CARES Technical Approval Report TA1-B 5096

Issue 1

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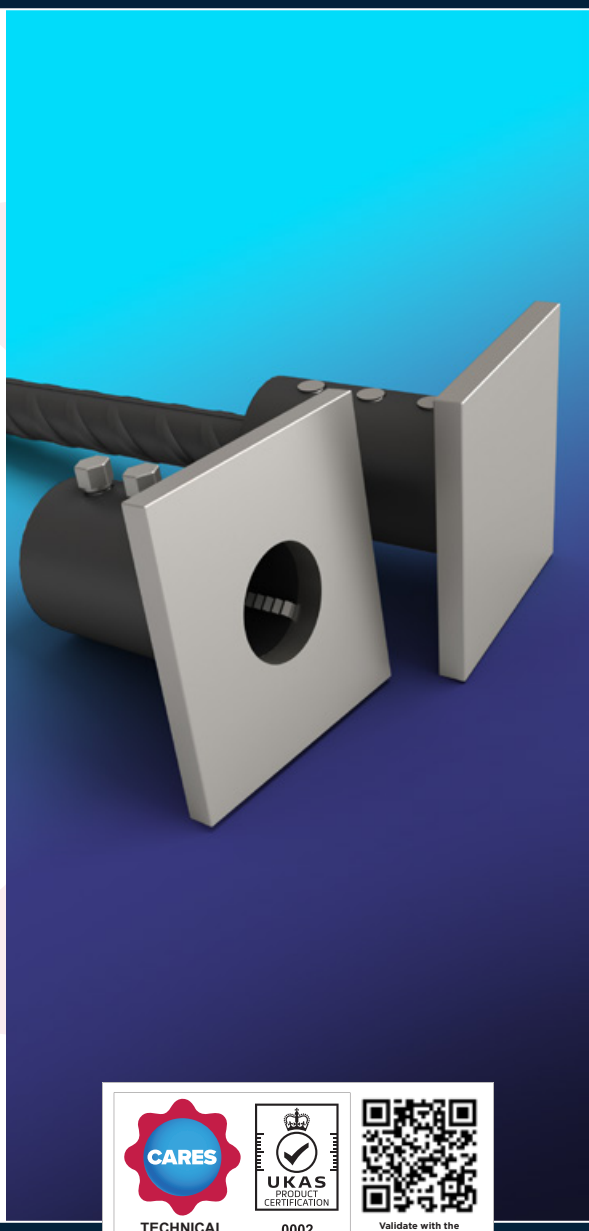
Leviat
A CRH COMPANY

Ancon
MBT Headed Anchor

Assessment of the Ancon MBT Headed Anchor Product and Quality System for Production



TECHNICAL APPROVAL 5096

0002

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Product

Ancon MBT
Headed Anchor
for reinforcing steel

Product approval held by:

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1 Product Summary

Ancon MBT Headed Anchor in the size range 10mm - 40mm are used for the mechanical connection of deformed high yield carbon steel bars for the reinforcement of concrete complying with the requirements of BS4449 Grade B500B & B500C to provide joints that can be subject to tensile stress.

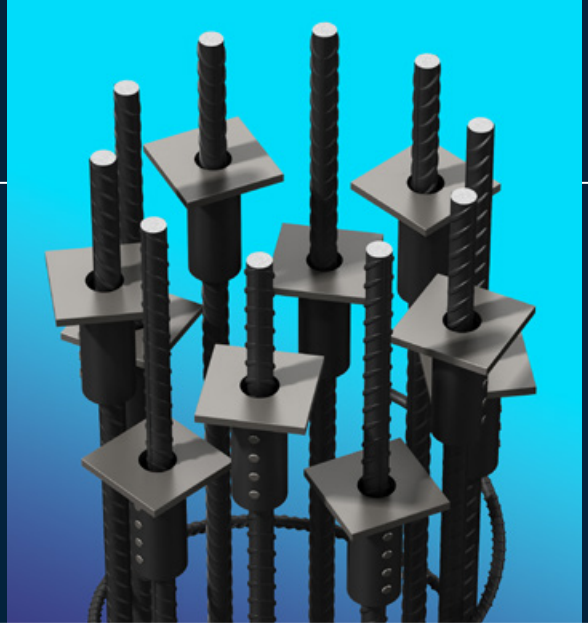
1.1 Scope of Application

Ancon MBT Headed Anchors in the size range 10mm - 40mm as detailed in table 1 have been evaluated for use in tension in reinforced structures and have been tested to satisfy the requirements of TA1-B, reinforcement anchors for EN-1992-1-1 applications for static loading in tension only, using reinforcement grade B500B or B500C to BS4449: 2005 as appropriate.

a) This assessment covers the connection between the Ancon MBT Headed Anchor and the reinforcing steel and does not cover the performance of the Ancon MBT headed Anchor or its connection to the structure in which it is used as these are matters for the designer and specifier.

1.2 Design Considerations

Eurocode 2, Clause 8.4 anchorage of longitudinal reinforcement requires:8.4.1 General (1) Reinforcing bars, wires or welded mesh fabrics shall be so anchored that the bond forces are safely transmitted to the concrete avoiding longitudinal cracking or spalling. Transverse reinforcement shall be provided if necessary.8.4.1 (5) (5) Where mechanical devices are used the test requirements should be in accordance with the relevant product standard or a European Technical Approval.



The specified cover for fire resistance and durability should be provided to the headed bar. All headed bars have been designed with controlled mechanical properties to be compatible with reinforcing bars complying with reinforcement of the relevant Grade in accordance with BS4449.

1.3 Conclusion

It is the opinion of CARES that Ancon Headed Anchors in the size range 10mm - 40mm are satisfactory for use within the limits stated in paragraph 1.1 when applied and used in accordance with the manufacturer's instructions and the requirements of this certificate.

L. Brankley
Chief Executive Officer
February 2025

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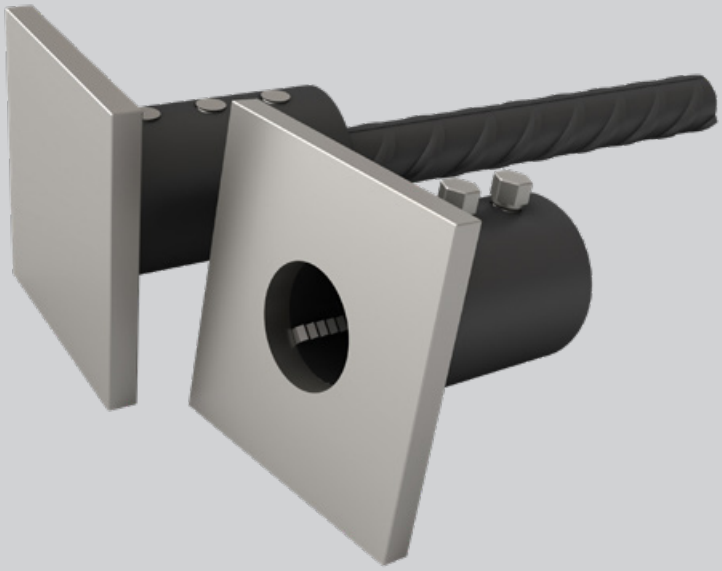
2 Technical Specification

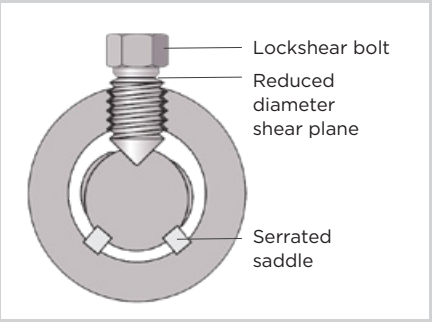
2.1 General

Ancon MBT Headed Anchors are designed to provide dead end embedment for bars in concrete. This helps to reduce congestion and simplify the placement of rebars by removing the need for hooked ends.

Ancon MBT Headed Anchors are for use in connection of deformed steel reinforcing bars complying with BS4449 grades B500B and B500C as appropriate and thereby create structural continuity of the reinforcing system.

2.2 Ancon MBT Headed Anchor





Section showing the embedment of the lockshear bolts and saddles into the bar and the shell of the anchor

The anchor comprises a shortened version of the Ancon MBT ET coupler with a plate welded to one end which carries the full tension load of the bar when it is bearing against the concrete. Plates can be supplied with or without a hole, allowing bars to either end in the coupler or pass through. The Ancon MBT Headed Anchor also has the added advantage of requiring no special bar end preparation.

In all cases heavy duty sockets should be used. When the pre-determined tightening torque for the bolts is reached, the heads shear off leaving the top of the installed bolt slightly proud of the coupler. This provides an instant visual check of correct installation.

Note: Impact tools must not be used to tighten lockshear bolts.

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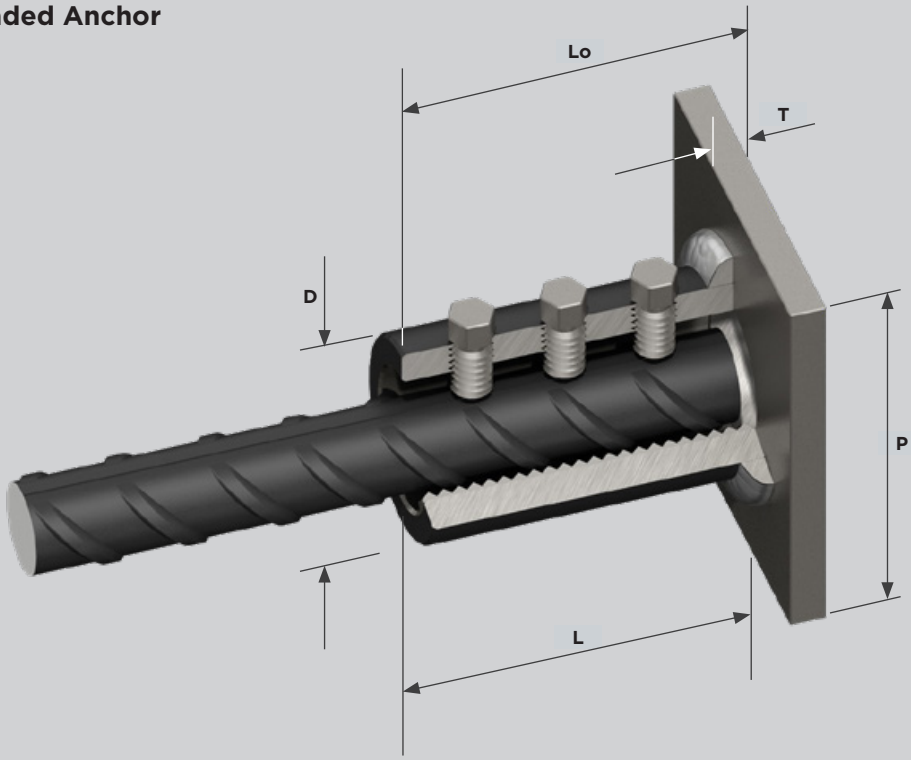
Ancon MBT Headed Anchor



Reinforcing Bar Diameter (mm)		10	12	16	20	25	32	40
External Diameter (mm)	D	33.4	33.4	42.2	48.3	54.0	71.0	81.0
Coupler Length (mm)	L	55	75	82	104	129	156	247
Total Length (mm)	Lo	65	85	92	114	139	171	262
Plate Thickness (mm)	T	10	10	10	10	10	15	15
Plate w x h (mm)	P	70	70	80	90	100	130	150
Socket Size A/F (ins)		½	½	½	½	⅝	⅝	¾
No. of Bolts		2	3	3	4	4	5	7
Weight (kg)		0.64	0.74	1.07	1.58	2.29	4.72	8.30
Torque (Nm)		55	55	108	108	275	360	525
Part No. (no hole in plate)		ETHA10	ETHA12	ETHA16	ETHA20	ETHA25	ETHA32	ETHA40
Part No. (hole in plate)		ETHA10H	ETHA12H	ETHA16H	ETHA20H	ETHA25H	ETHA32H	ETHA40H
Tension Slip		B500B/B500C	B500B/B500C	B500B/B500C	B500B/B500C	B500B/B500C	B500B/B500C	B500B/B500C

Table 1 **Note:** Minimum compressive strength of concrete 25/mm^2. Other sizes are available on request.

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3 Product Performance and Characteristics

Full destructive tests have been carried out to demonstrate compliance with the performance requirements defined in CARES Appendix TA1-B when used with reinforcing steel BS4449 grade B500B or B500C as appropriate:

CARES APPENDIX TA1-B strength requirements

- Permanent deformation is less than 0.10mm after loading to $0.65f_y$ in tension with BS4449 grades B500B or B500C reinforcement.

- 99% characteristic tensile strength is greater than 540MPa with B500B reinforcement 575MPa with B500C reinforcement.

The evaluation considers the strength of the connection between the Ancon MBT Headed Anchor and the reinforcing steel only and does not address aspects of the Ancon MBT Headed Anchor performance nor its connection to the structure which are matters for the designer or specifier.

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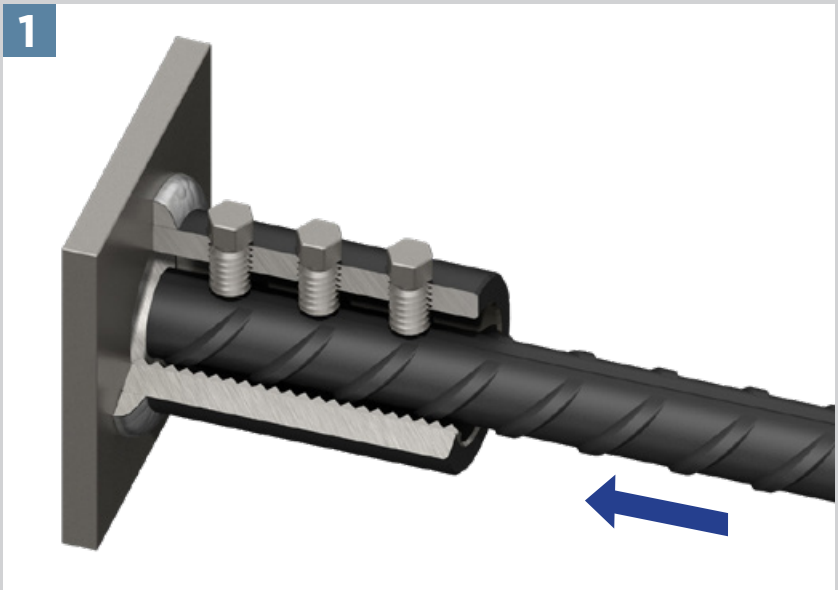
4 Installation

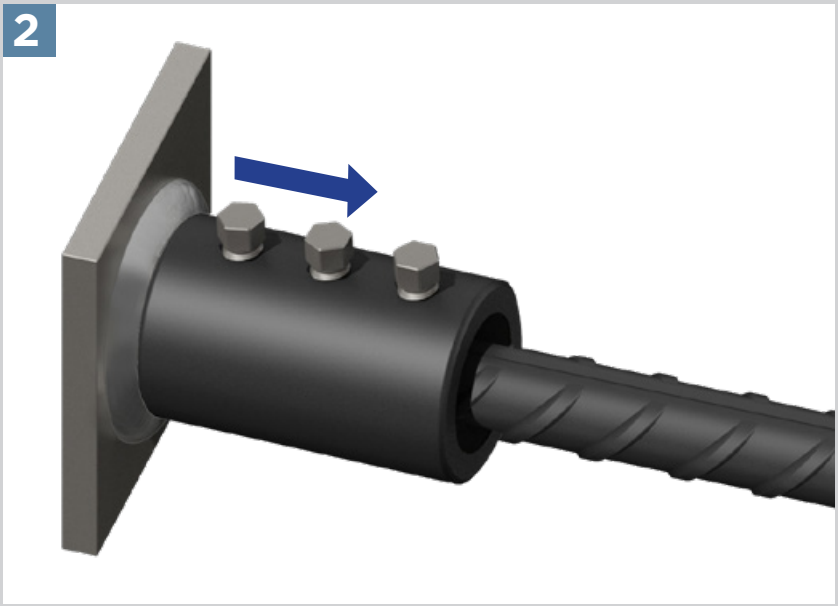
Ancon MBT Headed Anchors must be correctly installed to ensure that the full working capacity can be achieved. The headed anchor must be complete with the correct number of bolts and the two serrated strip saddles in place inside the anchor. For correct installation, all the bolts must be tightened until the heads shear off.

Ancon MBT Headed Anchor



1a) Headed Anchor with no hole in plate - place the headed anchor over the rebar such that the end plate and rebar are in contact within the tube. Tighten the lockshear bolts onto the bar by hand. Check the alignment and make any necessary adjustments.

1b) Headed Anchor with hole in plate - place the headed anchor over the rebar and hold in the required position. The rebar should be level with, or project beyond, the surface of the plate. Tighten the lockshear bolts onto the bar by hand sufficient that the anchor is held in place. Check the alignment and make any necessary adjustments.



Partly tighten all the lockshear bolts using either a ratchet wrench or an electric or pneumatic power tool.
Do not use impact power tools.
Start from the plate end and work outwards.

Leviat Electric Wrenches
The smooth continuous action of the wrench prevents the early shearing of the lockshear bolts and damage to threads. The wrench is supplied with specially hardened heavy duty sockets.

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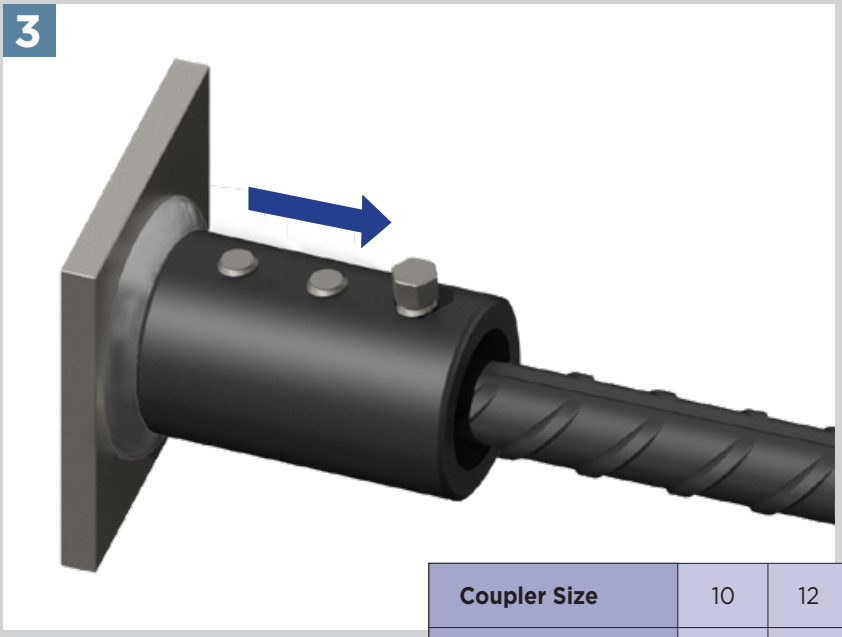

Repeat step 2, starting from the plate end outwards, but this time fully tighten all of the lockshear bolts, using an appropriate tool, until the bolt heads shear off.

See table 2 for correct shear torque.

Coupler Size	10	12	16	20	25	32	40
Shear Bolts Torque	55	55	108	108	275	360	525

Table 2

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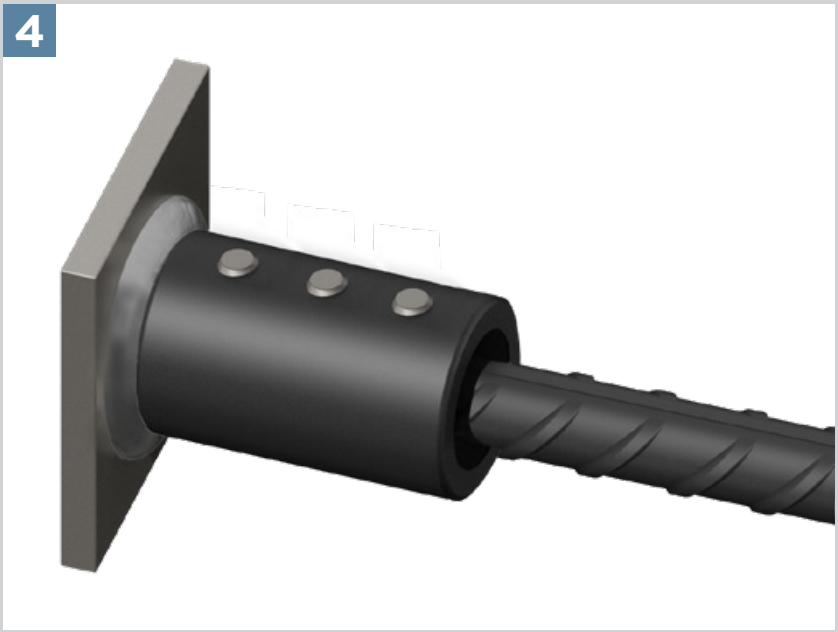

Finished Headed Anchor.

5 Safety Considerations

Ancon MBT Headed Anchors are generally supplied in heavy duty plastic wrap, packed in robust wooden crates. Anchors in heavy duty plastic wrap are less than 25 kgs and may be handled manually with care. Heavier cases (wooden crates) require the use of mechanical handling equipment. Protective gloves should be used when installing the couplers.

6 Product Testing and Evaluation

Ancon MBT Headed Anchors have been tested to satisfy the requirements of CARES Appendix TA1-B with reinforcing bars to BS4449 grades B500B and B500C as detailed in table 1.
The testing comprised the following elements:

- Tensile Strength
- Permanent deformation in tension as detailed in table 1

7 Quality Assurance

Ancon MBT Headed Anchors are produced under an EN ISO 9001 quality management system certified by CARES. The quality management system scheme monitors the production of the headed anchors and ensures that materials and geometry remain within the limits of this technical approval.

The products are also subject to a programme of periodic testing.

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8 Building Regulations

8.1 The Building Regulations (England and Wales)

Structure, Approved Document A

Ancon MBT Headed Anchors, when used in EC2 based designs using the data contained within this technical approval, satisfy the relevant requirements of The Building Regulations (England and Wales), Approved Document A.

Materials and Workmanship, Approved Document

This technical approval gives assurance that the Ancon MBT Headed Anchors comply with the material requirements of EC2.

8.2 The Building Regulations (Northern Ireland)

Materials and Workmanship

This technical approval gives assurance that Ancon MBT Headed Anchors comply with the material requirements of EC2 by virtue of regulation *23, Deemed to satisfy provisions regarding the fitness of materials and workmanship.*

8.3 The Building Standards (Scotland)

Fitness of Materials

This technical approval gives assurance that Ancon MBT Headed Anchors comply with the material requirements of EC2 by virtue of *Clause 0.8.*

Structure

Ancon MBT Headed Anchors, when used in EC2 based designs using the data contained within this technical approval, satisfy the requirements of *The Building Standards (Scotland) clause 1.*

8.4 MHCW Volume 1 Specification for Highway Works, Series 1700 Structural Concrete

This technical approval gives assurance that Ancon MBT Headed Anchors with the requirements of *Clause 1716. Reinforcement - Laps and Joints.*

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9 References

- BS 4449: 2005: Steel for the reinforcement of concrete - Weldable reinforcing steel - Bar, coil and decoiled product - Specification.
- BS 8597: 2015: Steels for the reinforcement of concrete - Reinforcement couplers.
- BS8110: Part 1: 1997: Structural Use of Concrete, Code of Practice for Design and Construction.
- BS EN 1992-1-1:2004 Eurocode 2 Design of concrete structures - General rules for buildings.
- BS EN ISO 9001: Quality management systems - Requirements.
- CARES Appendix TA1-B: Quality and Operations Schedule for the Technical Approval of Couplers for Reinforcing Steel and Reinforcement Anchors for Static Loading in Tension or Tension and Compression.

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10 Conditions

1. The quality of the materials and method of manufacture have been examined by CARES and found to be satisfactory. This technical approval will remain valid provided that:

   a) The product design and specification are unchanged.
   b) The materials, method of manufacture and location are unchanged.
   c) The manufacturer complies with CARES regulations for Technical Approvals.
   d) The manufacturer holds a valid CARES Certificate of Product Assessment.
   e) The product is installed and used as described in this report.

2. CARES make no representation as to the presence or absence of patent rights subsisting in the product and/or the legal right of Leviat to market the product.

3. Any references to standards, codes or legislation are those which are in force at the date of this certificate.

4. Any recommendations relating to the safe use of this product are the minimum standards required when the product is used. These requirements do not purport to satisfy the requirements of the Health and Safety at Work etc Act 1974 or any other relevant safety legislation.

5. CARES does not accept any responsibility for any loss or injury arising as a direct or indirect result of the use of this product.

6. This Technical Approval Report should be read in conjunction with CARES Certificate of Product Assessment No 5096. Confirmation that this technical approval is current can be obtained from CARES.

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