GNY MOORING SUBMERGED TRIPLE SEAL SWIVEL JOINTS

GNY EQUIPMENT, LLC

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GNY Equipment, LLC

The Company was an early pioneer in the development of hydrant type aircraft refueling equipment and related aircraft ground support equipment. Experience in this field led to the designing and manufacturing of pits required for the early hydrant systems. The company had traded under the name Garsite TSR. The Deer Park facility remained in New York as Garsite International until in December 1995, when GNY Equipment, LLC (GNY) was spun-off to an independent status, bringing with it, almost a half-century of experience in aviation fueling, in liquid, Air, Oil and Gas equipment. The people at GNY have been manufacturing fueling equipment for over three decades.

GNY Equipment, offers Swivel Joint/Swing Joint for Mooring (Submerged Services), Aviation, Mining Industry (For Hot Air), Oil and Gas Industry.

GNY MOORING SUBMERGED TRIPLE SEAL SWIVELS: List of Features.

Size: **2" (50 mm) to 36" (900 mm).**

Swivel Joints are available in style 20, 30 and 40 with flanged end connections or combination of ANSI 150 Class, 300 class or Speciality Flange. Designed as per API Spec. Standard 6H.

Material of Construction:

Carbon Steel: ASTM Plate A515/A516 Gr. 60/70 (sizes upto 6" in CS A105 Forging),
Stainless Steel: ASTM Plate/Casting of SS304/SS316 (CF8/ CF8M or equivalent)

Two different design constructions:

Two Piece Design: The main seal replacement requires dismantling both bearings.

Split Flange Design: The main seal can be replaced without dismantling any bearings.

Ball Bearing, fitted with two rows of widespread ball bearing (Chrome CS or SS).

Heavy-duty load bearing capacity widespread ball-bearing raceway hardened up to 345 BHN (equals to 37 Rockwell "C") through a special permanent metal hard facing process.

Seal Contact Faces are overlaid with Corrosion Resistant Stainless Steel (SS) Lining:

All CS Swivel Joints are supplied with Special Stainless Steel lining at the main seal faces, on both nipple and housing for longer seal life and smooth rotation.

Triple Seal Design:

Main seal of two different types: O-Ring or Lip Seal.
O-Ring type: Main Seal of O-ring cross section of Buna-n/Viton® material and O-rings,
Lip Seal type: Main Lip Seal of PTFE (Teflon®) with Buna-n/Viton® Insert/Spring Energized and O-rings or Main Lip Seal of Buna-n/Viton® is also available.
A special Inverted PTFE Lip Seal design for main-seal is also available.

External Lip Seal For Submerged Application:

A third additional seal specially designed to provide required **sealing for external Seawater pressure**.
External Lip Seal of PTFE (Teflon®) with Buna-n/Viton® Insert/Spring Energized or Buna-n/Viton®.
A special Inverted external PTFE Lip Seal design is also available.

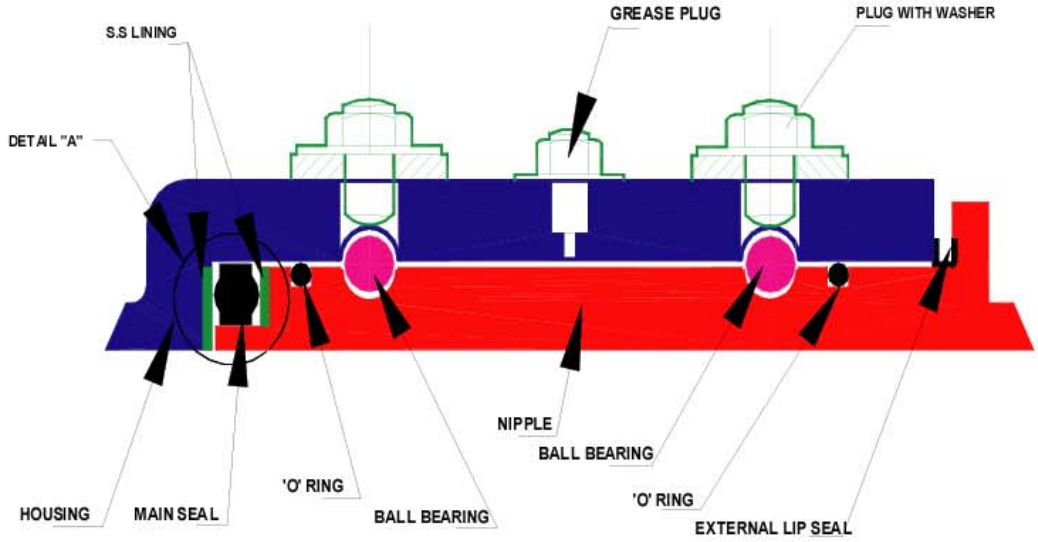
Positive and Negative pressures: Nipple (female) portion is specially dimensioned for the main seal to remain in the proper functioning position under both positive and negative pressure.

Designed to withstand temperature variations from -20 to 450+ Deg. F.
A special low or high temperature application is also available.

Factory Lubricated and Sealed: Lubricated with Special wear resistant high temp. PTFE based lubricant. Dust Proof.

Hydro testing and Special Testing: All Swivel Joints are Internally Hydro-tested at shop before shipping. The Air test, Vacuum test, Bending moment/Radial load test, Pull load test, Torque test, External Pressure test, Electrical conductivity test and Life Cycle Tests (US Patented) **have been conducted during the R&D** (research and development) and these tests can be conducted upon request at extra cost.

GNY MOORING SUBMERGED TRIPLE SEAL SWIVEL JOINTS



DETAIL "A"
OPTIONAL LIP SEAL OF PTFE

SUBMERGED TRIPLE SEAL SWIVEL JOINT

Heavy-duty load bearing capacity widespread ball-bearing raceways hardened up to 345 BHN

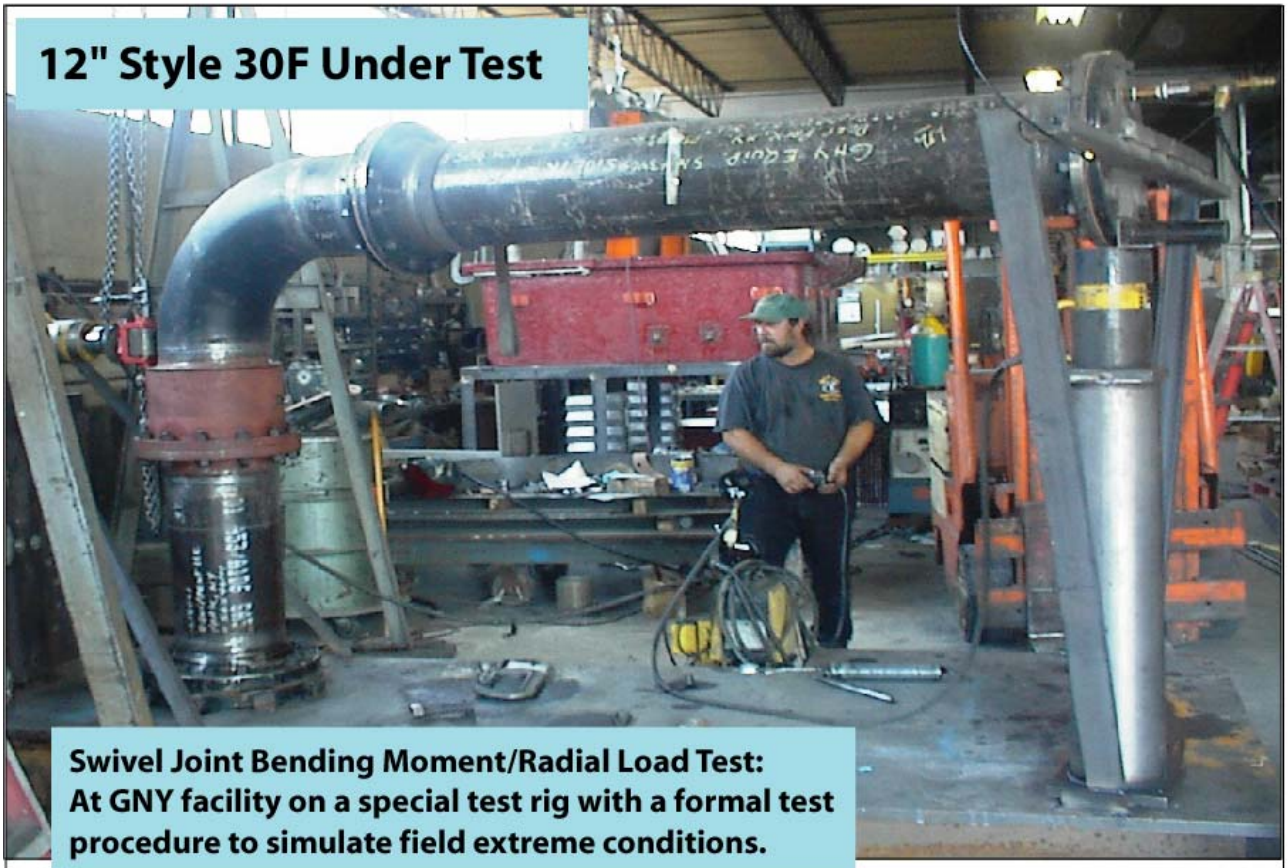
16" x Style 40 Triple Seal Two-Piece Swivel

12" Mooring Swivel Joints

12" Style 40 Flg x Flg Mooring Swivels

Split Flange Design with Inverted Main Lip Seal and External Seal of PTFE with Viton® insert, Special Lubricant and Heavy-duty Load Bearing Raceways. This units were designed, manufactured, tested, and installed for European client in 1999 and 2002.
Bending moment/radial load testing of (100% and 150%) was conducted.

GNY Mooring Submerged Swivel Joint Testing



12" Style 30F Under Test

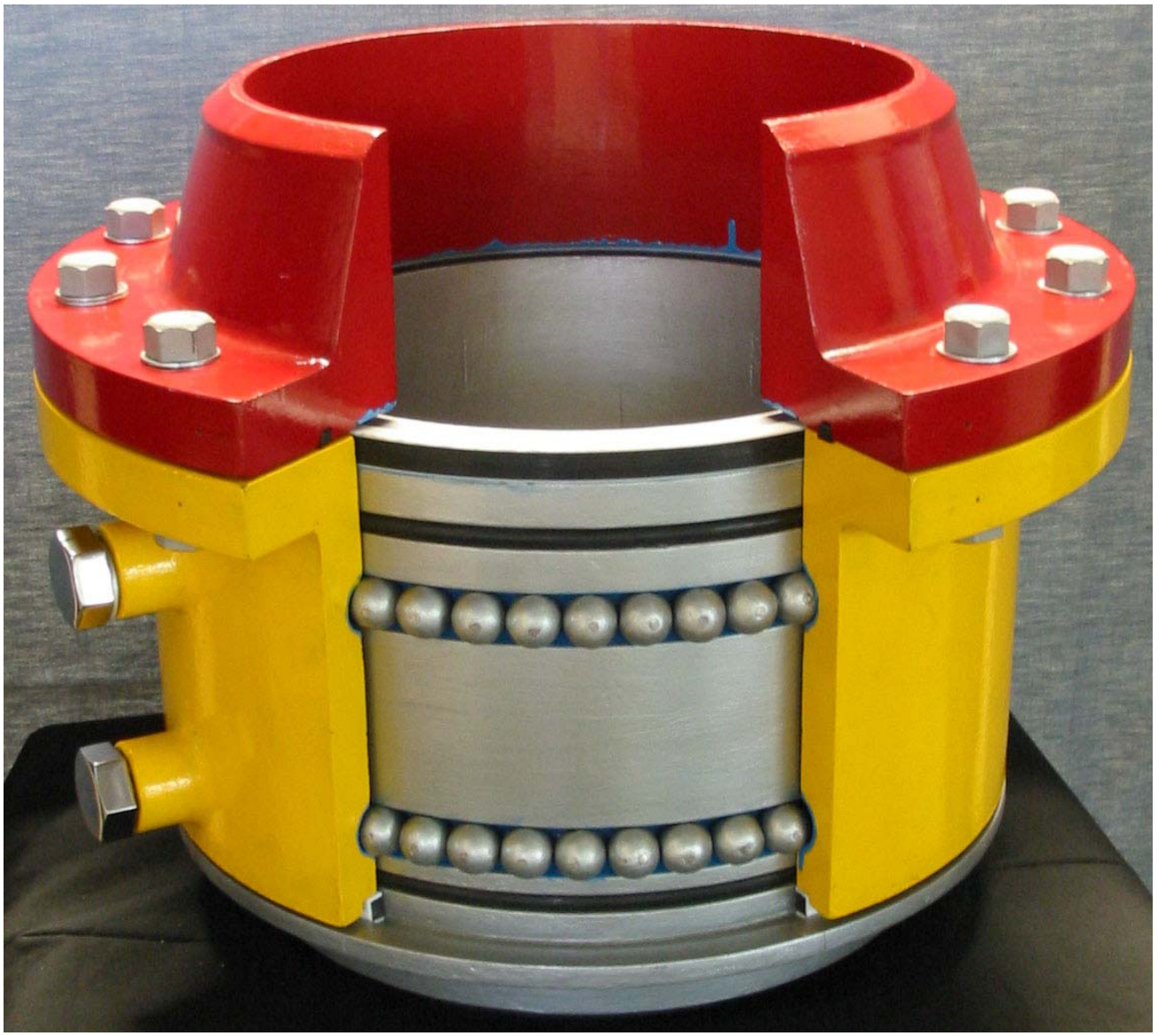
Swivel Joint Bending Moment/Radial Load Test:
At GNY facility on a special test rig with a formal test procedure to simulate field extreme conditions.

Radial Load/Bending Moment Test Procedure:

A 20,000 lb. Radial load applied to the Split Flange Design Swivel Joint Housing,
A 40,000 lb.-inch bending moment applied to the swivel joint.
An internal hydrostatic pressure of 275 P.S.I. applied to the swivels,
The Swivel is cycled through 30 degree swing in a period of two minutes, recording internal pressure hydraulic ram pressure and inspecting for leaks.
The Swivel is then disassembled and examined for possible deformation or damage or Brinelling. Brinelling damage is defined as any permanent indentation in the race when the width of the indentations is equal to or greater than 8% of the ball diameter.
After successfully completing of above tests, the bending moment of 150% (600,00 lb.-in) applied, keeping the radial load constant at 20,000 lb. during this test.
Test Results: Above results for 12" Swivel Joint (for 100% and 150% of loading) recorded, witnessed and certified by GNY. Met client's specification.

Inspection of the Load Impact on the Ball Races

CROSS-SECTIONAL VIEW OF GNY MOORING/MINING SPLIT FLANGE DESIGN SWIVEL JOINT



GNY TRIPLE SEAL SUBMERGED SWIVEL JOINTS FOR MOORING APPLICATION GNY JOB NO.: FB934 / CLIENT IN EUROPE

Size: 12” x Style 30 with PTFE seals

Supplied in Year 1999