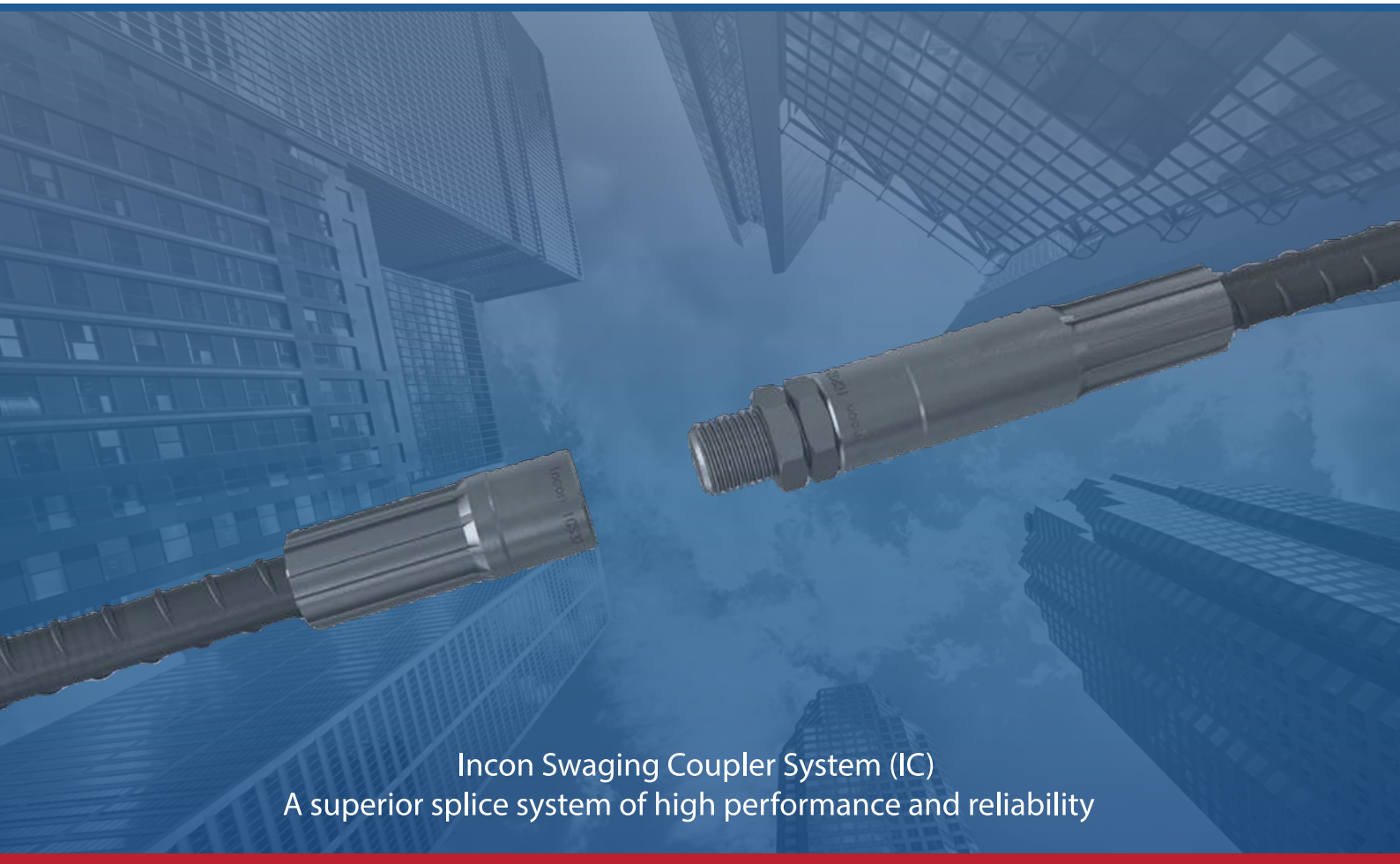
Rebar Couplers

INCON



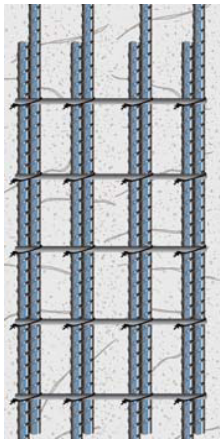
Incon Swaging Coupler System (IC)
A superior splice system of high performance and reliability

Introduction

Incon designs and manufactures high quality steel products for the construction industry, specializing in concrete related steel products. With years of continuous product development, upgrades in manufacturing capability and capacity, we are committed to maintaining the highest level of quality products as well as customer service in this dynamic time and challenging industry.

In the modern building industry, rebar is widely used and it is always of major concern for the contractors and engineers how to join them. Lapped joints have been replaced by different types of mechanical joints not only to save the rebar material, but to accelerate the speed of construction, increase productivity and simplify the design. Among all types of mechanical joints, contractors and engineers are always looking for a solution with the least compromise.

Lapped Joints



The traditional method of connecting rebar has been with lap splicing but nowadays many structural engineers have discovered more disadvantages of lap joints over its very few advantages:

- The higher the stress yield, the more lap length required while high strength rebar is more often used nowadays.
- Poor cyclic performance.
- Time consuming with difficult installation.
- More rebar used and greater congestion in the concrete.

Rebar Threaded Connection

Most mechanical splice adopts making thread on the rebar itself; it's not a perfect solution but a compromise:

- No matter if it is cold rolling thread or thread cutting after the rebar is upset, the metal structure of the rebar has been changed and potentially compromised.
- The harder the rebar (high yield strength), the more probable there is a hidden crack in the rebar after rolled or upset.
- Thread quality difficult to control and rebar cross section reduced by rolling.
- Time consuming to make the thread on the rebar.

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A superior splice system of high performance and reliability

Technology:

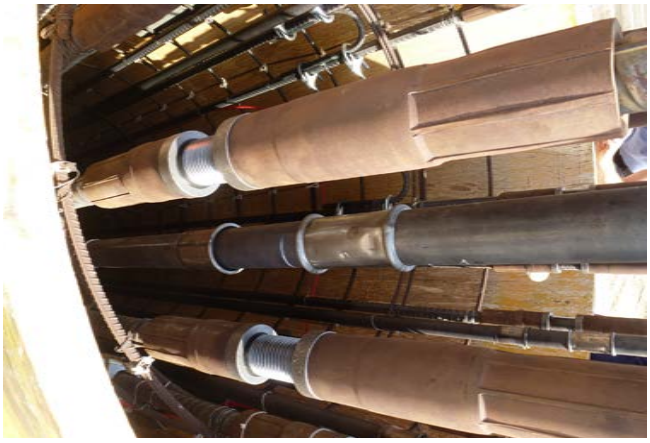
Combining our swaging technology and IC series couplers, our specially designed hydraulic press swages the coupler on the rebar. The process compresses the coupler around the profile of the rebar and the rebar rib even cuts into the coupler material to create a secured mechanical interlock with the rebar deformations that is greater than the rebar itself.

Performance:

The swaging process does not reduce the sectional area of the rebar and even the rebar itself remains intact to ensure the ultimate capacity of the rebar is maintained. The interlock between the rebar and the coupler is permanent so it is even good for seismic loads.
The sectional area of the thread on IC couplers is greater than that of the rebar, the additional capacity of the coupler strength meets the high performance requirements in areas subject to effects of seismic activity and dynamic situations.

Applications

Due to the nature of the permanent interlock from the swaging process, the Incon coupler is designed and manufactured in accordance with most of the popular standards such as ACI 318, Eurocode 2, BS 8110, DIN 1045, IBC, AASHTO, ASME Sec III Div 2. and suitable for use in stadiums, bridges, dams, power plants and high-rise buildings for normal and dynamic loads such as: wind, seismic and blast loads.



Advantages:

1. In Design and Planning Advantages

- Easy arrangement for the structural design as full strength of the rebar is maintained within the joint zone.
- Accurate rebar and joint length ease the design.
- Reduced rebar congestion allows more flexible design options.
- Steel-to-concrete ratio and concrete consolidation improved.

2. Practical Advantages

- Easy and fast installation on site, no torque wrench required.
- Prefabricated in house, easier and better quality control than thread made on rebar itself.
- Comprehensive range covered from the standard continuity to the cage connection.

IC Swaging Couplers

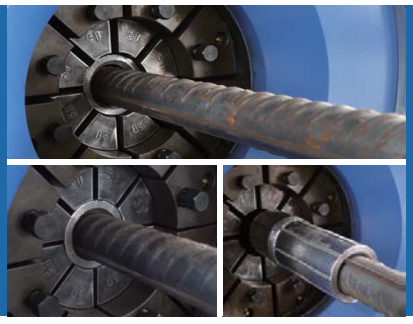
The swaging technology is the key of the system, instead of using a 3rd party universal-purpose press, we developed our own swaging machine which makes the swaging much faster and most of all much more accurate. The laser metering system controls the precision of the swaging to 0.1mm for the best interlock of the rebar and the coupler. Combining the improved coupler material property, our system ensures high performance as well as reliability.

3rd Generation Swaging Machine:

- Fully digital controlled system with a touch screen.
- Powerful 1000T pressing force completes the pressing of a 40mm rebar coupler in 15 sec.
- Precise swaging due to the laser metering system.
- Easy die changes since pre-programmed data for all sizes and types of couplers.

Easy Prefabrication

- No painful thread cutting or rolling on the rebar.
-Clean and precise press completes the splice preparation.
-Screw the male bolt into the female, no torque wrench required.



Quality Assured

- Manufactured under strict quality assurance plan, ISO 9001 certified.
- Full traceability of the coupler as well as the splice.
- Quality assured by accurate pressing.

Incon IC Coupler Types

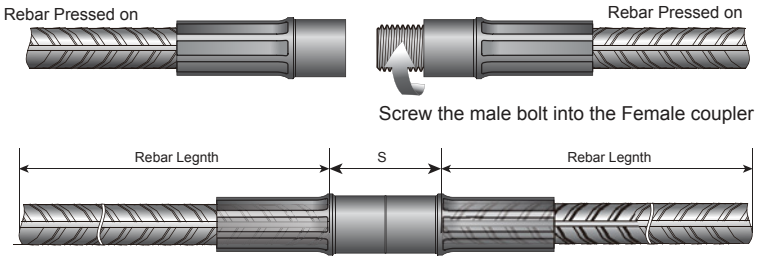
1. ICS - Standard Coupler

2. ICP - Position Coupler

3. ICST - Transition Coupler

4. ICT - Rebar Terminator

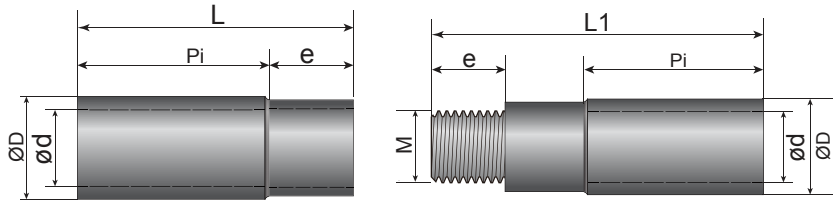
ICS - Standard Coupler



The ICS is composed of a female and male coupler, pressed on 2 rebars to be connected. With its high performance it ensures the ultimate tensile and compression strength of rebar can be fully applied with no compromise, satisfying all the major industry standards including: UBC 1997, ACI 318, BS8110, NF35-20-1 and DIN1045.

Features:

- Applicable for high strength rebar up to ASTM Grade 75.
- Easy and highly efficient for both preparing the splice and assembly on site.
- Accurate splice length control due to the precise coupler joint.
- Highly reliable and consistent performance due to our swaging technology and improved design of the couplers.



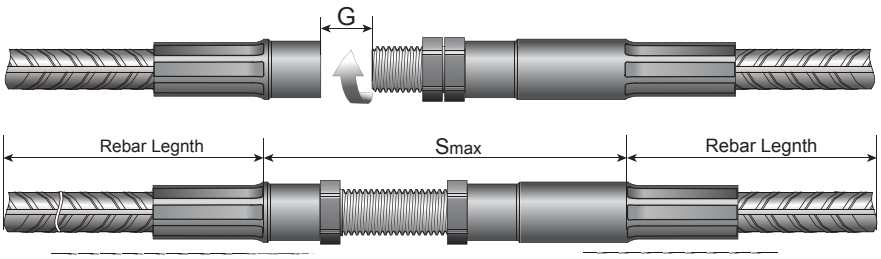
Product Sizes and Dimenions (all in "mm")

Coupler Code	Rebar Size	Thread Size	Tube outer Ø	Tube inner Ø	Female coupler Length	Male Coupler Length	Thread length	Rebar insertion Length	Splice Space
		M	D	d	L	L_1	e	Pi	S
ICS12	12	16	22	14.5	62	80	24	38	44
ICS16	16	20	28	19	76	99	28.5	48	53
ICS20	20	24	34	23.5	92	119	33	59	62
ICS25	25	30	42	29	110	143	39	71	74
ICS32	32	39	54	36	140	179	47	93	86
ICS40	40	48	67.5	45	170	218	57	113	104

The ICS coupler is a standard splice, widely used for general applications such as beams, walls etc., where the rotation and axial movement of one rebar is allowed.

Due to our consistent technical development and improvement, the technical data might be changed without notice.

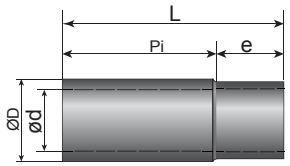
ICP Position Coupler



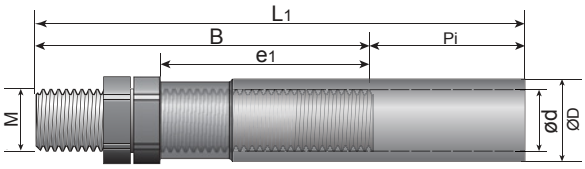
The ICP is composed of a female coupler and an extended coupler assembly, pressed on 2 rebars to be connected. Due to the improved design, it's one of the easiest and most reliable solutions for positioning and gap covering. Offering the highest performance and ensuring the ultimate tensile and compression strength of rebar can be fully applied with no compromise.

Features:

- Remarkable gap coverage to make the rebar cage connection easy and accurate.
- Applicable for high strength rebar up to ASTM Grade 75.
- Easy and highly efficient for both preparing the splice and assembly on site.
- Highly reliable and consistent performance due to our special crimping technology.



Female Coupler



Extended Assembly

Product Sizes and Dimenions (all in "mm")

Coupler Code	Rebar Size Ø	Thread Size	Tube outer Ø	Tube inner Ø	Female coupler Length	Female thread length	Rebar insertion Length	Central Bolt Length	Exd. Female Length	Exd. Female Thread length	Max. Gap	Max. Splice Space
		M	D	d	L	e	Pi	B	L1	e1	**g**	**Smax**
ICP12	12	16	22	14.5	62	24	38	93	93	55	**12**	**91**
ICP16	16	20	28	19	76	28.5	48	114	115	67	**16**	**112**
ICP20	20	24	34	23.5	92	33	59	135	139	80	**20**	**133**
ICP25	25	30	42	29	110	39	71	166	169	98	**25**	**162**
ICP32	32	39	54	36	140	47	93	197	211	118	**32**	**197**
ICP40	40	48	67.5	45	170	57	113	239	259	146	**40**	**243**

Suitable for the most challenging connection where the rebar must be positioned accurately and can't even be rotated such as in a cage. The deviation adjustability makes the cage connection easy and accurate. The rebar remains in its position and no rotation or movement is needed for either rebar while the gap is covered.

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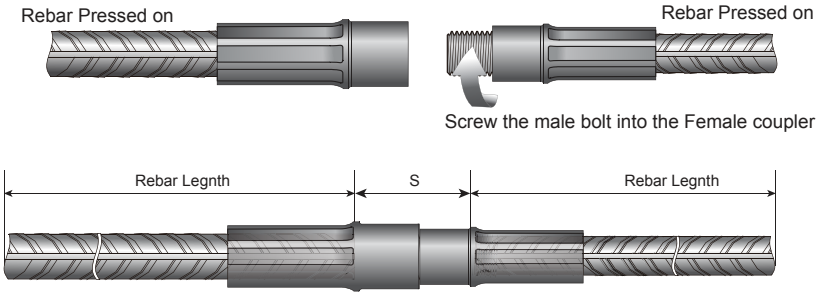
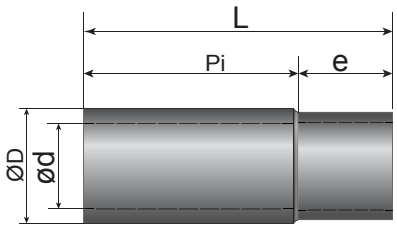
ICST Transition Coupler



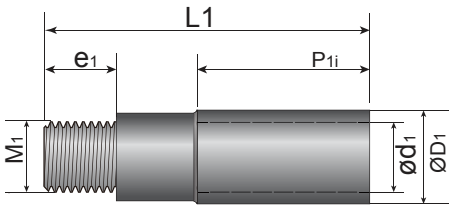
The transition coupler is used to connect rebars of different diameters. The ICT is similar to ICS but with a smaller sized male coupler to receive the smaller sized rebar. With the same high performance it ensures the ultimate tensile and compression strength of both the rebars of different diameters can be fully applied with no compromise, satisfying all the major industry standards including: UBC1997, ACI318, BS8110, NF35-20-1 and DIN1045.

Features:

- Connects rebars of different diameters, easily, quickly and accurately.
- Applicable for high strength rebar up to ASTM Grade 75.
- Highly efficient for both preparing the splice and assembly on site.



Female Coupler



Male Coupler

Coupler Code	Rebar Size	Female Coupler						Male Coupler					
		Thread Size	Tube outer Ø	Tube inner Ø	Female coupler Length	Thread length	Rebar insertion Length	Thread Size	Tube outer Ø	Tube inner Ø	Female coupler Length	Thread length	Rebar insertion Length
		M	D	d	L	e	Pi	M	D	d	L	e	Pi
ICST16-12	16-12	20	28	19	76	28.5	48	16	22	14.5	62	24	38
ICST20-16	20-16	24	34	23.5	92	33	59	20	28	19	76	28.5	48
ICST25-20	25-20	30	42	29	110	39	71	24	34	23.5	92	33	59
ICST32-25	32-25	39	54	36	140	47	93	30	42	29	110	39	71
ICST40-32	40-32	48	67.5	45	170	57	113	39	54	36	140	47	93

Suitable for the connection of 2 rebars of different sizes, where the rotation and axial movement of one rebar is allowed.

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ICT Rebar Terminator

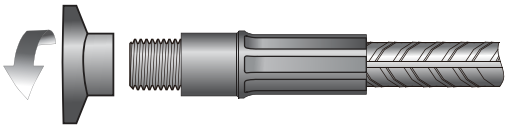
Due to the standard design and application of ICS couplers, with just a terminator they can easily be turned into a mechanical anchorage for rebar in concrete. The design is in compliance with ACI 318-08 and BS8110 for rebar sizes from 12mm to 52mm.
The terminator is a large anchorage foot with threading compatible with ICS couplers. Through screwing it on an ICS coupler which is already pressed on the end of a rebar, it provides the anchorage performance within the concrete as a hooked bar or bent bar does.

Features:

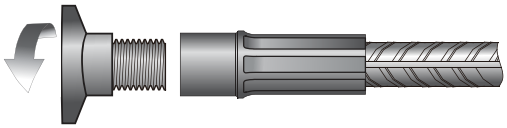
- Designed to work with ICS couplers, easy solution for rebar anchorage and future extensions allowed.
- It replaces the bent part or hook of the rebar, the reduced congestion results in increased design flexibility, as well as cost savings due to the rebar saved.

2 types of terminators available to work with either the ICS male coupler or female coupler.

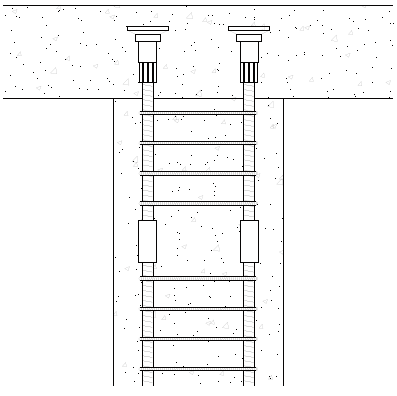
Terminator ICT-F w/t ICS male Coupler



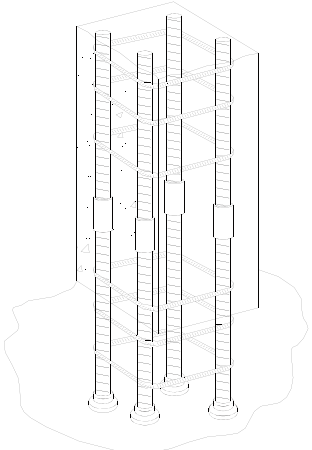
Terminator ICT-M w/t ICS female coupler



Anchorage can be easily achieved by screwing the terminator onto the ICS couplers in beams/columns and piles etc, and future extensions can be effortlessly arranged.



Beam anchorage

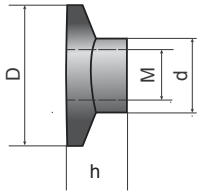


Column anchorage

ICT Rebar Terminator

Type ICT-F

Terminator ICT-F



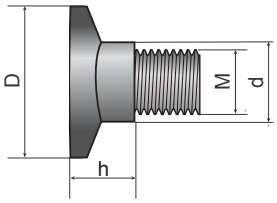
work w/t ICS male Coupler

Product sizes & dimensions

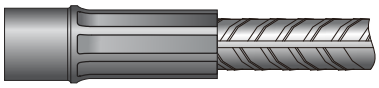
Product Code	Rebar Ø (mm)	Thread M	Dimensions (mm) d	D	H	ICS Male Coupler to go
ICT-F-12-M16	12	M16	22	40	17.5	ICS-M-12
ICT-F-16-M20	16	M20	28	53	22	ICS-M-16
ICT-F-20-M24	20	M24	34	66	26	ICS-M-20
ICT-F-25-M30	25	M30	42	86	33	ICS-M-25
ICT-F-32-M39	32	M39	54	105	40	ICS-M-32
ICT-F-40-M48	40	M48	67.5	132	50	ICS-M-40

Type ICT-M

Terminator ICT-M



work w/t ICS Female Coupler



Product sizes & dimensions

Product Code	Rebar Ø (mm)	Thread M	Dimensions (mm) d	D	H	L	ICS Female Coupler to go
ICT-M-12-M16	12	M16	22	40	17.5	35.5	ICS-F-12
ICT-M-16-M20	16	M20	28	53	22	44	ICS-F-16
ICT-M-20-M24	20	M24	34	66	26	52	ICS-F-20
ICT-M-25-M30	25	M30	42	86	33	66	ICS-F-25
ICT-M-32-M39	32	M39	54	105	40	79.5	ICS-F-32
ICT-M-40-M48	40	M48	67.5	132	50	98.5	ICS-F-40

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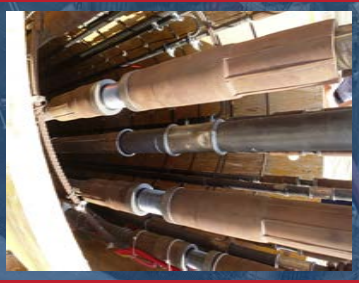

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