Definition – Elastomer Couplings:

Elastomer couplings can be plugged in, are backlash-free, flexible shaft couplings for small to medium torques. An elastomer spider serves as connection and compensating element with involute teeth and a high shore hardness. This is inserted in form-fit, with slight preload between two high-precision machined hubs with involutely shaped jaws. The elastomer spider can compensate slight shaft misalignments, is electrically insulating and has good oscillation dampening characteristics. Two variations with backlash-free, frictional shaft-hub connection are available as standard which ensure safe torque transfer even without keyways.

Characteristics – JAKOB Elastomer Couplings:

- plug-in
- backlash-free
- flexible
- compact
- oscillation dampening
- different shore hardnesses
- low moment of inertia
- high speeds
- electrically insulating
- temperatures up to 120°C

Coupling dimensioning:

The main layout criteria are the required drive torque, the necessary torsional stiffness, the running speeds, the dampening characteristics of the coupling, and the moment of inertia. Additionally, the minimum or maximum possible shaft diameter, the admissible temperature range, operating factors, and the existing shaft misalignment (particularly the radial misalignment) must be taken into consideration.

Approximation of required torque:

Roughly, the required coupling torque T_K can be calculated as for the following formula:

$$T_K = T_A \bullet f_D \bullet f_T \bullet f_B < T_{KN}$$

T_A = drive torque [Nm]
f_D = torsional stiffness factor
f_T = temperature factor
f_B = operating factor

The calculated coupling torque T_K should not exceed the nominal torque of the selected coupling size. Short term overload up to twice the value of the nominal torque is admissible. The drive torque results from product information of drive motor or can be calculated via motor output P_A.

$$T_A = \frac{9550 \bullet P_A}{n_B}$$

T_A = drive torque [Nm]
P_A = motor output [KW]
n_B = motor speed [min^{-1}]

Temperature factor f_T:

Admissible temperature range for continuous operation
PUR 98 Sh - A: -30°C bis +90°C
PUR 72 Sh - D: -20°C bis +120°C

operating temperature	+30°C -30°C	+50°C	+70°C	+90°C	+110°C
factor f_T	1	1,3	1,6	1,8	2

Torsional stiffness factor f_D:

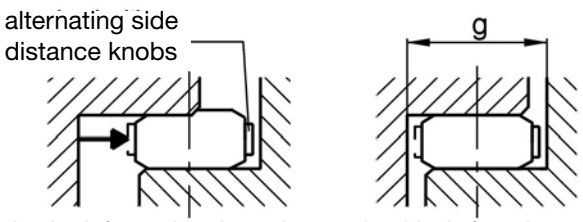
If an exact, accurate transfer of the torque is required, as for instance with servo drives or measuring systems, a high torsional stiffness is absolutely necessary. Here the required drive torque should be multiplied with a operating factor of at least 3 to 10 when selecting the size, or a torsionally stiff metal bellows coupling selected from the extensive coupling range in this catalogue.

Operating factor f_B:

Due to operating factor f_B application specific peculiarities, such as shock loading, are taken into consideration.

Installation:

Installation



elastic deformation through axial assembly force

backlash-free due to elastic distortion

The design of the ESM-A couplings requires mounting of the two hub halves on the shaft ends before the actual plug-in assembly. It is important that the mounting screws are tightened crosswise to prevent surface distortion of the conical clamping ring. Couplings of the EKM series on the other hand, can be assembled completely before hub mounting. For mounting the EKM hub, only a radially arranged clamping screw must be tightened. Chamfered edges at the face enable the blind assembly with both versions. Due to the obligatory preclamping of the elastomer, an axial assembly force must be applied while sliding together the coupling spider and the jaws. This assembly force can be minimized by slight oiling the spider. For disassembly of the ESM conical hub, draw-off threads are provided for releasing the clamping ring. The relevant tightening torques of the retaining screws can be found in the technical data sheets. The fit between shaft and hub is to be selected as transitional fit (e.g. bore 28G6 / shaft 28k6).

tolerable seat clearance shaft / hub: Series ESM-A: max 0,02 mm Series EKM: min 0,01 mm / max 0,04 mm
(see installation instructions page 4)

materials: hubs EKM / ESM-A: high-tensile aluminum
conical ring / taper ring ESM-A / expanding cone EKZ: tempered steel
elastomer spider: polyurethane (98 Shore A / 72 Shore D / others available on request)

Notes:

- The dampening capability of the elastomer spider protects the drive to a high extent from dynamic overload. Both coupling halves are always forced to move (min. $3xT_N$) because of the jaw construction, even if the spider should break down entirely.
- Because of the deformation of the elastomer spider under operation conditions, the housing (bell) should be approximately 5 % bigger than the outer diameter of the coupling itself.
- To ensure satisfactory function, dimension ‘g’ should be complied with as exactly as possible. The distance of the two shaft ends can be smaller than ‘g’ under consideration of measurements ‘m’ and ‘n’ of the spider.
- If required by the application or requested by the customer, diameter ‘p’ of the spider can be expanded up to øm - 2mm
- For smaller shaft diameters, the conical hub of ESM-couplings is slotted additionally.

Dimensions - elastomer spider [mm]:

Size	øs	øm	n	b	o	øp$^{+0,5}$
8/10	32	10,5	2	10	13	8,5
15/17/20/25	40	18	3	12	15	9,5
30/43/45/50	50	27	3	14	17	12,5
60/90	55	27	3	14	17	12,5
150/200	65	30	4	18	18	16,5
300/320/400	80	38	4	18	22	16,5
500	100	47	5	22	26	20,5
700/1000	120	58	6	25	30	22,5
2000	160	77	7	32	38	60