



**NEW**

## 齿轮加工

齿轮经济加工刀具的范围扩展

## GEAR MACHINING

Expanded tool range for the economical production of gears

在过去的几年里，HORN不断扩大其工具组合，以经济生产齿轮。使用哪种工具解决方案取决于各种因素：模块尺寸、批量大小和可用的机械技术是决定生产工艺选择的基本因素。HORN已经为一些应用开发了一种高效的工具解决方案。特别是，新的机床与同步轴，现在提供了齿轮制造的可能性，以前为特殊机器保留。

HORN不仅是工具供应商，也是新制造战略发展的合作伙伴。刀具的设计还包括加工参数的确定和机床上的设置，并在刀具交付时由我们提供。考虑零件成本时，齿轮刀具的准备是一个基本要点。HORN拥有内部控制所有生产过程的重磨，并保证新工具的质量，在不到五周的交货时间内。



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Over the last few years HORN has continuously expanded its tool portfolio for the economical production of gears. Which tool solution is used depends on various factors:

Module size, batch sizes and the available machine technology are the essential factors that decide on the production technology to be selected. HORN has developed a productive tool solution for some applications. In particular, new machine tools with synchronised axes now offer possibilities for gear manufacturing that were previously reserved for special machines.

HORN presents itself not only as a tool supplier, but also as a partner in the development of new manufacturing strategies. The design of a tool also includes determination of the machining parameters and the settings on the machine tool and are supplied by us when the tool is delivered. The preparation of the gear cutting tools is a fundamental point when considering cost-per-part. HORN has in-house control over all production processes for regrinding and guarantees the quality of a new tool in a delivery time of less than five weeks.



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# 齿轮加工概述

## Overview Gear Processes



技术 Technology	小批量 Small series	中等批量 Medium batch sizes	大批量 Large series
齿轮铣(外齿) Gear milling (external) 	+++	++	0
插齿(外齿和内齿) Gear broching (external and internal) 	+++	++	+
刮齿(外齿和内齿) Gear skiving (external and internal) 	0	+	+++
齿轮成形(外齿) Gear shaping (external and internal) 	0	+	+++

0 不合适  
0 not suitable

+ 有限的合适  
+ limited suitability

++ 合适  
++ suitable

+++ 非常合适  
+++ very suitable

# 齿轮加工概述

## Overview Gear Processes



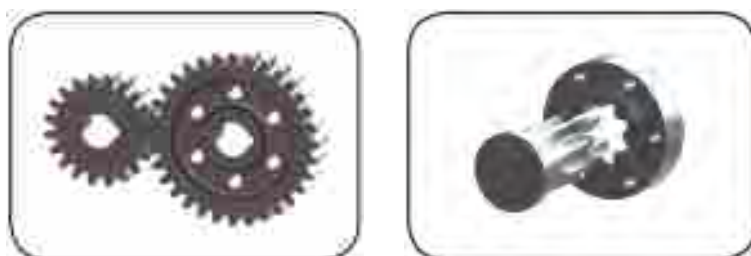
技术 Technology	小批量 Small series	中等批量 Medium batch sizes	大批量 Large series
单点齿轮铣 (外齿) Single-point gear milling (external) 	0	+++	+
伞齿铣 (外齿) Bevel gear milling (external) 	+	+	+++
5轴铣齿 (外齿) 5-Axis milling of gears (external) 	+++	0	0
齿轮倒角 Deburring of gears 	+++	+++	+++

0 不合适  
0 not suitable

+ 有限的合适  
+ limited suitability

++ 合适  
++ suitable

+++ 非常合适  
+++ very suitable



### 直齿和花键的铣削刀片

Milling inserts for spur gears and gear shafts

圆柱齿 / 花键 根据基本齿形 DIN 3972 Cylindrical gears / Tooth bars Basic profile 1 according to DIN 3972	花键/轴毂/齿 DIN 5480 / ANSI B92.1 Gear shafts / Shaft-hub / Serration DIN 5480 / ANSI B92.1	刀片类型 Insert type	Ds [mm]
$m_n \leq 0.8$	$m_n \leq 1 / d_B \geq 40$	606	11.7
$m_n \leq 1$	$m_n \leq 1.5 / d_B \geq 40$	608	15.7
$m_n \leq 1.25$	$m_n \leq 2 / d_B \geq 40$	611	17.7
$m_n \leq 1.5$	$m_n \leq 3 / d_B \geq 22$	613	21.7
$m_n \leq 2$	$m_n \leq 2.5 / d_B \geq 40$	628	27.7
$m_n \leq 2.5 / \text{Nr. } 5 - 8$	$m_n \leq 2.5 / d_B \geq 30$	632	31.7
$m_n \leq 2.25 / \text{Nr. } 2 - 8$			
$m_n \leq 2 \text{ Nr. } 1 - 8$			
$m_n \leq 3$	$m_n \leq 3 / d_B \geq 50$	635	34.7
$m_n \leq 1.5$	$m_n \leq 2 / d_B \geq 60$	636	35.7