

D390 Application/Installation Instructions

GENERAL PRE-CAST APPLICATIONS

REV. 11/24

■ Installing Taper-Lock® Threaded Rebar

1. Confirm the coupler thread size that will be used to splice the associated rebar together. Standard couplers have a taper thread that is the same size as the coupler size designation. However, this product can also be offered as a transitional splice, be sure the coupler threads and rebar threads match each other and match the jobsite drawing. Ensure that threads are clean and in good condition for both the coupler and the threaded rebar.
 - *The threaded rebar must conform to gauge requirements as published in the Taper-Lock Machine Operations Manual before assembly.*
2. Assemble threaded rebar into D390 coupler utilizing hand-tight assembly (5 foot-pounds minimum).
 - *Assemble the coupler to the threaded rebar before securing the rebar to the rebar mat. This will make setting and orientating the coupler easier. Ensure the top of the coupler (port plug side) points toward the desired concrete face for later grout pumping.*

■ Preparing for Concrete Placement

1. With the threaded rebar installed into the coupler, mount to form, keeping port plugs vertical. (Reference *“Attachment to the Form”* on page two)
2. Support with chairs as needed.
3. Install PVC in ports, assure length makes it to be flush with concrete surface or cut flush to the surface after casting panel.
4. Put port plugs back in PVC to keep clean and clear of debris during pour.
5. Place and vibrate concrete according to standard specifications and requirements.

■ Installing Rebar into the Grout Sleeve

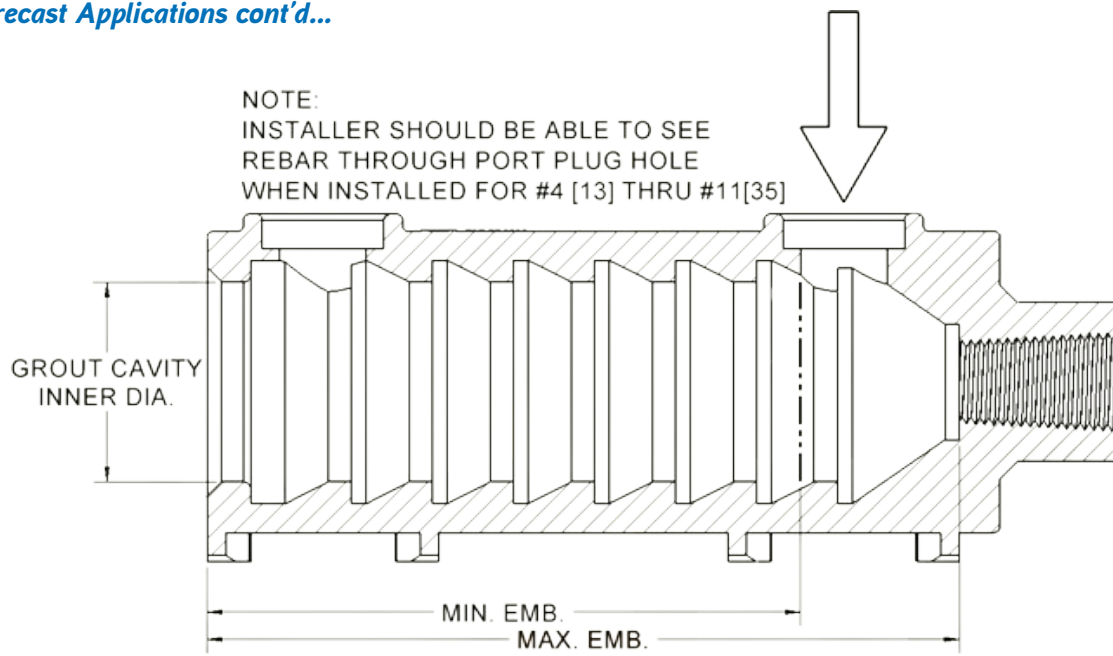
1. Insert the exposed rebar from the second pre-cast concrete element into the open grout cavity of the coupler until the pre-cast section is in place. Be sure to adhere to the jobsite and drawing specifications for setting and placing the pre-cast element.
 - *Prior to placing and grouting, be sure the exposed rebar size is appropriate for use with the cast-in coupler. Refer to the table below for grout cavity inner diameter and respective intended rebar size. Please note: these couplers can be used for transition splices; refer to the jobsite drawings to confirm which rebar size is intended for use in your application.*
 - *Be sure the exposed rebar is sized with the appropriate length to achieve minimum rebar embedment in the grout cavity as listed below. Take caution not to exceed the allowable maximum embedment to avoid the rebar from bottoming out in the coupler before proper placement of the pre-cast element. When determining rebar length, you should consider coupler embedment requirements, size of pre-cast joint/gap, and any additional setback the coupler or rebar has in the elements.*

Coupler Size Designation			Grout Cavity Inner Diameter Measurement		Minimum Embedment		Maximum Embedment	
US	Metric	Can	US	Metric	US	Metric	US	Metric
#4	[13]	[10]	1.26 in	32.0 mm	3.50 in	89.0 mm	4.75 in	120.5 mm
#5	[16]	[15]	1.42 in	36.0 mm	4.38 in	111.0 mm	5.75 in	146.0 mm
#6	[19]	[20]	1.73 in	44.0 mm	5.13 in	130.0 mm	6.50 in	165.0 mm
#7	[22]	-	1.89 in	48.0 mm	5.88 in	149.0 mm	7.25 in	184.0 mm
#8	[25]	[25]	2.01 in	51.0 mm	7.00 in	178.0 mm	8.26 in	210.0 mm
#9	[29]	[30]	2.16 in	55.0 mm	7.50 in	190.5 mm	9.00 in	228.5 mm
#10	[32]	-	2.32 in	59.0 mm	8.52 in	216.5 mm	9.77 in	248.0 mm
#11	[36]	[35]	2.67 in	68.0 mm	9.26 in	235.0 mm	10.26 in	260.5 mm
#14	[43]	[45]	2.99 in	76.0 mm	11.27 in	286.5 mm	13.27 in	337.0 mm
#18	[57]	[55]	3.76 in	95.5 mm	15.50 in	393.5 mm	18.00 in	457.0 mm

Note: The Couple Size Designation determines the largest allowable rebar size that can be used in that coupler. Grout cavities can utilize any smaller size rebar for a full connection capacity. The capacity of the connection is limited by the smallest rebar size and grade used in the splice. If a smaller rebar size is used with respect to the coupler designation, the minimum embedment of the smaller designation can be used.

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General Precast Applications cont'd...



2. Fill the cast-in grout cavity with D490 High Strength Splicing Grout via one of two methods below, depending on your application. Be sure to mix the grout per the mixing instructions outlined in its Technical Data Sheet (TDS) and be sure to fill the grout cavity completely. Look for grout overflowing from the pre-cast element joint or from the second PVC pipe.
 - **AFTER ALIGNING PRE-CAST ELEMENTS** ... Pump the mixed grout into the cavity through the exposed SCH40 PVC pipe furthest from the joint using an electronic, hydraulic, or manual grout pump with the exposed rebar properly inserted into the grout cavity until grout overflows from the pre-cast element joint or from the second PVC pipe.
 - **PRIOR TO ALIGNING PRE-CAST ELEMENTS** ... Pre-fill the grout cavity with mixed grout by pumping the mixed grout into the cavity through the exposed SCH40 PVC pipe furthest from the joint using an electronic, hydraulic, or manual grout pump until grout overflows from the second PVC pipe or coupler mouth and insert exposed rebar into the cavity filled with grout.
3. The minimum compressive strength shall be 10,800 psi at 28-days for a Type 2 Mechanical Splice with ASTM A706 Grade 60 & 80 & A615 Grade 60, 75, & 80 rebar.
 - It is up to the structural engineer to determine when bracing or initial structural supports can be removed.
 - Do not disturb the splice or casted panels around the splice until the initial set is complete. Typically, the initial set of the grout takes around 24 hours and is normally around 6,000 psi.
 - If the splice is disturbed before the initial set of the grout, bondage or embedment may be impacted, which could affect the strength of the grout at a full cure.
 - When grouting in cold weather below 50 degrees Fahrenheit (10 degrees Celsius), follow ACI 306R Cold Weather instructions. This criteria explains the process for heating panels, D390 Taper-Lock Grout Sleeves, and any associated components to 50 degrees Fahrenheit (10 degrees Celsius) for proper grout curing.
 - **NOTE:** Temperatures below 50 degrees Fahrenheit (10 degrees Celsius) increase the curing time and the time it takes for grout to develop strength.
 - Grout should NOT be placed/pumped into frozen D390 Taper-Lock Grout Sleeves.

ATTACHMENT TO THE FORM

Assembly of Form Plug to Coupler

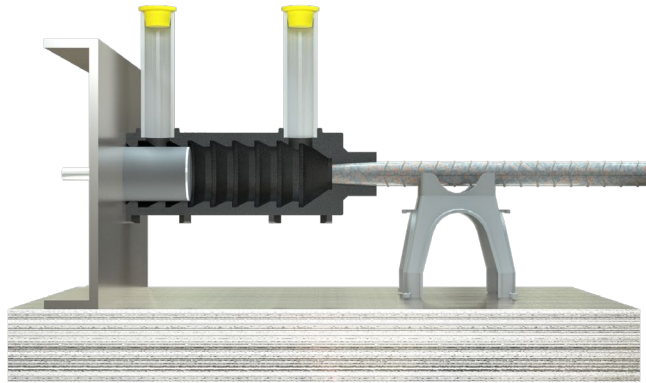
1. Attach the D491 Form Plug to the steel formwork. Identify the intended mounting location and mark on the formwork as specified in the project details. The D491 Form Plug should be assembled to the formwork in its relaxed/decompressed state. This will allow for the coupler to be located on the form plug.
2. Compress the rubber grommet by tightening the nut/wingnut onto exposed threaded rod, securing the external washers to the form and allow the coupler to be secured to the internal side of the form. Tighten until it creates a rigid connection.

Attachment To The Form cont'd...

- a. *Different Form Plug sizes use different hex sizes. PCN 129843 uses a 5/16"-18 NC Wingnut, PCNs 129844 & 129845 uses a 9/16" socket, and PCN 129846 uses a 3/4" socket.*
3. Use chairs and supports under the coupler and extend rebar as necessary to maintain location.

■ Removal of the Form Plug

4. Decompress the D491 Form Plug by backing off the hex nut from the exposed threaded rod. Be sure to leave the Form Plug partially assembled to the form work.
5. Strip the form work. The D491 Form Plug should come with the form if properly decompressed. Use standard hand tools to release the form work from the concrete.
6. Chip away slurry around the coupler that may have seeped in.

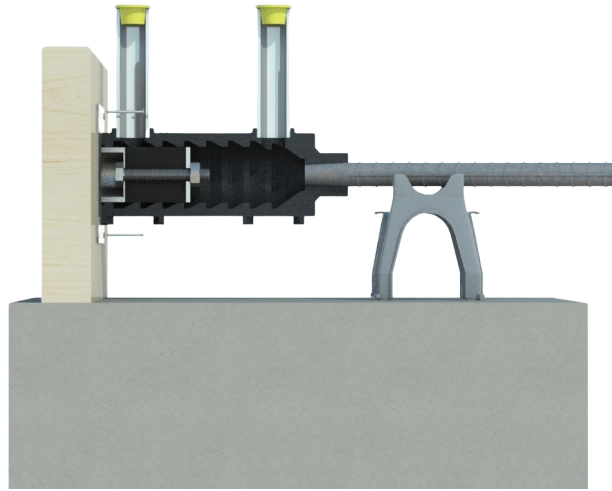


■ Assembly of Formsaver to Coupler

1. Insert the D491 Formsaver in its relaxed/decompressed state into the grout cavity of the coupler.
2. Compress the rubber grommet by tightening the captured bolt head on the flange side. Tighten until it creates a rigid connection.
 - *Different Formsaver sizes use different hex sizes. PCN 101721; use 13mm socket, PCNs 101722 & 101723; use 16mm socket, and PCNs 101724 & 101725 use 18mm socket.*
3. Identify the intended mounting location and mark on the formwork as specified in the project details. Nail the flange/ coupler assembly to the formwork to secure in place.
 - *Use chairs and supports under the coupler and extend rebar as necessary to maintain location.*

■ Removal of the Formsaver

4. Strip the form work, leaving the D491 Formsaver secured to the coupler. Use standard hand tools to release the form work from the concrete and Formsaver. Releasing the form work will have some resistance as it remains attached to the mounted Formsaver.
 - *Take caution after form work removal; mounting nails will be exposed.*
5. Chip away any slurry around the Formsaver that may have seeped in.
6. Loosen the hex head until the rubber is fully decompressed. At this point, the Formsaver should be free to remove.
7. If needed, pry the decompressed Formsaver out of the coupler cavity with hand tool.



POUR STRIP ELIMINATION APPLICATIONS

■ First Slab Casting Procedures

1. The D390 Taper-Lock® Grout Sleeve should be assembled with threaded rebar using the *“Installing Taper-Lock Threaded Rebar”* details on page one. All positioning and locations of the pre-spliced specimens shall be specified by the structural engineer and/or the jobsite drawings.
2. Follow the *“Assembly of Formsaver to Coupler”* procedure listed on page two to create a secure connection of the coupler to the form work. Be sure to align the port plug holes toward the slab face for later grout pumping.
3. Assemble the SCH40 PVC pipes into the coupler port plug holes allowing for around 3-5 inches of PVC exposed after casting.
 - *The top of the exposed pipes should be sealed with either a D493 Port Plug or tape before pouring the concrete. This keeps concrete slurry and other debris from entering the grout cavity during and after the concrete pour.*
4. The exposed PVC pipes should be cut flush against the cast panel at any point after the concrete has reached its initial cure to reduce trip hazards on-site.
 - *Place D493 Port Plugs back into the exposed PVC pipes to prevent dust and debris from getting into the cavity.*
5. With the panel complete cured, the form work can be removed. Remove the formwork along with the Formsaver to expose the grout cavity within the first slab.
 - *Reference the “Removal of the Formsaver” procedure on page two for more detail.*

■ Second Slab Casting Procedures

1. Confirm the coupler size in the first pour and intended continuation rebar are suitable to be used together. Refer to the supporting information listed on page one in *“Installing Rebar into the Grout Sleeve”* under the general application.
2. The continuation rebar is to be inserted fully into the grout cavity of the coupler in the first slab. Fully insert the rebar to the cavity, allowing for the alignment aide to assist with centering the continuation rebar. Use rebar chairs to support the continuation rebar placed inside the cavity.
 - **IMPORTANT NOTE:** *Minimum rebar embedments listed in “General Applications” do not apply for installing rebar when using the D390 in pour strip elimination applications. Rebar should be installed fully into the coupler prior to the second concrete pour to allow for concrete shrinkage. Concrete shrinkage will effectively reduce the rebar embedment in the coupler. The D390 Taper-Lock Grout Sleeve Coupler is designed to account for the concrete shrinkage of the second pour in these pour strip elimination applications. When fully installed rebar is used, the difference between “maximum embedment” and “minimum embedment” listed in the general application section represents the maximum shrinkage that can occur while maintaining full product performance. If less-than-fully installed rebar is desired, it must be verified that the general application minimum embedments are satisfied after concrete curing and shrinking occur.*

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Pour Strip Elimination Applications cont'd...

3. Tie in the continuation rebar onto the rebar mat for the second slab, so that the rebar can be held in place while inserted into the D390 coupler.
4. Apply the appropriate DSC bond breaker (Sure Lift™ or Maxi Tilt™), depending on application, to the form-face of the first slab before pouring the second slab of concrete.
5. Pour and vibrate the concrete for the second slab according to standard specifications and requirements.

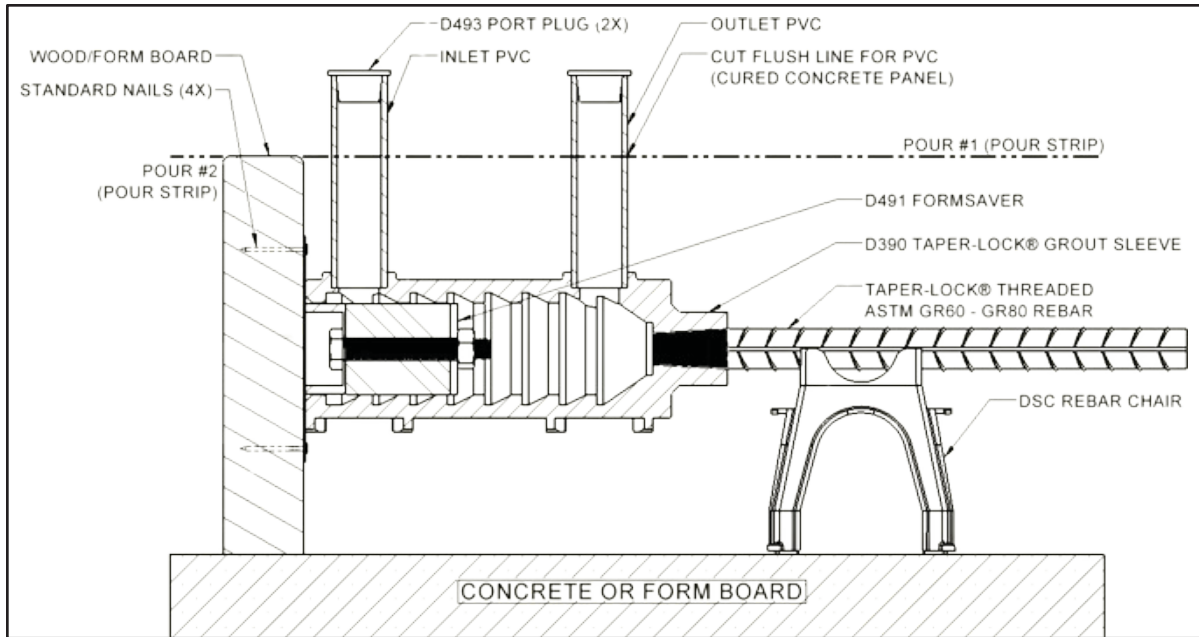


Figure 1 - Standard Setup

Grouting and Finishing Procedures

1. After the second slab has reached a minimum of 28-day cure proceed with mixing the D490 High Strength Splicing Grout per the mixing instructions outlined in the TDS and pump the grout into the grout cavity via the PVC pipe furthest from slab joint.
2. Fill the cavity until the grout overflows from the second PVC pipe serving as a ventilation hole.
3. The minimum compressive strength shall be 10,800 psi at 28-days for a Type 2 Mechanical Splice with ASTM A706 Grade 60 & 80 & A615 Grade 60, 75, & 80 rebar.
 - Do not disturb the splice or casted panels around the splice until the initial set is complete. Typically, the initial set of the grout takes around 24 hours and is normally around 6,000 psi.
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 - **NOTE:** Temperatures below 50 degrees Fahrenheit (10 degrees Celsius) increase the curing time and the time it takes for grout to develop strength.
 - Grout should NOT be placed/pumped into frozen D390 Taper-Lock Grout Sleeves.
 - Grout cure must achieve a minimum compressive strength of 10,800 psi at full cure.

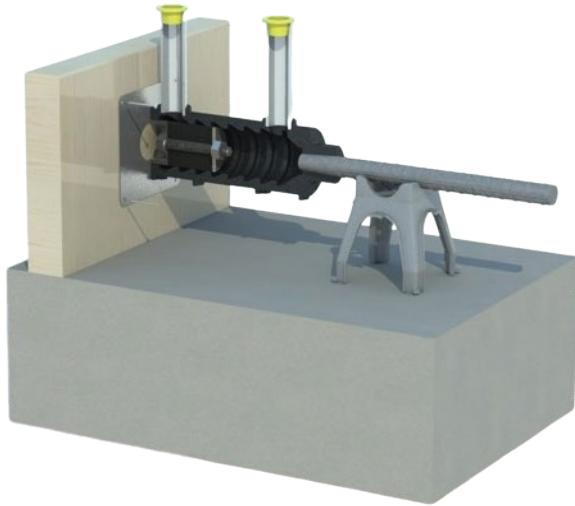


Figure 2 – Pour Strip Configuration

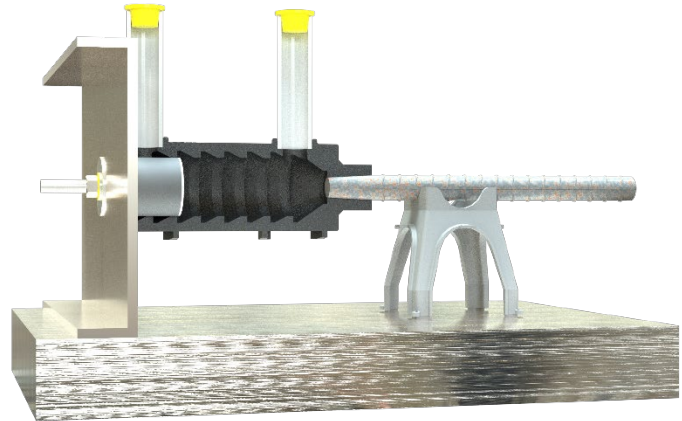


Figure 3 – Precast Configuration

Questions?

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