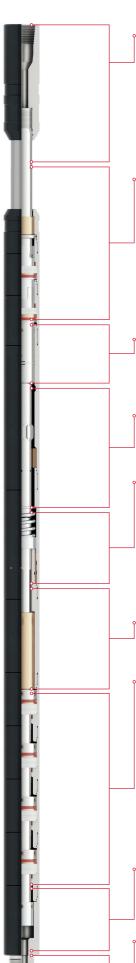
Technical Features



Premium Connection Sub

PolyVolve SWIVEL DS can be dressed with any standard or premium threaded connection, removing the need for cross-overs.

UP-SWIVEL PolyVolve Module

The UP-SWIVEL POLYVOLVE module allows high tension forces to be applied to the device whilst allowing rotation.

POLYVOLVE is a modular, stackable, polymeric thrust bearing swivel capable of withstanding ultra-high thrust forces whilst rotating for extended periods in extremely hostile conditions.

POLYVOLVE delivers a proven and unrivalled thrust load bearing capability, is impervious to wellbore fluids and debris and can operate comfortably at high temperatures.

Secondary Lock Module

This is the secondary or contingency system for rotationally locking the mandrel of the swivel in the splined position to allow tool manipulation such as releasing from a liner hanger system.

Drive Spline Module

A precision high-torque drive spline provides the torsional drive force required for manipulation of deployment tools as and when required. The drive spline is disengaged in the swivel modes.

Primary Lock Module

The primary lock module provides a system for rotationally locking the mandrel of the swivel in the splined position to allow tool manipulation such as releasing from a liner hanger system. This is pressure activated. A low pressure threshold temporarily locks the mandrel in the splined position which can then be released with the relief of the pressure. An elevated pressure threshold permanently locks the mandrel in the splined position once the desired shear rating is exceeded. The shear rating is adjustable at the wellsite.

HAMMER Transmission module

This system provides torque transmission through the lower PolyVolve modules to power the HAMMER vibro-impact deployment.

DOWN-SWIVEL PolyVolve Module

The DOWN-SWIVEL POLYVOLVE module allows high compression forces to be applied to the device whilst allowing rotation.

POLYVOLVE is a modular, stackable, polymeric thrust bearing swivel capable of withstanding ultra-high thrust forces whilst rotating for extended periods in extremely hostile conditions.

POLYVOLVE delivers a proven and unrivalled thrust load bearing capability, is impervious to wellbore fluids and debris and can operate comfortably at high temperatures.

Add or subtract POLYVOLVE bearing modules as desired to achieve the optimal required thrust load rating.

HAMMER Module Option

A HAMMER vibro-impact module may optionally be fitted to the lower end of a PolyVolve SWIVEL DS to provide superior deployment capability by delivering precise, controllable friction-reducing downward acting vibrational and axial impacting forces.

Premium Connection Sub

PolyVolve SWIVEL DS can be dressed with any standard or premium threaded connection, removing the need for cross-overs.

Case History





PolyVolve SWIVEL DS

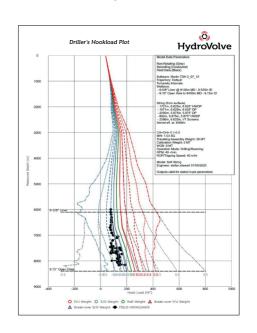
2022 Qualification Test | 2022/2023 Field Trial Real Results

PolyVolve SWIVEL DS is the world's strongest and most durable swivel. It's patented stackable polymer bearing design allows an unlimited number of bearing modules to be added to give unlimited load bearing and durability capabilities.

PolyVolve SWIVEL DS in the drill string above a liner or casing during deployment allows dynamic rotation to mitigate the negative effects of static friction and can significantly improve deployment capability. This provides operators with the utmost confidence of speedy, accurate and safe placement of their wellbore systems and can allow for longer more complex wells to be planned with confidence and executed safely.

Real Results

- Step-change in operating load, speed and life
- Advanced polymer bearing stack
- Best in class load bearing proven
- Best in class speed rating proven
- Best in class bearing life proven
- On-demand on-off temporary locking facility delivered
- Permanent lock executed with 100% reliability
- Multiple contingency dart options qualified
- 100% deployment track record
- 100% service satisfaction
- Deployed across 3 continentsFirst class in-house torque and drag simulation service delivery
- Demonstrated T&D modelling accuracy against deployed requirement
- Strong case history portfolio across all tool sizes
- Cement-through capability proven

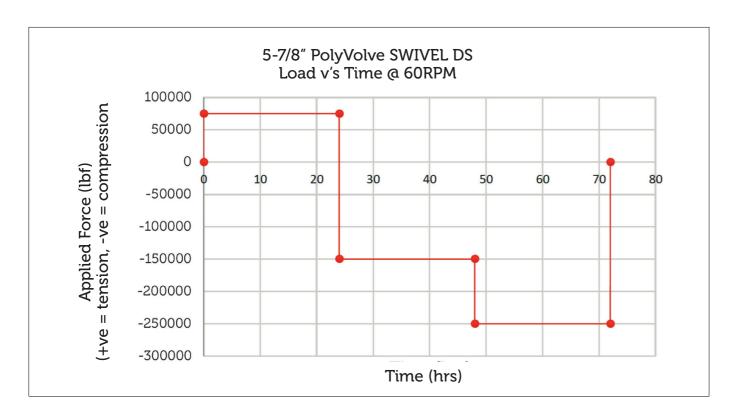


PolyVolve SWIVEL DS: Qualification testing



PolyVolve SWIVEL DS passed qualification testing for **maximum customer load** over a **24 hour rotating duration** at **60RPM** in both **tensile and compressive load** modes **with no damage** or loss or performance.

Qualification Test Load Chart



Test Summary

- 5-7/8" PolyVolve SWIVEL DS was subjected to 75,000lbs tensile load and rotated for 24hrs at 60rpm
- 5-7/8" PolyVolve SWIVEL DS was subjected to 150,000lbs compressive load and rotated for 24hrs at 60 rpm
- 5-7/8" PolyVolve SWIVEL DS was subjected to 250,000lbs compressive load and rotated for 24hrs at 60rpm
- 5-7/8" PolyVolve SWIVEL DS temporary & permanent lockout functions were fully tested
- Full qualification test was declared successful

Case Study

5-7/8" PolyVolve SWIVEL DS Norway

Field Application Overview:

- Norwegian Continental Shelf | Offshore | Fixed Platform Drilling Rig | Mid to end of Well Life
- Extended reach horizontal production hole section | 2,000m 8 ½" open hole horizontal section
- TD at 8,164m MD / TVD 90° Historical record of high drag and DP buckling
- 5-7/8" (8" OD) PolyVolve SWIVEL DS | 6-5/8" Stand alone screens with IDC modules.
- Conventional hydraulic set liner hanger system | Glass plug to set liner and release running tool

Operations Summary:

- Executed a safe operation | Delivered all equipment on-time | Thorough pre-job planning engagement
- Tool passed surface function test and RIH
- Swivelling (torque) parameters taken at 10 and 30 rpm at 9-5/8" casing shoe before entering open hole.
- Encountered tight spot at 7,060m | Hung up several times | Activated swivel @ 40rpm | Passed restriction.
- Further restriction at 7,636m | Attempted to pass several times | Activated swivel @ 50 rpm | Passed restriction.
- Stalled at 7,889 when sliding without swivelling due to buckling | Activated swivel @ 50-75rpm | Prevented buckling | Continued in hole to TD at 8,164m.
- Set liner hanger & locked swivel | Primary release of liner hanger running tool successful.
- Swivel confirmed locked upon POOH.

