



## Manufacturing Long-Length Polished Bore Receptacles (PBRs) With Corrosion Resistant Alloys

Polished bore receptacles, or PBRs, are a common item in completion assemblies and liner hanger assemblies. The casing design and tubular movement programs help determine the length of sealing assembly needed for casing tie back seals and tubing seals. As completion designs get more complicated, and more reservoirs are completed at one time to reduce capital cost, proper zonal isolation becomes more critical. PBRs are one way of engineering zonal isolation by providing a receptacle for seal assemblies of any length. A growing trend on critical completions is the need for longer length PBR's. Some deep water Gulf of Mexico completions have been requiring 50+ ft long PBR's for producing wells, and 100+ ft long PBR's for water injection wells. This helps facilitate expected tube movement under changing life-of-well conditions. In today's cost-focused market, it is also becoming more important to reduce workover and intervention costs. When planned future zone change workovers, or unplanned tubing string replacements are needed, PBR's can help reduce mechanical risk and cost of such future workovers. The PBR assembly protects the packer bore itself and in many cases eliminates the need to retrieve (or possibly fish) the production packer. This in turn reduces workover time duration and cost. As the requirement for longer lengths grows, it is important to note the value obtained from longer length PBRs.

With the growing trend of longer-length PBR's being required, they are surprisingly not often available. In some regions of the world such as the North Sea, many operators are not able to secure these PBR's due to both manufacturing and material length constraints. When corrosion resistant alloys are the required material for PBR's, we can help deal with this growing demand. We are able to manufacture long length material with an average lead time of 8 weeks. For urgent requirements, we can expedite up to 1-2 weeks if the project demands it. We have the capability to manufacture single integral pieces up to 55' long. Our ability to meet these size and lead time requirements is by use of tube material products rather than pH hardened bar materials. See our video titled "Downhole Completion Equipment Manufactured with Corrosion Resistant Alloys" for more information.

Long-length PBRs are beneficial for numerous reasons:

- **Maximize Flow Rates:** PBR's facilitate consistent ID throughout the completion system
- **Reduces Operational Risk:** Less connections means lower risk of seals hanging up in connection areas and less potential leak points
- **Reduced Operational Cost:** Less connections to buck up and test in the shop prior to rig arrival
- **Faster delivery Times:** Use of tube material to manufacture long length integral parts can substantially reduce lead times for critical applications
- **Cost savings:** Eliminating bar material, less connections and less machining means lower overall cost of the assembly