



*“Creating a Safe Environment for All Road Users”*

## DPI Preform Thermoplastic

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### Product Description

DPI Preformed Thermoplastic Pavement Marking Material is a Non-Hazardous and Environmental-Friendly product which is pre-cut and conforms to Australian Standard Specification AS 4049.2. The binders are based on Alkyd Resins. DPI Preformed Thermoplastic are used for the delineation (including straight line, arrows, numerals, lettering, symbols) of various types of road surfaces to increase the safety and provide the guidance for all road users. Due to its outstanding wear-resistant durability, resistance to oil, grease, and diesel drops, as well as high retro-reflectivity and anti-slip properties, DPI Preformed Thermoplastic is particularly well-suited for heavy-traffic roads and 'black-spot' areas. Application of DPI Preformed Thermoplastic directly onto the road surface by a professionally trained operator using a heating torch ensures an easy, quick, and economical repair for worn road markings and small line marking patch jobs

### Physical and Chemical Properties

Colour:	White, Yellow, Blue, Green, Red, Black
Whiteness/Luminance:	White: $\geq 80\%$ , Yellow: 45-55%
Glass Beads Content:	$\geq 20\%$
Flash Point Temperature:	$> 230^{\circ}\text{C}$
Softening Point:	$> 90^{\circ}\text{C}$
Density:	1.95 – 2.05 g/cm <sup>3</sup>
Skid Resistance:	minimum 45 BPN
Abrasion Resistance:	$< 400$ milligram for 500 cycles
Application Temperature:	$190^{\circ}\text{C} - 210^{\circ}\text{C}$
Recommended Glass Bead:	B, BHR, C, CHR, D, DHR, 70/30, 60/40, Glass Sand 1-2mm (dependent on job requirements).

### Weather Conditions

It is recommended to apply DPI Thermoplastic under the following conditions on both asphalt and concrete surfaces.

#### Temperature

Min / Max Air temp	$10^{\circ}\text{C} - 40^{\circ}\text{C}$
Mini / Max Road temp	$10^{\circ}\text{C} - 60^{\circ}\text{C}$



## Humidity & Dew

Subsurface moisture may be present in sufficient amounts to affect bonding during dew and fog in the early morning or after rain. Moisture can lead to blisters on hot-melt Thermoplastic and poor bonding. If these conditions arise, it is advised to halt the application. A quick moisture test is recommended before proceeding with the application.

## Quick Moisture Test

Tape a 30 cm square sheet of thin plastic to the road surface, ensuring all edges are sealed. 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 DPI Thermoplastic involves professionally trained personnel using a heating device (Torch Burner) to carefully apply heat to the preformed thermoplastic, ensuring adherence to pre-marked job sites. The recommended application temperature ranges from 190°C to 210°C, depending on the substrate and ambient conditions. Proper safety gear and protective wear are essential during the application process.

## Product Application Guideline

DPI Preformed Thermoplastic Pavement Marking Materials are typically applied to two main types of roadway surfaces: Bituminous Surfaces (Asphalt) and Concrete. The following recommendations are provided to ensure optimal performance results. Proper personal protective equipment (PPE) is 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 as it prevents from the thermoplastic's heat transferring to asphalt surface.



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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 the strong cold wind; if heavy mist, it might take a longer 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 oxidized, surface polished or worn due to aging and heavy trafficking, it is strongly recommended to apply a coat of DPI Thermo Primer and please allow this thin coat of primer to dry completely before applying thermoplastic material on top. DPI 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 is recommended under the following conditions:

- (a) If the surface substrate and ambient temperature is 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 DPI 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 DPI Preformed Thermoplastic materials using a flame burner with a constant slow motion from side to side along the preform.
  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").



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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 to use the "Heat Wave" to apply the heat to melt the DPI Preform Thermoplastic ("Heat Wave" is generated from the flame and about 2~15cm in-front extension to the flame tongue for the conventional flame burners). Depending on the flame burner capacity, the Heat Wave is about 1/3 to 1/4 of the overall size of the flame in front of the flame tongue.
  
16. Recommended application temperature for DPI Dura 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 °C -200 °C.
  
17. Once DPI 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 m<sup>2</sup> depending on the performance requirements) and please ensure the glass bead are 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.

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

Stop right away and 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.

### **For New Concrete Surface-**

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

- The concrete curing agent used is a straight chain C5 hydrocarbon.



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- 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. DPI Preformed Thermoplastic material can be applied over old and worn Waterborne Paint when the loose paint, dirt, oil & grease are removed.
2. Please Do Not Apply DPI Preformed Thermoplastic material over Cold Plastic also known as Cold-Applied Plastic (CAP) and MMA Sound and/or newly applied Waterborne Paint. Always refer to Dura Products Industries if in doubt, and test the thermoplastic adhesion with Hammer and Chisel.
3. Roadway surfaces lined with DPI Preformed Thermoplastic material can be opened for traffic once the applied lines are cooled and bond is formed between the roadway surface & preform.
4. If adhesion and bond between roadway surface & DPI Preformed Thermoplastic material is not achieved when initially test - Stop the application immediately and rectify the problem before continuing the job.
5. DO NOT heat DPI Thermoplastic material to temperature higher than 230°C, decomposition and discoloration of thermoplastic will take place.

## **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.
3. Also, please take caution that all thermoplastic CAN NOT be applied directly on top of waterborne paint/cold plastic. Please check incompatible materials and complete remove by grinding off or any other means.
4. The practice of checking for total adhesion between preformed thermoplastic and



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road surface is very important. If no adhesion is evidenced, this failure may be recovered by reheating the preformed thermoplastic material.

5. 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 oxidized, 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 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 12 months from the product received date. The Material Safety Data Sheet (SDS) is available on request.

## Health and Safety

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

## Disclaimer

Dura Products Industries Pty Ltd's Product warranty on DPI Thermoplastic product is the required & specified time period after installation for full replacement of thermoplastics.



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This will not apply where the issue or damage is not fully investigated. This will not apply where the issue or damage is found to be caused by vandalism, incorrect laying or application procedures or other factors which are beyond the control of Dura Products Industries Pty Ltd. This will not apply for products to be used for transverse line-markings or where the sections are on the wheel-on-path of vehicles due to unforeseen factors which are beyond the control of Dura Products Industries Pty Ltd, The unforeseen factors include (but not limited to) the followings: application procedures, applicator skills, road and temperature and ambient conditions, substrate surface conditions, and traffic conditions.

Deliveries of all orders are accompanied by Delivery Notes and Compliance Certificates for material supplied.

## Our Quality Commitment

Dura Products Industries-DPI focuses on longstanding commitment to continue its outstanding service to customer, and continuously strive for quality improvements and development of new and highest quality road safety products. Our long term aim has always been to “Create a Safe Environment for all Road Users”.

DPI holds ISO 9001:2015, ISO 17025:2017, and APAS certificates, adhering to the Australian Standard Specification AS 4049.2, NSW RTA/RMS QAS 3357, and APAS 0041/4.

If you have any questions, please contact us. Happy to help.

### **Dura Products Industries Pty Ltd.**

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