**Gear machining made easy: new TNC cycles for the shop trend of skiving**

*The machining of gears is still regarded by many machine tool operators as a true challenge and a realm reserved exclusively for specialists. Three new cycles of the HEIDENHAIN TNC 640 for the skiving and hobbing of straight, helical, and herringbone gear teeth are now altering this perception. These cycles enable the simple and economical machining of high-quality external and internal gears completely within a single setup. The software allows the two machining operations to be performed in both milling and turning mode.*

Millions of internal and external gears are constantly at work behind the scenes—including in every vehicle. From bikes to earthmovers and from pedal-powered drives aided by electric motors to powerful hydraulic drives for heavy machinery, things get rolling only when the gears used in hubs and transmissions mesh smoothly. Yet gears are still often manufactured on special machines, a practice that requires the time-intensive rechucking of the workpiece. Moreover, traditional gear manufacturing methods are very time consuming. Accordingly, machining in a single setup with the dynamic gear-machining cycles of a TNC-controlled machine can yield significant savings in terms of time, effort, and cost.

**Programming complex movements with ease**

The new cycle 287 “gear skiving” supports the TNC user in programming the complex processes required for skiving. The only parameters needed are the data for the gear geometry and the tools to be used. All other calculations, including those required for the complicated synchronization of movements, are handled by the HEIDENHAIN TNC 640. As a result, the production of internal gears turns into a standard application that can be easily mastered.

Skiving is a method of manufacturing external gears and, above all, internal gears on machines equipped with synchronized spindles. In skiving, parts can be completely machined within a single setup. No special machines, and therefore no machine changeovers, are required. The user benefits from time savings and increased quality.

Moreover, the current popularity of skiving is due to its considerably higher efficiency and productivity compared with that of traditional gear shaping. New tool technologies and the dynamic motion control of the HEIDENHAIN TNC 640 in double spindle operation enable the complex processes involved in skiving. The only requirement is a machine that features a workpiece spindle with sufficiently high speed along with appropriately configured spindle synchronization.

**Skiving made easy**

With the same ease as skiving—through programming on the basis of the gear geometry and tool definition—the TNC 640 supports users with its cycle 286 “gear hobbing.” Gear hobbing is especially well suited for the machining of external gears. The required synchronized movements of the tool spindle and workpiece spindle can be implemented either physically through a mechanical linkage or electronically through a linkage in the control. The advantages of skiving lie in the method’s high productivity. In addition, a wide variety of tooth forms, including complex ones, can be machined. This can be accomplished with a sizeable array of standard tools, while any special tools needed can be manufactured with relative ease.

**Define it once; use it repeatedly**

The basis for the new gear-machining cycles is cycle 285 “defining the gear.” As its name suggests, this cycle is used solely for the definition of the gear geometry. With this cycle, the geometry need be defined only once. This definition is then used in all of the required machining steps of the subsequent production process, including roughing and finishing.

**Optimized lift-off for greater protection and reliability**

In addition to the benefit of easier programming, the new cycles provide a further advantage in terms of protection and reliability. For the avoidance of damage during unforeseen program interruptions, such as power outages, cycles 286 and 287 support optimized lift-off. These cycles automatically determine both the direction and the path of the tool’s retraction from the workpiece.

**HEIDENHAIN at AMB 2018:**

* **Hall 2, Booth 2D03 – HEIDENHAIN booth**
* **Hall 2, Booth 2C02 – TNC Club Lounge**
* **Atrium – Special show for young people**

***For more information, visit:***

https://amb.heidenhain.de/en/

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|  | *With new cycles for the TNC 640, HEIDENHAIN is enabling the easy programming of complex gears, such as for the skiving of internal gears.* |
|  | *Only a few parameters need to be entered for defining the gear geometry.* |