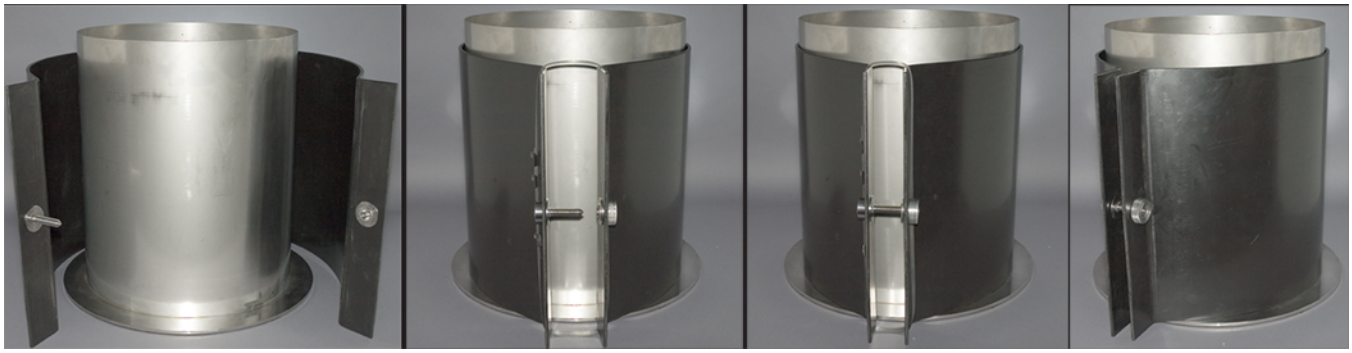
FASTORQ®

The Speed of Innovation.



Zip-Nut Fastening Mechanism for VIV Suppression Fairings

The Robotic Solution

Vortex Induced Vibration (VIV) occurs when ocean currents flow past the risers that transport well fluids from the sea bottom to the surface/offshore production structures. The vibration is extremely destructive to risers and associated equipment. To counteract VIV, suppression fairings are fastened around the risers. This fastening task is usually carried out with tooling that is mounted on an ROV. One of the challenges encountered is fastening the fairings to the risers once they are in place.

To accomplish this, the fastener must:

- lend itself to robotic installation using an ROV and its tooling capabilities.
- allow free movement of the fairing so it can re-orient itself to the ocean currents.
- not loosen under unpredictable natural forces.
- stay secure for at least 30 years.

Standard threaded fasteners DO NOT meet these criteria.

The Solution:
The Fastorq Zip-Nut Fastening Mechanism

The **FASTORQ Zip-Nut Fastening Mechanism** follows the same principle of a check valve by allowing movement only in one direction. The design solution incorporates a female fastener with segmented threads that separate slightly to allow entry and engagement of the male fastener as it is pushed into the female segment. No rotation is required!

The Fastorq Zip-Nut Fastening Mechanism is:

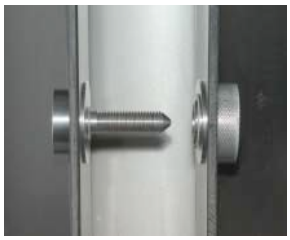
- compatibility with ROV tooling capabilities.
- rugged enough to withstand vibration and rotational stresses.
- made of material that is corrosion-resistant for 30 years.

This series of photos show the mounting and closing of the faring around the steel riser:



The ROV would be positioned opposite of the fairing opening. The robotic arms of the ROV push on opposite sides of the fairing flanges to close.

This next set of photos show the engagement of the fastener. Notice the conical tip on to the male component to help alignment for smooth fastening into the female component. Once the Zip-Nut fasteners engage, the action is irreversible.




The photos below illustrate the special thread design of the fastener components. To prevent loosening due to vibration or rotation, radial grooves cut in the male components replace the helical threads normally used in fasteners.

As you can see in the photo below, the female- segmented threads are held together by the garter spring. The garter spring keeps the concentric threaded female segments around the male component. Once inserted, any force pulling the make component will cause the female to clamp tighter due to the chamfered angle cut in the leading end of the male threaded segments and the corresponding cut in the Zip-Nut body.

Ferralium 255 was selected to provide excellent corrosion resistance.

The specific innovation in mechanical engineering is the use of our exclusive Zip-Nut technology (segmented threads) coupled with the use of radial grooves to make the connection permanent.

FASTORQ has enhanced the cost-effectiveness of a proven design (Zip-Nut Technology) with an innovative radial groove design and material selection without having to create an entirely new design that would require extensive and additional R&D, time and cost.

Users have quickly gained the capability to install fairings on risers utilizing ROV tooling at greater speed and reliability. Previous methods have been ineffective, consuming time and resources as well as exposing the workers and the project to catastrophic failure from vortex induced vibration.

The **FASTORQ Zip-Nut Fastening Mechanism** is currently being used to install fairings on the Uras, Macaroni and Mars projects.

For more information on the FASTORQ Zip-Nut Fastening Mechanism for VIV Suppression Fairings , contact us at 281.449.6466 (Global) or Toll Free at 1.800.231.1075 (US & Canada), or e-mail at sales@fastorq.com.