Technology Introduction Group
Asset Management Services
The Quadrant: MK
Elder Gate
Milton Keynes
MK9 1EN

Network Rail

Certificate of Acceptance

Certificate No: PA05/05505 Issue: 2

Valid from: 19/11/2012

Product	Tensar TriAx Tx190L
Manufacturer	Tensar International Ltd

Network Rail Acceptance Panel (NRAP) hereby authorises the product above for use on railway infrastructure for which Network Rail is the Infrastructure Manager under the ROGS regulations.

Failure to abide by the requirements in this Certificate of Acceptance may invalidate the certificate, thereby restricting the right to operate the product and / or limiting the future supply and deployment of the product on the infrastructure.

This certificate can only be amended by Network Rail Asset Management Services. Any alterations made by a different person will invalidate the entire certificate.

Scope of Acceptance

To be used as a method of binding/ locking track ballast.

Authorised by

Andy Jones CEng, MICE
Head of Track Engineering

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1. SPECIFIC CONDITIONS

The following Conditions are specific to the approved product/s contained within Section 2 of this certificate. These conditions must be adhered to in addition to the Network Rail General Conditions contained within Appendix A 'Certificate Of Acceptance – General Conditions'.
Failure to adhere to these conditions may result in the withdrawal or suspension of Acceptance of some, or all of the items contained within the accepted configuration.

Manufacturer

1) The grid shall be manufactured from polypropylene sheet, oriented in three directions so that the resulting ribs shall have a high degree of molecular orientation which continues through the area of the integral node.
2) The characteristic radial stiffness (secant modulus) at 0.5% strain shall be 600 ± 65KN/m, determined in a test conducted in any in-plane direction and which records the maximum and minimum radial values when tested in accordance with ISO 10319:2008
3) The typical isotropic stiffness ratio expressed as the ratio of the minimum / maximum radial stiffness at low strain, shall be 0.6
4) The typical strength of the nodes between the longitudinal and transverse ribs, as determined by the Geosynthetics Research Institute, Drexel University, USA, Test Method GG2-87, shall be not less than 95% of the Quality Control Strength in all directions.
5) The grid shall be non-biodegradable and shall have a minimum of 2% finely divided carbon black, as determined by BS 2782:Part 4:Method 452B:1993, well dispersed in the polymer matrix to inhibit attack by ultra violet light.
6) The durability requirements are to meet that specified in the table below:

Durability Requirements

Characteristic	Test Method	Unit	95% Tolerance	Value
Resistance to oxidation based on PP or PE defined conditions	EN ISO 13438	%	NA	> 50
Resistance to Weathering % strength (50mm strips) retained after exposure	EN ISO 12224	%	NA	> 60
Resistance to Liquids (Chemical Ageing) **ACID** 0.25M H_2SO_3 at 60°C for 3 days	EN ISO 12960	%	NA	> 50
Resistance to Liquids (Chemical Ageing) **ALKALI** $Ca(OH)_2$, suspension (2.5g/l) at 60°C for 3 days	EN ISO 12960	%	NA	> 50
Durability: minimum lifetime	EN ISO 13438		NA	> 25 yrs
Chemical resistance: pH conditions statement	EN ISO 12960		NA	pH 1-14

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User

1) The user/ designer must follow the manufacturer's instructions in the application of this product in Network Rail infrastructure. These instructions should only be applied in conjunction with current Network Rail Standards involving the use of Geogrid Products in track construction.

2. PRODUCT CONFIGURATION

System or Complete Assembly

Part No.	Description	PADS No.
----	Tensar TriAx Tx190L	057/100470

Note: For complex products and systems, sponsors and manufacturers may be requested to submit a more detailed configuration report to be appended to this certificate.

3. ASSESSED DOCUMENTATION

Reference	Title	Date and Applies to Cert. issue No.	
NR/L2/TRK/4239 This standard is not yet issued but represents the future criteria for the performance of trackbed products.	Specification for synthetic products for improving the performance of ballasted track.	September 2012	1
NR/L2/TRK/8100	Railway Ballast and Stoneblower Aggregate	September 2012	1

4. CERTIFICATE HISTORY

Issue Number	Date	Issue History
1	09/10/2012	First accepted for use.
2	19/11/2012	Re-issued to amend manufacturer conditions 2,3 & 4.

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5. DISTRIBUTION

Manufacturer
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Certificate of Acceptance
Appendix A – General Conditions

Certificate No: PA05/05505

1) Manufacturer

The Manufacturer shall:

1) Ensure that all products supplied comply with the standards defined in the Acceptance Requirements or otherwise documented as part of the assessment, including meeting the reliability requirements included in the Acceptance Requirements and in any deed of warranty for the relevant certificate number.
2) Notify Network Rail Technology Introduction Group:
    a. Within 48 hours, of any deficiencies affecting the quality, functionality or safety integrity of the product (including corrective action undertaken or proposed).
    b. Of any intended change to the accepted product; changes include:
        i. a change to the product configuration (to the actual product or its application);
        ii. a variation to or addition of manufacturing locations or processes;
        iii. a change in the name or ownership of the manufacturing company;
        iv. any changes to the ability or intention to support with technical services, spares or repairs.
3) The Manufacturer shall provide Network Rail Technology Introduction Group at least 12 (twelve) months notice of its intention to discontinue supply or to provide such notice as is reasonable if such discontinuance is outside its control and will offer the opportunity of a Last Time Buy to Network Rail together with date for last order placement and supply of the parts affected. The introduction of proposed alternative products shall be communicated to the Network Rail Technology Introduction Group.
4) Provide further copies of operating and maintenance manuals to purchasers / users of the product as necessary (including certificates of conformance, calibration etc).
5) Provide further copies of training manuals and an appropriate level of training to purchasers or users of the product as necessary.
6) Where applicable, specialist technical support, repairs and servicing of the product shall be carried out by the Original Equipment Manufacturer (OEM) or authorised agent only.
7) Network Rail may request information from the manufacturer to prove product compliance with clauses 1 and 2 above and reserve the right to suspend and/or withdraw any application where information is not forthcoming within a reasonable timeframe.
8) In accordance with Network Rail's Quality Assurance Policy Statement 2011, where the specification and/or Product Acceptance Certificates specify quality assurance classifications (QA1 to QA5) for the products, the manufacturer shall comply with the specified level of quality assurance for each product and allow Network Rail access to carry out its quality assurance checks.
9) The manufacturer shall give Network Rail's representatives access at all reasonable times to its premises and allow them to inspect its quality systems and production methods and, if requested, to inspect, examine and test the products both during and after their manufacture and the materials being used in their manufacture.

2) Conditions of Use

Specifiers, installers, operators, maintainers, etc. using the product shall:

1) Comply with the certificate conditions. If a condition is not understood guidance must be sought from Network Rail Technology Introduction Group.
2) Check that the application of use complies with the relevant certificate's scope of acceptance.
3) Report any defect if it is a design or manufacturing fault likely to affect performance and/or the safe operation of the railway in writing to Network Rail Technology Introduction Group.
4) Inform Network Rail Technology Introduction Group in writing of a change to the product configuration (or to the actual product or its application).
5) Operate, maintain and service the product in accordance with Network Rail standards and Operation and Maintenance manuals as appropriate.
6) Be appropriately trained and authorised for the installation, maintenance and use of the product.
7) Only send products for repair or reconditioning to the Original Equipment Manufacturer (OEM) or authorised agent.
8) Users are to be aware that Product Acceptance is not a substitute for design approval.

3) Compliance

Railways and Other Guided Systems (ROGS) Regulations

1) Where the product is to be used in areas where Network Rail is not the Infrastructure Manager (e.g. leased stations), the sponsor shall additionally obtain formal consent from the Infrastructure Manager for the locality where the equipment is to be installed. This may include a requirement for additional safety verification. The decision of that Infrastructure Manager is binding, and cannot be overridden by Network Rail except by the escalation processes established in the ROGS regulations
2) As required in Railway Group Standard GE/RT8270, at each use of this product the project or group responsible for installation and commissioning shall be required to demonstrate compatibility with:
    a. All rail vehicle types that have access rights over the area affected by the change
    b. Infrastructure managed by others
    c. Neighbours.

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Certificate of Acceptance
Appendix A – General Conditions

Certificate No: PA05/05505

Railway Interoperability Regulations

3) For interoperable constituents of systems the project or group responsible for installation and commissioning shall be required to demonstrate compliance with the relevant Technical Specifications for Interoperability (TSI) where appropriate.
4) An authorisation from the national safety authority (i.e. the Railway Safety Directorate of the Office of Rail Regulation) is required before the equipment is to be used in revenue earning service.

4) Supply Chain Arrangements

1) Certificates of acceptance do not imply any particular quantity of supply nor any exclusivity of supply.
2) Products may be purchased by Network Rail or its agents, suppliers or contractors.
3) Manufacturers should note that it is not necessary to enter into any exclusive supply arrangements with resellers or other suppliers.