

Firm: John C Wilkins Acoustic Supplies Ltd
Unit 1C Britania Business Park
Bolton
BL2 2HP

Attention of: Mr M Wilkins

Technical Services Report

Subject: Assessment of the suitability of a cork rubber underlay in conjunction with vinyl tiles.
Firm: John C Wilkins Acoustic Supplies Ltd
For the attention of: Mr M Wilkins
Your ref: Impacter 4551- Karnedean
Our ref: FLO 0148393-0707
Date: 15th February 2007

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Tests marked † are not UKAS accredited

Report signed by: S P Ferry
Floorcoverings Team Leader
Floorcoverings Evaluation Centre
On behalf of SATRA Technology Centre Ltd

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ASSESSMENT OF THE SUITABILITY OF A CORK RUBBER UNDERLAY IN CONJUNCTION WITH VINYL TILES

As requested we have completed an assessment of the dynamic loading characteristics and an investigation of potential plasticizer migration of the samples submitted as detailed below.

SAMPLE SUBMITTED

Reference

- a) Karndean Renoir Vinyl Planks
- b) Karndean Vinyl Tiles
- c) Karndean Pressure sensitive adhesive
- d) Karndean High Temperature adhesive
- e) Impacter 4551 – High Performance
- f) Impacter 4551

Intended application: Domestic / Commercial / Contract use as a combination acoustic insulation system in conjunction with Karndean vinyl floor products and adhesives

Date received: December 2006

Conditioning commenced: December 2006

Testing commenced: 4th January 2007

Testing completed: 10th February 2007

Testing conducted by: Sarah Morris

The samples submitted have been prepared into four test specimens to represent the final applications with the following combinations, all preparation was conducted in accordance with the adhesive instructions.

Table 1 – Test Specimen Combinations

Test Specimen	Subfloor	Adhesive	Vinyl
1	e) Impacter 4551 – High Performance	c) Karndean Pressure sensitive adhesive	a) Karndean Renoir Vinyl Planks
2	f) Impacter 4551	c) Karndean Pressure sensitive adhesive	a) Karndean Renoir Vinyl Planks
3	e) Impacter 4551 – High Performance	d) Karndean High Temperature adhesive	b) Karndean Vinyl Tiles
4	f) Impacter 4551	d) Karndean High Temperature adhesive	b) Karndean Vinyl Tiles

TESTS CARRIED OUT


- BS ISO 2094:1999, Textile Floor coverings – Determination of thickness loss under dynamic loading-Modified⁽¹⁾
- SATRA TM 343: 1992 Contact Storage Test for Discolouration - PVC Migration test

Note(s):

- (1) The test has been modified to assess possible loss of thickness, movement of the vinyl tile, loss of adhesion between the vinyl tile and the cork-rubber acoustic underlay when the combined materials are subjected to repeated heavy compression both over a tile/plank joint and beside a tile/plank joint.

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RESULTS

SATRA TM 343: 1992 Contact Storage Test for Discolouration - PVC Migration test

This method of test is intended to determine the propensity of a material to cause discolouration or plasticizer migration to another material when stored in close contact. The method is applicable to all materials which are used in intimate contact, and to adhesives which are used to bond them. In this instance the samples have been bonded together in four combinations as specified in Table 1. The test specimen specified have then been stored in the dark in an oven at the temperatures specified below for a specified period of time and periodic assessments of the appearance undertaken.

Test Specimen	7 days at 50°C	14 Days at 60°C	7 Days at 80°C
1	No Change	No changes in appearance, slight softening of the vinyl flooring	No changes in appearance. Softening of the vinyl flooring.
2	No Change	No changes in appearance, slight softening of the vinyl flooring	No changes in appearance. Softening of the vinyl flooring.
3	No Change	No changes in appearance, slight softening of the vinyl flooring	No changes in appearance. Softening of the vinyl flooring.
4	No Change	No changes in appearance, slight softening of the vinyl flooring	No changes in appearance. Softening of the vinyl flooring.

BS ISO 2094:1999, Textile Floor coverings – Determination of thickness loss under dynamic loading

Specimen 1

Sample	Mean thickness loss after 50 cycles (mm)	Mean thickness loss after 100 cycles (mm)	Mean thickness loss after 200 cycles (mm)	Mean thickness loss after 1000 cycles (mm)	Mean thickness loss after 24 hours recovery (mm)
Across Join	0.16	0.17	0.21	0.23	0.06
Along Join	0.07	0.07	0.08	0.17	0.11

Sample	Overall percentage loss (%)	
	After 1,000 cycles	After 24 hours recovery
Across Join	3.92	0.95
Along Join	3.01	2.16

Comments:

At the end of the test, inclusive of the 24 hour recovery period, no damage was observed to the vinyl flooring of either of the test samples. It was also noted that there was no lifting of the samples from the cork-rubber acoustic underlay on either of the tested samples. Some movement was recorded at the end of the test where an opening of 0.4 and 0.2 mm was observed between the plank joints of samples 1 and 2 respectively. This is likely to be due to spreading of the underlay but in the opinion of SATRA is minimal and would be reduced in the final application due to the enclosed edges reducing the ability to spread.

Specimen 2

Sample	Mean thickness loss after 50 cycles (mm)	Mean thickness loss after 100 cycles (mm)	Mean thickness loss after 200 cycles (mm)	Mean thickness loss after 1000 cycles (mm)	Mean thickness loss after 24 hours recovery (mm)
Across Join	0.04	0.07	0.08	0.08	0.01
Along Join	0.07	0.08	0.11	0.13	0.07

Sample	Overall percentage loss (%)	
	After 1,000 cycles	After 24 hours recovery
Across Join	1.46	0.11
Along Join	2.28	1.25

Comments:

At the end of the test, inclusive of the 24 hour recovery period, no damage was observed to the vinyl flooring of either of the test samples. It was also noted that there was no lifting of the samples from the cork-rubber acoustic underlay on either of the tested samples. On the samples where the repeated compression moved along the joint between the planks a small opening of 0.2 mm was seen. This is likely to be due to spreading of the underlay but in the opinion of SATRA in minimal and would be reduced in the final application due to the enclosed edges reducing the ability to spread.

Specimen 3

Sample	Mean thickness loss after 50 cycles (mm)	Mean thickness loss after 100 cycles (mm)	Mean thickness loss after 200 cycles (mm)	Mean thickness loss after 1000 cycles (mm)	Mean thickness loss after 24 hours recovery (mm)
Across Join	0.09	0.12	0.14	0.15	0.07
Along Join	0.21	0.27	0.32	0.42	0.28

Sample	Overall percentage loss (%)	
	After 1,000 cycles	After 24 hours recovery
Across Join	2.65	1.34
Along Join	7.70	5.14

Comments:

At the end of the test, inclusive of the 24 hour recovery period, no damage was observed to the vinyl flooring of either of the test samples. It was also noted that there was no lifting of the samples from the cork-rubber acoustic underlay on either of the tested samples. Some movement was recorded at the end of the test where an opening of 0.05 was observed between the tile joints of both samples 1 and 2. This is likely to be due to spreading of the underlay but in the opinion of SATRA in minimal and would be reduced in the final application due to the enclosed edges reducing the ability to spread.

Specimen 4

Sample	Mean thickness loss after 50 cycles (mm)	Mean thickness loss after 100 cycles (mm)	Mean thickness loss after 200 cycles (mm)	Mean thickness loss after 1000 cycles (mm)	Mean thickness loss after 24 hours recovery (mm)
Across Join	0.18	0.26	0.27	0.29	0.22
Along Join	0.16	0.18	0.21	0.22	0.16

Sample	Overall percentage loss (%)	
	After 1,000 cycles	After 24 hours recovery
Across Join	5.55	4.15
Along Join	4.23	3.18

Comments:

At the end of the test, inclusive of the 24 hour recovery period, no damage was observed to the vinyl flooring of either of the test samples. It was also noted that there was no lifting of the samples from the cork-rubber acoustic underlay on either of the tested samples. Some movement was recorded at the end of the test where an opening of 0.2 and 0.15 mm was observed between the plank joints of samples 1 and 2 respectively. This is likely to be due to spreading of the underlay but in the opinion of SATRA in minimal and would be reduced in the final application due to the enclosed edges reducing the ability to spread.

For individual test results see appendix 1.0

COMMENTS AND CONCLUSIONS

All of the test specimens prepared from the samples submitted demonstrated no plasticizer migration. Some softening of the Vinyl floors (A and B) occurred at 80°C but the adhesive bond remained in tact and the samples did not change in appearance.

Each composite specimen demonstrated some thickness loss after the dynamic compression test but at levels of no consequence to the final applications. In this test some thickness loss is always expected but with a maximum of 0.5 mm typically recommended. Each of the prepared specimens easily achieved this recommendation and in the opinion of SATRA is therefore suitable for the intended applications.

Report signed by: S P Ferry
 Floorcoverings Team Leader
 Floorcoverings Evaluation Centre
 On behalf of SATRA Technology Centre Ltd

APPENDIX 1

Assessment of Dynamic Loading for the carpet tile referenced 'Specimen 1'.

Table 1. Measurements taken throughout the testing.

Sample	Initial thickness (mm)	Thickness after 50 cycles (mm)	Thickness after 100 cycles (mm)	Thickness after 200 cycles (mm)	Thickness After 1000 cycles (mm)	Thickness after 24 hours recovery (mm)
A	5.960	5.773	5.768	5.740	5.754	5.875
	5.972	5.833	5.830	5.782	5.720	5.944
B	5.842	5.712	5.713	5.693	5.663	5.697
	5.881	5.811	5.807	5.798	5.707	5.773

Table 2. Thickness loss at each recovery stage.

Sample	Thickness loss after 50 cycles (mm)	Thickness loss after 100 cycles (mm)	Thickness loss after 200 cycles (mm)	Thickness loss after 1000 cycles (mm)	Thickness loss after 24 hours recovery (mm)
A	5.96	0.187	0.192	0.22	0.206
	5.972	0.139	0.142	0.19	0.252
B	5.842	0.13	0.129	0.149	0.179
	5.881	0.07	0.074	0.083	0.174
<i>Mean</i>	5.91	0.13	0.13	0.16	0.20

Assessment of Dynamic Loading for the carpet tile referenced ‘Specimen 2’.

Table 1. Measurements taken throughout the testing.

Sample	Initial thickness (mm)	Thickness after 50 cycles (mm)	Thickness after 100 cycles (mm)	Thickness after 200 cycles (mm)	Thickness After 1000 cycles (mm)	Thickness after 24 hours recovery (mm)
A	5.568	5.568	5.514	5.513	5.513	5.556
	5.633	5.550	5.543	5.529	5.523	5.633
B	5.644	5.600	5.594	5.597	5.534	5.586
	5.737	5.640	5.630	5.570	5.588	5.653

Table 2. Thickness loss at each recovery stage.

Sample	Thickness loss after 50 cycles (mm)	Thickness loss after 100 cycles (mm)	Thickness loss after 200 cycles (mm)	Thickness loss after 1000 cycles (mm)	Thickness loss after 24 hours recovery (mm)
A	5.568	0	0.054	0.055	0.055
	5.633	0.083	0.09	0.104	0.11
B	5.644	0.044	0.05	0.047	0.11
	5.737	0.097	0.107	0.167	0.149
<i>Mean</i>	5.65	0.06	0.08	0.09	0.11

Assessment of Dynamic Loading for the carpet tile referenced 'Specimen 3'.

Table 1. Measurements taken throughout the testing.

Sample	Initial thickness (mm)	Thickness after 50 cycles (mm)	Thickness after 100 cycles (mm)	Thickness after 200 cycles (mm)	Thickness After 1000 cycles (mm)	Thickness after 24 hours recovery (mm)
A	5.146	5.093	5.123	5.097	5.088	5.15
	5.274	5.154	5.057	5.049	5.04	5.13
B	5.515	5.313	5.237	5.179	5.101	5.248
	5.495	5.273	5.226	5.182	5.061	5.196

Table 2. Thickness loss at each recovery stage.

Sample	Thickness loss after 50 cycles (mm)	Thickness loss after 100 cycles (mm)	Thickness loss after 200 cycles (mm)	Thickness loss after 1000 cycles (mm)	Thickness loss after 24 hours recovery (mm)
A	5.146	0.053	0.023	0.049	0.058
	5.274	0.12	0.217	0.225	0.234
B	5.515	0.202	0.278	0.336	0.414
	5.495	0.222	0.269	0.313	0.434
<i>Mean</i>	5.36	0.15	0.20	0.23	0.29

Assessment of Dynamic Loading for the carpet tile referenced ‘Specimen 4’.

Table 1. Measurements taken throughout the testing.

Sample	Initial thickness (mm)	Thickness after 50 cycles (mm)	Thickness after 100 cycles (mm)	Thickness after 200 cycles (mm)	Thickness After 1000 cycles (mm)	Thickness after 24 hours recovery (mm)
A	5.224	5.051	4.981	4.982	4.980	5.042
	5.270	5.078	4.984	4.965	4.938	5.017
B	5.190	5.048	5.036	5.002	4.981	5.026
	5.136	4.960	4.938	4.900	4.908	4.972

Table 2. Thickness loss at each recovery stage.

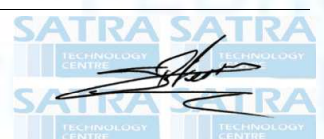
Sample	Thickness loss after 50 cycles (mm)	Thickness loss after 100 cycles (mm)	Thickness loss after 200 cycles (mm)	Thickness loss after 1000 cycles (mm)	Thickness loss after 24 hours recovery (mm)
A	5.224	0.173	0.243	0.242	0.244
	5.27	0.192	0.286	0.305	0.332
B	5.19	0.142	0.154	0.188	0.209
	5.136	0.176	0.198	0.236	0.228
<i>Mean</i>	5.21	0.17	0.22	0.24	0.25

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Signed:



SATRA TECHNOLOGY CENTRE