Mechanical Rebar Splicing Systems

[Image of mechanical rebar splicing systems]
ERICO® is the worldwide leader in design and manufacturing of advanced mechanical rebar splicing systems. With more than 40 years experience, the “Rebar Splicing Specialists” at ERICO understand the concrete construction business and inherent rebar splicing problems. Our engineering capabilities, broad experience and extensive testing base combined with our multiple splicing and anchorage systems, allow us to provide engineers and contractors with product solutions to rebar splicing challenges – today and into the future.

Ease of use, reliability, structural integrity, and minimal congestion are the benefits of using ERICO products. Our systems will handle your needs in tension, compression, cyclic and stress reversal applications.

ERICO mechanical rebar splices are tested and proven. They offer the most effective method of joining reinforcing bars and meet the codes of national and international regulatory organizations.

Our products are:
- LENTON® Taper Threaded Splices
- LENTON® FORM SAVER
- LENTON® INTERLOK
- LENTON® SPEED-SLEEVE
- LENTON® QUICK-WEDGE
- LENTON® TERMINATOR
- CADWELD® Rebar Splices

Lap splices depend on concrete for strength, and therefore lack structural integrity and continuity in concrete construction.

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

More and more engineers are specifying mechanical rebar connections over lap splices. They’ve found that mechanical connections afford a reliability and consistency that can’t be found with lap splicing.

- Mechanical systems are more reliable than lap systems because they don’t depend on the concrete for load transfer.
- Mechanical connections offer greater structural integrity. Mechanical splices offer strength and toughness during man-made, seismic or other natural events.
- Codes require that mechanical splices deliver higher performance than typical design lengths for lap splices. This is typically 125% to 150% greater capacity provided by the mechanical splice versus the lap splice.
- Lap splicing increases rebar congestion at the lap zone and is one of the major causes for forming rock pockets and voids in the concrete. Mechanical splices eliminate these congestion problems and will make the overall job more cost effective through minimized job site problems.
- Building codes stipulate a steel ratio of under 8% and this makes it nearly impossible to achieve a balanced design with lap splicing. Mechanical splices allow the designer to achieve an ideal balance of steel and concrete by eliminating the additional rebar in the lap zone.
- Working with “small” diameter reinforcing bars may require the use of larger column dimensions to accommodate a greater quantity of bars. Using mechanical splices allows the option of larger diameter rebar in a smaller column while minimizing congestion. This reduced column size results in a more efficient design and an optimum use of floor space.
- Mechanical splices eliminate tedious lap calculations.
- Mechanical splices are fast and easy to install and require no specialized skilled labor.
- Mechanical splices are cost effective by reducing labor costs and accelerating job schedules.
- Dowel bar substitutes reduce labor on site, formwork costs and increase job site safety.
- Bar terminators eliminate congestion and simplify bar placing.
- Repair splices eliminate the cost of breaking away massive amounts of concrete

* Depending on reinforcing bar standard
International Codes & Standards
ERICO mechanical splices meet the requirements of major international codes and standards:

- **Australia**
  - AS3600

- **Austria**
  - ÖNORM B4700

- **Brazil**
  - ABNT – NBR 8548 – AGO/84

- **Canada**
  - CAN3-N287.2
  - CAN3-N287.3

- **Chile**
  - NCH 204

- **China**
  - GB 1499-91

- **France**
  - NF A 35-020-1

- **Germany**
  - DIN 1045

- **Japan**
  - JIS G3112

- **Malaysia**
  - M 5146

- **Netherlands**
  - BRL 0504

- **Norway**
  - NS 3437

- **United Kingdom**
  - BS 8110

- **United States**

**LENTON® TAPER THREADED SPLICES**
LENTON splices are the slimmest couplers available and their tapered thread makes them the most reliable, easy to install and cost effective system. The LENTON taper threaded range consist of standard and transition couplers as well as positional couplers to join bars of any shape, size and diameter. Also weldable and bolt couplers are available for joining structural steel to reinforced concrete.

**LENTON® FORM SAVER**
LENTON FORM SAVER is ideal for eliminating protruding dowel bars in segmental pour applications and temporary openings. It is uniquely designed with the LENTON tapered thread, factory installed thread protector and nailing plate for easy attachment to the form.

**CADWELD®**
CADWELD rebar splices are used where strength and toughness are critical. CADWELD - the world’s premier mechanical splicing system - offers consistency as well as versatility and flexibility. CADWELD rebar splicing system is the most used system in nuclear construction worldwide.

CADWELD is also used for no bar end preparation applications where new reinforcement is connected to existing reinforcement.
ERICO, Inc. manufactures a complete line of rebar splicing systems. Each system is designed to meet different splicing requirements. ERICO has the staff, experience and resources to help select the system that's right for any application. The following is a list of the most popular splicing systems available from ERICO – The rebar splicing specialists.

**LENTON® INTERLOK**
LENTON INTERLOK is a pre-cast joining system, designed to provide structural integrity for joining rebar in precast construction. The LENTON INTERLOK system allows maximum efficiency in precast construction as blockouts and concrete patching are eliminated providing architecturally appealing results.

**LENTON® QUICK-WEDGE**
LENTON QUICK-WEDGE is designed for retrofit applications and is fast and easy to install. Because it utilizes short dowels, LENTON QUICK-WEDGE reduces costly and potentially damaging concrete removal. It is an extremely cost effective system to use for bridge widening, seismic upgrades, closure pours and pile extensions.

**LENTON® SPEED-SLEEVE**
LENTON SPEED-SLEEVE is the first choice of contractors for compression only applications. LENTON SPEED-SLEEVE is uniquely designed for fast, one-man installation and easy inspection. Using square saw cut ends, LENTON SPEED-SLEEVE meets international code requirements for compression only splicing.

**LENTON® TERMINATOR**
LENTON TERMINATOR is a taper-threaded anchorage, which is secured to the end of a length of reinforcing steel bar and is capable of creating a more effective anchorage than the traditional hooked rebar. This approach greatly simplifies rebar placement, reduces congestion and improves structural integrity.
LENTON is the most widely used mechanical splicing system in the world today. The LENTON system is designed to connect two pieces of rebar together in the field quickly and easily.

LENTON taper threaded splices utilize the time-tested, field proven taper thread for assurance of strength, consistency and reliability while simplifying installation. Designed for use with worldwide grades of rebar, LENTON develops the full tension splice strength requirement per numerous international design standards. The LENTON system is available in several styles to meet virtually any application. The applications include standard bar-to-bar connections, precaging applications, hooked bar applications, closure pours, precast connections, rebar terminations and anchorages, transition splices, segmental construction and connections to structural steel.

For compression only connections the LENTON SPEED-SLEEVE is ideal. SPEED-SLEEVE installs quickly in an easy one man operation.

The CADWELD rebar splicing system is the most widely used mechanical splice in nuclear construction. The CADWELD metal filled splice is also ideal for repair applications.

The LENTON INTERLOK precast joining system is designed to provide structural integrity for joining rebar in precast construction. The system allows maximum efficiency in precast construction as blockouts and concrete patching are eliminated - providing architecturally appealing results.

LENTON TERMINATOR is a replacement for hooked rebar in beam/column, roof/column, piles and pile cap, footings, and just about anywhere a typical hooked bar would be utilized for anchorage in traditional cast-in-place precast construction. The LENTON TERMINATOR is simply an oversized coupling secured to the end of a length of rebar, creating anchorage within the concrete. Pioneered by ERICO in the 1970s, mechanical rebar anchors effectively eliminate the rebar hook, minimize embedment lengths, simplify concrete placement, reduce construction costs and allow greater flexibility in design and construction. In addition to providing an alternative to hooked rebar, it can also be utilized as a stop nut for bar passing through a pile plank or structural steel element.
LENTON COUPLERS
Ideal for shear wall applications. Mechanical splices reduce overall congestion.

LENTON POSITION COUPLER
For bar-to-bar connections where neither bar can be rotated and where one bar is free to move in its axial direction.

LENTON TERMINATOR
Replacement for a bent section of reinforcing steel.

LENTON Weldable “C3J/C2/C12”
Coupler designed to be arc-welded to structural plates and shapes.
LENTON FORM SAVER is ideal for segmental pours by eliminating protruding dowels. It is uniquely designed with our LENTON taper thread, factory installed thread protector and keyed mounting holes for easy attachment to the form. LENTON Form Saver eliminates drilling expensive formwork and the need for bend/rebend of rebar. FORM SAVER is ideal for slip form, jump form, segmental pour, stairwell applications, bridge and highway construction and precast applications. LENTON FORM SAVER is available in sizes #4 through #11 (12mm - 36mm).

**Applications**

**Dowel Bar Replacement**

LENTON FORM SAVER

Installed into the precast wall panels. Once the panel is positioned at the jobsite, the matching external threaded rebar is screwed into the coupler to maintain continuity between the cast-in-place and precast sections.

**Equipment and Crane Openings**

Stairwell

1st Pour

Floor Slab, Highway or Bridge Slabs

2nd Pour

1st Pour
ERICO offers a wide range of products to splice rebar in the field or to repair or extend column or beam bars that are in a structure. Sometimes rebar may be accidentally cut in the field or a structure may get an addition and the reinforcement must be extended. For these applications, ERICO offers several products including the CADWELD rebar splicing system and the QUICK-WEDGE mechanical rebar splice. The CADWELD splice is the original mechanical splice pioneered by ERICO in the 1950s and is suitable for connecting two pieces of rebar in-situ with no bar end preparation required. This system is the premier rebar splice in the world, and as a result, it is the primary splicing method used for nuclear and blast resistant structures. In addition, the QUICK-WEDGE splice is ideal for repairing or extending small rebars in sizes #4 - #6 (12mm - 20mm). This quick and easy to use system is flexible, reliable and economical. Installation is made in seconds by over-lapping rebar in the steel sleeve and driving a wedge pin between the bars with a portable hydraulic hand tool. Splices can be made with as little as 3” (76mm) of exposed dowel. This system is also ideal for adding confinement steel (stirrups) in seismic upgrade applications.

**REPAIR/RETROFIT APPLICATIONS**

**LENTON QUICK-WEDGE • CADWELD Rebar Splicing System**

**QUICK-WEDGE**
Stirrups are joined at two locations around an existing column. The column is encased with additional concrete pour.

**QUICK-WEDGE**
Remove sections of deteriorated road slabs or bridge decks. Expose a minimal length of rebar by chipping out additional concrete. New reinforcing steel is joined by an oval shaped coupler. A hydraulic hand tool is used to install a wedge pin between new and old rebar.

**CADWELD**
Metal-filled rebar connection used to splice to existing reinforcement bars. No bar end preparation is required.

**CADWELD**
Metal-filled rebar connection designed with an over-sized interior to allow for radius bars.

**CADWELD**
Metal-filled rebar connection used to splice to existing reinforcement bars.
LENTON is the most widely used mechanical splicing system in the world today. And why not? LENTON is unique because it uses a taper thread for assurance of strength, consistency and reliability while simplifying installation.

Designed for use on worldwide standard grades of rebar, LENTON develops the ACI full tension splice strength requirement as per many international standards. No “special” high strength, enlarged thread section, or increased rebar size are necessary, allowing the supply of rebar from multiple sources for maximum cost savings.

• Fastest system to install – accelerating construction schedules.
• Threading at the fabrication shop eliminates installation equipment “problems” at the job site.
• Excellent for future extension applications.
• Contractor can save valuable crane time while gaining flexibility on mechanical splicing schedules.
• Electrostatically epoxy coated couplers are available to maximize corrosion protection.
• Taper thread design eliminates cross threading problems.
• Available in sizes #3 - #18 (10mm - 57mm)

LENTON Offers a Coupler for Every Application:
A Type - Standard bar-to-bar application
P Type - For bent bar applications
C Type - For connecting reinforcing bar to structural steel
S Type - For joining reinforcing bar to standard metric bolt
D Type - An alternative to hooked bar or as an anchor
R Type - A Type transition coupler

Luxor Casino – Las Vegas, USA
LENTON FORM SAVER solves the age old problem of joining rebar through a concrete form. As an extension of the LENTON product line, FORM SAVER offers the LENTON advantages with additional features. All couplers are supplied pre-assembled to the rebar with built in internal coupler thread protection to eliminate concrete paste contamination. The plate designed to mount the coupler assembly is pre-attached and features keyed holes to ease attachment to the form.

- Ideal for slip form, jump form, segmental pour and stairwell applications, to name a few.
- Provides job site safety by eliminating protruding dowels.
- Exceeds International Building Code Requirements.
- Quality assurance tensile testing during production runs.
- Available in sizes #4 - #11 (12mm - 36mm)

The system eliminates:
- The need to cut holes in expensive form work;
- Questionable condition of "bent and rebent" rebar;
- Bars breaking during straightening;
- Specifying Grade 40 rebar for the application.
For the most demanding applications, CADWELD rebar splicing system has earned its reputation as the strongest splice. The primary usage for CADWELD is related to critical structures requiring high safety margins such as blast resistant facilities, pressure vessel applications, or seismic resistance.

CADWELD is a mechanical splice, not a weldment. The system utilizes an internally grooved sleeve working in conjunction with the rebar deformations. Load is transferred from the rebar to the sleeve via CADWELD filler material. The finished connection develops strength and consistency – there is no equal in the industry.

Due to its popularity in critical structures, CADWELD is the world’s most tested mechanical splice. Its record includes over 25,000 actual field made tensile tests.

- Consistently develops minimum ultimate strength of the rebar.
- Excellent for joining circumferential bars.
- Simplifies acceleration of splicing schedules.
- Retrofit and repair with short dowels and requires no bar end preparation.
- Available in sizes #4 - #18 (12mm - 57mm)

CADWELD rebar splices have been used in over 200 nuclear power plants worldwide.
LENTON QUICK-WEDGE

The QUICK-WEDGE splicing system is designed to deliver a quick and simple method of splicing #4 - #6 (12mm - 20mm) bar. Installation is made in seconds by over-lapping rebar in the steel sleeve and driving the wedge pin between the bars with a portable hydraulic hand tool.

QUICK-WEDGE offers fast installation by allowing rebar to be cut to the approximate size that spans between the rebar being joined, doing away with custom cutting and fitting as in butt splicing.

Splices can be made with as little as 3” (76mm) of exposed dowel.

- Minimal dowel lengths eliminate excessive and expensive concrete chipping in retrofit installations.
- “Lapped bar” capability and minimal exposed bar ends make the QUICK-WEDGE system a natural for road/bridge repair and closure pours.
- The ideal splice system for adding confinement steel (stirrups) in seismic upgrade applications.
- Exceeds characteristic strength requirements in the code.
- Can make up to 100 splices per hour.

QUICK-WEDGE

Protruding bars from the precast wall are joined using an oval shape coupler. The bars are overlapped and assembled using a hydraulic hand tool. Cast-in-place concrete is poured after the connections are completed.

QUICK-WEDGE

A minimal amount of concrete is removed from the existing road way or bridge deck. An oval shaped mechanical lap splice coupler is assembled using a portable hydraulic hand tool.

CityLink – Melbourne, Australia
For precast construction, ERICO offers the LENTON INTERLOK rebar splicing system. Splices are designed to maintain structural integrity between load bearing precast members such as columns, beams and shear walls. The completed connection exceeds the ACI Building Code Requirement.

LENTON INTERLOK utilizes the LENTON taper threaded system on one end, which has been recognized worldwide for nearly two decades. The opposite end of the sleeve is filled at the jobsite with a specially formulated cementitious filler (grout). A quality connection is assured since both the coupler and filler are supplied by ERICO as a system.

Unlike embedded connections, tensile loads are transferred through the rebar, and are not dependent on the compressive strength of the concrete.

- Maintains structural integrity through precast sections. The reinforcing steel acts as one continuous bar well above 125 percent of yield.
- Unlike embedded connections, tensile loads are transferred through the rebar, and are not dependent on the compressive strength of the concrete.
- The connection is not detrimental to surrounding concrete, since no heat is produced, as in arc-welding.
- No more unsightly and costly patchwork required, creating an aesthetically appealing finish.
- Designed for all rebar sizes from #6 - #18 (20mm - 57mm).
For compression only applications, SPEED-SLEEVE is the splice of choice. The system is designed to allow compressive loads to be transferred by aligning square cut rebar to bear on one another. SPEED-SLEEVE is desirable because it can be installed on rebar dowels without the upper bar in place. This feature allows one-man installation and is conducive to prefabricated cage assembly.

- Installation is a one-man operation keeping labor costs down.
- Transition splices can be made with the use of simple adaptor inserts.
- Install with an air or electrically driven impact wrench.
- Fast installation keeps construction on or ahead of schedule.
- Designed for sizes #6 - #18 (20mm - 57mm).
Recent code changes have significantly increased the amount of rebar required, while at the same time, designers are striving for more compact structural elements. This results in rebar congestion and placement problems. Built on the extensive testing conducted for headed anchors, the LENTON TERMINATOR answers these challenges by eliminating the majority of rebar embedment lengths required, while reducing job-site man-hours and related labor costs.

Utilizing the principles of the Shear Cone Theory on which ACI-355 is based, the LENTON TERMINATOR is designed for use on all rebar grades sizes #4 - #18 (12mm - 57mm). The LENTON Terminator incorporates the time-tested, field-proven LENTON tapered thread and is supplied through a network of local rebar fabricators.

- 60% less rebar congestion by eliminating the need for hooked rebar embedments.
- Complies with major codes and standards while minimizing embedment lengths to reduce congestion.
- Simplifies concrete placement for better concrete consolidation.
- Offers more embedment options, while allowing greater design flexibility.
- Faster installation lowers the in-place cost.
- Standard product dimensions require minimal detailing.
- Simplifies expansion while allowing for future extensions.

ACI-355 is based on the principles of the Shear Cone Theory

Malampaya Offshore Platform – The Philippines
Put the ERICO Advantage to Work for You

Celebrating its 100th year, ERICO is a diversified global manufacturer with a network of offices and manufacturing facilities in over 24 countries and with more than 1400 employees. Headquartered in Solon, Ohio, USA, ERICO has two businesses: the Fixing and Fastening Business selling Electrical and Mechanical Fixings and Fasteners and Concrete Reinforcement products; and the Electrical Business offering Facility Electrical Protection, Panelboard and Rail and Industrial Electrical products. Well-known brand names include: CADDY® fixings and fasteners; CADWELD® welded electrical connections; CRITEC® surge protection devices; ERIFLEX® low-voltage components featuring FLEXIBAR® busbar; ERITECH® lightning protection and grounding; and, LENTON® mechanical rebar splices. Visit ERICO online at www.erico.com.

The LENTON Rebar Splicing Family

LENTON® Taper Threaded Splices
LENTON® FORM SAVER
CADWELD®
LENTON® INTERLOK
LENTON® QUICK-WEDGE
LENTON® SPEED-SLEEVE
LENTON® TERMINATOR

The Rebar Splicing Specialists
Projects

Petronas Towers - Malaysia

KPN, Rotterdam - Netherlands

Skydome - Toronto, Canada

Messeturm - Frankfurt

Panoramic Tower - Lisbon

Sizewell B - UK

Storebaelt West Bridge - Denmark

Fernmeldeturm - Hannover
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