

# ASK Hydraulik **uses** Stauff Form

## Secure connections: tube forming system on hydraulic test bench

Short tube runs were a main requirement for the series of tasks that Plettenberg/Germany based ASK Hydraulik GmbH completed for Stauff Group: ASK installed the tubes in a test bench used by Stauff for pressure pulse testing of hydraulic hoses. Previously, Stauff supplied ASK with two Stauff Form tube end forming machines. And so the companies own connection system returned to the Stauff Technology Centre in Werdohl, with a detour via ASK.

**T**he extensive testing program conducted by Stauff Group at their Technology Centre in Werdohl includes various endurance tests and stress tests on hose assemblies, i.e. hoses with the appropriate connection fittings attached according to requirements.

One of these tests is described in EN ISO 6803. For this test, the hoses are subjected to a continuously alternating pressure load between almost zero and a pressure load that is usually 20 to 30% of the rated operating

pressure without bending – at a load change frequency of  $1 \pm 0.25$  Hz. The number of load cycles until hose failure is measured. This standard does not stipulate a bending load, however, so that the hoses are tested under conditions which do not reflect practical application.

### Dynamic pulse testing of hoses

For this reason, the so-called “omega test” as per EN ISO 6802 (or the “half omega test” as per EN ISO 8032) is also used. For this test, a hose is subjected to alternating bending stress which is precisely defined in the standard – again also with alternating (and precisely defined) pressure loads. This verifies the durability of the hose and the tightness of the connecting elements under close-to-realistic conditions with dynamic applications.

### Specialist for high quality tubing

For this task, Stauff operates several test benches at their Technology Centre, one of which was extensively modernised during a recent building conversion and expansion and also fitted with new tubing assemblies.

Stauff appointed ASK Hydraulik GmbH in Plettenberg (see info box) for this and other related tasks.

One of the core competencies of ASK is professional tube installation in hydraulic systems. Dirk Schaaf, one of the managing directors of ASK, explains: “Our service engineers also install tube assemblies in complex systems on site where flexibility and speed are key. This applies to new systems and also conversions and repair work. In addition to welding and cutting ring fittings, we also use tube end forming systems, especially for complex applications. We often add our own hose service to these services.”

### Première for the assembly machine – at the manufacturer’s site

The “tubing for a test system at Stauff” project was significant for all involved, because the connection system



With the pulse testing system, Stauff carries out “Omega tests” on hoses to test their service life under bending and pressure change stress

With Stauff Form, Stauff has developed a connection system for complex applications



1 Around 50 metres of steel tubes were required for the new tubing in the test bench



2 Alexander Becker, specialist hydraulics installer at ASK, forming with the compact assembly machine



3 The tasks of ASK at the Stauff Development Centre also included assembly of the tubes

used as well as the assembly machine come from Stauff and were therefore used at the original factory. Dirk Schaaf: “We were using two older tube forming machines from another manufacturer, which we replaced with two of the latest generation Stauff Form machines earlier this year.”

### Stauff Form: A reliable connection – also in testing systems

This also included the change to the forming system with which Stauff adds an “elite” product to its complete tube connection range. A contour is formed on the end of a seamlessly cold-drawn precision steel or stainless steel tube using a machine with electro-hydraulic drive (figure 2). The Stauff form ring is pressed onto the tube end with a fixed non-detachable elastomeric seal. This creates a positive connection which provides a reliable, permanent and maintenance-free seal at the only possible leakage path when used in combination with a conventional fitting body with a 24° inner cone and a union nut compliant with ISO 8434-1. The sealing effect is supported by the system pressure of the hydraulic system, making the new tube forming system ideal for high pressure applications or for changing pressure cycles.

### User-friendly and safe assembly

Stauff Form was developed with a focus on especially complex applications in stationary and mobile hydraulics where an extre-

mely powerful hydraulic system operates at high pressure under adverse conditions such as vibrations and shocks.

When assembling the system, users benefit from a very short assembly process: The user tightens the union nut by only 15 to 20° (without resetting the wrench and with a low torque requirement) until a clearly discernible increase in torque signals the end of assembly, making over or undertightening virtually impossible.

### Forming machine for flexible use

The tube forming machine is at the heart of the new system. It is highly compact, extremely quiet and very easy to operate with a touch pad with plain text display. A bayonet lock makes it a snap to change the tooling when the tube diameter changes. This makes the machine ideal for partial automation of even small batches, which typically occur with local tube installation.

As a part of the mobile tube forming assembly service from ASK, one of these machines was now returned to the Stauff development centre. Alexander Becker, specialist hydraulics installer at ASK, installed around 50 metres of steel tubes with diameters of DN 8, 16 and 20 in the Omega test system. Around 60 connections were established with Stauff Form, the tubes were first bent to shape and then the ends were formed. Cutting rings or other connection types were not used in this case.

### Info box:

## A short profile of ASK Hydraulik GmbH: a versatile specialist for hydraulics and pneumatics

- ASK Hydraulik GmbH, founded in Plettenberg (Germany) in 1999, plans and builds complex hydraulic systems and units. The company also manufactures cylinders for custom projects. They also distribute hydraulic and pneumatic components including line components and hydraulic filters from Stauff.
- As a flexible service provider, ASK takes on tube installation for hydraulic systems on site with reliable connection systems, as described here. Pressure vessel testing and press services are also handled reliably and with a high level of competence.
- With this wide-ranging portfolio and a demanding market, ASK targets users of hydraulics systems not only in the local Sauerland and North Rhine-Westphalia regions but also in a wider area.

One of the reasons for using Stauff Form in this system was the fact that the system pressure of the hydraulic system changes very quickly during pulse testing. The stress on the tubes, which feed the pressure medium to the test hoses in a short pulsation frequency and with a maximum pressure of 160 bar, is correspondingly high. Stauff Form was developed specifically for applications such as these.

### Good experiences with the new forming system

The first experiences of ASK with the new system have been entirely positive. Alexander Becker: “The performance of the machine is really good. It is easy to operate and delivers reproducible results.” The only criticism: Becker would like fewer operator options to complete assembly even faster. However, he is a highly experienced hydraulics installer and the machine is designed for operation by personnel who do not regularly make hydraulic system connections.

ASK sees good potential for using the two new machines. Dirk Schaaf: “We are currently planning additional projects with the two forming machines and Stauff Form and will also be using the system for other applications where we previously used other connection types.”

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