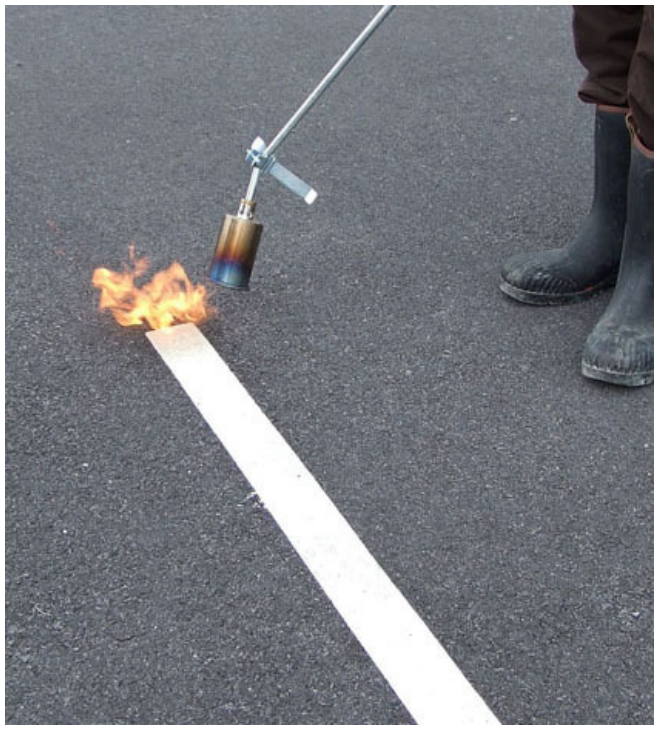
THERMOPLASTIC CAR PARK MARKINGS



Compliance:

- All Thermoplastic Materials comply with IS EN 1871: Road Marking materials - Physical Properties
- All Paint Materials comply with BS 6044: Specification for Pavement Marking Paints

Specifications:

What is Thermoplastic?

Thermoplastic is a long life road marking material that was first used in the USA in 1958, followed quickly by its introduction into many countries throughout Europe. It is a mixture of glass beads, binder, pigment and filler material. Thermoplastic as its name suggests has to do with heat. Dry thermoplastic compound is generally heated in a thermostatically controlled pre-heater/boiler to a temperature of 180-200^{o}C and agitated continuously until a homogenised liquid is achieved, before transferring to an application vehicle. Applied at this temperature, the thermoplastic melts into the upper surface of the asphalt forming a thermal bond. When applying onto a concrete surface, the use of a tack coat primer is recommended.

What is the purpose of each ingredient in the mixture?

Glass Beads - often called intermix beads in conjunction with the pigment, give the material the retroreflectivity necessary for the bright night-time appearance.

Binder - is a mixture of plasticiser, waxes, anti-settling agents and resins that hold all the other ingredients together;

- Plasticiser affects the flexibility and melt viscosity
- A blend of modified waxes is utilised to give the desired viscosity and flow
- Anti-settling agents help to keep aggregates and glass beads in suspension

Pigment - supplies the colour - white or yellow to the thermoplastic. Titanium dioxide pigment is used for the white thermoplastic and heat stable yellow to make the yellow thermoplastic.
Filler Material - can consist of various grades of calcite (calcium carbonate) quartz (silica) or calcined flint. Finer white grades are extender added to assist the dispersion of pigment in the mixture, thereby providing colour uniformity throughout.

What are the proportions of the Ingredients?
What thermoplastic is made of and how it is applied are the keys to its durability and long lasting retroreflectivity. When properly formulated and correctly applied, thermoplastic should last in excess of five years under normal traffic conditions. The now superseded BS 3262 was a "recipe" specification i.e. the proportions of each ingredient in the thermoplastic was specified. However IS EN 1871: Road Marking materials - Physical Properties deals with a range of performance tests on the mixture i.e. the manufacturer must decide what proportions will yield the best results from the seven performance tests outlined in IS EN 1871.

Application Methods

Screed

Consists of a heated hopper mounted on a pram, which feeds hot molten thermoplastic under gravity to a rectangular screed with a gate at the base. The gate opening is set to produce the thickness specified for the hot thermoplastic as it flows onto the pavement. Where immediate reflectivity is required, a manually operated glass beads dispenser should be attached to the screed applicator. For letters, numerals and hatched areas, a hand-held mould box is filled manually using a bucket. Glass beads are then applied by hand. Generally used for Stop Lines, Pedestrian Crossings, Letters, Arrows and Double Yellow Lines.

Extrusion

This process employs a mechanically propelled vehicle. Extrusion utilises an auger or pump from a thermostatically controlled tank to extrude the hot thermoplastic through a gate opening set to produce a line of pre-selected thickness of material onto the road surface. Glass beads are automatically applied to the molten line. Generally used on new road construction projects and surface dressings.

Spray

The principle of spray is - hot material, stored in a mechanically agitated and thermostatically heated vessel, is sprayed under pressure through a nozzle onto the road surface. The height and pressure of the nozzle control the width of the line, while the pressure at the nozzle and the application speed controls the thickness of the line. Specially constructed spray equipment can travel and apply thermoplastic lines at a faster speed than extrusion. Sprayed applied markings are ideally suited for overlaying partially worn extrusion lines. Spray thermoplastic provides a low cost alternative to extrusion where

an improvement is required in terms of the performance characteristics of a line, without an excessive increase in the thickness of the line.

Profiled Markings

Profiled markings are applied using a specially developed shoe that can form the base line and ribs in one continuous process. The thixotropic nature of the material enables the molten thermoplastic to form neat raised ribs. Profiled Markings can be laid as a profiled edge line marking to enhance wet night visibility and which, when overrun, will provide a sensory and auditory impulse to the motorist. An important feature of Profiled Markings is an improved retro reflectivity in wet conditions. Profiled markings thus offer safety benefits in poor weather and additional sensory perception at all times.

Glass Beads

A specified quantity of drop-on glass beads must be applied onto the molten thermoplastic during installation for immediate retroreflectivity. For Extrusion, Spray and Profiled Markings, glass beads are applied onto the molten line from a pressurised storage tank. In order to achieve good reflectivity, the glass beads should be embedded, and not submerged in the hot material.

A number of grades of thermoplastic are used depending on the application method.

Application Thickness	Application Method
4.25 ± 0.25 mm	Screed / Extrusion
2.75 ± 0.25 mm	Screed / Extrusion / Spray
1.75 ± 0.25 mm	Extrusion / Spray