

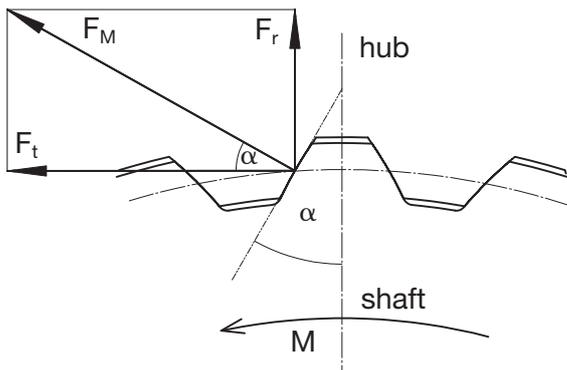
Leistritz

LEISTRITZ EXTRUSIONSTECHNIK GMBH



maXXshaft

For a long time, the standard involuted spline connection according to DIN 5480 had been first choice for screw elements and shafts. However, when transmitting extremely high torques the DIN 5480 spline profile meets its physical boundaries for thin walled hubs. Thus, it was necessary to reconsider using the spline profile in order to further develop co-rotating twin screws. The result - maXXshaft - is amazing as well as simple: Since the transmission of the power in a co-rotating twin screw just needs to be carried out in one direction of rotation, the spline profile is changed to an asymmetric shape.



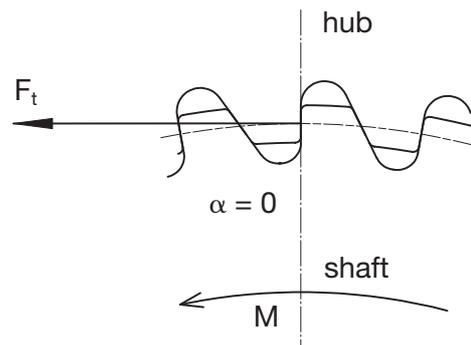
DIN 5480

$$\alpha = 30^\circ$$

$$F_t = \cos \alpha \cdot F_M$$

$$F_r = \sin \alpha \cdot F_M$$

When transmitting torque, a radial tension evolves which puts additional stress on the screw element. This means that the screw flights cannot be cut very low as otherwise the screw element would burst.



maXXshaft

$$\alpha = 0^\circ$$

$$F_t = F_M$$

$$F_r = 0$$

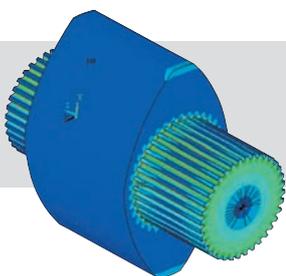
No additional radial tension arises, i.e. the screw flights can be cut lower and - benefiting from the optimized shape stability - the torque can even be increased.

When using an asymmetric spline profile, more splines can be placed around the shaft, i.e. the transmittable torque is higher than for a symmetric spline profile.

The handling of the maXXshaft connection is as easy as for the conventional involuted spline profile. Assembling the elements works perfectly. So the set-up time of ZSE HP and ZSE MAXX are comparable.

Due to the asymmetric spline profile, the assembling position of the elements is a given. Thus, no more mix-ups can occur. For special elements, this is a particularly important aspect.

Consequently, reversed assembling of worn elements is not possible any more and protects the extruder from damages.



With elaborate 3D calculations and long-term stress testing, the new hub/shaft connection was checked thoroughly by independent institutes. The outcome: The new hub/shaft connection transmits maximum torque.

