

# S02

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SERVICE MAGAZINE

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## TRELLEBORG SEALING SOLUTIONS HELPS DEVELOP REVOLUTIONARY SUBSEA PRODUCT

When faced with the challenge of helping to create a product to boost safety and efficiency for offshore engagement, Trelleborg went above and beyond in developing a complete sealing solution to help its partner “revolutionise” the oil industry.

When the question of whether it would be possible to create a large bore, high pressure hydraulically retractable coupler was first posed, one of the initial challenges that needed to be overcome was finding a seal that was up to the job.

As a leading global supplier of polymer-based critical sealing solutions, Trelleborg Sealing Solutions was the natural choice to help Subsea Technologies Ltd (STL) create an innovative engineered solution to accelerate performance of its dynamic two inch Hydraulically Retractable Subsea Coupler.

STL, which specialises in providing reliable and cost effective products to solve complex subsea challenges, required a custom-made seal which would work inside the pioneering product.

STL had previously developed small bore retractable couplers, used as sub-components in its unique XR Connector, however, scaling up to a large two inch bore to allow for choke and kill lines passing through the XR Connector, posed a number of major challenges.

The hydraulically retractable couplers assist in creating the XR Connector’s unequalled high-angle release capability which has no maximum riser angle limit. It was designed to deliver radically improved vessel safety, reduce environmental risk and decrease costs by greatly boosting a vessel’s operating window.

In order for the full potential and functionality of the two inch coupler to work, it needed a seal to be developed that would work in harmony with the coupler, the world’s first of that size with a hydraulically retractable element.

During the initial round of testing, STL discovered that the original hydraulic seals were extruding during the high temperature and high pressure phase of the test programme.

As the product development stage was so advanced, STL asked Trelleborg to propose a sealing solution that would address the issue of extrusion of the seal cap, without the need to change any of the existing hardware groove dimensions.



Trelleborg immediately set about overcoming the issue and developed custom versions of its Turcon® Captive Glyd Ring® with XploR™ V9T82 elastomer material and Turcon® Stepseal® 2A CR with PEEK corner reinforcement rings.



Left: Trelleborg set about meeting requirements and developed custom versions of its Turcon Captive Glyd Ring.

The Stepseal® 2A CR is the new standard corner reinforced rod/piston seal for single-acting use and has many advantages, such as its anti-tilt design and that the dimensions of the seal body and CR-Ring which can be modified to facilitate installation.

Andrew Longdon, Technical Manager for Trelleborg Sealing Solutions in the UK, said: “Throughout the process we constantly had to think about the safety issues and challenges that are frequently faced when working with heavy duty engagement of subsea equipment.

“We worked with STL as the team conducted a very lengthy test programme including a full PR-2 temperature and pressure cycling programme along with endurance cycle testing on the products in accordance with the ISO 10423 standard.

“STL also conducted two disconnects with 10,000 psi bore pressure. This was all completed with one set of seals which I think is some achievement.

“We pride ourselves on innovation and relished this opportunity to work with STL in a bid to find a solution and ensure the two inch Hydraulically Retractable Subsea Coupler was working to its full capability.”

Not only does the coupler provide new opportunities for remote emergency release system designs for subsea applications, it also enables people to be removed from stab plate engagement functions on the surface. By being hydraulically retractable, it allows the heavy duty engagement of equipment both on surface and subsea to be separated from the comparatively delicate engagement of control system interfaces.

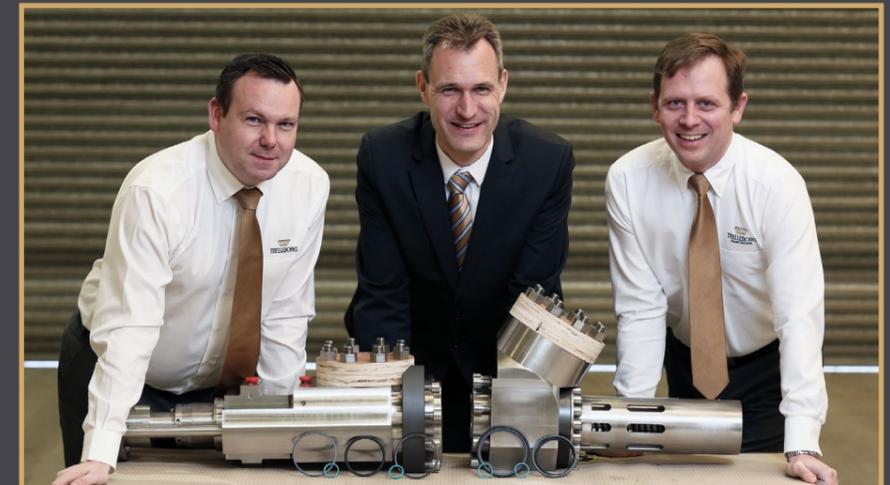
Subsea Technologies Ltd’s Managing Director Drummond Lawson said: “We knew Trelleborg – being a world-leader in sealing solutions – would be able to solve the challenge of finding a durable and robust seal to work in harmony with our product.

“Not only have they gone above and beyond in meeting expectations of the brief we outlined, but we were also impressed with the service we received throughout the process. We are by no means Trelleborg’s biggest client – but the support we received has been second to none. At every stage of the process a member of the Trelleborg team kept us fully informed from prototype development right through to bringing the product to market.

“This was no easy challenge and without Trelleborg, we would not have been able to produce what we believe to be the first coupler of this size ever to be made with a hydraulically retractable element, which we are certain will create opportunities for our clients beyond just its use in our XR Connector.”

The two inch Hydraulically Retractable Subsea Coupler was specifically designed for constant heavy duty operations and works with very small fluid volumes to ensure rapid movement. It is also more than capable of coping with solids laden fluids such as drilling muds and well effluents.

It is pressure balanced in both the extended and the retracted positions, ensuring the coupler will remain in position in the event of hydraulic control system failure.



Above: Trelleborg have helped produce what is believed to be the first coupler of this size to be made with a hydraulically retractable element.

Additionally, it is possible to pressure test to full system working pressure against the retracted coupler without the need for an additional test cap.

When retracted, the coupler stinger is flush with the coupler plate, preventing both dirt ingress and external impact on the retracted coupler from damaging the seals.

The coupler is fully Lloyds design verified and qualified to 3,000m (10,000ft) water depth, rated to 10,000psi hydraulic bore pressure and up to 5,000psi hydraulic function pressure.

It can be used on subsea wellhead connectors, riser connectors, emergency disconnect packages, quick release stab plates and

emergency disconnect points.

Mr Lawson added: “We’ve only just completed the last round of testing and delivered the first coupler and already we have received further orders. Clearly other people can see the benefits that this cutting-edge product will create in their operations and service offerings, enabling our customers to deliver the latest safety and operability enhancements to their clients.”

Trelleborg Sealing Solutions will be exhibiting at SPE Offshore Europe Conference & Exhibition 2017, which takes place in Aberdeen from September 5 to 8, in Hall 1, stand 1H81.

[www.tss.trelleborg.com](http://www.tss.trelleborg.com)



Below: STL’s Hydraulically Retractable Subsea Coupler is designed to deliver radically improved vessel safety.



## BENDER DEVELOPS MONITOR FOR SUBSEA AND UMBILICAL CABLES

Electrical safety solutions specialist Bender has launched new isoHR685W-D-B LIM for subsea cable insulation monitoring.

The ISOMETER iso685 is an insulation monitoring device used worldwide in unearthed IT system [AC, AC/DC and DC power supply applications].

Bender has focused on enhancing capability of iso685 with a new generation of insulation monitoring devices which exactly meet the needs of customers within challenging industry sectors.

The latest addition is the isoHR685W-D-B, designed specifically for subsea cable monitoring.

The isoHR685W-D-B monitors subsea and umbilical cables to provide earlier advance warning of cable degradation and failure. It is designed specifically to meet the needs of the oil and gas industry sector.

According to the company, the isoHR685W-D-B continuously monitors cables up to 10GΩ, delivering a huge performance improvement compared to previous versions, and offering very accurate synchronisation of up to 100 isoHR685 to limit cross cable disturbance between long parallel cables.

Earlier warning of a developing cable fault gives operators the breathing space to repair/replace and continue extracting from that subsea well.

Below: Bender Develops Monitor for Subsea and Umbilical Cables.

