



Durability against rolling loads



of Vinyl Sheets & Tiles



Use below data as a performance index to judge the durability against rolling loads.

Equipment such as stretchers, carts, pallet trucks, wheeled chairs, etc. give stress on floorings not only by their own weight but also by caster rolling. The cause of delamination and/or damage of floor coverings where casters run back and forth, is the stress by rolling loads affecting significantly the floorings' durability.

S & A rank represents enough durability against rolling loads.

Category	Product name	Thickness (mm)	Adhesive	Evaluation
Vinyl sheet	NONWAXLEUM NW	2.0	EPOGREY S	S
	OPELEUM	2.0	EPOGREY S	S
	New STANLOAD	2.0	EPOGREY S	S
	HITOE GRANZA/FINE	2.0	EPOGREY SS	A
	Deodorant NS TOWARE NW	2.0	EPOGREY S	A
	SF Floor NW	2.8	US CEMENT	A
	SF Floor NW 3.5mm	3.5	US CEMENT	A
	HOSPILEUM NW	2.0	US CEMENT	A
	CHEMICAL-RESISTANT SUPER K SHEET NW	2.0	EPOGREY S	A
	CHEMICAL-RESISTANT SUPER K SHEET EXCELLA NW	2.0	EPOGREY S	A
	NS AQUATREAD	2.0	EPOGREY S	A
	NS REAL DESIGN NW	2.5	EPOGREY S	A
	FACTLEUM	2.0	EPOGREY S	A
	NS FLATY	2.0	EPOGREY S	A
	BATHNA ARTI	2.8	BATHNA CEMENT EPO	A
	BATHNA FLORE	3.5	BATHNA CEMENT EPO	A
	BATHNA REAL DESIGN	3.5	BATHNA CEMENT EPO	A
	CARESAFE NW	4.5	US CEMENT	A
	MATURE NW	2.0	US CEMENT	B
	FLOORLEUM PLAIN/MARBLE NW	2.0	EPOGREY S	C
	FLOORLEUM Premier NW series *1	2.0	EPOGREY S	C
Vinyl tile	MATICO V	2.0	EPOGREY S	S
	E-CLEAN NW-EX	3.0	EPOGREY S	S
	TOUGHTEC TILE	3.0	EPOGREY S	S
	STRAINE	3.0	EPOGREY S	S
	ROYAL WOOD/ROYAL STONE	3.0	EPOGREY S	S
	FASOL PLUS	3.0	EPOGREY S	S
Others	Linoleum	2.5	US CEMENT	A

*1: series consists of FLOORLEUM SOILUD NW, LATTICE NW, FLAKE NW, NATTY NW.

● If installed on underlay sheet, durability against rolling loads will be deteriorated and the products will not achieve above evaluation.

[Criteria for Evaluation]

S and A are regarded as durable floorings against rolling loads.

Rank	Test results
S	Time until swelling is more than 30 minutes (2nd stage test by wheels of 46mm dia. Non-foamed sheet with backing)
A	Time until swelling is less than 30 minutes (2nd stage test by wheels of 46mm dia.)
B	Time until swelling is more than 60 minutes, less than 180 minutes (1st stage test by wheels of 110 mm dia.)
C	Time until swelling is less than 60 minutes (1st stage test by wheels of 110mm dia.)

● Test Method

Caster rolling test (JIS A 1454): as the 1st stage test

Set the specimen platform which moves back and forth, right and left directions (Figure 1). Let the pressure caster draw swivel trajectory (Figure 2) by the movement of the specimen platform. Evaluate by the time until the specimen is swelled or damaged.

Loading: 2000N (approx. 204kgf, approx. 900N/cm²)

Caster: Iron, 110mm dia., 50mm width

Substrate: Fiber-reinforced cement board, 10mm thickness

Independent test by TOLI: as the 2nd stage test

Conduct tougher test by changing to smaller caster in case the test result of 1st stage is "more than 180 minutes".

Caster: Iron, 46mm dia., 20mm width

Load per unit area: approx. 2700N/cm² (approx. 280kgf/cm²)

Fig.1

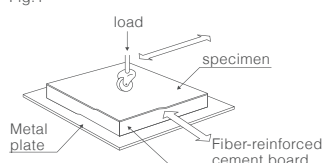
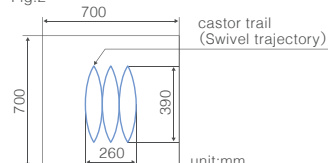










Fig.2



● Guide for Evaluating the Data

Roll the caster on the specimen with specified load. **If the time until floor gets swelled is longer**, it has better durability to rolling loads.

● Rolling loads onto floorings

	Total weight	Grounding area (cm ²)	Load /cm ²
 Wheeled chair (with 4 rubber casters)	87kg	1.1 x 4 wheels	200N /cm ²
 Wheeled chair (with 5 plastic casters)	98kg	0.7 x 5 wheels	280N /cm ²
 Motorized operating Table	680kg	2.0 x 4 wheels	850N /cm ²
 Electric care bed	191kg	1.3 x 4 wheels	370N /cm ²
 Bath stretcher	115kg	1.3 x 4 wheels	220N /cm ²
 Shower chair	67kg	1.0 x 4 wheels	160N /cm ²
 General wheel chair (Steel, 24inch, pneumatic tire)	79kg	1.8 x 2 wheels + 6.1 x 2 wheels	50N /cm ²
 Electric wheel chair	114kg	2.5 x 2 wheels + 4.3 x 2 wheels	80N /cm ²

*All the testing was conducted by TOLI's in-house labs unless otherwise specified. The data shows actual test results, not guaranteed value.



Durability against static loads



of Vinyl Sheets, Tiles & Carpet Tiles

Use below data as a performance index to judge the durability against static loads of heavy equipment.

When furniture or equipment are removed after they are left for a long period of time, we find indent in some cases. Durability to static load indicates how resilient each floor covering is. In general, soft-surface floorings tend to have low recovery from indentation.

Vinyl Sheets & Tiles

		The less indentation means the better durability against static load.		
Category	Product name	Thickness (mm)	Indentation (mm)	Evaluation
Vinyl sheet	Deodorant NS TOWARE NW	2.0	0.03	A
	HITOE GRANZA	2.0	0.04	A
	NONWAXLEUM NW (TS7000's)	2.0	0.04	A
	CHEMICAL-RESISTANT SUPER K SHEET NW	2.0	0.05	A
	New STANLOAD	2.0	0.04	A
	NONWAXLEUM NW (TS5000's)	2.0	0.06	A
	CHEMICAL-RESISTANT SUPER K SHEET EXCELLA NW	2.0	0.06	A
	NS AQUATREAD	2.0	0.06	A
	HITOE FINE	2.0	0.07	A
	NS FLATY	2.0	0.08	A
	BATHNA ARTI	2.8	0.08	A
	OPELEUM	2.0	0.09	A
	HOSPILEUM NW	2.0	0.10	A
	MATURE NW	2.0	0.11	B
	FLOORLEUM Premier NW series *1	2.0	0.11	B
	SF FLOOR NW	2.8	0.12	B
	BATHNA FLORE	3.5	0.12	B
	CARESAFE NW	4.5	0.12	B
	SF FLOOR NW 3.5mm (made to order)	3.5	0.14	B
	BATHNA REAL DESIGN	3.5	0.14	B
	FLOORLEUM PLAIN/MARBLE NW	2.0	0.15	B
Vinyl tile	SF FLOOR NW + Underlay sheet	7.3	0.21	C
	HOSPILEUM NW + Underlay sheet	6.5	0.39	D
	LOOSELAY MASTER NW-EX	5.0	0.06	A
	E-CLEAN NW-EX	3.0	0.07	A
	TOUGHTEC TILE	3.0	0.02	A
	STRAINE	3.0	0.11	B
	ROYAL WOOD	3.0	0.07	A
	FASOL PLUS	3.0	0.08	A
	LL FREE 40NW-EX	4.0	0.08	A
Others	LL FREE 50NW-EX	5.0	0.08	A
	MATICO V	2.0	0.10	A
	Linoleum	2.5	0.09	A

*1: series consists of FLOORLEUM SOILUD NW, LATTICE NW, FLAKE NW, NATTY NW.

Carpet Tiles

Category	Product name	Thickness (mm)	Evaluation
Carpet tile	GA-8900 + Underlay sheet for carpet tiles	10.0	a
	GA-100 + underlay sheet for carpet tiles	10.5	a
	GA-8900	6.0	a
	GA-100	6.5	a
	CORENTEV GX-9300V	6.5	a

Vinyl Sheets & Tiles

[Criteria for Evaluation]

Rank	Indentation (mm)
A	≤ 0.1
B	0.1 <, ≤ 0.15
C	0.15 <, ≤ 0.3
D	0.3 <

● Guide for Evaluating the Data

The less indented depth indicates the better durability against static load.

*TOLI conducts the test according to JIS, and evaluate by indented depth to indicate its conspicuous level.

● Test Method

Indentation Test B (in accordance with JIS A 1454)

Use the residual indentation tester with the attachment (steel stick with 19mmφ hemispherical tip which can put 222N load) and press the flooring for 5 mins. Measure the thickness at 60 mins. after removing the load, and compare with the thickness before testing.



Example of Indentation

Carpet Tiles

[Criteria for Evaluation]

Rank	
a	Highly durable
b	Durable
c	Ordinary

● Guide for Evaluating the Data

The less % of reduced thickness indicates the better durability.

● Test Method

Reduced thickness test by static loads (JIS L 1021-6 /long time/heavy weight)

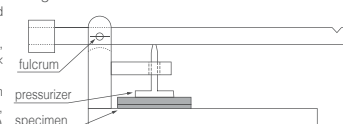
Measure the initial thickness before loading, then put 700kPa load on the specimen by static loading device for 24hours. Measure the thickness 24 hours after removal. Following equipment are used for this testing.

Measuring instrument: to measure the thickness in accuracy of 0.1mm, with disk pressurizer sized from 300mm² to 1000mm², with specified standard ability of pressuring 2.0kPa ±0.2kPa

Testing stand: Made of metal, 6mm thickness, capable to measure the specimen sized 100mm x 100mm.

Test machine for static indent load: Device with 2mm+ bigger than the pressurizer in radius, capable to put 700kPa on the specimen (Figure 1)

Fig.1



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