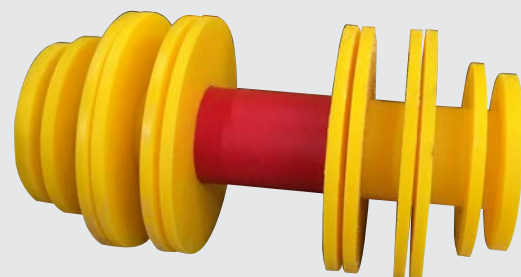




## PIGS FOR FLEXIBLE PIPELINES

Flexible umbilical pipelines are being used more and more in subsea infrastructures enabling efficient jumper connections, long distance tie-backs and eliminating the need for rigid spools. These flexibles are made up of multiple layers and will usually include an inner carcass from stainless steel, duplex or similar high chrome-content material. This requires the use of pig materials that are compatible and safe.



Propipe has been manufacturing and supplying pipeline pigs for the use in flexible umbilical pipeline pigs for many years. There are no significant performance differences between pigs for rigid pipelines and those for flexible pipelines. This is now regarded as a standard operation and these are only a few additional decisions to be made in order to select the correct pig type and material.

One point to note: end connectors on flexibles can have a smaller ID than the flexible itself. This should be checked and considered when pre-loading pigs.

## Pig Type

Pig designs for flexibles vary greatly, depending upon specific project requests. Propipe has supplied conventional foam pigs, foam disc pigs, solid-cast polyurethane pigs as well as conventional Bi-Di disc pigs. Each has its own merits and each can be made to provide a safe, effective solution.

## Pig Material

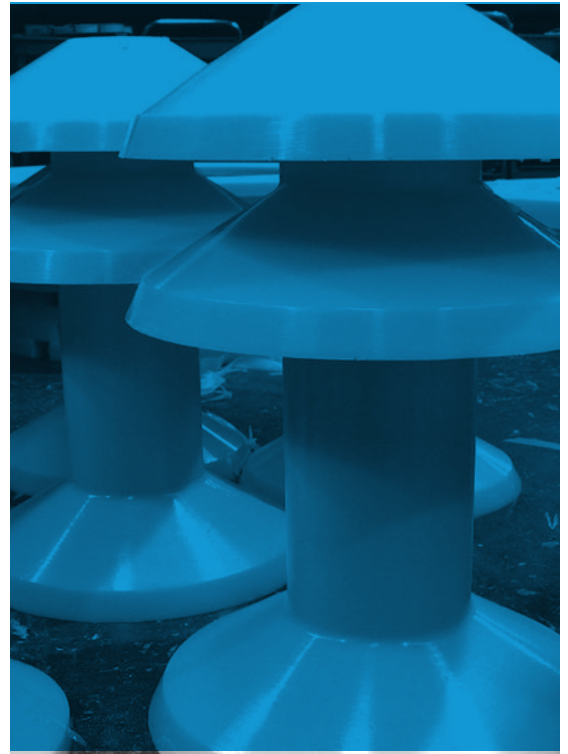
Metal bodied pigs are usually manufactured from stainless steel and where gauge plates are present; they can be coated in polyurethane to prevent any damage to the inner material of the flexible.

Due to material selection scale deposits are unlikely, so pigs do not necessarily need brushes. In the event that pre-commissioning pigs will pass both flexible and rigid pipeline sections, then nylon brushes are selected. Production cleaning pigs can also use nylon brushes or rely upon jetting bypass and scraper discs.

## Track Record

Propipe has provided a significant number of pigs for projects involving flexible tails, umbilical's, risers and pipelines. These pigs have been supplied to all major pre-commissioning contractors, such as Baker Hughes, Halliburton and EnerMech as well as directly to pipelay contractors such as Technip and Subsea 7.

In addition, the flexible manufacturer, GE Wellstream also purchases Bi-Di Gauging Pigs from Propipe, for the use during manufacturing FATs at its UK manufacturing plant.



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