

ZAP SCREWLOK® Mechanical Splices and Connectors for Reinforcing Bars – Review...

ZAP SCREWLOK® mechanical splices and connectors are compatible with reinforcing bars that comply with ASTM A 615, ASTM A 706, ASTM A 996, or equal and consist of smooth, shaped, steel sleeves with converging sides. A series of cone-pointed hex-head screws are arranged along the longitudinal axes in one or two rows. In the case of butt splices, reinforcing bars are inserted from each end to a center stop. No special bar-end preparation is required, so ends can be sheared, sawed, or flame-cut. Assembly instructions are normally supplied with your order or can otherwise be obtained directly from Barsplice Products, Inc.

During mechanical splice assembly, as screws are tightened, they embed themselves into the rebar surface and then the heads twist off at a prescribed tightening torque. Force from the screws causes rebar deformations to interlock within the coupler wedge. The DUAL mechanical action, results in a full positive connection for transferring tension or compression forces from bar-to-bar. Screws can be tightened using suitable impact wrenches or hand-held ratchet wrenches. Linear alignment is preserved across the splice by using reinforcing bars with straight ends and securing the continuation bar in the desired position at the time of assembly.

When making splices between fixed points, a coupler sleeve without a center stop can be slipped entirely onto one bar and subsequently repositioned over the two bar ends being spliced.

Mechanical butt splices and connectors are available for reinforcing bar sizes No. 3 through 18 (Ø10 through 57 mm) per BPI's **Dimensions and Data** charts. Transition splices are used to connect rebars of different sizes.

Mechanical lap splices are available for bar sizes No. 3 through 7 (Ø10 through 22 mm).

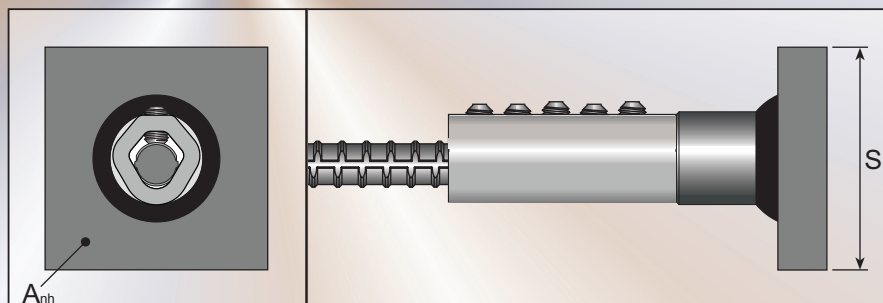
Epoxy-coated steel reinforcing bars that comply to ASTM A 775/A 775M can be spliced by means of epoxy coated coupling sleeves without shielding or removing the epoxy coating from the bar. Zinc coated (galvanized) bars can be mechanically spliced by means of galvanized coupling sleeves. Different types of ZAP SCREWLOK® mechanical splices are selectable for new construction, field repair applications, and the splicing of older types of reinforcing bars.

ZAP SCREWLOK® is a positive tension and compression mechanical splice system whose strength is independent of the concrete which surrounds it, thereby providing true structural continuity. Applications include heavy construction, field splicing of column steel, beam reinforcement, concrete piles and deck steel. The system is used for rehab projects, retrofit, strengthening, and up-grading concrete elements. Type 2 splices are used for mechanically splicing reinforcement in members resisting earthquake induced forces. Other uses may include extending deck steel to widen bridges, highway patch and repair projects and splicing of bars across closure pours.

Benefits to using ZAP SCREWLOK® include positive mechanical splicing, choices for Type 1 and Type 2 applications, splices for black or galvanized or epoxy coated bars, easy visual inspection, no specialized equipment, minimal clearance requirements and positive center-stop. ZAP SCREWLOK® is ideal in remote areas and tight access areas; it is suitable for new construction repair or retrofit and compatible with sheared, flame-cut or saw-cut bars.

Headed Anchorage suitable for Grade 60 reinforcing can be created by welding Zap Structural Connectors and structural steel plates*. For simplicity, **locally-sourced plate** that has been cut square and has a side length 'S' as specified in the table below will be more than adequate for many applications. However, other sizes and shapes of plate can be attached to suit structural demands.

ACI 318 Section 12.6 allows any mechanical device to be used as anchorage that is capable of developing at least the strength of the bar $\{f_y\}$ without damage to concrete.



Example of Zap Screwlok® Termination (plate and welding by others)

Reinforcing bar sizes No.4 through No.18 (Ø12 through 57 mm) that meet the deformation requirements of ASTM A 615/A 615M or ASTM A 706/A 706M can be anchored by this method. Applications might include the substitution of hook bars in congested area, or in renovation and repair work, to enhance straight bars where development length is inadequate. Headed bars reduce the development length of bars by transmitting a proportion of force from bar to concrete via head bearing area.

Square Headed Mechanical Anchorage Dimensions

A _{nh} **	Rebar and Zap 'SL' Structural Connector Size	4	5	6	7	8	9	10	11	14	18
4A _b	Square plate side length 'S' (in.)	1 3/4	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/4	5 1/4	6 1/2
9A _b	Square plate side length 'S' (in.)	2	2 1/2	2 3/4	3 1/4	3 3/4	4 1/4	4 3/4	5	6 1/4	8
	Plate thickness (in.)	1/2	1/2	5/8	5/8	3/4	3/4	7/8	1	1 1/4	1 3/4

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

**A_{nh} = net bearing area of the head in tension. 4A_b = 4 x area of reinforcing bar. 9A_b = 9 x area of reinforcing bar.

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