

XAIS-PTS Product Assessment Certificate

Product Acceptance Scheme in accordance with Manual for Contract Documents for Highway Works, Specification for Highway Works (MCHW SHW) Volume 1 Sub-Clause 104.15 and 104.16

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UK Approved Body (UKAB)
Product Area 23 Road Construction Products

Product Name: Ultracrete Instafill / Trenchfill
Product Family: Flowable Structural Materials for Reinstatements (FSMRs)
Certificate Reference: PA FSMR SROH 0001



XAIS-PTS Ltd has awarded this **Product Assessment Certificate** to the Company named above for the products described herein. These products have been assessed by XAIS-PTS Ltd as being fit for their intended use provided, they are manufactured, installed, and used as set out in this Certificate.

The issue of this Certificate under Specialist Group XAIS-PTSSG FSMR SROH, which sets out Guidelines and Criteria for the assessment, has been authorised by the XAIS-PTS Technical Supervisory Panel.

On behalf of XAIS-PTS Ltd

Signature

R Edwards Managing Director

Date First Issued: 27.08.21

Date of revision: 03.07.24

Certificate Valid until: 26.08.24

Product Name: Ultracrete Instafill / Trenchfill

Product Family: Flowable Structural Materials for Reinstatements (FSMRs)

This Product Assessment Certificate is issued by XAIS-PTS Ltd under XAIS-PTS Product Acceptance Scheme (XAIS-PTSPAS), in accordance with MCHW SHW Sub-Clause 104.15 and 104.16, supported by XAIS-PTS Technical Supervisory Panel (XAIS-PTSTSP) which includes representation from National Highways (NH), Association of Directors of Environment, Economy Planning and Transport (ADEPT), Road Surface Treatments Association (RSTA), Mineral Products Association (MPA), HAUC (UK) SROH Working Group, HAUC (UK) SROH Innovations Working Group and Transport Scotland.

Sub-clause 104.16 (e) requires that *“The scheme must have a technical supervisory panel that provides technical oversight on the operation of the scheme and formally consents to the issue of assessment and certification requirements of the specialist groups developing the assessment and certification requirements. This panel must include a balanced representation of key end users, recognized industry experts and those responsible for the highways on which such products will be used or installed”*.

XAIS-PTSPAS Product Assessment Certificates are each subject to a review every three years, with annual interim surveillance.

PRODUCT APPLICATIONS

Ultracrete Instafill/ Trenchfill is a self-compacting, non-air entrained, low strength & flowable, cementitious reinstatement structural material for reinstatement (FSMR) for use as a reinstatement layer in narrow and micro trenching applications in both footways and carriageways as defined in Specification for the Reinstatement of Openings in Highways (SROH) Table A9.1 and in line with manufactures Technical Data Sheet.

Appendix A9 of the Specification for Reinstatement of Openings in Highways (SROH) permits the use of both Alternative Reinstatement Materials (ARMs) and Alternative Technologies (ATs), once approved for use by a Local Authority after supporting a successful trial using a supporting Contractor/Installer.

The Ultracrete Instafill / Trenchfill trials detailed in this certificate were undertaken on behalf of Instarmac by MakeHappen Contractors and supported by Kirklees County Council.

KEY FACTORS ASSESSED

- Quality Management System (QMS) Audits
- Current BSI QMS accreditation to BS EN ISO 9001:2015
- NQA Certificate Number 6987 and recent audit
- Technical Data Sheet
- RAMS Method Statement
- Installation Trials
- Review of supporting documents
- Design and Development of Products and Services compliance with BS EN ISO 9001:2015
- Compressive strength on laboratory prepared specimens in accordance with BS EN 12504-1:2019.
- Compressive strength on cored samples in accordance with BS EN 12390-3:2009
- The class of compressive strength (R_c) is identified using the procedure given in BS EN 14227-1:2013
- Frost heave of Unbound or Hydraulically Bound Aggregates carried out in accordance with BS 812-124:2009
- Measurement of Air Content – Pressure Method carried out in accordance with BS EN 12350-7:2019
- California Bearing Ratio (CBR), Immediate Bearing Index and Linear Swelling of sample carried out in accordance with BS EN 13286-47:2004

1. TECHNICAL SPECIFICATION

Ultracrete Instafill/ Trenchfill is a self-compacting, non-air entrained, low strength & flowable, cementitious reinstatement structural material for reinstatement (FSMR) for use as a reinstatement layer in narrow and micro trenching applications in both footways and carriageways, developed as an alternative to Foamed Concrete where early placement of overlying bituminous surface course is required.

- Specification for the Reinstatement of Openings in Highways, Fourth Edition (England) May 2020

2. MANUFACTURE

- 2.1 The Quality Management System (QMS) of the manufacturer has been assessed and certified as meeting the requirements of BS EN ISO 9001: 2015 by NQA (Certificate 6987).
- 2.2 Design and Development of Products and Services compliance with BS EN ISO 9001:2015

3. DELIVERY AND SITE HANDLING

- 3.1 The product is delivered to site in 700kg-bulk bags or as pallets of 20kg bags, as specified in the Certificate Holder's QMS and in house documented procedure. Product packaging is labelled with the product type, name, date of manufacture, batch number, product details and includes instructions for use.
- 3.2 The product shall only be laid by approved installers who are trained in the operation of the type of mixing equipment and the installation methodology to be used. Installer competencies and training received are recorded. Please refer to the Technical Data Sheet for handling requirements.
- 3.3 Reference shall be made to the RAMS method statement for additional requirements

4. INSTALLATION METHOD STATEMENT (IMS)

- 4.1 Installation shall not take place in temperatures below 5°C, the ground to be laid upon must not be frozen, the ground temperature should be 5°C and rising, the stored product must be protected from frost, in dry conditions in accordance with the Manufacturer's Technical Data Sheet.
- 4.2 It is of vital importance that the ground-supporting layer that is to receive the product is stable and not liable to settlement or heave. Remove any loose material before application.
- 4.3 The product shall only be installed by approved installers, competent and experienced in cementitious products installation.
- 4.4 **UltraCrete Instafill:** Supplied in 700kg bulk bag the product should be mixed with 700kg of clean water via a dual feed pump capable of mixing the product in a 1:1 w /w ratio to provide a lump free, homogenous consistency before pumping in a batch process operation. Alternatively, the bulk bag quantity by weight is mixed with an equal quantity of clean water by weight to provide the same lump free homogenous consistency.
- 4.5 **UltraCrete Trenchfill,** screed mixing pumps using 20kg size units need to be able to mix homogeneously at 1:1 w /w ratio, product to clean water. Alternatively, the units can be mixed individually using a drill and paddle capable of obtaining a smooth homogenous and lump free consistency.
- 4.6 The material shall only be used where the minimum layer thicknesses and strength requirements are given in Table A9.1 of the SROH (reproduced below).

Table A9.1: UltraCrete Instafill/Trenchfill reinstatement layer depths

Road Classification	Combined Binder Course & Sub-Base	Base layer	Base & Sub-Base Layer	Sub-Base Layer &/or Below
Footways, Footpaths & Cycle Tracks	150 mm min	n/a	n/a	100mm min
0	n/a	n/a	n/a	150mm min
1	n/a	n/a	n/a	150mm min
2	n/a	n/a	n/a	150mm min
3	n/a	300mm min	450mm min	150mm min
4	n/a	200mm min	350mm min	150mm min

UltraCrete Instafill for Large Scale Pumping

Workability @ 20°C	40 - 60 minutes
Set Time@ 20°C	3 hours (within)
Density	1466kg/m ³
Unit Size	700kg Bulk Bag
Mixing Ratio (%/w with Water)	1:1
Yield	700kg Instafill to 700kg water = 1 cubic metre

UltraCrete Trenchfill for Hand Mixing & Small Scale Pumping

Workability @ 20°C	15 - 20 minutes
Set Time@ 20°C	30 - 45 minutes
Density	1466kg/m ³
Unit Size	20kg Bulk Bag
Mixing Ratio (%/w with Water)	1:1
Yield	20kg Trenchfill to 20kg water = 27.3 litres

- 4.7 Where the current Technical Data sheet does not cover all installation activities, reference must be made to the specific RAMS (Risk assessment and Method Statement available on request from the Certificate Holder.

5. TECHNICAL DATA

5.1 The assessment of the laboratory data on laboratory prepared specimens in accordance with:

- Compressive strength on cored samples in accordance with BS EN 12390-3:2009
- The class of compressive strength (R_c) is identified using the procedure given in BS EN 14227-1:2013
- California Bearing Ratio (CBR), Immediate Bearing Index and Linear Swelling of sample carried out in accordance with BS EN 13286-47:2004
- Frost heave of Unbound or Hydraulically Bound Aggregates carried out in accordance with BS 812-124:2009
- Measurement of Air Content – Pressure Method carried out in accordance with BS EN 12350-7:2019

Compressive Strength data confirms Ultracrete Instafill/ Trenchfill exceeds requirements. Minimum compressive strength (C4/5 at 28 days, Table A9.1, SROH).

Measured Compressive Strength to R_c Class

Specimen Age	1	2	Mean	R_c Class
1hr	0	0	0	n/a
2hrs	0	0	0	n/a
3hrs	1.1	0	0.55	C0,4/0,5
6hrs	1.7	1.6	1.65	C0,8/1
12 hrs	2.3	1.8	2.05	C1,5/2
24hrs	3.1	2.4	2.75	C1,5/2
7 Days	4.5	4.1	4.3	C3/4
28 Days	5.6	4.8	5.2	C4/5

BS EN 14227-1:2013 conversion to R_c Class

Minimum R_c for cylinders of slenderness ratio 1 ^a and cubes Mpa	R_c Class
0	n/a
0.5	C _{0,4/0,5}
1	C _{0,8/1}
2	C _{1,5/2}
3	C _{2,3/3}
4	C _{3/4}
5	C _{4/5}
6	C _{5/6}
8	C _{6/8}
10	C _{8/10}

^aIf cylinders with slenderness ratios other than 1 or 2 are used, then the correlation with cylinders of either slenderness ratio 1 or 2 shall be established before use.

Extract from Table A9.1 Provides the minimum strength class (R_c) requirements for

Layer	Road type					Footway, footpath or cycle track
	0	1	2	3	4	
Combined binder course & sub-base	NP	NP	NP	NP	NP	C _{1,5/2}
Base	NP	NP	NP	C _{1,5/2}	C _{1,5/2}	-
Base & sub-base	NP	C _{3/4}	C _{3/4}	C _{1,5/2}	C _{1,5/2}	-
Sub-base &/or below	C _{1,5/2}	C _{1,5/2}	C _{1,5/2}	C _{1,5/2}	C _{1,5/2}	C _{1,5/2}
Strength class at 28 days	C _{3/4} minimum to C _{9/12} maximum C _{1,5/2} minimum to C _{9/12} maximum					

NP = Not Permitted (see SROH, A9.3.1)

CBR data confirms Ultracrete Instafill/ Trenchfill exceeds the requirements for all classes of TMF (Treated Materials for Fills) materials within 4 hours of installation (CBR>15, Table 9.2, SROH)

Measured CBR & TMF Classes (Table A9.2)

Tested at age:	CRB Values		SMF Class	
	5°C	20°C	5°C	20°C
1hr		4	#N/A	C
2hrs		16	#N/A	A
3hrs		13	23	B
4hrs		21	27	A
5hrs		24	31	A
6hrs		34	38	A
12hrs		45	63	A
24hrs		50	67	A
7days		110	110	A
28days		140	170	A

Table A9.2 TMF CBR requirements

SMF Class	%CBR
A	>15
B	7 to 15
C	4 to 7
D	2 to 4

Ultracrete Instafill/ Trenchfill is classified as being Non-Frost Susceptible (mean frost heave <15mm, MCHW SHW Series 800: clause 801.8),
Ultracrete Instafill/ Trenchfill air content: 2%.

5. TECHNICAL DATA cont

5.2 Three installation trials were carried out during 2020:

- Junction of Ings Road and Fountain Street, Heckmondwike,
- Junction of Occupation Lane & Carrs Lane and Cresswell Lane, Dewsbury,
- Junction of Arncliffe Road and Aysgarth Road, Batley

Pavement Testing Services (PTS) witnessed installation at Arncliffe Road and Aysgarth Road, Batley for Ultracrete Instafill / Trenchfill process on behalf of Instarmac as carried out by MakeHappen Contractors and supported by Kirklees County Council.

Two in-house trials were also installed at Instarmac's premises as part of the design and development stage: Ainsley Hall Drive (2018) and Instarmac Lorry Park (2019).

Visual inspection of the installation trial sites reported good condition of the surface course and no defects were observed (eg. surface depression, crowning or edge shrinkage).

6. IN-SERVICE PERFORMANCE

Ultracrete Instafill/ Trenchfill material is typically overlaid by a surface course, the material has been shown to perform effectively as a reinstatement material with no defects identified for three trial sites over periods from 8 to 13 months and based on the definitions of defects given in SROH S2 Performance Requirements.

PTS Report Stage 5 dated July 2021

The inspection of the installation trial sites at Heckmondwike, Dewsbury and Batley reported all in good condition.

7. REQUIREMENTS

Product shall be manufactured only by the Certificate Holder using only the processes, procedures and raw materials approved and covered under the current QMS:

- NQA 6987

Product to be installed only by the Certificate Holder's approved installers.

8. TEST DATA

Available on request from the Certificate Holder

BIBLIOGRAPHY (correct at time of initial certificate issue):

- PTS SG FSMR SROH Guidelines and Criteria Document for the Assessment and Certification of Flowable Structural Materials for Reinstatements (FSMRs) to Support Submission & Approvals in accordance with the
- BS EN ISO/IEC 17065:2012 Conformity assessment—Requirements for bodies certifying products, processes, and services
- BS EN ISO 17025:2005 General requirements for the competence of testing and calibration laboratories
- BS EN ISO 17025:2017 General requirements for the competence of testing and calibration laboratories
- BS EN ISO/IEC 17067:2013 Conformity assessment—Fundamentals of product certification and guidelines for product certification schemes
- BS EN ISO/IEC 9001:2015 Quality Management System Requirements
- Manual of Contract Documents for Highways Works, Specification for Highway Works Series 800: sub-clause 801.8
- Manual of Contract Documents for Highways Works, Volume 1 Specification for Highway Works, amended July 2019
- Specification for the Reinstatement of Openings in Highways (SROH), Fourth Edition, May 2020
- Department for Transport – New Roads and Street Works Act 1991,
- BS 812-124:2009. Testing aggregates. Method for determination of frost heave
- BS EN 12350-7:2019. Testing fresh concrete. Air content. Pressure methods
- BS EN 12390-3:2009. Testing hardened concrete. Compressive strength of test specimens
- BS EN 12504-1:2019. Testing concrete in structures. Cored specimens. Taking, examining and testing in compression.
- BS EN 13286-47:2004. Unbound and hydraulically bound mixtures. Test method for the determination of California bearing ratio, immediate bearing index and linear swelling
- EN 14227-1:2013. Hydraulically bound mixtures. Specifications. Cement bound granular mixtures

CONDITIONS OF CERTIFICATION

1. This Certificate:
 - relates only to the product/system that is named and described on the front page
 - is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
 - valid only in the UK
 - has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
 - is copyright of XAIS-PTS Ltd.
 - XAIS-PTS Product Assessment forms part of the Product Acceptance Scheme as described in MCHW SHW Volume 1 Clause 104.16 and shall be submitted by the Contractor/Certificate Holder to the Overseeing Organisation for Approval.
2. Publications, documents, specifications, legislation, regulations, standards, and the like referenced in this Certificate are those that were current and/or deemed relevant by XAIS-PTS Ltd at the date of issue or reissue of this Certificate.
3. This Certificate will remain valid for an unlimited period, subject to 3 year review to revalidate that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:
 - are maintained at or above the levels which have been assessed and found to be satisfactory by XAIS-PTS Ltd
 - continue to be checked as and when deemed appropriate by XAIS-PTS Ltd under arrangements that it will determine
 - are reviewed by XAIS-PTS Ltd as and when it considers appropriate.
 - remain in accordance with the requirements of XAIS-PTSPAS. Additional review shall be carried out as necessary should Specification's / Standard's change to ensure compliance.
 - remain in accordance with XAIS-PTS Terms of Business.
4. XAIS-PTS Ltd has used due skill, care, and diligence in preparing this Certificate, but no warranty is provided.
5. In issuing this Certificate, XAIS-PTS Ltd is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:
 - the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
 - the right of the Certificate Holder to manufacture, supply, install, maintain or market the product/system
 - individual installations of the product/system, including their nature, design, methods, performance, workmanship, and maintenance
 - any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship, and maintenance
 - any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance, and removal
6. Any information relating to the manufacture, supply, installation, use, maintenance, and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained, and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.