



TESTING TECHNOLOGY FOR SPORT

Shockpad Analysis Report

EN 15330-4:2022

Specification for shockpads used with synthetic turf,
needle-punch and textile sports surfaces

REGUPOL Turfpad SP

Report Number: 15138/4866

Report Status: *Draft*

Client: REGUPOL Germany GmbH & Co KG
Am Hilgenacker 24, 57319 Bad Berleburg
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REGIONAL LOCATIONS

- England
- Netherlands
- Norway
- Sweden
- Italy
- Turkey
- United States
- France
- China



Foreword

This report has been prepared by Sports Labs Ltd with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it. This report is confidential to the Client, and Sports Labs Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

The test results contained within this report represent the values measured on the samples received and tested under laboratory conditions. The compliance requirement limit(s) applied and reported make no allowance for measurement uncertainty. Any change to the materials/components may affect the outcome of the tests.

The tests described in this report have been carried out in accordance with EN 15330-4:2022 Specification for shockpads used with synthetic turf, needle-punch and textile sports surfaces, and this report accurately reflects the outcome of the tests conducted.

* Not all tests carried out are within our scope of ISO 17025 accreditation.

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Date:	21/11/2024	Date:	22/11/2024
Signed:		Signed:	

Test Laboratory

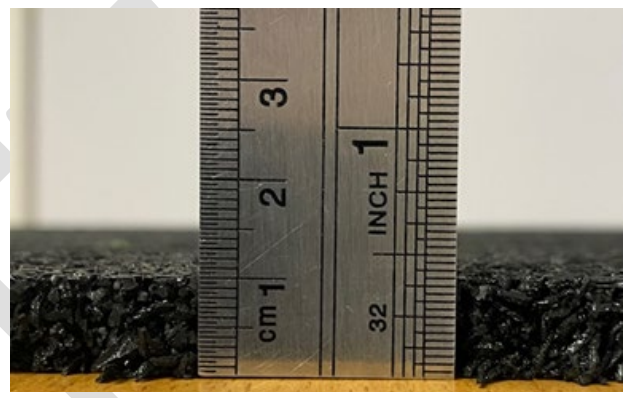
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Product Description

Product Name:	REGUPOL Turfpad SP
Product Type:	Pre-fabricated Shockpad
Product Description:	Elastic premanufactured mat made from selected rubber bound with polyurethane
Nominal Thickness:	10 mm
Substrate:	Concrete

Sample Image [Plan View]:**Sample Image [End Elevation]:****Sample Reference**

Laboratory Job No.	15138	Date Received
Sample Reference No.	Shockpad 4866	07/10/2024
Ambient Temperature Range During Testing	21.0 – 25.0 °C (unless otherwise stated)	
Ambient Humidity Range During Testing	40 – 60 %	

Physical Properties

Property	Test Method	Test Condition	Mean Result
Thickness	EN 1969:2000 Method A	As supplied	10.0 mm
Mass per unit area	ISO 8543: 2020	As supplied	542 kg/m ²

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Performance Testing Results - Shock Absorption PD CEN/TS 16717:2015*

Test Condition	Use of Load Spreading Plate	Mean Result	Requirement	Pass/ Fail	
DRY (23 ± 2) °C	No	33 %	≥ 20 %	PASS	
DRY (23 ± 2) °C	Yes	33 %	≥ 30 %	PASS	
DRY (23 ± 2) °C after accelerated air ageing	Yes	33 %	≥ 30 %	PASS	
WET (23 ± 2) °C	Yes	32 %	≥ 30 %	PASS	
Non-Standard Laboratory Conditions					
DRY (40 ± 2) °C	Yes	32 %	No requirement (Information only)		
DRY (5 ± 2) °C	Yes	33 %			
FROZEN (-5 ± 2) °C	Yes	31 %			
CLASSIFICATION		CLASS AB CLASS BB	Classification		
			SA%	A	B
			≤ 29 %	Class A (-5 to 40°C)	Class A (+5 to 40°C)
			30 – 40 %	Class B (-5 to 40°C)	Class B (+5 to 40°C)
			41 – 50 %	Class C (-5 to 40°C)	Class C (+5 to 40°C)
			51 – 60 %	Class D (-5 to 40°C)	Class D (+5 to 40°C)
			≥ 61 %	Class E (-5 to 40°C)	Class E (+5 to 40°C)

NOTE: Products not complying with 6.1.1 or 6.1.2 of EN 15330-4 can serve other functions within a sports surfacing system and also contribute to the sports performance properties, but they do not comply with this document or satisfy its definition of a shockpad.

Performance Testing Results - Deformation PD CEN/TS 16717:2015*

Test Condition	Use of Load Spreading Plate	Mean Result	Requirement	Pass/ Fail
DRY (23 ± 2) °C	No	3.9 mm	± 2 mm from manufacturer's declaration	PASS
DRY (23 ± 2) °C	Yes	3.6 mm	± 2 mm from manufacturer's declaration	PASS
WET (23 ± 2) °C	Yes	3.6 mm	± 2 mm from manufacturer's declaration	PASS
Non-Standard Laboratory Conditions				
DRY (23 ± 2) °C after accelerated air ageing	Yes	3.5 mm	No requirement (Information only)	
DRY (40 ± 2) °C	Yes	3.7 mm		
DRY (5 ± 2) °C	Yes	3.5 mm		
FROZEN (-5 ± 2) °C	Yes	3.1 mm		

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Performance Testing Results - Water Permeability EN 12616:2022*

Property	Mean Result	Requirement	Pass/ Fail
Vertical Water Infiltration EN 12616:2022 Part 1 Method A *	54672 mm/hr	≥ 500 mm/h	PASS
Horizontal Drainage EN 12616:2022 Part 2*	Not Applicable		

NOTE: Vertical Water Infiltration applies to shockpads designed for vertical flow of water, Horizontal Drainage applies to shockpads designed to provide horizontal drainage (eg. drainage layers)

Performance Testing Results - Tensile Properties EN 12230:2023*

Property	Mean Result	Requirement	Pass/ Fail
Shockpads without slots, grooves or holes and that are less than 25mm thick EN 12230:2023 Method 1*	0.22 MPa	≥ 0.15 MPa	PASS
Shockpads without slots, grooves or holes and that are equal to or greater than 25mm thick EN 12230:2023 Method 2 (Transverse)*	Not Applicable	≥ 0.10 MPa	Not Applicable
Shockpads with slots, grooves or holes, or with tangled filaments or net core EN 12230:2023 Method 3*	Not Applicable	≥ 0.5 kN/m	Not Applicable

NOTE: Some sports federations have set higher requirements than EN 15330-4. If a shockpad is used in a synthetic turf system that requires certification by a sports federation it shall preferably comply with their enhanced requirement.

Performance Testing Results - Dimensional Stability EN17326:2020*

Property	Mean Result	Requirement	Pass/ Fail
Resistance to bowing and curling	0 mm	≤ 5 mm	PASS
Physical Damage	No cracking or permanent damage noted	There shall be no cracking or other permanent damage	

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Performance Testing Results - Resistance to Dynamic Fatigue EN17324:2020*

Property	Mean Result				Requirement	Pass/ Fail
	Before test	After test	Effect of dynamic fatigue			
Shock Absorption (% FR)	32.5 %	32.4 %	Difference	- 0.1 %	$\leq \pm 5$ % Absolute FR loss from unaged and ≥ 20 %	PASS
Thickness (mm)	10.1 mm	9.9 mm	%	- 2.0 % 0.2 mm	$\leq \pm 15$ % from unaged and maximum 1.5 mm loss	
Physical Damage	No cracking or permanent damage noted				There shall be no cracking or other permanent damage	

Performance Testing Results - Resistance to Permanent Deformation after Short Term Loading EN15330-4: Annex A*

Property	Median Result			Requirement	Pass/ Fail
	Before test	Recovery Time			
		After 30 min	After 1 h		
Thickness (mm)	10.1 mm	9.8 mm	10.0 mm	≤ 1.0 mm difference from unaged after 1 hour	PASS
	Difference	0.3 mm	0.1 mm		
Physical Damage	No cracking or permanent damage noted			There shall be no cracking or other permanent damage	

NOTE: For some sports any form of deformation, even during the recovery period, can have an adverse effect on the performance of the playing surface. In such cases, shockpads that show deformation ≤ 1 mm after 30 min recovery should be used.

Performance Testing Results - Resistance to Permanent Deformation after Static Loading EN15330-4: Annex B*

Property	Median Result						Requirement	Pass/ Fail
	Before test	Recovery Time						
		After 30 min	After 1 h	After 6 h	After 24 h	After 72 h		
Thickness (mm)	10.2	9.8	9.9	10.0	10.0	10.1	≤ 1.5 mm difference from unaged after 72 hours	PASS
	Difference	0.4	0.3	0.2	0.2	0.1		
Physical Damage	No cracking or permanent damage noted						There shall be no cracking or other permanent damage	

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Performance Testing Results - Thermal Conductivity (informative) - EN 12664:2001^{*(1)}

Mean Temperature	Mean Result			Requirement
	Upper Conductivity	Lower Conductivity	Mean Conductivity	
10.02 °C	0.08053	0.08034	0.08043	No requirement (Information only)
20.02 °C	0.08212	0.08419	0.08315	
30.03 °C	0.08378	0.08797	0.08587	
40.02 °C	0.08289	0.09474	0.08881	

NOTE: Guidance on using thermal conductivity and thermal resistance data to select shockpads for use in cold climates is given in Annex C of EN 15330-4.

* Not all tests carried out are within our scope of ISO 17025 accreditation.

⁽¹⁾ The testing was carried out by a sub-contracted specialist laboratory under their report number 'SportsLab 15138-4866 Black Shockpad'.

Environmental and Toxicological Properties (informative) – EN 15330-4 Annex D*

Property		Mean Result	Requirement	Pass/ Fail
DOC (dissolved organically bound carbon)		13.48	≤ 50 mg/l ^(a)	PASS
EOX (extractible organic halides)		4.81	≤ 100 mg/kg	PASS
Lead	Pb	< 0.003	≤ 0.025 mg/l	PASS
Cadmium	Cd	< 0.001	≤ 0.005 mg/l	PASS
Total Chromium	Cr	< 0.002	≤ 0.05 mg/l	PASS
Chromium VI	CrVI	< 0.005	≤ 0.008 mg/l ^(c)	PASS
Mercury	Hg	< 0.0001	≤ 0.001 mg/l	PASS
Zinc 24hr	Zn	0.818	≤ 0.5 mg/l ^(b)	PASS
Zinc 24hr		0.274		
Tin	Sn	< 0.003	≤ 0.04 mg/l	PASS

NOTE: Guidance on the environmental properties of shockpads, for use in countries where there are no specific national regulations, is given in Annex D.

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⁽¹⁾ The testing was carried out by a sub-contracted specialist laboratory under their report number L259_1024.

^(a) Materials with a DOC content of more than 100 mg/l in an aqueous 24 h eluate fail to meet these recommendations. In cases where the DOC concentration in the 24 h eluate is in the range of > 50 mg/l to 100 mg/l, the limits stated for the 50 mg/l criterion for DOC in the 48-h eluate may be used to assess conformity. ^(b) Materials with a Zinc content of more than 1 mg/l in an aqueous 24 h eluate fail to meet these recommendations. In cases where the Zinc concentration in the 24 h eluate is in the range of >0.5 mg/l to 1 mg/ml, the limits stated for the 0.5 mg/l criterion for Zinc in the 48-h eluate may be used to assess conformity.

^(c) Since the standardized spectrophotometry method (see DIN 38405-24) or ion chromatography (see EN ISO 10304-3) can only determine Cr (VI) concentrations of ≥ 0,05 mg/l, samples with total Cr contents of ≤ 0,008 mg/l meet these recommendations. If this is not the case, proof that the Cr (VI) concentrations are ≤ 0,008 mg/l should be provided by means of another, non-standardized test method.

Conclusion

The product submitted was tested in accordance with the methods and requirements outlined in EN 15330-4:2022 Surfaces for sports areas - Synthetic turf and needle-punched surfaces primarily designed for outdoor use - Part 4: Specification for shockpads used with synthetic turf, needle-punch and textile sports surfaces.

Based upon the test results we consider the product supplied to have:

- Met all specified requirements of EN15330-4:2022*.
- Failed to meet some requirements of EN15330-4:2022*. Any failures have been highlighted within the results.

The test results contained within this report represent the values measured on the samples received and tested under laboratory conditions. The compliance requirement limit(s) applied and reported make no allowance for measurement uncertainty. Any change to the materials/components may affect the outcome of the tests.

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Manufacturer's Product Declaration

PRODUCT INFORMATION



REGUPOL turfpad SP

Application

Elastic shock pad under artificial turf

Product

Name of Product	REGUPOL turfpad SP
Colour	black
Material	elastic premanufactured mat made from selected rubber bound with polyurethane
Thickness	10 mm

Technical Data

Specific Weight	598 kg/m ³	
Weight per m ²	5.98 kg	
Tensile Strength	0.30 N/mm ²	following DIN EN ISO 1798
Elongation at Break	50 %	following DIN EN ISO 1798
Stress at 25 % Compression	0.25 N/mm ²	DIN EN ISO 3386-2
Force Reduction (without additional covering)	40,5 %	DIN 18032, part 2
Temperature Resistance	- 40° C up to 115° C	
Fire Resistance	Class E	DIN EN 13501-1

Notice: The above-mentioned test data are based on periodical laboratory testing of test specimen taken from the actual manufacturing process and show the average values measured. The publishing of these technical data does not relieve the user of the necessity to test the relevant product for physical fitness based on a specific application. As the final use and application of our products are out of our control, this is the sole responsibility of the buyer / end user. All our products do carry a warranty against manufacturer's defects according to our standard terms and conditions of sale. Due to deviations in raw materials, external influences like temperature and humidity variations, and the fact that this data relates to a resilient material the above-mentioned values are subject to vary up to +/- 25%.

END OF REPORT



TESTING TECHNOLOGY FOR SPORT