Basics-Design

Advantages and differences to other systems

Use of pressure rings / Shrink discs

Due to the use of pressure ring, the forces and moments are transferred directly between the shaft and connecting sleeve. In comparison with internal clamping systems the achievable runout accuracy is higher.

Clamping length for pressure rings

The insertion depth of the shaft at the junction l_K (between shaft and sleeve), should be chosen to be somewhat wider to minimize the stress concentration at this point. An excessively wide connection increases the tendency to fretting corrosion, because the pressure decreases outward. The pressure is distributed approximately at an angle between 15° - 20° through the hub. This is largely dependent on the hub wall thickness and stifness of the shaft. A good approximation can be made from the following equation:

Clamping length of the insertion depth: $l_K = 0{,}316\,(d - d_w) + l$

The cylindrical surfaces should be located symmetrically under the shrink disc or pressure ring! With a slightly different clamping length the transmissible torque *M* will not change, because a smaller contact surface results in a higher pressure - also a larger contact surface causes lower pressure.

Pursue the same diameter - but an adaptation to different diameters is also possible

Basically the target should be to connect shaft ends of the same size. With larger deviations the sleeves can be adapted for the different diameters. This is done by using different pressure rings or shrink discs or bore diameter.

Tightening torque of the clamping screws

When using different pressure rings and shaft diameters, the tightening torque and therefore the clamping forces are adjustable. For example, this is also possible with soft shaft materials and reduces, if required, the stresses in the components.

$$M\,(new) = \frac{M_{Agew}}{M_A}\ M \quad \text{also} \quad p_N\,(new) = \frac{M_{Agew}}{M_A}\ p_N$$

The tightening torques can not be reduced arbitrary, therefore apply the following limits:

$$M_{Agew} \geq \begin{pmatrix} \text{Klasse} & 8.8 : 0{,}85\ M_A \\ \text{Klasse} & 10.9 : 0{,}70\ M_A \\ \text{Klasse} & 12.9 : 0{,}60\ M_A \end{pmatrix} \leq M_A$$

Positioning

The cylindrical connection, as well as the used clearance, allows an easy and precise positioning of the sleeves on the shaft ends. During the clamping process there is no more shift.

No hydraulic necessary

A hydraulic expansion of the hubs is not necessary for mounting.

No heating necessary

There is no need for expansion of the sleeves by heating. To increase the clearance between the shaft and sleeve, a slight warming is possible.

Shafts with keyways

The couplings can be used on shafts with keyways. As far as possible, the keyways should be closed.

Tolerances and surfaces

The values found in the product data, are based on surface quality and tolerances, according to the table below. These values are given as recommendations.

Higher surface roughness reduces the transmissible torque and promote unwanted settling.

Larger clearance also reduces the transmissible torque and increases stresses in the connecting sleeve.

If you need different shaft tolerances, please let us know. The holes in the sleeves can then be adjusted accordingly!

Recommended tolerances and surfaces roughness				
>	≤	FS_{max} mm	Clearance Hub/Shaft	Rz µm
30	50	0,032	H6/h6	10
50	80	0,049	H7/h6	10
80	120	0,057	H7/h6	16
120	150	0,065	H7/h6	16
150	180	0,079	H7/g6	16
180	250	0,090	H7/g6	16
250	315	0,101	H7/g6	16
315	400	0,111	H7/g6	16
400	500	0,123	H7/g6	25
500	630	0,136	H7/g6	25