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Ihr Zeichen

Ihre Nachricht vom

Unser Zeichen
PII/Raumschall/2004

Braunschweig,
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Test report No. B-528e/2004

Commissioned by:	Interfloor Group Contact person: Mr. Bernhard Mrozek Broadway, Haslingden Rossendale, Lancashire BB4 4LS United Kingdom										
Offer:	December 4, 2003										
Commissioning date:	December 11, 19, and 23, 2003 (Dates of sample reception)										
Subject of test report:	Room acoustics of laminate floor coverings										
Contents of test report:	<table><tr><td>1. Task</td><td>Page 2</td></tr><tr><td>2. Test material</td><td>Page 2</td></tr><tr><td>3. Measurement and evaluation procedure</td><td>Page 5</td></tr><tr><td>4. Results and rating</td><td>Page 6</td></tr><tr><td>Appendix: Diagrams and results for each sample</td><td>Page 11</td></tr></table>	1. Task	Page 2	2. Test material	Page 2	3. Measurement and evaluation procedure	Page 5	4. Results and rating	Page 6	Appendix: Diagrams and results for each sample	Page 11
1. Task	Page 2										
2. Test material	Page 2										
3. Measurement and evaluation procedure	Page 5										
4. Results and rating	Page 6										
Appendix: Diagrams and results for each sample	Page 11										

The report contains 51 pages of text, including an Appendix "Diagrams and results for each sample" (P. 11).

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Task

Interfloor Ltd., Rossendale, UK, commissioned WKI with testing the room acoustic behaviour of laminate floor coverings according to the draft of the EPLF method „Laminate floor coverings - Determination of drum sound generated by means of a tapping machine“ (excitation using a standard tapping machine, stationary measurement in an acoustic environment similar to a free-field room, signal evaluation by specific loudness and overall loudness according to ISO 532B)

Test material and preparation

The test material was received by WKI on December 11, 19 and 23, 2003. The panels were cut to size for the room acoustic measurements so that a sample size of 2.40 m x 2.00 m could be assembled. The samples were laid on a bare concrete floor and tested during December 2003 and January/February 2004. All samples had glueless joints.



Measurement and evaluation procedure

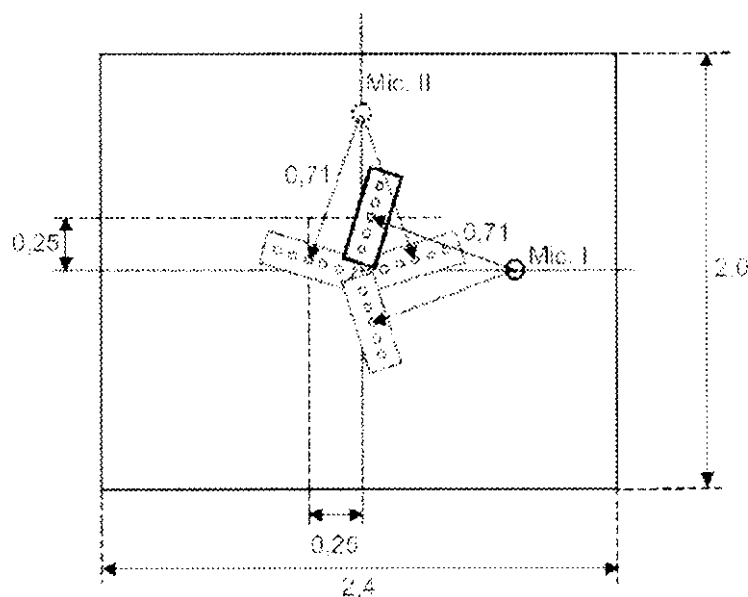
According to the draft EPLF-Norm 021029-1 „Laminate floor coverings — Determination of drum sound generated by means of a tapping machine“. Date October 29, 2002

Measuring environment:

- Test room with concrete floor (area approx. 7 m x 7 m, volume approx. 140 m³, reverberation time approx. 200 ms ... 300 ms), measurement at room temperature
- Test area: 240 cm x 200 cm in the center of the test room
- Free-field microphone (type Brüel & Kjær 4189) in a height of 71 cm above the test area and in a horizontal distance of 71 cm from the point of excitation, in four positions from each side of the test area

Sound excitation:

- Standard tapping machine type Brüel & Kjær 3207 (but without cover)
- Located on eight points, i.e. for each microphone position set aside by 25 cm from the center of the test area (see sketch showing two of four microphone positions)
- Sound level difference between background noise (tapping machine operating on 12 mm soft foam mat and room background noise) greater than 10 dB for frequencies < 1000 Hz and > 5000 Hz



Signal evaluation:

- Measurement time 30 s
- Direct acquisition of spectra for sound pressure level in 1/3 octave bands without correction
- Computation of overall loudness for each of the eight positions for frequency bands 125 Hz ... 12500 Hz without correction (according to the present draft) and additionally with correction by background noise and room acoustics (according to the discussion in the Technical Committee of EPLF in June 2003).
- Diagrams of specific loudness curves with the 4 lowest loudness values
- Arithmetic mean of the 4 lowest loudness values as value $N_{L,4}$ for drum sound emission



Appendix: Diagrams and results for each sample

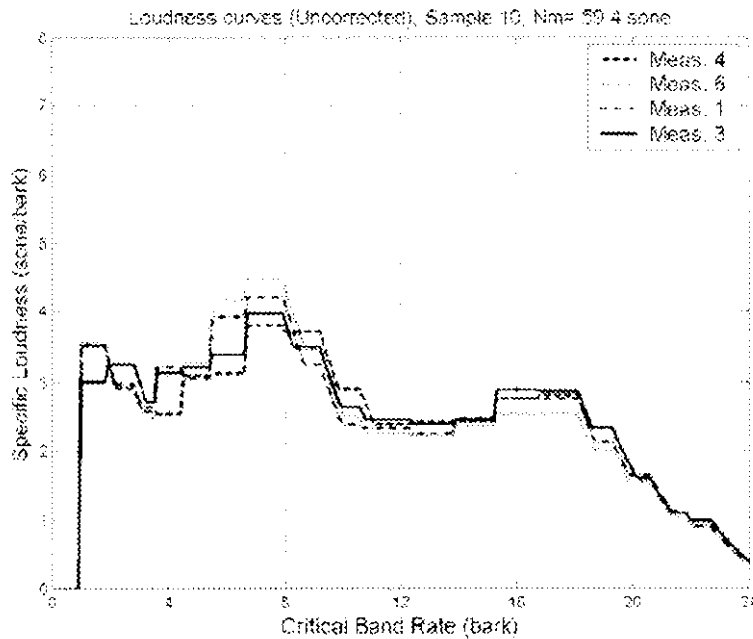
Hints for data presented:

Equal Sone values do not necessarily mean that sounds are perceived equally because changes in the frequency spectra (see diagrams) may cause different sound impressions but without change in the overall loudness value. On the other hand, loudness differences of less than 2 Sone between sounds with equal spectra can hardly be discerned.

In the following diagrams the specific loudness spectra are plotted using the bark scale rather than frequencies. The critical bands given in bark correspond to center frequencies in Hz according to this table:

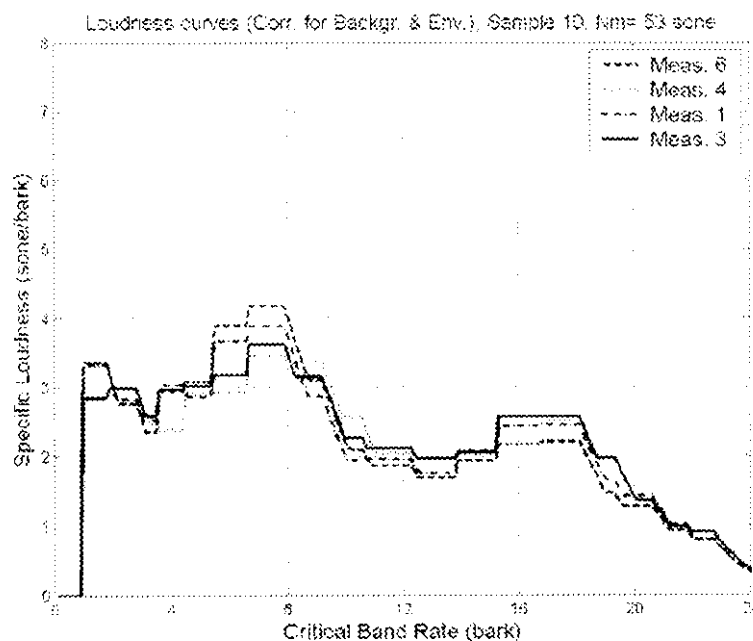
Band No. [Bark]	Center frequency [Hz]	Band No. [Bark]	Center frequency [Hz]	Band No. [Bark]	Center frequency [Hz]
1	50	9	1000	17	3400
2	150	10	1175	18	4000
3	250	11	1370	19	4800
4	350	12	1600	20	5800
5	450	13	1850	21	7000
6	570	14	2150	22	8500
7	700	15	2500	23	10500
8	840	16	2900	24	13500

Diagrams and loudness values are presented without and with correction. see details on page 3
For some diagrams a different scaling of the vertical (loudness-) axis was used



Pos.	Sone
1	<u>59.4</u>
2	60.9
3	60.0
4	<u>59.0</u>
5	61.6
6	<u>59.2</u>
7	60.5
8	60.9
N_m	59

Sample 10: Uniclic 700 floor with attached 4.2 mm Natural Colour Sponge and Gold Foil Underlay
Specific loudness curves (4 most silent positions, uncorrected)



Pos.	Sone
1	<u>53.0</u>
2	54.8
3	<u>53.6</u>
4	<u>52.8</u>
5	55.4
6	<u>52.4</u>
7	54.0
8	54.6
N_m	53

Sample 10: Uniclic 700 floor with attached 4.2 mm Natural Colour Sponge and Gold Foil Underlay
Specific loudness curves (4 most silent positions, corrected)