Well Completion and Liner Hangers
General Information
The Completion Tools business unit offers a wide range of customized and standard liner hanger systems for your well completion needs. With our extensive technical knowledge, customers around the world benefit from our experience in the oil and gas industry.

We develop and provide innovative solutions and efficient services for our customers. In order to provide the highest quality we are certified according to DIN EN ISO 9001:2008 and SCC**:2011.

Crude oil and natural gas continue to be the most important energy sources, and are an indispensable raw material for industry. A worldwide supply is one of the most fundamental challenges of our time that involves the continuous finding and exploitation of new energy sources. We face these challenges as your strong, comprehensive partner for well completion equipment and services.

Our offerings:
- Solutions through new developments
- Customized designs
- Wellbore completion
- Innovative liner hanger systems
- Short lead times
- A fast and reliable service

Many successfully completed projects in the world indicate our performance, for example:

- 9.88” Straddle PIP for cavern, welded connection test, Germany
- 7” ESP Compl. w. SCSSV and Zone Isolation Valve, Germany
- 3 5/8” Inflatable Open Hole Cement Job, Lithuania
- 5 1/2” Double Anchor PIP shutoff, France
- 10.38” PIP w. 13 3/8 Casing Patch, Germany
Design and Development

Our innovative products and customer specific components are designed by mechanical engineers with a 3D-CAD Software. By using additional analysis tools, e.g. Finite Element Analysis or Flow Simulation, various calculations can be made that are important for verification and ideal design of our products.

Engineering

Finite Element Analysis (FEA) is a numerical method for solving complex calculations. It is used to calculate tensions and displacements of components resulting from exterior loads, whereby each design step can be optimized. FEA is an inherent part of our design process. In this way, we can verify that our virtual prototypes meet our requirements for quality, stability and safety. This reduces time and cost of prototyping out new designs.

Flow Simulation is a numerical method for solving complex flow systems. This software enables our designers to simulate the liquid flow, heat transfer and flow force rapidly and in a straightforward manner. This numerical method is used during development for flow examination and optimization of the relevant components to ensure the perfect function of the products.
Experienced Team

Whether in the harsh conditions of the North Sea, in the heat of the Kazakh Steppe or in the swamps of the Niger Delta, our field engineers are prepared and ready to handle the demands of your projects.

The basis of our success is our service quality. For this purpose, we continually invest in the training of new engineers and further education of our experienced staff. In cooperation with the training alliance for mining technicians specializing in drilling engineering (AVBT) and on the basis of the German Vocational Training Act we offer this vocational training. Consisting of theoretical and practical components, this dual vocational education and training allows a broad and comprehensive training to a skilled worker on the drilling and production plant.
Running Procedure
The Running Procedure (RP) is a complete manual which documents the precise sequence description, installation instructions, and all target values of the liner hanger installation. Prior to each operation, the RP is discussed in a pre-job meeting by a project manager and field engineer. During installation of the liner hanger system, deviations between target values and actual values can be determined directly at the drill rig. The field engineer can react promptly and initialize appropriate measures in coordination with the customer. Any variation within the procedure is recorded in a new revision of the RP. Based on this qualified process, original documents can be compared with actual data and all changes can be retraced.

Operator Software
The specially designed Operator Software comprises of several modules: including calculating, investigating and obtaining information. Necessary documents supporting the workflow and facilitating the subsequent analysis are provided by this software.

Data Sheets
The Operator Software provides the field engineer with access to all product data sheets. The data sheets include technical data and information on both sales and rental equipment.

End-of-Well Report
After job completion, all data is summarized and discussed in a working group together with the project manager, design engineer, fitter, quality manager and the field engineer. The customer is provided with all data relevant for the order in an End-of-Well Report.
**Master Document**

Projects are implemented within an Integrated Quality Management System (IQMS) following a standardized schedule – the Master Document – and the Enterprise Resource Planning System (ERP System). All comprehensive data of the separate processes, from quotation and order processing up to the installation service, are recorded in the Master Document step-by-step and in a detailed manner.

This process ensures a persistent stream of data and continuously updated project status. Shared communication allows the project to proceed smoothly and efficiently. Upon completion of a project, all information is included in the Master Document, which is linked with the ERP System and all further project data.

**Well Planning**

For the design of customer specific components, we use an approved Well Planning Software. Using this software, the below comprehensive well calculations can be offered:
- Torque calculation
- Overload calculation
- Drilling hydraulics
- Swab and surge effects

**ERP System**

Our ERP-System fully supports our work processes. This includes modules for procurement, production, sales, asset management, finance and accounting. It is possible to map the entire project flow in the ERP-System. Offers, orders and contracts are recorded, qualified and linked together.

From the smallest individual component to the completed liner hanger system, all items can be traced through batch tracing or serial number.
Design and Development

Products
Our customers need professional solutions for applications such as open hole, cased hole and workover. We deliver these solutions with a large range of standard products and a maximum flexibility for customized designs.

Open Hole Equipment
“Open hole” refers to a well prior to casing with cement or steel. Pressures, liquids, gases, PH levels and other geotechnical factors are characteristics of the formation and have a direct impact on the well and the tools used. We consider these characteristics and offer a range of open hole equipment, from standard tools to customized solutions.

Cased Hole Equipment
Most wells are cased over a large interval. The casing prevents the formations from collapsing into the borehole, which protects the shallow fresh water sands and maintains pressure control. Cased hole equipment allows safe and controlled working environments during drilling or completion of a well.

Workover Equipment
To improve the proper functionality of a borehole, regular maintenance work has to be performed. Our “workover” equipment removes the sand bridges and scale to boost the production rate of the well.

Open Hole Equipment
- Liner hanger
- Liner packer
- External casing packer
- Plugs
- Drill bits
- Accessories

Cased Hole Equipment
- Flow control systems
- Safety systems
- Packer systems
- Inflatables
- Accessories

Workover Equipment
- Fishing
- Milling
- Casing clean up tools
- Bridge plugs and cement retainer
- Accessories