MFPA Leipzig GmbH

Testing, Inspection and Certification Authority for
Construction Products and Construction Types

Leipzig Institute for Materials Research and Testing
Business Division IV - Building Physics
Prof. Dr.-Ing. habil. Peter Bauer

Work Group 4.1 - Thermal Insulation and Moisture Protection

Dr.-Ing. Claudia Fülle
Tel.: +49 (0) 341-6582-131
fuelle@mfpa-leipzig.de

Dipl.-Ing. (FH) Rüdiger Pusch
Tel.: +49 (0) 341-6582-173
r.pusch@mfpa-leipzig.de

Test Report No. PB 4.1/17-111-2

6 December 2017
No. Copy 1

Client:	Scan Underlay ApS Ursusvej 16 8464 Galten Denmark
Task:	Determination of compression creep according to DIN EN 1606
Material:	Laminate floor covering underlay
Product:	*Acoustic Silence 3 mm*
Samples received on:	12/04/2017
Date of testing:	02/08/2017 – 02/12/2017
Responsible:	Stefan Laut, laboratory technician Dipl.-Ing. (FH) Rüdiger Pusch Dr.-Ing. Claudia Fülle

This document consists of 6 pages.

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11021-01-00

Testing laboratory accredited by DAkkS GmbH according to DIN EN ISO/IEC 17025. The certificate can be seen on www.mfpa-leipzig.de

Notified testing laboratories, inspection bodies and certification bodies recognized according to the Construction Products Regulation (NB 800) and the State Building Code (SAC02).

Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH (MFPA Leipzig GmbH)

Head Office	Hans-Weigel-Str. 2b – 04319 Leipzig/Germany
Managing Director:	Prof. Dr.-Ing. Frank Dehn
Comm. Register:	Local Court Leipzig HRB 17719
VAT-ID:	DE 813200649
Tel.:	+49 (0) 341-6582-0
Fax:	+49 (0) 341-6582-135

1 Definition of the task

MFPA Leipzig was commissioned by co. Scan Underlay ApS. to test the compressive creep according to EN 1606 for the laminate floor covering underlay *Acoustic Silence 3 mm*. In order to achieve designation class CC1 according to DIN CEN/TS 16354, a compression load of 2,1 kPa was chosen.

Therefore, 12 April 2017, 4 rolls of the material *Acoustic Silence 3 mm* were delivered to MFPA Leipzig.

Figure 1: Laminate floor covering underlay *Acoustic Silence 3 mm*

2 Test laboratory

MFPA Leipzig works according to the strict quality regulations of DIN EN ISO 17025. In this regard, the laboratory was accredited by DAkkS. The test of compressive creep counts among the accredited test methods. The certificate can be viewed at http://www.mfpa-leipzig.de.

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3 Testing procedure and results – Acoustic Silence 3 mm

DIN EN 1606 : 2013-05	Thermal insulating products for building applications – Determination of compressive creep

Pre-treatment:	6 hours storing at 23 °C and 50 % r.h.
Specimen dimensions:	100 mm x 100 mm
Date of testing:	02/08/2017 – 02/12/2017 (123 days)
Testing device:	Testing of compression with digital potentiometric dial gauges pressure frame, made of steel, 200 mm x 200 mm outside dimensions and 110 mm x 110 mm inside dimensions
Load Level:	2,1 kPa
Boundary conditions:	23 (±2)° C and 50 (±5) % rel. humidity
Procedure:	According to EN 1606, three specimens are tested. The thickness of the specimens is determined at the universal testing machine TT2850 S. Then the specimens are placed into the testing device with the pressure frame. The compressive force results from the pressure plate (100 mm x 100 mm) in the gap of the pressure frame. The load of 2,13 kPa is being applied on the specimen uniformly within 10 (±5) s. The initial deformation X_0 und the corresponding compression is determined 60 (±5) s after start of load. The measurement of the deformation X_t is being executed according to the logarithmic time steps mentioned in the standard EN 1606. The long term creep behaviour at compressive load X_{ct} and the total thickness decrease X_t are determined after 122 days of tests. With regard to the evaluation, the results are extrapolated 30 times, which corresponds to a load time of 10 years.

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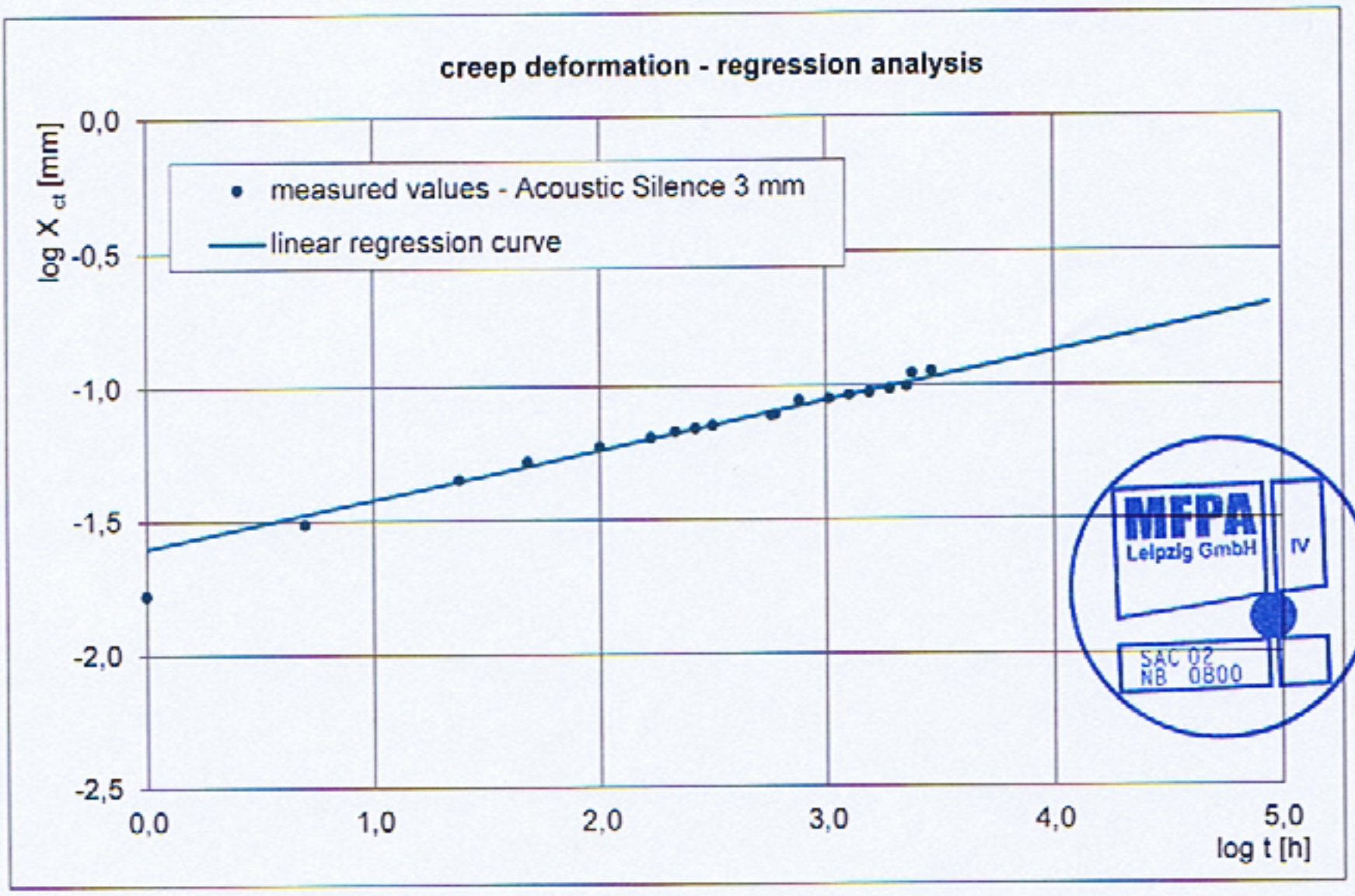
3.1 Measured values, tables and diagrams

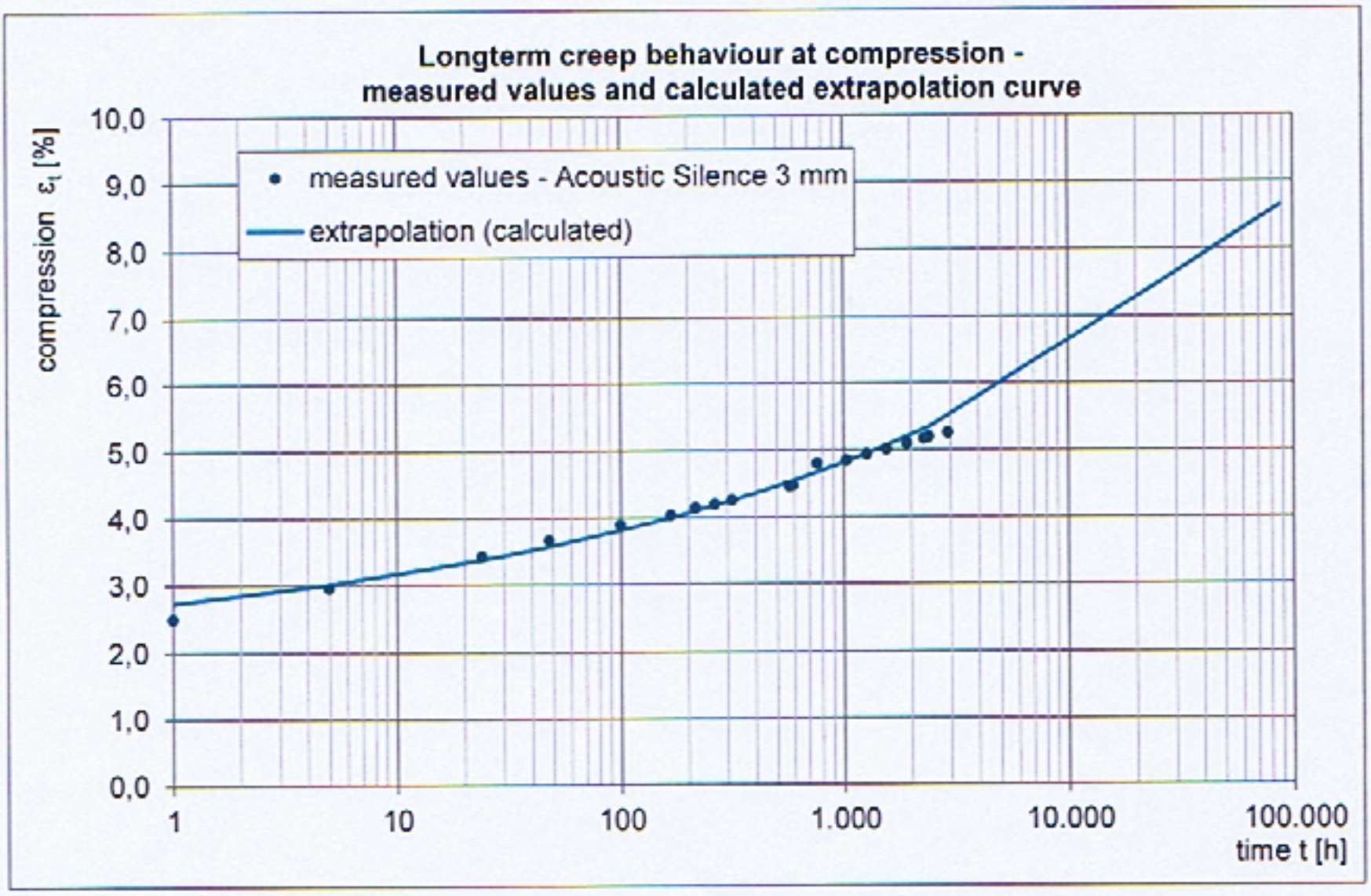
Sample	Length l [mm]	Width b [mm]	Thickness at initial load (100 Pa) d_S [mm]	Thickness[1)] d_0 [mm]	Initial deformation[1)] X_0 [mm]	Compression[1)] ε_0 [%]
AS3-1	100	100	3,10	3,04	0,06	1,90 %
AS3-2	100	100	3,10	3,06	0,04	1,39 %
AS3-3	100	100	3,00	2,92	0,08	2,57 %

[1)] Values 60 s after start of load

Time t [h]	Total deformation X_t [mm]			Mean value X_t [mm]	Total compression ε_t [%]			Mean value ε_t [%]
	AS3-1	AS3-2	AS3-3		AS3-1	AS3-2	AS3-3	
0,017	0,06	0,04	0,08	**0,06**	1,90	1,39	2,57	**1,95**
1	0,08	0,06	0,09	**0,08**	2,61	1,77	3,10	**2,50**
5	0,09	0,07	0,11	**0,09**	3,00	2,19	3,67	**2,95**
24	0,11	0,08	0,13	**0,10**	3,42	2,58	4,27	**3,42**
48	0,11	0,09	0,14	**0,11**	3,65	2,84	4,50	**3,66**
100	0,12	0,10	0,14	**0,12**	3,97	3,06	4,63	**3,89**
168	0,13	0,10	0,14	**0,12**	4,13	3,32	4,67	**4,04**
216	0,13	0,11	0,14	**0,13**	4,29	3,42	4,73	**4,15**
264	0,14	0,11	0,14	**0,13**	4,35	3,45	4,80	**4,20**
316	0,14	0,11	0,15	**0,13**	4,45	3,52	4,83	**4,27**
571	0,14	0,12	0,15	**0,14**	4,61	3,74	5,07	**4,47**
595	0,14	0,12	0,15	**0,14**	4,65	3,74	5,07	**4,48**
763	0,16	0,13	0,16	**0,15**	5,03	4,10	5,30	**4,81**
1035	0,16	0,13	0,16	**0,15**	5,03	4,13	5,40	**4,85**
1272	0,16	0,13	0,16	**0,15**	5,16	4,23	5,43	**4,94**
1560	0,16	0,13	0,17	**0,15**	5,23	4,32	5,50	**5,02**
1920	0,16	0,14	0,17	**0,16**	5,26	4,42	5,63	**5,10**
2282	0,17	0,14	0,17	**0,16**	5,32	4,45	5,73	**5,17**
2400	0,17	0,14	0,17	**0,16**	5,32	4,45	5,80	**5,19**
2928	0,17	0,14	0,18	**0,16**	5,32	4,52	5,90	**5,26**

Graphical representation of the mean values





3.2 Evaluation of the longterm creep behaviour according to EN 1606

Linear regression analysis:

The linear regression analysis according to EN 1606, annexes A and B, leads to the following results for a compression load of 2,1 kPa:

Statistical value:	r^2	b	a	m	Findley equation
Acoustic Silence 3 mm	0,970	0,18797	-1,61740	0,02413	$X_t = 0{,}06 + 0{,}02413t^{0{,}18797}$

Calculation of longterm creep behaviour under compression load:

The longterm creep deformation for 10 years (t ≈ 87600 h) at constant compression load is being calculated according to the Findley equation and results in the following values:

Longterm creep behaviour, extrapolated for 10 years	*Acoustic Silence 3 mm*
Total thickness decrease X_t	0,26 mm
Total compression ε_t	8,6 %
Compression creep deformation X_{ct}	0,20 mm
Creep compression ε_{ct}	6,7 %

4 Summary

The test of compressive creep according to EN 1606 yields the following designation class according to DIN CEN/TS 16354 for the laminate floor covering underlay *Acoustic Silence 3 mm:*

Material	Property	Result
Acoustic Silence 3 mm	Compressive creep according to EN 1606, total thickness decrease within 10 years	X_t = 0,26 mm ($X_t \leq$ 0,5 mm)
	Designation class according to DIN CEN/TS 16354	Class CC1

This document does not replace a certificate of conformity or suitability according to national and European building codes.

Leipzig, 6 December 2017

Prof. Dr.-Ing. habil. Peter Bader
Head of Business Division

MFPA Leipzig GmbH IV SAC 02 NB 0800

Dr.-Ing. Claudia Fülle
Head of Laboratory

Dipl.-Ing. (FH) Rüdiger Pusch
Testing Engineer