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Pli/Raumschall/2003

Braunschweig,
24.6.2003

Short version of Prüfbericht No. B-747/2003

Commissioned by: M. Kaindl Flooring
Contact person: Mr. Ruhdorfer
Walser Weg 12
A-5071 Wals

Commissioning date: April 23, 2003

Subject of test report: Room acoustics of laminate floor coverings

In April 2003 the room acoustic behaviour of laminate floor coverings was compared taking pattern from 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).

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The report contains 11 pages of text, including an Appendix “Diagrams” (P. 5).

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Test material

The tested area was 2,00 m x 2,40 m. The test material included the following floor covering constructions or products (description given by commissioner):

Sample	Designation	Laying method
Sample 1	Laminate floor covering	directly on bare floor
Sample 3	Laminate floor covering	directly on bare floor
Sample 4	Laminate floor covering	directly on bare floor
Sample 5	Laminate floor covering	directly on bare floor
Sample 6	Laminate floor covering	on PE vapour barrier foil, over bare floor
Sample 7	Laminate floor covering	directly on bare floor
Sample 8	Laminate floor covering	directly on bare floor
Sample 9a	Kaindl Flooring product „Snap Silent“ 1380 mm x 195 mm x 7,4 mm Attenuation: 0,45 mm heavy foil	directly on bare floor
Sample 9b	Laminate floor covering	on multi-layer attenuation over bare floor
Sample 10	Laminate floor covering	directly on bare floor
Sample 11	Laminate floor covering	directly on bare floor
Sample 12	Laminate floor covering	directly on bare floor
Sample 14b	Kaindl Flooring product 1380 mm x 195 mm x 7 mm, no attenuation	loosely laid on 2,5 mm PE foam
Sample 15	Laminate floor covering	directly on bare floor

Samples without detailed designation included laminate floor coverings (thickness 7 mm ... 10 mm) with attenuating underlays made from heavy foil (thickness 0,5 mm ... 2 mm, with or without fleece), PU with filler (thickness 2 mm), PE foam cross-linked (thickness 2 mm), recycling foam (thickness 2,5 mm), fiberboards, hot-melt glue (0,4 mm, area coverage complete or structured) or cardboard (thickness 0,6 mm ... 1 mm).

Measurement and evaluation procedure

Taking pattern from 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 (Volume ca. 140 m³), Test area 2,0 m x 2,4 m; Free-field microphone in a diagonal distance of 100 cm from the sound source; sound excitation using a standard tapping machine Brüel & Kjær, but without cover

Signal evaluation: Measurement time 30 s; acquisition of sound spectrum level in 1/3 octaves and of specific loudness according to the „Zwicker“ method in 24 critical bands, without further correction of background noise and room acoustic effects; determination of overall loudness for each of the 8 sound excitation points for frequencies > 100 Hz; display of uncorrected specific loudness spectra of the four excitation points with the lowest overall loudness; indication of arithmetic mean of specific loudness values of these four points as „drum sound“ value N_m

Benchmark value for impact sound insulation: Laboratory measurement but with small samples, area ca. 1 m²; values are comparable only within this experiment.

Results

	Overall loudness [Sone GF]													
Measurement	Sample 1	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9a	Sample 9b	Sample 10	Sample 11	Sample 12	Sample 14b	Sample 15
Pos. 1	<u>70,6</u>	<u>84,4</u>	<u>77,1</u>	<u>88,3</u>	<u>80,5</u>	<u>77,2</u>	<u>78,1</u>	<u>77,4</u>	<u>73,0</u>	<u>84,1</u>	<u>87,0</u>	<u>74,0</u>	<u>85,2</u>	<u>79,9</u>
Pos. 2	<u>71,6</u>	<u>83,7</u>	<u>74,4</u>	<u>87,1</u>	<u>85,6</u>	<u>77,9</u>	<u>75,6</u>	<u>72,5</u>	<u>75,5</u>	<u>84,6</u>	<u>89,5</u>	<u>77,9</u>	<u>89,4</u>	<u>82,6</u>
Pos. 3	<u>71,3</u>	<u>86,6</u>	<u>75,8</u>	<u>91,6</u>	<u>82,7</u>	<u>78,8</u>	<u>80,2</u>	<u>76,3</u>	<u>74,2</u>	<u>86,3</u>	<u>93,6</u>	<u>76,8</u>	<u>87,5</u>	<u>85,6</u>
Pos. 4	<u>74,8</u>	<u>86,5</u>	<u>75,6</u>	<u>92,0</u>	<u>87,5</u>	<u>78,1</u>	<u>78,5</u>	<u>73,8</u>	<u>74,6</u>	<u>86,5</u>	<u>92,5</u>	<u>78,3</u>	<u>89,4</u>	<u>86,2</u>
Pos. 5	<u>70,6</u>	<u>82,6</u>	<u>75,0</u>	<u>91,3</u>	<u>87,3</u>	<u>79,1</u>	<u>75,4</u>	<u>74,5</u>	<u>74,1</u>	<u>85,3</u>	<u>92,3</u>	<u>72,0</u>	<u>89,7</u>	<u>85,8</u>
Pos. 6	<u>70,9</u>	<u>84,7</u>	<u>77,8</u>	<u>88,8</u>	<u>81,4</u>	<u>77,3</u>	<u>75,8</u>	<u>73,9</u>	<u>76,3</u>	<u>85,3</u>	<u>89,4</u>	<u>71,7</u>	<u>86,6</u>	<u>79,3</u>
Pos. 7	<u>73,2</u>	<u>88,5</u>	<u>74,8</u>	<u>95,7</u>	<u>86,6</u>	<u>81,1</u>	<u>83,1</u>	<u>87,1</u>	<u>75,9</u>	<u>89,0</u>	<u>91,6</u>	<u>82,7</u>	<u>91,3</u>	<u>88,8</u>
Pos. 8	<u>71,8</u>	<u>85,6</u>	<u>75,1</u>	<u>89,9</u>	<u>83,2</u>	<u>79,5</u>	<u>81,0</u>	<u>81,3</u>	<u>77,6</u>	<u>85,1</u>	<u>92,1</u>	<u>77,4</u>	<u>88,9</u>	<u>83,4</u>
N _m Mean of four lowest values	71	84	75	89	82	78	76	74	74	85	89	74	87	81
Benchmark value for sound insulation [dB]	21	22	17	21	19	21	21	25	22	21	21	23	23	21



The range of values N_m (measure for perceived loudness, see table on p. 3) for all samples comprised 71 Sone (Sample 1) to 89 Sone (Samples 5, 11). Sample 9a (Product of Kaindl Flooring with a 0,45 mm heavy foil) does not perform significantly worse than the most silent product. The value of sample 14b (laminate floor, loosely laid on PE foam) can be considered as a reference value for products conventionally laid without integrated attenuating underlay. All readings comprise a background noise level (including the tapping machine operating without contact to the floor) of approx. 36 Sone.

The measurement procedure of EPLF is currently under development regarding the influence of background noise and room acoustics. Measurements according to the final version will probably result in different values for overall loudness and specific loudness but with no significant changes in frequency spectra and ranking of products according to the overall loudness.

The benchmark value for the sound insulation property has been measured with small samples for orientation and can be compared only within this experiment.

Braunschweig, June 24, 2003

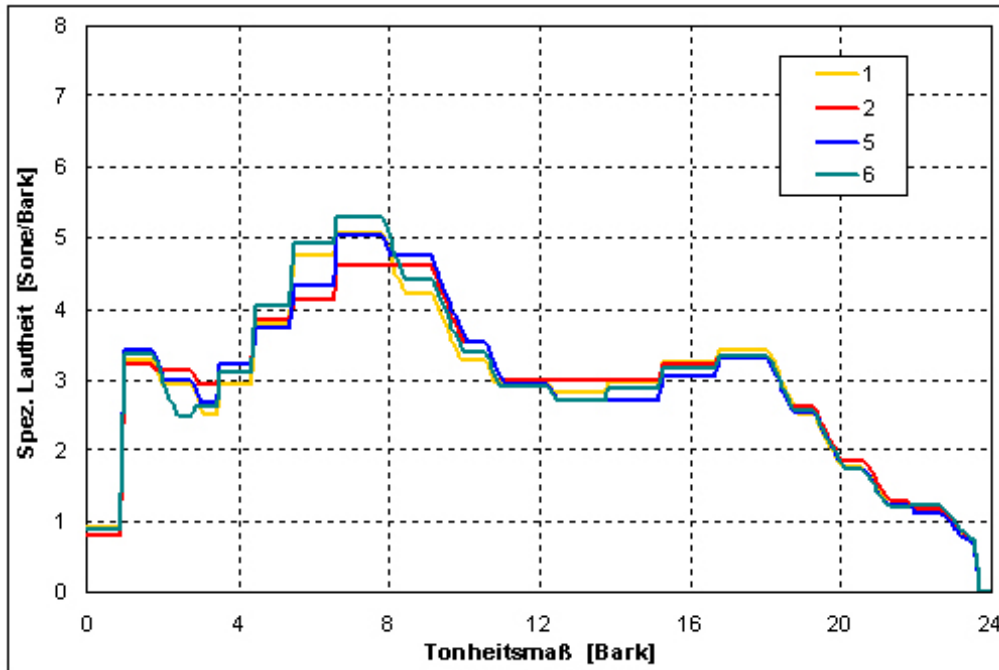
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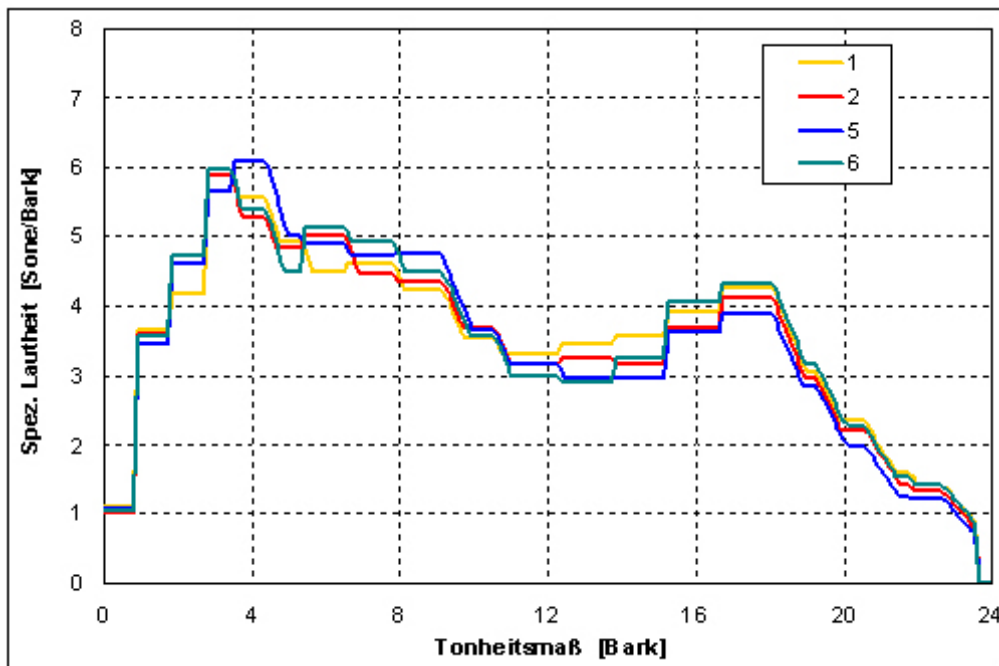
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Appendix: Diagrams

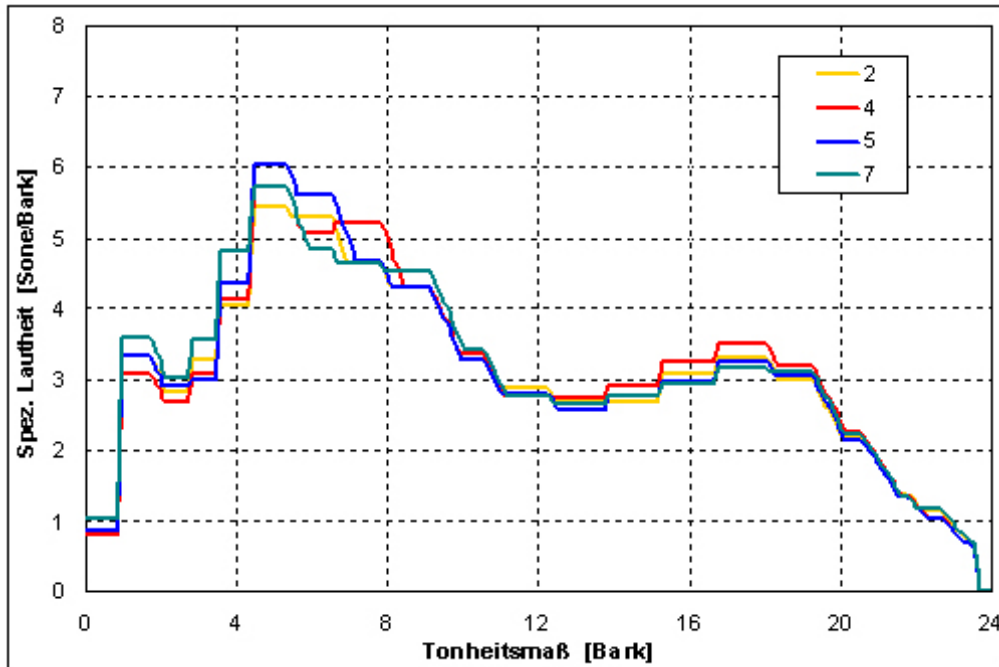


Sample 1: Specific loudness curves for 4 most silent positions

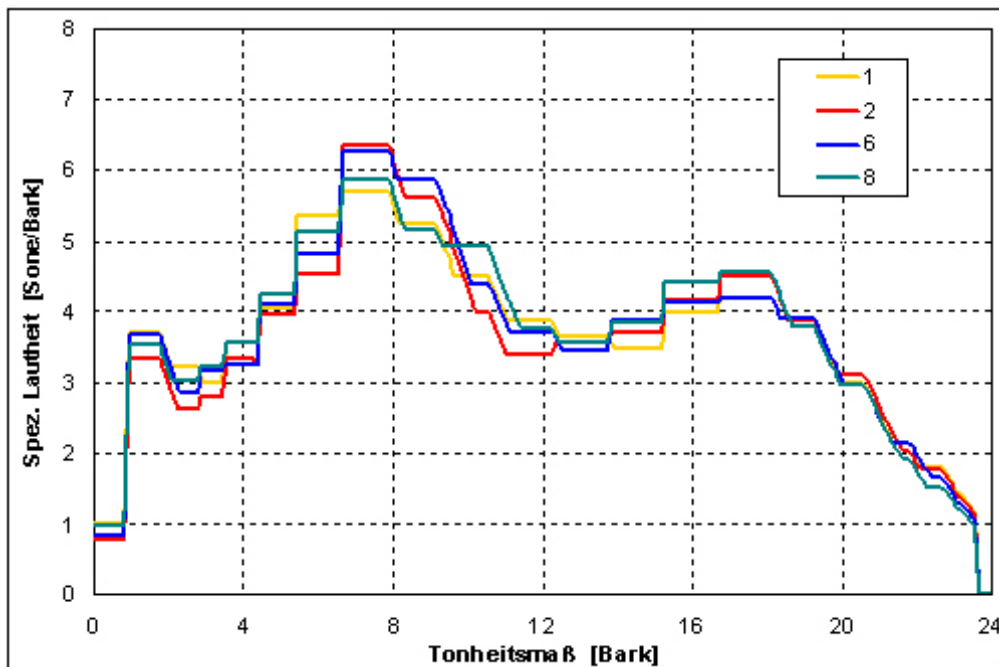


Sample 3: Specific loudness curves for 4 most silent positions

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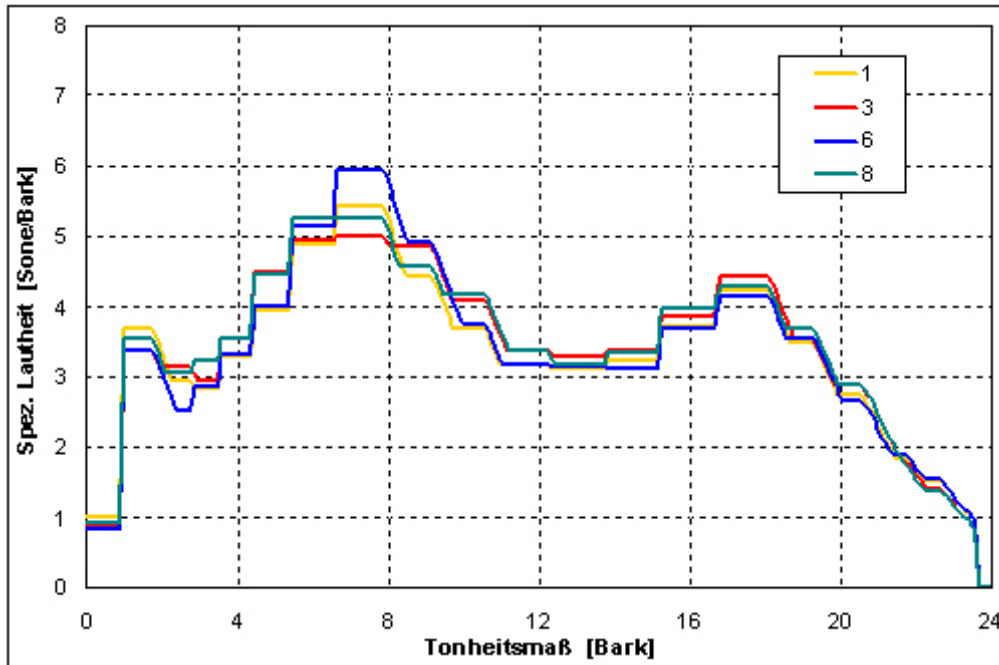


Sample 4: Specific loudness curves for 4 most silent positions

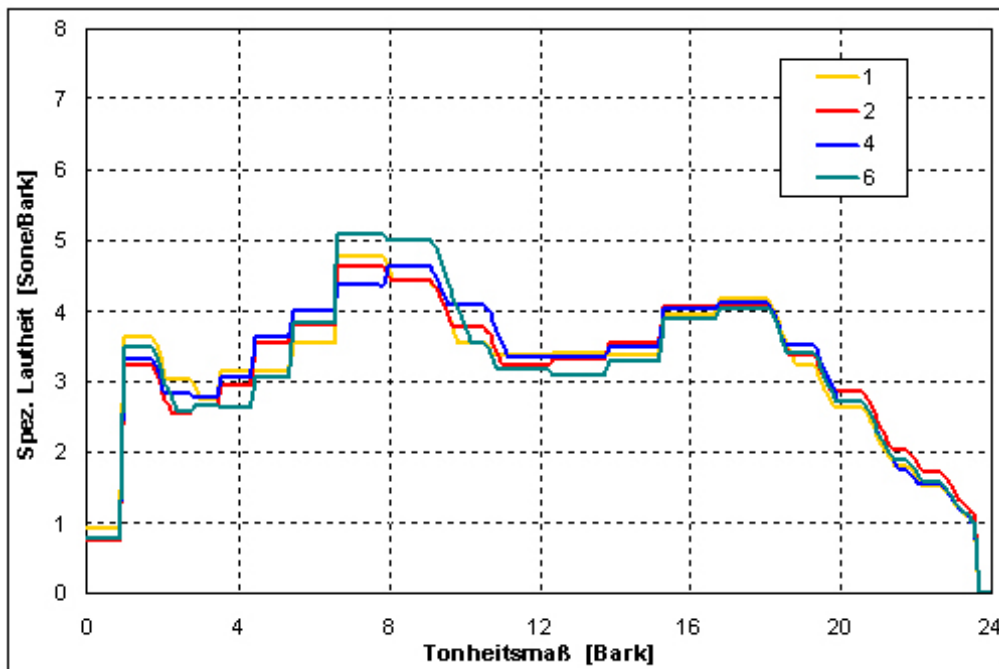


Sample 5: Specific loudness curves for 4 most silent positions

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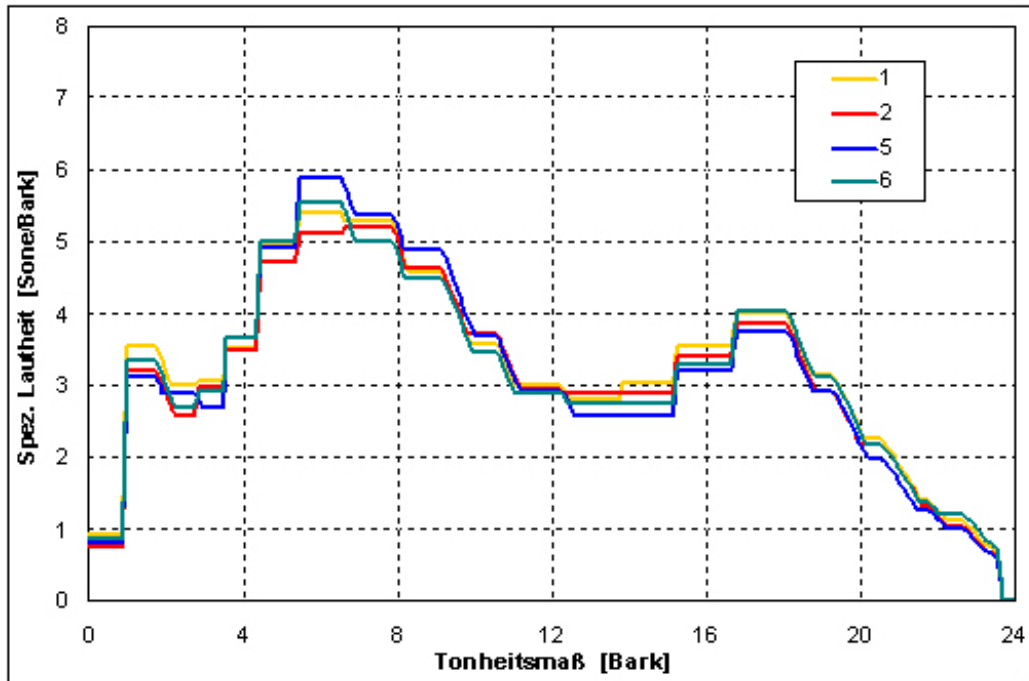


Sample 6: Specific loudness curves for 4 most silent positions

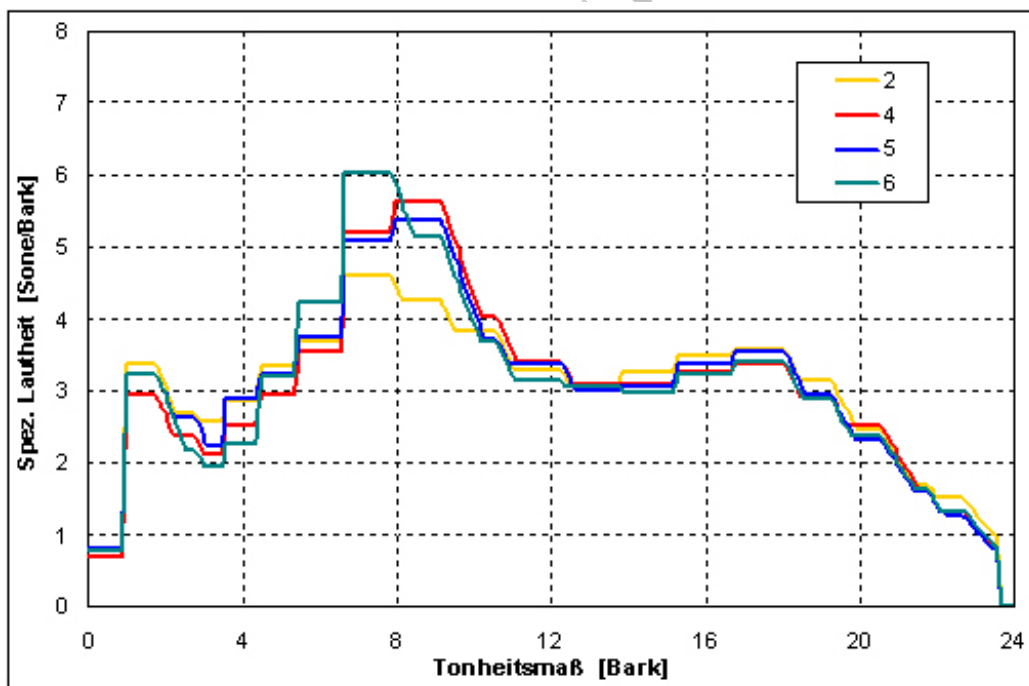


Sample 7: Specific loudness curves for 4 most silent positions

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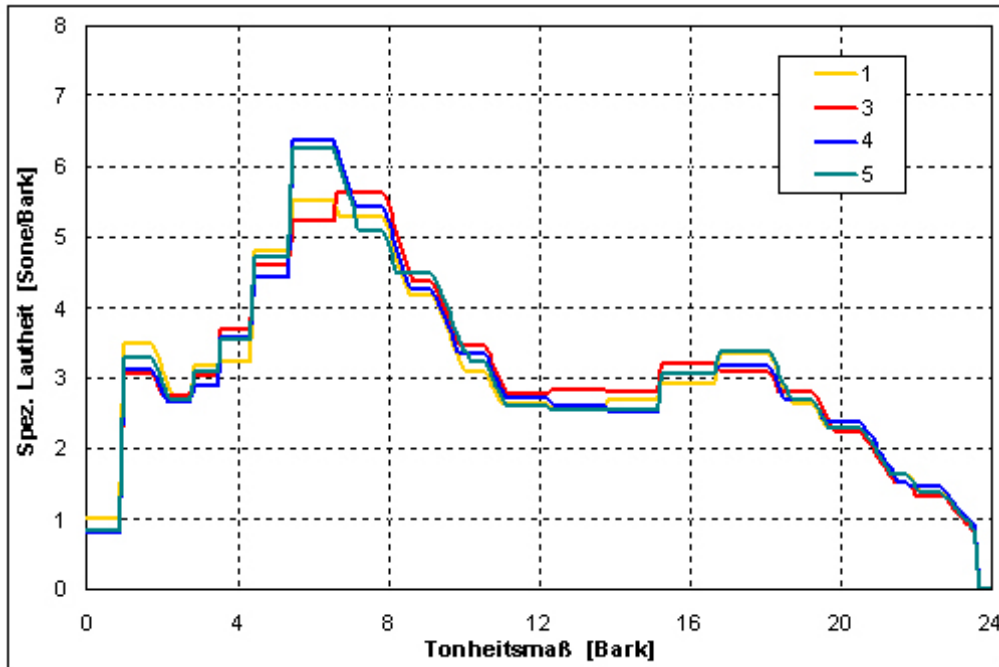


Sample 8: Specific loudness curves for 4 most silent positions

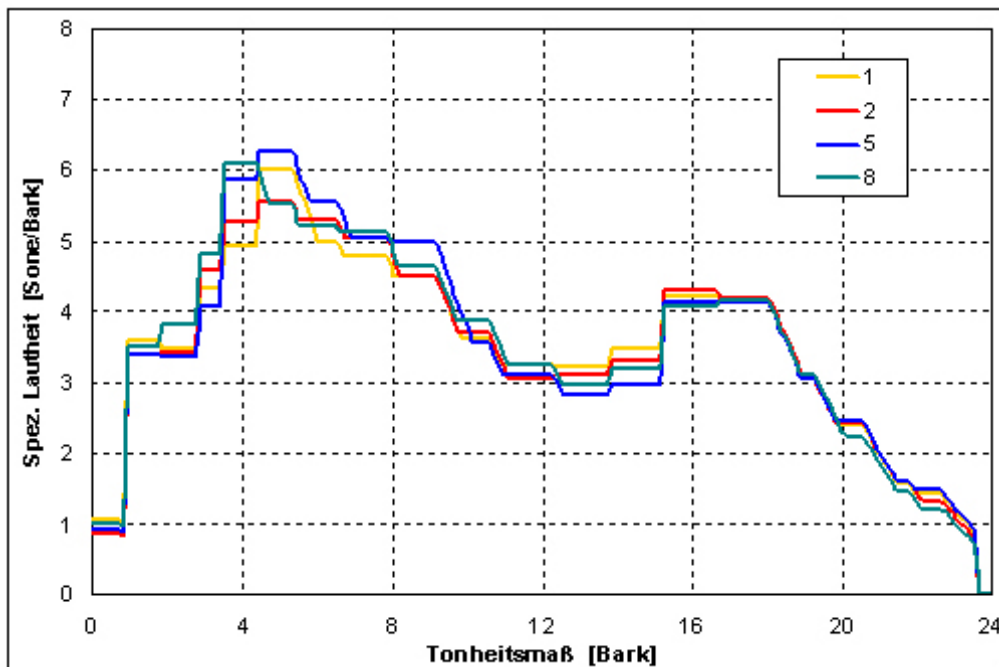


Sample 9a: Specific loudness curves for 4 most silent positions

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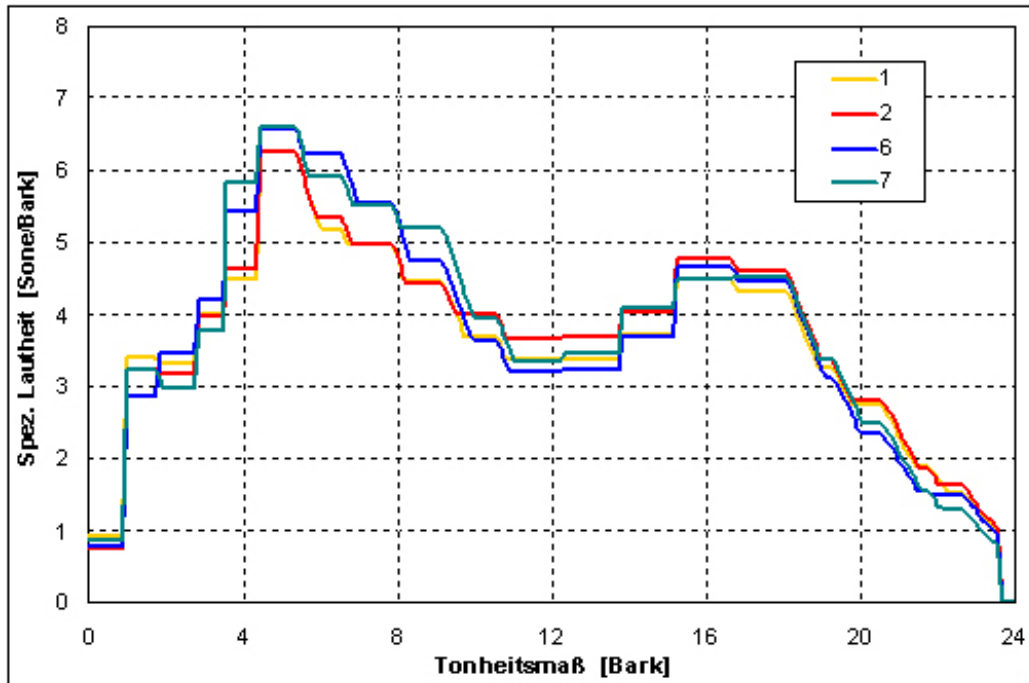


Sample 9b: Specific loudness curves for 4 most silent positions

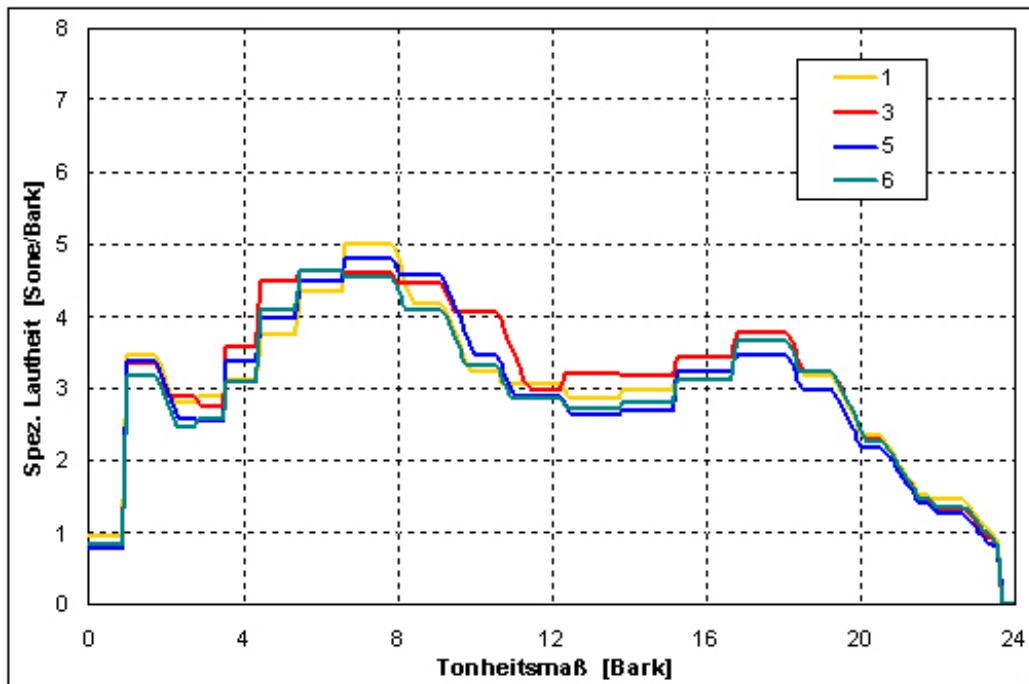


Sample 10: Specific loudness curves for 4 most silent positions

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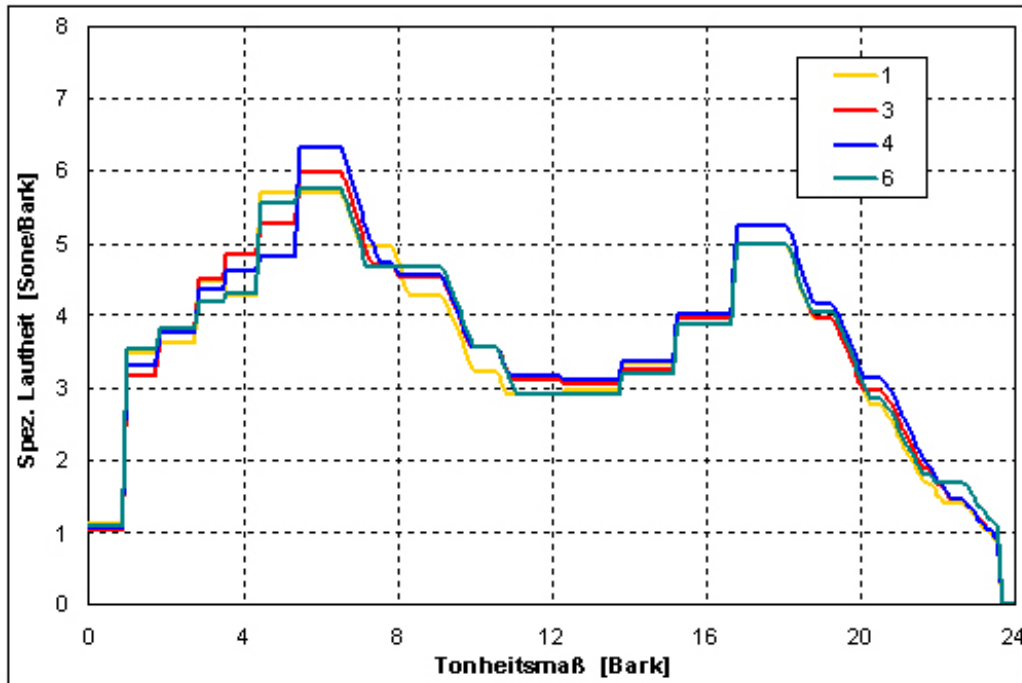


Sample 11: Specific loudness curves for 4 most silent positions

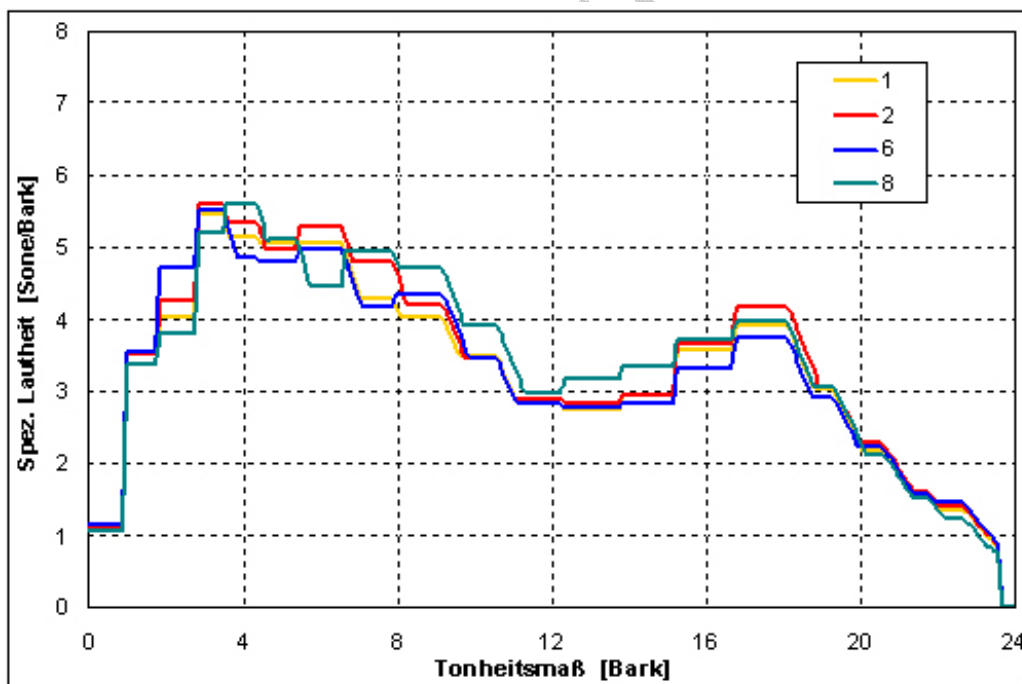


Sample 12: Specific loudness curves for 4 most silent positions

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Sample 14b: Specific loudness curves for 4 most silent positions



Sample 15: Specific loudness curves for 4 most silent positions