

# CARES Technical Approval Report TA1-F 5090



Issue 1



Product approval held by: ERICO

## nVent LENTON PM04 Hybrid Position Coupler

Assessment of the  
nVent LENTON  
PM04 Hybrid Position  
Coupler Product  
and Quality System  
for Production



Electronic Copy [www.carescertification.com](http://www.carescertification.com)

 TECHNICAL APPROVAL 5090	 0002	 Validate with the CARES Cloud App
--	---	---

# Product

## nVent LENTON PM04 Hybrid Position Coupler for reinforcing steel

### Product approval held by:

ERICO Europe BV,  
Jules Verneweg 75,  
5015 BG,  
Tilburg,  
The Netherlands

## 1 Product Summary

nVent LENTON PM04 Hybrid Position Couplers in the size range as detailed in table 1 are for the mechanical connection of deformed high-yield carbon steel bars for the reinforcement of concrete complying with the requirements of BS4449 Grade B500B.

By agreement, this Technical Approval is not valid in the United Kingdom, as it acknowledges that the UK Standards Committee rejected ISO15835:2018 during the public comment phase of its introduction.

The introduction of the TA1-F appendix by CARES is to facilitate a Technical Approval scheme incorporating a testing method for couplers in geographical areas where no national approval schemes currently exist.

### 1.1 Scope of Application

nVent LENTON PM04 Hybrid Position Couplers in the size range of as detailed in table 1 have been evaluated for use as follows:

- a) TA1-F: Eurocode 2 for static applications in tension only with BS4449 Grade B500B reinforcement.
- b) ISO15835-1:2018 Steels for the reinforcement of concrete - Reinforcement couplers for mechanical splices of bars - requirements Type B coupler under predominantly static loads in tension only using BS4449 Grade B500B reinforcement.

### 1.2 Design Considerations

Eurocode 2, Clause 8.7 Laps and mechanical couplers 8.7.1 General (1)P "Forces are transmitted from one bar to another by:

- lapping of bars, with or without bends or hooks;
- welding;
- mechanical devices assuring load transfer in tension-compression or in compression only."



Clause 8.8 Additional rules for large diameter bars goes on to state that “Splitting forces are higher and dowel action is greater with the use of large diameter bars. Such bars should be anchored with mechanical devices.”

The specified cover for fire resistance and durability should be provided to the coupler sleeve. The couplers as detailed in table 1 have been designed with controlled mechanical properties to be compatible with reinforcing bars complying with BS4449 Grade B500B.

### 1.3 Conclusion

It is the opinion of CARES that nVent LENTON PM04 Hybrid Position Couplers in the size range as detailed in table 1 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  
 August 2024

Electronic Copy www.carescertification.com

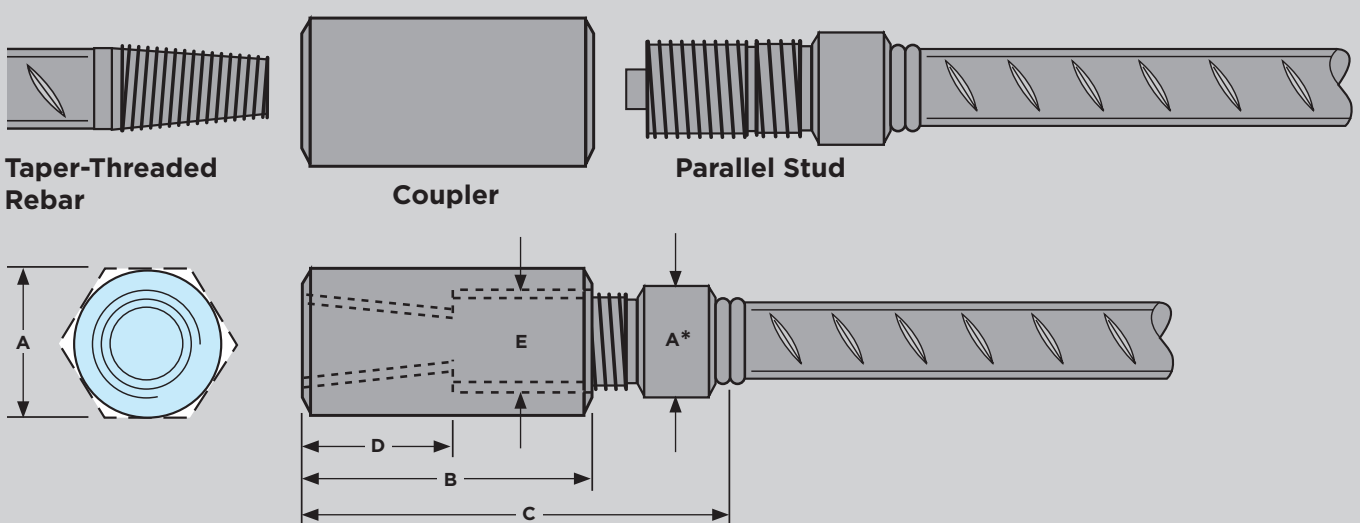


## 2 Technical Specification

### 2.1 General

nVent LENTON PM04 Hybrid Position Couplers are for joining deformed Grade B500B steel reinforcing bars complying with BS4449. Part numbers detailed in the following tables are stamped on the coupler and component parts. A further suffix and batch identity is also stamped ensuring traceability to the manufacturing unit and production respectively.

### 2.2 nVent LENTON PM04 Hybrid Position Coupler



#### PM04 Hybrid Position Coupler

The nVent LENTON Ultimate two-piece PM04 Hybrid Position Coupler is used in conjunction with LENTON taper-threaded rebar, that is produced on standard LENTON threading equipment globally.

LENTON Ultimate platform utilizes a high efficiency parallel thread that provides “full strength” in tension, compression, and stress reversal applications, while also providing positional adjustability. The nVent LENTON self-aligning taper-thread reduces misalignment issues and helps eliminate cross-threading during installation.

Typical applications include bent bar, prefabricated cages and precast structural elements.

The dimensions for the PM04 Hybrid Position Coupler are as follows:

Size mm	Part No	“A*” mm	“A” mm	“B” mm	“C”(Max) mm	“D” mm	“E”	Weight kg	Colour Plug	Installation Torque Nm
16	LU16PM04	22*	27*	49	73	24	M18	0.28	Black	120
20	LU20PM04	27*	36	68	92	35	M24	0.58	Yellow	180
25	LU25PM04	30*	38	77	101	40	M29	0.77	Red	270
32	LU32PM04	36	51	88	114	45	M36	1.34	Yellow	300
40	LU40PM04	45	60	106	133	57	M44	2.26	Green	350

Table 1

\*hexagon (measured across the flats)

### 3 Product Performance and Characteristics

Full destructive tests have been carried out to demonstrate compliance with the performance requirements defined in CARES Appendix TA1-F coupler when used with reinforcing steel BS4449 grade B500B as appropriate as detailed in tables 1.

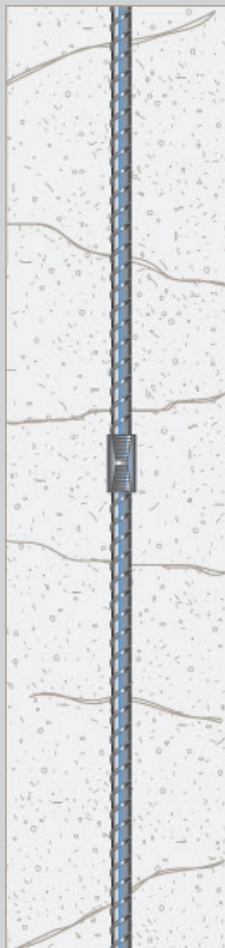
#### CARES APPENDIX TA1-F strength requirements

- Permanent deformation is less than 0.10mm after loading to 60% of the specified characteristic yield strength value of the reinforcing bar in tension with BS4449 grade B500B reinforcement, tested in accordance with option 2 of ISO15835-1 clause 5.4.1.
- The relaxed slip requirements for couplers longer than 100mm and calculation of slip as a median as defined in ISO 15835-1:2018 clause 5.4.2 is not be permitted for couplers approved under this TA1-F schedule

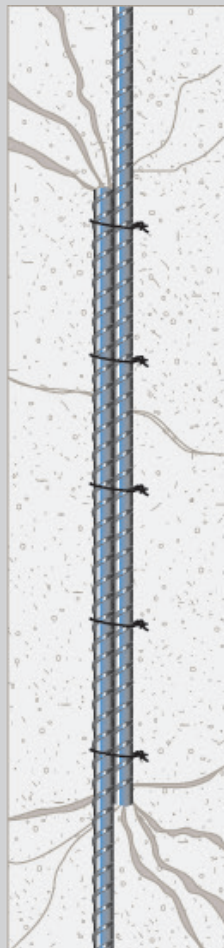
#### ISO15835-1:2018 requirements for slip and tensile strength

Tests verify compliance with Clauses 5.3 and 5.4 of ISO15835-1:2018 for the following for a category “B” coupler as defined in table 2:

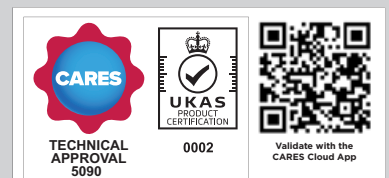
- slip under static forces; and
- tensile strength and ductility under static forces.



Mechanical splicing provides the assurance of maintaining load path continuity of the structural reinforcement independent of the condition or existence of the concrete



Lap splices rely on bond with the concrete for effective continuity of reinforcement, which can result in localised areas of increased concrete stress that must be considered by the designer



## 4 Installation

The bars to be threaded must be cut square and threaded, using LENTON equipment and suitably trained and experienced operatives in accordance with LENTON operating instructions. These operators will have received LENTON equipment training.

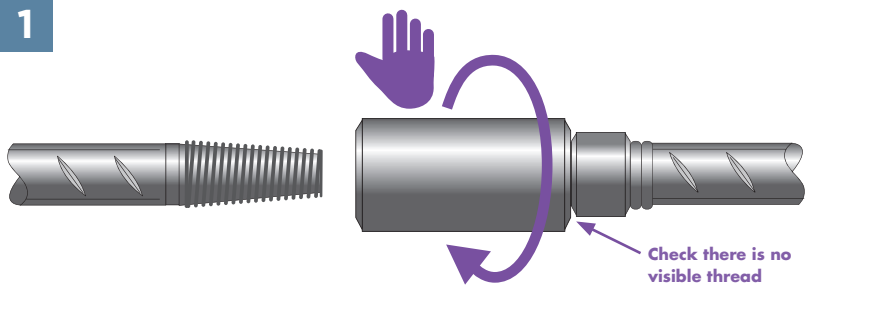
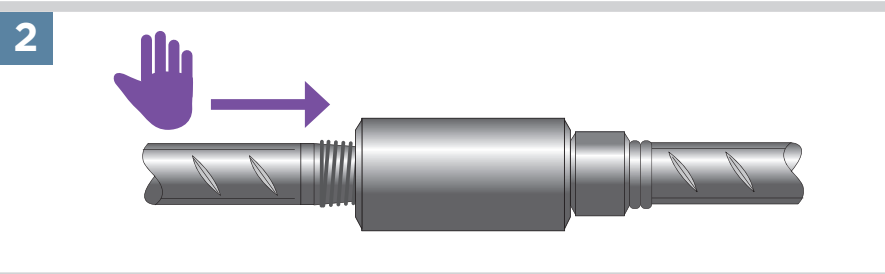
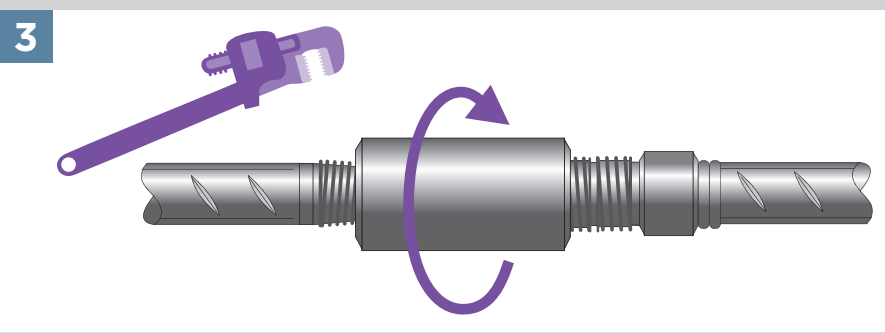
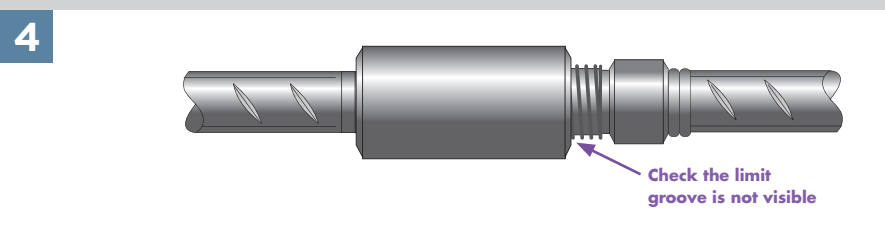
It is essential that the joints be tightened to the correct torque mentioned in the installation manual, using the appropriate LENTON torque wrench.

### 4.1 nVent LENTON PM04 Hybrid Position Coupler

The PM04 Hybrid Position Coupler is designed to connect reinforcing bars of the same diameter when neither bar in the splice can be rotated.

The components are initially hand-tightened and then torqued to specification.

#### PM04 Hybrid Position Coupler installation instructions

<p><b>1</b></p> 	<p><b>1. Join the Coupler Components:</b></p> <p>Hand-screw the coupler body into the parallel thread stud until no parallel threads are visible.</p>
<p><b>2</b></p> 	<p><b>2. Insert the Continuation Bar:</b></p> <p>Push the tapered continuation bar into the coupler until it rests against the parallel stud.</p>
<p><b>3</b></p> 	<p><b>3. Secure the Coupler:</b></p> <p>Screw the coupler body over the LENTON thread.</p> <p>Tighten the coupler body using a LENTON wrench to the correct torque as specified in the installation manual.</p>
<p><b>4</b></p> 	<p><b>4. Finalise Installation:</b></p> <p>Ensure the limit groove on the parallel stud is not visible beyond the coupler.</p>

## 5 Safety Considerations

Care must be taken in handling and installing couplers. Couplers are supplied in containers that have a maximum weight of 25kg. Protective gloves should be worn when handling the containers, threaded bars and installing the couplers.

## 6 Product Testing and Evaluation

nVent LENTON PM04 Hybrid Position Couplers have been tested to satisfy the requirements of CARES Appendix TA1-F for Couplers with reinforcing bars to BS4449 Grade B500B as appropriate. The testing comprised the following elements:

- Tensile Strength
- Ductility
- Permanent deformation in tension

Tests verify compliance with Clauses 5.3 and 5.4 of ISO15835-1:2018 for tensile strength, ductility and slip under static forces.





## 7 Quality Assurance

nVent LENTON PM04 Hybrid Position Couplers for reinforcing steel are produced under a BS EN ISO9001 quality management system certified by CARES at locations agreed with CARES.

The quality management system scheme monitors the production of the Standard and Standard Transition Couplers and ensures that materials and geometry remain within the limits of this technical approval.

The products are subject to a programme of periodic testing to ensure continued compliance.



## 8 Materials and Workmanship

This technical approval gives assurance that the nVent LENTON PM04 Hybrid Position Couplers to reinforcing steel comply with the material requirements of EC2.

## 9 References

- BS4449: 2005 Steel bars for the reinforcement of and use in concrete - Requirements and test methods.
- ISO15835-1:2018 Steels for the reinforcement of concrete - Reinforcement couplers for mechanical splices of bars - Part 1: Requirements.
- 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-F: Quality and Operations Schedule for the Technical Approval of Couplers for high cycle fatigue and low cycle loading and static loading applications in tension.

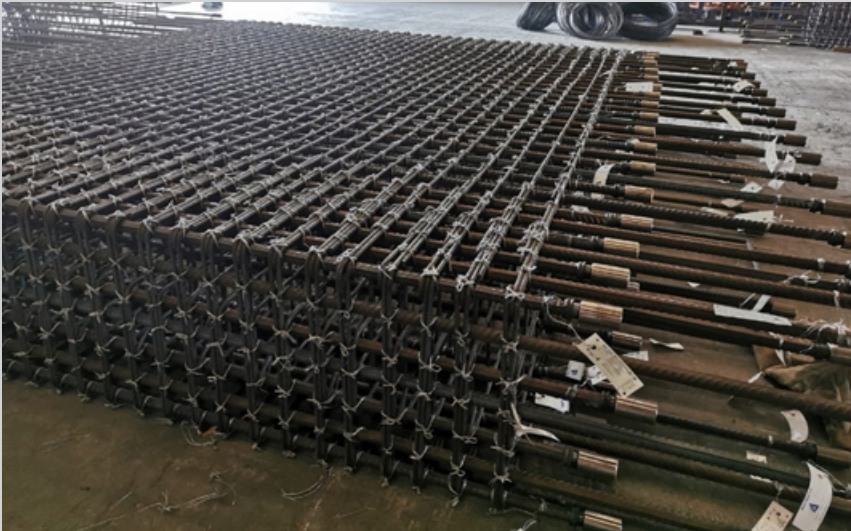


## 10 Conditions

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 providing 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 nVent 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 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 5090. Confirmation that this technical approval is current can be obtained from CARES.



## nVent LENTON PM04 Hybrid Position Coupler Applications



**Prefabricated reinforcing bar cage for a core wall with 2 layers and staggered splice locations.**



**Reinforcing bar is tightly secured within the cage structure preventing any movement of individual bars. Positional misalignment is overcome by using the LENTON Ultimate PM04 Hybrid Position Coupler at reinforcing bar connection locations.**



**Prefabricated reinforcing bar cage using LENTON Ultimate PM04 Hybrid Position Couplers being lifted into position for installation.**



Electronic Copy www.carescertification.com

## CARES

Pembroke House  
21 Pembroke Road  
Sevenoaks  
Kent TN13 1XR

Phone: +44(0)1732 450000  
E-mail: [general@carescertification.com](mailto:general@carescertification.com)  
[www.carescertification.com](http://www.carescertification.com)



**Independent Product Assessments  
for the Construction Industry**

Copyright CARES ©