DURA PRODUCTS INDUSTRIES

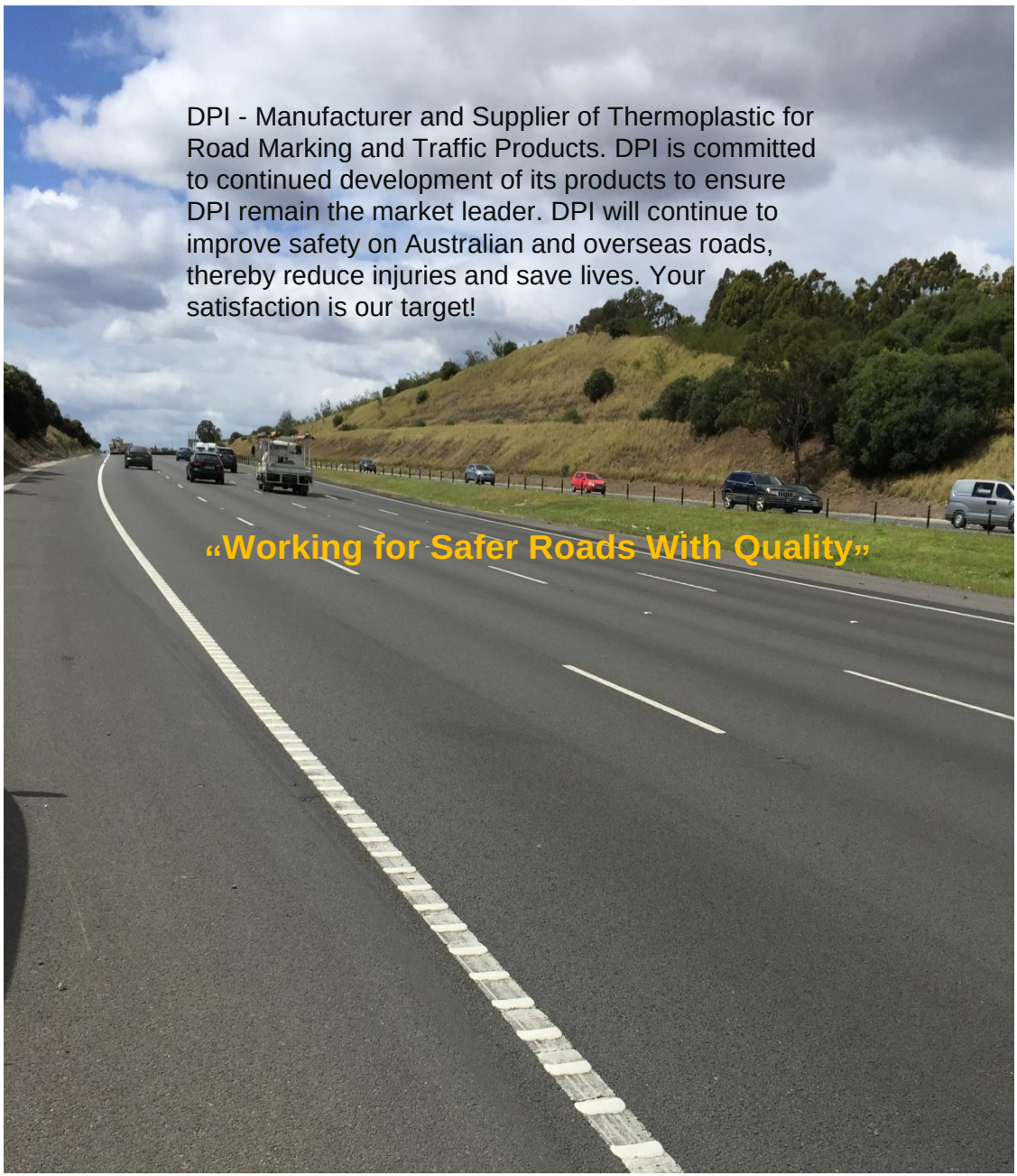
MEMBER
ROADMARKING INDUSTRY ASSOCIATION OF AUSTRALIA

ROADMARKING SUPPLIER ALLIANCE

SYSTEM CERTIFICATION
ISO 9001
SGS

NATA

DURA PRODUCTS INDUSTRIES



ABOUT DURA PRODUCTS INDUSTRIES

In 1991, DPI incorporated was one of the founders of Thermoplastic in Australia. In 1985, DPI Roadliner was developed with the assistance of Shinto Paint Japan. Consistent efforts were made to improve the quality of the product through research and development in order to obtain improved formulations to suit varying conditions. Our research and development team continues to upgrade our painting products over the past years to create a Thermoplastic that is consistently superior in quality. As a result of our pursuit of quality, we have formed many long term relationships with customers, such as, SprayLine VIC Roads, NSW Road and Brisbane City Council just to name a few. We work hard for customers so we can continue "working for Safer Roads with Quality "

Thermoplastic is the most economical, safest and environmentally friendly long-life road marking material, which is why it is the preferred road material used worldwide nowadays.

We manufacture and supply quality Thermoplastic road marking materials - spray, extrusion, screed, audible profile, tactile and preform grades in hydrocarbon or alkyd resins systems, in white and various colours as required for all substrates. In addition, we can supply manual screed machines and all types of glass beads to Australian specifications.

DPI is committed to continued development of its products to ensure DPI remains the market leader. DPI will continue to improve safety on Australian and overseas roads, thereby reduce injury and save lives.

Our product qualifies specifications set by Australian Standards 4049.2 and Japan Industrial Standards JIS K5665. Furthermore, DPI Roadliner can be fine-tuned to cater for overseas standards like that of U.S.A, European Union, Japan, etc.

Road markings have hitherto played an important role in guiding traffic directions. In the early forties, a single dividing line was drawn in the middle of the road to keep the traffic on the correct side of the road to prevent a head on collision. As the roads became wider, lane lines were introduced to make driving more orderly. Consequently, more marking features were introduced including edge lines, chevron lines, zebra crossings, directional arrow, letterings and numerals to guide drivers to their destinations safely.

Hot-Melt Thermoplastic road marking material was first used in the sixties, and has become a major marking material since. It gives more durable lines with all the features required.

DPI Roadliner is manufactured under very stringent quality control measures using the highest quality raw materials.

PRODUCTS

Road Infrastructure is one of the important assets of any country worldwide. With the ever-increasing number of road users, roads and highways must be clearly marked to safely guide users under day/night, as well as dry/wet conditions.

Of all various road marking materials available, Hot-Melt Thermoplastic is the most versatile and tested product.

DPI Specialises in consistently producing high quality Hot-Melt Thermoplastic conforming to Australian Specification AS4049.2. We can produce to any other specifications required by customers.

The general characteristics of DPI Hot-Melt Thermoplastic are:

- Excellent long-term durability;
- Good day and night visibility;
- Environmentally safe including the plastic bag which can be melted with the material;
- 100% solids, non-toxic;
- Solvent free, (zero VOC);
- Exceptional heat stability;
- Colour brilliance;
- High Skid resistance, or as required;
- Rapid, drying time, roads are opened for traffic within minutes after application;
- Good and smooth flow.

LINE & ROAD MARKING PRODUCTS

Hot-Melt Thermoplastic is classified as either Hydrocarbon resin or Alkyd resin. C5 aliphatic Hydrocarbon resin (also named as petroleum resin) is made from petroleum derived resin. It has good performance on tackiness, cohesive properties and has excellent heating stability. The purpose of adding petroleum resin in Hot-Melt Thermoplastic is mainly for improving tackiness.

Other characteristics of petroleum resin include:

- Excellent compatibility with oil, Styrene polymer and other material;
- Good thermal stability and weathering properties;
- Stable melt as well as solution viscosity.

Alkyd resin is made from plant-derived resin, which has less heat stability. Both Alkyd and Hydrocarbon resins have similar application temperature (around 210 °C), and expected lifetime (up to 4-5 years under normal condition). Products based on alkyd resins tend to be harder and is impervious to the effect of oil and grease.

Alkyd Thermoplastic has:

- Higher durability
- Good flexibility and gloss retention

Other raw materials, including aggregates, pigments, glass spheres and modifying resins are carefully selected to give a final product with the required skid resistance, durable whiteness, and high level of retro-reflectivity levels, suitable to end use.

Our products are formulated to meet the guidelines of the Australian Standards AS4049.2 for the Specification of Hot-Melt Thermoplastic as well as other relevant specifications, as required by customers.

In addition, products for other climatic conditions are available in a wide range of colours. Please contact DPI for more information.

a) Spray
b) Extrusion
c) Profile
d) Screed
e) Preform
Other colours are available

LINE & ROAD MARKING PRODUCTS (continued)

a) Spray

Spray is normally used for long edge lines, lane lines. Application is with a truck mounted spray system. Application temperature is between 190-210°C to obtain good end result. Application rate could be as high as 12km/hour.

Effective thickness of Spray Thermoplastic is about 1.8ml. Spray material can penetrate into the spaces between the aggregates in the road, creating good bonds. Glass Beads and Quartz aggregates are applied immediately behind the sprayed line to give initial skid resistance and retro-reflectivity.

DPI Spray Thermoplastic, in both Alkyd and Hydrocarbon, is widely used by customers and obtain very good results.

b) Extrusion

Extrusion is another method of marking edge lines and lane lines with a truck mounted machine or trailer transported unit. It is also known as ribbon line – the thick thermoplastic is extruded at about 195-215°C through a shoe with set width and thickness required. The hot extruded material is laid onto the road surface where the asphalt and hot thermoplastic form a bond in contact. Glass Beads and aggregates are applied immediately behind the extruded lines to give initial skid resistance and retro-reflectivity.

Extrusion gives lines with good edge and thickness but the substrate has to be good, clean and dry. Hence, it is not best on coarse sealed roads compared to Spray. In addition, application rate is slower than Spray.

DPI Extrusion Thermoplastic is also available in both Alkyd and Hydrocarbon.

LINE & ROAD MARKING PRODUCTS (continued)

c) Profile

Profile or audio tactile Thermoplastic is a traffic marking system. The lines give enhanced visual and audio effect to warn weary drivers from straying out of the road parameters. It is widely used in highways and in road "black-spot" areas to mark lane lines and edge lines.

Normal specification calls for a base line thickness of less than 2mm and profile height of 10±2mm from substrate. Drop-on glass beads is applied immediately onto the profile line to provide retro-reflectivity. While normal line markings, even with the biggest glass beads, will be submerged under a layer of water.

DPI Profile Thermoplastic is specially formulated to apply at 180-200°C by truck mounted application equipment. The equipment can be electronically set to apply the ribs at set heights.

d) Screed

DPI supplies Screed in both Alkyd and Hydrocarbon. It is applied with manually operated equipment.

Screed Thermoplastic is normally used for transverse lines, pedestrian crossing, symbols, car parks and small jobs. Application temperature is between 180-200°C. Glass beads and anti-skid aggregates are applied onto the molten line to provide immediate anti-skid and retro-reflectivity.

The use of Screed is limited, except in countries where labour is cheap. Longitudinal lines are Screed applied.

The equipment required is simple and inexpensive compared to Spray, Extrusion and Profile.

LINE & ROAD MARKINGPRODUCTS (continued)

e) Preform

DPI Preformed Thermoplastic Pavement Marking Material is Non-Hazardous and Environmental-Friendly product which is pre-cut and conforms to Australian Standard Specification AS 4049.2. The binders are based on Hydrocarbon and Alkyd Resins.

DPI Preformed Thermoplastic Pavement Marking Materials are used for the delineation, including 3D pavement marking, straight line, arrows, numerals, lettering, symbols, etc. It can be applied at various types of road surfaces to increase safety and provide guidance for all road users. Due to its excellent wear-resistant durability and resistance to oil, grease & diesel, drop and high retro-reflectivity and anti-slip properties, DPI Preformed thermoplastic Pavement Marking Material is especially suited for use on the heavy-trafficking roads and “black-spot” areas.

Preform Thermoplastic is specially formulated to apply between 180-200°C by blow torch.

LINE & ROAD MARKING PRODUCTS (continued)

3M™Stamark™Temporary Removable Tape

Removable pavement marking tape is used for temporary road marking where removability is required. This product is easy to apply and will not damage or scar road surface when removed. It is durable on normal work zone, and is high skid resistant. It can be applied on asphalt and concrete surfaces. With unique 3M microcrystalline ceramic beads, 3M™ Stamark™ Removable Tapes are tough and resistant to harsh roadway.

Colour:
710 White
711 Yellow
715 Black

Pack Sizes:
150mm x 110m

Applications For:
Car park
Car park Entry
Normal work Zone

3M™Stamark™ Removable Tape

3M™ Stamark™ Removable Tapes have flat surface, providing long lifespan and skid resistant road surface for normal work zone.

Easy to apply and remove without damage or scar on road surface. With unique 3M microcrystalline ceramic beads, 3M™ Stamark™ Removable Tapes are tougher and more resistant to harsh roadway. It can apply on asphalt and concrete surface.

Available colours:
734 Orange

Pack Sizes:
150mm x 100m

Applications For:
Car park
Car park Entry
Normal work Zone

LINE & ROAD MARKING PRODUCTS (continued)

Thermo-Primer – GR2

This product is normally used in an open area, before applying Thermoplastic pavement marking materials to the road surface, to improve bonding strength. Application of this product is by spray atomisation from a hand-held aerosol pack.

Pack Sizes:
400 grams aerosol can.
12 cans per box

Applications For:
DPI Thermo Primer is used as an intermediate tacky coat between aged bituminous substrate / concrete surfaces and DPI Thermoplastic pavement marking materials.

Thermo-Primer – Drum

This product is normally used in an open area, before applying Thermoplastic pavement marking materials to the road surface, to improve bonding strength. Application of this product is by spray atomisation from a hand-held aerosol pack.

Pack Sizes:
20 L Drum.

Applications For:
Primers are recommended prior to thermoplastic application on all hydraulic cement concrete surfaces and asphalt surfaces that are more than two years old, heavily oxidized, or have exposed aggregates.

LINE & ROAD MARKING PRODUCTS (continued)

Glow-Max Spray:

Formulated with premium quality phosphorescent pigments, anchor glow max is excellent glow in the dark aerosol that recharges with exposure to light. The glow it produces is highly visible at night. A great product for bikes, sporting equipment, safety markings and other decorative purposes

Pack Sizes:
400 grams aerosol can.
12 cans per box

Applications For:
Road Safety, Art

Available colours:

Aerosol Non-Flammable Marking Paint:

Temporary marker. Designed for hazardous-area marking activities where flammable materials are unsafe or prohibited. Intended particularly for underground coal mines. Available in either a horizontal or vertical spray configuration.

Pack Sizes:
400 grams aerosol cans.
12 cans per box

Applications For:
Mining and Construction Industries Formulated and approved for underground use including coal mines.

Available colours:

LINE & ROAD MARKING PRODUCTS (continued)

Aerosol Write 'N Mark:

Also referred to as “fluoro marker” and “tree marker”. An ideal lead-free paint for use where bright identification is required in a large range of colours. Non-fluoro colours are recommended for applications requiring greater durability.

Pack Sizes:
350 grams aerosol can.
12 cans per box

Applications For:
Forestry, Timber and Building Industries

Available colours:

Aerosol Survey Marking Paint:

Available in a wide **lead-free** colour range, fluoro colours best suited for temporary marking. For inverted use on bitumen, concrete, grass, wood, dirt and rock. Also known as “Spot Marker”.

Pack Sizes:
350 grams aerosol can.
12 cans per box

Applications For:
Surveying, Civil Engineering, Above Ground Mining and Landscaping Industries.

Available colours:

LINE & ROAD MARKING PRODUCTS (continued)

Aerosol Spray Paint:

A fast-drying lead-free spray paint which gives a high gloss finish. The spray nozzle, on the 250 grams can, is adjustable for either a vertical or horizontal fan pattern.

Pack Sizes:

250-grams aerosol cans.
12 cans per box

Applications For:

Ideal for tradesmen, craft or the home handyman.

Available colours:

Available in a large range of popular colours and a clear coat.

Aerosol Line Marking Paint:

Available in a wide range of long-lasting lead-free colours. Machine version uses a special T actuator to fit the Ultracolor 4 Wheel Line Marking trolley (#LMM4W), and most other manufacturer's aerosol line marking trolleys.

Methods of application:

Available to Suit either machine use or hand-held application.

Pack Sizes:

500 grams aerosol cans.
12 cans per box

Applications For:

Line-Marking, Warehousing and Civil Engineering industries.

Available colours:

Line Marking Applicators

Line-marking Equipment:
For other related products, Please contact DPI for further information.

Hand Held Extension Handle:
For free hand line marking, spotting and general marking, providing extra reach and reducing the chance of operator strain related injuries.

2 Wheel Line Marking machine:
For free hand line marking, spotting and general marking, avoiding the need to bend and so reducing the chance of operator strain injury.

Line Marking Applicators

Flame Torch:

The burner includes muzzle, gun barrel and valve, made by electroplating 304 stainless steel & brass. All the parts are detachable, which is convenient for changing. This burner is designed with extremely strong and windproof flames for road-marking, roofing works and for large-scale heating applications. It is ideal for preform thermoplastic laying, bitumen laying, detail and field torching, pre-heating and other heat demanding applications.

The hose is designed for the use with propane LP Gas and connected to a ¼" – 18NPSM thread. The hose has a working pressure of 350PSI.

- Host working pressure 350PSI
- Flame control valve gives precise adjustments
- Solid brass valve body for durability
- Comfortable handle design reduces operator fatigue

Product code	Muzzle	Gun barrel
J-007	3 inches (76.2mm)	60 cm or 100 cm

Hose Length	Outer Diameter Inner Diameter	Thickness	Max Working Pressure	Hose Connector
300 cm	13.5mm 6.3mm	3.6mm	350 PSI	¼" – 18NPSM W22.5-14-L
450 cm	13.5mm 6.3mm	3.6mm	350PSI	¼" – 18NPSM W22.5-14-L
600 cm	13.5mm 6.3mm	3.6mm	350PSI	¼"– 18NPSM W22.5-14-L

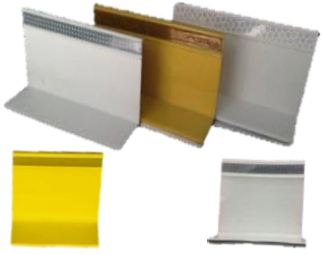
ROAD & SAFETY PRODUCTS

Raised Pavement Marking (RPM) and Adhesive

DPI / AUMAX RPM are heavy duty, sand & glue filled. The service life time is more than double of all plastic RPMs; thus, it is good for all type of roads. It is available in a variety of colours, orange/ white/ yellow/ red/ blue/ green, and comes in either as single or double reflective lens.(Size:100mmx100mm and 100mmx80mm) (100pcs/box)

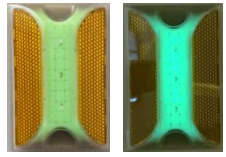
Temporary RPMs

For all your temporary delineation, guardrail, available in white, amber and red, please contact us for further information. (size 100mm and 50mm available)



2 in 1 AUMAX RPM

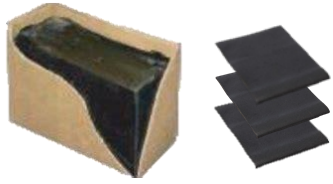
Our new product 2 in 1 AUMAX RPMs reflects vehicle lights and is self-lighted (glow-in-the–dark). It is good for parks, cliffs, playgrounds, walkways & driveways.
(Size: 100mmx80mm)(100pcs/box)



RPM Bitumen Adhesive Blocks/ Bundy RPM Pads

Bitumen Blocks: Each block 6.25kgs. Box contains 4 blocks, (55lb/box)

Bitumen Pads: each pad 100mm x 75mm. Box contains 200 pads.



Cat Eye(Glass Studs)

Manufacture of reinforced glass that enhances their visibility by retro-reflecting automotive headlights. (Diameter:100mm& 50mm) Box contains 24 glass studs.

ROAD & SAFETY PRODUCTS (continued)

Delineator Post:

300mm high with reflective bands and base. Used for

- Centreline Marking
- Lane Marking
- Highway Edge Marking
- Limited Access Highway Ramps
- Construction Zones
- Colour Coding of areas
- Entrances – Acceleration Lanes
- Exits – Deceleration Lanes
- Service – Low Speed Lanes
- Main Travel – High Speed Lanes

Runmble Bars

The size of Runmble bars are 305mm x 100mm x15mm Bevelled. The primary role of these is to prevent car run-off the road edge

- Car park
- Highway Edge Marking
- Playgrounds
- Walkways

Traffic Cones:

700mm and 450mm cones with or without reflective band are available. Material is 100% new fluorescent red/orange PVC.

Lane Dividers:

Our Lane Dividers are designed to withstand harsh treatment in heavy traffic areas with available as 1 or 2 way and Yellow or White.

Width on top : 80 mm
Width of the bottom : 120 mm
Base : 210 x 150 mm
Height : 330 mm

ROAD & SAFETY PRODUCTS (continued)

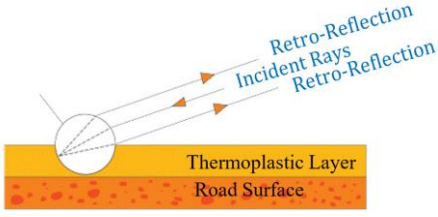
Glass Beads

Glass beads play the most important role in line marking retro-reflectivity. Markings without beads are virtually useless at night. The size of a glass bead can affect retro-reflectivity, especially under wet conditions. Larger beads (Type D) provide higher retro-reflectivity than small beads (ex: Type B) under dry conditions.

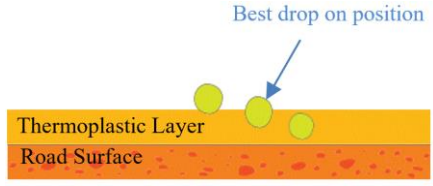
Recommended Usage

Category	Retro-reflectivity Guide (white thermoplastic AS 4049.2)	Recommended Application Rate
Type-B	250~340 mcd/lux/m^2	300g/m^2
TYPE B HR	TBA	300g/m^2
Type-C	300~450 mcd/lux/m^2	600g/m^2
TYPE C SILANE COATED	TBA	600g/m^2
Type-D	350~520 mcd/lux/m^2	600g/m^2
TYPE D SILANE COATED	TBA	600g/m^2
Type-DC/2GSS Mix	230~450 mcd/lux/m^2	550-600g/m^2
Potters Pristine Intermix beads Type C-HR	TBA	600g/m^2
Potters Pristine Intermix beads Type D-HR	TBA	600g/m^2
Beads/Glass Sand 60:40	TBA	-
Beads/Glass Sand 70:30	TBA	-
Glass Sand0.7-0.4MM	TBA	-

Principle of Retro-reflectivity



Position of drop on glass beads



ROAD & SAFETY PRODUCTS (continued)

Solar LED Light

Our Solar LED Lights has been sold in USA, Russia, France, Belgium, Israel, UAE, Chile, Greece, Czech, Portugal, Italy, Thailand, Spain, Romania, Turkey, Saudi Arabia, Kuwait, Hungary, Brazil, Mexico etc.

These wireless environmental friendly Solar Light are designed with no cost on electricity and low cost on maintenance, making a huge difference on the environment and your bank account.

The battery service lifetime is around 5-6 years under normal condition, of which 2.5 years' warranty is guaranteed.

Our Solar LED Light is ideally suitable for areas where it is too expensive to extend the electricity power grid.

Vandal proof designed, the body is made by stainless steel.

Model No.	Specification
H-936	Panel: 72 LED 12Ah/15W Battery: 12V/12Ah Material: #304 Stainless steel
H-979	Panel: 144 LED 40Ah/30W Battery: 12V/40Ah Material: #304 Stainless steel
H-941	Panel: 216 LED 65Ah/45W Battery: 12V/65Ah Material: #304 Stainless steel
H-978	Panel: 432 LED 100Ah/95W Battery: 12V/100Ah Material: #304 Stainless steel
H-961	Panel: 648 LED 155Ah/140W Battery: 12V/155Ah Material: #304 Stainless steel

DPI THERMOPLASTIC PRODUCT AS4049.2specification

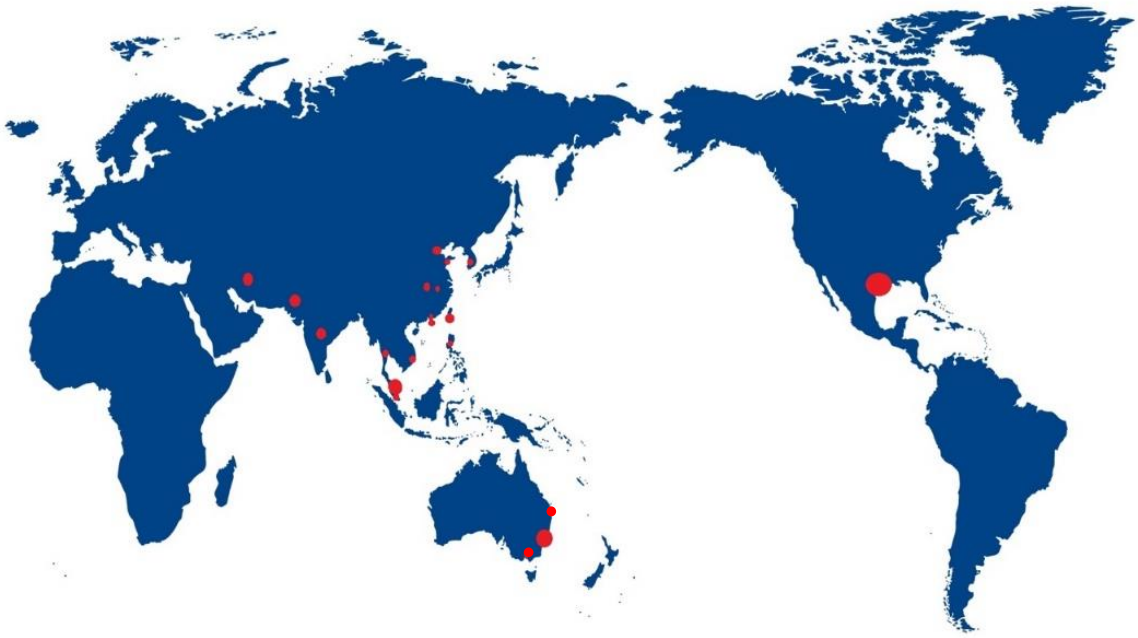
Binder Type	Alkyd and Hydrocarbon resins
Pigment	Rutile Titanium Dioxide, Inorganic Pigments and mineral extenders with excellent whiteness and heat resistance
Glass Beads	min. 20% Higher percentage made to order
Softening Point	> 100°C
Luminance Factor	> 80% (White)
SG.(Solidified Thermoplastic)	1.95-2.1
Compressive Strength	min. 150 kg/cm2
Application Surface	Asphalt Concrete – after it is primed with DPI Thermo Primer (GR2)
Coverage	Theoretical – 225m2 / Metric Tonne at thickness of 2.0mm

PROBLEM	CONTENT OFPROBLEM	CAUSE	C0UNTER MEASURE
Grooves and scratch marks	Open, deep and long stripes or grooves on top of line marking.	Laying shoe discharge point is choked with scorched, hardened thermoplastic solids and foreign solid particles.	Inspect filter sieve. Get rid of foreign matters like small solid particles.
Pinhole	Small holes in the thermoplastic line marking	Expanded air inside open void of the road broke through wet thermoplastic. Problem common with newly laid asphalt and concrete roads.	Lower the temperature of thermoplastic.
		Insulated moisture evaporates and then expands inside wet concrete.	Apply thermoplastic after the concrete is properly aged.
		Insulated moisture evaporates and then expands inside wet concrete.	Let primer dry completely before application. Allow moisture to dry completely.
Bleeding	Bituminous matters ooze out from the road surface to the top of thermoplastic line marking.	Soft bituminous binders of the conventional asphalt melt, combine with the molten thermoplastic and rise to the surface of the line marking.	Nil
		Excessive wet primer oozing out through the molten thermoplastic.	Do not apply too much primer. Apply thermoplastic after the primer dries completely.
Cracks	Cracks reaching the road surface.	Cracks on aggregate of road surface.	Nil
		Thermoplastic is too hard cannot cope with the softer asphalt road surface.	Refer matter to thermoplastic supplier.
		Cracks along the edge of the line at regular intervals. New asphalt is more prone to problem.	Nil
Irregularities on the line surface	Rough irregularities on the cross direction.	Poor deposit of the thermoplastic.	Raise the temperature of the thermoplastic. Keep a consistent temperature of the applicator machine.

PROBLEM	CONTENT OFPROBLEM	CAUSE	C0UNTER MEASURE
Hollow: – Small hollow – Cratering		Uneven thickness causes different hardening speed of the thermoplastic.	Apply uniformly.
	Hairline crack on the top film.	Uneven dispersion of the beads may cause this problem especially under low traffic condition.	Scatter the beads evenly.
	Hollow on the line surface.	Wrong viscosity of molten thermoplastic causing uneven deposits.	Fully preheating of applicator machine before use. Preheat thermoplastic to required temperature 200-220°C.
	Breaks on painted lines.	This problem may arise on the irregular road surface. Application speed is too fast.	Slacken the application speed.
– Stripe Mark – Brush Mark	Irregularities seen horizontally.	Applicator machine moves up and down due to the rough road surface.	Nil.
Poor Retro-reflector is at night.	Overall uneven and poor reflectorisation.	Uneven dispersion of the beads and insufficient drop-on beads.	Adjust the dispersing rate of the beads
	Poor reflectorisation on specific area.	Old films remain uneven and bad adhesion of the beads on the over-lapped area.	Nil.
Peel-off		1. Old asphalt and concrete surface not treated with primer. 2. Road surface is not properly cleaned. 3. Moisture, grease and oil remain on the road surface. 4. Low road surface and ambient temperature	
Change of the colour	White-Dirty White Yellow -Dark Green	Overheating during preheating of thermoplastic. Mix of the old and new material.	Control of the melting temperature. Do not melt the thermoplastic inside kneader for too long. Empty the pre-heater tank content when the change of colour occurs.

DPI Global Service Location

We can provide services not only in Australia but also throughout most of countries in Asia and USA.




Certificate of RMU Accrediation

Certificate

Organisation
Dura Product Industries Pty. Ltd
ABN 50 052 321 918
Minto, New South Wales

Category
Recognised Manufacturing Unit

Capability

Manufacturing Site(s)
Minto, New South Wales

Criteria
APAS Document AP-D177, revision v10

AUAS Signatories
R. Labde

Date of Issue
16-04-2018

Accreditation No.
059

Signed by the Executive Officer - AUAS


Texas Department of Transportation


SGS

Dura Products Industries

AS/NZS ISO 9001:2008

JAS-ANZ


NATA

NATA
ACCREDITED LABORATORY

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ISO/IEC 17025

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