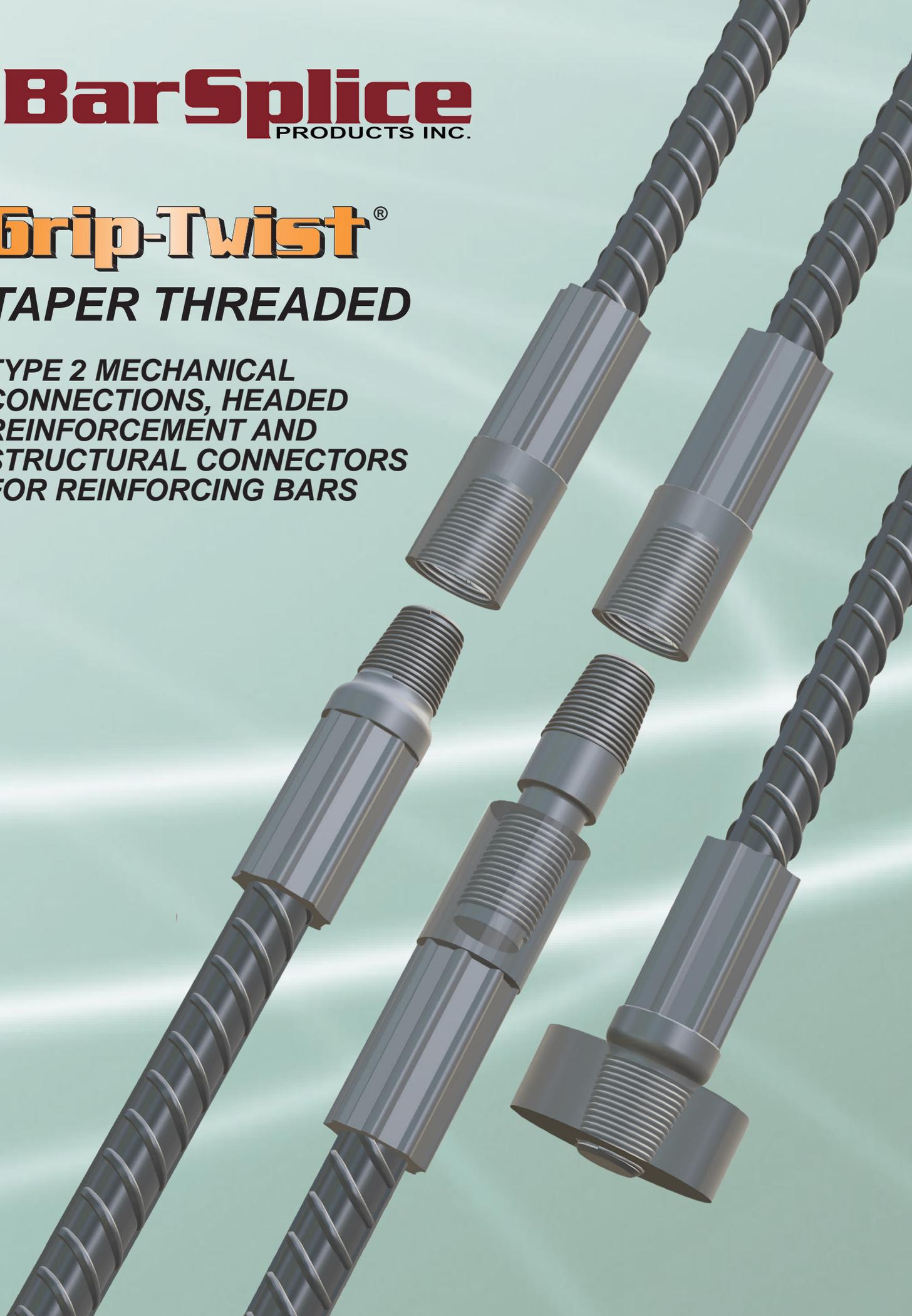




# **Grip-Twist<sup>®</sup>**

## **TAPER THREADED**

**TYPE 2 MECHANICAL  
CONNECTIONS, HEADED  
REINFORCEMENT AND  
STRUCTURAL CONNECTORS  
FOR REINFORCING BARS**



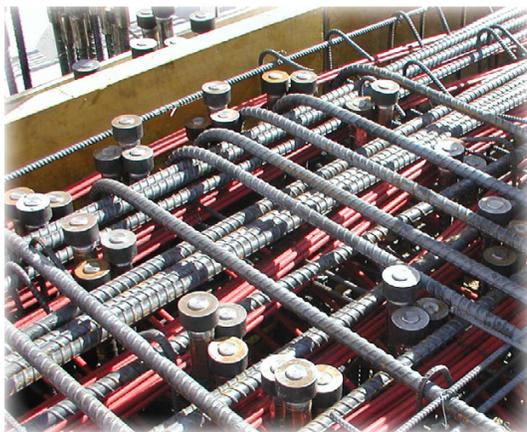
# Grip-Twist®

## TYPE 2 MECHANICAL SPLICES AND THREADED ANCHORAGE FOR REINFORCING BARS



### ADVANTAGES OF TAPER THREADED GRIP-TWIST®

- ✓ **SAVES TIME** – TTGT couplers are pre-installed by cold swaging. With INTERNAL STOPS for easy positioning, there is minimal detailing giving you more design flexibility.
- ✓ **NO SPECIAL BAR END PREPARATION** – Avoids roughing and thread cutting operation on rebars – No chasers, oils or cutting fluids are required.
- ✓ **SELF-LOCATING** – Tapered threads allow for quick assembly, and easy thread alignment, easing bar placement. NO SPECIAL TORQUE is required, and TTGT Position Couplers are available for bent bar installations.
- ✓ **NO CHEMISTRY RESTRICTIONS** – TTGT couplers are compatible with ASTM A615, A706, A996 and equivalent uncoated bars, as well as ASTM A775 (epoxy) and A767 (galvanized) coated bars.
- ✓ **THREAD PROTECTION** – Color coded plastic plugs and caps, matching the color of swaging dies, come installed on all couplers.
- ✓ **HIGH STRENGTH** – Type 2 performance and true structural continuity, with load transfer independent of concrete. ROLLED EXTERNAL THREADS INHERENTLY HAVE HIGH FATIGUE STRENGTH.
- ✓ **FULL REBAR CROSS-SECTIONAL AREA** – With TTGT couplers, there is no undercutting of rebar or heat affected zones.

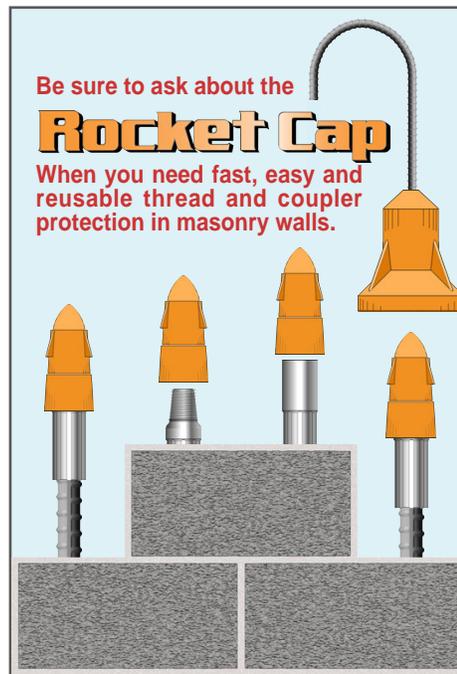


**MECHANICAL ANCHORAGE** is quickly and conveniently achieved using the GRIP-TWIST Taper Threaded DoughNUT™. Congestion problems brought about by hook bars are alleviated.

GRIP-TWIST® is a swaged splicing and anchorage system that incorporates the use of self-locating taper threaded ends on components for expeditious field assembly. Since the couplers are swaged onto the bars, and the threads are on the couplers instead of the reinforcing bars, there is no loss of cross-sectional area of the bars and the full ultimate design strength of the reinforcing system is maintained.

Rebar bar sizes #3 – #20 (Ø10 – 64 mm) [10M – 55M] can be spliced and anchored by Grip-Twist®. Swaging in advance means important time and cost savings for your project. Under fabrication shop conditions, with suitable equipment, just one or two pressings per coupler—half are all that is needed to install parts onto most bar sizes. Reinforcing bars of different sizes may be connected using Grip-Twist® Transition couplers.

In the field it is only necessary to rotate one of the two bars until the threads of male and female couplers are fully assembled...no specialized equipment or torque wrench is needed for this operation – only a simple pipe wrench may be needed to overcome bar weight in accordance with assembly instructions. For locations where rebars have a bend or offset and cannot be rotated, Grip-Twist® Position Couplers may be used.



Be sure to ask about the  
**Rocket Cap**  
When you need fast, easy and reusable thread and coupler protection in masonry walls.

GRIP-TWIST® couplers are superior to rebar lap splices – As a mechanical splice it does not rely on the surrounding concrete to transfer force between bars.

**Strength requirements** for mechanical splices established in ACI 318 are significantly higher than those for lap splices. Taper Threaded Grip-Twist has been qualified by in-air tests and protocols like AC-133 to sustain inelastic reinforcing bar strain excursions such as those that might be brought about by overload due to seismic activity – whereas the use of rebar laps in seismic zones is generally disallowed. The use of #14 and #18 lap splices is prohibited on all projects.

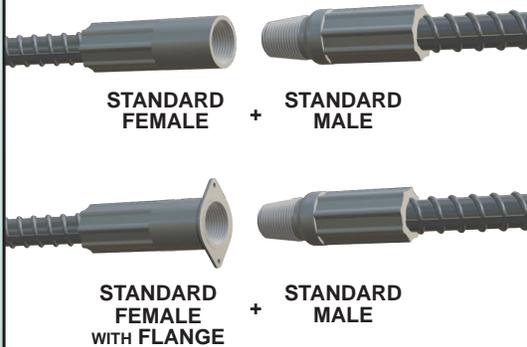
**If spalling** of concrete cover occurs around a lap bar by fire, corrosion or by another mechanism, the effectiveness of the rebar lap is severely compromised because its performance is 100% dependent upon the concrete that surrounds it.

**Clearly GRIP-TWIST® mechanical splices supplant all classes of lap splice including A, B and C.**



# Grip-Twist®

## VERSATILE AND MODULAR TYPE 2 SPLICE SYSTEM



## TAPER THREADED GRIP-TWIST®

### COLD-SWAGED STEEL COUPLER WITH TAPER THREADED ENDS & OPTIONAL FLANGE

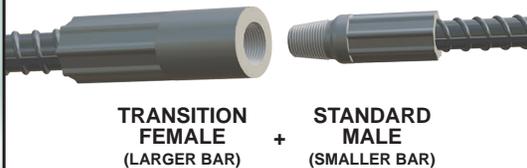
- **TYPE 2 FULL MECHANICAL SPLICE** – ACI 318–19 Section 18 and 2021 International Building Code. Exceeds specified tensile strength ( $f_u$ ) ASTM A615 Grades 60, 75 & 80 and A706 Grades 60 & 80 uncoated deformed bars.\*
- **IAPMO-UES EVALUATION REPORT ER-0796** – IBC, IRC and ACI 318. Available in English and Spanish.
- **NUCLEAR SAFETY RELATED SPLICE** – ASME Section III, Division 2 Boiler & Pressure Vessel Code Case N-794. Exceeds ASTM A615 Grade 60 tensile strength 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.
- **CALTRANS "SERVICE" AND "ULTIMATE" APPROVED** – Meets slip test CT670 & capable of exceeding 80,000 psi, the specified tensile strength of uncoated deformed Grade 60 bars.
- **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 uncoated bars.
- **MASONRY APPLICATIONS** – Exceeds 125% x specified yield ( $f_y$ ) per ACI 530/TMS 402.
- **COATED BARS** – Exceeds 125% x  $f_y$  and 135% x  $f_y$ , Grade 60 when swaged directly over ASTM A775 epoxy coated bars and ASTM A767 or A1094 galvanized bars. Coating removal or shielding is not necessary to swage on these coated bars.
- **COMMERCIAL APPLICATIONS** – In accordance with Building Code Requirements for Structural Concrete, can be used in columns, beams, walls, mats, tanks, parking garages and condominiums.
- **AVAILABLE WITH FLANGE** – Optional flanges, with holes that permit nailing to formwork, are available on all female couplers. They can be fully embedded in concrete thereby relieving certain constructability problems and potential injuries. No drilling holes through forms – No protruding rebar when concrete is poured. Continuity across construction joint is established when rebar with male coupler is engaged.
- **DOWEL BAR SPLICE** – Ideally suited for dowel bar replacement applications since fabrication shops can utilize their own bars at their own location, including drops.
- **CONVENIENCE** – No special bar end preparation or thread cutting – Easy visual inspection. Can be pre-installed using a BPI shop press in a controlled environment. Components include thread protection color coded to match appropriate swaging dies. For bars #3 – #20 (Ø 10 – 64 mm) [10M – 55M].

\*For strength applications over 80,000 psi, with bar Grades 100 or 120, use the **GRIP-TWIST XT** series.

## GRIP-TWIST® TRANSITION

### COLD-SWAGED STEEL TRANSITION COUPLER WITH TAPER THREADED ENDS

- **TYPE 2 FULL MECHANICAL SPLICE** – ACI 318–19 Section 18 and 2021 International Building Code. Exceeds specified tensile strength ( $f_u$ ) of the *smaller* ASTM A615 Grades 60, 75 & 80 and A706 Grades 60 & 80 uncoated deformed bars.
- **IAPMO-UES EVALUATION REPORT ER-0796** – IBC, IRC and ACI 318. Available in English and Spanish.
- **APPLICATIONS** – Used anywhere a change of bar size is required – typically in columns, walls, parking garages and condominiums.
- **VERSATILE & CONVENIENT** – Connect any size bar to any other bar size – typically 1 or 2 bar size changes, but as many as 5 standard size changes – using the TTGT Transition Female coupler on the larger bar and a standard Male coupler on the smaller bar.
- **TRANSITION-POSITION** – Can be achieved with a standard TPA (see below) on the smaller bar side and a Transition Female on the larger bar side – Simply unwinding the pre-assembled TPA stud into the adjoining Transition Female easily makes this connection.
- **AASHTO AND DOT PROJECTS** – Exceeds 125% x specified yield ( $f_y$ ) of the *smaller* bar per AASHTO *LRFD Bridge Design Specifications*. Capacity to exceed 135% x  $f_y$  and 100% x  $f_u$  of Grade 60 uncoated bars.
- **COATED BARS** – Exceeds 125% x  $f_y$  and 135% x  $f_y$ , Grade 60 when swaged directly over ASTM A775 epoxy coated bars and ASTM A767 or A1094 galvanized bars. Coating removal or shielding is not necessary to swage on these coated bars.
- **CONVENIENCE** – No special bar end preparation or thread cutting – Easy visual inspection. Can be pre-installed using a BPI shop press in a controlled environment. Components include thread protection color coded to match appropriate swaging dies.



## GRIP-TWIST® POSITION

### COLD-SWAGED STEEL POSITION COUPLER WITH TAPER THREADED STUD

- **TYPE 2 FULL MECHANICAL SPLICE** – ACI 318–19 Section 18 and 2021 International Building Code. Exceeds specified tensile strength ( $f_u$ ) of ASTM A615 Grades 60, 75 & 80 and A706 Grades 60 & 80 uncoated deformed bars.
- **IAPMO-UES EVALUATION REPORT ER-0796** – IBC, IRC and ACI 318. Available in English and Spanish.
- **APPLICATIONS** – The TPA (Tapered Position Assembly) can be used where bars are bent and cannot be rotated to engage the threads, or when bar lengths are long and impractical to rotate.
- **EASY ASSEMBLY** – Each TPA includes a parallel threaded Female coupler with a pre-assembled Stud that projects from one end. Assembly is completed in the field by simply unwinding the TPA Stud to engage the externally rolled tapered threads in a standard TTGT Female coupler.
- **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  $f_u$  of Grade 60 uncoated bars.
- **COATED BARS** – Exceeds 125% x  $f_y$  and 135% x  $f_y$ , Grade 60 when swaged directly over ASTM A775 epoxy coated bars and ASTM A767 or A1094 galvanized bars. Coating removal or shielding is not necessary to swage on these coated bars.
- **CONVENIENCE** – No special bar end preparation or thread cutting – Easy visual inspection. Can be pre-installed using a BPI shop press in a controlled environment. Components include thread protection color coded to match appropriate swaging dies. For bars #3 – #20 (Ø 10 – 64 mm) [10M – 55M].



# Grip-Twist®

## THREADED HEADS AND CONNECTORS



# GRIP-TWIST® DOUGHNUT™

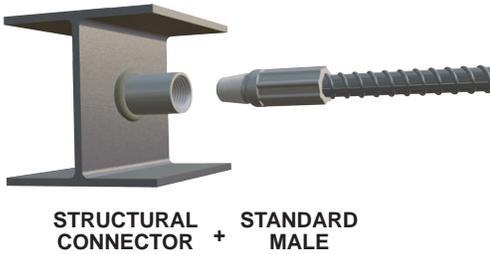
## COLD-SWAGED STEEL HEADED REINFORCEMENT WITH TAPER THREADS

- **5A<sub>b</sub> HEAD** – TDS series, the standard head size for most applications, is used to transmit bond force from the reinforcing bar to concrete by a combination of head bearing and development length.\*
- **10A<sub>b</sub> HEAD** – TDX series has larger area to transmit full force in bar by head bearing alone – Generally used in sections that may be required to withstand higher forces.
- **HIGH STRENGTH** – Connections exceed the specified yield strength ( $f_y$ ) of the bar as required by ACI 318-19 section 25.4, and confirming in-air tests exceed the specified tensile strength ( $f_u$ ) Grade 60 bar per ASTM A970.
- **BEARING FACE** – Meets all dimensional requirements of ASTM A970, Class A and HA.
- **CALTRANS "FULL" AND "REDUCED" APPROVED** – TDX approved as Full Size Head (9x net area) and TDS approved as Reduced Size Head (4x net area) for ASTM A706 reinforcing bar.
- **REPLACES HOOKS** – The DoughNUT requires no special bend direction which alleviates congestion in many situations such as beam-column joints, knee joints, pile caps and column roof slab connections – Replaces stirrup bars used as confinement steel.
- **KEY ADVANTAGES** – Avoids lengthy hook extensions and complex stress patterns – No heat, welding or forging is required – No special chemistry or rebar grades required – No bending or potential cracking of reinforcement bar.
- **CONVENIENCE** – No special bar end preparation or thread cutting – Easy visual inspection. Can be pre-installed using a BPI shop press in a controlled environment, or field installed using additional BPI equipment. TTGT Male includes thread protection color coded to match appropriate swaging dies. For #3 – #18 (Ø 10 – 57 mm) [10M – 55M].

\*A<sub>b</sub> = area of reinforcement. Minimum recommended anchorage length = 12 d<sub>b</sub> where d<sub>b</sub> = bar dia (REF: "Headed Reinforcement A Viable Option" viable) John W. Wallace.)

# TTGT STRUCTURAL CONNECTOR

## COLD-SWAGED STEEL WELDABLE CONNECTOR WITH TAPER THREADS



- **APPLICATIONS** – For attachment of reinforcement bar to structural steel, liner plates, flat shapes or for creating headed anchorage. Structural-Positions can be achieved by using a standard TPA instead of a Male.
- **NUCLEAR STRENGTH CAPACITY** – ASME Section III, Division 2 Boiler & Pressure Vessel Code. Meets minimum joint strength of 75,000 psi (125% x  $f_y$ ) and exceeds an average tensile strength of 80,000 psi (100% x  $f_u$ ) when used with ASTM A615 Grade 60 deformed bars.\*
- **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 and ASTM A36.
- **BEVELED FOR WELDING** – Pre-cut bevel allows for full penetration, and provides for greater strength, convenience and quality assurance. (Suited to E7018 electrode)
- **BETTER THAN A BUTT WELD** – The outside diameter of the structural connector is larger than the reinforcing bar so the weld is spread out over a larger area, resulting in LESS weld stress.
- **CONVENIENCE** – Standard Male coupler can be used on uncoated ASTM A615 or A706 bars, epoxy coated bars per ASTM A775 or galvanized bars per ASTM A767 or A1094. For bars #3 – #20 (Ø 10 – 64 mm) [10M – 55M].

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

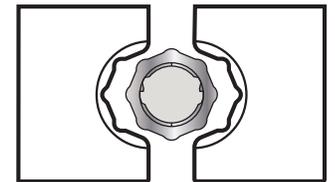
## HOW TO SPECIFY GRIP-TWIST® COUPLERS, HEADS AND CONNECTORS

	By Name:	By Generic Description:
BAR-TO-BAR	Taper Threaded Grip-Twist® Coupler ** or Grip-Twist® Position Couplers ** by BarSplice Products, Inc., Dayton OH	<i>Mechanical Splices shall be the tension-compression cold-swaged taper-threaded type, comprising male/female couplers, and/or position couplers, which shall be assembled by rotating the reinforcing bar and/or position coupler stud.</i>
BAR-TO-HEAD	Grip-Twist® DoughNUT™ TDS or TDX ** by BarSplice Products, Inc., Dayton OH	<i>Mechanical Reinforcing Bar Anchorages shall be the cold-swaged taper-threaded coupler type, which shall be assembled with 5A<sub>b</sub> or 10A<sub>b</sub> Heads (Specify Head Size)</i>
BAR-TO-STRUCTURAL STEEL	Grip-Twist® Structural Connectors ** or Grip-Twist® Structural Position Connectors by BarSplice Products, Inc., Dayton OH	<i>Bar-to-structural steel connections shall be the cold-swaged taper-threaded weldable connector type with weld bevels inclined 30-degrees to the rebar axis and comprising male couplers, and/or positional components, which shall be assembled to the welded connectors by rotating the reinforcing bar and/or positional coupler stud.</i>

\*\* Include flange requirements (if any), bar size(s), bar type and bar grade. Include statement: "Parts shall be manufactured to the quality requirements of ISO 9001."

Taper Threaded Grip-Twist® (TTGT) cold-swaged mechanical splices, end anchorages and connectors are made from high quality domestic steel meeting the chemistry and grade requirements of ASTM A519 & A576. Headed devices meet Class A and HA properties of ASTM A970 as applicable.

Powerful hydraulically actuated presses with color-coded octagonal die sets are utilized in fabricating shops for the most efficient swaging operation. Swaging pressure is factory preset and equipment is automated to release after each swaging 'bite' or pressing. When components have been compressed onto the reinforcing bar by cold-swaging they become mechanically interlocked with the rebar deformation.



*Cold swaging technology for mechanical splicing of reinforcing bars is one of the most established, developed, and refined splicing methods worldwide. Key to cold swaging success is its simplicity, low cost and adaptability. There is no loss of reinforcing bar cross-sectional area at the splice location so the system is a natural choice when considering the objectives of seismic design and safety related applications. BPI swaging equipment is easy to use and may be leased or purchased. Splicing manuals provided with equipment explain step-by-step installation and safety information.*

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Barsplice Products, Inc., 4900 Webster Street, Dayton OH 45414, USA  
Tel: 937-275-8700 • www.barsplice.com • e-mail: bar@barsplice.com

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