



LEESON GRIP® 2-1 (D3149/20) **Cold Applied Polyurethane HAPAS Type 1 High Friction Surfacing Material**

LEESON GRIP® 2-1 (D3149/20) is a polyurethane-based, cold applied, HAPAS/BBA approved Type 1 high friction surfacing system for use on bituminous and concrete highways. LEESON GRIP® 2-1 (D3149/20) comprises a two-component polyurethane binder incorporating 1-3mm grade calcined bauxite aggregate.

LEESON GRIP® 2-1 (D3149/20) is maintained under the BBA HAPAS Certificate 23/H6948.



As a Type 1 HAPAS approved high friction surfacing system LEESON GRIP® 2-1 (D3149/20) provides an effective road safety measure, reducing accidents by reducing braking distances if vehicles need to stop suddenly and lowering the risk of skidding if brakes are applied sharply. Colour coated calcined bauxite aggregate can also be used to highlight approaches to potential road hazard areas.

Usability:	Its ease of spreading allows for rapid application, and the cure speed for the product allows for application sites to be opened to use in a timely fashion.
Site Safety:	LEESON GRIP® 2-1 (D3149/20) is a solvent free system and does not require heat lances or burners to apply, lowering the number of risks installers may be exposed to.
Versatile:	LEESON GRIP® 2-1 (D3149/20) can be used to produce a range of surfaces include roads, pedestrian crossings, cycle paths, driveways, bridges, walkways, stairs, car park decks, ramps, flooring and airport runways. LEESON GRIP® 2-1 (D3149/20) can be used with a range of aggregates to provide varied aesthetic finishes.
Strong, resilient system:	The cured LEESON GRIP® 2-1 (D3149/20) exhibits excellent resistance to extreme temperatures (-20°C to +120°C), moisture and chemical contact for extended periods without loss of strength.

Technical Specification

Parameter	LEESON GRIP® 2-1 (D3149/20)	
	Part A Resin	Part B Hardener
Colour:	Opaque Buff	Transparent Brown
Specific gravity:	0.96 g/cm³	1.24 g/cm³
Solids Content:	100%	100%
Mixing Ratio by Weight:	2.15	1
Mixing Ratio by Volume:	2.78	1
Viscosity at 23°C:	4,000 ± 600 mPa.s	300 ± 75 mPa.s
Mix Viscosity at 23°C:	1,600 ± 400 mPa.s	
Pot life at 19°C:	25 ± 5 minutes	
Hardness, Shore A	≥ 90	

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For HAPAS Type 1 high friction surfacing aggregate type and performance is critical, for this application 1-3mm calcined bauxite aggregate is required.

Parameter	1-3mm Calcined Bauxite Aggregate	
	Requirement	Test Method
Polished Stone Value, PSV 10/6:	70+	BS EN 1097-8:2009
Aggregate Abrasion Value, AAV:	≤ 4	BS EN 1097-8:2009 Annex A
Particle Density:	≥ 2.8	BS EN 1097-6:2000
Moisture Content:	≤ 0.5%	EN 1097-6:2000
Particle Angularity:	Blocked shape (not flakes)	Visual Assessment
Grading % Passing:		
4.00mm	100%	EN933-1:1997
3.35mm	≥ 95%	
1.18mm	≤ 5.0%	
0.60mm	≤ 0.5%	
Chemical Composition:		XRF Spectrometry
Al ₂ O ₃	≥ 82.0%	
Fe ₂ O ₃	≤ 4.5%	
SiO ₂	≤ 12.5%	
K ₂ O+Na ₂ O	≤ 0.5%	
TiO ₂	≤ 4.5%	

All HAPAS Type 1 high friction surfacing systems must perform to exacting performance standards as described in Guidelines Document for the Assessment and Certification of High Friction Surfacing

Parameter	LEESON GRIP® 2-1 (D3149/20)	
	Requirement	Test Method
Skid Resistance:		TRL Report 176:1997, Appendix E
Initial	≥ 65	
After 100,000 wheel-passes	≥ 70	
Texture Depth:		BS 598-105:2000 or BS EN 13036-1:2010
Initial	≥ 1.4mm	
After 500 wheel-passes	≥ 1.2mm	
After 100,000 wheel-passes	≥ 1.1mm	
After heat ageing and 500 wheel-passes	≥ 1.2mm	
Erosion Index:		BBA Guidelines SG1, Appendix D
After 500 wheel-passes	≤ 3	
After 100,000 wheel-passes	≤ 3	
After heat ageing and 500 wheel-passes	≤ 5	
Tensile Adhesion:		TRL Report 176:1997, Appendix J
Stress at -10°C	≥ 1.0 N/mm ²	
Stress at 20°C	≥ 0.5 N/mm ²	
Resistance to Freeze/Thaw:		TRL Report 176:1997, Appendix L
Texture Depth	≥ 1.2mm	
Erosion Index	≤ 5	
Resistance to Diesel:		TRL Report 176:1997, Appendix M
Texture Depth	≥ 1.2mm	
Erosion Index	≤ 5	

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When Installed following the installation instructions and in accordance with the HAPAS Type 1 high friction surfacing systems requirements the LEESON GRIP® 2-1 (D3149/20) will have a service life of between 5 and 10 years, based on the below traffic levels.

Site Category ⁽¹⁾	Site Definition	Maximum Traffic Levels – Type 1 ⁽²⁾
Q	Approaches to and across major junctions, approaches to roundabouts.	3500
G1	Gradient 5% to 10%, longer than 50 m.	3500
S1	Bend radius <500 m – dual carriageway.	3500
R	Roundabout.	3500
G2	Gradient >10%, longer than 50 m.	2500
S2	Bend radius <500 m – single carriageway.	2500
K	Approach to pedestrian crossing and other high risk situations.	2500

(1) As defined in CS 228

(2) Commercial vehicles per lane per day

Instructions For Use

For full installation instructions refer to the installation document *LEESON GRIP® 2-1 (D3149/20) - Installation Guide (HAPAS)* and HAPAS Certificate 23/H6948. For decorative and off-highway applications refer to the *LEESON GRIP® 2-1 (D3149/20) - Installation Guide (Resin Bonded)*.

Packaging

LEESON GRIP® 2-1 (D3149/20) is supplied as a 17kg kit, with LEESON GRIP® 2-1 (D3149/20) Part A supplied as 11.60kg in a 25 litre metal ring latch pail and LEESON GRIP® 2-1 (D3149/20) Part B supplied as 5.40kg in a 5 litre plastic jerry.

LEESON GRIP® 2-1 (D3149/20) can also be supplied in IBCs for metering on site, with LEESON GRIP® 2-1 (D3149/20) Part A supplied at 1045kg and LEESON GRIP® 2-1 (D3149/20) Part B supplied as 1250kg.

Storage

LEESON GRIP® 2-1 (D3149/20) Part A and LEESON GRIP® 2-1 (D3149/20) Part B should be stored in their original, unopened containers, in dry conditions at a temperature between 10°C and 35°C. Storage outside of these conditions will reduce the product's shelf life. Once opened, containers of LeesonGrip D3149 Part B should be used within 14 days.

LEESON GRIP® 2-1 (D3149/20) Part A and LEESON GRIP® 2-1 (D3149/20) Part B have a shelf life of 12 months from point of manufacture.

Health and Safety

LEESON GRIP® 2-1 (D3149/20) Part A is not classified as a hazardous substance; however, the wearing of goggles and gloves is to be recommended.

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LEESON GRIP® 2-1 (D3149/20) Part B contains a non-volatile isocyanate, when used in the European Union, Great Britain, Norway, Iceland or Liechtenstein from 24 August 2023 adequate training is required before industrial or professional use. Before use, ensure that you have read the Safety Data Sheet for this product. Samples will be provided on request to enable customers to satisfy themselves as to the suitability of the product for any specific purpose and to assess the product under their own working conditions.

- Ensure non-porous gloves and eye protection is worn when handling.
- Avoid prolonged contact with skin.
- In cases of contact with eyes, flush out with excess water and seek medical attention.

Additional Notes

This information is for general guidance only and may contain inappropriate information under particular conditions of use. All recommendations and suggestions are therefore made without guarantee. Samples will be provided on request to enable customers to satisfy themselves as to the suitability of the product for any specific purpose and to assess the product under their own working conditions.

Every care has been taken to ensure that the information provided in the literature is correct and up to date. However, it is not intended to form any part of a contract or provide a guarantee. Purchasers/intending purchasers should contact Leeson Polyurethanes to check whether there have been any changes to the information since publication of the literature. Please ensure you have read the hazard labels and material safety data sheet before using this product.

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