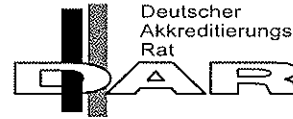


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MPA **MPA STUTTGART**
Otto-Graf-Institut
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DAP - PL - 2907.07

Test Report

Client: **Porplastic
Sportbau v. Cramm GmbH & Co. KG
Hohenneuffenstraße 14
72622 Nürtingen
Germany**

Order-No. (Client):

Order-No. (MPA): **901 7127 000-50 Kf/Sc**

Test Item: **Type testing on the point-elastic sports floor
product line „PORPLASTIC INDOOR basic“**

Specification Applied: **EN 14904**

Date of Receipt of Test Item: 05-07-2009

Date of Test: beginning 05-12-2009

Date of Report: 07-21-2009

Page 1 of 10 text pages

Enclosures : 4

Supplements: 2

Total Number of Pages: 16

Number of Reports: 2 x Porplastic (1 original, 1 copy)

The test results relate only to the items tested.

Publication of this report in full or partly is only allowed with written authorization by MPA Universität Stuttgart.

In compliance with DIN EN ISO/IEC 17025 accredited Testing Laboratory recognized by Deutsches Akkreditierungssystem Prüfwesen GmbH (DAP).
Accreditation valid for testing methods listed in the certificates (DAR-Reg. No. DAP-PL-2907.99).

1 Purpose of investigation

You commissioned us with a type testing on your point-elastic sports floor product line "PORPLASTIC INDOOR basic" according to EN 14904.

2 Description of the construction of the point-elastic sports floor

Top layer approx. 2 mm PUR-coating with PUR-sealing (same for all types)

Elastic layer approx. x mm PUR-bound rubber granules/fibres (prefabricated mat)

- a) **PORPLASTIC PEL basic 4+2** (thickness elastic layer approx. 4 mm)
- b) **PORPLASTIC PEL basic 6+2** (thickness elastic layer approx. 6 mm)
- c) **PORPLASTIC PEL basic 7+2** (thickness elastic layer approx. 7 mm)
- c) **PORPLASTIC PEL basic 9+2** (thickness elastic layer approx. 9 mm)

For the investigation we got one sample with the following sizes 1,0 x 1,0 m of each thickness of the elastic layer.

3 Testing procedure

The tests were carried out according to EN 14904.

The procedures applied which are accredited according to DIN EN ISO/IEC 17025:2005 (DAR-registration-no. DAP-PL-2907.07) are signed with [®].

4 Test results

In the following tables the average values of the test results for the different thicknesses of the elastic layer are summarized and as a comparison the requirements of EN 14904 are tabulated.

The individual test results are tabulated in the enclosures 1 - 4.

**Table 1: Test results and comparison with the requirements of EN 14904,
a) PORPLASTIC PEL basic 4+2**

Property tested	Test according to	Test results (average)	Requirement acc. to EN 14904
Friction☐	EN 13036-4	100 (-2 / +2)	80 -110 (mean +/- 4 units)
Shock absorption®	EN 14808	15 % ¹ (-1 / +0)	25 – 75 % (mean +/- 5 units)
Vertical deformation®	EN 14809	0,7 mm	≤ 5 mm
Vertical ball behaviour☐	EN 12235 (basketball)	96 % (- 0 / +1)	≥ 90 % (mean +/- 3 units)
Resistance to a rolling load☐	EN 1569	1500 N	1500 N
Resistance to wear of coatings and lacquers	EN ISO 5470-1 (CS10 wheels; load 0,5 kg, 1000 cycles)	30 mg	≤ 80 mg / 1000 cycles
Specular reflectance	EN 13745 (angle of incidence 85 °)	0,48	no requirement; average result to be reported
Specular gloss	EN 2813 (angle of incidence 85 °)	23	≤ 30
Resistance to indentation (residual impression) ☐	EN 1516	0,27 mm	≤ 0,5 mm
Resistance to impact	EN 1517	13	≥ 8 Nm

**Table 2: Test results and comparison with the requirements of EN 14904,
b) PORPLASTIC PEL basic 6+2**

Property tested	Test according to	Test results (average)	Requirement acc. to EN 14904
Friction [Ⓜ]	EN 13036-4	100 (-2 / +2)	80 -110 (mean +/- 4 units)
Shock absorption [Ⓜ]	EN 14808	21 % ¹⁾ (-1 / +1)	25 – 75 % (mean +/- 5 units)
Vertical deformation [Ⓜ]	EN 14809	0,8 mm	≤ 5 mm
Vertical ball behaviour [Ⓜ]	EN 12235 (basketball)	96 % (- 1 / +1)	≥ 90 % (mean +/- 3 units)
Resistance to a rolling load [Ⓜ]	EN 1569	1500 N	1500 N
Resistance to wear of coatings and lacquers	EN ISO 5470-1 (CS10 wheels; load 0,5 kg, 1000 cycles)	30 mg	≤ 80 mg / 1000 cycles
Specular reflectance	EN 13745 (angle of incidence 85 °)	0,48	no requirement; average result to be reported
Specular gloss	EN 2813 (angle of incidence 85 °)	23	≤ 30
Resistance to indentation (residual impression) [Ⓜ]	EN 1516	0,33 mm	≤ 0,5 mm
Resistance to impact	EN 1517	13	≥ 8 Nm

**Table 3: Test results and comparison with the requirements of EN 14904,
c) PORPLASTIC PEL basic 7+2**

Property tested	Test according to	Test results (average)	Requirement acc. to EN 14904
Friction☐	EN 13036-4	100 (-2 / +2)	80 -110 (mean +/- 4 units)
Shock absorption [®]	EN 14808	23 % ¹ (-1 / +1)	25 – 75 % (mean +/- 5 units)
Vertical deformation [®]	EN 14809	0,9 mm	≤ 5 mm
Vertical ball behaviour☐	EN 12235 (basketball)	96 % (- 1 / +0)	≥ 90 % (mean +/- 3 units)
Resistance to a rolling load☐	EN 1569	1500 N	1500 N
Resistance to wear of coatings and lacquers	EN ISO 5470-1 (CS10 wheels; load 0,5 kg, 1000 cycles)	30 mg	≤ 80 mg / 1000 cycles
Specular reflectance	EN 13745 (angle of incidence 85 °)	0,48	no requirement; average result to be reported
Specular gloss	EN 2813 (angle of incidence 85 °)	23	≤ 30
Resistance to indentation (residual impression) ☐	EN 1516	0,35 mm	≤ 0,5 mm
Resistance to impact	EN 1517	10	≥ 8 Nm

**Table 4: Test results and comparison with the requirements of EN 14904,
c) PORPLASTIC PEL basic 9+2**

Property tested	Test according to	Test results (average)	Requirement acc. to EN 14904
Friction [☐]	EN 13036-4	100 (-2 / +2)	80 -110 (mean +/- 4 units)
Shock absorption [☐]	EN 14808	28 % ¹ (-1 / +0)	25 – 75 % (mean +/- 5 units)
Vertical deformation [☐]	EN 14809	1,0 mm	≤ 5 mm
Vertical ball behaviour [☐]	EN 12235 (basketball)	96 % (- 1 / +0)	≥ 90 % (mean +/- 3 units)
Resistance to a rolling load [☐]	EN 1569	1500 N	1500 N
Resistance to wear of coatings and lacquers	EN ISO 5470-1 (CS10 wheels; load 0,5 kg, 1000 cycles)	30 mg	≤ 80 mg / 1000 cycles
Specular reflectance	EN 13745 (angle of incidence 85 °)	0,48	no requirement; average result to be reported
Specular gloss	EN 2813 (angle of incidence 85 °)	23	≤ 30
Resistance to indentation (residual impression) [☐]	EN 1516	0,38 mm	≤ 0,5 mm
Resistance to impact	EN 1517	9	≥ 8 Nm

5 Evaluation

The tested point-elastic sports floors of the product line “**PORPLASTIC INDOOR basic**” met the requirements laid down in EN 14904 regarding the tested properties as shown in the following tables:

Table 5: Properties met by PORPLASTIC PEL basic 4+2

Property	Paragraph	Additional information
Friction	4.2	-
Shock absorption (Force reduction)	4.3	not to be classified according to table B.1 (annex B, informative)
Vertical deformation	4.4	type P 1 according to table B.2 (annex B, informative)
Vertical ball behaviour	5.1	-
Resistance against a rolling load	5.2	-
Resistance to wear	5.3	-
Emission of formaldehyde	5.5	declaration see supplement 1
Content of pentachlorophenole	5.6	declaration see supplement 2
Specular reflectance (light grey)	5.7	no requirement; average value to be reported
Specular gloss	5.8	-
Resistance to indentation	5.9	-
Resistance to impact	5.10	-

Table 6: Properties met by PORPLASTIC PEL basic 6+2

Property	Paragraph	Additional information
Friction	4.2	-
Shock absorption (Force reduction)	4.3	not to be classified according to table B.1 (annex B, informative)
Vertical deformation	4.4	type P 1 according to table B.2 (annex B, informative)
Vertical ball behaviour	5.1	-
Resistance against a rolling load	5.2	-
Resistance to wear	5.3	-
Emission of formaldehyde	5.5	declaration see supplement 1
Content of pentachlorophenole	5.6	declaration see supplement 2
Specular reflectance (light grey)	5.7	no requirement; average value to be reported
Specular gloss	5.8	-
Resistance to indentation	5.9	-
Resistance to impact	5.10	-

Table 7: Properties met by PORPLASTIC PEL basic 7+2

Property	Paragraph	Additional information
Friction	4.2	-
Shock absorption (Force reduction)	4.3	not to be classied according to table B.1 (annex B, informative)
Vertical deformation	4.4	type P 1 according to table B.2 (annex B, informative)
Vertical ball behaviour	5.1	-
Resistance against a rolling load	5.2	-

Table 7: Properties met by PORPLASTIC PEL basic 7+2 (continuation)

Property	Paragraph	Additional information
Resistance to wear	5.3	-
Emission of formaldehyde	5.5	declaration see supplement 1
Content of pentachlorophenole	5.6	declaration see supplement 2
Specular reflectance (light grey)	5.7	no requirement; average value to be reported
Specular gloss	5.8	-
Resistance to indentation	5.9	-
Resistance to impact	5.10	-

Table 8: Properties met by PORPLASTIC PEL basic 9+2

Property	Paragraph	Additional information
Friction	4.2	-
Shock absorption (Force reduction)	4.3	type P 1 according to table B.1 (annex B, informative)
Vertical deformation	4.4	type P 1 according to table B.2 (annex B, informative)
Vertical ball behaviour	5.1	-
Resistance against a rolling load	5.2	-
Resistance to wear	5.3	-
Emission of formaldehyde	5.5	declaration see supplement 1
Content of pentachlorophenole	5.6	declaration see supplement 2
Specular reflectance (light grey)	5.7	no requirement; average value to be reported
Specular gloss	5.8	-
Resistance to indentation	5.9	-
Resistance to impact	5.10	-

The property

- Burning characteristics (paragraph 5.4)

has to be proved seperately.

- Eveness (paragraph 5.11) can only be checked on job-site.

Prepared by
iv. R. Wellhäußer
Dipl.-Ing. Rainer Wellhäußer
Tester



Approved and released by
Hans-Peter Knauf
Dipl.-Ing. Hans-Peter Knauf
Section leader „Sports floors, sports facilities“

Table 9: Individual test results PORPLASTIC PEL basic 4+2

Test			Testing place					Mean
			1	2	3	4	5	
Friction	FT	-	99	102	98	100	99	100
Shock absorption	SA ₅₅	%	14	15	15	14	15	15
Vertical deformation	VD	mm	0,6	0,7	0,7	0,7	0,7	0,7
Vertical ball behaviour	VBB	%	96	96	97	97	96	96
Resistance against a rolling load	RRL	N	1500					1500
Resistance to wear	RTW	mg	31	29	29	-	-	30
Specular reflectance	SR	-	0,48	0,48	0,49-	-	-	0,48
Specular gloss	SG	-	23	24	23	-	-	23
Resistance to indentation	RIN	mm	0,26	0,29	0,25	0,27	0,27	0,27
Resistance to impact	RI	Nm	13	13	14	13	13	13



Table 10: Individual test results PORPLASTIC PEL basic 6+2

Test			Testing place					Mean
			1	2	3	4	5	
Friction	FT	-	99	102	98	100	99	100
Shock absorption	SA ₅₅	%	21	20	21	21	22	21
Vertical deformation	VD	mm	0,8	0,8	0,8	0,8	0,9	0,8
Vertical ball behaviour	VBB	%	95	96	97	96	95	96
Resistance against a rolling load	RRL	N	1500					1500
Resistance to wear	RTW	mg	31	29	29	-	-	30
Specular reflectance	SR	-	0,48	0,48	0,49-	-	-	0,48
Specular gloss	SG	-	23	24	23	-	-	23
Resistance to indentation	RIN	mm	0,30	0,35	0,33	0,36	0,33	0,33
Resistance to impact	RI	Nm	13	13	12	12	13	13



Table 11: Individual test results PORPLASTIC PEL basic 7+2

Test			Testing place					Mean
			1	2	3	4	5	
Friction	FT	-	99	102	98	100	99	100
Shock absorption	SA ₅₅	%	23	23	22	24	23	23
Vertical deformation	VD	mm	0,9	0,9	0,9	1,0	0,9	0,9
Vertical ball behaviour	VBB	%	96	96	95	96	95	96
Resistance against a rolling load	RRL	N	1500					1500
Resistance to wear	RTW	mg	31	29	29	-	-	30
Specular reflectance	SR	-	0,48	0,48	0,49-	-	-	0,48
Specular gloss	SG	-	23	24	23	-	-	23
Resistance to indentation	RIN	mm	0,34	0,37	0,37	0,35	0,34	0,35
Resistance to impact	RI	Nm	10	11	10	10	11	10



Table 12: Individual test results PORPLASTIC PEL basic 9+2

Test			Testing place					Mean
			1	2	3	4	5	
Friction	FT	-	99	102	98	100	99	100
Shock absorption	SA ₅₅	%	28	28	27	28	28	28
Vertical deformation	VD	mm	1,0	1,1	0,9	1,0	1,0	1,0
Vertical ball behaviour	VBB	%	95	96	95	96	96	96
Resistance against a rolling load	RRL	N	1500					1500
Resistance to wear	RTW	mg	31	29	29	-	-	30
Specular reflectance	SR	-	0,48	0,48	0,49-	-	-	0,48
Specular gloss	SG	-	23	24	23	-	-	23
Resistance to indentation	RIN	mm	0,40	0,37	0,39	0,38	0,36	0,38
Resistance to impact	RI	Nm	9	9	10	9	9	9





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Nürtingen, 20.07.2009

Manufacturer's Declaration

PORPLASTIC INDOOR

We declare that for the production of all products for

PORPLASTIC INDOOR Systems

with the following construction:

Elastic-layer	Prefabricated PUR bound rubber granules / fibres or foam mat
Adhesive for fabric	PORPLASTIC L375 (optional)
PUR coating	PORPLASTIC C524
PUR sealing	PORPLASTIC S620

we use formaldehyde –free raw materials only.

VIACOR Polymer GmbH

Michel Haseidl
Head of Development

Dr. Katrin Mahnke
Product management





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