

LENTON
Mechanical Splicing Systems

Why use LENTON?

- 1 Load transferred independent of concrete
- 2 Less congestion
- 3 Provides greater structural integrity
- 4 Consistent steel-to-concrete ratio
- 5 Eliminates time-consuming lap splice calculations
- 6 Quick installation – job site schedules maintained
- 7 Safety – no protruding dowels
- 8 Material / labour cost savings
- 9 Minimal column sizing for optional floor space
- 10 Offers a grounding path for lightning strikes

LENTON®

ERICO, the company:

ERICO was incorporated in 1903 as the Electric Railway Improvement Company. The company originally specialized in rail bonding for the Rail Road and Mining Industries. Today ERICO is a diversified international corporation headquartered in Solon (Cleveland), with manufacturing and sales operations worldwide.

A Diverse Product Range

A diverse product range allows ERICO to serve: railroad, mining, construction, manufacturing, electrical, electrochemical, electric utility and communication industries and markets. ERICO believes in providing superior customer service and on time delivery. ERICO backs this commitment with an emphasis on engineering and manufacturing quality products.

Continuous research and development efforts provide product line expansion to meet our customers future needs.

Mechanical Rebar Splicing Systems:

One of our most successful product lines is the line of mechanical splicing systems. All mechanical splices are quality assured to ISO 9000 series accreditation. They offer the most cost-effective alternative to conventional lap splicing systems.

LENTON couplers play a critical role in the construction of structures requiring quick and dependable rebar connections that keep crane time to a minimum. The Melbourne City Link project,

Stadium Australia and the Petronas Twin Towers in Kuala Lumpur are among a growing list of prestigious construction projects to utilise the range of LENTON mechanical splices.



Figure 1: Melbourne City Link Project

The LENTON Range

As a world leader in reinforcement bar splicing, ERICO offers a complete line of full tension and compression splices for the construction industry. LENTON couplers conform to recognised industry Standards. Whatever the splicing application, ERICO have a coupler to suit.

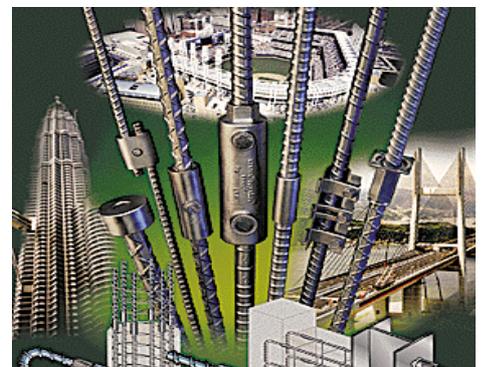


Figure 2: LENTON splicing systems

Mechanical Verses Lap Splicing

Lap splicing has traditionally been the accepted form of connecting steel reinforcing bars in concrete construction. The task of gaining acceptance of mechanical rebar splicing has been made more difficult by the misconception that lap splicing is a “low cost” method of splicing.

Hidden Costs

Engineers are increasingly coming to recognise the cost benefits of mechanical splicing over lap splicing. The time taken to prepare lap splices, the need for additional transverse reinforcement, the material used in forming the lap splice and the cost of rebar placement represent the hidden costs of lap splicing.

Cost is not the only factor affecting the increased use of mechanical splices.

The Need for an Alternative

Continuing research, more demanding designs in concrete construction, new materials, hybrid concrete and steel designs and other advances in the construction industry are calling for the use of alternatives to lap splicing.

Improved Structural Integrity

While Lap splicing systems depend on the bond between concrete and steel to transfer load, mechanical splicing systems provide load path continuity independent of the condition or existence of surrounding concrete. In other words, mechanical splices are stronger than traditional lap splices.

Improved Design Options

Lap splicing requires the use of small diameter reinforcing bars to offset problems with rebar congestion. This often means column dimensions must be unnecessarily increased. Mechanical splices utilize larger diameter rebar allowing for use of smaller columns for the same construction requirement.

This reduction in column size allows more design flexibility, less cost and an optimum use of floor space.

Eliminates Time-Consuming Calculations

Compliance with current ACI codes requires tedious calculations. Accounting for average centreline distances, concrete strengths and location of bar to determine the proper length of each lap splice are not required for mechanical splices. Besides eliminating design calculations, mechanical splicing reduces potential design errors while eliminating waste and unnecessary rebar costs.

Consistent Steel to Concrete Ratio

Using a mechanical rebar splicing system results in reduced rebar congestion, complying with the ACI Code which stipulates an 8% steel to concrete content ratio. Mechanical splices achieve an ideal balance of steel and concrete by eliminating unnecessary rebar while providing greater structural integrity. Achieving a balanced design is nearly impossible with lap splicing systems because of the additional rebar in the lap zone.

Reduced Congestion

Lap splicing doubles the number of bars required, contributing to unnecessary rebar congestion, which adversely affects uniform stiffness and concrete placement. This congestion in the “lap zone” cause rock pockets which can lead to the strainer effect” – inhibiting the proper distribution of concrete aggregate around the rebar. Mechanical splicing eliminates concrete pour congestion, while minimizing potential job site problems.

Clearly mechanical splices offer numerous advantages. The negligible short-term perceived economics of lap splicing are far-outweighed by the many structural and economic benefits of mechanical splicing.

A case study using LENTON couplers

Construction of the World’s Tallest Building
Construction of the world’s tallest buildings, The Petronas Twin Towers in Kuala Lumpur, Malaysia, created unique challenges. The 88-storey Towers rise more than 1,400 feet in the air, and are connected by a two-story skybridge.

Unique Challenges
Malaysian construction codes required the Petronas 142-foot diameter towers to stand up to the 65-mph winds clocked during major storms. The construction time for each floor was extremely short – only four to five working days, making it vital to keep crane time to minimum.

Couplers Make the Connection
The LENTON splicing system was chosen for easy installation and reliability, because it complies with all major international building codes, including those of Germany, the US, the UK and Australia. Approximately 300,000 LENTON taper-threaded couplers lend support to this historic landmark.

Standard LENTON couplers were used in the horizontal column to beam connections; standard and transition couplers were used for vertical column splices; position couplers were used in the construction of the skybridge and LENTON couplers played a critical role in the slip-form construction, providing quick and dependable connections.

LENTON Taper-Threaded Couplers

Design Benefits

- Allows maximum bar cross-section to be used
- Short length and slim design ensure the least disturbance to uniform stiffness
- Splice strength independent of rebar deformation
- Provides positive locking, no-slip connection
- Any length, shape, diameter or combination of bar sizes can be mechanically spliced
- Smallest diameter in the industry reduces need for cover and eliminates congestion

Installation Benefits

- Coupler takes approximately 4 turns to engage
- Taper threads provide self-aligning and prevents cross-threading
- No special tools or skills required
- No power required for installation
- Splice inspection is quick and easy
- Fast installation reduces crane time
- Bar threader is easy to use and can be set up on site or at the fabricator
- Because most of the work is done in the fabrication shop, construction schedules are accelerated

LENTON Taper-Threaded Couplers



Most widely used mechanical splicing system in the world.

The unique LENTON self-aligning taper-threaded design provides ease of installation, consistent performance and durability. It also develops higher tensile strength than lap splicing and provides full load transfer with the slimmest and shortest coupler possible.

The LENTON couplers are designed to meet the stringent requirements of seismic design codes.

As construction codes and federal regulations regarding seismic frame construction become more stringent, LENTON splices provide the ability to design and build concrete structures that meet today's codes and fulfill tomorrow's structural demands. LENTON couplers are designed to withstand man-made blasts, seismic and other natural events by providing reinforcing splices for rebar.

LENTON couplers are designed for nominal yield values up to 550 MPa and tensile strength values up to 750 MPa.

A completed LENTON splice exceeds the requirements of International Codes including: AC1318; AS3600; BS8110; DIN1045; MS146 codes for full tension splices.

The ERICO Coupler Range

As a pioneer in the construction industry for over 30 years, ERICO offer a complete line of full tension and compression mechanical splices

LENTON TERMINATOR

- an embedment anchor that offers an ideal alternative to hooked rebar anchorage

LENTON INTERLOK

- a unique rebar splicing system that utilizes LENTON taper-threads together with a grouted sleeve to provide structural integrity for precast applications

LENTON QUICK-WEDGE

- a mechanical lap splice designed for quick retrofit / in-situ applications

LENTON SPEED-SLEEVE

- ideal splice for compression only applications

LENTON FORMSAVER

- taper-threaded segmental construction splice with factory-installed thread protectors and keyed mounting holes eliminates protruding dowels and is easy to attach to formwork

CADWELD

- this premiere exothermic welded splice offers consistent, versatile and reliable performance and is commonly referred to as the world's strongest splice

For further information on ERICO's line of mechanical rebar splicing systems, contact in the UK:

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