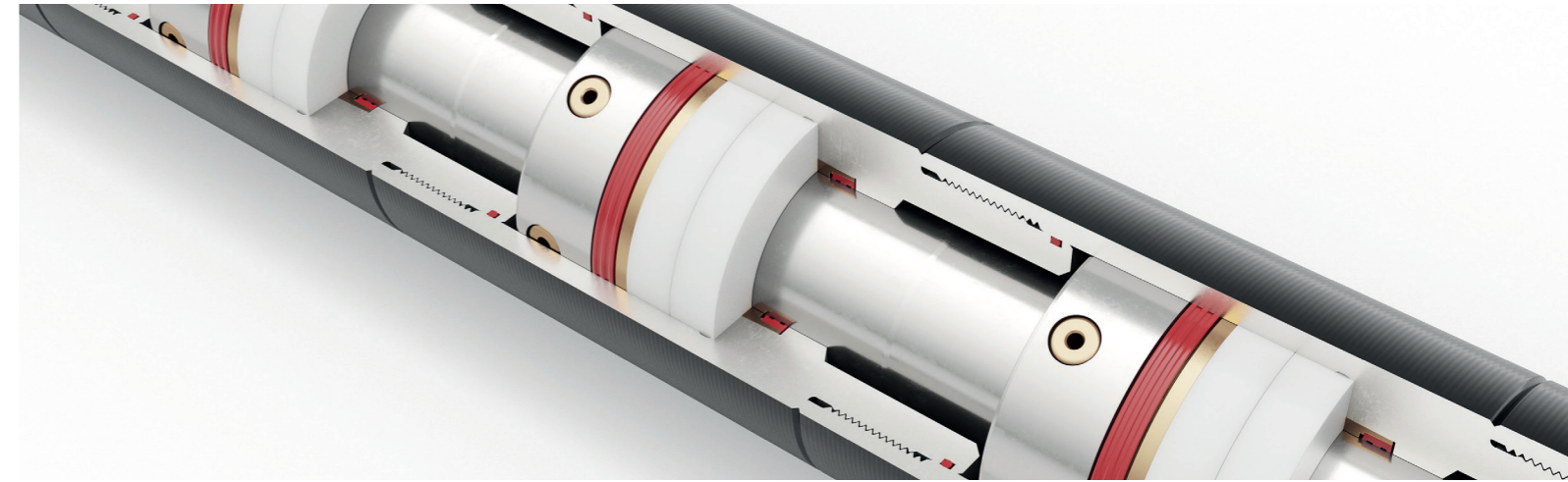


# Case History



## PolyVolve SWIVEL DS

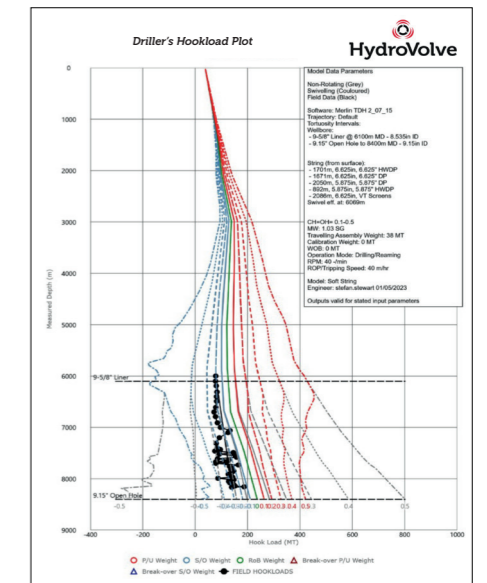
### 2022 Qualification Test | 2022/2023 Field Trial Real Results

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 continents
- First 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

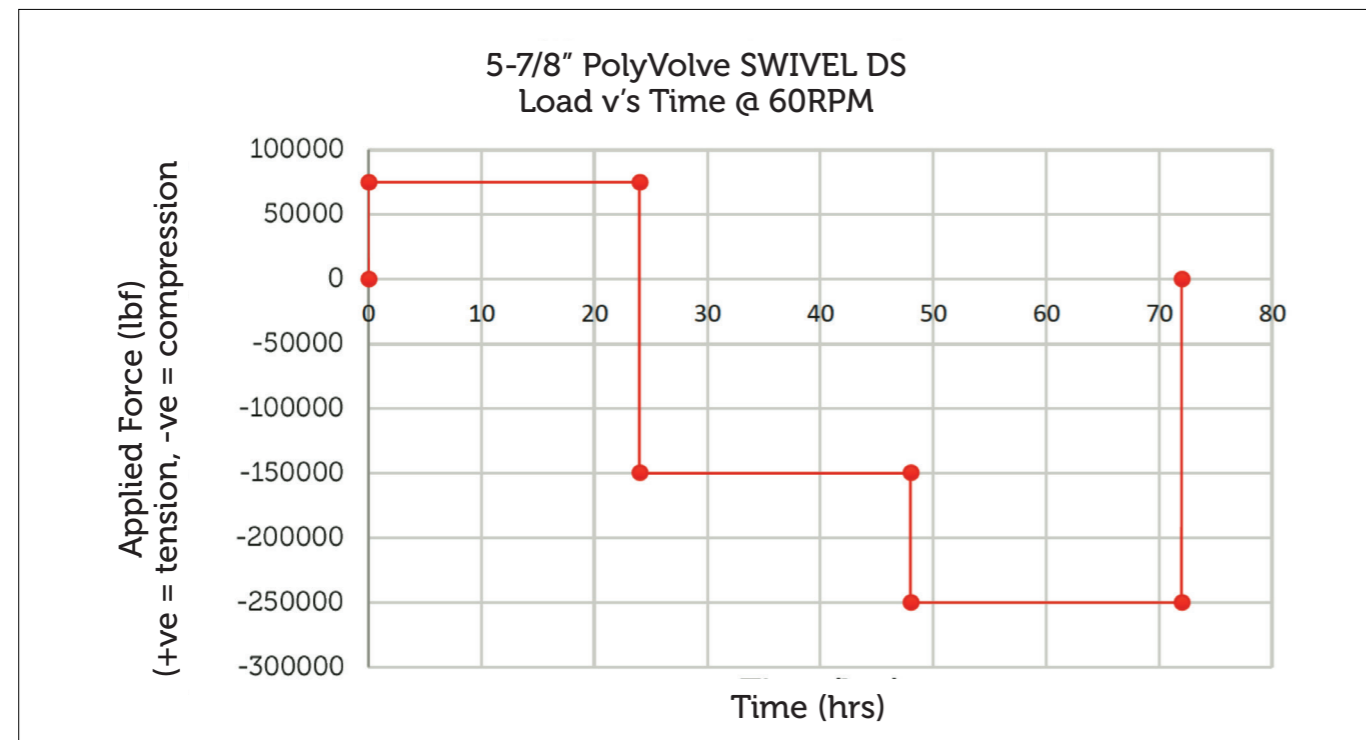


## PolyVolve SWIVEL DS: Qualification testing



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 of 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 1/2" 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.

