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Technical Data Sheet

Safe.T.Line Preform Thermoplastic

Product Description

Safe.T.Line (STL) Preformed Thermoplastic Pavement Marking Material is a Non-Hazardous, Environmentally-Friendly product which is pre-cut and conforms to Australian Standard Specification AS 4049.2. The binders are based on Hydrocarbon and Alkyd Resins known as MMRE (Maleic Modified Rosin Ester). STL Preformed Thermoplastic are used for the delineation (including straight line, arrows, numerals, lettering, symbols) of various types of road surfaces to increase safety and provide the guidance for all road users. Due to its excellent wear-resistant durability and resistance to oil grease & diesel drop as well as high retro-reflectivity and anti-slip properties, STL Preformed Thermoplastic is especially suited for use on the heavy-trafficking roads and 'black-spot' areas. For ease of application, STL Preformed Thermoplastic can be applied directly onto road surface by professionally trained operator with heating torch. Preform provides a quick and easy, economical repair to worn road marking and small line marking patch jobs.

Physical and Chemical Properties

Colour:	White, Yellow, Blue, Green, Red, Black
Whiteness/Luminance	White: minimum 80% Yellow: minimum 40%
Glass Beads Content	minimum 20%
Flash Point Temperature	minimum 230°C
Softening Point	min 90°C
Density	1.9 - 2.1 g/cm3
Skid Resistance	minimum 45 BPN
Abrasion Resistance	< 400 milligram for 500 cycles
Application Temperature	190°C - 210°C

Weather Conditions

Applying STL Thermoplastic under the following conditions is recommended (Asphalt and Concrete Surface)

Temperature

Min / Max Air temp	10°C - 40°C
Mini / Max Road temp	10°C - 60°C

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Humidity & Dew
Subsurface moisture can be present in sufficient amounts to affect bonding during dew and fog in early morning and after rain. Moisture will result in blisters on hot-melt Thermoplastic and poor bonding. Stop the application if the condition occurs.
A quick moisture test is recommended before application.

Quick Moisture Test
Tape a 30 cm square sheet of thin plastic to the road surface, being careful to seal all edges. After 15 minutes, examine the bottom of the sheet and the road surface. If more than a sparse amount of moisture is present, do not apply thermoplastic.

Application Instruction

The application of STL Thermoplastic is applied through professionally trained personnel using heating device (Torch Burner) to gently apply heat on preformed thermoplastic and adhere on pre-marked job sites. The application temperature is recommended to be 190°C to 210°C depending on the substrate and ambient conditions. Proper safety gear and PPE are essential during the application.

Product Application Guideline

Generally, STL Preformed Thermoplastic Pavement Marking Materials are applied onto two main types of roadway surfaces, Bituminous Surfaces (Asphalt) and Concrete. The following are recommendations to achieve the best performance results.

"Proper PPE are essential during the application."

A. Bituminous Road Surface (Asphalt)

1. Do not apply thermoplastic materials on a freshly laid bituminous asphalt surface. Let it cool and may require possible weathering for a few days before application.

2. Stop right away and do not apply thermoplastic materials IF there is any doubt of peeling or adhesion issue, especially there is an existing coating or marking or the job site substrate such as brick, concrete or loosen structured surface or worn/polished surface.

3. Removal of existing, old, worn & loose pavement markings such as waterborne paints, solvent borne paints and cold applied plastics by grinding before applying surface.
as it prevents the thermoplastic's heat transferring to asphalt

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4. Clean roadway surface of dirt, loose particles, oil & grease patches before application.

5. Ensure the roadway surface is completely dry before application of material. Especially under conditions of a heavy rainfall; if the humidity is high; if the ambient temperature is low; if there's strong cold wind; or heavy mist, it might take more time for the road to dry. Delaminating will occur if applied when road surface is wet.

6. Do not apply thermoplastic material if roadway surface temperature is less than 10˚C, unless the road surface is preheated to above 10˚C before applying material.

7. If a roadway is oxidised, surface polished or worn due to ageing and heavy trafficking, it is strongly recommended to apply a coat of Thermo Primer and please allow this thin coat of primer to dry completely before applying thermoplastic material on top. The thermo primer will improve adhesion between thermoplastic and roadway surface.

8. Pre-mark the jobsite, and pre-heat the road surface if required.

Pre-Heating the Surface Substrates- recommended for following conditions:

(a) If the surface substrate and ambient temperature is too cold below 10˚C.

(b) If the surface substrate has a small amount of moisture/water contents.

(c) If the surface substrate is new asphalt when the condition allows.

9. Lay down and adjust Preformed Thermoplastic materials, stand back to check correct positioning. Extra care must be exercised in handling STL Preformed Thermoplastic materials.

10. Symbols, arrows, letters, numerals, special designed Preformed Thermoplastics are supplied in pre-numbered parts and a diagram is provided within the product package to assist in correct & easy laying out.

11. Applying heat to STL Preformed Thermoplastic materials using a flame burner with a constant slow motion from side to side along the preform.

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12. The height of the flame will depend on the capacity of the flame burner used.

13. DO NOT over-heat the Preformed Thermoplastic materials ("discoloration").

14. For coloured preformed thermoplastic, please take extra care to apply heat more gently and always evenly as the "organic" pigments tend to change colour when overheated or burnt. Please be reminded to always keep the burner moving around while applying heat.

15. Recommended application temperature for STL Preformed Thermoplastic is 190˚C - 210˚C. The molten thermoplastic will “flow” and slightly "bubbling" indicated the air escaping from the holes underneath the thermoplastic material due to molten thermoplastic is trying to fill the gaps and porous holes. Thus, the thermoplastic adhesion to road substrate is completed. Asphalt melts about 180 ºC -200 ºC.

16. Once STL Preformed Thermoplastic material is applied, this is immediately followed by the application of surface drop-on wet/night retro-reflective glass beads and antiskid mixes (recommended to apply minimum 350 to 700 grams per m² depending on the performance requirements) the glass beads should be sitting 50% to 60% "inside" the thermoplastic material for adhesion and 40% to 50% exposed to maximize the retro-reflectivity from the incoming traffic light sources.

18. Always check applied Preformed Thermoplastic material and surface drop-on material for complete bonding and adhesion to road surface before continuing on to next job.

Applying preform to difficult surfaces
There are some surfaces which may be difficult to apply Preform or one may be unsure of the compatibility of the surface and the product. For example, Alkyd or Epoxy resin may have “Waxy” ingredients which resist adhesion and bonding. Some concrete may contain accelerants or silicone ingredients which may repel adhesion. There are many variations of surfaces and ingredients and it is impossible to test for every eventuality.
As a rule, **If you’re not sure, Test it.**

B. Concrete Surface – a coat of Thermo Primer is required

Do not apply thermoplastic materials if there is any doubt of peeling or adhesion issue, especially there is an existing coatings or line-markings.

For Existing Concrete Surface - Please read through Section A and follows the instructions 2-18.

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For New Concrete Surface-

STL Thermoplastic material can be applied over new cured concrete ONLY IF:

- The concrete curing agent used is a straight chain C5 hydrocarbon.
- The new road is allowed to weather for the time recommended by the curing agent supplier before the application of Thermoplastic material.
- If the above conditions are met and the new concrete surface is suitable for pavement marking, follows the instructions as Existing Concrete Surface under Section B above.

Cautions:

1. STL Preformed Thermoplastic material can be applied over old and worn Waterborne Paint when the loose paint, dirt, oil & grease are removed.
2. Roadway surfaces lined with STL Preformed Thermoplastic material can be opened for traffic once the applied lines are cooled and bond is formed between the roadway surface & preform.
3. If adhesion and bond between roadway surface & STL Preformed Thermoplastic material is not achieved when initially tested - Stop the application immediately and rectify the problem before continuing the job.
4. DO NOT heat STL Thermoplastic material to temperature higher than 230˚C, decomposition and discoloration of thermoplastic will take place.

The Chisel Test

The chisel test is the final test to ascertain is the Thermoplastic has bonded to the pavement material. Using a hammer and chisel, remove a small corner to confirm adhesion has occurred by chiselling into the preform and substrate. The preform should still adhere to the piece of substrate after it has been chiselled away.

Delaminating Prevention:

1. Delaminating is one of the most common failures in the application of thermoplastic, more so with preformed thermoplastic.
2. The biggest cause is insufficient heating. Under all conditions the heat applied must penetrate through Preformed Thermoplastic materials and be continuing to heat and melt the bitumen of the road to form the adhesion bonding.

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3. The practice of checking for total adhesion between preformed thermoplastic and road surface is very important. If no adhesion is evidenced, this failure may be recovered by reheating the preformed thermoplastic material.

4. The following conditions will cause delaminating of preformed thermoplastics-

- Water between road surface and Preformed Thermoplastic. i.e. road surface is not dry.
- Fresh or newly laid bituminous asphalt surface, as the asphalt contain solvents, and this thin layer of solvent will prevent the full bonding of Thermoplastic to asphalt.
- Oil, grease, dirt, worn & loose polished road surfaces.
- Primed concrete surfaces not dried completely.
- Concrete or brick surfaces not primed.
- Bituminous road surfaces oxidised, worn and polished.
- Lines previously marked with solvent borne paints and cold plastic materials.
- Lines previously marked with waterborne paint. It will adhere only if with worn waterborne paint (virtually gone) and the roadway surface is bituminous.
- Always test for adhesion before carrying on with next job. If in doubt, please contact the supplier.

Shelf Life and Storage

Please store under cover and in cool and dry condition. Recommended product shelf life is 6 months from the product received date. The Material Safety Data Sheet (MSDS) is available on request.

Health and Safety

Before using this product please consult our Material Safety Data Sheet (MSDS) for information on safe handling and storage.