



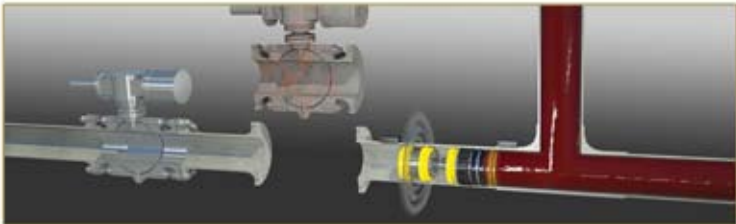
## Tecno Plug™ - Process & Pipeline Isolation

### Pipeline Isolation Applications

- Pipeline valve replacement / repair
- Riser replacement / repair
- Pressure testing / leak detection of risers / repaired pipelines
- Mid-line pipeline repair / tie-in
- Platform abandonment and bypass
- Pipeline diversion

STATS comprehensive Tecno Plug™ range provides fail-safe double block and bleed isolation tools for high pressure operations. These dual seal isolation plugs are available for remote, tethered, piggable or manual deployment and operation.

The dual seal configuration of the Tecno Plug™ provides an annulus void which can be pressure tested to verify both seals are leak tight before maintenance work is carried out, both seals are leak tested at 110% of the maximum potential isolation pressure. Once the seal integrity has been proved the annulus is then vented to ambient to create a zero energy zone, providing effective double block and bleed isolation. The large section elastomer seals are highly compatible with poor pipe surfaces and are customised to suit corrosion or ovality issues ensuring a leak tight seal even in ageing assets. A through-port is provided for downstream pressure monitoring or pressure application as required.



The Tecno Plug™ fail safe design uses differential pressure acting on the tool to energise the locks and seals, this is referred to as self energisation. When the isolation plug is self energised the isolation is maintained independent of the control system, it is however backed up by the hydraulic control system which maintains the isolation when the differential pressure is below the self-energisation threshold. Once the Tecno Plug™ is activated the hydraulic circuits are locked in by pilot operated check valves and manual isolation valves (tether controlled) or fail-safe solenoid valves (remote controlled). The Taper lock-ring provides twice the required lock contact area giving 100% contingency. In the event that the hydraulic control system is compromised, the tool actuation mechanism will unset when differential pressure is equalised. This feature ensures pipeline integrity is maintained and the Tecno Plug™ is always recoverable upon job completion.

The remotely operated Tecno Plug™ system is a piggable, remote controlled, tetherless isolation tool. The remote control system provides a high degree of flexibility and eliminates the need for tethers or specially modified pig-trap doors. Through-wall communication is achieved using an extremely low frequency (ELF) radio control system for reliable tracking and accurate positioning of the Tecno Plug™. An onboard hydraulic power pack provides the necessary actuation and control functions for the tool. The remote control module is ATEX rated and provides a robust system for safety critical activities, undertaken a rigorous validation programme.

Tecno Plug™ is a Trade Mark of STATS (UK) Limited



## Tecno Plug™ - Process & Pipeline Isolation

### Operator Benefits

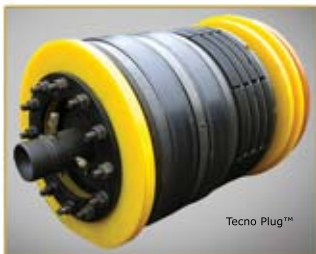
- De-commissioning (bleeding down) and re-commissioning (refilling / re-pressurising) of pipelines minimised or eliminated, saving time and reducing costs
- Production continued during pipeline maintenance or modifications
- No flaring of gas or displacement of pipeline inventory
- No emissions of gas / hydrocarbon vapour to atmosphere during blow down
- No danger of accidentally flooding offshore pipelines during construction
- No need to dispose of hydrates, chemicals and contaminated water
- Isolates short sections of pipeline anywhere in the pipeline system
- Emergency preparedness and operational readiness

### Key Features Tecno Plug™

- Size range: 3" – 42"
- Pressure range: up to 350 bar / 5075 psi
- Available as 3D / 5D compliant
- Robust compact design, enables Tecno Plug™ to be set in short sections of pipeline. In many instances production can be continued during pipeline maintenance or modifications activities
- Twin compression elastomer seals are highly effective even in pipelines with corrosion & ovality issues
- High integrity isolation, taper lock-ring provides twice the required lock contact area - 100% contingency
- Annulus bleed between seals allows pressure to be vented to ambient creating a zero energy zone providing effective double block & bleed isolation
- Fail-safe design feature; lock & seals energised by differential pressure; referred to as self-energisation
- Self-energisation feature maintains safe isolation while differential pressure exists across the plug
- Hydraulic system override releases the plug setting mechanism when pressure is equalised (Fail-safe passive unset feature)
- Both seals fully energised by pressure – rubber pressure 1.1 – 1.4 times greater than pipeline pressure
- Reverse pressure can be applied across the isolation plug to facilitate system leak testing
- Outboard pressure monitoring options

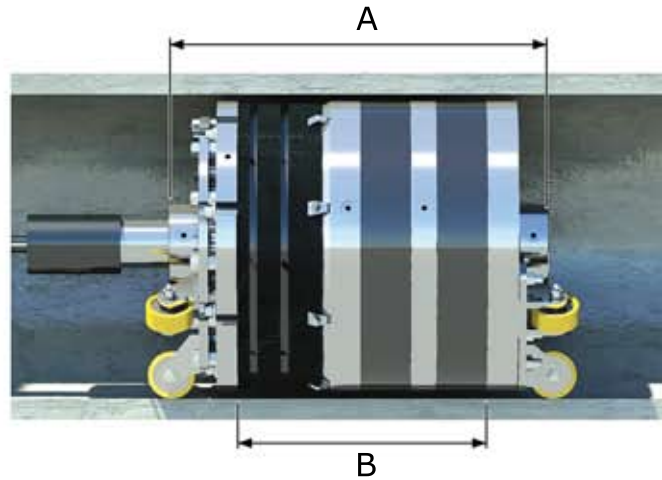
### Key Features Remote Tecno Plug™

- Size range: 12" – 42"
- Pressure range: standard remote control module housing rated for 200 bar (2900 psi) external pressure
- The remote control module provides a robust system for safety critical activities and has undertaken a rigorous validation programme with ATEX rating to Ex P2 II 3 GT3
- The external communication system is housed in an ATEX rated enclosure EE xd IIB T5
- Through-wall communication is achieved using an extremely low frequency (ELF) radio control system for reliable tracking and accurate positioning
- Subsea communication via acoustic link (3000m depth rating)
- Remote Tecno Plug™ does not use lithium batteries negating the need for Emergency Response Procedures for the transportation / use of extremely hazardous materials





**Tecno Plug™ - Data**



\* Dimension B reduces by approximately 15% - 20% when the tool is in the set position.

| Plug Nominal Diameter | Pipe ID (Min - Max) | Plug Outside Diameter | A - Overall Length | B - Seal To Lock (Unset)* | Weight |
|-----------------------|---------------------|-----------------------|--------------------|---------------------------|--------|
| 6"                    | 140-150mm           | 130mm                 | 274mm              | 177mm                     | 15kg   |
| 6"                    | 153-163mm           | 143mm                 | 285mm              | 189mm                     | 19kg   |
| 8"                    | 173-193mm           | 163mm                 | 326mm              | 205mm                     | 30kg   |
| 8"                    | 200-230mm           | 190mm                 | 257mm              | 207mm                     | 33kg   |
| 10"                   | 220-245mm           | 210mm                 | 372mm              | 248mm                     | 50kg   |
| 10"                   | 245-268mm           | 235mm                 | 372mm              | 249mm                     | 57kg   |
| 12"                   | 287-301mm           | 277mm                 | 578mm              | 307mm                     | 112kg  |
| 12"                   | 303-317mm           | 293mm                 | 578mm              | 307mm                     | 123kg  |
| 14"                   | 318-332mm           | 294mm                 | 578mm              | 308mm                     | 128kg  |
| 14"                   | 328-358mm           | 308mm                 | 578mm              | 308mm                     | 130kg  |
| 16"                   | 356-376mm           | 346mm                 | 683mm              | 355mm                     | 197kg  |
| 16"                   | 376-396mm           | 366mm                 | 683mm              | 355mm                     | 218kg  |
| 18"                   | 398-423mm           | 388mm                 | 683mm              | 357mm                     | 262kg  |
| 18"                   | 415-440mm           | 405mm                 | 683mm              | 358mm                     | 264kg  |
| 20"                   | 440-465mm           | 430mm                 | 751mm              | 391mm                     | 355kg  |
| 20"                   | 460-500mm           | 450mm                 | 676mm              | 392mm                     | 403kg  |
| 22"                   | 490-530mm           | 480mm                 | 676mm              | 393mm                     | 405kg  |
| 22"                   | 510-550mm           | 500mm                 | 676mm              | 395mm                     | 426kg  |
| 24"                   | 530-570mm           | 520mm                 | 947mm              | 457mm                     | 681kg  |
| 24"                   | 560-600mm           | 550mm                 | 947mm              | 458mm                     | 755kg  |
| 26"                   | 605-645mm           | 595mm                 | 967mm              | 460mm                     | 833kg  |
| 30"                   | 635-675mm           | 625mm                 | 1025mm             | 584mm                     | 993kg  |
| 30"                   | 654-694mm           | 644mm                 | 1025mm             | 584mm                     | 1062kg |
| 30"                   | 704-744mm           | 694mm                 | 1025mm             | 587mm                     | 1223kg |
| 32"                   | 754-794mm           | 744mm                 | 1156mm             | 674mm                     | 1567kg |
| 34"                   | 780-820mm           | 770mm                 | 1151mm             | 671mm                     | 1686kg |
| 34"                   | 804-844mm           | 794mm                 | 1151mm             | 674mm                     | 1785kg |
| 36"                   | 835-875mm           | 825mm                 | 1105mm             | 705mm                     | 2039kg |
| 36"                   | 879-919mm           | 869mm                 | 1105mm             | 705mm                     | 2180kg |