

Cold Surfacing Materials, pros and cons and new hot-mix equivalents

Winter / Cold Weather Issues

Michael Reynolds Viatec UK



Extract from C.J. Summers' 'Idiots Guide to Highway Maintenance'

It is extremely important to take into account the **WIND CHILL FACTOR** when laying hot bituminous materials, especially when laid in thin layers.

This problem relates especially to H.R.A. WEARING COURSE when applying PRECOATS, and in particular with a "dry" H.R.A. DESIGN WEARING COURSE. The minimum air temperatures laid down in specifications allowing the laying of bituminous materials do not always take account of wind speed. The rate at which a "hot material" loses heat is greatly increased with increase in wind speed. Graphs are available in the "700" series in the March 1998 DOT Specification for Highway Works.

WIND CHILL is a *very* real problem, and if you do not take account of it in your site management the quality of work will suffer.

ALL MATERIAL TO BE LAID TO BE ON SITE BEFORE YOU START LAYING, HAVE THE CHIPPER CLOSE BEHIND THE PAVER, AND THE ROLLER CLOSE BEHIND THE CHIPPER

A hot material laid at an actual air temperature of plus 7 degrees centigrade and a wind speed of 25 m.p.h. will lose heat at a rate equal to a still air temperature of minus 5 degrees.

Cold PCSM repair failure – bleeding & rutting



Incomplete curing and surface crusting of cold-mix



Bitumen Cleaner or cold-mix binder ingredient?

Danger

Causes skin burns and eye damage. Harmful if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation. Suspected of causing cancer. May be fatal if swallowed and enters airways. Flammable liquid and vapour.



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT
Mineral spirits, regular
Solvent naphtha, heavy aromatic
Naphthalene
Trimethylbenzene 1,2,4



Solvent Content of Cold-Mix Binder



Specimen age	Total mass lost (M %)		
	PCSM	Viafix	Depot stock
1 day	9.7	0.5	36.7
2 days	11.3	0.5	40.2
3days	11.3	0.5	40.4

PCSM tested is considered to be 'solvent-free' under EU Law.

BS 4987 - Coated macadam (asphalt concrete) for roads

- **Do not lay in standing water**, where possible remove water from patches and potholes prior to laying.
- Do not lay on frozen ground.

Met Office data shows UK average number of rainy days is 145 per year.

Extract: Enterprise presentation to Staffs Highways



Appendix A10. PCSMs

- Re - worded and moved to A2 – A10 not now used.
- Materials are now to be approved as equivalent to a Hot Lay type and used as appropriate.
- Due to concerns over soft and unstable PCSMs they must be capable of wet flush core sampling, to allow void testing, at 6 months from the date of permanent reinstatement (A8.3)
- On occasion materials were so soft that cores could not be obtained even after
- 2yrs in the ground so how could these materials be 'equivalent to hot-lay'?

Marshall Load Comparison



Test temp	Marshall Load Value (kN)		
	PCSM	Viafix	depot stock
25°C	0.7	16.5	n/a disintegrated
60°C	n/a disintegrated	5.8	n/a disintegrated

The test at 60°C was carried out to enable a comparison to hot-mix asphalt

Viafix repairs on wet trunk roads: Severn Bridge M4



Viafix in 'quite wet' situations!



Quote from Viafix user

“I have never seen a more effective cold material. It really does do what it says it will. The first time we used it was three years ago during a cold, wet winter’s night for a ‘water-burst’ on a busy arterial road and the Viafix repair is still there, completely intact!”

**Brian Allinson, Depot Supervisor,
Renfrewshire Council in Western Scotland.**

Client testimonials

- “The silver bullet of cold lays” - [Lancashire Highways](#);
- “It does exactly what it claims” - [Cumbria Highways](#);
- “The best thing since sliced bread, very impressive” - [Transerv Scotland](#)
- “We call it magicadam ” - [London Borough of Islington](#)
- “The dog’s!” - [Surrey CC Materials lab.](#)
- “All your claims are true , it’s brilliant” - [Highways Agency Area 10.](#)
- “Superb in the wet unlike the other stuff!” - [Cambridgeshire Highways.](#)
- “Extremely versatile especially useful for busy roads” - [East Lothian Council.](#)
- “Never had a defect with Viafix repairs, even in the London Borough of Bromley!” - [BT Openreach](#)

HAPAS approval

HAPAS Roads and Bridges

Österreichische Vialti Gesellschaft mbH

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Agreement Certificate
09/H147
Product Sheet 1

VIALTI PERMANENT COLD LAY SURFACING MATERIALS

REPAIR & MM AND 10 MM

This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrement (BBA) in conjunction with the Highway Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport, the Scottish Executive, the Welsh Assembly Government, the Department for Regional Development, Northern Ireland), the County Surveyors' Society, the Local Government Technical Advisors' Group, and industry bodies. HAPAS Agreement Certificates are normally each subject to a review every five years.

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Repair & mm and 10 mm for use as a permanent cold lay surfacing material (PCSM) in any position in footways, footpaths, cycle tracks and as a permanent cold lay surface course (PCSC) in Type 2, 3 and 4 carriageways.

AGREEMENT CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five yearly review



KEY FACTORS ASSESSED

Performance – The product meets the PCSM and PCSC requirements of the Guidelines for the Approval and Certification of Permanent Cold Lay Surfacing Materials (PCSM) (see section 5).

Durability – The results of tests and an assessment of the product in service performance indicates that it can be used as a full-time replacement of openings in footways, footpaths and cycle tracks (PCSM), and as a surface course in Type 2, 3 and 4 carriageways (PCSC) (see section 7).

The BBA has awarded this Agreement Certificate to the company named above for the product described herein. The product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrement

Date of First Issue: 13 August 2009

Simon Woo
Head of Approvals – Materials

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body – Number 173. The schedule of the current scope of accreditation for product certification is available in pdf format on the UKAS site or the BBA website or www.bba.com or www.bba.org.uk

Readers are advised to check the validity and latest issue number of this Agreement Certificate by referring to the BBA website containing the BBA-List.

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Viafix test patch wheel-track area lane 1, A320



Laid April 2007



Patch in good condition Dec 2014

viafix cored 24 hours after compaction

Void content approximately 8%



Viafix wheel tracker test result



Surrey's Environment
Transportation Services
Materials
Networks
Qualified
Surrey G17 7BD
Tel: 01472 31700
Fax: 01472 31745

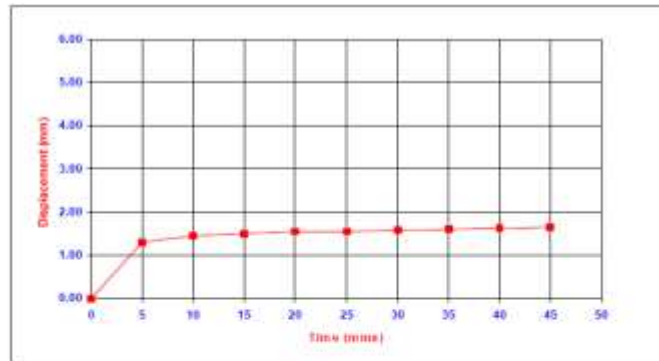


0731

Cert. No	096451-H
Site Ref.	H
Project	09 VIATEC 01

The Determination of Wheel Tracking Rate of Bituminous Materials

Source **Viatec UK** Date Received **01/06/2009**
Date/Time Sampled **18/05/2007** Time Received
Specimen Thickness (mm) **58** Date/Time Tested **05/06/2009**
Specimen Size (mm) **200** Test Temperature **45 (°C)**
Sample Preparation **Sawn/Plastered** Specimen Density (Mg/m3) **2.322**
Sample Type **Site Core** Max Rut Depth **1.7 mm**
Test Method **BS598 - 110: 1998 (Automatic Deflection Measurement)**



Mean Rate of Increase of Specimen (mm/hr) **0.3**

Operator **J. Nicholls**

Remarks (1)

Remarks (2)

Distribution **Mr M. Reynolds, Viatec UK Ltd
Westfield Business Centre
Rushstock
Bath**

Signed

Engineers Laboratory

Date **10/06/2009**

Digitally signed by J. Nicholls
DN: cn = J. Nicholls, o = Surrey County
Council, ou = Highways
Date: 2009.06.10
11:43:22 +0100

Gulley reinstatement, standing water

Demonstration for Northern Ireland Road Service, Ballymena, Jan 2013



1



2



3



4

1. Water displaced by loose Viafix (in freezing conditions, Jan2013)
2. Viafix dropped in by hand
3. Compaction by traffic
4. Finished repair

Reinstatement on a dual carriageway: Roman Road A6078, Blackburn



Viafix repair being made



Compacted finish – May 2008



Still intact March 2012

New venture for UK production of Viafix

Wainwright's Technical Director, Ian Timberlake, says, "Viatec's Mike Reynolds called me to ask for a meeting, I didn't know him or the company but I had heard rumours on the market of an impressive new cold product. I have been in this industry a long time and, generally speaking, when someone presents you with an 'innovative' product it invariably turns out to be a re-hash of something from the past. When Mike showed us the properties and performance of Viafix I could not believe it. Who would have thought in a million years that asphalt could be chemically hardened to such strength using water as a catalyst? Clearly we could not let this opportunity pass."



Viafix mixer tower at Viatec's new high capacity production plant



Fig 10: Viafix mixer tower at the new high capacity production plant

Viafix HRA and SMA equivalents

Viafix reactive binder enables replacement of traditional hot binders to duplicate most grades of asphalt into cold, hand-layable equivalents. Viatec UK uses BSEN standard graded mixes to produce two of the most commonly used; 30/14 Hot Rolled Asphalt (to BSEN 13108-4 2006) and 10 and 14 Stone Mastic Asphalt (to BSEN 13108-5 2006).

Perfect for smaller first time permanent reinstatements during out-of-hours / foul weather conditions. No hot crews or hot works permissions or fair weather required. As with all Viafix products our cold mixes can be laid in or underwater and trafficked immediately and are easily worked and compacted in low or freezing temperatures.



Example of Viafix HRA equivalent



HRA core detail



SMA core detail

Viafix Mastic Asphalt Alternative for Thames Water



Hot Mastic sample as supplied
by Essential Water Services



Viatec Cold Mastic Alternative

Viatec UK

Business Centre
10000, Bath, BA3 4BH

Thank-you for your time. Any questions?

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Video Clip – Viafix on ITV