

SOFTRONG  
SAFEPLAN  
SPOFLEX  
SAFEMARINE  
SAFEGUARD

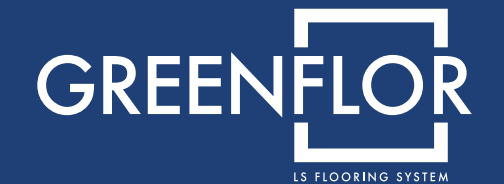
2011/12 NEW COLLECTION

## LS FLOORING SYSTEMS

**LS** Cable&System

14F, LS Tower, 1026-6, Hoge-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-080, Korea  
TEL : KOREA \_ 82.2.2189.9451 | GLOBAL \_ 82.2.2189.8893 | CHINA \_ 82.2.2189.8885 | FAX : 82.2.2189.9119  
[www.lsgreenflor.com](http://www.lsgreenflor.com)

2011 / 12 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.  
You 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.



contents

CONTENTS	02_03
INTRO	04_05
SOFTRONG	06_19
SAFEPLAN	20_29
SPOFLEX	30_37
SAFEMARINE	38_45
SAFEGUARD	46_49
TECHNICAL NOTE	50_52
EPILOGUE	53
MEMO	54_55

2011 / 12  
LS GREENFLOR  
NEW COLLECTION





# GREENFLO

## 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 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.

# SOFTRONG

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







Shanghai Pudong Library. CHINA

Safe and Comfort | Soft Rong



Chung-Ang University Library. KOREA



CMH31  
SOLID HAMMERED



NMH441  
CHIP HAMMERED

CHIP HAMMERED



Shanghai Pudong Library. CHINA

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 indentation 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)
	Burning Cigarette	Method B rating 3			
	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
Other Properties	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
	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 HAMMERED    ↑ CML20 SOLID SLATE    Safe and Comfort | Soft Rong



CMH10 SOLID HAMMERED

Byclo store. KOREA



Safe and Comfort | Soft Rong

CMH31 | 48 | 12 | 52  
SOLID HAMMERED



Melbourne Dockland ANZ Bank. AUSTRALIA





Solid Round  
3T / 4T

>>



CMR421 **NEW**



CMR42/CTR42



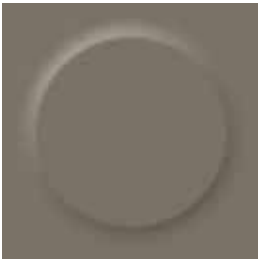
CMR43



CMR40



CMR425 **NEW**



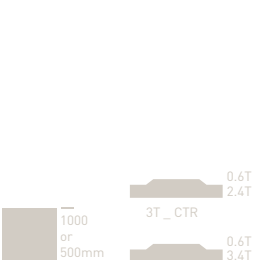
CMR404 **NEW**



CMR31



CMR10



CMR20

CMR97/CTR97

CMR33/CTR33



**SOFTTRONG** \_ 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 Round  
3T / 4T

>>



CMR47



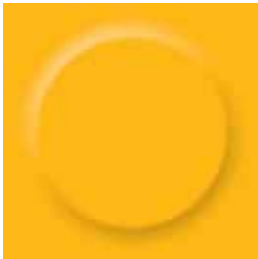
CMR48



CMR54 **NEW**



CMR57



CMR402 **NEW**



CMR12



CMR922 **NEW**



CMR52



CMR83



CMR86/CTR86



CMR806 **NEW**



CMR82



CMR92



CMR93/CTR93



CMR91



CMR972 **NEW**



Solid  
Hammered  
3T


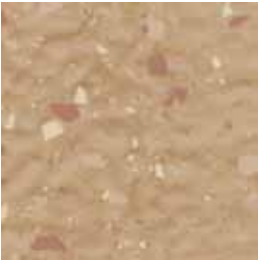
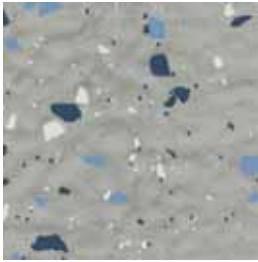
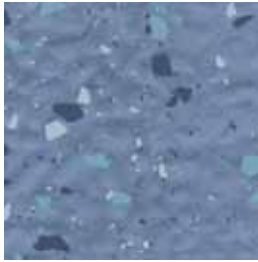

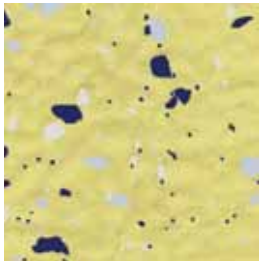
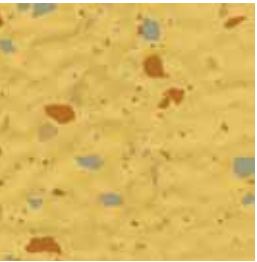
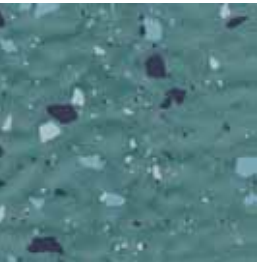
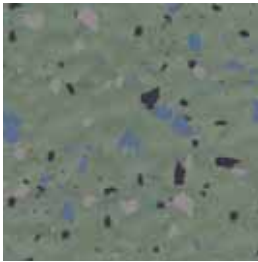
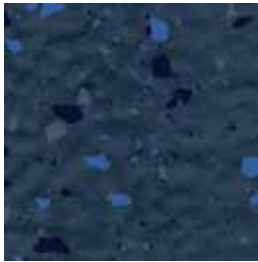
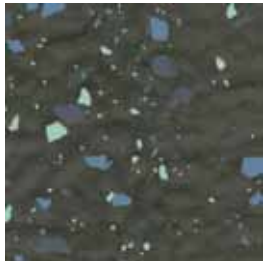



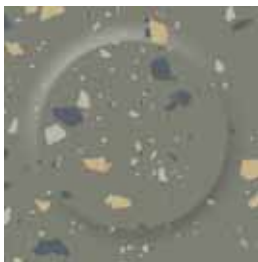


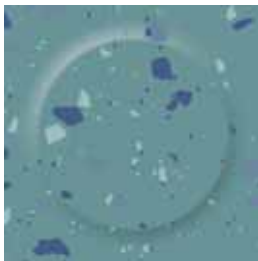
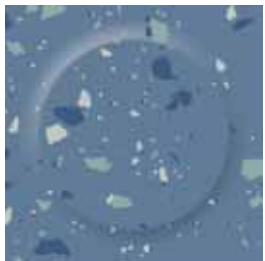
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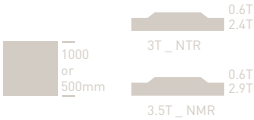
			
CMH47	CMH42	CMH431 <b>NEW</b>	CMH404 <b>NEW</b>
			
CMH10 <b>NEW</b>	CMH31	CMH30 <b>NEW</b>	CMH20 <b>NEW</b>
			
CMH86	CMH93	CMH921 <b>NEW</b>	CMH972 <b>NEW</b>



Chip  
Hammered  
3T/3.5T >>



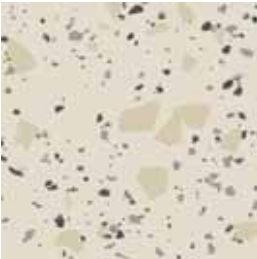
					
NMH43	NMH44	NMH331 <b>NEW</b>	NMH93	NMH31	
					
NMH81	NMH48	NMH88	NMH853 <b>NEW</b>	NMH99	NMH210 <b>NEW</b>
					
NTR44 / NMR44	NTR45 / NMR45	NTR46 / NMR46	NTR31 / NMR31	NTR81 / NMR81	
					
		NTR48 / NMR48	NTR88 / NMR88	NTR93 / NMR93	



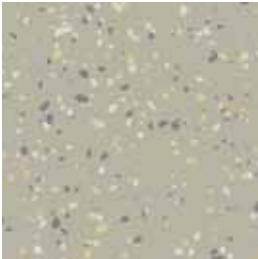


Chip Stone  
3.5T

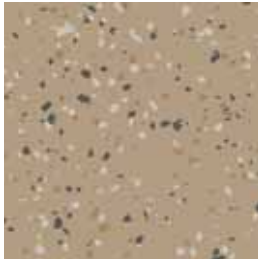
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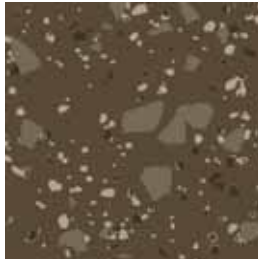
MCI143 **NEW**



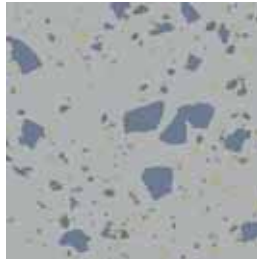
MCI139 **NEW**



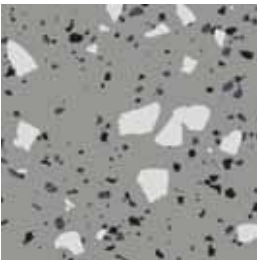
MCI441 **NEW**



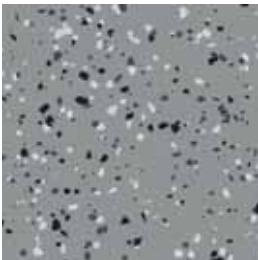
MCI431 **NEW**



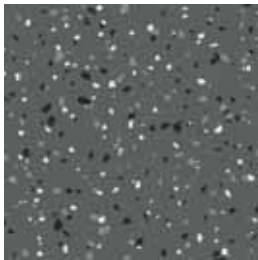
MCI174 **NEW**



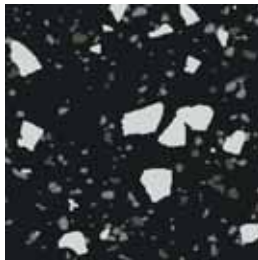
MCI192 **NEW**



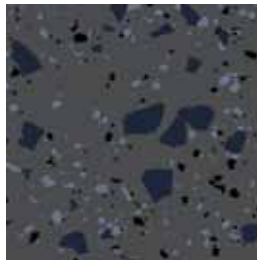
MCI132 **NEW**



MCI634 **NEW**



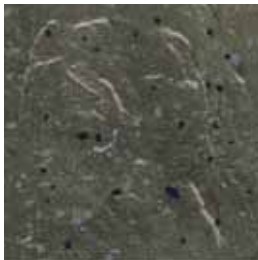
MCI439 **NEW**



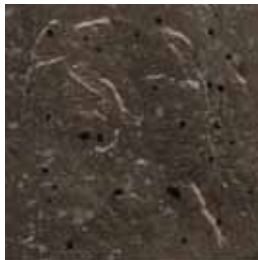
MCI975 **NEW**

Chip Slate  
3.5T

>>



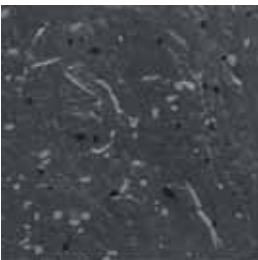
MCN425 **NEW**



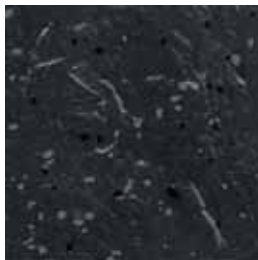
MCN623 **NEW**



MCN412 **NEW**



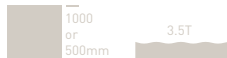
MCN323 **NEW**



MCN233 **NEW**



MCN223 **NEW**

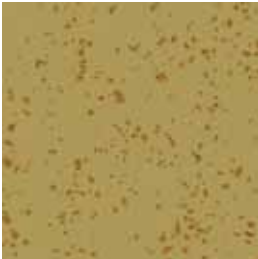


Chip Cork  
3T

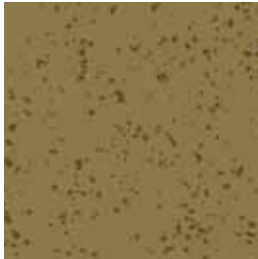
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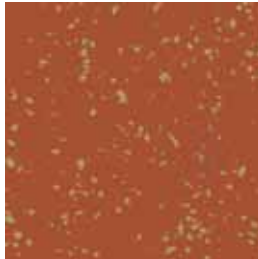
CTC40 **NEW**



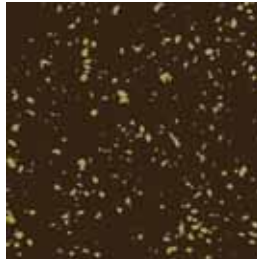
CTC42 **NEW**



CTC41 **NEW**



CTC51 **NEW**



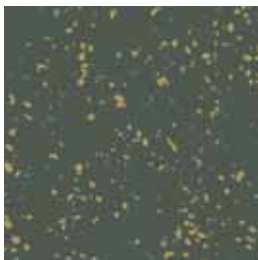
CTC44 **NEW**



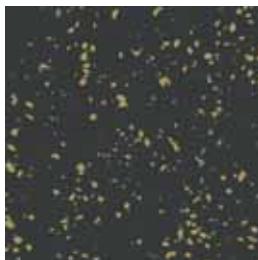
CTC30 **NEW**



CTC90 **NEW**



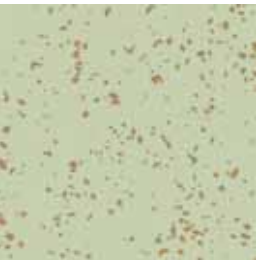
CTC32 **NEW**



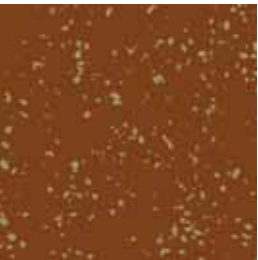
CTC20 **NEW**



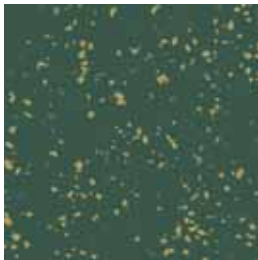
CTC80 **NEW**



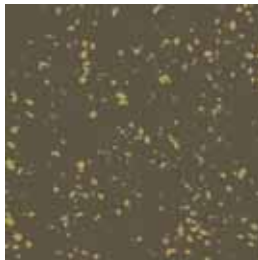
CTC10 **NEW**



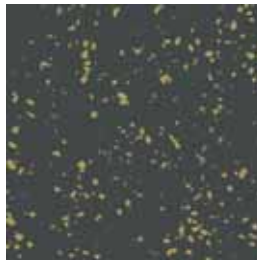
CTC50 **NEW**



CTC31 **NEW**



CTC43 **NEW**



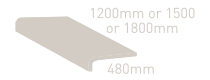
CTC33 **NEW**







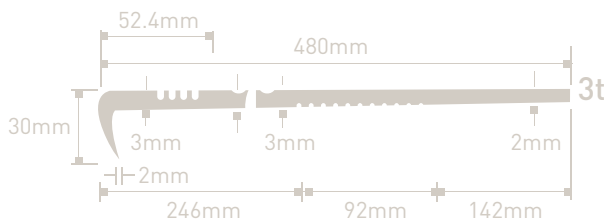
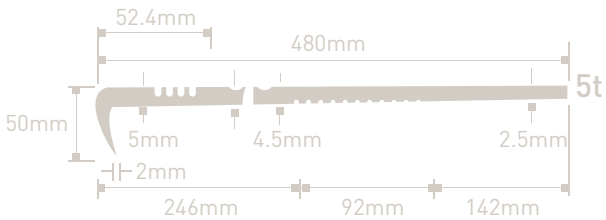
Solid Stair  
5T



Color : SOLID Round 4T the same



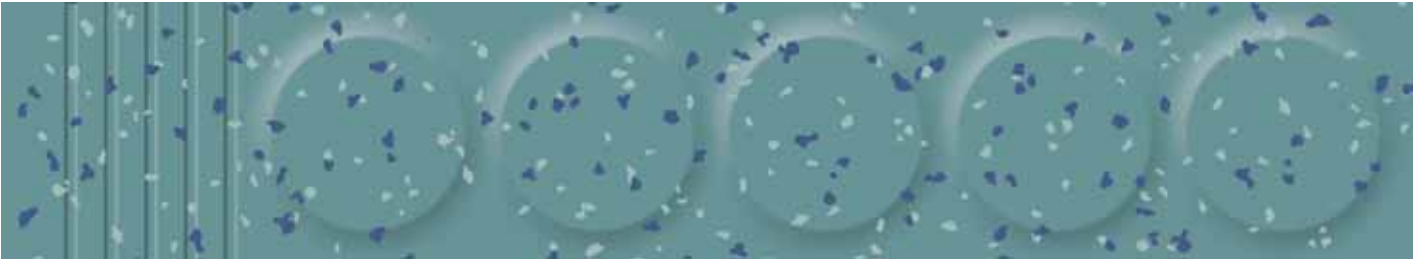
SOCR42



Chip Stair  
5T



Color : CHIP Round 4T the same

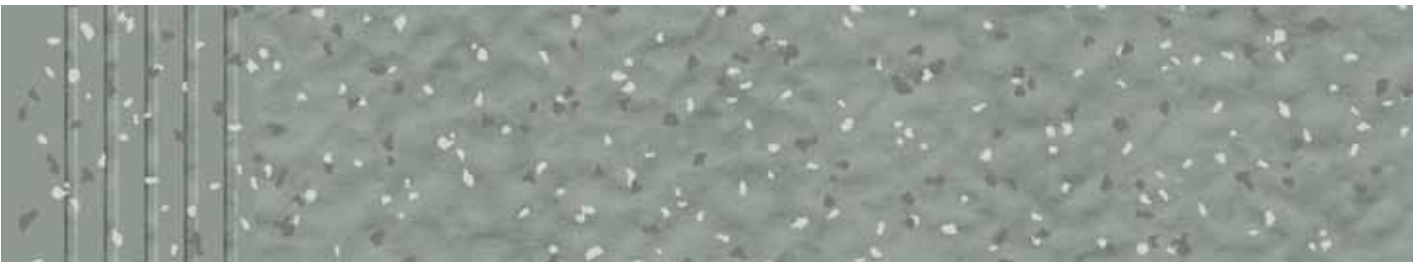


SNOCR88

Chip  
Hammered  
Stair 3T

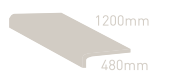


Color : CHIP Round 4T the same



**NEW** SNHCR31

Solid Stair  
3T



Color : SOLID Round 3T the same

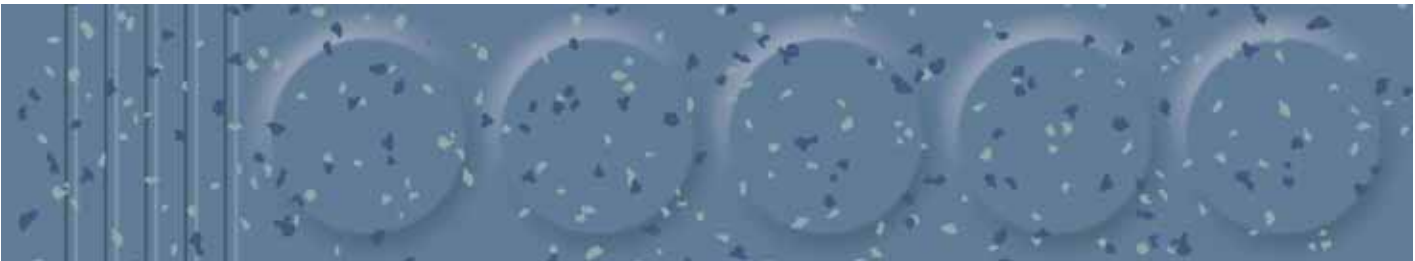


SOCT97

Chip Stair  
3T



Color : SOLID Round 3T the same



SN OCT93



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.

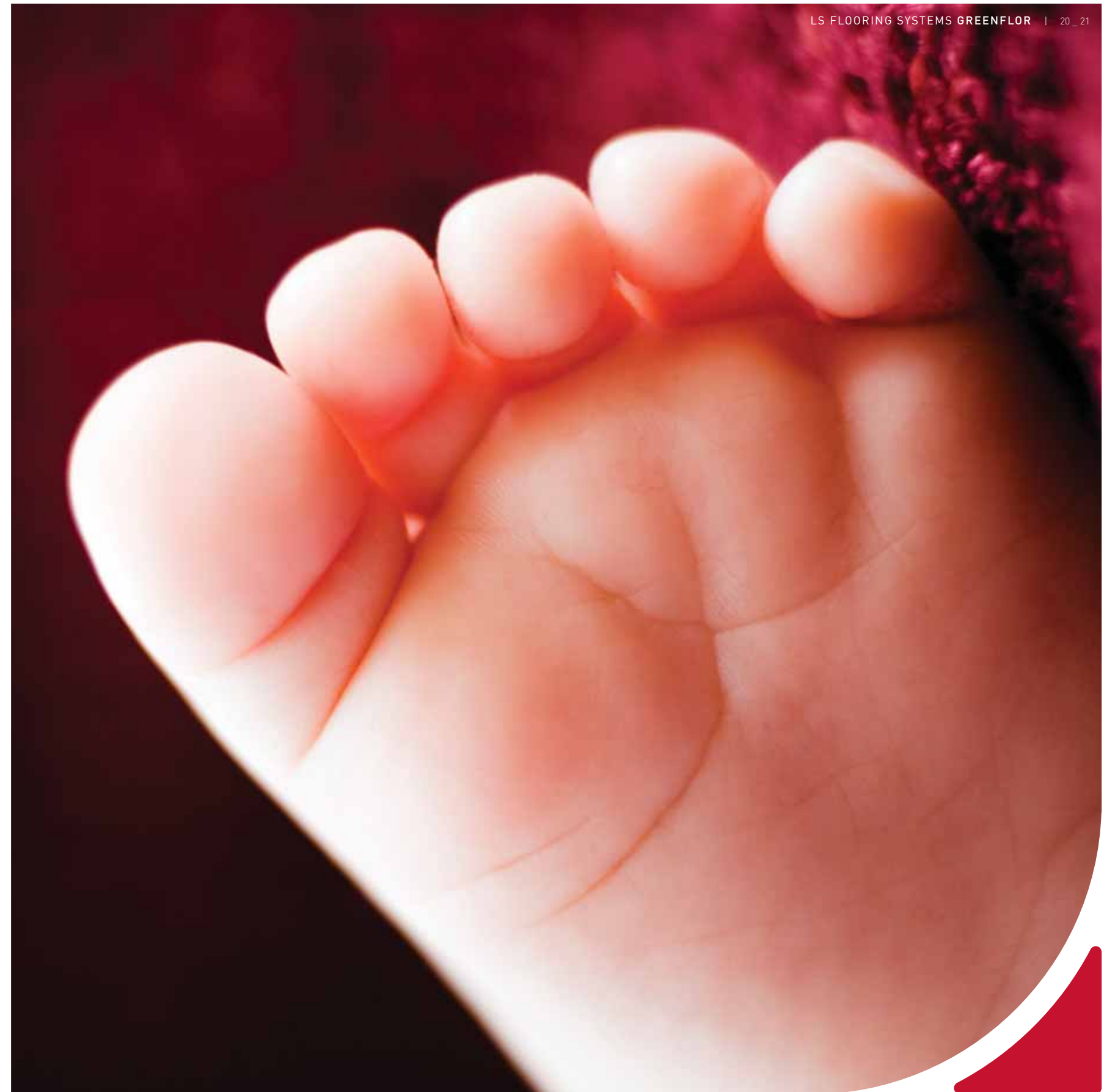
# SAFE PLAN

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

**SAFEPLAN** \_ roll type rubber flooring suitable for health care

LS FLOORING SYSTEM  
**GREENFLOR**





RC8191  
ROLL CHIP



RC8098  
ROLL CHIP

RC4143  
ROLL CHIP

Clean and Hygienic | **Safe Plan**



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 1399:1998	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
	Burning Cigarette	Method B rating 3			
	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
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





Guangzhou, Honghui Hospital, CHINA

Clean and Hygienic | Safe Plan



Guangzhou, Honghui Hospital, CHINA

RC1021 | 3021  
ROLL CHIP

RC3021  
ROLL CHIP

RC1021 | 3021  
ROLL CHIP



Guangzhou, Honghui Hospital, CHINA





Clean and Hygienic | **Safe Plan**

ROLL NEO CHIP →

← ROLL NEO CHIP      ROLL NEO CHIP →

Yinchuan Ningxia, Ningmei Commander Center. CHINA



Yinchuan Ningxia, Ningmei Commander Center. CHINA



Yinchuan Ningxia, Ningmei Commander Center. CHINA



Foshan Hospital. CHINA



Foshan Hospital. CHINA

← RC4043 | 8191  
ROLL CHIP

RC4043  
ROLL CHIP →

← RC4043 | 8191  
ROLL CHIP



Foshan Hospital. CHINA

Clean and Hygienic | **Safe Plan**

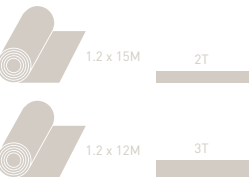


Roll Solid  
2T/3T

>>



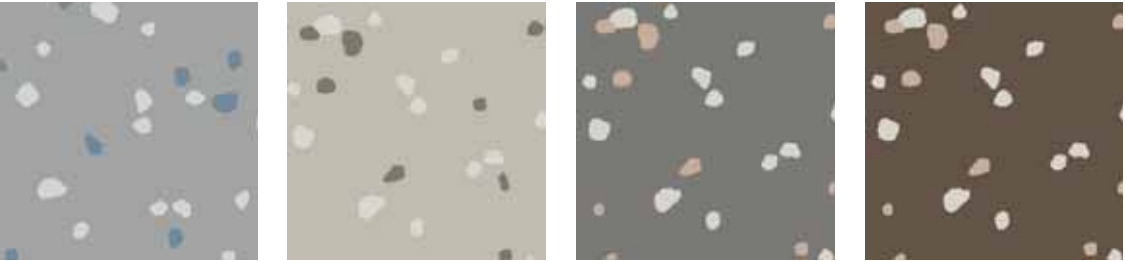
RM5000 RM4300 *NEW* RM1000 RM3700 *NEW* RM4200 *NEW*



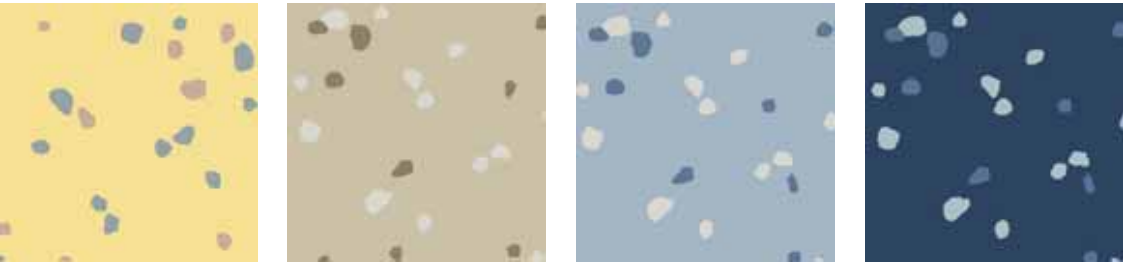
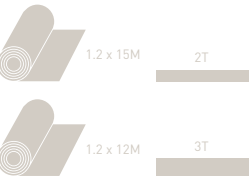
RM8000 RM4100 RM9000 RM3200 *NEW* RM3000

Roll  
Neo Chip  
2T/3T

>>



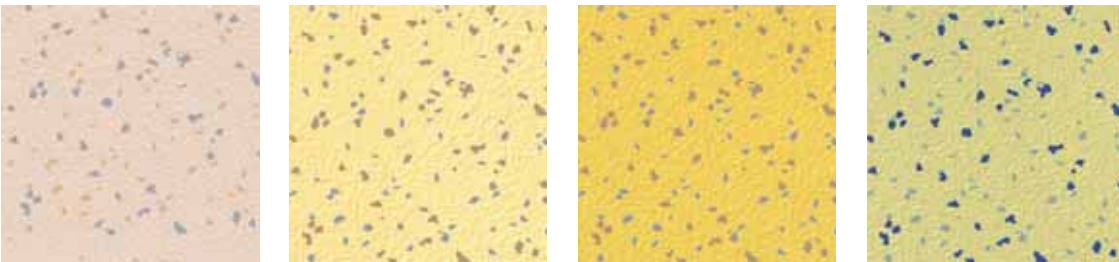
RU9419 *NEW* RU3713 *NEW* RU1174 *NEW* RU4219 *NEW*



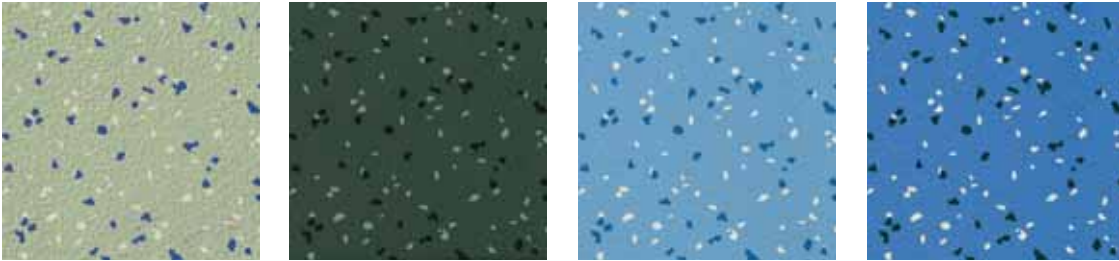
RU4238 *NEW* RU4147 *NEW* RU9518 *NEW* RU9989 *NEW*

Roll Chip  
2T/3T

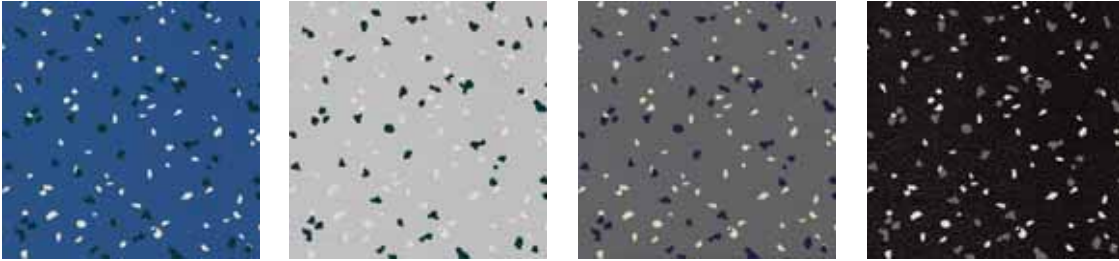
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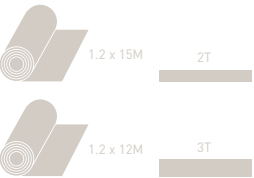
RC5043 RC4043 RC4143 RC8098



RC8191 RC8228 RC9091 RC9121



RC9221 RC1021 RC3021 RC2031



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

LS SPOFLEX is sturdy enough to withstand the power spikes of Ji-sung Park and the speed jumps of Yuna Kim. The super high-strength rubber tile for sporting activities is a multifunctional flooring developed with LS' world-class technology that can be used in any sporting facility.

# 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.

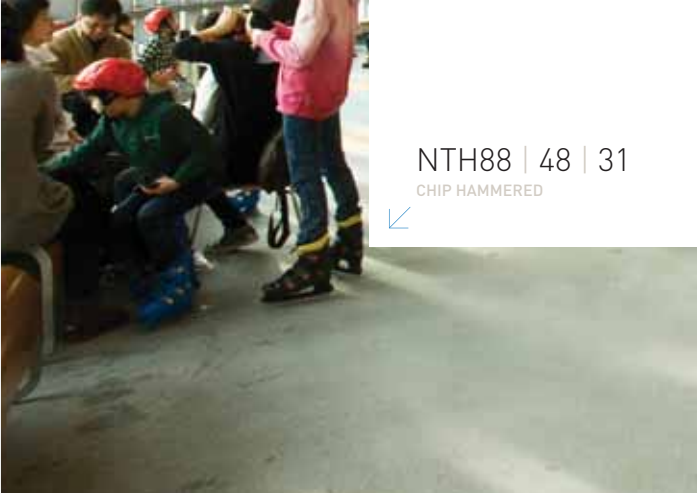
CHIP HAMMERED | CHIP SLATE | CHIP SIMPLE

SPOFLEX \_ rubber flooring for a wide range of sports facilities

LS FLOORING SYSTEM  
**GREENFLOR**

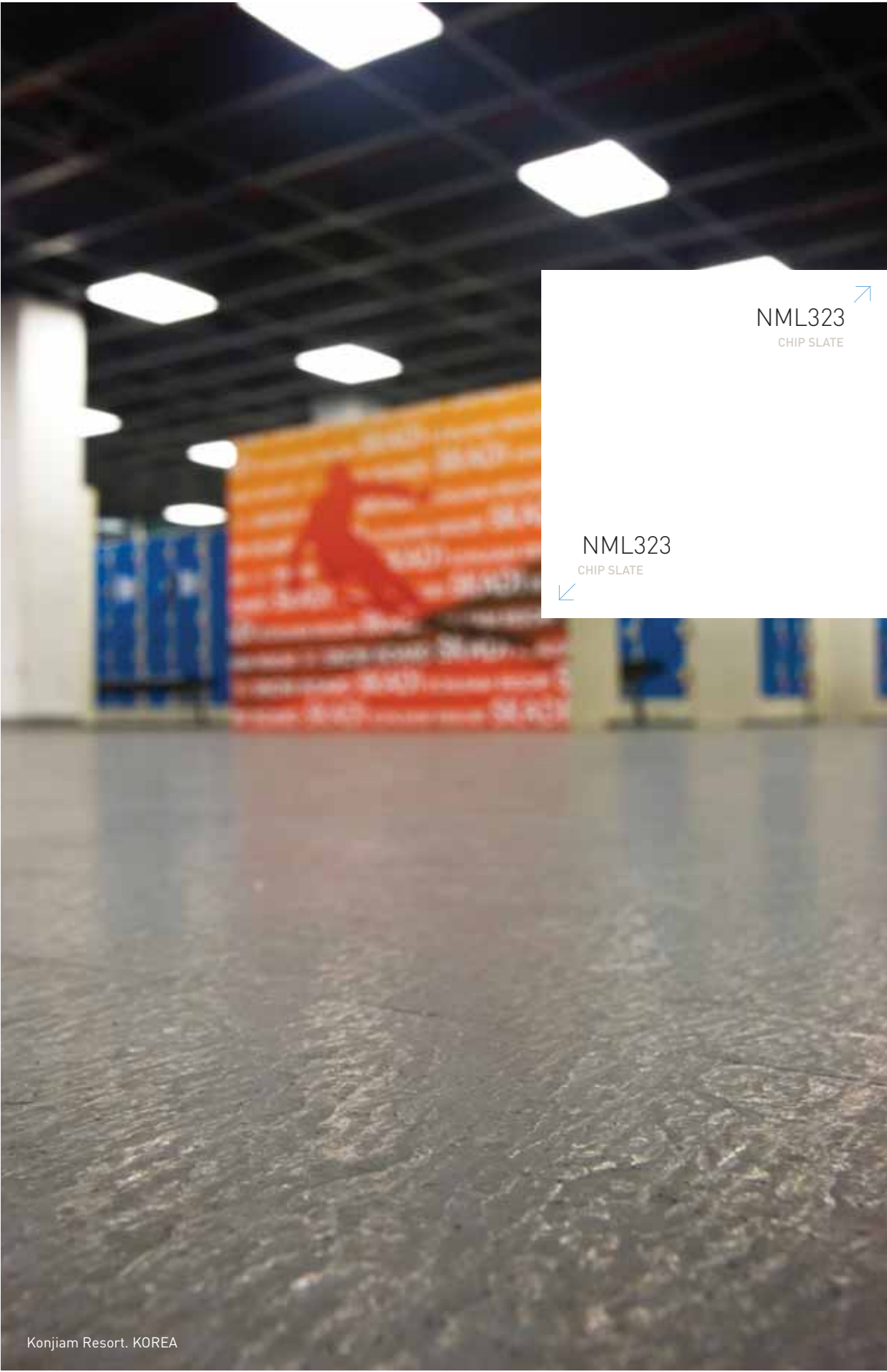






Classification		Requirements	Results	Method	Test Description
General Properties	Color Fastness to artificial light	6 minimum on blue wool scale 3 on grey scale	Fulfilled	BS EN ISO 105 B02:1992	Color changes easured in response to changes in lighting
	Residual Indentation	Nominal thickness < 2.5mm Average 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 1399:1998	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
	Burning Cigarette	Method B rating 3			
	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
Other Properties	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
	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








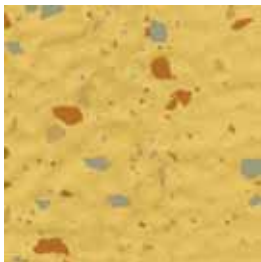
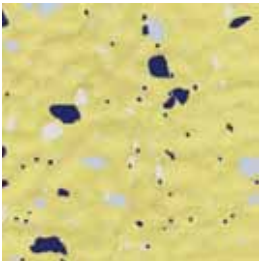
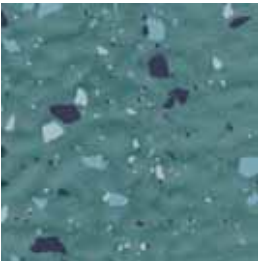
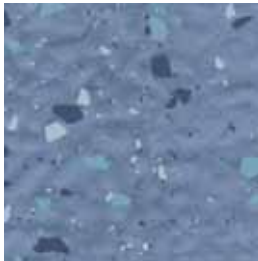
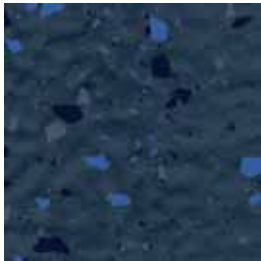

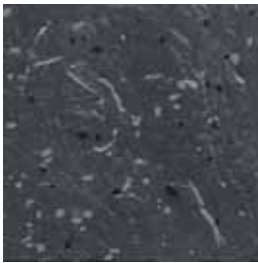
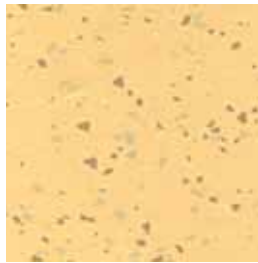
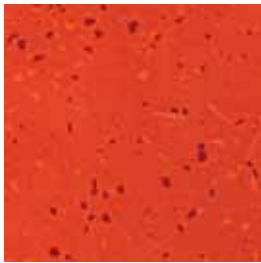
**SPO-FLEX** | rubber flooring for  
a wide range of sports facilities





Chip  
Hammered  
9.5T

>>

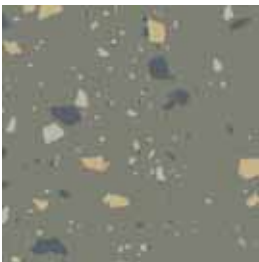


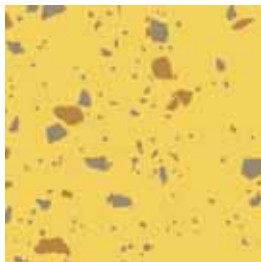
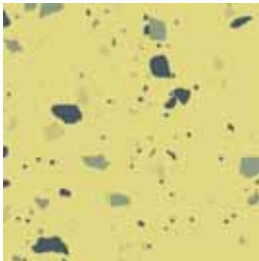
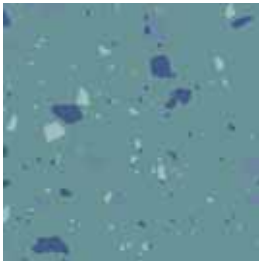
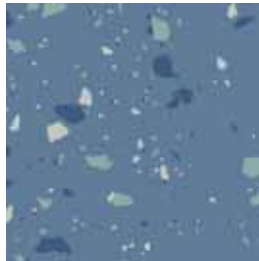
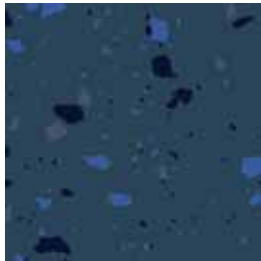
			
NTH31	NTH43	NTH44	NTH48
			
NTH81	NTH88	NTH93	NTH99
			
NML203	NML323	NML401	NML501



Chip Slate  
6T >>

Chip Simple  
9.5T

>>

			
NTS31	NTS43	NTS44	NTS48
			
NTS81	NTS88	NTS93	NTS99



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

Leonardo Dicaprio's sacrifice was touching, but had there been LS' SAFEMARINE, the tragic sinking of the Titanic would not have been. With technology proven throughout the world, LS has developed this flooring especially for ocean-going ships to be far more slip and fire resistant than alternatives. LS will protect you by ensuring your journey on the sea to be no longer a risky adventure that may cost you your life.

# SAFE MARINE

Specially developed for ships that are vulnerable to fire and safety hazards, this flooring material has been acknowledged for its technological sophistication throughout the world.

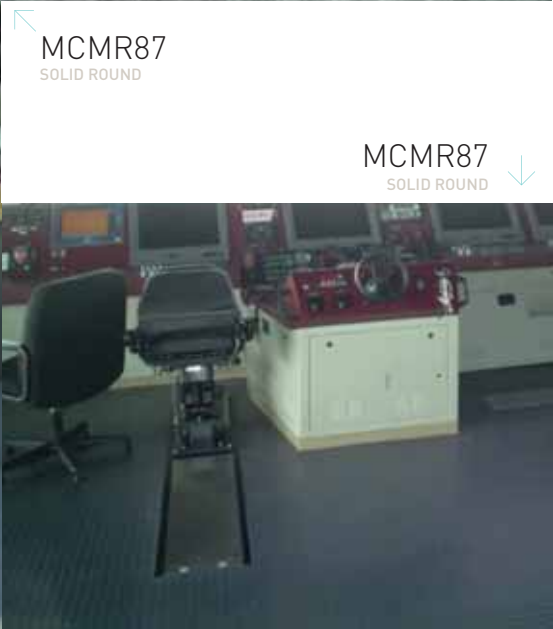
SOLID ROUND | CHIP HAMMERED | CHIP ROUND | CHIP STAIR | ROLL CHIP

**SAFEMARINE** \_ conformity to strict requirements of seagoing vessels

LS FLOORING SYSTEM  
**GREENFLOR**







SAFE MARINE | conformity to strict requirements of seagoing vessels

MCMR87  
SOLID ROUND

MCMR87  
SOLID ROUND

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 1399:1998	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
	Burning Cigarette	Method B rating 3			
	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
Other Properties	Dimensional stability	Tolerance allowed:±0.4%	-0.02%	BS EN 434:1994	Dimensional changes measured after exposing product to heat
	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  
4T

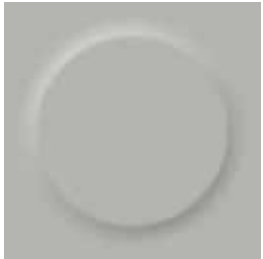
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MCMR48



MCMR42



MCMR10



MCMR33



MCMR97



MCMR93



MCMR87



MCMR91



MCMR82



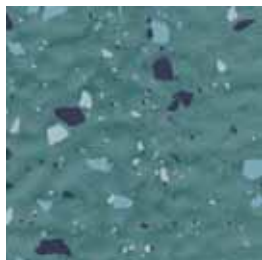
MNMH43



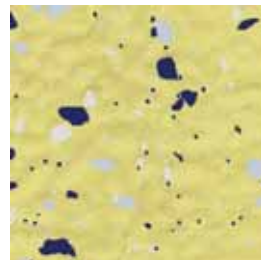
MNMH44



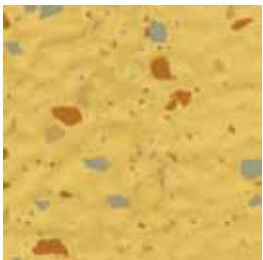
MNMH31



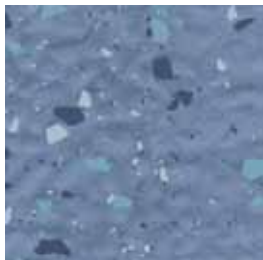
MNMH88



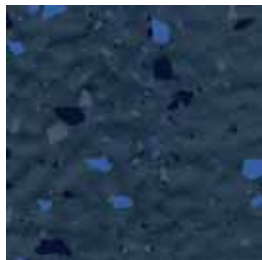
MNMH81



MNMH48



MNMH93



MNMH99



Chip  
Hammered  
3T

>>



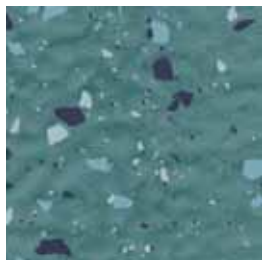
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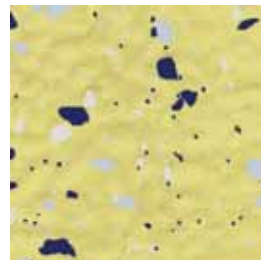
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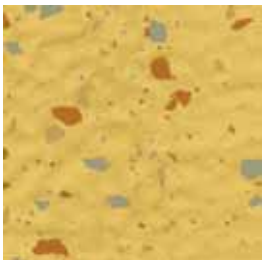
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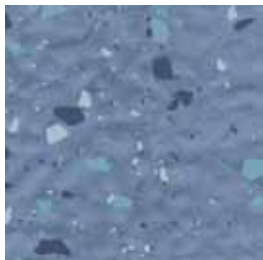
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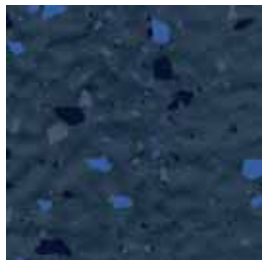
MNMH81



MNMH48



MNMH93

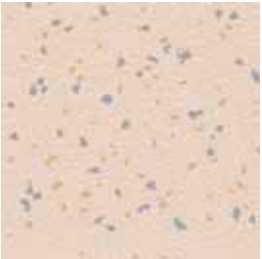


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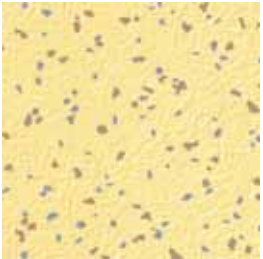


Roll Chip  
2T

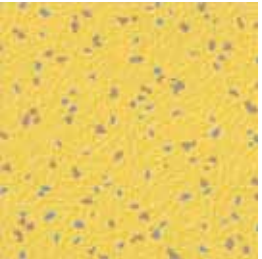
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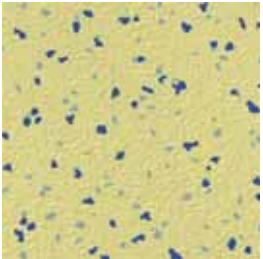
CHIP5043



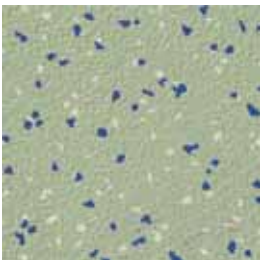
CHIP4043



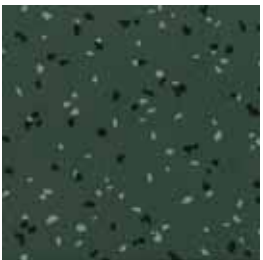
CHIP4143



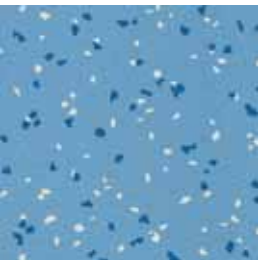
CHIP8098



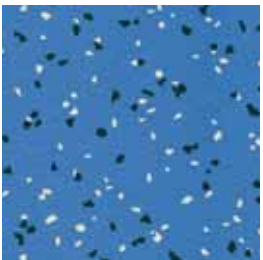
CHIP8191



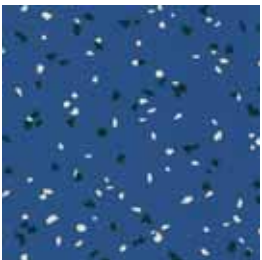
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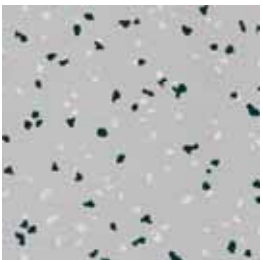
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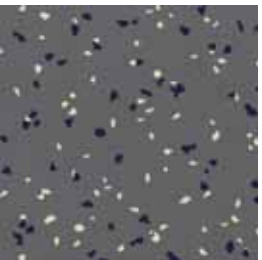
CHIP9121



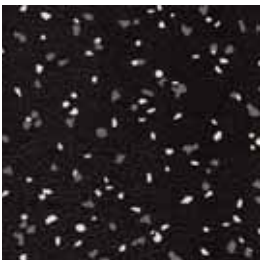
CHIP9221



CHIP1021



CHIP3021



CHIP2031



SAFE-MARINE\_ conformity to strict requirements of seagoing vessels

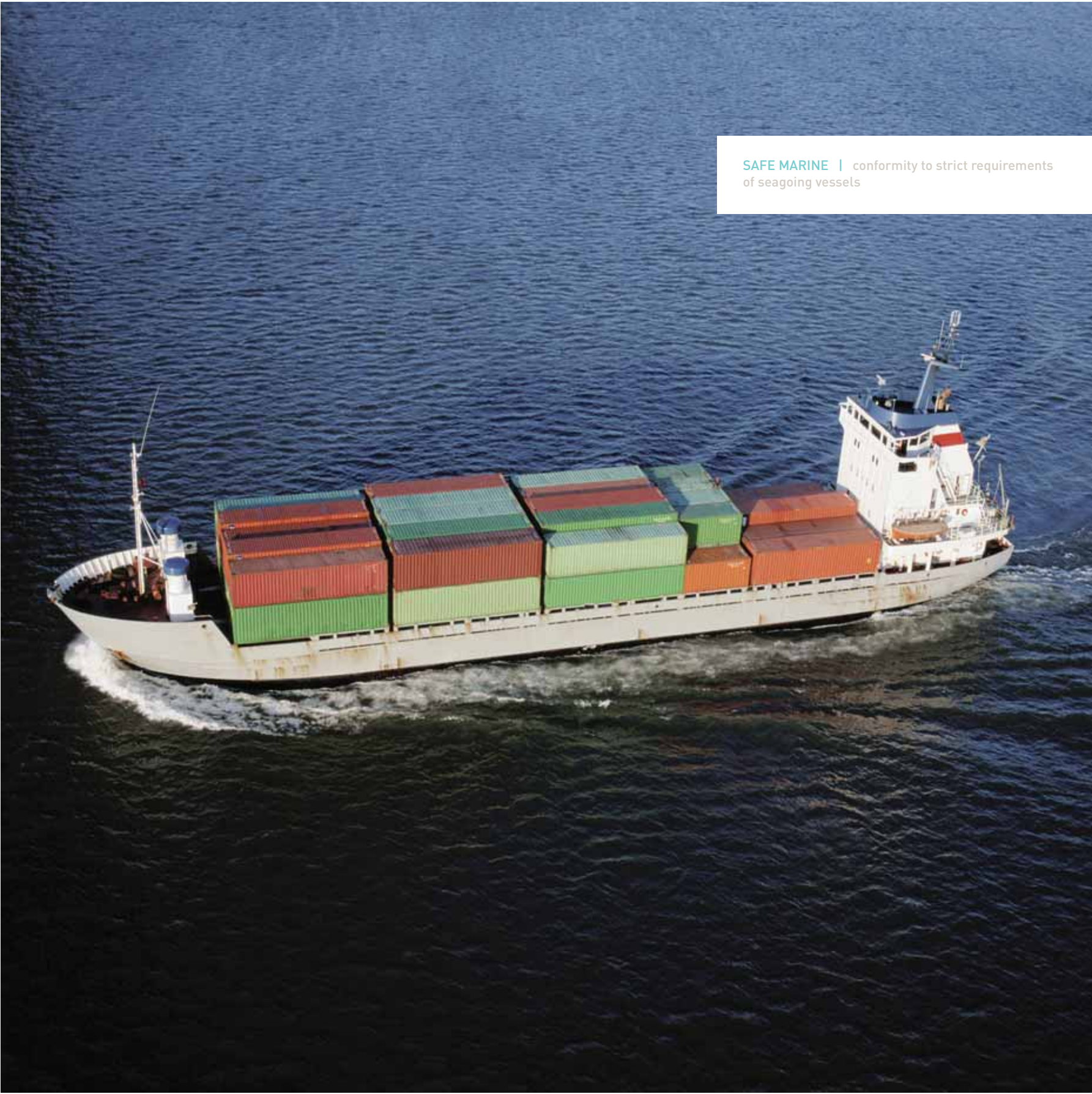
Low flame spread surface material, not generating excessive quantities of smoke nor toxic products in fire. Approved for use as floor covering on non-combustible substrate throughout the accommodation.

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





SAFE MARINE | conformity to strict requirements of seagoing vessels

Chip Round  
3T

>>



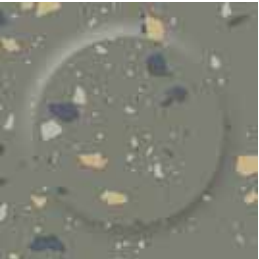
MNTR44



MNTR45



MNTR46



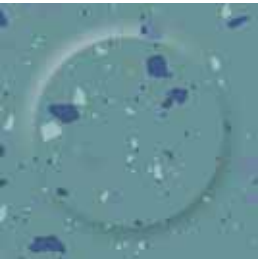
MNTR31



MNTR81



MNTR48

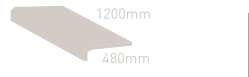


MNTR88

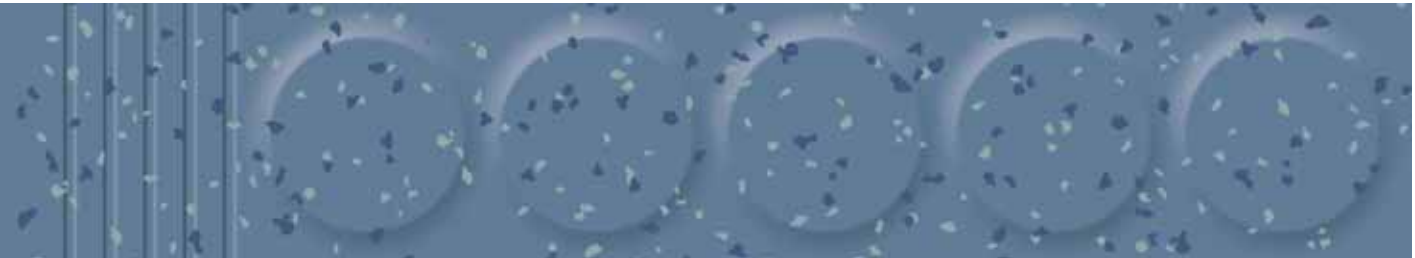


MNTR93

Chip Stair  
3T



Color : SOLID Round 3T the same



MNOCT93



Travel the rails of your dreams at anytime. The journey you desire to re-visit... 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.

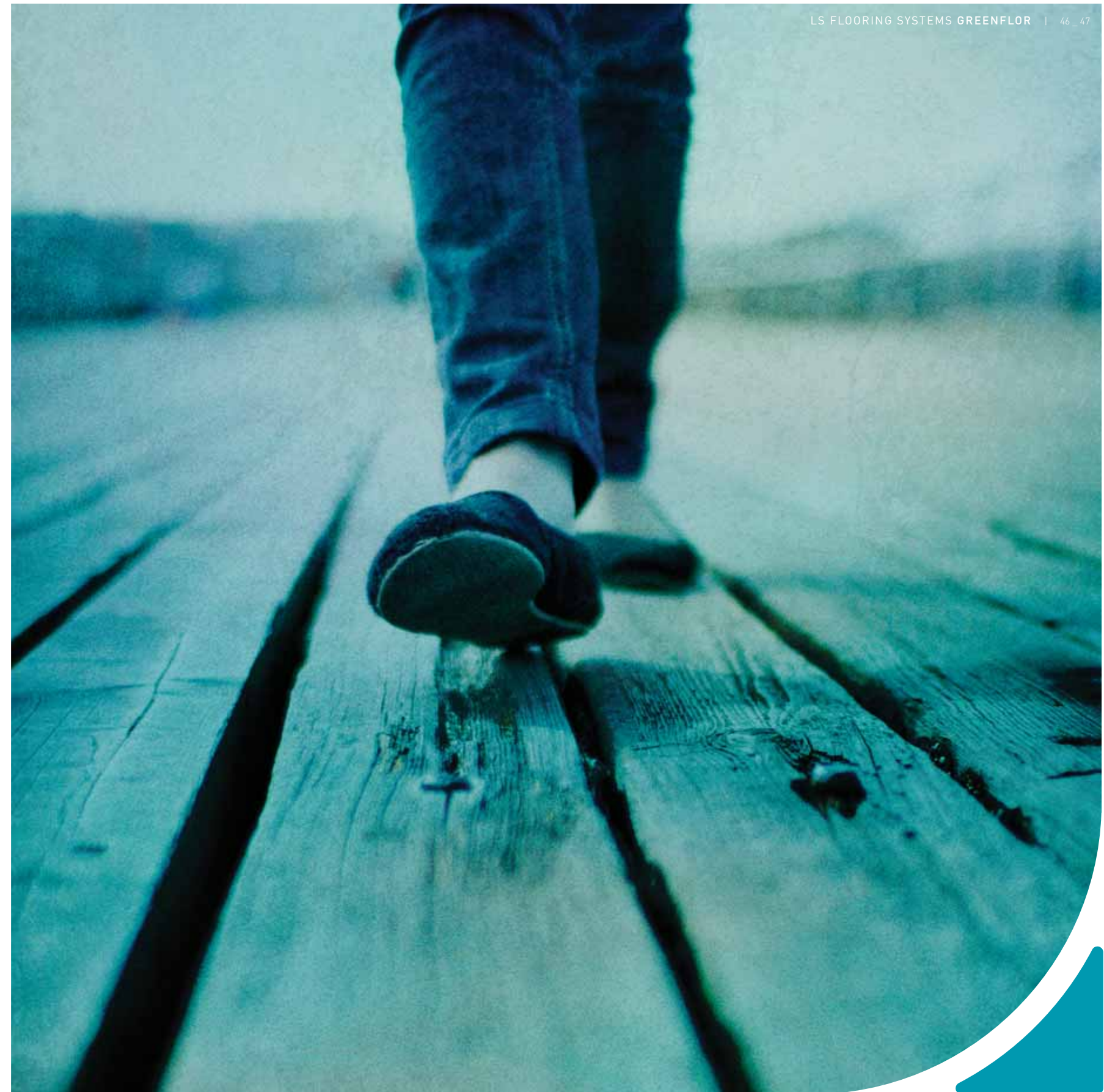
# SAFE GUARD

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

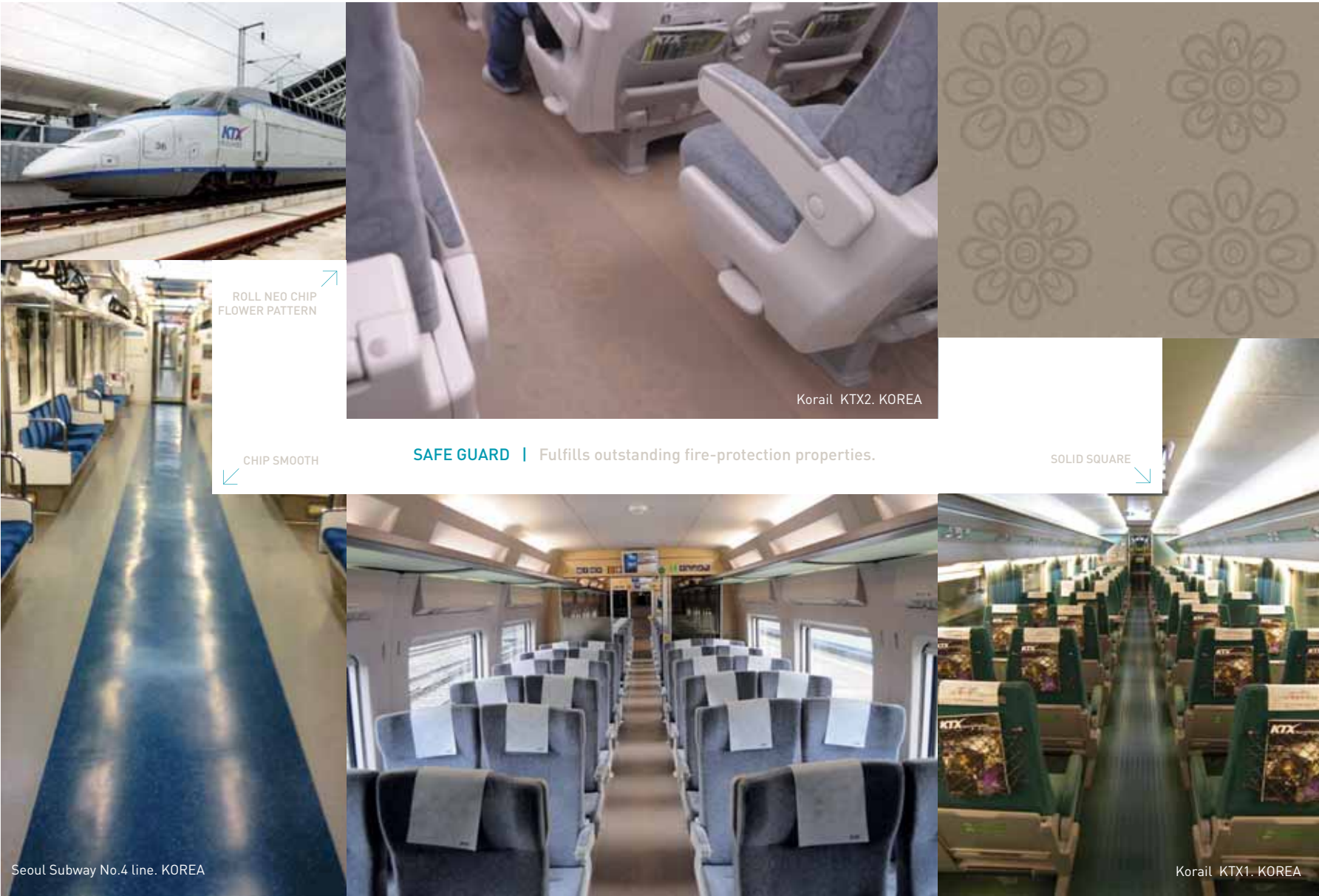
SOLID ROUND | CHIP ROUND | SOLID HAMMERED | CHIP HAMMERED | CHIP STONE  
CHIP SLATE | CHIP CORK | STAIR | ROLL SOLID | ROLL CHIP | ROLL NEO CHIP | ORDER MADE DESIGN

**SAFEGUARD** \_ non-flammable rubber flooring

LS FLOORING SYSTEM  
**GREENFLOR**







## 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)
- resistance to cigarette burns in accordance with EN 1399
- halogen free-**non-toxic gas** when a fire breaks out
- comfort underfoot
- customized surface design available upon request

### APPLICATION

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

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 1399:1998	Surface changes measured after exposure to stubbed cigarettes (method A) and spontaneous burning (method B)
	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 differently sloping ramps
Flame Resistance	Oxygen Index			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, HCl, HBr, HCN, NO2, SO2) with standard levels, when burning product sample
	Smoke Density			ASTM E662	Density of smoke resulting from burning product sample measured by changes in light 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 dimensions.

# 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 contaminants

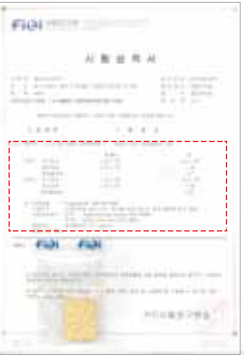
General Classification	I Synthetic resin indoor flooring
Certification No.	I 7669
Model	I SOFTRONG Green
Reasons for Certification	I Reduced indoor air pollution, reduced environmental contaminants
Application	I school, office, hospital, library, airport, station, laboratory etc.

## 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 <sup>2</sup> .h	0.30 mg/m <sup>2</sup> .h
Toluene emissions	0.08 mg/m <sup>2</sup> .h	0.01 mg/m <sup>2</sup> .h
Formaldehyde emissions	0.12 mg/m <sup>2</sup> .h	0.01 mg/m <sup>2</sup> .h




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




Anti-bacteria Test  
Result = 99.9% reduction



Fungal resistance Test  
Result = 0



Result '0' means  
'No changes in color  
& appearance'



Halogen Free :  
Non-toxic gases are  
occurred on fire

## ISO



## RUBBER flooring vs PVC flooring

### Outstanding Dimensional Stability



SOFTRONG Tile type



PVC Tile type

Joint →



Since welding is not required,  
joints are nearly indistinguishable.

Joint ← →

Joint ←



Welded area damaged due to  
low dimensional stability

Joint ←

SOFTRONG Roll type

PVC Roll type

### Outstanding Resistance against Cigarette Ashes



slight color change

SOFTRONG



surface damage

PVC



Serious surface damage

Linoleum

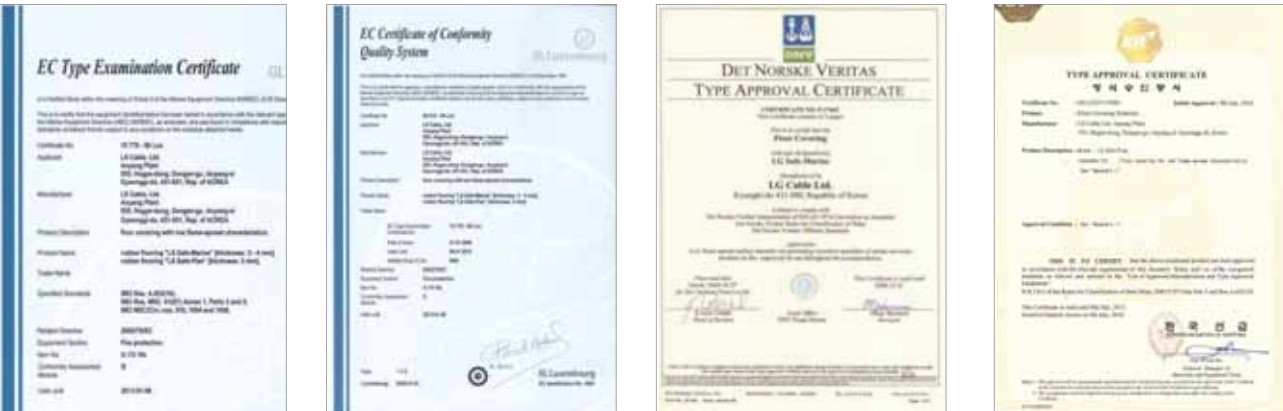
DIVISION	REQUIREMENT	SOFTRONG
Cigarette-burn resistance (BS EN 1399)	- Stubbed Cigarette - Burning Cigarette	rating 4 rating 3 5 4

- Rating : 1 (Serious surface damage) ~ 4 (slight color change) ~ 5 (no change)
- Stubbed Cigarette : Stubbing out a cigarette
- Burning Cigarette : Cigarette burning (down to 10cm)

## Q mark



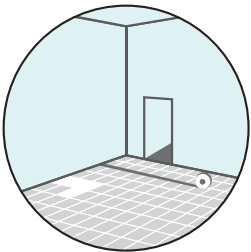
## MARINE Certification





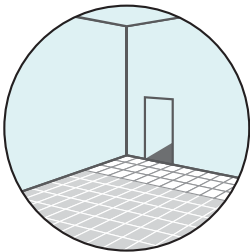
Installation Manual

Tile Type



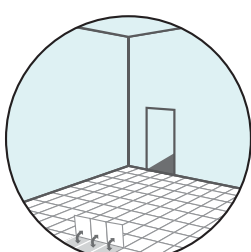
STEP 1

Draw a center line on the floor before installation.  
Lay out product along the line.



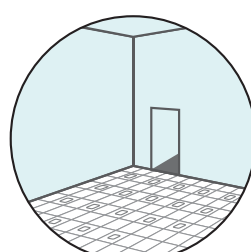
STEP 2

Apply adhesives to the bottom of the product laid out and attach product to the floor surface.



STEP 3

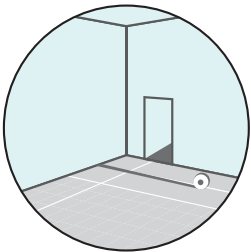
Make sure the bottom surface of the product is completely attached to the floor.



STEP 4

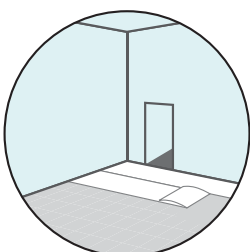
Settle the product in position by placing heavy objects, such as sand bags, on top of the product.

Roll Type



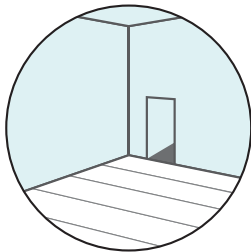
STEP 1

Draw a center line on the floor before installation.



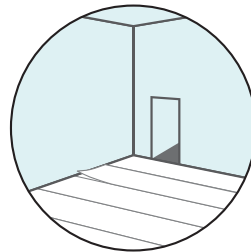
STEP 2

Lay out two products along the line so that the products overlap each other by 2cm.



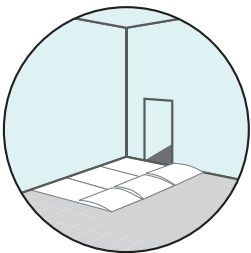
STEP 3

Lay out all products in the installation site until flattened for at least 48 hours.



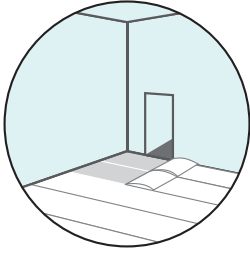
STEP 4

Double-cut the overlapped part so that the joint does not have any gap.



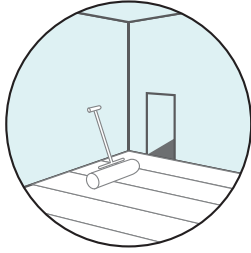
STEP 5

Flip the half of the product over and apply adhesives to the floor.



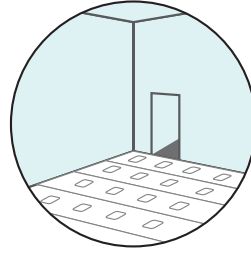
STEP 6

Flip the other half of the product over and apply adhesives to the floor. [Pay attention to removing air when attaching the product to the floor.]



STEP 7

Using a roller of 50Kg or higher, remove air from between product and the floor.



STEP 8

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.

MEMO

