

AVAILABLE FOR BASE, BINDER AND SURFACE COURSE APPLICATIONS, PAVEMENTS UTILISING BREEDONSuperior HAVE DEMONSTRATED EXCEPTIONAL DURABILITY PERFORMANCE.

BREEDONSuperior incorporates elastomeric polymer modified binders to outperform 'standard' bituminous materials in relation to fatigue, deformation, water sensitivity and cracking resistance. The outstanding results are obtained using specifically designed aggregate combinations and improved adhesion, cohesion, ductility, strength, and thermal resistance from polymer modified binders, when compared with paving grade binders.

The high softening point of the polymer modified binders in comparison with paving grade binders enables BREEDONSuperior to be trafficked earlier than conventionally used hot mix materials without detriment, reducing construction times, health and safety risks, and disruption to users. Suitable for most machine-lay sites, the product will offer whole-life cost savings compared with traditionally used bituminous materials, and is principally designed for sites where cracking (including reflective cracking) is, or could potentially be, an issue.



**APPLICATIONS**

- Urban and rural locations
- Overlaying concrete
- Sites requiring high fatigue and deformation resistance (e.g. heavily trafficked sites and roundabouts)

**TECHNICAL DATA**

BREEDON Superior base and binder courses performance summary:

The results below demonstrate BREEDON Superior base and binder courses:

- Have comparable compactability characteristics to conventional bituminous materials.
- Contain higher binder volumes than standard asphalt concrete base and binder courses.
- Have similar resistance to permanent deformation performance to 40/60 Pen Asphalt Concretes.
- Exhibit lower indirect tensile stiffness modulus results than 40/60 Pen asphalt concretes (i.e. materials are favourably more flexible), but higher than Hot Rolled Asphalt mixtures utilising polymer modified binders.
- Perform exceptionally well when tested for fatigue resistance.
- Water sensitivity is significantly higher than 40/60 Pen Asphalt Concretes and Hot Rolled Asphalts using polymer modified binders.

	10mm BREEDON Superior bin	14mm BREEDON Superior bin	20mm BREEDON Superior bin	32mm BREEDON Superior base	AC 20 dense bin 40/60	AC 32 dense base 40/60	HRA 50/14 F bin PMB	HRA 50/20 F bin PMB
In situ air void content (BS EN 12697-8)	7.9%	7.6%	3.8%	5.8%	6.2%	6.9%	4.5%	4.2%
Refusal void content (BS EN 12697-6, BS EN 12697-9 and BS EN 12697-32)	5.7%	4.0%	2.9%	3.8%	4.7%	4.1%	ND	ND
Binder content by volume (BS 594987 Annex C)	12.9%	13.2%	12.7%	11.3%	10.2%	9.0%	14.0%	14.4%
Resistance to permanent deformation (BS EN 12697-22 small device at 60°C)	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 2.2mm Mean proportional rut depth at 10,000 cycles: 3.2%	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 2.8mm Mean proportional rut depth at 10,000 cycles: 4.8%	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 2.6mm Mean proportional rut depth at 10,000 cycles: 3.3%	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 3.0mm Mean proportional rut depth at 10,000 cycles: 4.4%	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 2.6mm Mean proportional rut depth at 10,000 cycles: 3.6%	<b>Procedure B in Air</b> Mean wheel track slope: 0.1mm/1,000 load cycles Mean rut depth at 10,000 cycles: 2.6mm Mean proportional rut depth at 10,000 cycles: 3.6%	<b>Procedure A in Air</b> Mean wheel tracking rate: 0.4mm/1,000 load cycles Mean rut depth at 1,000 cycles: 1.5mm	<b>Procedure A in Air</b> Mean wheel tracking rate: 0.1mm/1,000 load cycles Mean rut depth at 1,000 cycles: 1.2mm
Resistance to fatigue (BS EN 12697-24 Annex E at 20°C). Load applications to fatigue life at 200 micro strains	433,226	2,675,448	476,976	ND	ND	ND	ND	ND
Resistance to fatigue (BS EN 12697-24 Annex E at 20°C). Load applications to fatigue life at 500 micro strains	9,906	9,598	15,094	ND	ND	ND	ND	ND
Water sensitivity (BS EN 12697-12 Method A)	>70%	>70%	>70%	>70%	59.6%	62.3%	49.7%	46.2%

ND = Not determined

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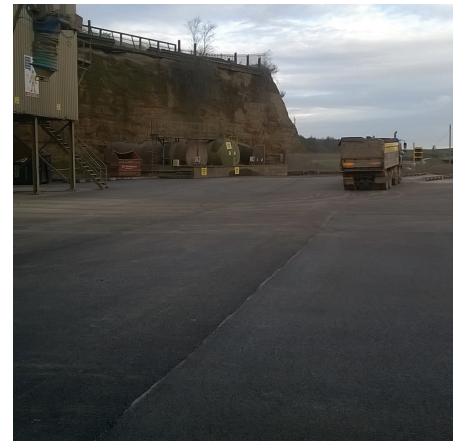
BREEDONSuperior surface courses have the following characteristics:

Test Method	6mm BREEDONSuperior surf	10mm BREEDONSuperior surf	14mm BREEDONSuperior surf
Initial texture depth (BS EN 13036-1)	≥0.5mm	≥1.0mm	≥1.3mm
Retained texture depth (BS EN 13036-1 after two years trafficking)	≥0.3mm	≥0.7mm	≥0.9mm
Binder content by volume (BS 594987 Annex C)	15.5%	14.9%	14.2%
In situ air void content (BS EN 12697-8)	6.2%	5.1%	4.9%
Water sensitivity (BBA HAPAS Guideline Annex A.2)	>80%	>80%	>80%
Binder drainage (BS EN 12697-18)	<0.3%	<0.3%	<0.3%
Resistance to permanent deformation (BS EN 12697-22 small device at 60°C)	<b>Procedure B in Air</b> Mean wheel track slope: <1.0mm/1000 load cycles	<b>Procedure B in Air</b> Mean wheel track slope: <1.0mm/1000 load cycles	<b>Procedure B in Air</b> Mean wheel track slope: <1.0mm/1000 load cycles

## CONSTRUCTION

BREEDONSuperior is available in a variety of sizes suited for the application, and can be installed at a range of layer thicknesses:

Application	Designations Available	Nominal Layer Thickness (mm)	Minimum Thickness at Any Point (mm)
Base Course	32mm	70 - 150	55
	32mm	70 - 150	55
Binder Course	20mm	60 - 150	50
	14mm	50 - 130	40
	10mm	40 - 100	30
	6mm	25 - 40	20
Surface Course	10mm	30 - 50	25
	14mm	40 - 50	35



When overlaying concrete or Cement Bound Granular Materials (CBGMs), any loose or broken material must be removed, joints ‘made good’ and sealed. Wherever possible, tanker applied bond coats should be used between all layers. The bond cost shall be allowed to fully ‘break’ (i.e. turn from brown to black). For improved performance, the inclusion of BREEDONFlex SAMI between the concrete or CBGM and the other bituminous layers will further delay the onset of reflective cracking.

Installation should be carried out in accordance with the general requirements of BS 594987, using a tandem roller with a minimum deadweight of 6 tonnes (preferably a 10 tonne deadweight roller) as the lead roller. Smaller machines should only be used in areas of restricted access, and to remove any marks left by the lead roller. The product must be sufficiently compacted (a minimum of six roller passes) before the temperature of the material reaches 120°C.

## BENEFITS

- Increased performance life and reduced maintenance and whole life costing (WLC).
- Suitable for high volume sites requiring high fatigue, deformation and cracking resistance
- Can be used to reduce construction time and therefore:
  - Lower costs
  - Minimise disruption to users
  - Lessen health and safety risks
- Exceptional fatigue, water sensitivity, fretting, raveling and rut resisting properties.
- Impermeable to water penetration, preventing detrimental ingress.
- Good rate of spread due to high binder volumes.
- Extremely quiet when trafficked.
- Smooth, uniform finish.
- Minimal maintenance required.
- High softening point, reducing the risk of damage.
- Area can be opened to traffic once the centre of the layer has reached ≤60°C.
- Surface courses exhibit smooth, uniform finishes, and are available as coloured materials.

## MAINTENANCE AND REPAIR

BREEDONSuperior is not subject to any specialised routine maintenance processes, and should be maintained in accordance with the Design Manual for Roads and Bridges HD 31/94 “Maintenance of Bituminous Roads”. Although BREEDONSuperior will significantly delay the onset of reflective cracking from concrete, cracking will inevitably occur on the surface of the bituminous layers. When this does eventually happen, the damaged areas can be removed by planing to the appropriate depth (i.e. concrete surface) to provide a minimum length of 15m for paver resurfacing. The planed area can be resurfaced, again utilising BREEDONSuperior above the concrete substrate. The inclusion of BREEDONFlex SAMI between the concrete and overlaying bituminous layers is recommended to inhibit the commencement of reflective cracking. Wherever possible, bond coats shall be used between layers.



**Major repairs**

Any damaged areas are to be removed by planing to the appropriate depth to provide a minimum length of 15m for paver resurfacing. The planed area will be resurfaced using material to the same specification.

**Minor repairs**

- Minor repairs can be carried out by cutting out the damaged section and replacing it with a material of suitable specification.
- A K1-40 (C40 B 4) or K1-60 (C60 B 4) tack coat, or an acceptable proprietary bond coat, will be used on the receiving substrate.
- Wherever possible a diamond patch reinstatement shall be used, extending a minimum of 0.25m beyond the damaged section.
- Joints must be saw cut vertical, cleaned and painted with a thick uniform coating of hot bitumen, hot elastomeric polymer modified bituminous binder, or cold applied thixotropic bituminous compound.

**WHY CHOOSE BREEDON PROPRIETARY MATERIALS?**

The Proprietary Materials offered by Breedon are extensively designed and rigorously tested to exceed the performances of traditionally used asphalts in specific applications. Our Proprietary Materials often include additives to achieve these high levels of operation.

**PRECAUTIONS AND LIMITATIONS**

Asphalt remains relatively soft for up to one year after laying; until it has time to oxidise and harden (i.e. elasticity is reduced). It is recommended that the surface is not trafficked for at least 4 hours following installation, when it is most susceptible to damage. When trafficked by vehicles, it is recommended that vehicles are moving when the wheels are turned. If a vehicle is stationary when the wheels are turned (particularly with modern power steering), the asphalt can be displaced and marked by stresses applied at that particular point. It is also recommended that (wherever possible) vehicles are parked in different positions to avoid marking the asphalt, and heavy vehicles, trailers, plant, machinery and ladders with small footprints are parked on wooden boards to disperse the loading. Fuel spillages should also be contained and cleaned up as soon as possible as these will compromise durability. Recommended procedure for removing diesel spillages is as follows:



- Stem the leak.
- If necessary, contain the spillage by deploying booms around the source and block any drains.
- Apply absorbent granules (e.g. cat litter) or sand to the spillage area.
- Sweep up the absorbent granules and dispose of in accordance with environmental regulations.
- Scrub the surface using a mild detergent. Any effluent resulting from the clean-up activity must not be washed into surface water drains as it is an offence under the Water Resources Act 1991.

**QUANTITY REQUIRED**

As a guide, please refer to the Material Calculator on our website ([www.breedongroup.com](http://www.breedongroup.com)).

**AVAILABILITY**

BREEDONSuperior can be laid all year round (depending on climatic conditions), and may be installed by Breedon or experienced Contractors.

**TO DISCUSS YOUR PROJECT REQUIREMENTS, AND FOR MORE INFORMATION ABOUT OUR PRODUCTS CONTACT:**

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