

## 9.6 Gear honing machine

### Gear-honing machine

Gear-honing machine is one of machine tool that can process precisely on cylindrical gear with hard tooth surface with gear type or worm type gear honing machine. It developed on the basis of gear shaving machine. It hones gear in accordance with the engagement principle of helical gear with alternating shaft. The character is that the workpiece rotates freely driven by the honing wheel. Based on the type of honing wheel, the machine can be divided into two types: gear honing machine and gear honing machine with worm type honing wheel. It is mainly used to reduce the surface roughness of quenched gear. It can also modify partial error to some degree. The precision can be Class 7. If the precision of the gear before honing is relative high, the honed can be higher, so the honing tooth can replace gear lapping.

### Gear honing machine

Gear-honing machine is one of machine tool that can process precisely on cylindrical gear with hard tooth surface with gear honing machine. The working principle is the same as that of common gear honing machine. The structure and layout is quite similar to gear-shaving machine. What's more, there are two types of working form, in which the honing wheel is over workpiece while the other has the honing wheel behind the workpiece. When processing, the honing wheel and workpiece are engaged. The workpiece rotates driven by honing wheel at the same time; the working table makes vertical reciprocating movement. This kind of machine is mainly used to lower the surface roughness of cylindrical gear with hard tooth surface. Its tooth surface roughness can be reduced to  $R_a 0.63 \sim 0.16 \mu_m$ . It can also correct the partial error of tooth orientation and tooth profile. The processing accuracy can reach Class 7-6. The productivity is high and the cost is low. Therefore, gear honing can replace gear lapping and gear grinding.

### Gear honing machine with worm type honing wheel

Gear-honing machine with worm type honing wheel is one of machine tool that can process precisely on cylindrical gear with hard tooth surface with worm type gear honing machine. The working principle is the same as that of common gear honing machine. Its structure and layout is quite similar to worm grinding wheel type gear grinder. The structure and transmission characteristics are that there is no chain connects between worm honing wheel and workpiece. The latter is driven by the former to make free rotation. It is mainly used to reduce the surface roughness of cylindrical gear with hard tooth surface. It can also correct partial error of tooth orientation and tooth profile to some degree. The processing accuracy can be Class 7 or even higher. Therefore it can be used to replace gear lapping and gear grinding.