

# DURATOUGH® TECHNICAL DATA SHEET



## DURATOUGH®

Duratough is a semi-flexible surfacing system for pavement areas that are subject to heavy and/or slow moving traffic, or where a durable, hard wearing, impermeable and fuel resistant surface is required. It consists of a porous asphalt support coat designed to provide approximately 20% void content, which is filled with a high strength proprietary grout. The low viscosity of the Duratough grout ensures the voids are effectively filled throughout the porous layer and the resulting product provides exceptional load spreading ability, resistance to fuel spillage and permanent deformation.

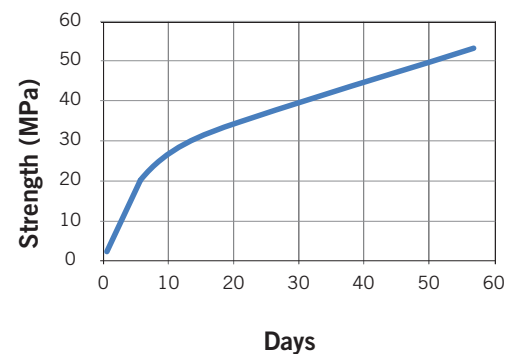
## PROPERTIES OF THE SUPPORT COAT

Duratough utilizes a 12.5mm nominal size asphalt support coat, which provides a better void structure compared with larger nominal size variants, leading to better flexural strength in the finished product. The support coat is manufactured in an asphalt plant using a computerized plant control system to ensure consistency at a temperature between 140°C and 160°C.

## PROPERTIES OF THE GROUT

- Strength typically in excess of 35 MPa at 28 days
- Rapid strength gain (typically 15 MPa at 7 days), allowing for early trafficking of the finished material.
- Low viscosity at time of application, resulting in effective penetration of voids in the porous asphalt structure.

Particle Size Distribution	
Sieve Size (mm)	Typical Percentage Passing
19	100
12.5	90
10.0	75
5.00	15
80 µm	3
Components	
Coarse Aggregate 93%	High quality, 100% crushed
Asphalt Cement 4%	Conventional or PMA
Fibres	Cellulose or MSM (3%)
Mixing Temperature	140 - 160°C
Laying temperature	130 - 150°C



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## SUPPORT COAT APPLICATION

The support coat mix shall be transported to the job site using haul trucks that have been thoroughly cleaned of any debris to avoid contamination. The support coat must be placed using a conventional asphalt paver. Any irregular shapes will require the necessary handwork for placement. Generally, any hand work must be kept to a minimum to avoid segregation of the support coat mix. Rolling and compaction of the support coat shall utilize a dual steel drum roller in static mode and rolled to seat the support coat (usually 2 - 3 passes). No further compaction is required. Under no circumstances is the use of a combination roller or rubber tired rollers permitted. No vehicular traffic is allowed on the support coat prior to the grout placement.

In the event of inclement weather, the surface is to be protected from the ingress of surface water. After any rainfall, the support coat must be free of any entrapped water. A vacuum truck and/or compressed air using an air lance shall be used to eliminate any entrapped water.

## GROUT APPLICATION

Duratough grout shall be manufactured using a high shear mixer such as an in-line impeller pump to ensure complete dispersion of the cementitious components within the grout mixture. Grout discharge from the haul truck should be limited to the amount required to facilitate the spreading, which shall be performed using a squeegee applicator. Some vibration may be necessary in order to ensure adequate void reduction and filling with the grout. Several passes of the grout application may be required to fill any surface air bubbles observed. The grout shall be placed to the top surface of the support coat.

Using a standard flow cone, the viscosity of the grout should be measured on a continuous basis throughout grout placement. Grout viscosity is measured by the time measured to allow complete discharge of a full grout flow cone. The viscosity should be 12 seconds +/- 2 seconds.

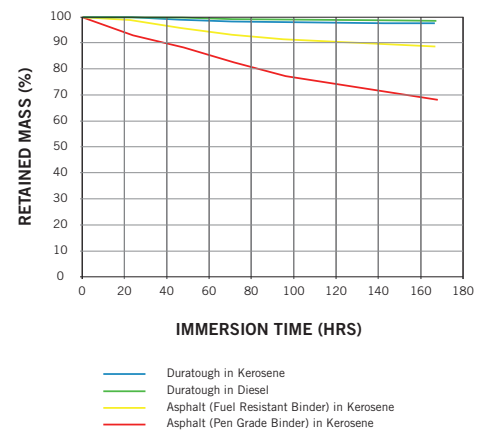
Attention to the air temperature and pavement temperature is critical during grout placement. Ideally the pavement temperature should be cool to the touch. During hot weather, attention to the pavement temperature is critical. In no case should grout placement occur if the pavement temperature of the support coat exceeds 60°C. Ice and or retarder admixture may be required to prevent flash setting of the grout prior to complete infilling of the support coat voids.

## PROPERTIES OF THE COMPOSITE

Typical 28-Day properties of Duratough:

- NAT Indirect Tensile Stiffness Modulus: 6,000 MPa
- Flexural Strength: 2.5 to 3.0 MPa
- Freeze/Thaw: No impact after 20 cycles
- Skid Friction (British Pendulum Test): 80 (dry), 65 (wet)
- Duratough has a suggested AASHTO 93 structural number of 0.47, This compares to an SN of 0.5 for concrete and 0.44 for asphalt

## RESISTANCE TO FUEL INGRESS



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## TYPICAL DURATOUGH CONSTRUCTION

Duratough provides a tough scuff resistance surface to provide superior performance. To ensure superior performance Duratough® must be placed on a stiff support base to minimize cracking. For new construction, a typical pavement cross section would consist of a thick layer of granular base course over prepared subgrade, overlaid by a layer of asphaltic concrete pavement, overlaid by a layer of Duratough®. A 75 mm thick layer of Duratough® is recommended. A structural pavement design is required to determine pavement layer thicknesses to meet the anticipated loading conditions.

Duratough® may be overlaid over existing concrete pavement or replacement of a deteriorated asphalt concrete surface. Minimum thickness of 75 mm of Duratough is recommended.

## QUALITY CONTROL TESTING

Samples of the hot applied support coat should be tested for compliance to the Job Mix Formula. Quality Control Testing would include asphalt cement content and gradation analysis. No compaction requirements are required. Coring may be done after completion of the placement of the support course to determine the in-situ air voids content. A minimum air voids content of 18% is recommended.

Samples of the grout should be obtained during placement to determine the grout compressive strength. The grout strength should be approximately 15 MPa (7 day compressive strength) and 35 MPa (28 day compressive strength). Grout testing may include flow testing measurements to monitor the grout viscosity.

## JOINTING

To minimize cracking, saw cutting of the Duratough slab is recommended. Typical panel sections should be a square section measuring 15 meters wide or to match existing concrete panel placement as applicable. Saw cuts should be crackfilled with an elastomeric crack filler.

