

**TAS**  
**SCHÄFER**

## Hydraulic-Actuated Shaft/Hub Connections

Hydraulic-actuated shrink discs, manufactured by the company TAS Schäfer GmbH, are used in every requirement, where a shaft is to be securely and quickly connected to a hub. With the TAS-SHS Series TAS Schäfer GmbH has developed a hydraulic-actuated shrink disc which has applications everywhere in drive technology. It is particularly suitable for installation on gearing test benches and for repeat clamping procedures as a result of its rapid and secure clamping. Further advantages are its unique features, such as e.g. the low pressure required for clamping and the feasibility of maintenance and repair undertaken by the customer.

### Requirements

Further development and the satisfaction of specific customer requirements, as well as the highest demands on quality control, are today essential prerequisites in modern manufacture. The TAS-SHS product series has already been in use for years in thousands of cases in many application fields. These hydraulic-clamping shrink discs can be found world-wide, particularly in wind power plants, on hydraulic motors and in gear test benches. The primary function of a shrink disc is the secure connecting of a shaft with a hub by means of frictional contact. For example, the shrink disc generates a backlash-free connection between a drive shaft and a gear hollow shaft where it presses the hub onto the shaft. This type of connection is used mainly for the

transfer of torque. The shrink disc makes available only the required forces and does not itself transfer any forces or moments between shaft and hub. It is therefore not a part of the force-flow chain. In case of the SHS products of the company TAS Schäfer GmbH, the basic principle of the mechanical, three-part shrink disc has been retained. This principle has been proved over time in many applications. In this case, the power-transmitting, contact-friction surfaces are strictly separated from the hydraulic system. Any oil contamination of these surfaces is prevented by this strict separation.

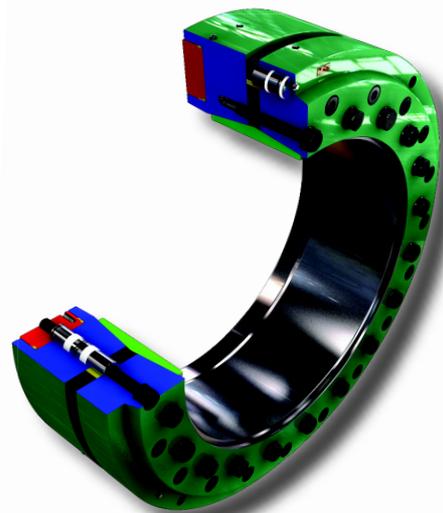


Fig.: 1. Sectional view SHS

## Differences

No play arises between shaft and hub after installation in contrast with alternative connection possibilities like the connecting of shaft and hub by means of a key and keyway. As a result of this, a higher torque can be transferred. This has the advantage, that no additional movements occur within the connection when force is applied. This occurs in case of parallel key connections, which are not especially shockproof as a result of their smaller loading surfaces and their play in case of alternating load. Consequently they can be easily overloaded. In addition, no additional fixing on the component part is necessary when using hydraulic shrink discs. Compared to the feather key, it has the further advantage that no additional slots have to be milled into the shaft or hub. As a result of this, greater stability is achieved and lower notch factors occur. Hubs and shafts with smaller wall-thickness and/or smaller diameter can therefore be used. This saves material and weight, as well as reducing costs.

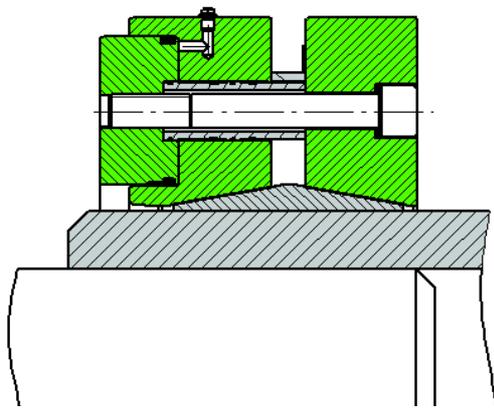


Fig.: 2. Sectional view of SHS

## Advantages

The greatest advantage of the TAS-SHS hydraulic shrink disc is in the enormous saving of installation time. This system can be clamped with low pressure levels between 120 bar and 200 bar and this considerably reduces assembly times. The shortening of this time increases exponentially with the diameter. In case of larger diameters, e.g. 530 mm, a hydraulic shrink disc can be clamped after a few minutes. This compares to a clamping time of several hours in case of a mechanical shrink disc. The time outlay and the physical strain on fitters and maintenance personnel can thus be reduced considerably. The TAS-SHS shrink disc can even be dismantled

like a mechanical shrink disc, if for example seals have failed after many years' service. This is implemented by loosening the screwed connections and without the need for further pressurising.

## Simple installation

The installation is implemented by sliding the shrink disc onto the hollow shaft and the subsequent tightening of the hydraulic system. Due to the conical surfaces, the inner diameter decreases and the radial pressure builds up. After clamping has been implemented, the hydraulic shrink disc is blocked mechanically and the hydraulic pressure is released. Because of this simple procedural method, the SHS shrink disc is particularly suitable for repeat clamping procedures, and it can be implemented by the customer himself. The hydraulic unit required for the installation can consist of a fixed-in-place unit, e.g. on test benches and test points, however, the employment of an hydraulic manual-feed pump is also possible. Thus the system can be employed safely and rapidly even at locations which are difficult to access. The dismantling is also implemented with support from the hydraulic system. As a result of the alternative clamping possibility with an hydraulic manual-feed pump, clamping can also be done with low expenditure in the platform of a wind power system. Added to this is the fact, that spare parts for the SHS series can be supplied quickly and at low cost. The customer can implement repairs autonomously directly on site, thus dispensing with expensive and time-consuming return transport.



### Continuous further development

The well-proven design has undergone constant further development in past years in order to realise special customer preferences and to open up new areas of application. Based on experience acquired over years, as well as new challenges faced with customers and from our involvement in research projects, various further developments have been realised. As a consequence, the well-proven SHS series concept has also been applied to shaft and flange couplings. Hybrid solutions have resulted from this new design which allow the user to use TAS Schäfer GmbH hydraulic products either in complete form or mechanically / hydraulically in mixed mode operation. These solutions can be completely adapted to respective customer preferences and circumstances.

### Advantages:

- Application-specific design / customization
- Relatively low pressure
- Rapid tightening and loosening in comparison with mechanical shrink discs
- Mechanically releasable and may at times also be mechanically tightened if no hydraulics are available
- Maintenance and repair feasible customer-sided
- Backlash-free connection
- Transfer of high torques
- Easily detachable in comparison with conventional shrink fits
- Not impact-sensitive
- No additional axial fixing required
- No oscillation of the connection in case of changing and pulsing loading

### Areas of application



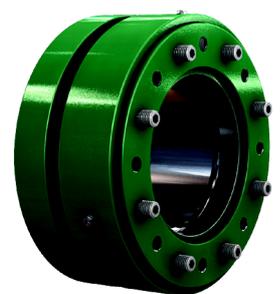
Industrial application



Test bench



Wind energy



Marine

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