MOBILE HYDRAULICS AND HEAVY DUTY

# Securely connected with screw-to-connect couplings

Stauff is adding two nominal sizes to its QRC-FG series of flat-face screw-to-connect couplings: DN 6 for low volumetric flow rates and tight installation spaces where every millimetre benefits the user, and DN 51 for heavy-duty uses at sea, in mining and on construction sites.



On the QRC-FG couplings, a coloured ring at the bottom of the thread provides additional safety during installation.

Source: Stauff/Cadera Design

STORYTITLE SPECIAL



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Stauff developed the QRC-FG DN 51 for heavy-duty applications, such as cable and towing winches on offshore platforms and ships.

The couplings on hoses and components that carry oil represent sensitive points in the hydraulic power transmission system. These connections must be absolutely tight and leak-free under high operating pressures in order to ensure efficiency and safety at these points. At the same time, they need to be easy to couple and uncouple during maintenance and modification work. Incorrectly sized or worn couplings can result in leaks and significant power losses within the entire system, and indeed the same holds true for installation errors. This explains why, when designing the QRC-FG coupling series, Stauff focussed particularly on its ease of practical use alongside excellent load-bearing strength.

## Coupled at residual pressure

The series represents the further development of a coupling series that has been marketed for over a decade. One of the key differences: both sides of the QRC-FG can be coupled at residual pressure. Svenja Küch, Product Manager for Quick-release Couplings at Stauff Germany, explains: "The QRC-FG series was developed to meet the request from end-users to be able to undertake maintenance and modification work at residual pressure." Only the male tip side of the previous series could be coupled at up to 250 bar. The further development of the coupling series also focussed on higher flow rates and lower coupling forces.

In 2022, the company introduced sizes DN 10 to DN 25 and announced the launch of additional sizes. A QRC-FG coupling with a nominal size of DN 6 – comparable in length to a matchstick – will soon be available to provide the solution for low volumetric flow rates and especially tight installation spaces. A QRC-FG coupling with a nominal size of DN 51 was developed in response to demand from the oil and gas industry and international OEMs in the construction and mining machinery sector. The QRC-FG is a flat-face screw-to-connect coupling, that is a quick-release coupling with a screw thread and smooth faces. The coupling is designed in such a way that both valves only open when they are connected together. Quick-release couplings also act as safety valves to stop the uncontrolled loss of oil during hose changes, modifications and maintenance, preventing hydraulic oil from being released into the environment. The smooth faces minimise the volume of drips during coupling and uncoupling, preventing dirt particles or air from entering the hydraulic system.

## Screw-to-connect or push-to-connect?

Screw-to-connect couplings are generally recommended for use under high burst and operating pressures. Compared to push-to-connect couplings, they offer a larger contact surface between the male tip and the female body. This results in a more even distribution of the forces produced and better resistance to loads, such as vibrations and pressure peaks. In addition, the components of screw-to-connect couplings are subject to less wear. With push-to-connect couplings, recurring vibrations and pressure surges can cause "brinelling", that is deformation in the groove of the male tip: depending on how serious the deformation is, the female body and male tip can then no longer be uncoupled and need to be replaced.

**TIP**

STAUFF will be showcasing the QRC-FG coupling series at the Hanover Fair 2025: Hall 5, Stand D16.

QUOTE

*"The QRC-FG series was developed in response to the request from end users to be able to undertake maintenance and modification work at residual pressure."*

Svenja Küch, Product Manager for Quick-release Couplings



Source: Stauff

The two new couplings: the QRC-FG in size DN 6 is similar in length to a matchstick. On the other hand, the male tip side of the DN 51 alone weighs around 15 kilogrammes.



Source: Stauff

Pressure test bench in the Stauff Technology Centre: a male tip consists of up to 30 individual component. Several pilot production series and test series are produced before a component, such as this, is ready for series production.

## Straightforward installation process

Connection by a screw thread is advantageous especially with larger nominal sizes: fitters are not just reliant on their own strength when coupling and uncoupling them, and can also use commonly used hook spanners to minimise the manual effort required. Simple threaded screws can also be screwed into the three holes provided for this purpose on the male tip side to aid the manual rotational motion.

Generally, this reduces the potential for error when fitting threaded connections: the installation process is clearly defined. On the QRC-FG, a coloured ring at the bottom of the thread provides additional safety: only when it is no longer visible has the screwing process been done correctly. Svenja Küch stresses: "This installation aid is very helpful. We get positive feedback from the users on site."

Fitters also appreciate the colour coding. The male tip and female body can be marked with coloured rings to avoid confusion of the lines during connection. Svenja Küch and her colleagues at the Stauff Development and Technology Centre have learnt that some OEMs are using the QRC-FG for applications where a screw-to-connect coupling is not mandatory.

## DN 51 for heavy-duty applications

The QRC-FG coupling series is designed to cope with high burst and operating pressures, strong vibrations, and pressure peaks. Among other applications, sizes DN 6 to 25 are used in sectional excavator booms, as well as in many other mobile machines. On the other hand, the QRC-FG DN 51 is ideal for absolute heavy-duty applications, such as cable and towing winches on offshore platforms, which are used to move semi-submersible drilling units, floating production vessels, anchor cranes, and other large machines. In these cases, the coupling and uncoupling of a hydraulic hose requires teamwork rather than manual effort. The male tip side of the QRC-FG 51 alone weighs around 15 kilogrammes, and the hose needs to be held by two people.

In these conditions, the benefits of screw-to-connect couplings – larger contact face between the female body and the male tip, reduced application of force by the use of tools – are obvious. The option of coupling both sides at residual pressure is also particularly important when these couplings are installed outdoors: this is because pressure can build up in hydraulic hoses due to solar radiation, even when the machine is stationary. And last but not least: on an offshore platform, it is crucial that no oil enters the environment. The smooth faces even reduce the volume of drips when coupling and uncoupling.

Stauff's zinc/nickel coating offers reliable corrosion protection even in extreme conditions, such as humidity, temperature fluctuations, and contact with salt water, and also exceeds the requirements of the offshore industry. *(dm)*

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## Niche products on request

**Who is the "Connect with Stauff" slogan aimed at?**
Svenja Küch: "The 'Connect with Stauff' slogan is an invitation to the international mechanical and plant engineering sector to work closely together, ideally starting with the planning of the hydraulic system. For instance, the QRC-FG 51 was developed on the initiative of Stauff UK colleagues, because the need became clear in contact with the oil and gas industry. They thus set in motion a complex research and development process. Stauff is very willing to invest, even if economic success cannot immediately be predicted. The two new nominal sizes will probably remain niche products, but will help the company to develop the international oil and gas industry."