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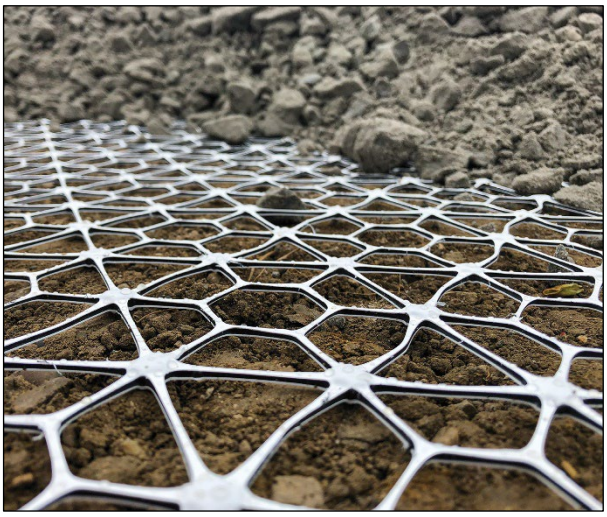
Agrément Certificate
23/7063
Product Sheet 1 Issue 1

TENSAR GEOGRIDS

TENSAR INTERAX GEOGRIDS

This Agrément Certificate Product Sheet(1) relates to Tensar(2) InterAx(2) Geogrids, punched and stretched polypropylene sheets, non-reinforcing hexagonal geogrids for the stabilisation of unbound granular layers by way of interlock with the aggregate.

(1) Hereinafter referred to as 'Certificate'.
(2) Tensar and InterAx are registered trademarks.



The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review

KEY FACTORS ASSESSED

Section 1. Mechanical resistance and stability
Section 2. Safety in case of fire
Section 3. Hygiene, health and the environment
Section 4. Safety and accessibility in use
Section 5. Protection against noise
Section 6. Energy economy and heat retention
Section 7. Sustainable use of natural resources
Section 8. Durability

The BBA has awarded this Certificate to the company named above for the product described herein. This 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 Agrément

Date of issue: 18 January 2024

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

In the opinion of the BBA, the use of Tensar InterAx Geogrids is not subject to the national Building Regulations.

Fulfilment of Requirements

The BBA has judged Tensar InterAx Geogrids to be satisfactory for use as described in this Certificate. The product has been assessed as a non-reinforcing hexagonal geogrid for the stabilisation of unbound granular layers by way of interlock with the aggregate.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the product under assessment. Tensar InterAx Geogrids are manufactured from a co-extruded composite polymer sheet with a complex pattern of holes punched into it, prior to a two-stage orientation/stretching process that produces the resulting geogrid structure that is supplied in finished roll form.

The product has the nominal characteristics given in Table 1.

Table 1 Tensar InterAx Geogrids characteristics

Characteristic	Geogrid properties	
	NX750	NX850
Aperture shapes	Hexagonal, trapezoidal and triangular	Hexagonal, trapezoidal and triangular
Structure	Coextruded and integrally formed	Coextruded and integrally formed
Rib shape	Rectangular	Rectangular
Continuous parallel rib pitch	80 mm	80 mm
Rib aspect ratio	>1.0	>1.0
Node thickness	3.5 mm	4.5 mm
Geogrid labelling	Blue	Brown
Roll width	3.8 m	3.8m
Radial Secant Stiffness at 2.0%	190 $kN \cdot m^{-1}$ (-60 $kN \cdot m^{-1}$)	270 $kN \cdot m^{-1}$ (-45 $kN \cdot m^{-1}$)
Radial Secant Stiffness Ratio	0.60 (-0.25)	0.60 (-0.25)
Junction efficiency	100% (±10%)	100% (±10%)

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

Mechanical resistance and stability

1.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the product were assessed.

1.2 Specific test data were assessed, as in Tables 2 and 3 of this Certificate.

Table 2 Performance assessment

Product assessed	Assessment method	Requirement	Outcome
NX750	Full scale trafficking data to establish effect of geogrid by US Army Corps of Engineers	Demonstrate and quantify improved performance of the stabilised granular layers incorporating Tensar InterAx Geogrids	Pass

Table 3 Product characteristics

Product assessed	Assessment method	Requirement	Outcome
NX750 and NX850	Radial Secant Stiffness to EOTA TR041	Demonstrate greater than declared property value	Pass
NX750 and NX850	Radial Secant Stiffness Ratio to EOTA TR041	Demonstrate greater than declared property value	Pass
NX750 and NX850	Junction Efficiency to EOTA TR041	Demonstrate greater than declared property value	Pass

1.3 The product has the characteristic properties as declared by the Certificate holder and functions to stabilise and increase the modulus of the granular layer and its associated trafficking performance and load bearing capacity.

2 Safety in case of fire

Not applicable.

3 Hygiene, health and the environment

Not applicable.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the product were assessed.

8.2 Specific test data were assessed, as in Table 4 of this Certificate.

Table 4 Long term durability assessments

Product assessed	Assessment method	Requirement	Outcome
NX750	Resistance to weathering (including exposure to UV light) to BS EN 12224 : 2000	No significant deterioration	Pass
NX750	Resistance to liquids, chemicals and environmental effects to BS EN 14030 : 2001	No significant deterioration	Pass
NX750	Resistance to oxidation to BS EN ISO 13438 : 2004	No significant deterioration	Pass

8.2.1 The material must be covered within 30 days of installation.

8.2.2 The material is predicted to be durable for 100 years in natural soils with 4≤pH≤9 and soil temperatures ≤15°C, and for 50 years in natural soils with 4≤pH≤9 and soil temperatures ≤25°C.

8.3 Service life

Under normal service conditions, the product will have a life of at least 120 years, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 Tensar InterAx Geogrids are suitable for stabilisation of unbound granular material as laid out in BS EN ISO 10318 : 2015.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance is provided in Annex A of this Certificate.

9.3 Workmanship

The practicability of installation was assessed by the BBA on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or a contractor, experienced with this type of product.

9.4 Maintenance and repair

As the product is installed as a component of a mechanically stabilised aggregate layer and has suitable durability, maintenance is not required.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The product is manufactured in a three-stage process. First co-extruding a composite polymer sheet. Second, a complex pattern of holes is punched into it. Lastly, a two-stage orientation/stretching process that produces the resulting geogrid structure that is supplied in finished roll form.

10.1.2 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.3 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.4 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.5 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.6 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

11 Delivery and site handling

11.1 The Certificate holder stated that the product is delivered to site in rolls bound with self-adhesive tape, and indicate geogrid type and name, polymer type, roll weight, unit weight and roll length. The self-adhesive tape label is colour coded as identified in Table 1 of this Certificate, in accordance with BS EN ISO 10320 : 1999.

11.2 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 The rolls should be stored under cover in clean and dry conditions.

11.2.2 The rolls should be protected from mechanical or chemical damage.

11.2.3 The material must be covered within 30 days of installation to meet the Resistance to Weathering requirement.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN 14001 : 2015 by British Standards Institute Quality Assurance (Certificates Q05288 and EMS 86463 respectively).

Additional certification

UKTA-0836-22/6501
UKTA-0836-22/6523

Additional guidance

A.1.1 The material must be covered within 30 days of installation.

A.1.2 The product is predicted to be durable for 100 years in natural soils with 4≤pH≤9 and soil temperatures ≤15°C, and for 50 years in natural soils with 4≤pH≤9 and soil temperatures ≤25°C.

Additional information on installation

A.2.1 For a subgrade which construction plant cannot safely traverse, the site is prepared by removing major protrusions, such as rocks, and tree and bush stumps, and also filling local hollows and depressions with the approved fill, but otherwise retaining the vegetation and topsoil covering the site.

A.2.2 Where site conditions permit, the subgrade must be levelled in accordance with the *Manual of Contract Documents for Highway Works* (MCHW), Volume 1 *Specification for Highway Works* (SHW), Clause 616, or as specified in the contract documents.

A.2.3 Personal protective equipment as specified by the Certificate holder should be worn when handling Tensar InterAx Geogrids.

A.2.4 Tensar InterAx Geogrids may be placed on the subgrade either parallel to the road centre line or in the transverse direction. If a geotextile separator has also been specified to accompany the Tensar InterAx Geogrids, then the geogrid must be placed above the geotextile (so that the placed fill can interlock with the apertures of the geogrid).

A.2.5 The width of overlap between adjacent Tensar InterAx geogrid lengths is dependent upon the grading and thickness of fill and the stiffness of the subgrade. The minimum overlap is 300 mm and the maximum normally required is 600 mm, or as directed within the contract documents. Overlaps must be secured and maintained during the filling operation. This is generally achieved by placing small heaps of granular fill locally over the overlaps ahead of the main filling operation.

A.2.6 A well-graded aggregate fill is suitable for the unbound granular fill. Types 1 or 2 is recommended, as described in the MCHW, Volume 1 SHW, Series 800, clauses 803 and 804, or as specified in the contract documents.

A.2.7 Specifiers are requested to contact Tensar International Ltd or a local Tensar distributor for specific advice when fill other than that described in section A.2.6 is to be used.

A.2.8 Lorry loads of granular fill material must be tipped into stockpiles on placed fill, and not tipped directly onto the Tensar InterAx Geogrids. The fill stockpiles must be spread by mechanical plant which causes the aggregate to cascade onto the geogrid, such as an excavator bucket or dozer with an opening bucket.

A.2.9 The fill must be spread in layers of not less than 150 mm thickness. The initial layer thickness to be placed on the geogrid must be specified in the contract documents, along with the maximum layer thickness.

A.2.10 In the stabilisation of wide and broad areas, the fill must be spread such that the first layer advances across roll widths, rather than along roll lengths.

A.2.11 Care must be taken to avoid damage to the Tensar InterAx Geogrids. No traffic or site plant must be permitted to travel on the geogrids prior to covering them with a minimum 150 mm layer of granular fill.

A.2.12 Compaction of granular sub-base must normally be carried out in accordance with the MCHW, Volume 1 SHW, Series 800, or as specified in the contract documents.

A.2.13 Compaction of other fills must be carried out in accordance with the MCHW, Volume 1 SHW, Series 600, or as specified in the contract documents.

A.2.14 Over exceptionally soft subgrade, the degree of compaction applied to the lowest layer of fill may have to be reduced from standard requirements. Details must be specified in the contract documents.

Bibliography

BS EN 12224 : 2000 *Geotextiles and geotextile-related products — Determination of the resistance to weathering*

BS EN 14030 : 2001 *Geotextiles and geotextile-related products — Screening test method for determining resistance to acid and alkaline liquids*

BS EN ISO 9001 : 2015 *Quality Management systems — Requirements*

BS EN ISO 10318 : 2015 *Geosynthetics, terms and definitions*

BS EN ISO 10320 : 1999 *Geotextiles and geotextile-related products— Identification on site*

BS EN ISO 13438 : 2004 *Geosynthetics — Screening test method for determining the resistances of geotextiles and geotextile-related products to oxidation*

BS EN ISO 14001 : 2015 *Environmental management systems — Requirements*

EOTA TR041 *Non-reinforcing hexagonal geogrid for the stabilization of unbound granular layers by way of interlock with the aggregate*

Manual of Contract Documents for Highway Works (MCHW)*, Volume 1 Specification for Highway Works*

Conditions

1 This Certificate:

- relates only to the product 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
- is valid only within 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 the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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 the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA 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 or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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.

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