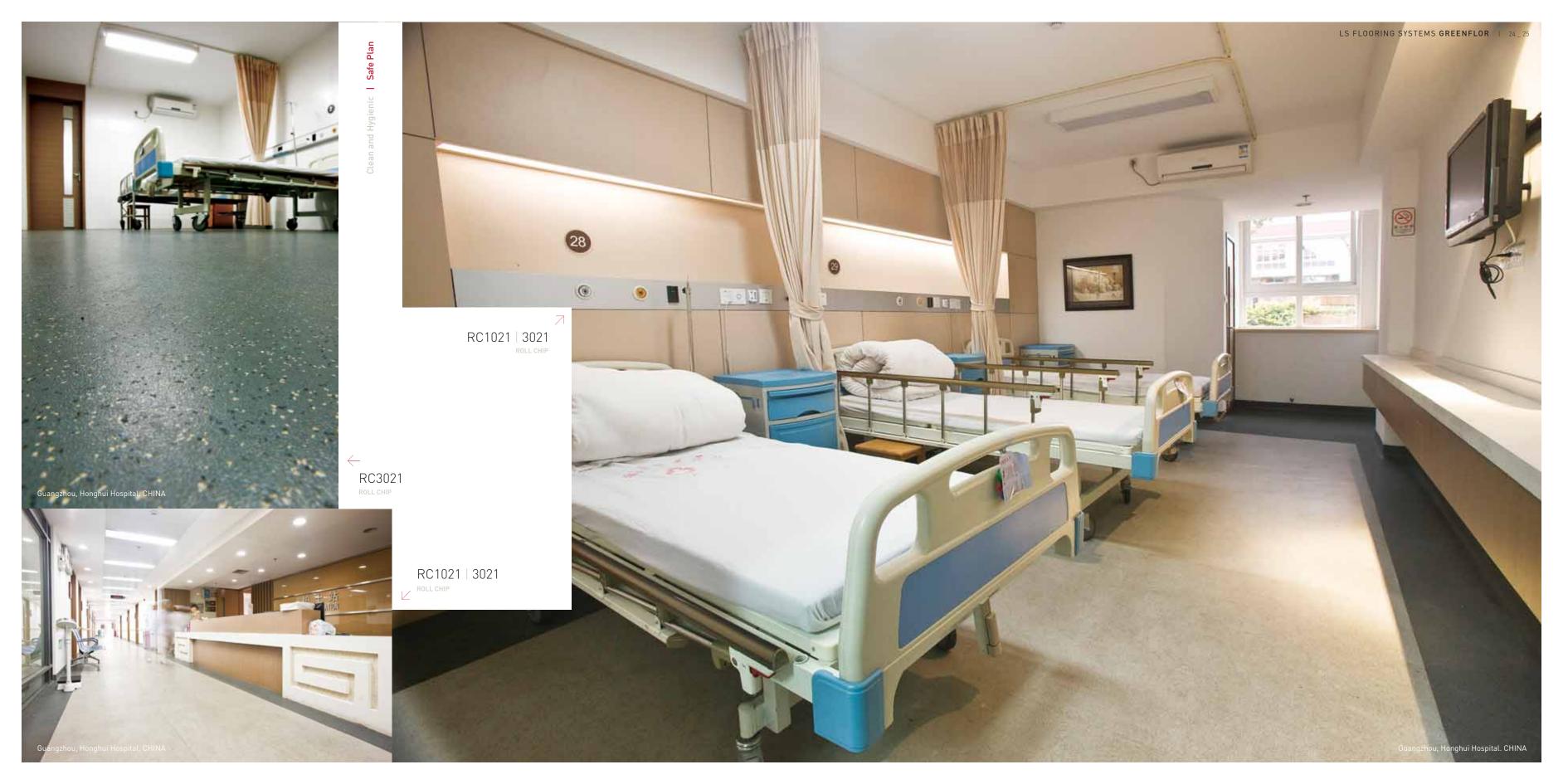


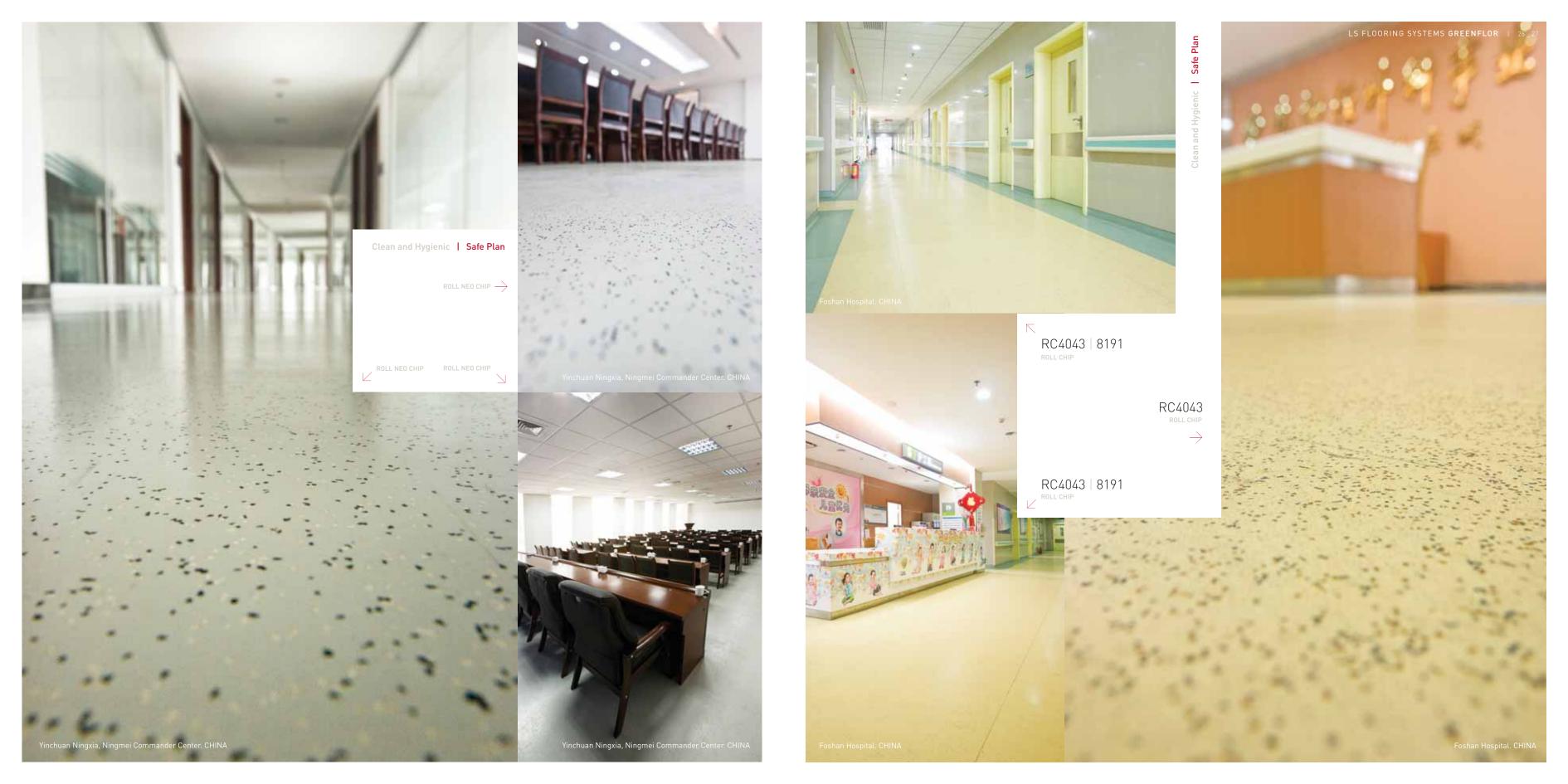




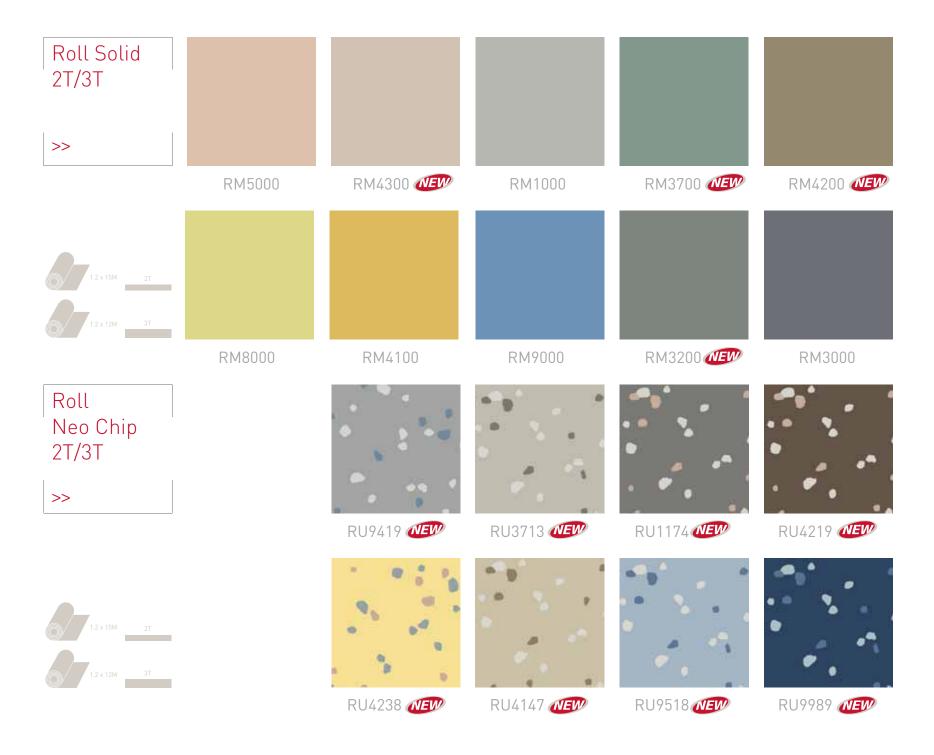


Classification		Requirements	Results	Method	Test Description
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	Stubbed Cigarette	Method A rating 4	Fulfilled	BS EN	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
Properties	Burning Cigarette	Method B rating 3		1399:1998	
	Abrasion resistance Method A, Vertical load (5±0.1)N	250mm3	160mm3	ISO 4649:1985	Measurement of product surface abrasion
	Hardness	75 Shore A	87	ISO 7619:1986	Measurement of product hardness
	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
Other Properties	Chemical Resistance		Fulfilled	BS EN 423	External changes measured after exposing samples to chemicals for determined amounts of time and then washing
	Slip resistance – ramp test		R 9	DIN 51130:1992	Slip resistance measured by directly walking on differently sloping ramps
Flame Resistance	Smoke Density	Ds 450	Fulfilled —	ASTM E662	Density of smoke resulting from burning of product measured
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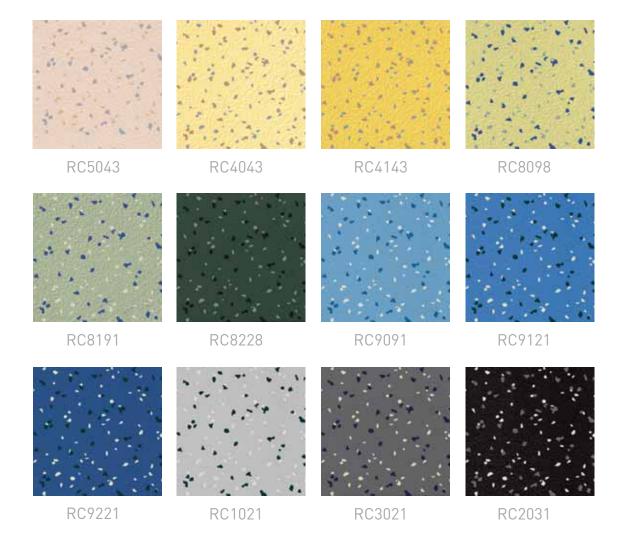


ROLL SOLID | ROLL CHIP | ROLL NEO CHIP



Roll Chip 2T/3T







SAFE PLAN _ roll type rubber flooring suitable for health care

PRODUCT FEATURES

resistant to chemicals | no damages from short-time exposures to solvents, acids and alkaline agents skin disinfectants such as iodine | containing products can be removed easily bacteriostatic and fungistatic property

dimensionally stable when installed, thus can be installed without joint | sealing even in large areas

APPLICATION

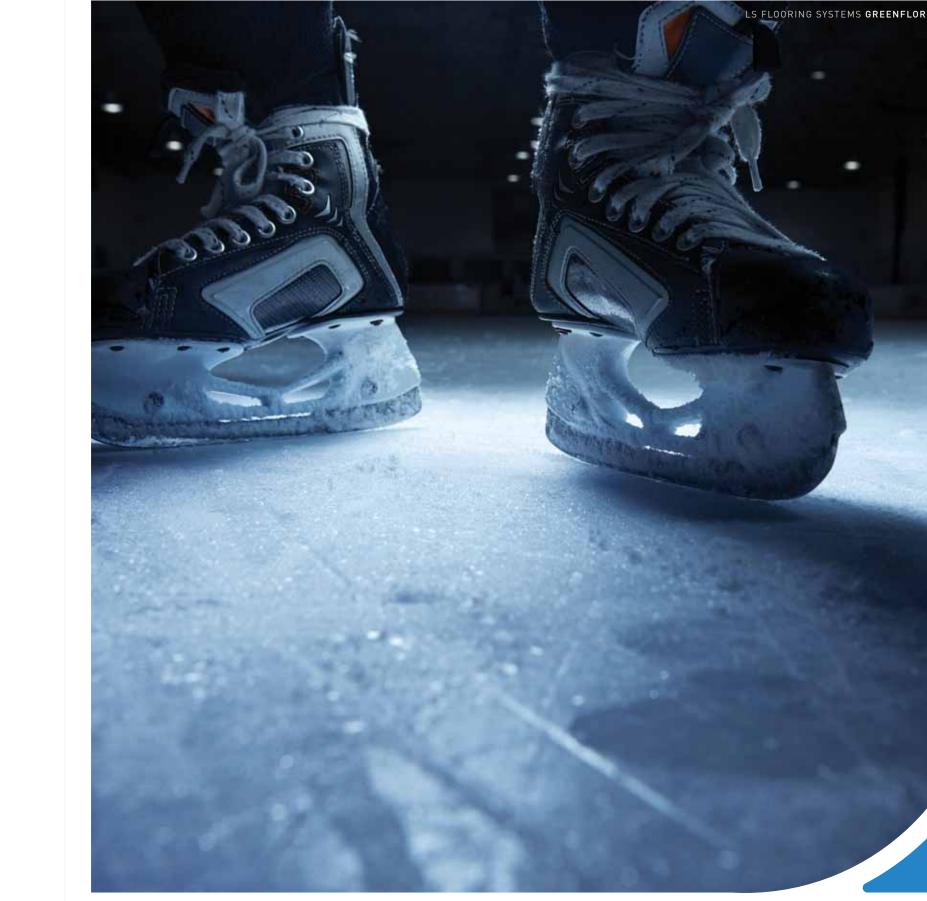
hospital, school, office building etc | corridor, escape route, patient room, ward station intensive care unit, visitor room, administration office

SPO FLEX

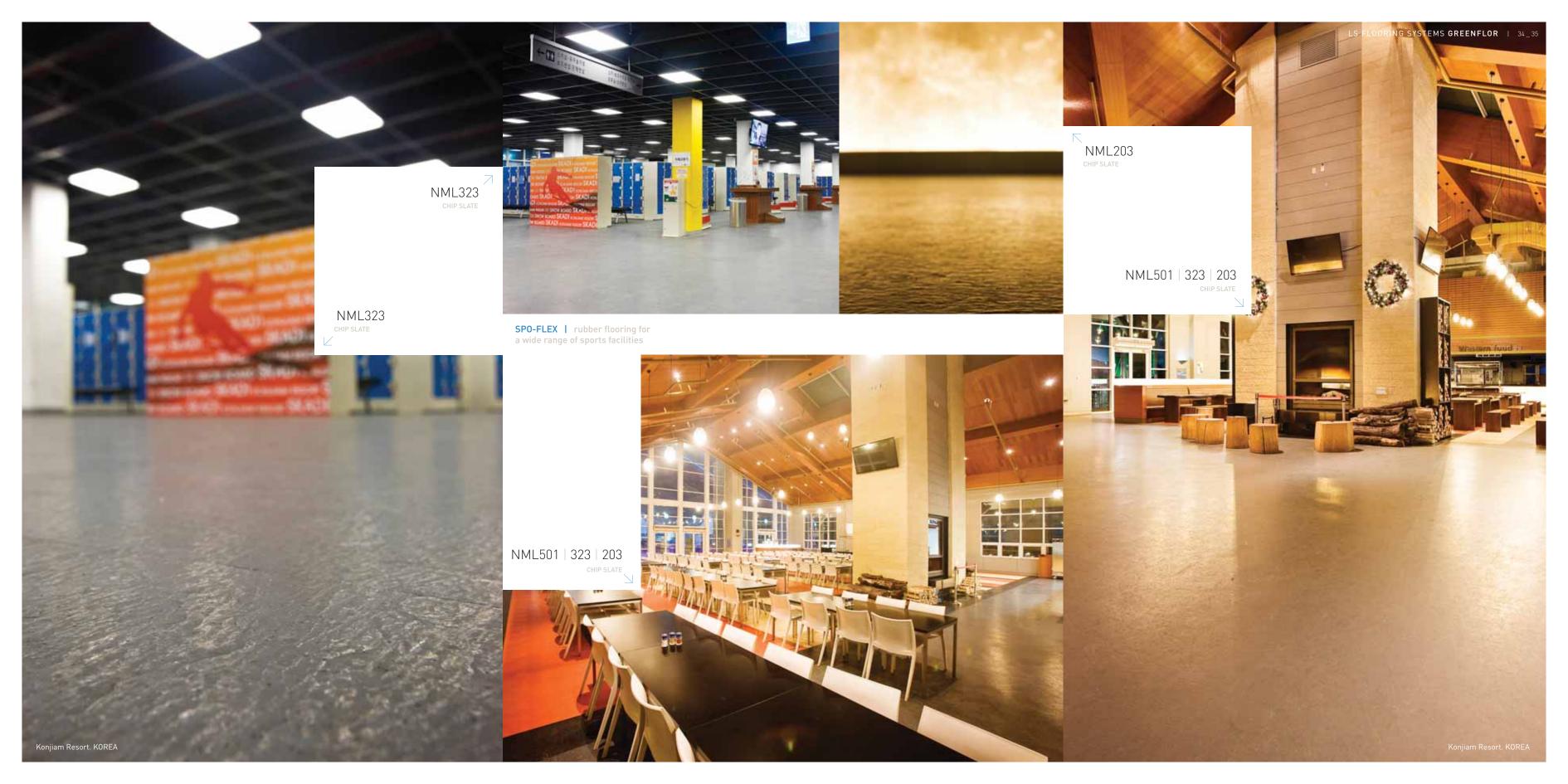
Made with materials sturdy enough to withstand skate blades, golf cleats and football spikes, LS SPOFLEX is engineered to be tough and safe with the advanced technology of Greenflor.

CHIP HAMMERED | CHIP SLATE | CHIP SIMPLE





Classification		Requirements	Results	Method	Test Description
General Properties	Color Fastness to artificial light	6 minimum on blue wool scale 3 on grey scale	Fulfilled	BS EN ISO 105 B02:1992	Color changes easured in response to changes in lighting
	Residual Indentation	Nominal thickness < 2.5mm Average value 0.2mm	Fulfilled	BS EN 433:1994	Product indentation measured from loads
	Flexibility Diameter of mandrel 20mm	No cracking at 20mm	Fulfilled	BS EN 435:1994	Product measured for damage after bending
	Stubbed Cigarette	Method A rating 4	Fulfilled	BS EN	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
	Burning Cigarette	Method B rating 3	rutitteu	1399:1998	
	Abrasion resistance Method A, Vertical load (5±0.1)N	250mm3	155mm3	ISO 4649:1985	Measurement of product surface abrasion
	Hardness	75 Shore A		ISO 7619:1986	Measurement of product hardness
	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
Other Properties	Chemical Resistance		Fulfilled	BS EN 423	External changes measured after exposing samples to chemicals for determined amounts of time and then washing
,	Slip resistance - ramp test		R 9	DIN 51130:1992	Slip resistance measured by directly walking on differently sloping ramps
Flame Resistance	Smoke Density	Ds 450	Fulfilled —	ASTM E662	Density of smoke resulting from burning of product measured
	Surface Flammability	0.45W/cm2		ASTM E648	Radiant heat value required for ignition of product measured to gauge surface flammability properties



CHIP HAMMERED | CHIP SIMPLE | CHIP SIMPLE | CHIP SIMPLE | 1 36_37

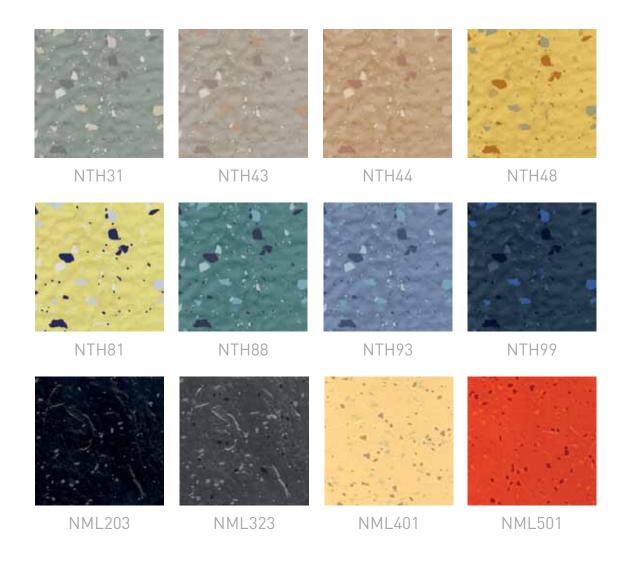
Chip Hammered 9.5T





Chip Slate 6T >>

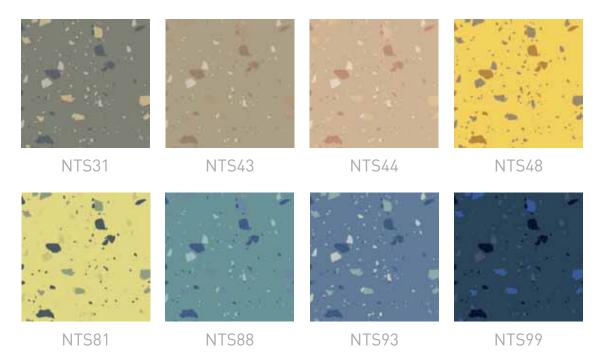












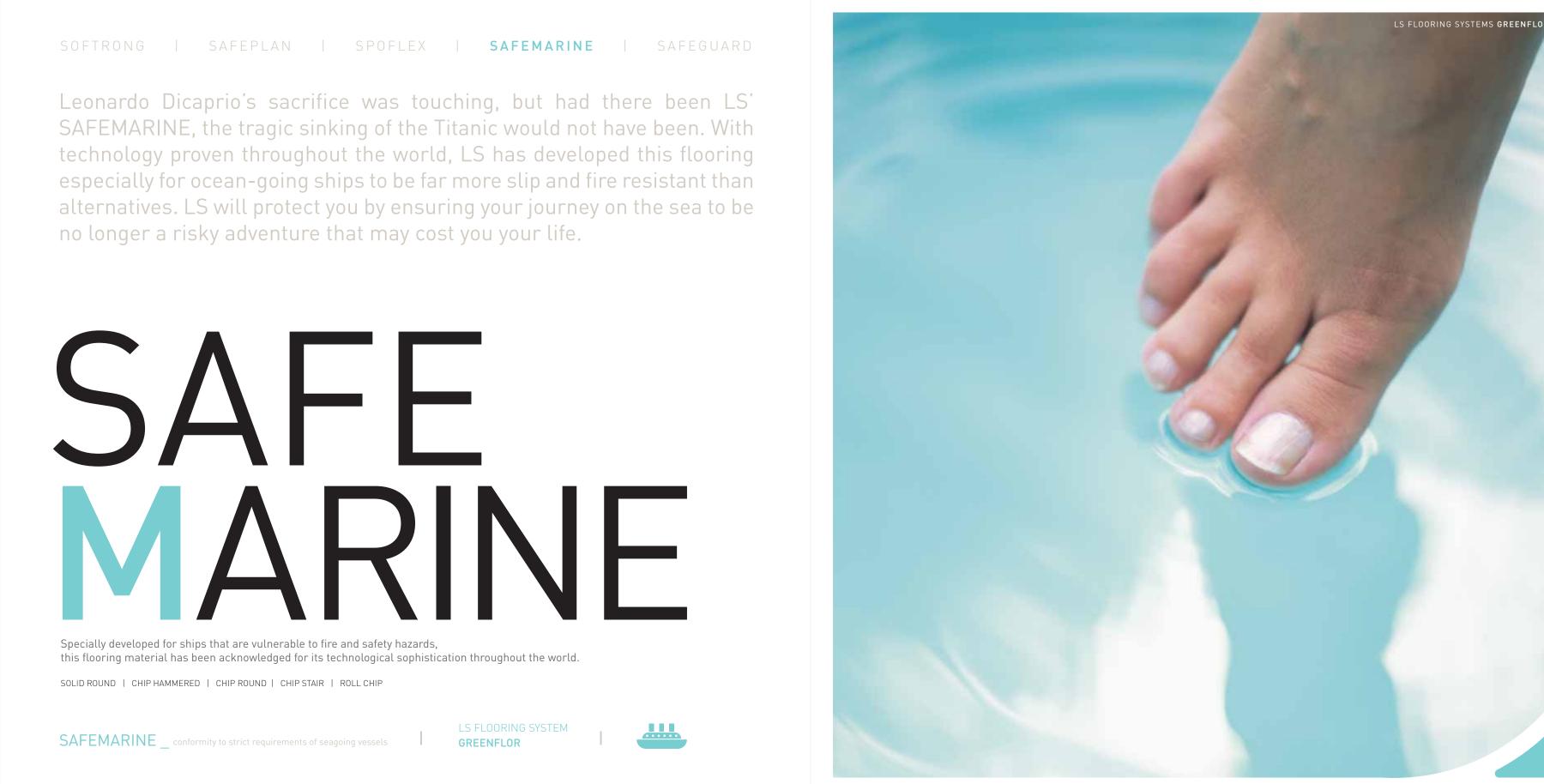
SPO-FLEX _ rubber flooring for a wide range of sports facilities

PRODUCT FEATURES

ideal solution in the special sports floors for figure skating and ice hockey and their supplement areas such as locker room rextra thick 9.5mm tile with double-layer provides impactabsorption while assuring permanent resilience against heavy loads caused by spikes or skate runners withstanding static load from heavy fitness equipments-no remarkable imprint when occasional relocation of such equipments non-porous surface layer assures hygiene and easy maintenance bacteriostatic and fungistatic against sweat and saliva

APPLICATION

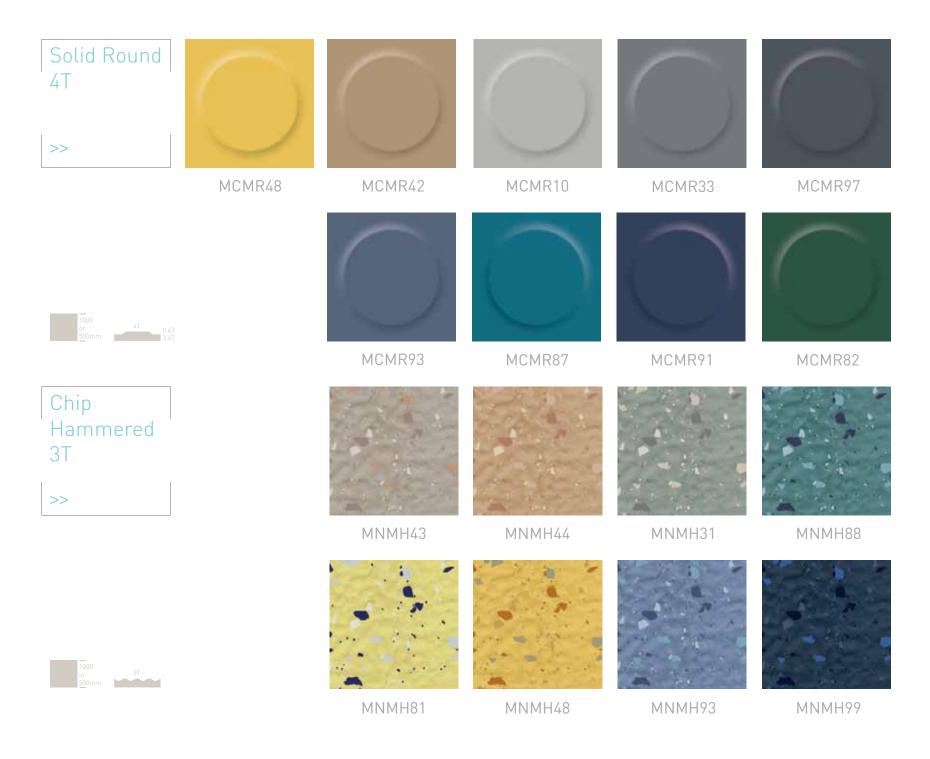
indoor area in sports complex, ice-rink, fitness club





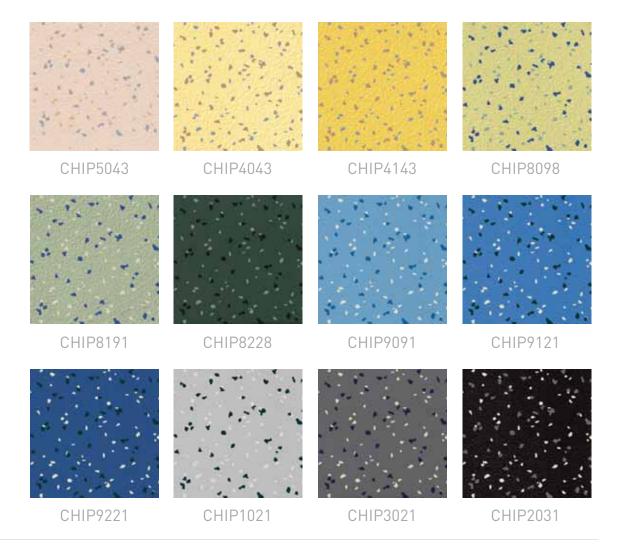
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General	Stubbed Cigarette	Method A rating 4	Fulfilled	BS EN	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
Properties	Burning Cigarette	Method B rating 3		1399:1998	
	Abrasion resistance Method A, Vertical load (5±0.1)N	250mm3	155mm3	ISO 4649:1985	Measurement of product surface abrasion
	Hardness	75 Shore A	85	ISO 7619:1986	Measurement of product hardness
	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
Other Properties	Chemical Resistance		Fulfilled	BS EN 423	External changes measured after exposing samples to chemicals for determined amounts of time and then washing
	Slip resistance - ramp test		R 9	DIN 51130:1992	Slip resistance measured by directly walking on differently sloping ramps
Flame Resistance	Smoke Density	IMO RES,MSC 61(67)	Fulfilled —	IMO Resolution MSC61(67): Anne x1,Part5	Density of smoke resulting from burning of product measured
	Smoke Density& Toxity			IMO Resolution MSC61(67): Anne x1,Part2	Radiant heat value required for ignition of product measured to gauge surface flammability properties

SOLID ROUND | CHIP HAMMERED | CHIP ROUND | CHIP STAIR | ROLL CHIP











SAFE-MARINE_conformity to strict requirements of seagoing vessels

Low flame spread surface material, not generating excessive quantities of smoke nor toxic products in fire. Approved for use as floor covering on non-combustible substrate throughout the accommodation.

PRODUCT FEATURES

satisfies the SOLAS(safety of life at sea) 1974
satisfies the Marine Equipment Directive (MED) 96/98/EC
passed test according to IMO FTPC Part 2 and 5 (ISO 5659:1994 and IMO Res. A. 653(16)
with regard to fire behavior, smoke density, and fire-toxicological safety in case of fire

APPLICATION cruise ship, passenger liner/ferry, container ship, tanker, marine ship, oil rig

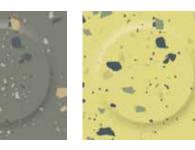


Chip Round 3T









MNTR44

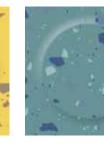
MNTR45

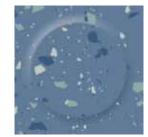
MNTR46

R46

MNTR31 MNTR81







or 0.61 500mm 2.41

MNTR48

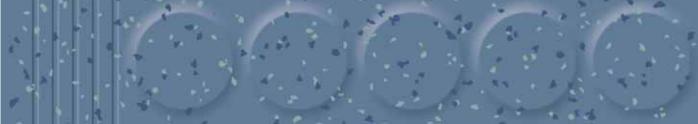
MNTR88

MNTR93









MNOCT93

Travel the rails of your dreams at anytime. The journey you desire to revisit... But there is no pleasure in a trip without safety and comfort guaranteed. Developed with the technological expertise of LS, the rubber flooring for rail cars will let you enjoy the journey that will be cherished forever.

SAFE GUARD

This rubber flooring specially developed for passenger safety and comfort is being used in KTX passenger cars and in subway cars.

SOLID ROUND | CHIP ROUND | SOLID HAMMERED | CHIP HAMMERED | CHIP STONE

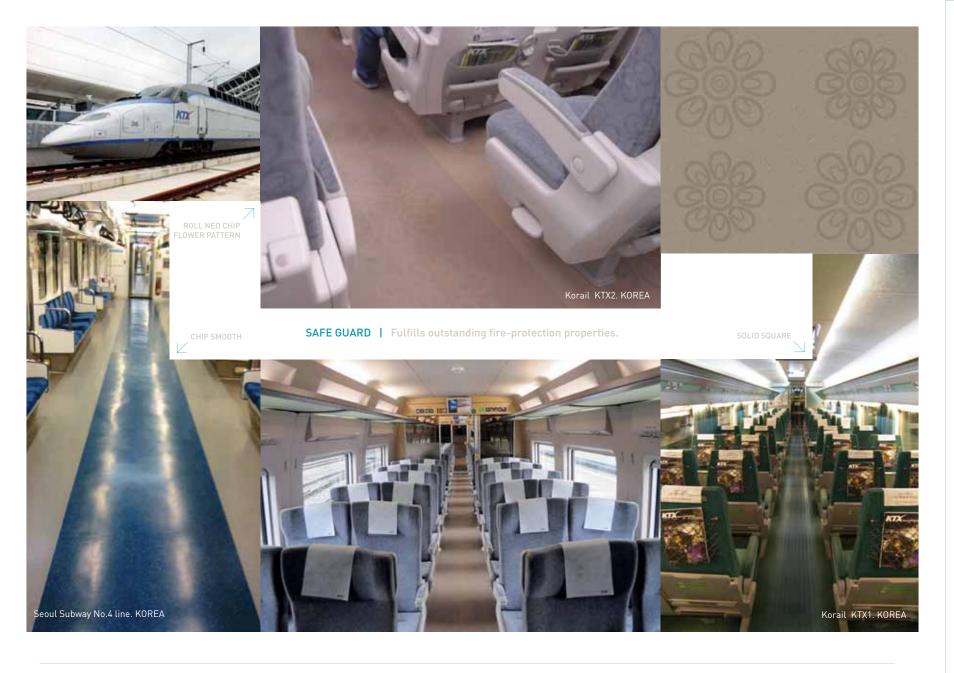
CHIP SLATE | CHIP CORK | STAIR | ROLL SOLID | ROLL CHIP | ROLL NEO CHIP | ORDER MADE DESIGN











SAFE-GUARD

non-flammable rubber flooring _ Fulfills outstanding fire-protection properties.

PRODUCT FEATURES

meets world leading standards : BS 6853 (GBR), DIN 5510 Part 2(DEU), NF F 16-101 (FRA)NFPA 130 (USA)

esistance to cigarette burns in accordance with EN 1399

halogen free-non-toxic gas when a fire breaks out

comfort underfor

customized surface design available upon request

APPLICATION

metro, rapid transit, commuter rail, high speed rail locomotive

Classification		Requirements	Results	Method	Test Description
	Color Fastness to artificial light	6 minimum on blue wool scale 3 on grey scale	Fulfilled	BS EN ISO 105 B02:1992	Color changes easured in response to changes in lighting
	Residual Indentation	Nominal thickness < 2.5mm Average value 0.2mm	Fulfilled	BS EN 433:1994	Product indentation measured from loads
General	Flexibility Diameter of mandrel 20mm	No cracking at 20mm	Fulfilled	BS EN 435:1994	Product measured for damage after bending
	Stubbed Cigarette	Method A rating 4	- Fulfilled	BS EN 1399:1998	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
Properties	Burning Cigarette	Method B rating 3			
	Abrasion resistance Method A, Vertical load (5±0.1)N	250mm3	180mm3	ISO 4649:1985	Measurement of product surface abrasion
	Hardness	75 Shore A	89	ISO 7619:1986	Measurement of product hardness
	Dimensional stability	Tolerance allowed:±0.4%	-0.2%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
Other Properties	Chemical Resistance		Fulfilled	BS EN 423	External changes measured after exposing samples to chemicals for determined amounts of time and then washing
	Slip resistance - ramp test		R 9	DIN 51130:1992	Slip resistance measured by directly walking on differentl sloping ramps
Flame Resistance	Oxygen Index	KORAIL safety standards for trains	Fulfilled	ISO 4589-2	The minimum oxygen level required to keep product sample burning
	Index of Toxicity			BS 6853 Annex B.2	Quotient used to compare concentration levels of major gases (CO2, CO, HF, HCI, HBr, HCN, NO2, SO2) with standard levels, when burnin product sample
	Smoke Density			ASTM E662	Density of smoke resulting from burning product sample measured by changes in ligh transmittance
	Surface Flammability			ASTM E648	Radiant heat value required for ignition of product measured to gauge surface flammability properties

^{*} Properties of SAFEGUARD products vary according to train vehicle dimension

Technical Ability

LS RUBBER FLOORING?

This halogen-free, homogeneous structured flooring is highly functional as it possesses the unique characteristics of rubber strengthened with reinforcing agents.

Eco-friendly mark signifying reduced indoor air pollution and contaminant

General Classification I Synthetic resin indoor flooring

Certification No. 1 7669

Model I SOFTRONG Green

Reasons for Certification I Reduced indoor air pollution, reduced environmental contaminants

Application I school, office, hospital, library, airport, station, laboratory etc.

Certifications on Eco-friendliness for Indoor Air Quality

Harmful substances	Eco-friendly certification criteria	SOFTRONG Green	
Volatile organic compound(VOCs)emissions	0.40 mg/m ² .h	0.30 mg/m ² .h	
Toluene emissions	0.08 mg/m ² .h	0.01 mg/m ² .h	
Formaldehyde emissions	0.12 mg/m ² .h	0.01 mg/m ² .h	



Anti-Bacteria/Fungal resistance/Residence to Staining & Chemical /Free of Halogen



Anti-bacteria Test Result = 99.9% reduction Fungal resistance Test

601

从数数用用

ngal resistance Test Result '0' means
sult = 0 'No changes in color
& appearance'

Technical
Services Report

Technical

Halogen Free : Non-toxic gases are occurred on fire

50



RIJBBER flooring vs PVC flooring

Outstanding Dimensional Stability







Outstanding Resistance against Cigarette Ashes







SOFTRONG PVC Linoleum

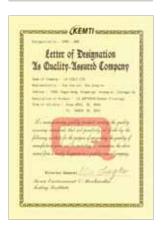
	REQUIREMENT	SOFTRONG
Cigarette-burn resistance (BS EN 1399)	- Stubbed Cigarette rating 4 - Burning Cigarette rating 3	5 4

Rating: 1 (Serious surface damage) ~ 4 (slight color change)
 ~ 5 (no change)

LS FLOORING SYSTEMS GREENFLOR | 50_51

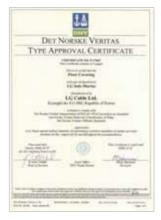
- Stubbed Cigarette : Stubbing out a cigarette
- Burning Cigarette: Cigarette burning (down to 10cm)

Q mark



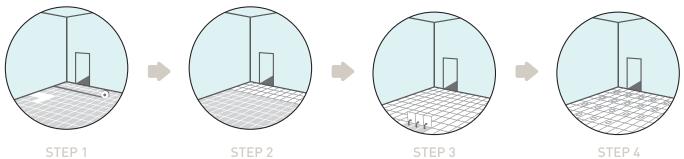








Tile Type



before installation. Lay out product along the line.

Draw a center line on the floor

Apply adhesives to the bottom of the product laid out and atta-ch product to the floor surface.

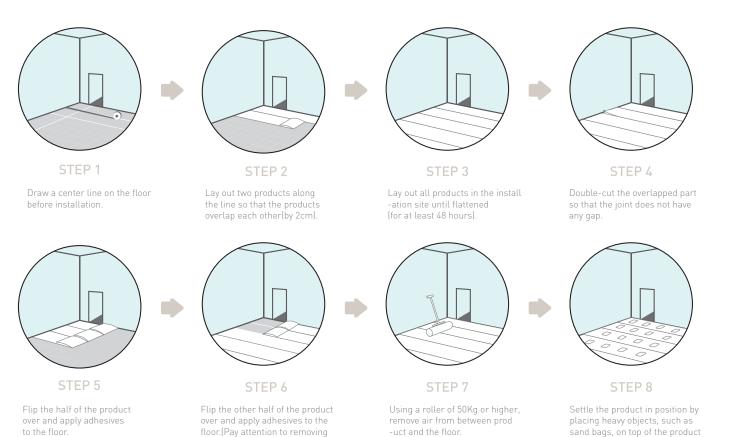
air when attaching the product to

the floor.)

Make sure the bottom surface of the product is completely attached to the floor.

Settle the product in position by placing heavy objects, such as sand bags, on top of the product.

(for more than 24 hours).



GREENFLOR believed in the possibility and soon the world began to believe in GREENFLOR.

A flooring system created by LS Cable may at first have appeared reckless.

However, Greenflor believed in the possibility and the technology of Greenflor eventually won over skeptical customers the world-over. Now, more and more people start their days with Greenflor.

With confidence in our products and pride in our technology, Greenflor will march towards greater possibilities.

LS FLOORING SYSTEMS GREENFLOR | 54_55

MEMO





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