CYCLOIDAL GEARBOXES

grinding of cycloidal discs and ring gear housings

KAPP NILES

Cycloidal gearboxes allow for very high transmission ratios, have small space requirements, and are characterised by very high torque, high stiffness and resistance to wear. Cycloidal gearboxes are typically used in drives for industrial robots.

In cycloidal gearboxes two or more profiled cycloidal discs roll off in excentrical motion with ring gear pins inside a ring gear housing. The distance of the ring gear pins equals the pitch of the cycloidal discs. Since the ring gear housing has one pitch more than the

cycloidal disc, the cycloidal disc advances one pin further with each complete rotation.

KAPP NILES offers powerful technologies for highest accuracy grinding of the two main components of a cycloidal gearbox: the cycloidal disc and the ring gear housing.

generating grinding of cycloidal discs

The external profile of the cycloidal discs is commonly finish-ground by continuous generating grinding with dressable grinding worms. The desired profile is defined by an equivalent profile of an involute gear, which is also basis for the dressing tool design and the programming of the grinding machine. This allows for highly efficient and accurate manufacturing of the cycloidal discs with profile deviations of less than 3 µm. Simultaneous grinding of all cycloidal discs of a transmission can be realised by optimised solutions for set-up and clamping.

scale
10.0 µm
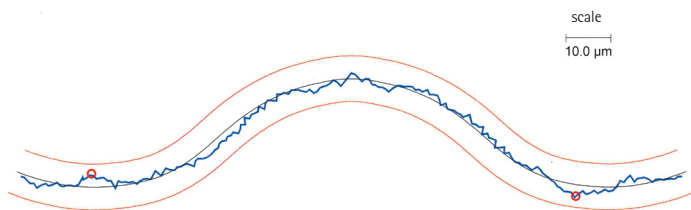
profile measurement

profile grinding of ring gear housings

The inside of the ring gear housing features slots with a semi-cylindrical profile for the cylindrical pins. A special internal grinding device enables most accurate finish-grinding of these slots using discontinuous profile grinding.
While serial production generally prefers non-dressable CBN profile wheels, dressable grinding wheels are suitable for prototype grinding. Customised machine solutions permit for a combination of profile and internal diameter grinding in the same machine and one set-up.