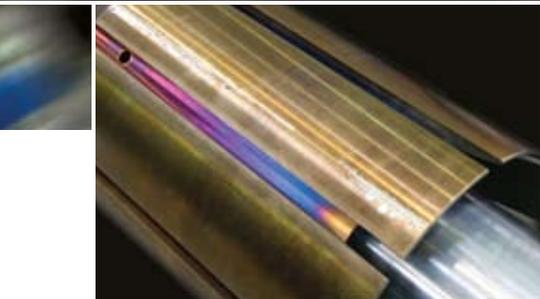


Options that make the difference



Completions Tubular Accessories

Completions Tubular Accessories

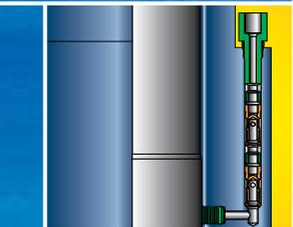


Mitigating risk, saving rig time, and minimizing your completion costs

As a leader in oilfield completions, Schlumberger offers an extensive array of completion tubular accessories (CTA). These products and systems will customize your well completions, mitigating risk for the life of the well.

The CTA portfolio covers a wide range of applications—from tubular products and simple expansion devices to state-of-the-art chemical injection subs and smart subassemblies. Our products resolve problems related to tube movement, scale buildup, selective production, zonal isolation, and malfunctioning intelligent completions and can be customized to your particular set of needs.

All CTA products are backed by vigorous qualification and testing processes, as well as by highly trained engineering teams and field personnel. You can count on the quality of Schlumberger Completions tubular accessories to give you the peace of mind you need.

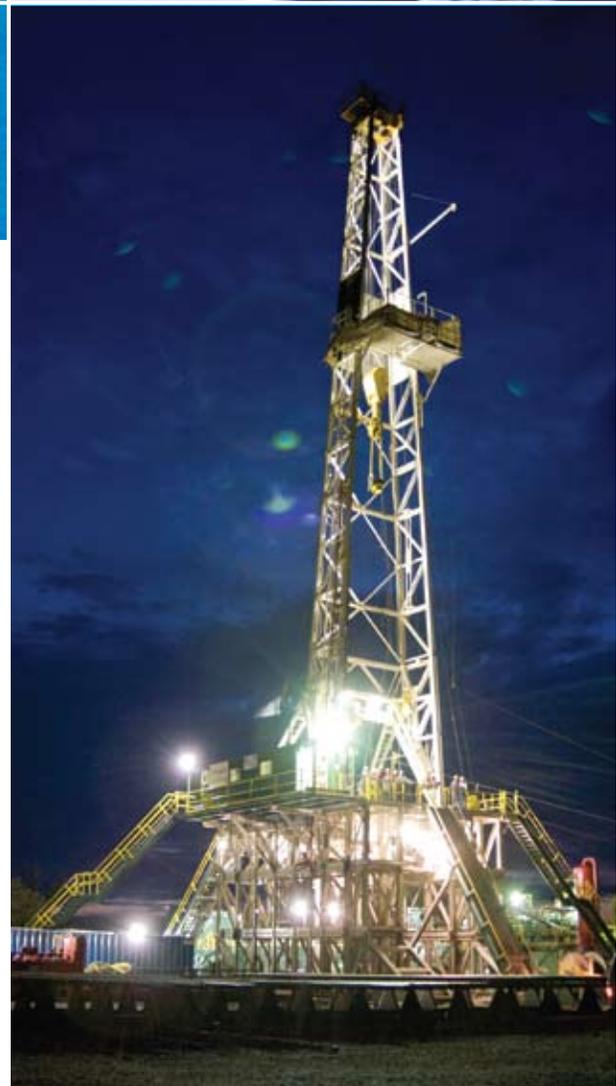


CHEMICAL INJECTION MANDRELS

Schlumberger provides the widest range of chemical injection mandrels in the industry, from cost-efficient, high-pressure chemical injection (HPCI) mandrels to the premium dual-check chemical-injection systems (DCIN and DCIN-II). This broad portfolio provides the flexibility in function, price, and delivery needed to fit any project requirement.

All chemical injection mandrels are made with the unique dual-check-valve sealing system that prevents communication between the tubing and the control lines in instances of intermittent or stopped injection.

The DCIN-II comes with standard external slots for bypassing the down-hole cables. It has a working pressure of up to 103.42 MPa [15,000 psi] at temperatures of up to 177 degC [350 degF] and mandrels that incorporate the Schlumberger hydraulic dry-mate connector, an externally testable control line connection.



EXPANSION AND SEPARATION ASSEMBLIES

Schlumberger also provides a wide variety of expansion assemblies, including the industry-standard packer bore receptacle, Model C expansion joint, overshot expansion joints for easy completion string retrieval, and thermal expansion joints for steam-assisted gravity drainage applications, where temperatures can rise to more than 232 degC [450 degF].

Schlumberger separation assemblies are the most reliable in the industry and are backed by extensive engineering qualification procedures. These products provide a way to separate the completion string above the packer without unsetting the packer. The portfolio includes the LJ and SL on-off units, the Type A rotational-release safety joints, and the industry-standard tension safety joint.

LOCKS AND NIPPLES

Camco* locks and nipples have for decades been the industry standard. The portfolio of nipples includes several series: A, D, DB, and the DB-HP, which is designed specifically for high-pressure applications. Locks are available for all nipples, along with accessories for making blanking plugs, circulating plugs, and standing valves.

SLIDING SLEEVES AND TUBING DRAINS

Sliding sleeves and tubing drains provide a means of communicating between the tubing and the annulus. Schlumberger offers a wide range of sliding sleeves, with various models for a variety of applications: CS-1, CS-3, AS-3, and TS-3 and the Model A tubing drain.

CS-1

A cost-effective elastomeric sliding sleeve.

CS-3

A nonelastomeric sliding sleeve that can open under a 10.34-MPa [1,500-psi] differential without damage to the seals.

AS-3

An annulus pressure-activated sliding sleeve that combines all the features of the CS-3 and has an externally shearable shroud for one-time activation.

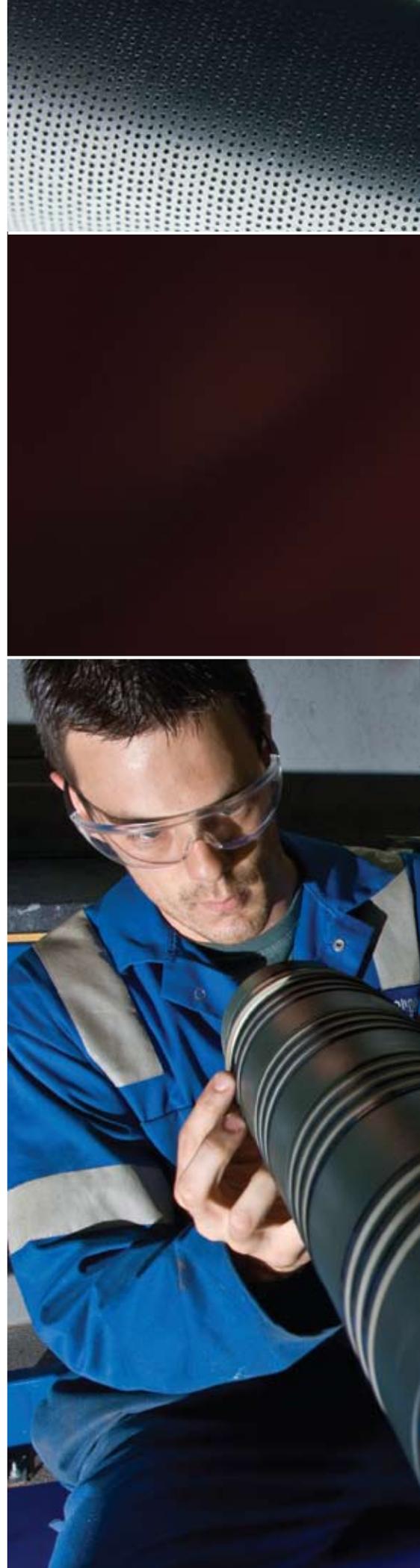
TS-3

A tubing pressure-activated sliding sleeve that combines all the features of the CS-3 and has an externally shearable shroud for one-time activation.

Model A tubing drain

An inline pressure-activated tubing drain that is commonly used in rod-pumped wells to provide a means of draining tubing when a pump or parted rod string becomes stuck.

Providing the industry with an accessories portfolio that raises your completion to higher standards.





TEMPORARY TUBING PLUGS

Temporary tubing plugs are designed specifically to provide a way to blank off the tubing to set hydraulically actuated packers without the need for slickline intervention.

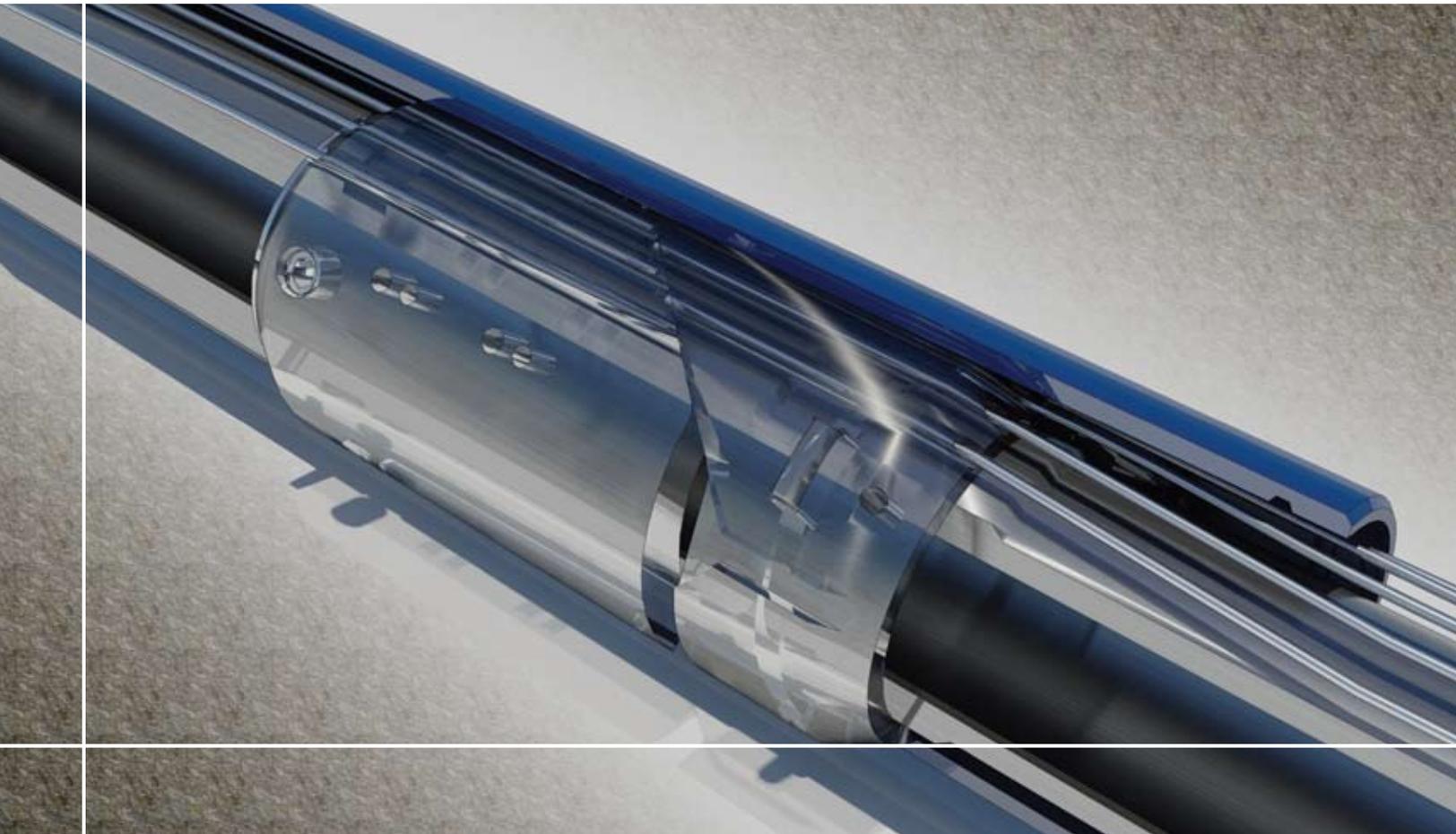
SAFETY SCREEN FILTER SUBS

Safety screen filter subs resolve a chronic control line fluid contamination problem that customers have faced for decades. In the past, control line contamination contributed to malfunctions in chemical injection subs, subsurface safety valves, and other downhole equipment. Such failures translated to early well failure and, ultimately, production loss. Entire completion strings sometimes had to be pulled to redress or replace the damaged components. The Schlumberger safety screen filter sub mitigates this risk of failure by capturing

debris before it reaches critical components in the hydraulic subsurface equipment. In the event that a screen becomes plugged, the safety screen sub's automatic screen bypass feature provides a secondary path for communication with subsurface equipment.

Safety screen subs are made up serially in the control line or injection line directly above hydraulic subsurface equipment using two externally testable hydraulic dry-mate connections. These subs are available in sizes of ¼ in, ⅜ in, and ½ in and have working pressures and temperatures of up to 103.42 MPa [15,000 psi] and 177 degC [350 degF], respectively. The standard filter screen is 76 microns; other sizes are also available.

Schlumberger Completions experts can help you reach and exceed your production goals.



SMART SUBASSEMBLIES

Smart subassemblies are designed for intelligent completion applications.

Line management system

The line management system (LMS) provides a way to retrieve a complex completion string that has multiple electrical and hydraulic control lines. The LMS, pictured above, is installed above a multiport packer as a contingency in case the packer fails to release and cannot be retrieved. The LMS provides a point in the completion string at which the tubing string and any control lines can be reliably parted. The control lines are parted in a predetermined location, creating a clean fishing neck to facilitate packer retrieval.

Perforating contingency sub

The perforating contingency sub provides a production flow path for instances in which a flow control valve becomes stuck. A ported outer housing holds and protects the hydraulic and electrical cables running alongside the sub. The outer housing serves as a barrier during the perforation process and protects the line against mechanical and erosional problems.

Orientation coupling

Completion string designs using eccentric components must be oriented to ensure completion fit and deployment. Orientation couplings are manufactured with timed threads to enable 360° orientation. Each coupling provides a 30° orientation. All orientation couplings are manufactured with standard threads.

Resettable contraction joint

The resettable contraction joint provides space-out for the tubing hanger. The joint is deployed shear-pinned in the extended position, allowing the upper completion to be landed into the lower completion before the joint shearing. After it is sheared, the contraction joint provides a space-out for the tubing hanger to be landed. If a tubing hanger space-out error occurs, straight pickup resets the tool in the expanded position. Resetting the tool enables the tubing hanger space-out to be corrected and provides multiple chances to land the tubing hanger. The resettable contraction joint is also available with control line options.

TUBULAR COMPONENTS

Tubular components include blast joints, wireline entry guides, flow couplings, pup joints, and perforated pup joints.

Blast joints

Positioned opposite perforations in the casing, blast joints are used in the tubing string to protect from the abrasive action of flowing fluid. They expose the maximum of metal in the abrasive area, at the same time maintaining the API tubing inside diameter and the coupling outside diameter.

Wireline entry guides

Wireline entry guides are run on the bottom of the tubing string to help wireline tools reenter the tubing.

Flow couplings

Flow couplings are used above and below an inside diameter restriction in the flow path to protect tubing from erosive turbulence.

Pup joints

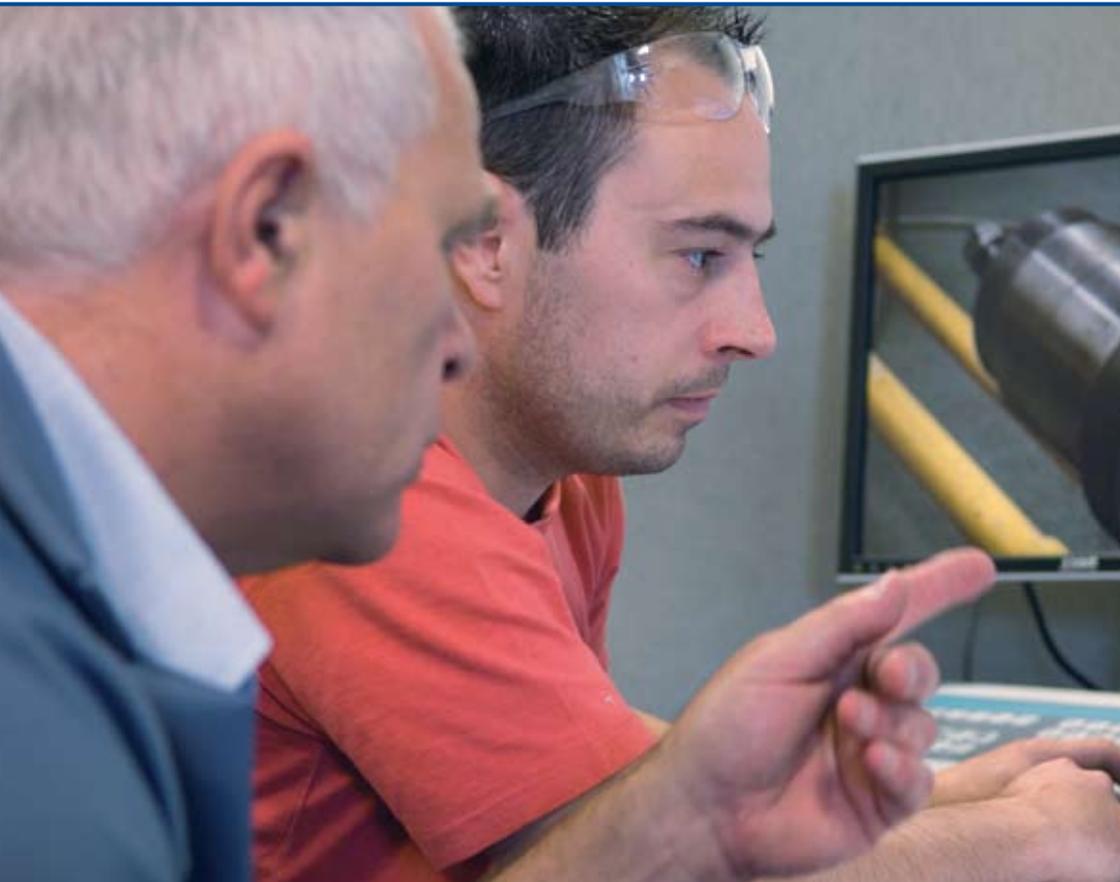
Pup joints provide a way to space out the tubing string to land the tubing hanger.

Perforated pup joints

Perforated pup joints provide an alternate flow path when wireline measuring devices hang in the no-go nipple below.



Completions Tubular Accessories



The extensive Schlumberger portfolio of completion tubular accessories is supported by dedicated experts throughout the world. By combining this portfolio with multidisciplinary expertise, Schlumberger can help you tailor your completions to prevent and mitigate risks, save time, and minimize costs—for the life of your well.

Schlumberger CTA systems portfolio

- Chemical injection mandrels
- Expansion and separation assemblies
- Locks and nipples
- Sliding sleeves and tubing drains
- Temporary tubing plugs
- Safety screen filter subs
- Smart subassemblies
- Tubular components

www.slb.com/completions

Schlumberger