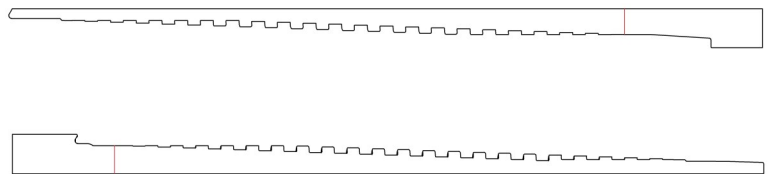
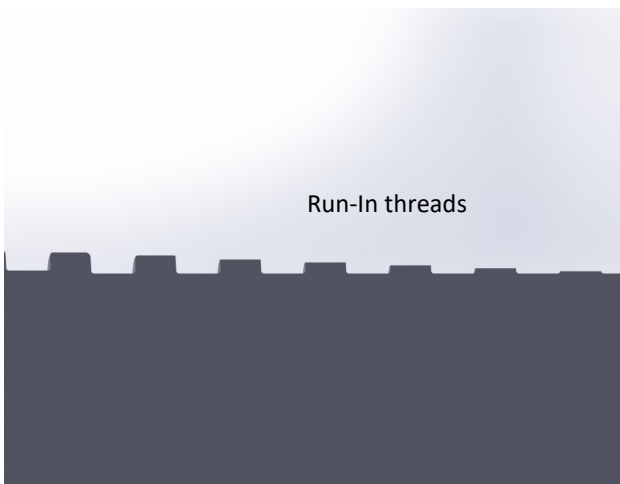


The Precision Connections OG™ Flush Joint is a true flush joint that is formed onto plain end pipe. It is typically stronger in a straight pull than traditional flush joints and can take more bending. It is not interchangeable between different weights of the same pipe diameter. Crossovers are necessary between different weights or diameters.

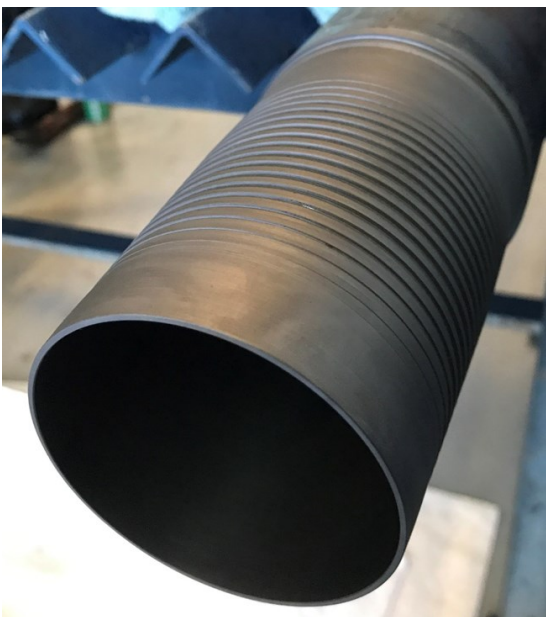
It is a run in / run out style thread. The imperfect starting threads are clipped /topped in lead to fit into the roots of the run out threads. This increases the pull strength and makes the OG™ easily identifiable.

The OG™ is threaded on tubing and casing sizes. The pins are swaged and the ID is machined to size and drift.

The connection typically has phosphated pins and boxes but in some instances may be blasted with a moly coating.



The threads are special patented stepped square threads. The box thread form differs from the pin thread form but both are essentially square. (Patent: US 9,593,786)



Sales

Phone: (832) 799-7414

Technical Support

Phone: (832) 405-3711

Mike.Nations@precision-llc.com

Precision Couplings, LLC

Phone: (713) 678-8900

<http://precision-llc.com/>



Thread Compound Application

A moustache brush is recommended because of its ability to evenly apply thread compounds and its unique angle which aids fully coating internal threads and seal. The brush should be kept free and clean of debris and liquids that would adversely affect the thread compound. Likewise, the container with the thread compound shall remain free of contaminants. Oil based muds can thin out the grease in the thread compound which can cause galling or premature connection yielding.

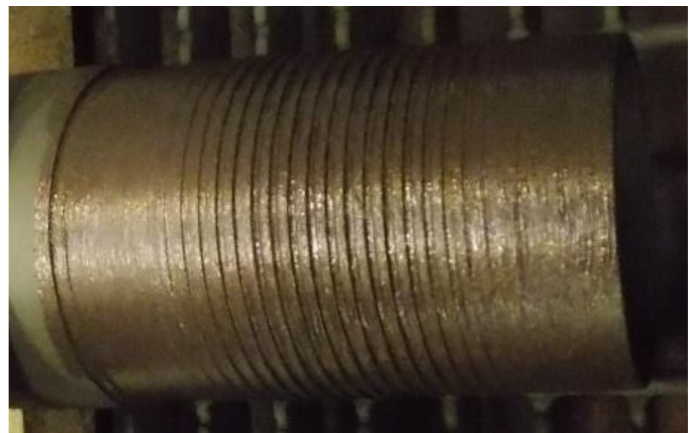
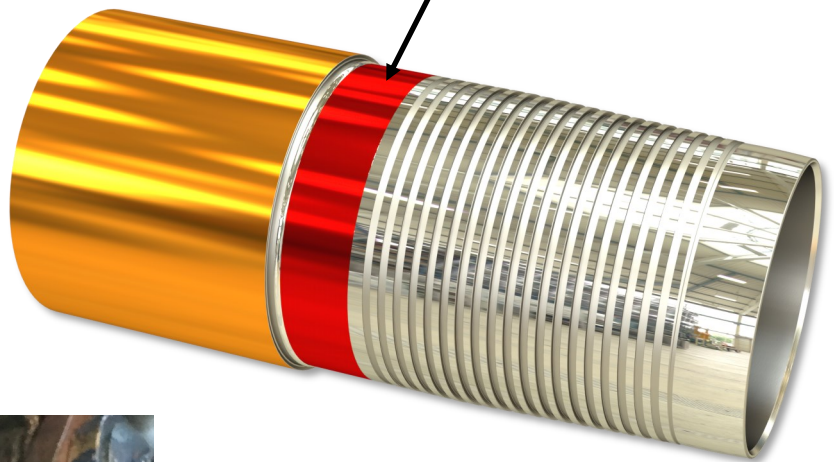
A light coat should be applied to the threads and seals of the box and pin. Alternately the pin seal and first 4 threads shall be lightly doped with thread compound; the entire box area shall be coated. The coating should be light and cover no more than 1/3 of the thread height. If dope squeeze is apparent in the graph then use the alternate method of doping.

Best of Life 2000, Best of Life 72733, JET-LUBE® RUN-N-SEAL®, Kluberlub OCTG LF HT are the recommended running compounds. Other proprietary thread compounds may be used that are API Bulletin 5A2 compliant and / or equivalent. Artic grades are recommended for cold weather applications. Green-Seal II Thermal is recommended for high temperature steam injection wells.



Mustache Brush

Do not overdope area in red. Light Doping.





Supplemental Thread compound Information

Thread Compounds

- Thread compounds meant for casing must be utilized since they have very fine particle size additives when compared to drill collar or drill pipe compounds. The compound will reference API Bulletin 5A2 compliance on the container. ISO 13678 and API RP 5A3 compounds are also authorized.
- It is recommended that a specified dropping point of 150°F (66°C) or higher than the well temperature be chosen. For elevated temperature wells a dropping point of 450°F (230°F) is recommended.
- Arctic grades are suggested when the outdoor temperature is 40°F or lower because the thickness and adherence for non arctic grades is very poor. The thread compound has to stick and be evenly applied to be effective as a sealant and to prevent galling.
- Confirm that the thread compound has not expired by checking the container documentation.
- Always stir the thread compound before use because generally the grease and solids separate during storage. Not stirring the whole container can make the connection too slick and cause low shoulders.
- Keep the container covered to prevent contamination from water, rain, and drilling fluids. Especially oil based drilling fluids which act like paint thinner.



Thread Compound Application

Approximate weights and volumes for application are listed below for reference. Roughly equal amounts are applied to the box and pin. Too little results in a high shoulder torque and too much can give an odd graph.

Pipe OD	Dope Volume		Dope Weight Approximate		
(in)	(cm ³)	(in ³)	Weight (lbs)	Weight (Ounce)	Weight (grams)
2 7/8	10	0.58	0.040	0.63	18
3 1/2	10	0.61	0.042	0.67	19
4	11	0.69	0.047	0.75	21
4 1/2	12	0.76	0.052	0.83	24
5	19	1.14	0.078	1.25	35
5 1/2	20	1.22	0.083	1.33	38
6 5/8	24	1.45	0.099	1.58	45
7	32	1.98	0.136	2.17	61
7 5/8	35	2.13	0.146	2.33	66
8 5/8	47	2.90	0.198	3.17	90
9 5/8	52	3.20	0.219	3.50	99



The following torque graphs are supplied to aid in the running of the OG™ Flush Joint. The values provided in the technical data sheets are determined by laboratory testing at standard room temperature in a clean environment with perfectly made pipe and perfectly aligned and calibrated tongs. Your conditions will vary, but these guidelines can help to troubleshoot common problems. The graphs depict the full torque profile up to yield.

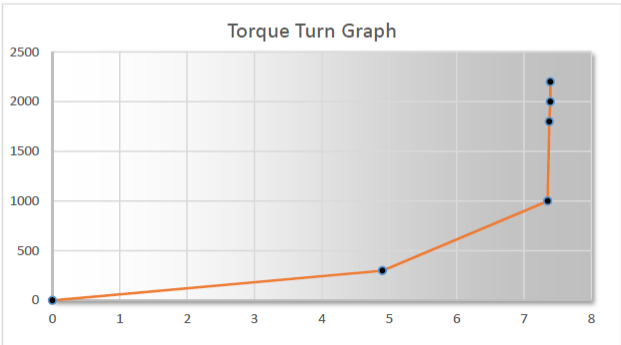
- Shoulder Torque:** Point on the graph where the torque spikes dramatically when the connection shoulders make contact. Must be visible on the graph to verify proper make-up. No shoulders are rejectable.
- Yield Torque:** Torque that crushes the connection shoulders / torque stops. Generates a lot of heat due to friction.
- Optimum Make Up Torque:** Recommended torque to ensure pressure integrity, breakout capability and structural stability. The value is between Minimum and Maximum Make Up Torque.
- Minimum Make Up Torque:** Lowest recommended assembly torque.
- Maximum Make Up Torque:** Highest recommended assembly torque. Exceeding this value can make it difficult to re-run the connection if the casing string must be tripped out. It is best to leave the connection together if this value is only slightly exceeded.
- Rotating Torque:** Maximum torque when rotating a casing string under load. Not to exceed Maximum make up torque.
- Thread Locking:** Add 10% to the optimum for make-ups using thread locking compound (Baker Lok).



Torque Data Sheet -

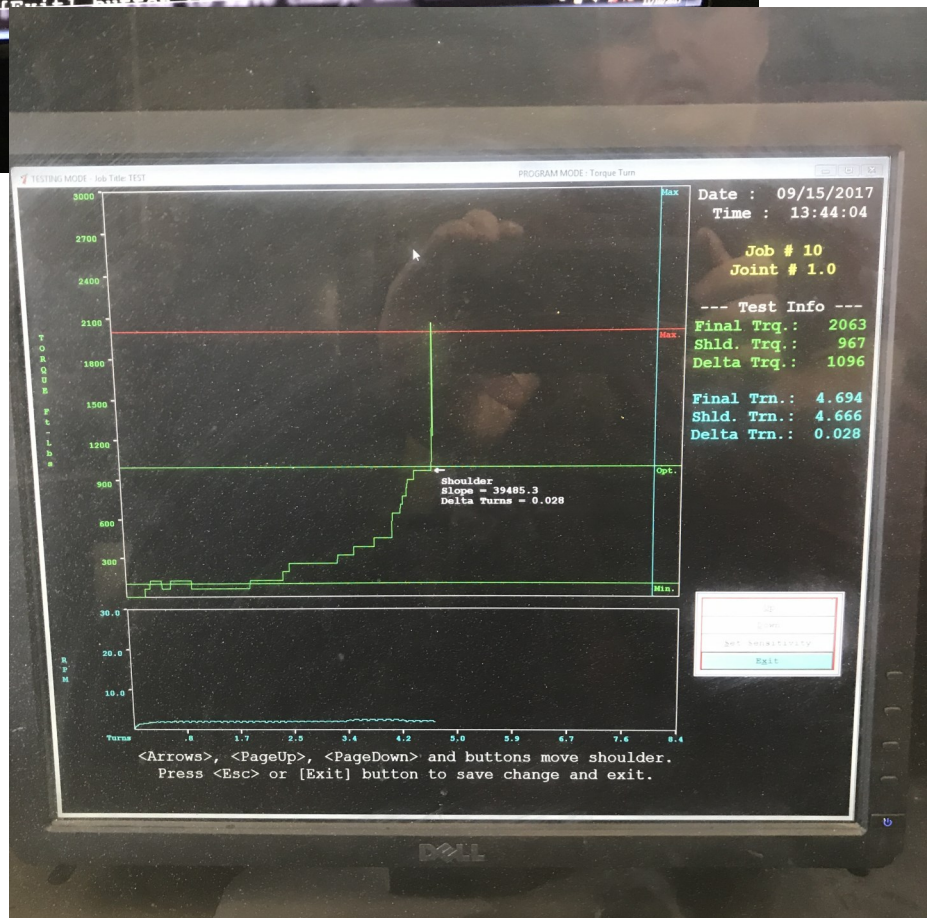
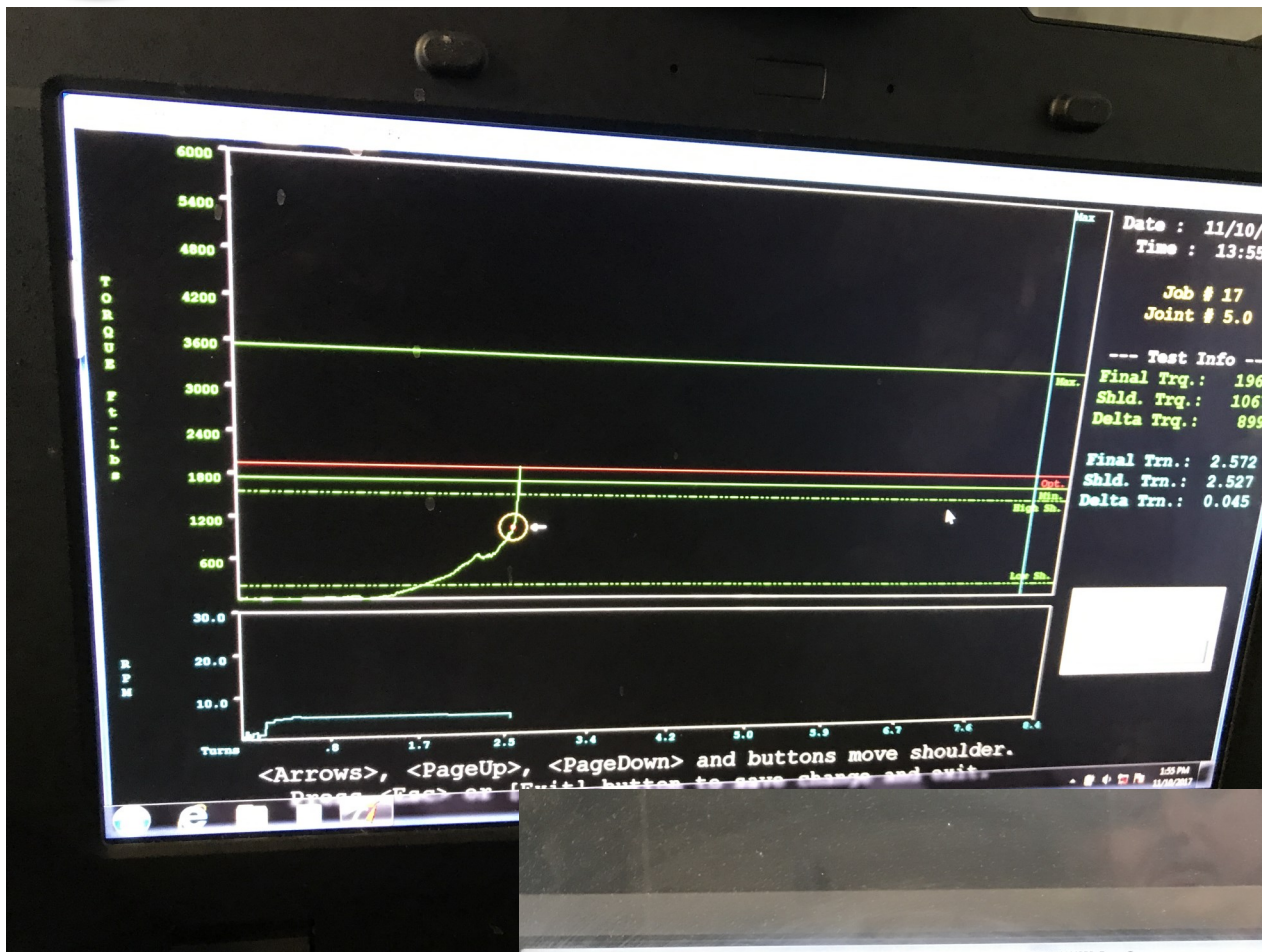
3.5in. x 9.2 lb/ft P-110

Min Make Up Torque	1,800	ft-lbs	Nom Shoulder Torque	1,000	ft-lbs
Max Make Up Torque	2,200	ft-lbs			
Optimum Torque	2,000	ft-lbs			





Representative Torque Graphs





Make-Up

- A stabbing guide shall be used to align the pin and box.
- It is recommended that small diameter flush joints be made up hand tight or started to avoid cross threading and galling. Strap wrenches or chain tongs can be used for initial thread engagement.
- The power tong jaws should be 6" above the pin end and 6" or more below the box end.
- Initial rotation should begin in high gear with a low torque. Ensure the make up is not biting into the thread.
- Shift to low gear after the thread interference but before the seal engagement. Remain in low gear but maintain a consistent RPM after the seal engages.
- The last 2 turns should be done in low gear so the seal engagement appears in the torque turn graph. This also allows a good graph of the shoulder.
- Once the seal engages the tongs should remain in low gear and at a constant RPM. Recommended RPM's are listed in the table below. They may be modified to achieve a better graph (generally slower).
- The joint should be layed out if it fails 3 make-up attempts. Sometimes the joint can be made to another joint just fine if the connections checks out after inspection.

Buck On RPM

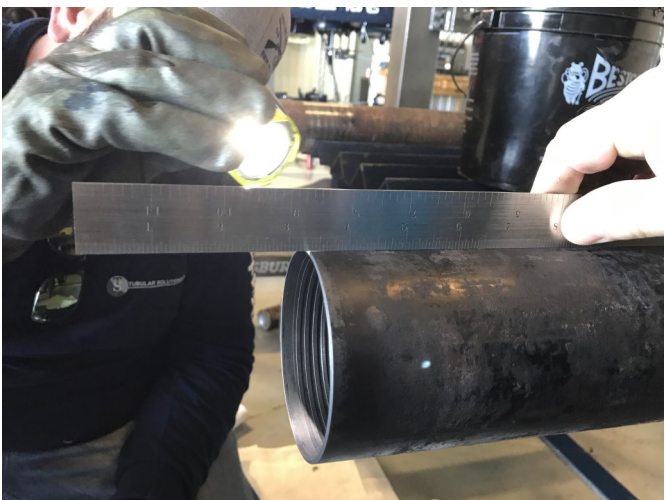
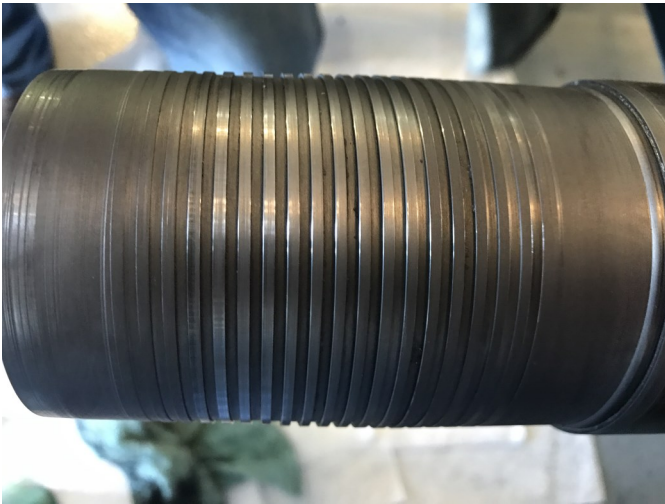
Pipe OD	Initial RPM	Final RPM
2 7/8	30	15
3 1/2	30	15
4	20	10
4 1/2	20	10
5	20	10
5 1/2	20	10
6 5/8	15	8
7 3/4	15	8
8 5/8	10	5
9 5/8	10	5

- The shoulder torque shall be clear and defined. There must sufficient delta torque to find the shoulder. The shoulder shall be within 10% to 80% of the optimum torque. Generally 0.020 - 0.100 delta turns is expected. Check rig alignment If the shoulder is too high.
- For shoulder torques that are not within spec break out the connections and inspect.
- Any large torque increase before reaching the shoulder may indicate cross threading or galling.
- Abnormal Spikes in the torque graph may indicate over-doping.
- Break out and inspect connections that have failing graphs.



Break Out, Re-makes and Repairs

- After break out, the pin and box must be thoroughly cleaned and inspected for any damage.
- Some connection repair is allowable using scotch brite, a fine file, stone or sand paper. Remove all sharps, raised edges or burrs from the threaded areas.
- Trained technicians may make decisions regarding the serviceability.
- The seal areas must be free of damage and may not be repaired in the field.
- The seals may be lightly cleaned with scotch brite and re-mollyed as long as the intent is to remove minor surface scratches, excessive moly or prepping areas where the phosphate has worn off from repeated make-ups.
- Run in and Run out threads should be smooth to the touch since they receive the most abrasion on make up.
- Check the Box OD for signs of over-torque before deciding to re-run.
- Once repaired the connection should be sprayed with an even coat of "dry moly" and allowed to dry.





Rotating

Rotating Flush is not considered a normal operation and is not recommended.

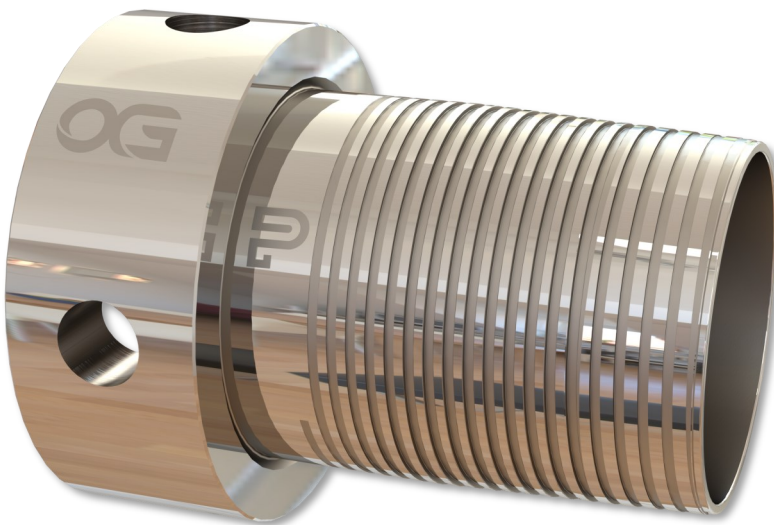
However, If it must be done:

- DO NOT rotate above the optimum make-up torque.
- Use the minimum amount of torque necessary to break downhole friction between the tubing or casing and the well bore.
- Gradually increase and decrease torque to avoid impact loads from winding up the string. Backlash may part the string or rotational inertia may over-torque the connection.
- The RPM should be limited to 30 RPM or lower. Doglegs that are 20°/100 ft. or less will fatigue within 24 hours at 30 RPM.



Handling Plugs

Handling Plugs are designed for lifting and/or protecting your box end threads. They are engineered products designed to accommodate lifting a joint of pipe from the rack to position over the rotary table. They can withstand the load of Singles, doubles or triples. They are designed to be free running and can be installed without tongs. Because of this there are limitations on their pull strength. **They are not good for supporting the load of the entire string.**



Warning! Handling plugs shall be obtained from an authorized provider. Sawing off an OG Flush pin and welding it to another piece of steel is not authorized. Using an unauthorized handling plug can result in death, injury and property loss. A sawed off pin will not provide enough thread contact to support much weight since they are designed to be press fit into the box with thousands of pounds of torque.

Authorized handling plugs are integral pieces of steel with 2 to 4 holes drilled in the collar portion. They are labelled and serialized. The labelling will denote the size and wall thickness (weight) of the pipe the plug was designed for. They are made from high grade steel and phosphate coated to extend the useful life.

Safety:

- Ensure that elevators are slacked off and disengaged when rotating the connection to prevent backoff. Falling handling plugs can be lethal.
- Use setting plates on slip type elevators to ensure the slips do not grip on the box connection. Refer to the make-up loss to choose the right plate. Generally 6" from the box face/edge of handling plug is a good minimum distance.
- Handling plugs shall be installed to a hand tight position to ensure full thread engagement with manual tightening with a steel bar or wrench through the provided holes.
- Ensure the handling plug is free of debris clean and in good running condition since it will be installed on every joint.



Stabbing Guides

A stabbing guide is required for the proper make-up of the OG™ Flush.



Stabbing Guide:

- The stabbing guide centers the pin with the box and prevents the pin face and seals from denting or scraping on the box face. Protecting the seals on the box face and the pin nose is very important for most flush joint connections.
- Stabbing guides also minimize the chance of a cross thread by centering the joints with one another.
- Stabbing guides are sized with the pipe size and connection type. Generally the stabbing guide will work for all wall thicknesses of the same connection. Some other proprietary flush connection stabbing guides may work, but it is best to find an OG™ Flush specific stabbing guide.
- Stabbing guides are kept with our OG™ Flush authorized field service companies (Thread Reps). The OG™ Flush authorized field service companies may differ from our BK and HOSS product lines.

Sales

Phone: (832) 799-7414

Technical Support

Phone: (832) 405-3711

Mike.Nations@precision-llc.com

Precision Couplings, LLC

Phone: (713) 678-8900

<http://precision-llc.com/>