BarSplice PRODUCTS INC.

# Zap Screwlok®

***SHEAR SCREW & WEDGE MECHANICAL CONNECTIONS FOR UNCOATED AND EPOXY COATED REINFORCING BARS***

# Zap Screwlok®

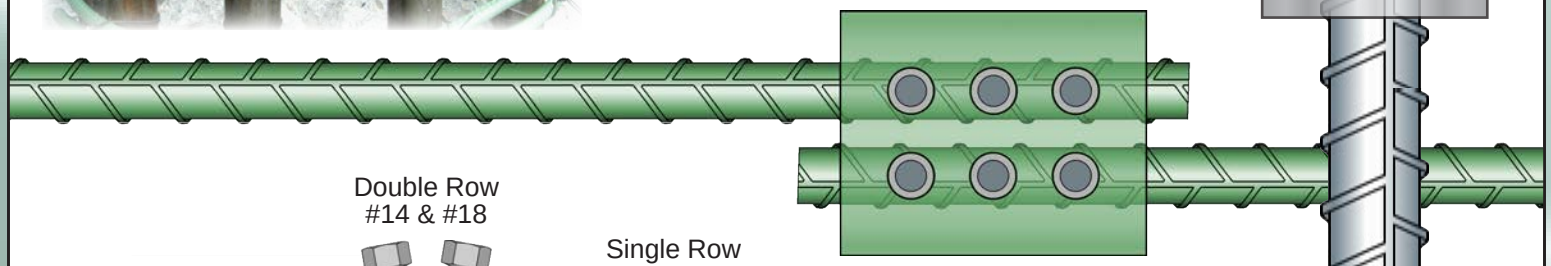
## *SHEAR SCREW & WEDGE MECHANICAL CONNECTIONS FOR REINFORCING BAR*

### *APPLICATIONS*

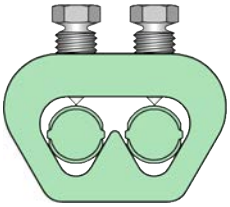
- ✓ Retrofit or repair existing structures
- ✓ Eliminate expensive rebar-welds
- ✓ Extend deck steel to widen bridges
- ✓ Highway patch and repair projects
- ✓ Connect bars across closure pours
- ✓ Reinforced concrete piles and columns
- ✓ High rise buildings
- ✓ Safety related structures

### *SIMPLE INSTALLATION*

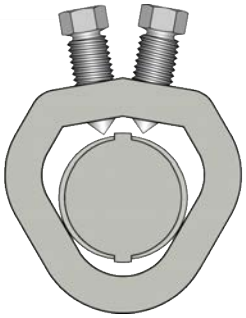
Depending upon the size, pre-assemble manually with a socket wrench, then for a FAST and EASY installation, use a standard air impact wrench. Following the instructions supplied with your order, tighten the screws, from each end to the center, until the heads twist off at a prescribed value. The force from the screws causes the rebar deformations to interlock within the coupler wedge while the screws embed themselves into the rebar surface. This dual mechanical action results in a full positive connection that transfers the tension and/or compression force from one bar to the other.



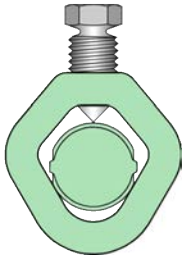
Double Barrel
#3 - #8

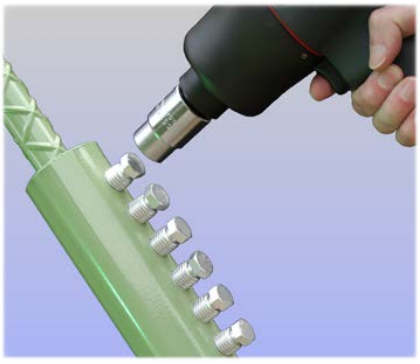


Double Row
#14 & #18

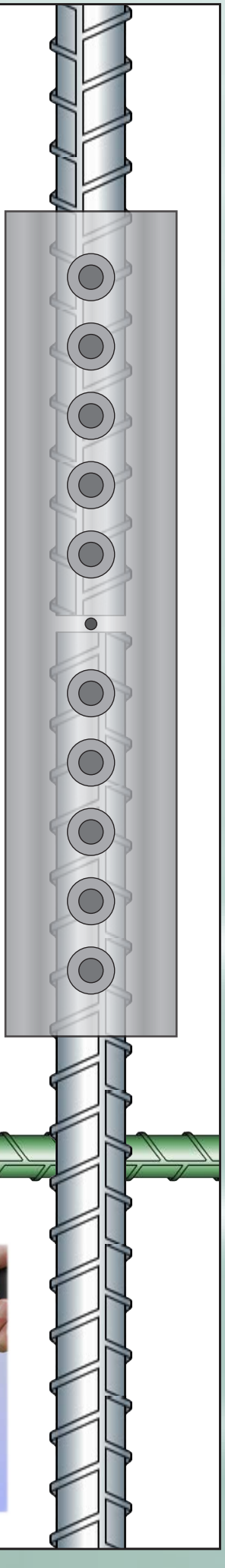


Single Row
#3 - #11





*Force from the screws causes rebar deformations to interlock within the coupler wedge, while at the same time, the screws embed themselves into the rebar. When the proper torque is reached, the heads TWIST OFF.*



Zap Screwlok®

## CONVENIENT FIELD SPLICE OPTIONS FOR YOUR PROJECTS

# ZAP SCREWLOK TYPE 2 SERIES

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- ***TYPE 2 FULL MECHANICAL SPLICE*** – ACI 318-19 Section 18 and 2021 International Building Code. Exceeds specified tensile strength ($f_u$) ASTM A615 and A706 Grade 60 uncoated and epoxy coated deformed bars.
- ***IAPMO-UES EVALUATION REPORT ER-0796*** – IBC, IRC and ACI 318. Available in English and Spanish.
- ***NUCLEAR SAFETY RELATED SPLICE*** – ASME Section III, Division 2 Boiler & Pressure Vessel Code Case N-791 (Shear Screw and Sleeve Splice). Exceeds ASTM A615 Grade 60 tensile strength ($f_u$) of 80,000 psi.
- ***SEISMIC LOADING*** – Withstands plastic strain excursions to 5 x rebar yield strain value and stress reversals in accordance with ICC Acceptance Criteria AC-133.
- ***NEW CONSTRUCTION, RENOVATION OR REPAIR*** – Suited for butt-splicing of reinforcing bars new-to-new or new-to-old. Tested with Grades 30, 33, 40 and 50 (square bar, round bar and threaded rod) to 125% x $f_y$.
- ***GRADE 75 BARS**** – Exceeds 125% x specified yield strength ($f_y$) uncoated ASTM A615 Grade 75 and capable of developing 100,000 psi, the specified tensile strength ($f_u$) of Grade 75.
- ***CALTRANS "SERVICE" APPROVED*** – Meets slip test CT670 & capable of exceeding 80,000 psi, the specified tensile strength of uncoated deformed bars ASTM A706. (Not classified as CalTrans "Ultimate")
- ***AASHTO AND DOT PROJECTS*** – Exceeds 125% x specified yield ($f_y$) per AASHTO *LRFD Bridge Design Specifications*. Capacity to exceed 135% x $f_y$ and 100% x $f_u$ Grade 60 bars.
- ***MASONRY APPLICATIONS*** – Exceeds 125% x specified yield ($f_y$) per ACI 530 / TMS 402.
- ***EPOXY AND GALVANIZED APPLICATIONS*** – Available with ether epoxy or hot dip galvanized coating for butt-splicing epoxy coated bars that comply with AASHTO specifications and ASTM A775 Grade 60, and galvanized bars per ASTM A767 or A1094 Grade 60. Widely used on bridge decks, and parking garages susceptible to salt induced damage and in other adverse condition locations including wastewater treatment and chemical plants.
- ***CYCLIC LOADING*** – Qualified to DOT protocols including 100 cycles 5% $f_y$ to 90% $f_y$ in tension and 10,000 cycles stress reversal from 25,000 psi tension to 25,000 psi in compression.
- ***FATIGUE STRENGTH*** – Pre-qualified to '18 ksi' stress-range by testing for more than 1-million load cycles.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bar sizes #3 – #18 (Ø 10 – 57 mm) [10M – 55M].

* Zap Screwlok Type 2 couplers are not suitable for use with ASTM A1035 Grade 100/120 MMFX bars or "Dual-Certified" Grade 75/100, Grade 80/100 bars or any variation thereof. Contact BPI for **Zap Screwlok** FX series.

# ZAP SCREWLOK SL SERIES

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- ***FULL MECHANICAL SPLICE*** – Per ACI 318-19 Section 25, develops in tension or compression, as required, at least 125% x specified yield ($f_y$) of the bar, ASTM A615 and A706 deformed Grade 60.
- ***COMMERCIAL APPLICATIONS*** – Meets minimum building code requirements for structural concrete. Used in columns, beams, walls, mats, tanks, parking garages and condominiums.
- ***MASONRY APPLICATIONS*** – Exceeds 125% x specified yield ($f_y$) per ACI 530 / TMS 402.
- ***SUPERIOR TO ALL TENSION LAP SPLICES*** – Strength is independent of surrounding concrete and cover. Takes up less space than rebar lap. Replaces lap splice classes A, B or C.
- ***COMPACT DESIGN*** – Shorter than Type 2 series, with fewer screws, results in faster installation time. Ideal for hard to reach places since less room is needed.
- ***FOR STANDARD REINFORCING BARS*** – For ASTM A615, A706, A996, and equal deformed bars, Grades 40, 50 and 60. Capable of exceeding 125% x fy for epoxy coated bars, and 135% x fy for uncoated bars.
- ***CALTRANS "SERVICE" APPROVED*** – Meets slip test CT670 & capable of exceeding 80,000 psi, the specified tensile strength of uncoated deformed bars ASTM A706. (Not classified as CalTrans "Ultimate")
- ***EPOXY AND GALVANIZED APPLICATIONS*** – Available with either epoxy or hot dip galvanized coating for butt-splicing epoxy coated bars that comply with AASHTO specifications and ASTM A775 Grade 60, and galvanized bars per ASTM A767 or A1094 Grade 60.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bar sizes #4 – #18 (ø 12 – 57 mm) [10M – 55M].

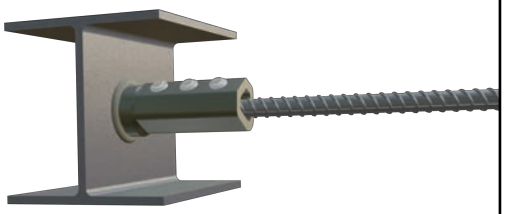
# ZAP SCREWLOK TRANSITIONS

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- ***FULL MECHANICAL SPLICE*** – Capacity to exceed 125% x specified yield ($f_y$), 135% x $f_y$ and 100% x specified tensile ($f_u$) of the *smaller* size ASTM A615 and A706 Grade 60 uncoated bar. Also exceeds 135% x $f_y$ ASTM A775 epoxy and ASTM A767 or A1094 galvanized Grade 60 bar.
- ***IAPMO-UES EVALUATION REPORT ER-0796*** – IBC, IRC and ACI 318. Available in English and Spanish.
- ***PURPOSE*** – For butt-splicing bars of different sizes, or for connecting bars of different configurations or shape.
- ***APPLICATIONS*** – Many vertical applications such as columns, walls, piers, caissons, parking garages, high rise buildings – or for connecting different types of reinforcing bars (i.e. smooth, square, threaded rod, etc) to standard rebar in retrofit or repair situations.
- ***SIMPLE DESIGN*** – One piece device with converging sides for wedging of different bar sizes – Made from seamless shaped tubing with no welds – Includes center stop.
- ***TYPE 2 SPLICE*** – ACI 318-19 Section 18 Seismic Design and International Building Code. Develops specified tensile strength of the *smaller* uncoated ASTM A615 and A706 bar.
- ***SEISMIC LOADING*** – Withstands plastic strain excursions to 5 x rebar yield strain value and stress reversals in accordance with ICC Acceptance Criteria AC-133.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection.

Zap Screwlok®

## ADDITIONAL SOLUTIONS AND APPLICATIONS

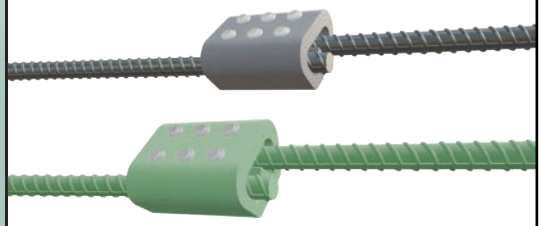


# ZAP STRUCTURAL CONNECTOR

### SHEAR SCREW AND WEDGE WELDABLE CONNECTOR

- ***STRENGTH RATING**** – Has capacity to exceed a minimum joint strength of 75,000 psi measured in the rebar; equal to 125% x specified yield ($f_y$) Grade 60.
- ***COMPATIBILITY*** – For use with ASTM A615 and A706 Grade 60. Has capacity to exceed 125% x $f_y$ in all cases.
- ***VERSATILITY*** – For attachment of reinforcing bars to plates, structural steel shapes or for creating headed anchorage. Shop or field weldable, before or after bar placement.
- ***CERTIFIED LOW CARBON STEEL*** – Weldable steel component conforms to CC –2310(c) material requirements of ASME Section III, Division 2, and meets the chemistry of AISI Grade 1018 or 1026. Mill certified analysis for each heat lot of steel available. (Suitable for Electrode E7018)
- ***WELDING BEVELS*** – For full penetration, provided for greater strength, convenience and quality assurance.
- ***LESS WELD STRESS*** – When compared to a direct butt weld since the outside diameter of the structural connector is larger than the reinforcing bar, so the weld area is disposed over greater length.
- ***DOT PROJECTS*** – Capacity to exceed 125% x $f_y$ and 135% x $f_y$ for ASTM A615 and A706 Grade 60 uncoated deformed bars.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bar sizes #4 – #18 (ø 12 – 57 mm) [10M – 55M].

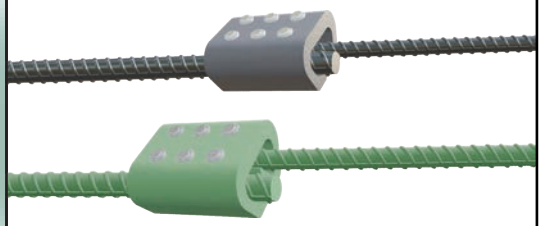
*Welder qualification, weld procedure, integrity and strength are the responsibility of others.



# DOUBLE BARREL ZAP SCREWLOK

### SHEAR SCREW AND DOUBLE WEDGE MECHANICAL LAP SPLICE

- ***MECHANICAL LAP SPLICE –*** Per ACI 318-19 Section 25, in-air tests confirm ability to exceed 125% x specified yield ($f_y$), 135% x $f_y$, and 100% x specified tensile ($f_u$), for ASTM A615 and A706 Grade 60 uncoated bar.
- ***DOT PROJECTS AND COATED BARS*** – Exceeds 125% x $f_y$, Grade 60 epoxy coated ASTM A775 bar and galvanized ASTM A767 or A1094 bar, with capacity to exceed 135% x $f_y$.
- ***MASONRY APPLICATIONS*** – Exceeds 125% x specified yield ($f_y$) per ACI 530 / TMS 402.
- ***SUPERIOR TO ALL TENSION LAP SPLICES*** – Eliminates hard-to-predict nature of lap splices – especially long epoxy bar laps – Positive connection instead of reliance on concrete – Used to widen bridges, make slab repairs, connect hoop bars and in piles to terminate spirals.
- ***COMPACT DESIGN*** – Shorter than mechanical butt-splices and significantly shorter than lap splices – less room needed – ideal for many repair applications and construction joints.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bar sizes #3 – #8 (ø 10 – 25 mm) [10M – 25M].



# DOUBLE BARREL ZAP TRANSITION

### SHEAR SCREW AND DOUBLE WEDGE MECHANICAL LAP SPLICE

- ***PERFORMANCE*** – Exceeds 125% x specified yield ($f_y$), 135% x $f_y$ and 100% x $f_u$, for the *smaller* ASTM A615 and A706 Grade 60 uncoated bars, with capacity to exceed 135% x $f_y$ for ASTM A775 and A767 Grade 60 bars.
- ***PURPOSE*** – For mechanical lap splicing bars of different sizes – or for connecting bars of different types such as old to new.
- ***SIMPLE DESIGN*** – One piece device with converging sides for splicing of different bar sizes – manufactured as ductile casting with no welds.
- ***FOR ALL STANDARD REINFORCING BARS*** – Uncoated ASTM A615 & ASTM A706, Epoxy coated ASTM A775, Galvanized ASTM A767 & A1094 or Stainless ASTM A996 and equivalent deformed bars.
- ***CONVENIENCE*** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection.

# HOW TO SPECIFY ZAP SCREWLOK® SPLICES AND CONNECTORS

| | By Name: | By Generic Description: |
|---|---|---|
| **BAR-TO-BAR**<br>Mechanical butt splice | **Zap Screwlok® Type 2 Series**** *or*<br>**Zap Screwlok® SL Series****<br>*by* **Barsplice Products, Inc., Dayton OH** | ***Mechanical butt splices shall be the tension-compression shear screw and wedge coupling sleeve type,*** *with smooth converging sides and cone-pointed hex-head screws, to develop a strength in the bar equal to [state strength requirement].* |
| **BAR-TO-BAR**<br>Mechanical lap splice | **Double Barrel Zap Screwlok®****<br>*by* **BarSplice Products, Inc., Dayton OH** | ***Mechanical lap splices shall be the shear screw & double wedge coupling sleeve type,*** *with converging sides and cone-pointed hex-head screws opposite the wedges.* |
| **BAR-TO-STRUCTURAL STEEL**<br>Structural Connector | **Zap Screwlok® Structural Connectors****<br>*by* **BarSplice Products, Inc., Dayton OH** | ***Bar-to-structural steel connections shall be the shear screw and wedge weldable connector type with*** *smooth converging sides, cone-pointed hex-head screws and* ***weld bevels inclined 30-degrees to the rebar axis.*** |

** Include bar size(s), bar type, bar finish (uncoated, epoxy, etc.) and bar grade. Include statement: "Parts shall be manufactured to the quality requirements of ISO 9001."

***Field splicing of reinforcing bars by the Zap Screwlok® method is most popular because of the systems simplicity, cost effectiveness and adaptability. Instructions provided with Zap Screwlok® splices and connectors explain step-by-step installation and safety information.***



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