



*ROV mating the female and male connectors*



*Female connectors and hoses laid out on board*



*Male grout connector*

## GOOD TO KNOW

The seal has a designed working pressure of 65bar (1000 psi) although it is rated to 100bar (1470 psi).

FoundOcean's unique ROV Grout Connectors are specifically designed for underwater connection of grout lines. FoundOcean developed this system for deep-sea structures in the Gulf of Mexico in the early 1980s and for over 20 years, have been used to reduce onshore fabrication costs and offshore installation costs by eliminating the installation and removal of temporary pipework.

The connectors are manufactured from mild steel with the exception of the locking pin assembly, which is in high tensile stainless steel. The male half is provided with a protective coating with a dry film lubricant which provides corrosion protection until offshore installation of the structure is complete. Protective end caps can also be supplied. These are vented to enable subsea removal by ROV. FoundOcean supplies grout connectors to suit both 2" and 3" pipework. An ROV mates these connectors during structural grouting of subsea structures and sealing is achieved with a piston fluid seal located on the male piece.

The male connector is mounted on the structure; the female half is attached to the grout hose. The males are either mounted in a manifold arrangement to provide a single location for connection or at the individual sleeves. The female connector houses the locking pin mechanism for ROV operation and may be fitted with a three-way "dump" valve and additional buoyancy, as required. The mechanical lock has to be turned through 180° using the ROV manipulator, to engage in the groove in the male half. Minimum torque is required. A positive indicator is provided to show when the lock is engaged.

### FoundOcean's grout connectors offer the following advantages:

- Proven and well established track record
- Elimination of grout lines above pile sleeve
- Savings in materials, fabrication and commissioning
- No pipework removal at offshore work site
- Safe working by ROV: No diver support required
- Suitable for platform or template installation
- Compatible with FoundOcean's grout monitoring system
- Inexpensive compared with other mechanical connection techniques

FoundOcean is happy to consult on connector location(s) or provide complete design of the grouting system for a project.