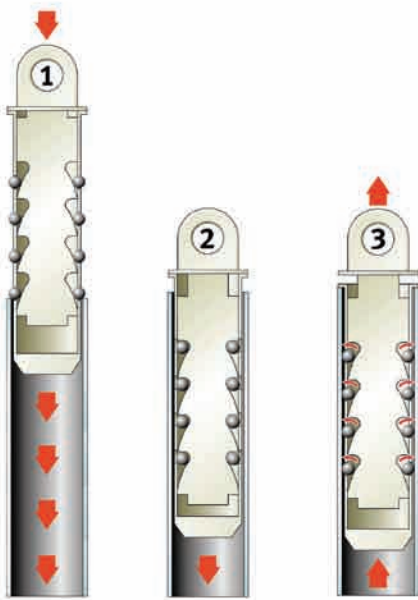


► Overview

The ball and taper technology works on the simple principle of a ball engaged in a taper. As the balls roll up the tapers, the tightness of the grip increases in direct proportion to the load applied.

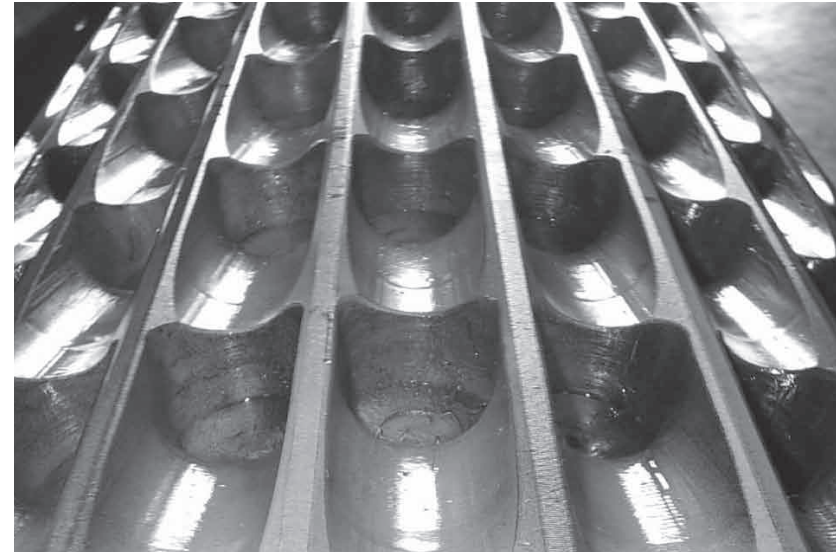
The tool is aligned into position and inserted; once engaged, it cannot be released until the load is removed. A simple disengage mechanism releases the tool off-load prior to its recovery and re-use. This self-activating mechanism allows rapid deployment and recovery.



► Benefits

- Reliable designs
- Suitable for water depths of 2,000m+
- Simple, fully mechanical system
- ROV friendly
- Release-under-load designs available
- High strength and integrity of the connection
- Lightweight, scalable
- Adaptable for hydraulic, electric and control systems
- Proven in the field
- Approved by DNV, ABS, BV and Lloyd's Register

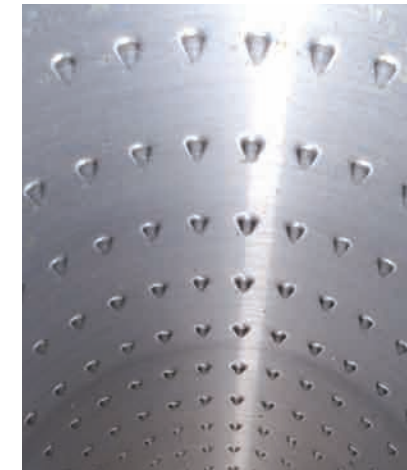
► Images



Tapers and ball pockets, machined on the mandrel



BP Bombax Manifold (600T), subsea deployment using Ballgrab



Ball indentation inside the receptacle

► **The tools are uniquely designed to fit into your installation procedure and operational environment:**

- Custom-made interface (pad-eye, clevis-head, thread, socket, swivel, joint, etc)
- Optimised load up to 2,500mT
- Can be designed in a female configuration
- Vertical or horizontal stabbing connection
- Secondary locking mechanism available
- Supplied with matching female receptacle if required

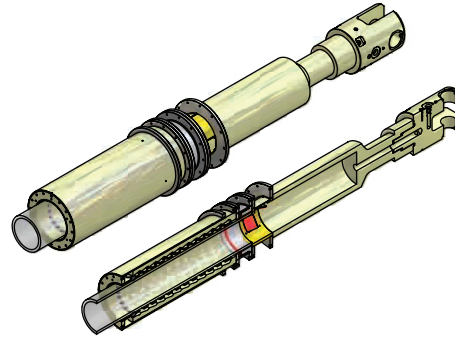
► **Client list includes:**

Acergy, APL, BJ Services, BP, Canrig, ConocoPhillips, Esso E&P, ExxonMobil Global Services Co, Frugro, Halliburton, Heerema, Hydril, Intermoor Inc, Nexen Petroleum Ltd, Oceaneering, Petrofac, SBM Atlantia, Talisman, Technip, Total Upstream Nigeria, Tyco, Upstream Petroleum, Saibos, Shell, Sonsub, Subsea 7, Trelleborg Offshore, Wellstream, Welltonic.

► **Today's applications of the technology, some of which are developed from clients' suggestions, include:**

- Subsea Mooring Connectors (mooring FPSOs, Buoys, PLETs, SPARs and Drilling Units)
- Diverless Bend Stiffener Connectors (DBSC)
- Pipeline Recovery Tools
- Deck Connectors
- Riser Handling Tools
- Tendon Pull-In Tools
- Manifold Deployment Tools
- Coiled Tube Handling Tools
- Drill String Recovery Tools
- Umbilical Repair Tools
- High Pressure Connectors
- Installation & Recovery Tools
- Pile Handling Tools
- Pipeline Connections
- Mooring of renewable energy devices

► **Examples**



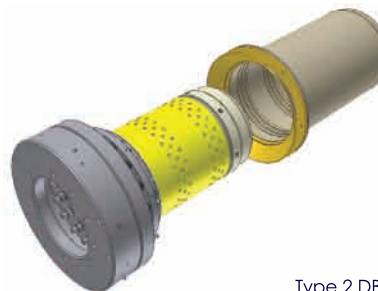
Double pig-catcher female PLRT



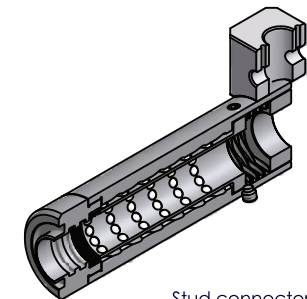
Buoy mounted SMC



Fender recovery tool



Type 2 DBSC



Stud connector

Typical SMC with trunion interface



In-line pull in SMC

