PERTLESS CO.

REBAR COUPLERS

What are rebar couplers?

Rebar couplers are prefabricated elements used to join two rebars at the rebar breaks and transfer the forces between the two of them.

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Lapped joints may not always be the most suitable method for connecting reinforcing bars. Their utilization can prove time-consuming during both the design and installation phases, potentially resulting in increased congestion within the concrete due to the greater volume of rebar utilized.

Key features that make couplers a better alternative for the traditional overlapped method:

- **High Installation Speed of Couplers:** Thread and coupler mechanical connections have a high speed of execution and do not require expert personnel, and cause faster progress of activities in large projects.
- **Lower Cost and Lower Waste of Material:** Since the overlapped length in regulation are 50-60 times the rebar diameter, the cost of buying a coupler and running a thread will be significantly lower for high-sized rebars than the cost of running an overlap.
- **No Need for Expert Staff:** Implementation of thread and coupler is very simple and does not require special expertise.
- **Uniform Quality of Couplers:** Since the coupler parts are prefabricated in factories, these parts usually have a certain and uniform quality.
- **High Strength of Coupler and Thread Against Heavy Loads:** Mechanical joints create a non-relying on concrete rebar connection while overlapped quality of connections are highly dependent on the quality of concrete.

Most significant applications of couplers:

- Reducing Dimensions of Sections
- Mega Structures and Sky Scrappers
- Infrastructures such as Dams and Tunnels
- Very Important Structures such as Hospitals, Airports and Telecom Centers

Content

Introduction of Pertless Couplers:

Pertless couplers are crafted in accordance with ASME B1.13M standards and compliant with esteemed codes such as ACI318, ACI349, UBC1997, and Eurocode2, these couplers epitomize precision and adherence to industry benchmarks.

Each coupler undergoes quality assurance protocols, including thorough testing with gauges to ensure uniformity and consistency across all products. Any coupler failing to meet our quality criteria is promptly excluded from production, guaranteeing a standardized level of excellence.

Furthermore, regular tensile testing conducted weekly ensures that our mechanical joints consistently deliver the required strength, earning them the classification of Type 2 mechanical joints in accordance with industry standards.

With Pertless couplers, reliability and performance are assured, making them a preferred choice for demanding construction applications.

Cold Pressing Rebar Couplers

Midcouplers

Headcouplers

Transition Rebar Coupler

Installation Method

Here's a summarized installation process for mechanical joints, specifically for rebars using couplers:

1. Thread the Rebars: Utilize threading machines to thread the heads of each rebar intended for connection.

2. Place the Threaded Rebars: Position the threaded rebars at their designated locations within the structure.

3. Install the Prefabricated Couplers: Place the corresponding prefabricated couplers onto the threads of the rebars. These couplers have internal threads that match the threads on the rebars.

4. Add the Upper Rebar: Once the couplers are in place, add the upper rebar onto the coupler.

5. Use a Rebar Coupler Wrench: Employ a rebar coupler wrench to fasten the connection securely and ensure a precise fit.

This process allows for the efficient and reliable connection of rebars using mechanical couplers, providing structural reinforcement within the construction project.

Pressing Coupler Installation: Pressing couplers are used when reinforcement bars are short, not threaded and there's no overlap distance.
These couplers are blank and do not have threads as well as the rebars therefore the mechanical joint forms when a pressing machine presses the coupler against the connecting bars.

Mechanical joint in a column

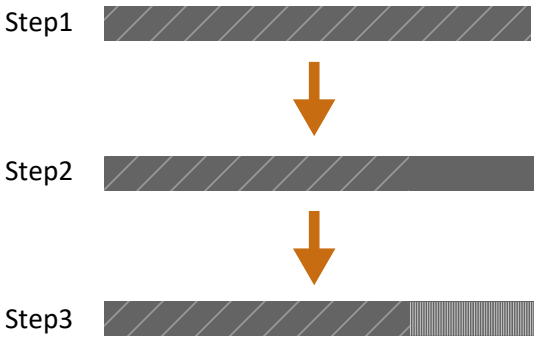
Threading machine and threads

Rebar coupler wrench

Types of Threads:

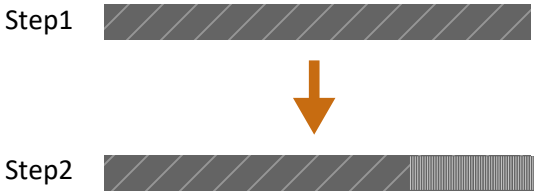
1. Rib Peeling Threading Method:

The rib peeling threading method represents a traditional approach to threading reinforcement bars. In this method, the ribs of the bar are initially cut, followed by the thread creation process through rolling. it is a trusted choice in construction applications where structural integrity is paramount.



2. Direct Threading Method:

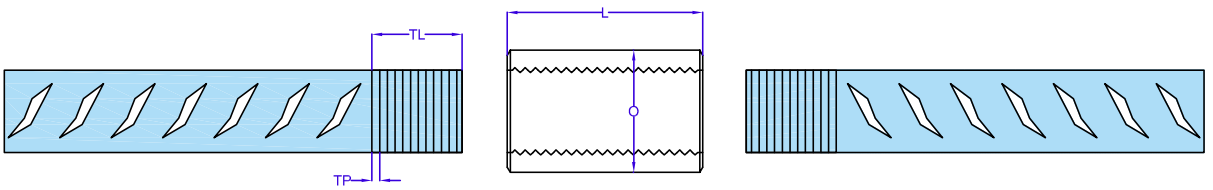
Direct threading of rebars introduces a novel approach to threading, wherein the rib of the rebar is pressed into its core during the threading process. This method utilizes the mass of the ribs along with the bar's core to create the threads, resulting in even a more reliable and stronger connection compared to traditional threading methods.



Available Sizes and Technical Data of Rebar Couplers:

1. Midcouplers:

The midcouplers are the most common type of couplers in the construction sector. It connects two bars of the same size by joining them using the end threads of each bar. The employed material for this product is CK45.

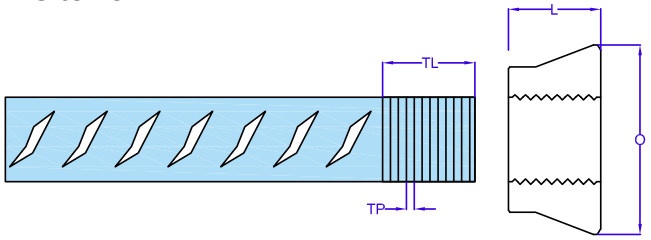


Code	Bar Size	Bar Thread Method	O (mm)	L (mm)	Cross Section (mm2)	Coupler Weight (g)	Design Load (kN)	TP (mm)	TL (mm)
1616	ϕ16	Direct/Rib-Peeling	23/5	40	232/67	90	139/60	2/5	19
1818	ϕ18	Direct/Rib-Peeling	26/5	45	297/08	125	178/25	2/5	21
2020	ϕ20	Direct/Rib-Peeling	29/5	50	369/33	177	221/60	2/5	23
2222	ϕ22	Direct/Rib-Peeling	32/5	54	449/44	202	269/67	2/5	25
2525	ϕ25	Direct/Rib-Peeling	37/5	60	613/59	317	368/16	3	28
2828	ϕ28	Direct/Rib-Peeling	41/5	67	736/90	418	442/14	3	31
3232	ϕ32	Direct/Rib-Peeling	47/5	75	967/81	671	580/68	3	35
3636	ϕ36	Direct/Rib-Peeling	53/5	83	1230/13	818	738/08	3	39
4040	ϕ40	Direct/Rib-Peeling	58/6	92	1440/39	1117	864/23	3	43

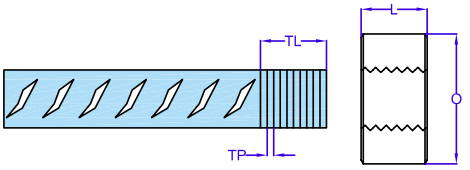
2. Headcouplers:

Headcouplers serve as efficient terminations for reinforcement bars, offering a convenient alternative to traditional hooks. Notably, the design of headcouplers varies between sizes 16 to 22 and those sized 25 and above. The employed material for this product is CK45.

25 to 40:



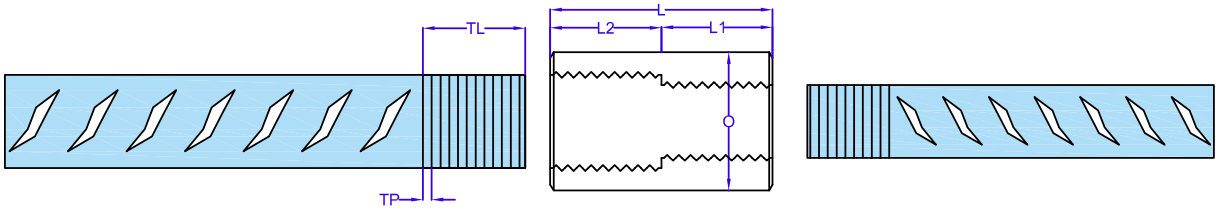
16 to 22:



Code	Bar Size	Bar Thread Method	O (mm)	L (mm)	Cross Section (mm2)	Coupler Weight (g)	Design Load (kN)	TP (mm)	TL (mm)
16	ϕ16	Direct/Rib-Peeling	35/9	19	809/88	136	485/93	2/5	19
18	ϕ18	Direct/Rib-Peeling	40/3	21	1024/21	164	614/52	2/5	21
20	ϕ20	Direct/Rib-Peeling	44/8	23	1263/67	228/5	758/20	2/5	23
22	ϕ22	Direct/Rib-Peeling	49/3	25	1528/27	314/75	916/96	2/5	25
25	ϕ25	Direct/Rib-Peeling	56/0	28	1972/28	250	1183/37	3	28
28	ϕ28	Direct/Rib-Peeling	62/7	31	2472/85	347	1483/71	3	31
32	ϕ32	Direct/Rib-Peeling	71/7	35	3228/24	487/3	1936/94	3	35
36	ϕ36	Direct/Rib-Peeling	80/6	39	4084/16	703	2450/49	3	39
40	ϕ40	Direct/Rib-Peeling	89/5	43	5040/61	-	3024/36	3	43

3. Transition Couplers:

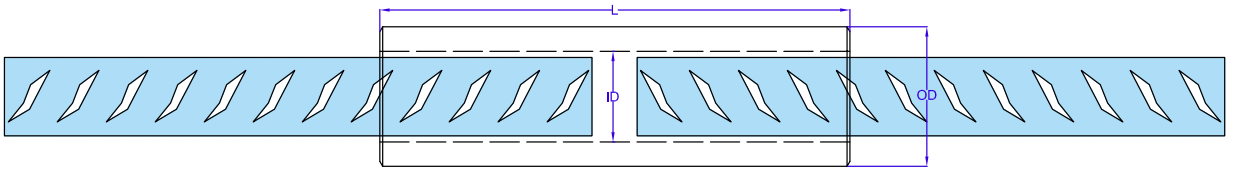
Transition couplers are indispensable when joining reinforcement bars of differing sizes. These versatile couplers are engineered to connect bars ranging from size 16 to 36 to bars sized 18 to 40. The employed material for this product is CK45.



Smaller Bar (X)	ϕ16	ϕ18	ϕ20	ϕ22	ϕ25	ϕ28	ϕ32	ϕ36
Bigger Bar (Y)	ϕ18	ϕ20	ϕ22	ϕ25	ϕ28	ϕ32	ϕ36	ϕ40
Code	XY							
Bar Thread Method	Direct/Rib-Peeling							
O (mm)	It could be 2mm less than the outer diameter of the larger size midcoupler.							
L (mm)	It is 3mm less than the average length of Midcouplers from two different sizes.							

4. Pressing Couplers:

The pressing coupler is a pipe that covers two rebars end to end, and then this pipe is pressed at several points up to 700 bars using a hydraulic press machine, depending on the size of the rebars. For the execution of this method, the minimum required length of the protruding rebar from the concrete is 25 centimeters. The amount of pressure to be applied for each press and the number of presses for each size are specific and measurable.



Code	Corresponding Bar	OD (mm)	ID (mm)	L (mm)	Cross Section (mm2)	Coupler Weight (g)	Design Load (kN)
16	ϕ16	30	19/4	107	505/80	345	303/48
18	ϕ18	34	22/5	118	653/45	473	392/07
20	ϕ20	36	24	120	703/72	533	422/23
22	ϕ22	40/4	27	134	901/76	746	541/06
25	ϕ25	45	30/2	148	1099/56	1016	659/73
28	ϕ28	50	33/2	168	1347/74	1448	808/65
32	ϕ32	57	37	192	1747/51	2225	1048/51