

RELMAT LAMINATE FLOORING

NISSOS LINE

TECHNICAL SPECIFICATIONS

1. Product Information

Laminate floors of Nissos Line are industrially manufactured floor coverings, made through an innovative technology according to which the decor is printed directly onto the natural wood-fibre core board. Nissos Line products are environmentally friendly, because of the less energy used for their fewer-step production process, but also ecological, given the use of only PEFC-certificated wood from sustainable forests, as well as water- soluble varnishes. The new direct printing process of Nissos Line also delivers improved acoustic properties thus making the Laminate flooring produced using the direct-printing method up to 20% quieter than "conventional" laminate flooring.

All in all, Laminate floors of Nissos Line, form the perfect solution in the cases where the flooring must be cost effective, but the quality is still essential.



- 1 Highly abrasion resistant UV finish
- 2 Direct print
- 3 Hydro- basic
- 4 HDF
- 5 Reverse coating

2. Classification Overview & Requirements

European Standard **EN 15468**, specifies characteristics, states requirements and gives test methods for Laminate floors made with this particular technology. All such Laminate floors shall conform to the general requirements given in the below table.

Characteristic	Requirement
Thickness of the element t <i>EN 15468, Annex A</i>	$\Delta t_{average} \leq 0,50\text{mm}$ (relative to nominal value) $t_{max} - t_{min} \leq 0,50\text{mm}$
Length of the surface layer l <i>EN 15468, Annex A</i>	For the nominal values given, no measured value shall exceed $l \leq 1500\text{mm}: \Delta l \leq 0,50\text{mm}$ $l > 1500\text{mm}: \Delta l \leq 0,30\text{mm/m}$
Width of the surface layer w <i>EN 15468, Annex A</i>	$\Delta w_{average} \leq 0,10\text{mm}$ (relative to nominal value) $w_{max} - w_{min} \leq 0,20\text{mm}$
Length and width of squared elements $l=w$ <i>EN 15468, Annex A</i>	$\Delta l_{average} \leq 0,10\text{mm}$ (relative to nominal value) $\Delta w_{average} \leq 0,10\text{mm}$ (relative to nominal value) $l_{max} - l_{min} \leq 0,20\text{mm}$ $w_{max} - w_{min} \leq 0,20\text{mm}$
Squareness of the element q <i>EN 15468, Annex A</i>	$q_{max} \leq 0,20\text{mm}$
Straightness of the surface layer s <i>EN 15468, Annex A</i>	$s_{max} \leq 0,30\text{mm/m}$
Flatness length and width of the element, f (Maximum single values) <i>EN 15468, Annex A</i>	$f w_{concave} < 0.15\%$ $f w_{convex} < 0.20\%$
	$f l_{concave} < 0.50\%$ $f l_{convex} < 1.00\%$
Openings between elements o <i>EN 15468, Annex B</i>	$o_{average} \leq 0,15\text{mm}$ $o_{max} \leq 0,20\text{mm}$
Height difference between elements h <i>EN 15468, Annex B</i>	$h_{average} \leq 0,10\text{mm}$ $h_{max} \leq 0,15\text{mm}$
Dimensional variations after changes in the relative humidity $\delta l - \delta w$ <i>EN 15468, Annex C</i>	$\delta l_{average} \leq 0,90\text{mm}$ $\delta w_{average} \leq 0,90\text{mm}$
Surface Soundness <i>EN 15468, Annex D</i>	$\geq 1,0 \text{ N/mm}^2$

European Standard **EN 15468**, also includes a classification system, giving practical requirements for areas of use and levels of use, to

indicate where the Laminate floor will give satisfactory service and to encourage the consumer to make an informed choice. Laminate floor is considered for domestic and commercial levels of use. This standard does not specify requirements relating to areas which are subjected to frequent wetting, such as bathrooms, laundry rooms or saunas, but it does apply to domestic kitchens.

The different classifications into classes 21 to 23 and 31 to 33 make it easier for the consumers to decide on the most suitable product, for different application areas.

Class of Use	Symbol	Description	Application
DOMESTIC - Low		Temporary Use	Bedrooms, guest rooms
DOMESTIC - Medium		Normal Use	Living rooms, dining rooms, hall ways / living area
DOMESTIC - Heavy		Intensive, Increased Use	Entrance areas, kitchens and complete living area
COMMERCIAL - Low		Temporary Use	Hotel rooms, conference rooms, small offices
COMMERCIAL - Medium		Normal Use	Offices, waiting rooms, boutiques
COMMERCIAL - Heavy		Intensive, Increased Use	Open-plan offices, stores, multi-purpose halls

In order to be classified into a certain class, the Laminate floor has to meet different laboratory- technical test requirements. These requirements are listed in the following table and are the **minimum specification values of the new European Norm for laminate floor coverings**.

		Domestic			Commercial		
		Moderate	Medium	Heavy	Moderate	Medium	Heavy
Class		21	22	23	31	32	33
Marks							
EN 15468	Abrasion Resistance	AC1	AC2	AC3		AC4	AC5
EN 15468	Impact Resistance	IC1				IC2	IC3
EN 438	Resistance to staining	Level 4 Level 3	Level 5 Level 4				
EN 424	Effect of furniture leg	-	No damage shall be visible, when tested with Type 0 artefact				
EN 425	Effect of Castor chair	-	No visible change				
EN 15468	Thickness Swelling	≤ 20,0%			≤ 18,0%		

3. Nissos Line Technical Specifications

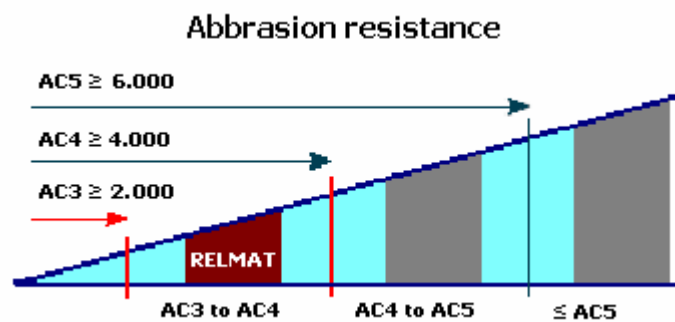
As it appears on the Classification Requirements table, the differences in categorizing from 23 to 33 are more or less restricted to abrasion and shock resistance.

The difference in Abrasion resistance

Abrasion class	AC3	AC4	AC5
Normative requirement	≥ 2000	≥ 4000	≥ 6000

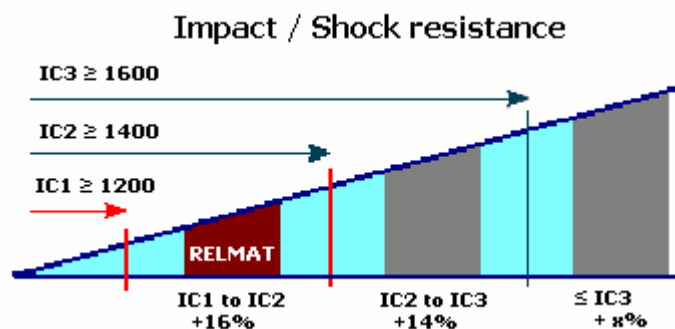
This means that all products which have an abrasion of 2.000 to 4.000 are in class AC 3. Thus the difference between the minimum requirements to the "leap" into the next class is 2.000 revolutions.

Nissos Line from RELMAT is in the medium to the upper area within the classifications and therefore ensures a consistent, high quality. Therefore the guarantee does not exclude the edges of the elements.



The difference in Impact / Shock resistance

The differences in impact/ shock resistance are similar to what has been described above. The graph below shows the results of an impact test, highlighting the different categories.



4. Nissos Line Tolerances / Requirements according to EN 15468

Characteristic	EN 15468 Test method	Unit	Nissos Line
Thickness of element (<i>t</i>)	Annex A		
Thickness		mm	± 0,50
Length of the surface layer (<i>l</i>)	Annex A		
Length		mm	± 0,20
Width of the surface layer (<i>w</i>)	Annex A		
Width		mm	± 0,10
Length and width of squared element	Annex A		
Length		mm	≤ 0,20 ($l_{\max} - l_{\min}$)
Width		mm	≤ 0,20 ($w_{\max} - w_{\min}$)
Squareness of the element (<i>q</i>)	Annex A		
Squareness		mm	< 0,20
Straightness of the element (<i>s</i>)	Annex A		
Straightness		mm/m	< 0,30
Flatness of the element (<i>f</i>)	Annex A		
f_w concave		%	< 0.15
f_w convex		%	< 0.20
f_l concave		%	< 0.50
f_l convex		%	< 1.00
Openings between the element (<i>o</i>)	Annex B		
Openings		mm	≤ 0,20
Height difference between elements (<i>h</i>)	Annex B		
Height difference		mm	average ≤ 0,10 single value ≤ 0,15 acceptable
Dimensional variations after changes in relative humidity	Annex C		
Variations		mm	≤ 0,90 ($\delta l_{\text{average}}$ and $\delta w_{\text{average}}$)
Surface soundness	Annex D		
Surface soundness		N/mm ²	≥ 1,4

Characteristics	Symbol	Test Method	Nissos Line
Class		EN 15468	31
Abrasion Resistance		EN 15468	AC 3
Impact Resistance Small ball (N) Big ball (mm)		EN 15468	IC 1 ≥10N / ≥800mm ≥8N / ≥1000mm
Resistance to stains		EN 438	Level 4 (Group 1*+2*) Level 3 (Group 3*)
Slip Resistance		EN 13893	μ>0,43
Reaction to fire		EN ISO 11925-2	C _{fl}
Formaldéhyde émission		EN 717	E1
Thickness Swelling		EN 15468	≤ 20%
Thermal Conductivity		EN 12667	0,06 m ² K/W Installation ONLY on hot water systems
Static Indentation with a straight steel cylinder Ø 11,30mm		EN 433	< 0,01
Guarantee In Domestic Area			12 years
Guarantee In Commercial Area			5 years

* The EN 438-2:2005 describes which substances the flooring has to resist to in order to be classified in the certain groups

- **Group 1** (duration of impingement, 16h): toothpaste, crème (for hands), urine, alcoholic beverages, juice, lemonades, meat, sausages, greases and oils, water, salt, soap etc
- **Group 2** (duration of impingement, 16h): coffee (80 °C), black tea (80 °C), milk (80 °C), coke, vinegar, nail varnish, lipstick, water based colors, water resistant ink, ball pen ink etc
- **Group 3** (duration of impingement, 10m): shoe polish, hair coloring and bleaching agents, boric acid, lacquers, adhesives, etc

** According to the EN 438-2 the rating scale is 1 to 5, where; 5: states that there are no visible changes, 4: Slight change of gloss visible at certain viewing angles and/or slight brown stain, 3: Moderate change of gloss and/or moderate brown stain, 2: Severe brown mark, but no destruction of the surface, 1: Blistering and/or cracks.



New concept



5. CE 14041:2004

The CE Marking guarantees that the product properties correspond to the requirements set by the European Union. Nissos Line from RELMAT, carries the CE sign, which guarantees that the product properties correspond to the requirements HEALTH, SAFETY and ENERGY SAVING



HEALTH

PCP test (pentachlorophenol)

Requirement	Nissos Line
PCP may not be contained This applies when the percentage by mass is <0.1%	Do not contain PCP (percentage by mass 0.0%)

This means that the consumer is not put at any risk concerning PCP release.

FORMALDEHYDE test

Requirement	Nissos Line
E1 – This means that the max formaldehyde release permitted is 0.1ppm	Have E1- with formaldehyde release of 0.01ppm and thus reach only 1/10 of the permissible limiting value

The formaldehyde release of Nissos Line corresponds to the formaldehyde release of grown wood.

SAFETY

REACTION TO FIRE test

Requirement	Nissos Line
Laminate floors thicker than 6.5mm are automatically classified into fire class E _f (Normal flammability)	Are categorized as fire class C_f (Low flammability)

Thus the consumer knows that the spread of fire and development of smoke is minimized in case of fire.

SLIPPAGE RESISTANCE test

Requirement	Nissos Line
Coefficient of sliding friction > 0,30	All Nissos Line surfaces have a coefficient of sliding friction of > 0,43 – this is greater than required by 44%

Thus the consumer knows that it is safe to walk on the floor and the risk of slipping is small.

Extremely caution must be given to the EN14041:2004 and especially in Annex C. The information given in this annex is aimed at raising the awareness of the problem of slips and falls and resultant injuries. However, in giving advice on how to help reduce some of the major contributors to such accidents, it can only provide guidance rather than an absolute guarantee



New concept



ENERGY SAVING

THERMAL RESISTANCE test FOR THE SUITABILITY AS UNDERFLOOR HEATING

Requirement	Nissos Line
Thermal resistance < 0,15 m ² K/W	Nissos Line has a thermal resistance of < 0,06 m²K/W – less than half of the allowed maximum value

Thus the consumer knows that: the less resistance, the less energy needs to be spent. This saves heating costs.

6. Dimensions – Packing Info

Characteristic	Unit	Nissos Line
Core layer		HDF core layer swell stop plus
Type		Plank
Thickness of element		
Thickness	mm	7,0 ± 0,50
Length of the surface		
Length	mm	1292, ± 0,20
Width of the surface		
Width	mm	192,0 ± 0,10
Panel per parcel		
Number of pieces	pieces	10
Weight		
Per parcel	kg	15,30
Surface per parcel		
Surface	m ²	2,4806
Parcel per pallet		
Number of parcels	parcels	52
Weight per pallet		
Approximately	kg	831
Surface per pallet		
Surface	m ²	128,9933
Edges		
Edges		No Bevel (Square edge)

7. Nissos Line Properties



HYGIENE

One of the most Hygienic solutions - no firmly sticking dirt, no stains which can not be removed, no formation of bacteria on the floor



SHOCK RESISTANCE

Guaranteed no damage - Even if something falls on it - we vouch for a timeless beautiful floor with our shock resistance guarantee



APPEARANCE

Brilliant beauty - The unique decors with their beautiful and noble appearances even surpass their natural originals. Exotic decors, rustic floor appearance or natural pore - diversity for every need



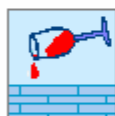
LONGEVITY

Guaranteed long lasting beautiful floors. The extremely hard surface of the floor provides for long-lasting beautiful decor surfaces and edges. We ensure this with the abrasion results. That does not exclude edges



LIGHT-FASTNESS

UV light fast. Even after years of exposure to light, your floor will remain as new: No fading, No stains, No shading



SWELLING

Robust to moisture- The specially developed swell barrier coreboard makes your floor resistant to ingress of moisture. Even if a mishap does occur your floor will remain as new



ANTISTATIC

The antistatic feature prevents electrostatic charges from building up



ECOLOGICAL COMPONENT

Environmental conscious. The Laminate floor consists of over 90% wood. The wood used is residual wood from sustainable managed forest enterprises. We protect nature and the rain forest



CLIC TECHNOLOGY

Easy and quick - No special tools and knowledge required
 Quickly installed