KOEPFER
EMAG

Gear Hobbing Machine

160

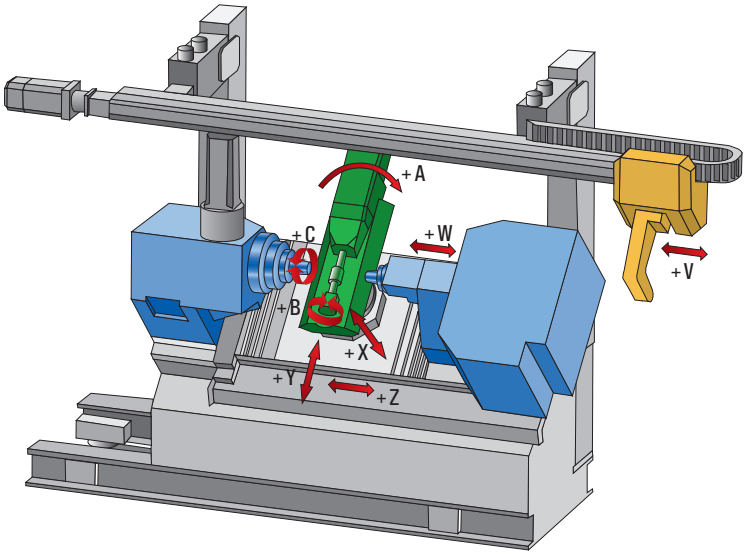
Dry- and wet hobbing

Basic structure of the machine

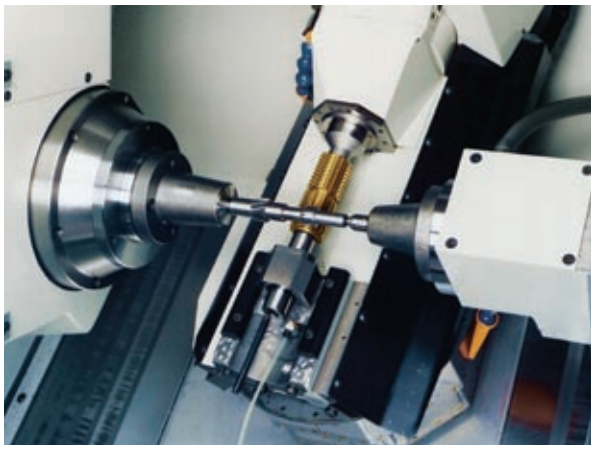
The Model 160 hobbing machine combines current technological developments and an innovative design along with many generations of KOEPFER gear cutting experience.

With eight axis of CNC-control the latest generation 160 gear hobbing machine opens new possibilities for true high-speed machining of gears. The machine is based upon the KOEPFER design concept of symmetrical distribution of cutting forces without any cantilever effects on the guideways.

The machine bed is a composite epoxy material which provides the highest static, dynamic and thermal stability. High accuracy gear cutting is accomplished with KOEPFER´s symmetrical design, the use of preloaded dampened linear roller bearing packs, and a new tailstock concept.



CNC-axes:
A – hobhead swivel movement
B – hob rotation
C – workpiece rotation
W – tailstock movement
X – radial movement
Y – hob tangential (shifting)
Z – axial movement
V – gantry loader



Working area with direct drive hobhead

Working area

With its slant bed design the machine is ideally suited for either dry or wet hobbing. Chips are directed away from both the work and cutter spindles and out of the basic machine structure to provide optimum flow with a minimum of influence on the temperature of the machine. As a special accessory for dry hobbing a vacuum chip extractor can be provided.

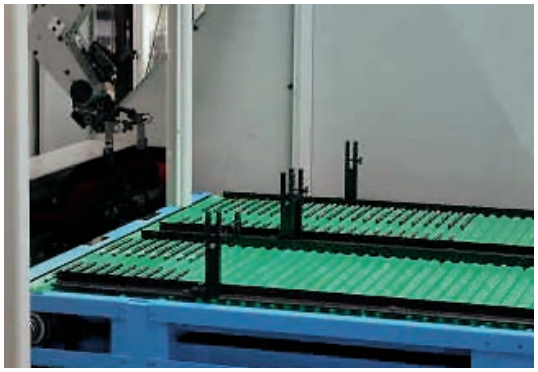
Flexible automation

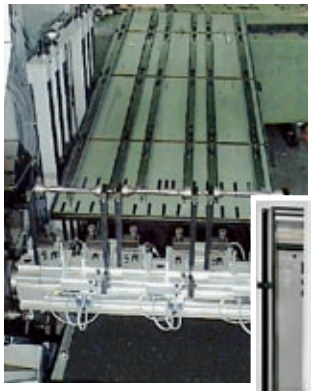
Loading area with flexible automation systems, chain magazine or special systems

A new rotary double gripper for the part loading meets the needs of a high speed machine with minimum idle time. A loading time of two to three seconds provides the shortest possible work piece cycle.

Large capacity-circulation magazine

Large capacity-magazines like the circulation magazine allow a running time of several hours. They are convenient for wheels as well as for shaft-type workpieces and are easily adjusted.



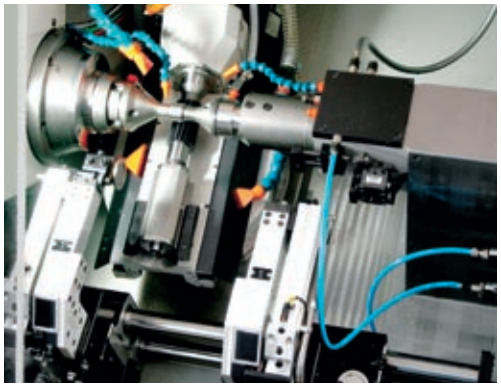


Multiple distributor and feeding-rail

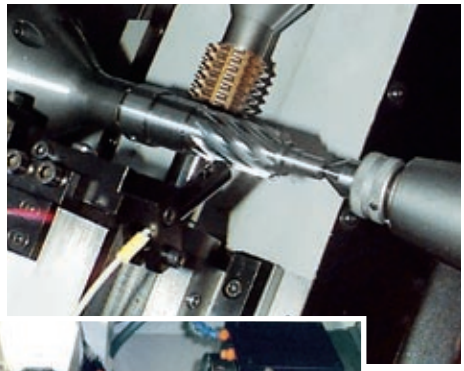
Multiple feeding rails for symmetrical components that roll by gravity can be inserted to greatly increase magazine capacity.

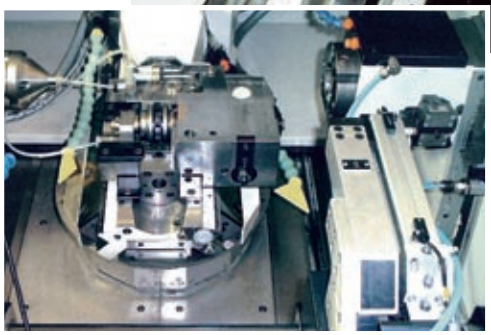
A triple distributor can also be used as well as a dual or a single distriubtor. The basic part jaws of the loader arms are easily adjustable. This results in a practically unlimited number of setting possibilities for different lengths and diameters of components.

Options



An auxiliary tool holder can be provided in single or double version. The double version can be used for example to position and for deburring workpieces concurrently.





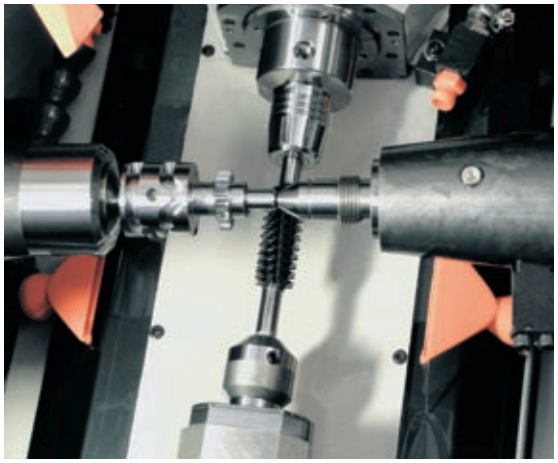
Besides using the auxiliary tool as a carrier for deburring tools of different types it is also suitable as a vibration dampening device, holder for sensors for automatic positioning or for special purposes, such as power driven deburring tools.

Right angle hobhead for milling single and multi-start worms.

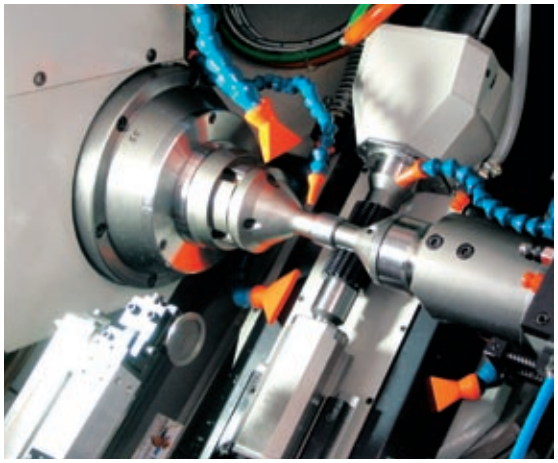
Options:

- Workpiece fixture for wheel-, pinion- and shaft parts
- Hob arbor
- Hydraulic precision collet to clamp shank hobs
- Hydraulic quick clamping device for workpieces and hobs
- Deburring device (vibration dampener, carrier for rehobbing sensor) in single- or double version
- Automatic chip removal unit
- Oil mist suction system
- Suction system for dry hobbing
- Automatic orientation for skiving
- Software for special programs such as skip shifting of a damaged area on the hob, for positioning tasks etc.
- Magazine loading-systems for blanks or semi finished parts

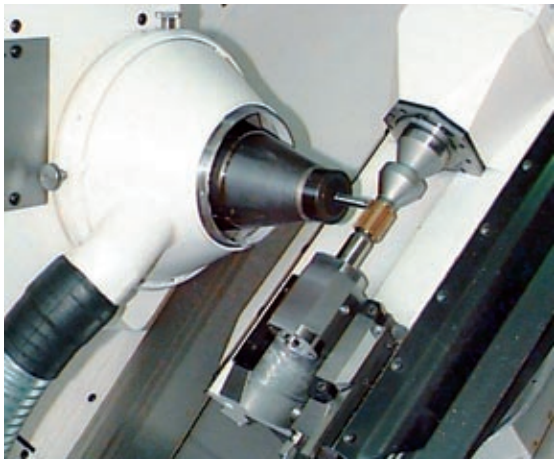
Examples of use



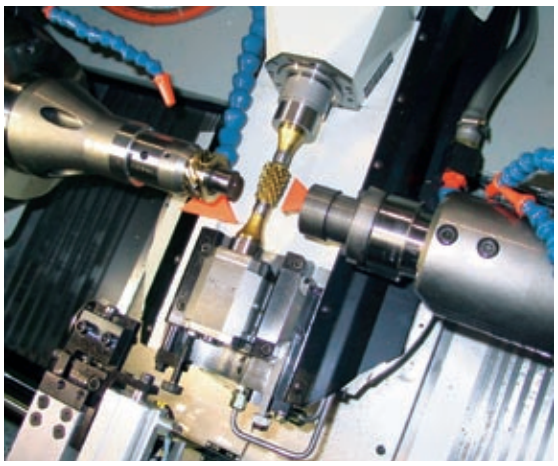
Shanktype hob in action: hobbing a gear which is oriented with the cam of a camshaft.



High-speed-dry-hobbing of planetary gears.



High-speed-dry-hobbing of shafts without tailstock.



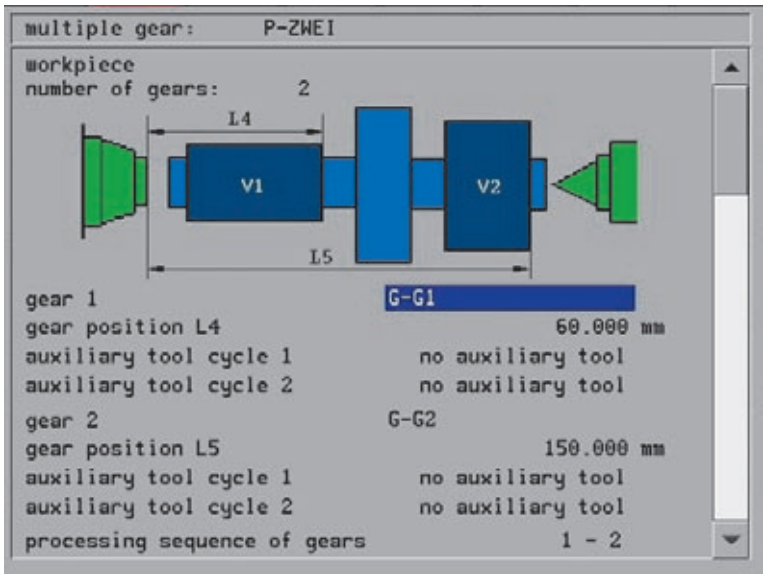
Worm wheels can be hobbed by using radial infeed of the hob or – especially for wheels with a relatively large helix angle – by using tangential hob feed. The shanktype hob is clamped by a hydraulic operated precision chuck collet.

CONTROL PANEL

The control for the 160 machine utilizes the latest generation of electronics and features:
A Touch Screen Panel instead of mouse or keyboard. An internal program memory with a capacity of 1MB is sufficient for more then 750 different components.
The CNC provides a desktop Windows "Look and Feel" similar to software used with office PC´s.

Continuing development of the extensive KOEPFER-Dialog program provides the creation of complex programs in a simple manner.

The control allows extensive diagnostic-functions including online access to the controls by the KOEPFER-Service-staff.



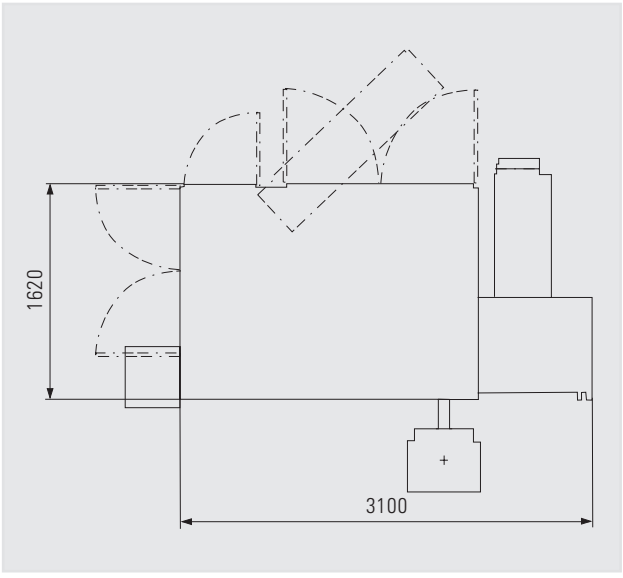
Technical Data

Technical specifications of the machine:

Maximum module	mm	2,5
Maximum workpiece-diameter		
– Standard (with automatic loading)	mm	60
– Option (with automatic loading)	mm	90
– Maximum hob Ø-32 mm	mm	140
Maximum hobbing length	mm	200
– alternatively	mm	480
Maximum workpiece length	mm	300
– alternatively	mm	600
Maximum work spindle speed	RPM	1.000
Maximum cutter spindle speed	RPM	5.000
Maximum hob width	mm	130, (250)
Maximum hob shift	mm	100, (160)
Hobhead swivel angle		+/- 50°

Right angle hobhead:

Speed milling cutter	RPM	400 – 1.500
Max. milling cutter-diameter	mm	80
Max. milling cutter width	mm	30
Swivel-angle		+/- 45°
Max. Module		2,5



Subject to change without prior notice