

# Line Markings Application Chart

# Company Overview



	SOLVENT BASED PAINT	WATERBORNE PAINT	ZEBRABRIGHT	MITESITE (COLD APPLIED MMA)	FLEXILINE	SPRAYPLASTIC	GUIDEMASTER	CRYSTALEX	LIFELINE	VIBRALINE	RAINLINE
Method of Application	Spray	Spray	Hand	Hand / Machine Applied	Preformed, use gas torch	Spray	Screed or Extrusion	Screed or Extrusion	Screed, Extrusion or Spray	Profiled Screed	Machine
Application Rate	350 grams	350 grams or 600 grams for big bead systems	3kgs/m <sup>2</sup>	2-4kg/m <sup>2</sup>	4kg/m <sup>2</sup>	3-4kg/m <sup>2</sup>	6kg/m <sup>2</sup>	6kg/m <sup>2</sup>	extrusion: 6kg/m <sup>2</sup> spray 3kg/sqm	7kg/m <sup>2</sup>	6kg/m <sup>2</sup>
Recommended Thickness	220 microns	220 microns or 400 for wet night version	1.5mm	1 - 3mm	2mm	1.5 - 2.0mm	3mm	3mm	Extrusion 3mm, spray 1.5mm	2mm base/ 8mm profile	5mm
EN 1436 SRV available grades	45	55	55	45	45	45 or 55	45 or 55	45, 55	45, 55	45	55
EN 1436 Luminance	0.4	0.4	0.4	n/a	0.3	0.3	0.3	0.3	0.4	0.3	n/a
EN 1436 Retro-reflectivity (mcd/sqm/lux)	Wet	n/a	35	50	50	n/a	n/a	n/a	n/a	50	50
	Dry	400	500	900	200	n/a	100, 150, 200	n/a	100, 150, 200	100	150
TYPE OF LINE	Heavy Wear Areas			●	●		●	●	●	n/a	●
	Edge Lines	●	●	●	●	●	●	●	●	●	●
	Centre Lines	●	●	●	●	●	●	●	●	Subject to local road authority regulations	●
	Lane Lines	●	●	●	●	●	●	●	●		●
	Symbols	●	●	●	●	●		●	●	●	n/a
TYPE OF SURFACE	H.R.A.	●	●	●	●	●	●	●	●	●	●
	Surface Dressing				●	●	●	●	●		
	Porous Asphalt	●	●		●	●	●	●	●	●	●
	Thin Overlay (SMA)	●	●	●	●	●	●	●	●	●	●
	Concrete (28 days old)	●	●	●	●	●	●	●	●	●	●

Markon is a specialist contractor servicing a variety of different industries, e.g. Car Parks, Highways, Airports, Industrial and Architectural Landscaping.

Markon offers a one stop shop facility from specifying a product to suit your application to final installation. Markon believes you will achieve successful project completion by providing expertise in the following areas:

- **Consultation - Establishing requirements**
- **Technical Advice - Appropriate system to suit your needs**
- **Site Survey - Ensuring all project needs considered**
- **Installation - Within chosen time frame**
- **Technical Support - Ongoing**

Markon carries out stud installation and marking works to roads, parking, airfields and harbours throughout Scotland.

Our experience and capabilities are acknowledged throughout the construction industry. We have broad experience in the application of specialist surfaces that can be applied to delineate speed restriction, bus lanes, cycle paths or any other highlighted surface.

Notes:

# Road Marking Products

## Road Markings

Road markings are used to provide visual and audible warnings, prohibition, segregation and delineation information to the motorist, in order to improve traffic safety and traffic movement.

Materials are applied to the surface of the road markings in order to enhance performance characteristics, such as visibility and skid resistance.

**Visibility** - By day, visibility is achieved by ensuring that the markings have sufficient luminance, which provides a contrast with the road surface.

By night, this is achieved by the retro-reflectivity of glass beads on or in the marking material.

**Skid Resistance** - Pedestrian areas, cycle lanes, larger area road markings and those in critical locations may need a degree of skid resistance. Applying anti-skid materials on or in the marking, results in a roughened surface, which increases the skid resistance. Wherever possible the skid resistance of the line should not be less than the road surface.



Notes: 1. All Markon line marking products are available in a wide range of skid resistance levels, retro-reflectivity and luminances. Please contact Markon for more details.  
2. Markon thermoplastic road marking products are suitable for standard road locations.  
3. Products are available in the following colours: white, yellow, red, blue, green and black (for marking applications) Other colours are available upon request.  
Primers should be used on concrete surfaces and the substrate should be free from debris before lining.



Telephone: 01236 875134  
Fax: 01236 875525  
E-mail: enquiries@markon.co.uk

## Types of Marking

There are five main types of road marking that we supply and manufacture:

**Hot Applied Thermoplastic** - This is a hard wearing material for heavily trafficked roads. It hardens within approximately 60 seconds of application and can be applied as a flat or profiled line. Primary used colours are white and yellow, although other colours are available. It is applied by screed, spray or extrusion and sets by temperature loss.

**Preformed Thermoplastic** - This product is supplied in ready-made form as either standard lines or pre-cut logos and designs. Preformed Thermoplastic is ideal for complex logo designs and multi-colour usage as well as lower trafficked areas including car-parks. It is applied by hand using a gas torch and sets by temperature loss.

**Cold Plastic Methyl Methacrylate (MMA)** - A two component road marking system which is highly durable and is suitable for use in areas with high traffic wear such as roundabouts, box junctions, give-way lines and heavily trafficked roads. It is applied by either hand or machine, and sets by chemical reaction.

**Solvent Based Paint** - Due to its solvent base, this product has a fast drying time. It performs well on asphalt and concrete and has excellent glass bead retention. It is applied using spray and hardens through evaporation.

**Waterborne Paint** - This paint contains no organic solvents and is therefore ideal for environmentally sensitive areas. Thicker application enables the use and excellent retention of larger glass beads for improved reflectivity in wet conditions. It is applied using spray and hardens through evaporation.

Markon has a large portfolio of line marking products, including screed, spray, extruded, profiled and pre-formed products.

This extensive range can be used on highways, car parks, airfields, cycle lanes, bus lanes, footpaths, playgrounds and many more applications.

## Paints



### WATERBORNE PAINT

**High Build** - The most durable high reflective waterborne system available today. Designed for thick application for long lasting road markings, enabling use of larger glass beads for improved reflectivity in wet conditions.

**EP Series** - A high solids, high performance paint available in all ICAO approved colours, making it the ideal paint for airports worldwide. Ecologically sound and available in two sorts to suit varying climatic conditions.

### SOLVENT BASED PAINT

**987051 Acrylic Co-polymer** - Produces a hard, clearly defined line with excellent abrasion resistance. Withstands climatic variations and is excellent in heavily trafficked areas with a fast drying time.

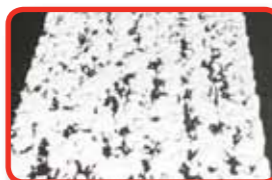
**Low VOC** - Recommended where ecological considerations are important but water-based paint is not selected.

## MMA



### ZEBRABRIGHT

Zebrabright is a cost effective high performance road marking utilising Clusterbead technology, high index beads and an MMA, two component acrylic road marking material. It is specifically designed to provide early and clear visibility of zebra crossings and other line markings in poor visibility conditions, positively influencing driving behaviour and reducing accidents.



### NITESITE (COLD APPLIED MMA)

A two component Methyl-Methacrylate road marking product, that is highly durable and is suitable for use in areas with high traffic wear such as mini-roundabouts, box junctions, give-way lines and heavily trafficked roads. The product is supplied in a screed grade called Roadline M6 and an agglomerate grade called Nitesite. The Nitesite provides very good wet night visibility and both products comply to BSEN1436.



## Thermoplastic



### CRYSTALEX

A reflectorised thermoplastic extrusion or screed road-marking product designed and developed to comply with the individual international specifications for use on all national highways and mandatory markings throughout the world.

### GUIDEMASTER

A non-reflectorised thermoplastic extrusion or screed road marking product used for applications that do not require any night-time reflectivity.

### LIFELINE

A high performance spray and extruded thermoplastic fully conforming to the performance levels of European specification BSEN1436 designed for use on all national roads and mandatory markings.

### RAINLINE

A specialist profiled and reflectorised thermoplastic road marking product, maximising wet night visibility performance. The thermoplastic is applied by an extrusion or screed technique and immediately embossed to create a continuous pattern of inverted profiles on the road surface, channelling water away from the marking & ensuring the line is visible above surface water.

### VIBRALINE

An award winning reflectorised profiled thermoplastic material providing good night visibility as well as an audible warning on high speed motorways; a proven safety measure to protect motorists if they stray onto the edges of the carriageway.

### SPRAYPLASTIC

A reflectorised or non-reflectorised spray applied thermoplastic manufactured and developed to comply with individual international specifications. Spray plastic is used for high output and recovery of existing road markings and in areas with least impact on disruption to the road users. Minimum traffic management is required during installation.

## Preformed Thermoplastic

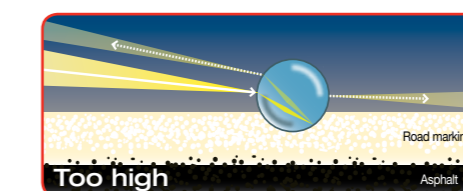
### FLEXILINE

A preformed thermoplastic road marking available in a wide range of colours. Uses include lines, letters, numbers, symbols, corporate logos and playground markings. Easy installation with a gas torch and ideal for utility reinstatements of the road surface.

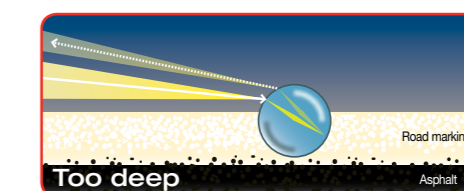


## Retro-reflectivity

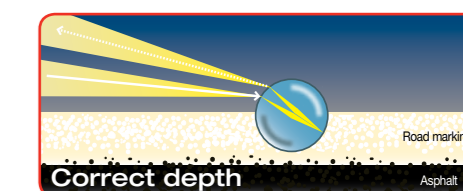
Markon understands the importance of correctly applied road markings. This is in order to enhance the safety potential of the products and deliver superior performance for wet/night conditions, beyond normal expectations. The illustrations below show how incorrect glass bead application can deliver poor retro-reflectivity, and how to achieve the optimum results.



If the glass beads are embedded too high in the body of the marking, the light reflected back is reduced and some light passes completely through the bead.



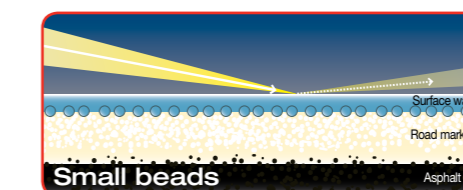
If the glass beads are embedded too low into the body of the marking, the retro-reflectivity of the bead is reduced significantly and the light is reflected back weaker. In addition, the low beads will affect the marking's skid resistance too.



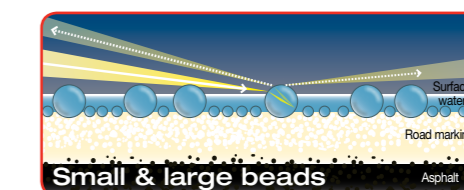
Here the glass beads have been applied correctly and the light is reflected back towards the oncoming vehicle, providing safety at night, in wet or dry conditions.

## Wet/Night Visibility

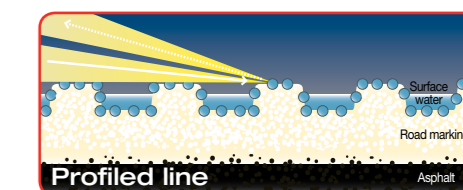
The retro-reflectivity of glass beads applied correctly, enables road markings to be visible at night. The effectiveness of retro-reflectivity can be impaired during wet conditions. The images below show why this is the case and how a combination of different sized glass beads, and to a greater extent a profiled line incorporating glass beads, can increase road marking visibility in wet/night conditions.



If only small beads (or no beads at all) are used, then the light from headlights is reflected off the surface water away from the driver. This has the effect of making the lines 'disappear'.



When a combination of small and large beads are used, in damp conditions the large beads will protrude above low level surface water providing some retro-reflectivity. However if the level of surface water increases, the line will 'disappear'.



Using a profiled line with glass beads such as the Markon Rainline or Nitesite, not only protrudes above surface water, but also channels it away to ensure levels of retro-reflectivity are not compromised. Technological developments like these have helped to keep Markon at the forefront of the traffic safety industry.

## European Standards for Road Markings

### Specifying Criteria for White Road Markings - EN 1436

Retro-reflectivity <sup>o</sup> (dry)		Retro-reflectivity <sup>o</sup> (wet)		Luminance*		Skid Resistance <sup>▲</sup>	
Class	Value	Class	Value	Class	Value	Class	Value
R0	NIL	RW	NIL	B0	NIL	S0	NIL
R1	100 mcd/sqm/lux	RW1	25 mcd/sqm/lux	B2	0.30	S1	45 SRV
R2	200 mcd/sqm/lux	RW2	35 mcd/sqm/lux	B3	0.40	S2	50 SRV
R3	300 mcd/sqm/lux	RW3	50 mcd/sqm/lux	B4	0.50	S3	55 SRV
				B5	0.60	S4	60 SRV
						S5	65 SRV

### Specifying Criteria for Yellow Road Markings - EN 1436

Retro-reflectivity <sup>o</sup> (dry)		Retro-reflectivity <sup>o</sup> (wet)		Luminance*		Skid Resistance <sup>▲</sup>	
Class	Value	Class	Value	Class	Value	Class	Value
R0	NIL	RW	NIL	B0	NIL	S0	NIL
R1	80 mcd/sqm/lux	RW1	25 mcd/sqm/lux	B1	0.20	S1	45 SRV
R3	150 mcd/sqm/lux	RW2	35 mcd/sqm/lux	B2	0.30	S2	50 SRV
R4	200 mcd/sqm/lux	RW3	50 mcd/sqm/lux	B3	0.40	S3	55 SRV
						S4	60 SRV
						S5	65 SRV

<sup>o</sup> Retro-reflectivity - the ability of a road marking to reflect light from a vehicle's headlights back to the driving position of a vehicle

\* Luminance - property of the marking which describes the brightness of its colour during the day

<sup>▲</sup> Skid Resistance - the ability of a road surface or marking to prevent a vehicle from skidding

NB. Thermoplastics are available in AASHTO as well as EN 1436