MECHANICAL REBAR COUPLER

REGBAR
CONSTRUCTION TECHNOLOGY SOLUTIONS

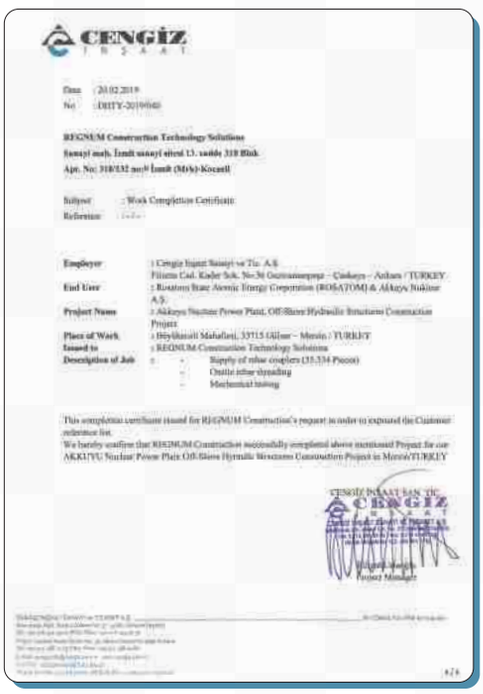
www.regbar.com / info@regbar.com

Who are we?

As REGBAR family, we have vast knowledge and international experience in the fields of engineering and applications as of 2010. We have carried out important domestic and international projects including on-site applications in many developing fields with regard to manufacturing Reinforcement Couplers, Anchorage, Rock Bolts, Tunnel and Soil Equipment, Pre and Post-Tensioning Systems, Fiber Reinforcements, Steel and Case, Shoring and Steel Constructions.

Quality

All REGBAR equipment are designed and manufactured to be installed and operate in factory and field. The machines have CE and related certificates and are used by technicians specialized in provision of high quality service. If needed, fast installation in the field is performed and on-site anchorage and coupler services are provided. REGBAR Couplers comply with; ASTM A706, ASTM A615, ASTM A996, TS708, BS8110, BS4449, ISO 15835 S2, ACI 318, BS8110, ISO 15835 S-1 / S-2, TS500,GOST 34278-2017 standards. All REGBAR products have been tested and approved by independent laboratories.


CENGİZ İNŞAAT

Date : 20.02.2019
No : DBTY-2019/040

REGNUM Construction Technology Solutions
Sanayi mah. İmrit sanayi sitesi 13. sokak 318 Blok
Apt. No: 318/332 nolu İmrit (Mrk)-Kocaeli

Subject : Work Completion Certificate
Reference :

Employer : Cengiz İnşaat Sanayi ve Tic. A.Ş.
Filistin Cad. Kader Sok. No:36 Gaziosmanpaşa - Çankaya - Ankara / TURKEY
End User : Rosatom State Atomic Energy Corporation (ROSATOM) & Akkuyu Nükleer A.Ş.
Project Name : Akkuyu Nuclear Power Plant, Off-Shore Hydraulic Structures Construction Project
Place of Work : Büyükmanlı Mahallesi, 33715 Gülnar – Mersin / TURKEY
Issued to : REGNUM Construction Technology Solutions
Description of Job : - Supply of rebar couplers (35.334 Pieces)
- Onsite rebar threading
- Mechanical testing

This completion certificate issued for REGNUM Construction's request in order to expound the Customer reference list.
We hereby confirm that REGNUM Construction successfully completed above mentioned Project for our AKKUYU Nuclear Power Plant Off-Shore Hydraulic Structures Construction Project in Mersin/TURKEY

CENGİZ İNŞAAT SAN. TİC.
CENGİZ İNŞAAT
Project Manager

Work Completion Certificate Rosatom State Atomic Energy Corporation Akkuyu Nuclear Power Plant

Innovative solutions for better future

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REGBAR
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MECHANICAL REINFORCING BAR SPLICING SYSTEM

Why Reinforcement Coupler?

Conventional reinforcement connection methods such as overlapping and welding don't satisfy the need of overcoming the ever-increasing technical difficulties in construction industry any more.

In spite of this Coupled Joint Systems, a product of modern technology, reduce the costs and provide a more successful structural integrity.

The low-cost Reinforcement Couplers will speed up your project and bring in competence. **Regbar Mechanical Reinforcement Couplers** provide solutions for construction reinforcement bundles such as overlapping and welding.

Our strategy is offering more affordable and extremely safe rebar inserts as compared to the options of overlapping and welding. **Regbar Mechanical Couplers** and the equipment are economic, safe, designer-friendly and easy to implement. In brief, REGBAR provides matchless benefits and higher earnings to its customers!

Coupled joint system has innumerable benefits.

We can list its main benefits as follows:

- Overlap method requires concrete for load transfer. In addition, when the reinforcement reaches the zone of leakage and its diameter changes, clamping ends and the joint doesn't work. In coupled joints on the other hand, such lock in is not required and the joint continues to take up load until the tensile strength. It delivers outstanding performance at cold joints formed between the floor columns.
- Provides uninterrupted structural continuity due to having higher strength than reinforcement. In this way, it offers static advantages especially in multi-storey buildings.
- Eliminates the problems of time and labor loss, formation of air voids at the joints and exceeding the percentage ratio. Reduces reinforcement density at joints zones.
- Reduction of reinforcement density increases architectural strength and this helps the design of small columns and increases the living space.

- It lowers the amount of reinforcement consumed in the project in such a way that this saving cannot be provided by any other item. It offers significant advantage in terms of purchase, logistics and in-field storage of reinforcement.
- Shortens project time by reducing worker and crane usage times and offers cost advantages.
- Allows rebar assembly without the need for lapping.

- Reduces the quality control frequency and provides quick and easy joining during assembly with no question marks.
- Quality control can be done easily with the existing test methods.
- Coupled joints have facilitated construction of heavy reinforcement systems with high strength values all over the world.
- Ensures continuity of reinforcement in top-down manufacturing used in subway and top-down projects.
- For these reasons, Turkish Construction Standard TS500 requires it to be used for diameters above 30 mm.
- Mechanical Couplers enable to get free from various calculations in overlapping and potential calculation errors.
- One of the biggest problems expressed by the employees in the construction site is that the concrete is not placed well in the structural elements due to the reinforcement frequency. The maximum percentage allowed by ACI 318 and TS500 are 8% and 6% respectively (TS allows this value only at the column-beam overlap point). Mechanical Couplers remove the overlap insert so that there is no coupling lengths and the percentage remains within bounds. However, it is more comfortable to place the concrete with the decrease of the reinforcement frequency.

- Reduces transportation, stock and crane costs.
- Since the early completion of rough construction will shorten the construction time, putting the structure into service earlier provides economic advantage. Since the reinforcement workmanship, number of ironsmiths and crane density are reduced, working environment will be calmer, safer and controlled.
- Mechanical Coupler ensures transfer of the load on the reinforcement on the same axis independent of concrete and ambient conditions. In seismic applications, mechanical couplers ensure the whole continuity of reinforcement when the reinforcement transits to a non-elastic state.

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- Plastic interlock zone often breaks the requirements for insertion standards. Since mechanical fasteners can be easily moved out of their high-tension zones, they ensure the integrity of the reinforcement without insertions in these zones.

- In regions where the weather is cold and causes crack formation in the concrete, on the shores and where the cross section of the concrete receives a blow, the concrete covering the overlap insert doesn't function. Thus, interlock length of the reinforcement becomes dysfunctional and the reinforcement doesn't work. Mechanical couplers ensure the continuity of reinforcements independently of this situation.

- Due to the increasing construction complexities and design requirements in recent years, the need for a more efficient joining (coupling) system is more apparent. Use of reinforced concrete reinforcement couplers can simplify the design and production of reinforced concrete and reduce the amount of required reinforcement.

Advantages of reinforced couplers over overlapping method:

- Blockage of reinforcement bars with reinforced inserts affects the integrity of the structure. This can be prevented by using high strength **Regbar Couplers**.

- Size of the zones with decreased concrete and floor areas are maximized and thus, the value of the building increases especially in the main areas of progress.

- Bearing the upholstered joint loads fully depends on adherence of the surrounding concrete. Deterioration of concrete may affect the performance of the joint.

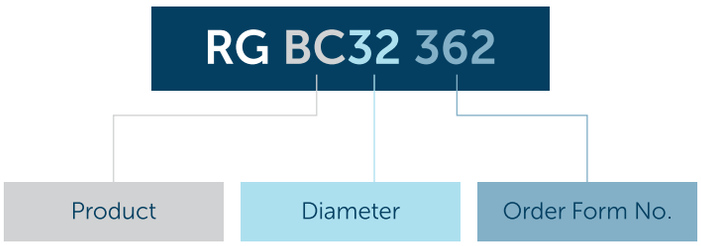
- Bars can be coupled with **Regbar Couplers** by using a coupler and this can prevent the mold to be damaged.

- Provides material and cost savings because less steel is used.

- Creates a greener and lighter building. Compatible with Leed Certificates.

Marking of **Coupler Circumference**

Every coupler the production of which has been completed and shipped to the user is marked on with production information. Even when the box is discarded, and the rebar couplers are used, there is still full traceability. Thus, any Regbar rebar coupler found in any location can be instantly identified.



Example for, **RG BC32 362,**

RG Letter: Represents Regbar.

BC Letter: Represents Barcoup product.

32: 32mm refers to the diameter of the reinforcing bar.

362: This variable number refers to the number of the order form. It can be traced back to all stages of the production of coupler with this number.

Reinforcing **Bar Labeling**

Batch of threaded reinforcing bars are also labeled with metal sheets according to;

- Bar size
- Thread type (roll or cut threaded)
- Thread length (short or long)
- Thread quantity (one side or both sides)
- Bar length

these entries indicate general information about the batch. All threads are controlled by quality control technician and metal sheet includes production place, controller's name and control date.

Coupler Name	Prefix marking number begin with
BARCOUP	BC
BARCOUPL	BC
TAPERCOUP	TC
SOSCOUP	SC
WELDCOUP	WC
TRANSCOUP	TRC
DOUBLECOUP	DC

Coupler Name	Prefix marking number begin with
FRICCOUP	FC
PRESCOUP	PRC
POSCOUP	PC
BRIDGECOUP	BRC
CRYOCOUP	CC
ROLLCOUP	RC
HEADCOUP	HC

MECHANICAL REINFORCING BAR SPLICING SYSTEM

Upset Parallel **Thread System**

Upset Parallel Thread System is based on square cutting, enlargement and tangential cut threading of rebar ends using Regbar equipment designed for this purpose.

This method provides a larger diameter of rebar ends for threading and balance cross section loss. In the other hand, a slight loss of rebar occurs due to square cutting and cold enlargement of rebar end that should be considered in structural design and rebar pre-cut by rebar fabricators / subcontractor.

Each rebar end should have been delivered to Regbar with below mentioned additional allowances to tolerate the reduction of square cut and upset on each bar splice.

Each coupler splice two rebar, therefore for each splice, loss on each rebar length should be multiplied by two.

INITIAL AND FINAL LENGTHS FOR COUPLED REBARS

Metric [mm]	Initial Unit Length [mm]	Square Cut Loss [mm]	Upset Loss [mm]	Total Loss [mm]
12	100	20	12	32
14	100	20	13	33
16	100	20	14	34
18	100	20	16	36
20	100	20	17	37
22	100	20	19	39
26	100	25	22	47
28	100	25	24	49
30	100	25	25	50
32	100	25	25	50
36	100	25	30	50
40	100	25	33	50

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Please note that, exceptionally distorted rebar ends due to improper cutting by shear cutter or cutting torch might need longer allowance depending on the case.

Dimensional quality of the rebar such as roundness and diameter must be carefully inspected since these are important issues for optimum upset and thread quality that affects performance of the splice.

Regbar recommends the use of professional rebar cutters that is highly productive, cost cutting, avoiding excessive rebar loss and reducing labor time.

Photos from production phases in plant.

Production **Phases**

There are two types of Upset Parallel Thread System. Threading with tangential chasers is called cut threading and threading with roll thread machine is called roll threading.

Regbar produces both products. BarCoup couplers are used with cut threaded reinforcing bars and RollCoup couplers are used with roll threaded reinforcing bars.

Regbar uses its own machines to produce high quality threads. Machines can be transported to anywhere with shipping container.

Photos from production phases in site.

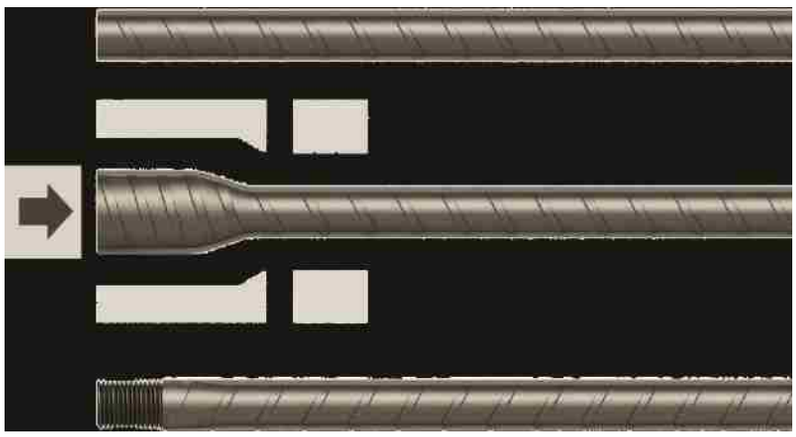
Cut Threading

UPT System with cut threading is based on square cutting, enlargement and tangential cut threading of rebar ends using Regbar equipment designed for this purpose.

1 **Rebar end cut square with band saw.**

2 **Rebar end enlarged by cold upsetting press.**

3 **Rebar end is cut threaded by Regbar threading machine.**



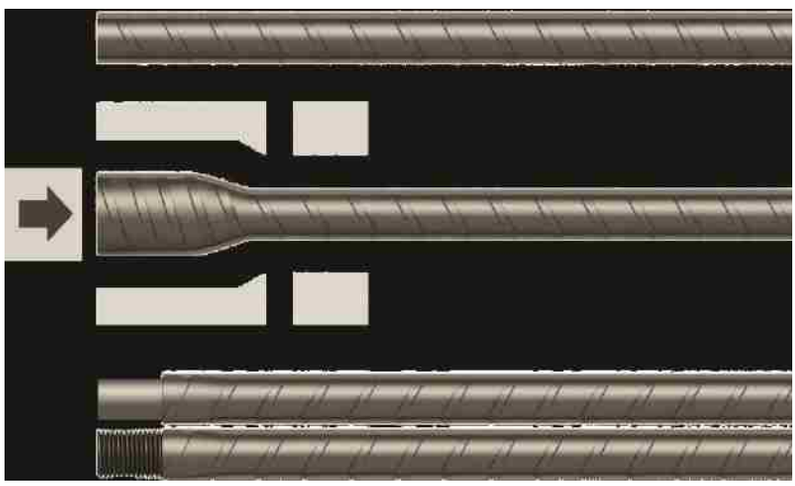
Roll Threading

UPT System with roll threading is based on square cutting, enlargement, turning and roll threading of rebar ends using Regbar equipment designed for this purpose.

1 **Rebar end cut square with band saw.**

2 **Rebar end enlarged by cold upsetting press.**

3 **Rebar end is turned and roll threaded by Regbar roll threading machine.**



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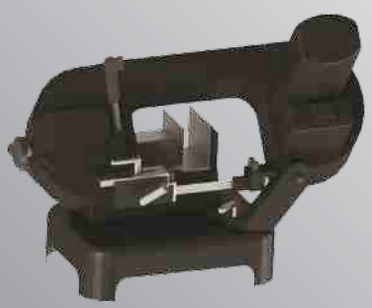
Equipment

A Regbar Upset Parallel Thread Equipment Set is consisted of a rebar cutter or saw, an upsetting press and a cut threading machine designed for ribbed rebar.

A set of this equipment will be placed at jobsite or jobsite, usually close to rebar area. Equipment settlement plan is prepared for every project.

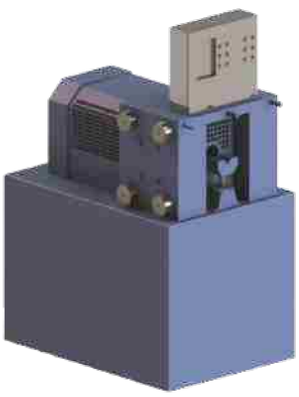
Regbar manufactures high quality and heavy duty equipment for reinforcing bar upsetting and threading. All equipment, tools, dies and accessories are designed and manufactured by Regbar.



Band Saw Machine

Regbar Cold Upset Press

Regbar Cut-Threading Machine



Regbar Proof Loading Machine

The Regbar Proof Loading machine is designed for the precision production of cut or rolled threads required for reinforcing bar coupler systems.

It is designed, built and supplied for the safer processing of threaded ends of steel reinforcing bar in the range of 12mm - 50mm diameter, and capable of loading up to 15.000kN.

The machines can only be used with Regbar equipment and Regbar coupler system.