Expert Comment

Date: 02.09.2016

Principal:	Nolim b.v. Rheastraat 21 5047 TL Tilburg Netherlands
Project:	Determination of the compressive stress for support plates of elastomer (HMPE 500 R), according to EN ISO 844: 2014
Order dated:	02.08.2016
Our ref:	124961298
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This document includes 9 pages.

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1 Reference

Instruction of TUEV Rheinland Industrie Service (TUEV Rheinland), dated 02.08.2016, by Nolim b.v. in der Rheastraat 21, 5047 TL Tilburg, Netherlands.

2 Preliminary notes

The instruction includes the determination of the compressive stresses in 2 different support plates of elastomer (HMPE 500 R) with different types of use. Plate Type 1 is planned for use as a crane support plate; Plate Type 2 for use as a drive plate.

3 Documents

[1] Instruction Co. Nolim b.v., dated 02.08.2016

[2] EN ISO 844:2014 Hard Foamed Materials - determination of the pressure characteristics

4 Investigation basics

On the part of the Principal, 2x5 test specimens were made available, i.e. 5 test specimens per plate type. The test specimens with the dimensions 50 mm x 50 mm x 40 mm (Plate Type 1) were delivered by the principal for use as a drive plate and the test specimens with the dimensions 50 mm x 50 mm x 15 mm (Plate Type 2) for use as a crane support plate

The investigation procedure was implemented according to EN ISO 844: 2014 "Hard foamed materials - determination of the pressure characteristics", Process A. This process includes the determination of the compressive stress with 10% strain.

The experiments were implemented on the company grounds of TUEV Rheinland in Nuremberg.

5 Investigation procedure

The investigation procedure was implemented on 25.08.2016 in a universal testing machine of Class 1, in accordance with DIN ISO 7500-1. The preparatory treatment was implemented, in accordance with DIN ISO 844, Chapter 7.4, at 23°C and a relative humidity of 50%.

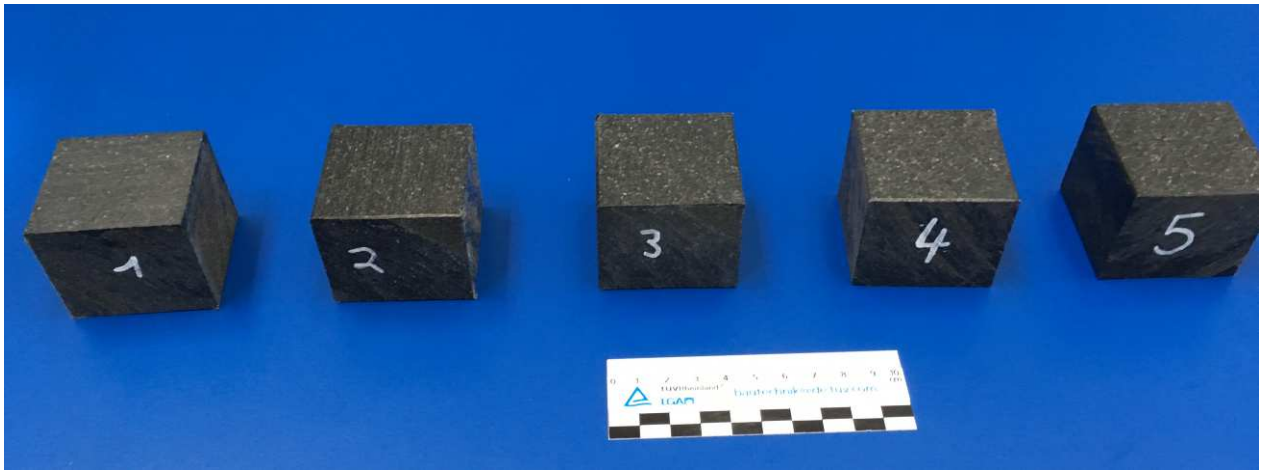

Fig. 1: Plate Type 1: Dimensions: 50 mm x 50 mm x 40 mm, test specimen 1 to 5

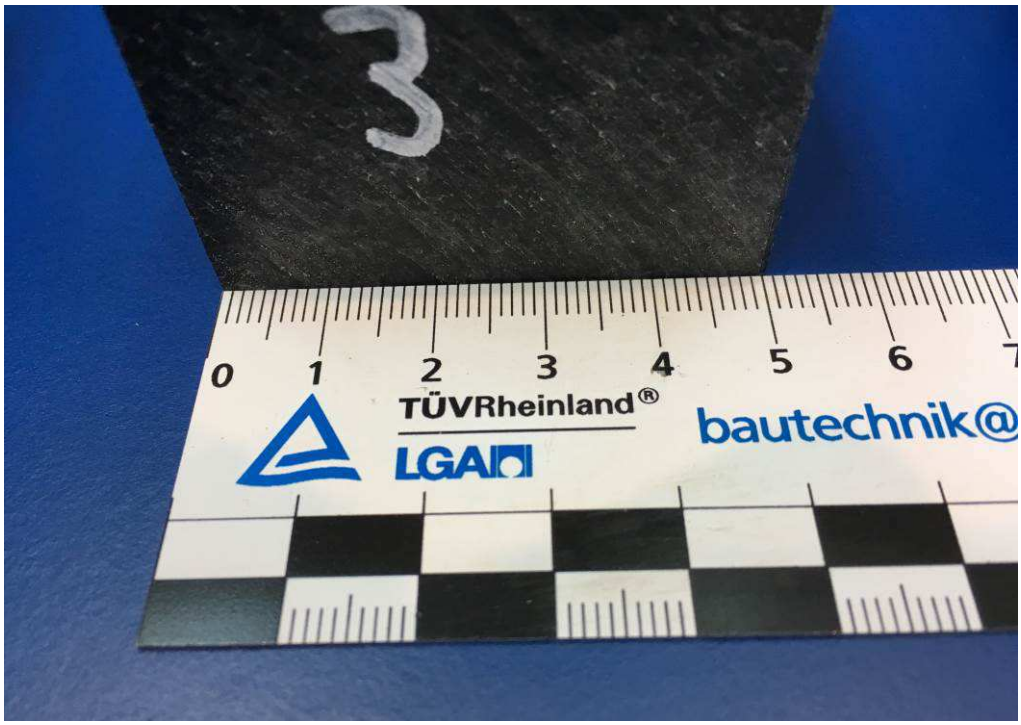

Fig. 2: Plate Type 1: Dimensions: 50 mm x 50 mm x 40 mm, test specimen 3

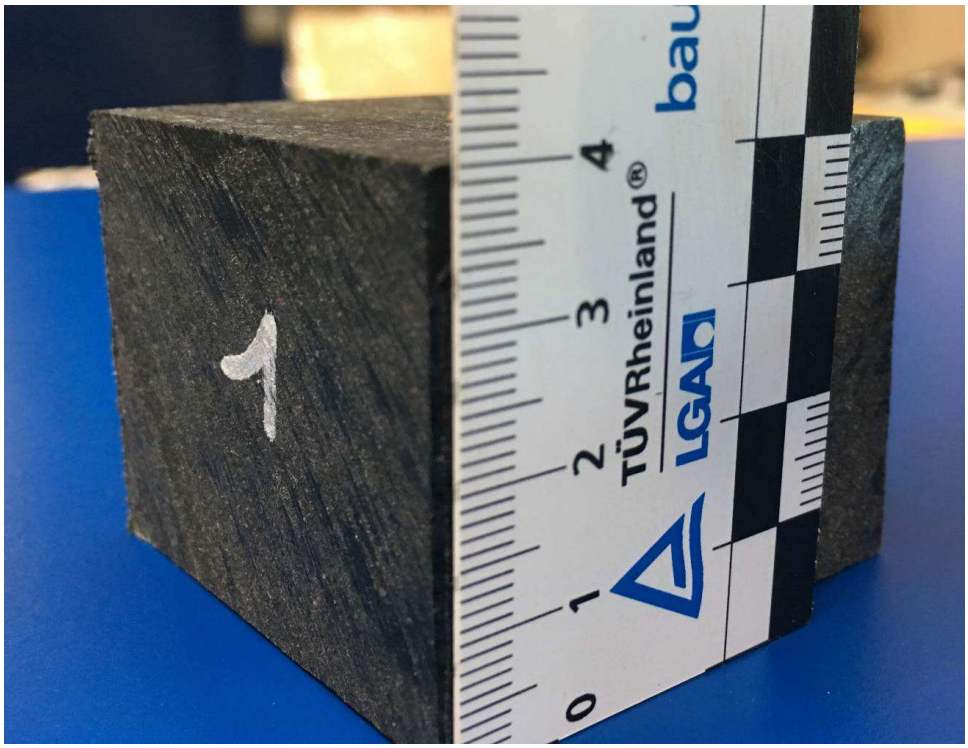

Fig. 3: Plate Type 1: Dimensions: 50 mm x 50 mm x 40 mm, test specimen 1

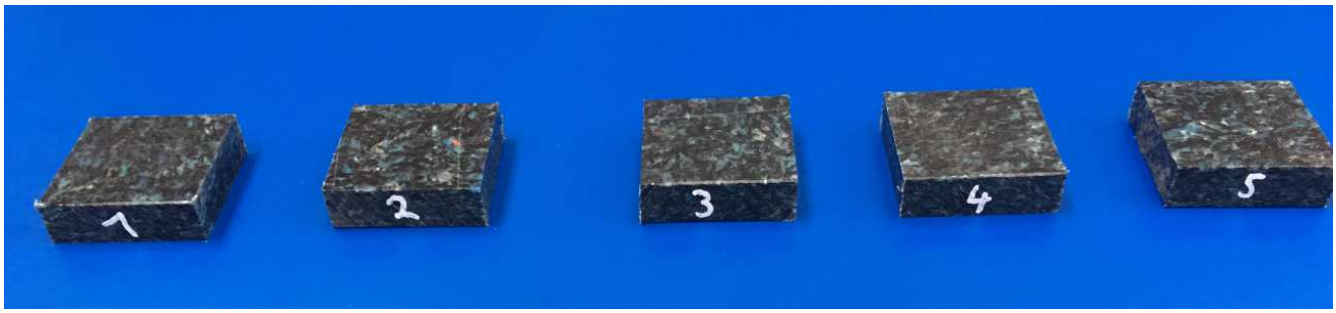

Fig. 4: Plate Type 2: Dimensions: 50 mm x 50 mm x 15 mm, test specimen 1 to 5

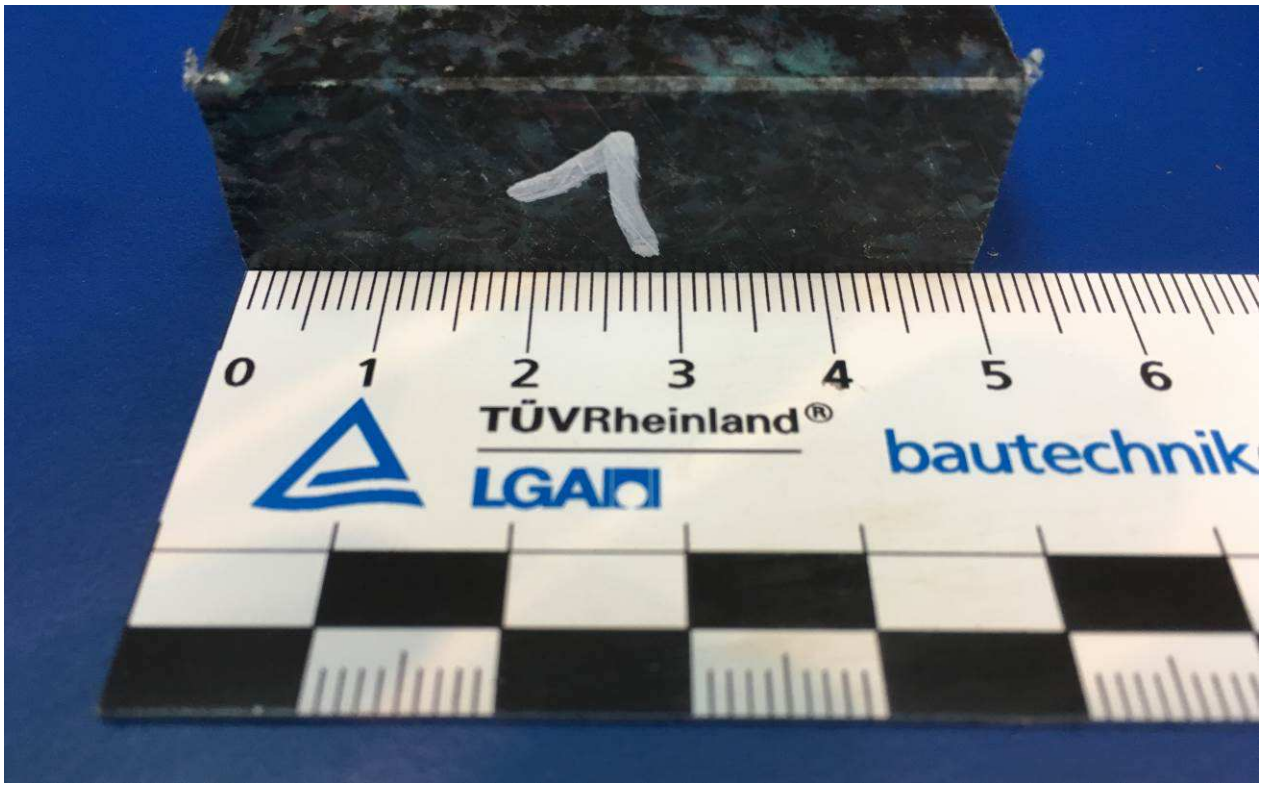

Fig. 5: Plate Type 2: Dimensions: 50 mm x 50 mm x 15 mm, test specimen 1

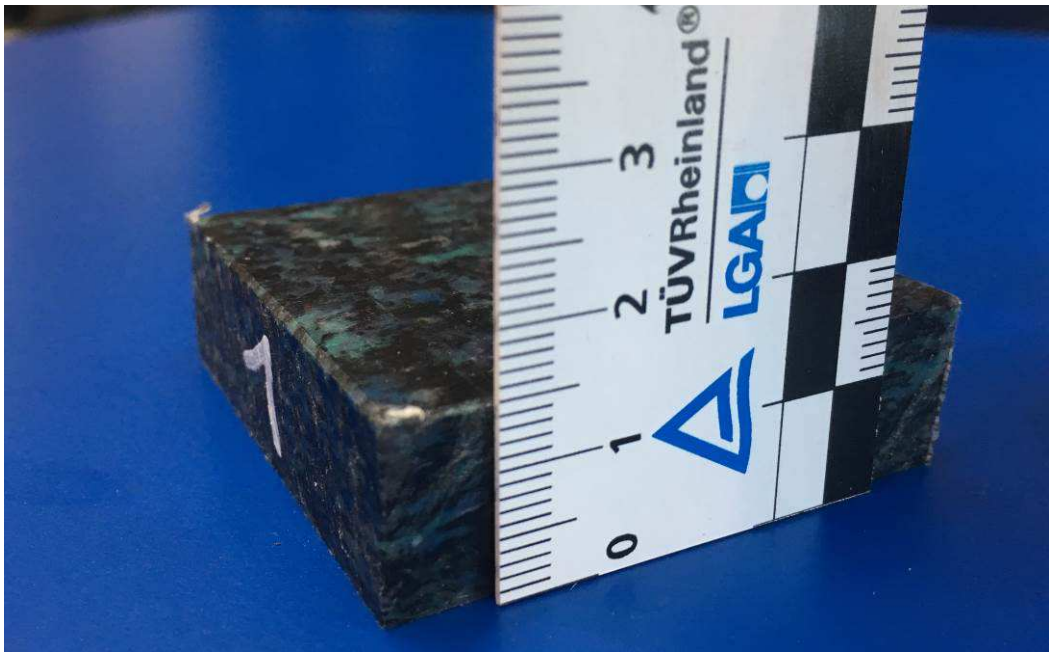

Fig. 6: Plate Type 2: Dimensions: 50 mm x 50 mm x 15 mm, test specimen 1

Fig. 7: Test Rig EDC 580

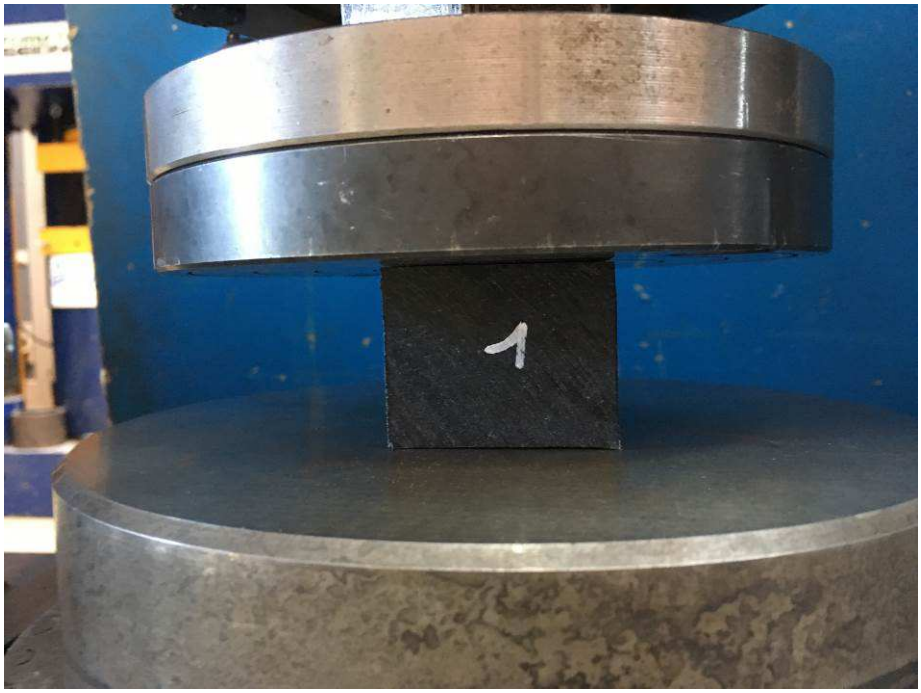

Fig. 8: Investigation Plate Type 1, test specimen 1

6 Assessment of the results

Plate Type 1 - 50 mm x 50 mm x 40 mm:

Test parameters

Test specification:	Pressure test
Machine type:	EDC580
Force transducer;	200kN
Strain gauge:	
Mounting device:	None
Test room:	Lower test room
Specimen dimensions:	a = 50 mm; b = 50 mm; h = 40 mm; m = 100 g
Length specifications:	Le = 15.1 mm; Lc = 15.1 mm
Test rates:	V0 = 5 mm/min; V1 = 10 mm/min
Switching points:	F0 = 50 N
Investigation end criteria:	

Pressure test

Extension [%]

Result table

	F10 H	O10 MPa	E10 %	X10 mm
1	70790.3	28	10.0	4.0
2	71549.0	29	10.0	4.0
3	72111.6	29	10.0	4.0
4	72668.8	29	10.0	4.0
5	71207.3	28	10.0	4.0

Fig. 9: Assessment Plate Type 1, test specimen 1 to 5

Plate Type 2 - 50 mm x 50 mm x 15 mm:

Test parameters

Test specification:	Pressure test
Machine type:	EDC580
Force transducer;	200kN
Strain gauge:	
Mounting device:	None
Test room:	Lower test room
Specimen dimensions:	a = 50 mm; b = 50 mm; h = 15.1 mm; m = 100 g
Length specifications:	Le = 15.1 mm; Lc = 15.1 mm
Test rates:	V0 = 4 mm/min; V1 = 5 mm/min
Switching points:	F0 = 50 N
Investigation end criteria:	

Pressure test

Extension [%]

	F10 N	O10 MPa	E10 %	X10 mm
1	65314.3	26	10.0	1.5
2	62671.6	25	10.0	1.5
3	63405.1	25	10.0	1.5
4	62597.8	25	10.0	1.5
5	64253.6	26	10.0	1.5

Fig. 10: Assessment Plate Type 2, test specimen 1 to 5

7 Summary

TUEV Rheinland was instructed with the determination of the compressive stresses, in accordance with EN ISO 844:2014 (Process A), in support plates of elastomer (HMPE 500 R). The experiments were implemented on 2 plate types. The results of the mean compressive stresses for strain at 10% shrinkage, in accordance with Process A, are represented as follows:

Plate Type 1 (50 mm x 50 mm x 40 mm): $\sigma^{1}_{10\%,k}$ = 29.0 N/mm² (F = 71.66 kN)
Plate Type 2 (50 mm x 50 mm x 15 mm): $\sigma^{2}_{10\%,k}$ = 25.0 N/mm² (F = 63.65 kN)

The test results refer to the samples in the delivered status.

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