



Reinforcing Bar Coupler System

For The Construction Industry

Unbrako Reinforcing Bar Coupler System

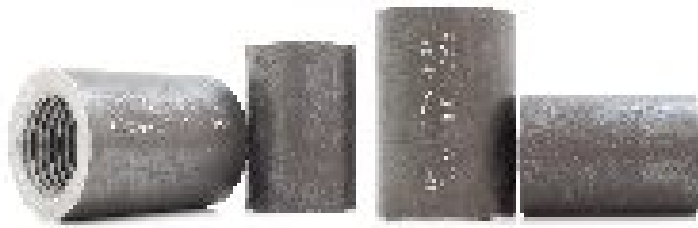
Unbrako Rebar Coupler Systems, also known as reinforcing bar couplers or coupler splicing connection, is a threaded sleeve that guarantees an ultimate tensile strength of the splice (joint) greater than that of the parent bar. Coupler splicing system is suitable for joining reinforcement bars end to end.

Unbrako Rebar Couplers are designed and manufactured in accordance with governing specifications of ASTM A615, ASTM A706, ASTM A775 and comply to ACI 318, ACI 349, A.A.S.H.T.O, IS 1786, IS 16172:2014, and UBC 1997.

Unbrako STANDARD COUPLERS are produced from carbon steel with tensile strength of 600 MPa.

If higher tensile strength is required, Unbrako SUPER COUPLERS can be customized to 800-900 MPa according to specific project needs.

Unbrako couplers are generally supplied in self colour. Unbrako couplers are also available with Galvanized coating & in Stainless Steel.



New Method : Rebar Coupler

Advantages Over Lap Splice Joints

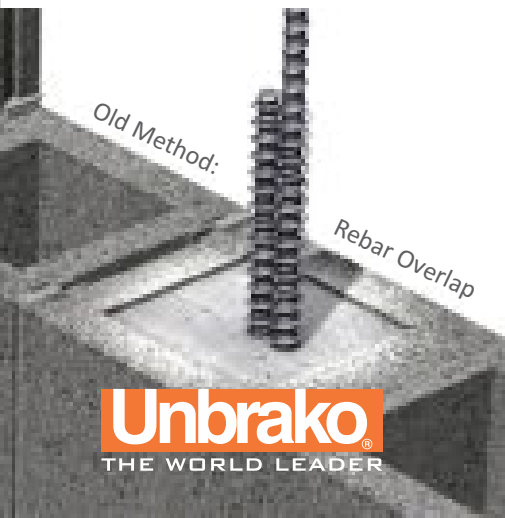
Unbrako Rebar Couplers are an effective and efficient alternative for lap splice or overlapping joints. A lap splice is when two pieces of rebar are tied together where the bars overlap. The length of the overlap is calculated by using the

equation $30 - 40$ times the bar diameter (d). Cost comparisons show that it is more cost effective to use threaded mechanical couplers to join the bars than it is to lap rebar over a length of $40d$ or greater, as less material is used.

The strength of Unbrako rebar coupler however is independent of the concrete in which it is located and therefore will retain its strength even with loss of cover either due to impact damage or seismic event.

Further lap splice joints depend upon the concrete for load transfer. Thus any degradation in the integrity of the concrete could significantly affect the performance of the joint.

Unbrako rebar couplers are easy to install, quickly and safely, saving you the time that would be otherwise spent in planning costly laps design & installation. Thus speed up the construction time.



Features of Unbrako Rebar Couplers:

- Quick and easy installation
- Simpler design details
- Increased productivity and safety of the connection.
- Strength joint allows full ductile elongation of reinforcing bars.
- Manual assembly. No special calibrated wrenches required.
Can be assembled using a pipe or chain wrench.
- No risk of cross threading, as it can be visually inspected.
- Reduced congestion of bars, unlike lapping where greater congestion within the concrete can lead to production of transverse forces having the effect of pushing the bars apart.
- Faster construction time.
- Reduced cost of erection.

CONTENTS :

Unbrako Upset Parallel Threaded Coupler	4
Unbrako Transitional Splices	4
Bar-End Preparation Process	5
Unbrako Parallel Threaded Coupler	6
Bar-End Preparation Process	6
Splicing Systems	7
Technical Data	8
E-code™ Total Traceability	8
Quality Assurance	9
Colour-coded Protective Caps	10
Mobile Preparation Facility	10

Unbrako Upset Parallel Threaded Coupler

The Unbrako upset rebar coupler is perfect for large scale projects. It is a parallel threaded system for reinforcing bars dia 12 mm. to 50 mm diameter. It is fully capable of producing full strength joint in the rebar connection. Threads are ISO-metric with 60° angle to provide sufficient strength to the joint.

Standard Unbrako Couplers are produced from carbon steel with tensile strength of 600 MPa.



Part No.	Bar Diameter			Outer Diameter [mm]	Length in mm	Thread size
	Inch.	Metric	Bar Designation No. [mm]			
787739	1/2"	12	4 [13]	20	28	M14x2
787740	5/8"	16	5 [16]	26	40	M20x2.5
787741	3/4"	20	6 [19]	34	48	M24x3
787742	7/8"	22	7 [22]	36	54	M27x3
787743	1"	25	8 [25]	42	60	M30x3.5
787744	1 1/8"	28	9 [29]	48	66	M33x3.5
787745	1 1/4"	32	10 [32]	53	72	M36x4
787746	1 1/2"	36	11 [36]	60	84	M42x4.5
787747	1 5/8"	40	14 [43]	65	90	M45x4.5
787748	2"	50	18 [57]	80	110	M56x5.5

If higher tensile strength is required, SUPER COUPLERS can be customized to 800-900 MPa according to specific project needs.

Unbrako Transitional Splices

Unbrako transitional splices or reduced thread couplers are used to join bars of different diameters. The transitional coupler is internally threaded with 2 different threads. The diameter of each thread corresponds to the respective bar size. Consequently transitional splices help to change one bar size to another, as per engineers design, most commonly found in column structures that get narrow as they rise.

Bar Combination	Thread at one end	Thread at second end
5 [16] / 4 [13]	M20x2.5	M14x2
6 [19] / 5 [16]	M24x3	M20x2.5
7 [22] / 6 [19]	M27x3	M24x3
8 [25] / 7 [22]	M30x3.5	M27x3
9 [29] / 8 [25]	M33x3.5	M30x3.5
10 [32] / 9 [29]	M36x4	M33x3.5
11 [36] / 10 [32]	M42x4.5	M36x4
14 [43] / 11 [36]	M45x4.5	M42x4.5
18 [57] / 14 [43]	M56x5.5	M45x4.5



What you build is only as good
as what holds it together



The GANGA RIVER BRIDGE in Patna, DAHEJ (SEZ) CHEMICAL PLANT in Gujrat and J3 JAMNAGAR PROJECT in Gujarat (World's Largest Refinery Project) are all built using Unbrako Rebar couplers.

Bar-End Preparation Process

For Upset Parallel Threaded Coupler

First, the ends of the reinforcing bars are cut on a saw machine to achieve an end to end flat surface. This sawn end is then enlarged by cold forging process. This increases the core diameter of the bar to ensure that the joint is stronger than the bar, & makes it suitable for threading.

Parallel standard ISO metric threads are then cut onto the enlarged ends that match the threaded coupler.

Parallel threads reduce the risk of cross-threading and the risk of mismatch. The threaded ends are protected by external plastic caps.

Finally mechanically splice the rebar with parallel threaded Unbrako couplers. Generally, a nominal allowance should be made per threaded bar end for the length consumed in cutting and cold forging, by adding extra length to the required length of the bar.

OPERATION : 1

Make parallel face of bar by cutting in saw machine



OPERATION : 2

The sawn cut end of the reinforcing bar is enlarged by cold forging process, thus increasing its diameter



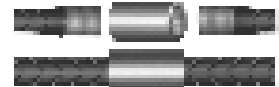
OPERATION : 3

Standard ISO metric threads are then cut onto the enlarged end & covered by plastic caps to protect the thread of rebar.



OPERATION : 4

Finally splice the rebar by using threaded Unbrako rebar couplers.



The couplers are supplied with protective end caps that protect their internal threads from dirt & concrete water. Unbrako couplers can be assembled easily and do not require special calibrated wrenches. For further information contact Unbrako today.

Unbrako Parallel Threaded Coupler

The Unbrako parallel threaded rebar coupler is suitable for small scale projects. It involves a simple process using only one machine & one operator for all the peeling, ribbing & threading operations. Unbrako production facilities are ISO 9001 and ISO/TS 16949 certified. Our quality measures go beyond to include *Total Traceability*.

Our patented E-code head marking system allows tracing of test records for each production lot.

Model	Part No.	Bar Diameter			OD(mm)	Length (mm) +2	Thread Pitch (mm)	Size of Thread
		Inch.	Metric	Bar Designation No. [mm]				
UNB12	795922	½"	12	4 [13]	21	36	1.75	12.1 x 1.75
UNB16	795924	5/8"	16	5 [16]	24	38	2.5	16.8 x 2.5
UNB20	795926	3/4"	20	6 [19]	29	48	2.5	20.6 x 2.5
UNB22	795927	7/8"	22	7 [22]	33	53	2.5	22.6 x 2.5
UNB25	795928	1"	25	8 [25]	37	58	3	26.0 x 3.0
UNB28	795929	1 1/8"	28	9 [29]	41	63	3	28.6 x 3.0
UNB32	795930	1 1/4"	32	10 [32]	47	73	3	32.8 x 3.0
UNB36	795931	1 1/2"	36	11 [36]	54	83	3.5	36.7 x 3.5
UNB40	795932	1 5/8"	40	14 [43]	59	88	3.5	40.4 x 3.5

Bar-End Preparation Process

For Parallel Threaded Coupler

1. Cutting :

The end of the reinforcing rebar is sawn square



2. Peeling

The transverse and longitudinal ribbing at the end of the rebar is peeled.



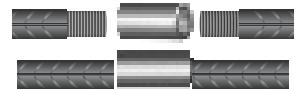
3. Threading

Finally, the peeled end of the rebar is rolled thread.



4. Mechanical Splice

Coupler can be used to connect the ends rebars of double steel rebar.



Splicing Systems:

Two types of splicing systems are used as per the requirement at construction site:

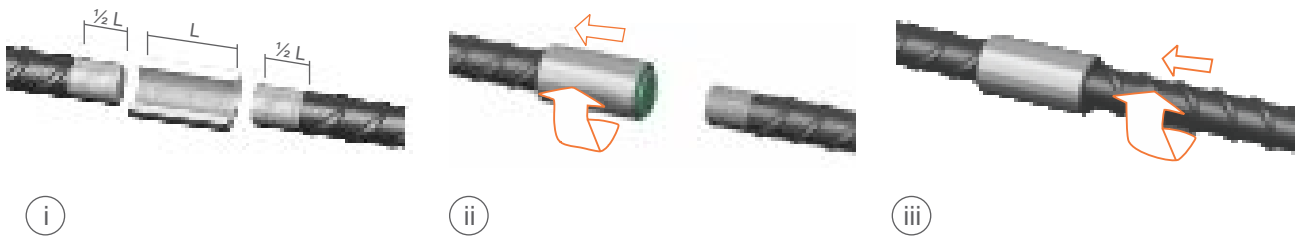
- Type A system is used when the connecting rebar is rotatable.
- Type B system is used when the both bars are not rotatable.

Type A (When the Connecting Rebar is rotatable)

When at least one connecting rebar can be rotated, then ends of both the bars are threaded for half the length of the coupler. After threading, coupler is screwed on the rear of the fixed rebar. Remove the plastic cap from the coupler. The second rebar is then rotated against the initially screwed coupler to fully engage the coupler.

Detailed process is shown through appropriate figure below :

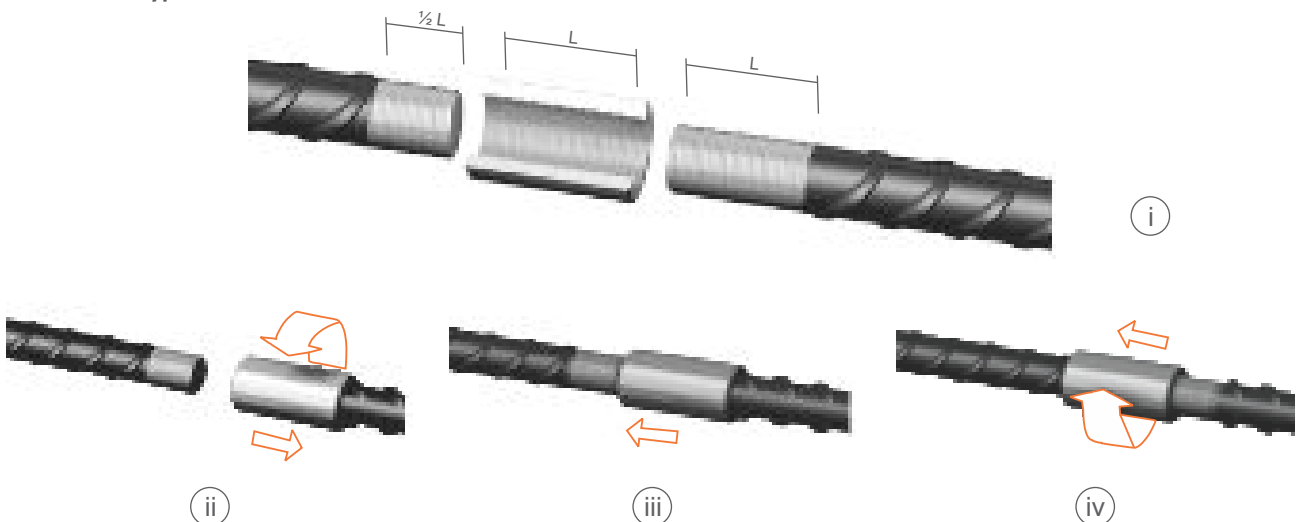
Installation Type A



Type B (When both the Bars are not rotatable)

When both bars are not rotatable, then first bar is threaded for the full coupler length to screw coupler fully onto the extended threads. The second bar is threaded to half of the coupler length. The assembly is completed by butting the bars end to end and rotating the coupler onto the second rebar.

Installation Type B



Technical Data

Unbrako couplers are designed to match the requirements of all the governing specifications ASTM A615, ASTM A706, ASTM A775 and comply to ACI 318, ACI 349, A.A.S.H.T.O and UBC 1997. During design development and testing full attention is paid to critical use of the product.

UNBRAKO coupler system achieves full strength of reinforcement bars grade 60, which is higher ultimate tensile strength than the actual ultimate tensile strength of the bar grade.

Bar Designation No.[mm]	Diameter inch. [mm]	Cross Sectional Area in. ² [mm ²]	Perimeter inch. [mm]	Load w.r.t Stress Kips[Kn]	Load w.r.t Tensile Kips[Kn]
Stress KSI [N/mm ²]				75 [520]	100 [690]
4 [13]	0.500 [12.7]	0.20 [129]	1.571 [39.9]	15.0 [67.1]	20 [89.0]
5 [16]	0.625 [15.9]	0.31 [199]	1.963 [49.9]	23.3 [103.5]	31 [137.3]
6 [19]	0.750 [19.1]	0.44 [284]	2.356 [59.8]	33.0 [147.7]	44 [196.0]
7 [22]	0.875 [22.2]	0.60 [387]	2.749 [69.8]	45.0 [201.2]	60 [267.0]
8 [25]	1.000 [25.4]	0.79 [510]	3.142 [79.8]	59.3 [265.2]	79 [351.9]
9 [29]	1.128 [28.7]	1.00 [645]	3.544 [90.0]	75.0 [335.4]	100 [445.1]
10 [32]	1.270 [32.3]	1.27 [819]	3.990 [101.3]	95.3 [425.9]	127 [565.1]
11 [36]	1.410 [35.8]	1.56 [1006]	4.430 [112.5]	117.0 [523.1]	156 [694.1]
14 [43]	1.693 [43.0]	2.25 [1452]	5.320 [135.1]	168.8 [755.0]	225 [1001.9]
18 [57]	2.257 [57.3]	4.00 [2581]	7.090 [180.1]	300.0 [1342.1]	400 [1780.9]

* Nominal Dimensions

E-Code™ Total Traceability

Your application demands a fastener which outperforms all others. Unbrako's patented E-CODE™ head marking system allows tracing of test records to specific production batches. Unique letters and numbers in the marking ensure 100% traceability from a single coupler to

Unbrako mechanical & dimensional certificates. It is the ultimate in fastener traceability. Even when the box is discarded, and the rebar couplers are used, there is still full traceability. Thus, any Unbrako rebar coupler found in any location can be instantly identified.



BS	xx	UNBRAKO	xx	xx	xxxx	xxxxxxx
Bar Size	Dia	Mfg. ID	Outer Dia	Length	Thread Pitch	Unique Batch No. For Total Traceability

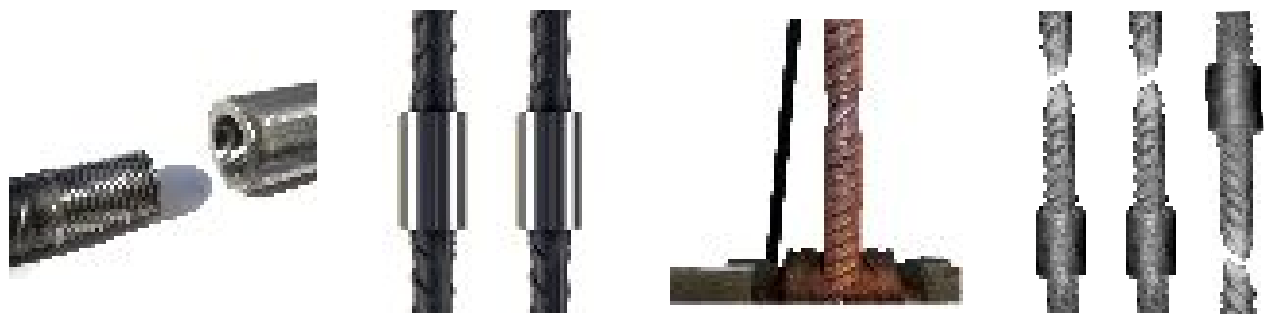
* X represents value taken in due course of time.

Quality Assurance

Unbrako production facilities are ISO 9001, ISO/TS 16949, ISO 14001 and BS OHSAS 18001 certified. Unbrako Rebar Couplers are manufactured in these modern facilities conforming to strict technical specifications and governing standards to provide the

ultimate coupler system to our customers. Full traceability of the couplers production batches and raw materials allows for defect-free manufacturing. Note the couplers must be used as per manufactures' specifications & instructions.

Unbrako Rebar Couplers are tested in our in-house labs with fully automated testing machines. Full destructive tests are carried out complying with ACI 318, ACI 349, among others.



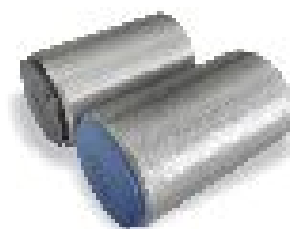
Typical Test Results

Nominal Bar Size Dia. mm	Yield Stress (N/mm ²)	Ultimate Stress (N/mm ²)	Elongation %	Failure Mode
16	534	588	18	Bar Break
16	534	588	18	Bar Break
16	534	588	18	Bar Break
16	534	588	18	Bar Break
16	534	588	18	Bar Break

Colour Coded Protective Caps

The colour-coded plastic sealing caps are provided to protect the threads of couplers & bars against penetration of dirt and cement grout. Further they also enable quick identification of the bar size and prevent mismatching of threads.

BAR SIZE	COLOUR
4 [13]	Green ●
5 [16]	Blue ●
6 [19]	Red ●
7 [22]	Clear ○
8 [25]	Brown ●
9 [29]	Orange ●
10 [32]	Yellow ●
11 [36]	Black ●
14 [43]	Pink ●
18 [57]	Grey ●



Mobile Preparation Facility

On large contracts where bar end preparation can be carried out on site, equipment can be made available for hire. For further information please contact Unbrako.



Disclaimer

The information in this literature is given as a guide only. The information is based on International Fastener Standards. All such source material and information beyond the control of Unbrako is subject to change. Whilst every care has been taken to ensure that all information and technical data is accurate, Unbrako will not be liable to any customer that relies on any matter, fact or representation nor will it be liable for any subsequent damage or loss resulting from the use of any information contained in this catalogue. Customers are advised to make their own enquiries or seek independent advice regarding the fitness and suitability of the products listed. The products listed in this catalogue might not be stocked at Unbrako at all times and customers are advised to enquire the availability of the same. E. &O.E.



ALSO AVAILABLE IN Unbrako Construction Fasteners

Arc Welding Stud / Shear Connector

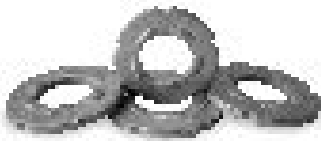


The UNBRAKO ARC Welding Stud is used in the construction of tall buildings, bridges and steel structures. The drawn-arc process produces a full cross-sectional weld forming a bond that is greater than the surrounding material. It improves the strength of the structure.

Product Range :
Metric: M13, M16, M19,
M22, M25 – Any Length

Inch: 1/2", 5/8", 3/4",
7/8", 1" – Any Length

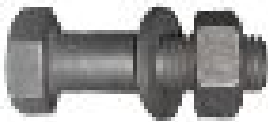
Direct Tension Indicator



UNBRAKO Direct Tension Indicator also known as Auto Torque Indicator, are single-use mechanical load cells designed to indicate the magnitude of preload in the assembly. It shows if the bolt is properly tensioned, very useful while tensioning High Strength Structural Bolts.

Product Range :
Metric: M16 – M36 as per
BS EN 14399-9
Unbrako Feeler Gauge is
available to check if the
required torque is achieved.

High Strength Structural Bolt Assembly



Compared to the conventional methods of riveting or welding, UNBRAKO Pre-load bolts maintain the permanent strength of the joint due to reduced stress concentration. Hence, it does not permit loosening, making it most ideal where vibration is involved.

Product Range :
Metric: M12 to M36
Any Length

As per BS EN 15048-1/2
& 14399-3/4 or as
per IS 3757

Tension Control Structural Bolt Assembly



Unbrako
Electric
Shear Wrench

UNBRAKO Auto Torque Check Bolt also known as Tension Control Bolt is an easy to install heavy duty bolt used in Steel Frame Construction. It has its own built-in torque control device. The outer socket of electric wrench rotates the nut until the torque control groove in the spline shears off, on achieving proper bolt tension.

Product Range :
Metric: M12 – M30
(any length) – As Per
BS EN 14399 - 10

Unbrako Electric Shear
Wrench is also Available.

Prices available on request.
Contact Unbrako for further detail.



UNBRAKO AUSTRALIA

Deepak Fasteners (Australia) Pty. Ltd.,
67-69 Licola Crescent Dandenong
South Victoria 3175, Australia
Tel: +61-3-98940026,
Fax: +61-3-98940038



UNBRAKO EUROPE

Deepak Fasteners (Shannon) Ltd.,
Bays 25-30 Shannon Industrial
Estate, County Clare, Ireland
Tel: +353-61-716-500,
Fax: +353-61-716-584



UNBRAKO INDIA

Deepak Fasteners Ltd.,
4th Floor, First Mall, Mall Road
Ludhiana- 141001 (Pb.) India
Tel: +91-161-3911111, 7131111
Fax: +91-161-2774400



UNBRAKO UK

Deepak Fasteners (UK) Ltd.,
12-14 Tower Street, New Town
Birmingham - B19 3RR, U.K.
Tel: +44-121-333-4610,
Fax: +44-121-333-4525



UNBRAKO USA

Unbrako LLC
11939 Woodruff Ave
Downey, CA 90241-USA
Tel: +1-562-674-3550,
Fax: +1-213-402-2547



Interested to know more?

Scan the code

or log on to

www.deepakfasteners.com

