APPENDIX 'D'

HITEX CM PRIME AND PUMATRACK ROLLABLE ROAD SURFACE SYSTEM

Pavement Markings

HITEX
North America
Part of the Hitex International Group

Puma**Track**

MMA Cold Applied Surface Treatment

PumaTrack manually rollable surface treatment is engineered to achieve the highest levels of durabillity, adhesion and colour stabillity. PumaTrack is the ideal application for cycle tracks and walk ways.

Product specification and technical data

Puma**Track**

PumaTrack comprises an MMA binder system, lead / heavy metal free pigments, aggregates and fillers.

PumaTrack is available in a range of colours for different applications.

Why PumaTrack?

- Roller application ensures high quality, even finish
- Provides enhanced safety for cyclists and vulnerable road users
- Tough and durable with a long service life
- Catalyst controlled, rapid curing, typically 10 - 30 minutes
- Non-toxic binder system
- Fast and easy to apply
- Highly resistant to discolouration
- Can be adapted to suit particular climatic requirements

Typical uses:

- Cycle routes
- Paths/ walkways
- Smaller scale works e.g. car parks, factory markings

Compliances/approvals

Hitex design and develop road marking and surfacing products to the highest level of international or customer specific requirements.

The management system of Hitex Traffic Safety Ltd has been assessed and registered as meeting the requirements of ISO 9001 and ISO 14001.

Colors

PumaTrack is available in a range of colours. Standard colours are red, green, yellow and blue. Other colours available on request.

Application method

PumaTrack can be applied as follows:

- By squeegee to regulate surface, finished with a roller to achieve textured skid-resistant finish
- By hand screed

PumaTrack requires the use of a catalyst to enable curing of the system. Please refer to the relevant Installation Method Statement for full instructions on the application process.

Technical data

Table 1 Physical properties

Typical coverage rate	4.6 lb/yd^2 (2.5kg/m^2)
Pot life*	5–15 mins
Curing time*	10–30 mins
Road surface temperature range	32–104°F (0–40°C)

*** Dependant on ambient temperature and catalyst dosage**

Packaging & storage

PumaTrack is supplied in pre-weighed 22lb (10kg) or 44lb (20kg) pails. Other pack sizes available upon request. The catalyst (hardener) is supplied separately. Dosage of the catalyst varies according to material temperature.

It is recommended that PumaBrite and PumaSpray product should be kept totally dry and stored away from direct sunlight and areas of potential contamination.

The binder component must be stored away from any catalyst. Stable for 6 months when stored in a cool, dry place. Long periods of over-heating (e.g. external storage in summer) may lead to gelling of the material.

Health & safety

For further information consult the relevant Safety Data Sheet (SDS).

Disclaimer

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PRIMER FOR HITEX PUMA MMA SYSTEMS ON METAL AND CONCRETE SUBSTRATES

KEY BENEFIT SUMMARY

- Exhibits excellent adhesion to metal and concrete substrates
- Easy to apply

PRODUCT INFORMATION

Description

CM Primer is a low viscosity, colourless, 2 component reactive resin based on methyl methacrylate (MMA).

Usage

CM Primer is used as primer to give excellent bonding to concrete and metal substrates (e.g. iron, aluminium, stainless steel).
We strongly recommend with CM primer that curing and adhesion tests are conducted on the particular substrate prior to general use on site.

Packaging

180 kg steel drums, 20 kg pails

Shelf life

6 months when stored in a cool and dry place and in originally closed packaging. The optimal storage temperature is 15 - 20°C.

TECHNICAL INFORMATION

Technical characteristics (liquid state)

Viscosity, 25°C:	100-130 mPa*s	DIN 53018
Density, 25°C:	0.99 g/ml	ISO 2811
Pot life / processing time at 20°C:	approx. 15 min.	
Curing time at 20°C:	approx. 30 min.	
Flash point:	+ 11.5°C	ISO 1516

Technical characteristics (cured state)

Tensile strength:	13.8 N/mm²	ISO 527
Elongation at maximum strength:	1.3 %	
Elongation at fracture:	1.3 %	
Modulus of elasticity:	1500 N/mm²	
Density, 20°C:	1.16 g/cm³	ISO 1183

Please note that an objective comparison with other data is only possible if norms and parameters are identical.

USAGE GUIDELINES

Substrate preparation

All substrates must be dry, firm, solid and free of dust, fat and oil. Loose tiles and tiles over hollows must also be removed. Laitance and loose articles must be thoroughly removed. Steel substrates must be prepared to SA 2.5 (according to DIN 55929).
Surface structure shall allow the correct application of the primer.
-Surface tensile strength shall be min. 1.5 MPa.
-Mechanical preparation shall expose concrete aggregate.
-Visible pin holes and craters shall be filled separately using filled primer or suitable cement mortar.
For further details, see our Installation Method Statements for Hitex PUMA MMA systems.

Mixing

Prior to use CM Primer must be carefully stirred to achieve a uniform distribution of the paraffin contained in the product. CM Primer is thoroughly mixed together with the Catalyst (50% dibenzoyl peroxide), in accordance with the below guidelines. It should be noted that the amount of catalyst powder to be added depends upon the substrate temperature.

at 30°C add 1% by weight of resin
at 20°C add 2% by weight of resin
at 10°C add 4% by weight of resin
at 0°C add 6% by weight of resin

Note: Weight to Volumetric conversion of Catalyst.
1 cm³ of Catalyst weighs 0.64 g
1 g of Catalyst = 1.57 cm³

CM PRIMER

APPLICATION

-Substrate surface temperature may range from 0°C to 40°C.
-Do not apply when surface temperature is above 40°C and/or rapidly rising. Special care must be observed if area is under exposure to direct sunshine.
-Substrate temperature must be at least 3°C higher than the actual dew point.

After the catalyst has been stirred in, the primer is poured onto the substrate in stripes and distributed with a short-pile paint roller. A notched rubber squeegee can be used for fast distribution of large quantities. Apply at a rate of between 300 g/m² to 500 g/m² depending on density and porosity of the substrate. In any case, continue applying primer until saturation occurs to obtain a continuous resin film. On extremely porous substrates a second prime coat may be required. When a continuous resin film is obtained, broadcast fire-dried quartz sand (particle size 0.7 - 1.2 mm or 0.3 - 0.7 mm) into the still wet primer.
Consumption of this broadcast sand: approximately 0.3 kg/m^2.

For further details, see our Installation Method Statements for Hitex PUMA MMA marking and surfacing Systems.

HEALTH AND SAFETY PRECAUTIONS

Suitable protective clothing, gloves and safety goggles must be worn during mixing and application of CM Primer.
When the product is applied in enclosed areas without natural ventilation, forced ventilation must be arranged. Avoid strong concentration of vapour as well as direct contact with skin or eyes.
CM Primer is highly flammable; keep away from heat and all sources of ignition and do not smoke. The stirrer as well as all the other electric appliances used on the application site must be explosion-proof versions.
For further information see our Material Safety Data Sheet.

TECHNICAL SERVICE

Contact Hitex Traffic Safety Ltd

The information and recommendations herein are believed by Hitex International to be accurate and reliable.

HITEX International Group
Road Surface Innovation

PROPOSED METHOD STATEMENT FOR THE INSTALLATION AND QUALITY CONTROL OF PUMATRACK ROLLABLE ROAD SURFACING SYSTEM

1. General

1.1 The installation and composition of PumaTrack Rollable Road Surfacing System shall be as stated in the product specification and this installation method statement.

1.2 PumaTrack Rollable Road Surfacing System consists of a Methyl Methacrylate binder, blended fillers, pigment(s), aggregate, and property modifying additives.

1.3 A programme of work shall be agreed with the purchaser prior to commencement of installation. Requirements for the provision of sufficient working area, plant, safety and, if required, protection to the system shall be agreed.

1.4 The current installation method statement together with all the necessary Health & Safety data sheets and COSHH risk assessment shall be deposited with the purchaser and maintained on-site.

2. Quality Control

2.1 Every batch shall be subject to quality control checks to ensure compliance with the system specification.

2.2 Each component received on-site shall be logged and stored to prevent contamination or deterioration, in accordance with the manufacturer's instructions.

3. Suitability of the Road Surface

3.1 The system is deemed suitable for use on highways with concrete or bituminous surfaces.

3.2 The purchaser should ensure that the pavement structure is adequate to support the traffic without undue cracking or deformation during the expected life of the system

3.3 New bituminous substrates should be allowed to weather for at least 6-8 weeks prior to the installation of the system. This is because bituminous substrates can contain residues of oils, bitumen and additives which can inhibit adhesion and curing. Depending on the type of substrate, this can take even longer than 8 weeks, and tests should be carried out on a small area before the full application commences to ensure the adhesion is fine.

3.4 Concrete surfaces should be a minimum of 28 days old and must be primed using a CM Primer prior to the installation of the system.

4. Traffic Management

Traffic Management shall be in accordance with Department of Transport Traffic Signs Manual Chapter 8 current edition, or as agreed between the Purchaser and Installer.

5. Preparation of the Road Surface

5.1 The areas to which the system is to be applied shall be clearly defined and marked by the Purchaser prior to commencement of work on-site.

5.2 Any imperfections in the road surface not acceptable to the Installer shall be reinstated with a material approved by the Purchaser in consultation with the Installer.

5.3 The road surface shall be clean, dry and free from ice, frost, loose aggregate, oil, grease, road salt and other loose matter that may impair the adhesion of the system.

5.4 Where the road surface does not comply with Section 5.3 it shall be cleaned by the Installer or others, by grit blasting, high pressure water jetting, low pressure water/abrasive blast cleaning, scarifying, scabbling or other means approved by the Purchaser. To remove dust and other loose matter the road surface should be vigorously brushed or treated with hot compressed air. Any oil visible on the road surface shall be removed by washing and scrubbing with a suitable detergent solution followed by flushing with clean water or by other suitable means.

5.5 Existing road markings, ironwork, road edges of area to be treated and road studs shall be suitably masked.

5.6 On concrete substrates, CM primer shall be applied using a short pile paint roller or serrated edge squeegee at a typical coverage rate of 0.4kg/m², depending on the substrate texture and porosity. The road surface temperature shall be between 0 and 40°C. The CM primer needs to be catalysed according to the following table:

Table 1: Catalyst Addition Levels when using CM primer

Substrate temperature (ºC)	**Primer** pack (kg)	BPO powder catalyst required (g)
0 – 5	20	1,200
5 – 15	20	800
15 – 25	20	400
25 – 40	20	200

Primer choice is critical and should be approved by the certificate holder before use.

6. Weather Conditions

6.1 Installation of the system shall only be carried out with a road surface temperature of 0°C to 40°C and with a relative humidity of ≤85%. At temperatures below 5ºC, the pails should be warmed to above 5ºC

6.2 Ambient and road surface temperatures shall be recorded at the start and, if the weather is variable, during the installation process.

6.3 Road surfaces shall be dry before and during the installation of the system.

6.4 The curing period for the prevailing weather conditions shall be notified to the Purchaser.

7. Installation

7.1 System Installation Procedure:

7.1.1 The PumaTrack system is available as a single grade for use at substrate temperatures from 0°C to 40°C.

7.1.2 PumaTrack pails should be kept out of direct sunlight during storage and use. Storage at elevated temperatures can lead to degradation of the system. Application of hot PumaTrack material can lead to premature gelling or curing, which can adversely affect product performance.

7.1.3 PumaTrack rollable surfacing system is a two-component cold applied chemically curing Methyl Methacrylate compound, consisting of a pre-accelerated base resin, blended fillers, pigment(s), aggregate, trace amounts of property modifying additives and a powder catalyst (BPO), supplied in pre-weighed quantities ready for on-site mixing. For the amount of BPO powder catalyst required for the installation temperature, see the following table:

Table 2: Catalyst Addition Levels when using PumaTrack

Substrate temperature (ºC)	PumaTrack pack size (kg)	BPO powder catalyst required (g)
0 – 15	20	400
20	20	300
25	20	200
30 – 40	20	100

7.1.4 The catalyst level is critical – the minimum catalyst level is 100g per 20kg pail. Using less catalyst will cause partial curing and lead to product failure. Excessive levels of catalyst can lead to premature gelling and curing, which can lead to reduced adhesion to the substrate and product failure.

7.1.5 Immediately prior to use, stir the binder thoroughly using a mechanical mixer until the resin is fully homogenised. Add the correct amount of BPO powder catalyst and mix thoroughly for at least 30 seconds. Ensure that the binder at the bottom and sides of the container is completely mixed in. Do not delay once the catalyst has been added, a chemical reaction is occurring that if left in the pail will ruin the mix.

7.1.6 The mixed binder and catalyst shall then be immediately spread onto the dry prepared road surface uniformly with a serrated squeegee at the desired thickness. Typically a 4mm serrated squeegee will be used to give a uniform thickness of 2mm. For the highest levels of durability, a thicker squeegee may be required (e.g. 6mm). The binder should then be backrolled to give the desired texture depth. A short pile roller can be used to give a finer texture depth.

7.1.7 The applied material should be rolled as soon as possible after being squeegeed to avoid any gelling or partial curing before the texture has been rolled in.

7.1.8 If there is any delay to the work, the squeegee must be checked before work restarts to ensure that no cured material is left on the squeegee, which could lead to lower coverage rates, and thus reduced durability.

7.1.9 The squeegee should also be regularly inspected to ensure that there is no wear to the teeth, as this can also lead to lower coverage rates and reduced durability.

7.1.10 PumaTrack is made to tight quality tolerances. However, for larger areas, use material with the same batch number wherever possible. If different batch numbers are used on a single area, colour comparison checks should be made between each batch of product being used before any application starts.

7.1.10 On more open textured surfaces a greater material usage may be required to ensure adequate coverage of the surface.

7.1.11 The masking tape shall be removed promptly as the work progresses, before the binder begins to gel.

7.2 System Installation Checks by the Installer

7.2.1 A visual check shall be carried out for uniform surface texture, blemishes, and any discernible faults.

7.2.2 A check shall be made on completion of each site to determine the quantities of material used.

7.3 Sampling and Testing of Materials used on-site

If required, materials shall be sampled and tested at a frequency as requested and agreed between the Purchaser and Installer.

7.4 Maintenance and Repair

7.4.1 In the event that damage occurs during the installation or during service the system shall be repaired as follows:

7.4.1.1 The damaged and or de-bonded system shall be cut back to firmly adhering material, squaring off the area to be reinstated.

7.4.1.2 The area to be repaired shall be cleaned, dried and the perimeter masked, allowing a 50 mm overlap on the existing well adhered system.

7.4.1.3 The system shall then be applied in accordance with Section 7.1.

8. Aftercare

8.1 Any remaining masking shall be removed and the system allowed to fully cure. During the curing period, no disturbance or trafficking of the system shall be permitted.

8.2 The Installer should endeavour to inspect the site after 24 hours and carry out any necessary remedial work.

End of Method Statement