

Technical Data Sheet

The process StoneSet is a thermosetting aliphatic polyurethane system, the curing reaction is mildly exothermic and is ideally catalysed using selected tin compounds.

StoneSet can be designed for a wide range of applications from tree surrounds, pathways, light vehicular areas and heavier trafficked access roads.

The exact recipe is varied to suit each project and the conditions pertaining to each site so that flexibility can be adjusted depending on construction, traffic and weather conditions. The exact proportion of resin also varies from job to job to account for expected wear and the grading (particle size distribution) absorbency and particle shape of the selected aggregate.

Resin bound surface course consisting of aggregate particles, fully coated with a chemically curing polyurethane binder that must be:

- UV stable
- Flexible
- Crystal Clear
- High tensile strength

The aggregates used must be:

- Clean <2.0% smaller than 75micron
- Hard, wet strength .100kn
- Durable Water Absorption <3.0%
- Los Angeles Abrasion <20%
- Na₂ SO₄ Soundness
- Consistent, quality controlled process to monitor grading and shape. Attractive, colour and particle shapes selected and blended to specific design.

Mixing

The aggregate and resin must be thoroughly combined in a forced-action mixer immediately before spreading so that each aggregate particle is fully coated with resin before laying. The resin must also include a suitable adhesion agent to ensure complete adhesion with the aggregate and the setting time must be controlled by the use of a catalyst so that the timing of the cure ensures a) sufficient trawling time, b) adequate time to allow the application of glass/sand dusting to ensure early life grip.

StoneSet recipes are all laboratory determined to establish the correct:

- Density, crucial to establish spread rates, porosity values and resin ratios. Texture, to satisfy visual and grip characteristics by blending suitable sizes using ANZ asphalt specifications guidelines.
- Appearance, the correct colour and texture to suit specific project design criteria. Durability, calculate the resin percentage for each project taking into account the traffic type, application and aggregate type.
- Curing time, controlled using a catalyst, meaning we can lay in varying temperatures without concern.

StoneSet Characteristics:

- Compressive Strength 7.7-8.6N/mm²
- Thermal Conductivity 0.75-5.0 W/m.k
- Flexural Strength 1.4-1.8 N/mm²
- Secant Modulus of elasticity 0.2-0.4GN/mm/mm²
- Tensile Adhesion 0.2-1.5N/mm²
- Permeability 54-103 L/m² /sec Tensile Stiffness (NAT) 800-3500 Mpa

Properties in relation to fire The reactively low fire risk properties of StoneSet paving are principally derived from two factors. The very high proportion of inert aggregate and fillers normally used (around 95% by weight) which serves to suppress ignition and development of fire. The high ignition point of the resin film due to the particular grades of resin used and the absence of any solvents.

Flexibility

Flexibility testing of several typical StoneSet blends has been carried out to the standard test method specified in BS 6319-3 1990 "Testing of resin and polymer/cement compositions for use in construction".

The test method entails a four point bending beam test of a 25mm by 25mm cross sectional bar of StoneSet between 300mm centres. The flexural strength is first determined by loading the beam until it breaks and then duplicate specimens are repeatedly loaded to much lower levels and the deflections measured. The average ratio of the applied load against deflection is then calculated as the "mean secant modulus of elasticity in flexure", which gives a comparative indication of the flexibility, i.e ease of bending, the StoneSet surfacing.

The values determined were: Mean secant modulus of elasticity 0.2-0.2 GN/m² Mean flexural strength 1.4-1.8 N/mm² For comparison please find below typical values for other common building materials. Mean secant of modulus of elasticity in flexure GN/m² Rubber 0.007-0.004 Polypropylene 1.5-2.0 Stone 20-150 Concrete 20-40 Steel 210

Permeability

StoneSet mixes are permeable and this can be varied to suit the requirements of the specific application, for example to maximise permeability in the case of tree surrounds. Another application might require extensive turning traffic to be tolerated in which case a carefully selected blend of different sizes of aggregate will be preferred. In this instance the ratio of resin will be adjusted using StoneSet's long established Optimum Resin Content system to allow for variations in surface area of the aggregate particles.

A 10mm aggregate size can achieve flow rates of 78litres/m²/second, this in turn can be reduced down to just 16litres/m²/second when using a 3mm aggregate size.

Slip Resistance

StoneSet provides a smooth yet slip resistant surface. The exact results for slip testing vary between mixes however 90% of our range will show a very low risk of slipping in the wet. For product specific testing please place a request with the sales team. To ensure instant on slip resistance we specify a light application of a sand is sprinkled over the surface.

History

The StoneSet system was developed during the mid-nineties in England by SureSet UK Ltd, the first areas being laid in London in 1997. Since then over 1 million square metres have been laid including areas in Russia, Spain, Greece, USA, Scandinavia, Holland, UAE and more. SureSet launched in Australia in 2008 and rebranded as StoneSet.

Over the years there have been numerous imitations where the SureSet/StoneSet technology has been mimicked. Some of the variants have proved to be quite successful whereas some have failed badly. There are many types of resin available (including aromatics) and these have varying degrees of success. It is easy to use cheaper resins but it will never give the value for money enjoyed by using the ingredients designed to give the best performance.

StoneSet has what we believe to be a unique system to enhance the resistance to damage by UV light and this is applied to all of our mixes except when laid as base, for which it would be clearly unnecessary. This together with our design procedure to arrive at a job by job formulation makes StoneSet the obvious choice. It is our belief that none of the alternative systems have an equivalent or are aware that StoneSet has this advantage.