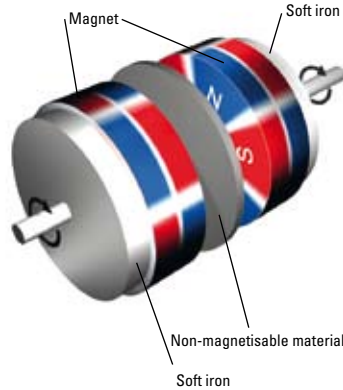
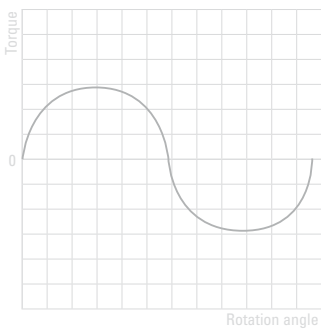
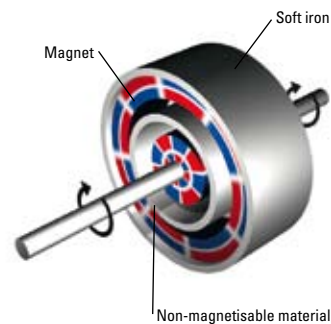
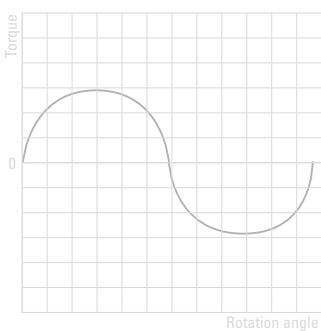


Permanent magnet couplings can transfer forces without contact and wear. Also, the driving and driven coupling components can be separated by a closed container wall. There are different types of permanent magnet couplings, which will be described in the following. It is always important to keep the air gap between the components of the coupling as small as possible, to maximise efficiency.



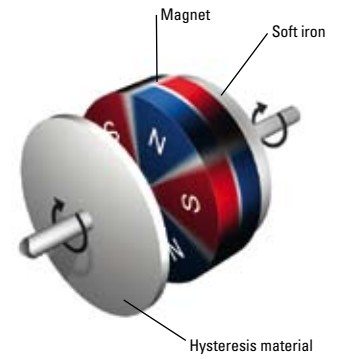
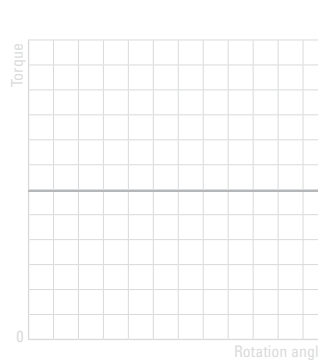
Disc coupling

In a disc coupling, two multiple-pole, often anisotropic, disc or ring magnets, magnetised on the circular face in sectors, are placed face to face. High axial forces must be considered, and the starting speed should be selected to avoid skipping of the magnetic poles. The torque is dependent on the magnet material, the magnetised area, the air gap, and the type of magnetisation.



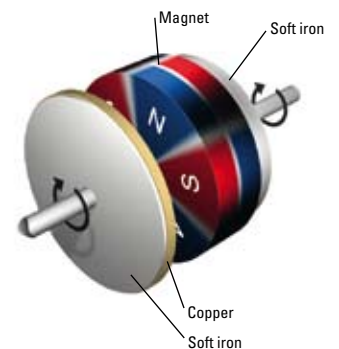
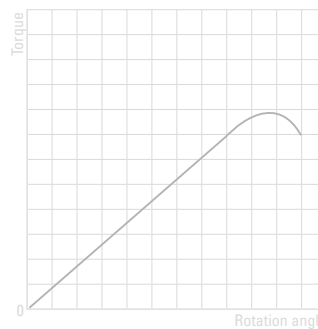
Radial coupling

In a radial coupling, two ring magnets move concentrically, one inside the other. The inner magnet is magnetised in multiple poles on its outer cylindrical surface, and the outer magnet is magnetised in multiple poles on its inner cylindrical surface. The starting speed should be selected to avoid skipping of the magnetic poles. The torque is dependent on the magnet material, the air gap, and the number of poles.



Hysteresis coupling or hysteresis brake

In a hysteresis coupling or hysteresis brake, a magnet with multiple poles is placed opposite a disc made of hysteresis material (permanent magnet material with high remanence and very low coercivity). This type of coupling is normally used for operating drive units with different rotational speeds. Then the driving and driven units will have a constant torque between the two couplings, independent of the relative rotational speed. The torque is dependent on the magnet material, the hysteresis material, the air gap, and the number of poles.



Eddy current coupling and brake

In an eddy current coupling with brake, a permanent magnet with multiple poles is placed opposite a copper or aluminium disc, in contact with a soft iron disc of the same diameter. It is also used when a drive unit and a driven unit are operated with differing rotational speeds. The torque varies linearly with the relative rotational speed between the driving and driven units. The torque is dependent on the magnet material, the air gap, the relative rotational speed, and the number of poles.

>> Permanent magnet couplings can be dimensioned and calculated with finite element calculations. We will be pleased to advise and support you in technical application questions.