

fluid *SPECIAL*

Solutions for agricultural technology and more



28 Plowing, sowing, harvesting,
instead of waiting and maintaining
Stauff accessories make it possible

Hydraulic tubes in agricultural technology

Ploughing, sowing and harvesting - instead of maintenance and servicing

Time frames in agriculture are narrow. There can't be any downtime when it comes to soil preparation, grain sowing, maize harvesting or straw baling. Farmers and contractors expect reliable hydraulic systems. OEMs need to take this into account.

IBoth hose lines and tubes are commonly used in the hydraulic systems of agricultural machines. There are few fundamental differences, which are clear decision criteria for one option or the other, when viewed individually. In almost all cases, the pros and cons have to be considered individually.

A rule of thumb is that tubes have a longer service life than hose lines, which essentially need to be replaced regularly. But even this rule only applies when metal lines are used in static sections with little or no movement stress, are additionally connected to leak-proof tube connections and everything is correctly fitted. Under these conditions, the Stauff experts also recommend tubes for limited and difficult-to-access assembly areas, which often have to be taken into account in agricultural machinery.

Cutting ring connections with a soft seal

The operating principle of Stauff's 24° tube connectors with a cutting ring is based on a metallic ring with two cutting edges arranged in tandem. When tightening the union nut, both cut into the tube one after the other and create a dense metallic connection with maximum tear-out strength.

The front cutting edge not only ensures the primary tube position, but also clearly signals the end of assembly to the user through a stable raised material clearly visible on all sides in front of the contact face. The second cut supports the overall function.

In agricultural technology, cutting ring connections, which are secured with two elastomer elements in addition to the purely metallic connection, are the first choice.

Cutting rings can be easily fitted to tubes with narrow bending radii using a special assembly head.

Images: Stauff





With this concept, a sealing ring made of FKM (Viton®) is positioned to remain in place in the rear area of the taper as a delivery standard, while another O-ring is placed between the cutting ring and the tube and secures the second possible leakage path. This provides additional protection against possible leakage risks, such as those caused by the „setting“ of purely metallic sealing connections, temperature fluctuations or significant pressure and vibration loads in the system.

In field use, it is at least as important that no „sweating effects“, i.e. the uncontrolled escape of lubricating oil, can occur with the concept of soft-sealing cutting rings. This avoids unnecessary machine downtime that would otherwise be necessary to control such „seepage“.

Pre-assembly and final assembly for narrow bending radii

Line sections with small bending radii are often installed in confined spaces. That is why Stauff offers a special assembly head for the cutting ring assembly machines. It moves the tube holder upwards and reduces the distance from the axis in the assembly stud to the upper edge of the machine. This means that cutting rings can be fitted with ease to tubes with small axis distances. For particularly complex geometries (e.g. with a short tube end and 90° tail), the safety light barrier, which secures the assembly area, can be disabled if required. The driving force for this development was at the time discussions with a tractor manufacturer who wanted to take advantage of the reproducible, machine-driven cutting ring assembly, even for tubes with small bending radii.

STAUFF supplies machines as standard with an integrated connection to its own data-secure cloud. Assembly processes with different parameters are documented online and can be reproduced 1:1 at any time. The user is directly connected to the Stauff online service, which simplifies error analysis or the optimisation of machine settings, for instance.

Assembly without lubrication

Another special feature of the Stauff tube connections simplifies handling during assembly, whether at the manufacturer's site or by a hydraulic service provider at

the site: The Stauff zinc/nickel coating, with which all components are coated as standard.

Special additives in the coating of the steel components form part of the sealing and replace the lubricating oil, so that threads and cones no longer need to be lubricated separately during assembly.

This saves on lubricant and prevents seepage.

Little is known about the fact that lubrication also has an influence on assembly safety. Normally and for products from other suppliers, the assembly parameters between lubricated and non-lubricated connecting elements differ significantly.

The angles of rotation can differ by up to 40% with the same force. If connections are accidentally not lubricated or not sufficiently lubricated, but the assembly methods are not adjusted, over-tightening or under-tightening occurs, which in the medium term leads to connections that are not leak-tight. When using Stauff components, this risk is excluded:

They do not need to be lubricated, but can be lubricated without changing the assembly parameters. Therefore, even if the production instructions require lubrication, the fitter does not have to take into account different torques and tightening angles.

In-house research laboratory

The Stauff zinc/nickel coating for steel components offers particularly good and long-term corrosion protection even under the demanding environmental conditions in agriculture. Extensive test series in the salt spray chamber (DIN EN ISO 9227) demonstrated a resistance to red rust of sometimes significantly more than 1200 hours, while at the same time minimising the formation of white rust.

In addition to the standard tests, the coating is also confronted with aggressive media, such as hydraulic, lubricating and engine oil or fuels, coolants or brake fluids, in the company's own research laboratory.

Agricultural machinery manufacturers can also order additional tests and have Stauff document the resistance of the coating to specific fertilisers, pesticides, cleaning agents and other substances.

The O-ring between the cutting ring and tube secures the second possible leakage path.

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