NACHI

精密工具

GEAR CUTTING TOOLS & BROACHES

齿轮加工工具・拉刀

滚刀系列
Solid Hobs Series

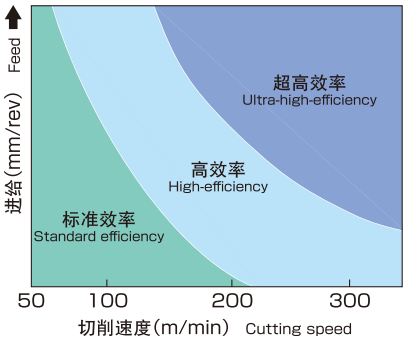
- 凭借膜的成分设计和成膜过程的优化，大幅改善滚刀加工所必需的膜特性
- 针对不同用途，准备了4种涂层
  Hyper DuAl SP涂层滚刀　　Hyper DuAl GP涂层滚刀
  DuAl EX涂层滚刀　　DuAl VX涂层滚刀
- 凭借与具备出色耐热冲击性、抗崩刃性、耐磨性的滚刀专用新溶解高速钢(FMH材质)的组合，发挥卓越性能

- Greatly improved coating quality needed for hobbing by optimizing deposition process and design of components of coatings.
- 4 coating are available depending on the application.
  Hyper DuAl SP Hob　Hyper DuAl GP Hob
  DuAl EX Hob　DuAl VX Hob
- Combination of superior thermal shock resistance, chipping resistance, and wear resistance of new HSS-Co material (from FMH) gives outstanding performance.

按适合用途进行选择 | Selection Chart

针对不同用途的 4 种涂层　4 coatings available to support various applications

	湿式加工（油性、水溶性）Wet cutting (oil or water soluble)	干式加工 Dry cutting		
		标准效率加工 Standard efficiency cutting	高效率加工 High-efficiency cutting	超高效率加工 Ultra-high-efficiency cutting
再研磨与再涂层规格（全涂层）Specifications for re-grinding and re-coating (full coating)				Hyper DuAl SP
	Hyper DuAl GP			
再研磨规格（前刀面无涂层）Specifications for re-grinding (no coating on cutting face)	DuAl EX			
	DuAl VX			



涂层性能比较 | Comparison of Coating Performance

	DuAl VX（再研磨规格）(For regrind only)	DuAl EX（再研磨规格）(For regrind only)	Hyper DuAl GP（再涂层规格）(For regrind and recoating)	Hyper DuAl SP（再涂层规格）(For regrind and recoating)
耐磨性 Wear resistance	○	◎	◎	◎
韧性 Toughness	○	○	◎	◎
耐热性 Heat resistance	△	○	◎	◎
粘合性 Adhesion	◎	◎	◎	◎
加工用途 Applications	湿式 & 干式 Wet & Dry	湿式 & 干式 Wet & Dry	泛用加工湿式 & 干式 General purpose wet and dry	高效率干式 High-Speed dry 难削材加工 High-hardness material cutting
硬度 Hardness	2300 ~ 2500	2300 ~ 2500	2400 ~ 2600	2500 ~ 2700
氧化温度 Oxidation temp.	850℃	950℃	1100℃	1150℃

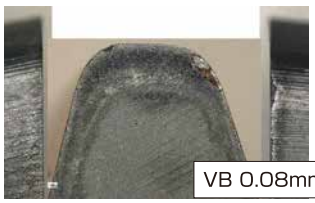
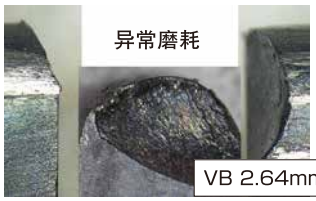
FMH-SV

- 通过分析切削原理和磨损产生的过程，开发出来的新材料，在超高速的情况下实现超高效率的加工
  （提升生产率，延长高效加工领域中的滚刀寿命）
- 开发耐高温特性和耐磨性出色的滚刀专用新材料，为滚刀材料“FMH系列”追加新种类
  新材料名：FMH-SV
  SV【Special Value：特别的价值、性质】
  - 可在高速加工中发挥性能
  - 配合使用Hyper DuAl SP涂层滚刀，可使切削速度达到V=300m/min以上，并实现长寿命化
- 凭借发挥材料特性的工具设计技术和加工技术，
  实现接近硬质合金工具的加工领域

滚刀加工评价（切削速度 400m/min）（前刀面有涂层）

Comparison of Hobbing at High Speed of 400 m/min (Coating on Cutting Face)

参数　　：m2.4，PA14° 30′，3 条，沟槽数 12
加工条件　：V=400（m/min），f=1.7（mm/rev），干式加工，被削材　SCM420H

	切削长度　125m	切削长度　150m
NEW! FMH-SV	 VB 0.08mm	 VB 0.16mm
FMH	 VB 0.26mm	 异常磨耗 VB 2.64mm

抑制月牙洼磨耗的加剧

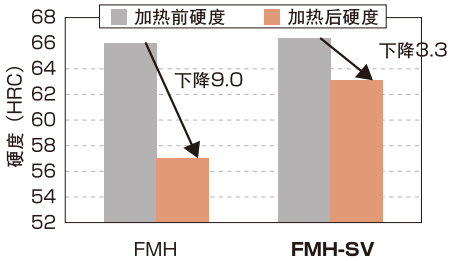
滚刀材质的功能比较

Feature Comparison of the Hob Material

	FMH-VX	FMH	FMH2	NEW! FMH-SV	FAX38	FAX55
耐热性	◎	◎	◎	◎◎	△	○
耐磨性	○	◎	○	◎	△	○
韧性	○	○	◎	○	○	△
安全性	○	◎	◎	◎	△	△
加工用途	湿式 & 干式	湿式 & 干式	湿式 & 干式	干式	湿式	湿式

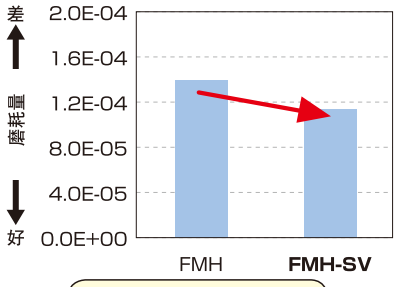
- 新材料 FMH-SV 具备非常卓越的耐热性
- 适合用于超高速干式加工的材料特性

[加热试验条件] 热风炉 650℃ × 4h → 空冷



新材料 FMH-SV 加热后硬度下降很小
→　在高温环境下有优秀的表现。

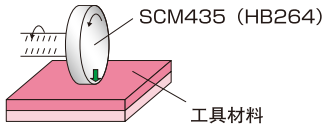
大越式磨耗试验



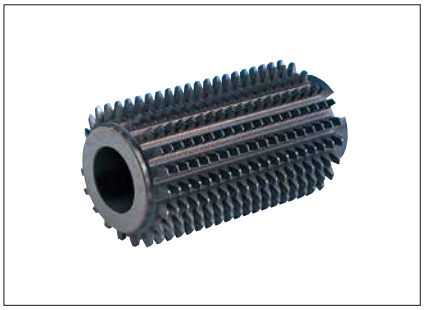
FMH-SV 在高速加工中具有出色的耐磨性

[试验条件] 最终负载：6.3kg

高速 V=200m/min



超硬滚刀
Solid Carbide Hobs



可用高刚性的高速滚刀机床进行高速滚刀加工。
本公司制作齿轮用滚刀、旋刮滚刀等各种超硬滚刀。
Carbide hobs can cut at high speed, which is significant improvement in gear productivity. NACHI can manufacture various solid carbide hobs like Gear hobs, Skiving hob.

超硬滚刀加工
Hard Hobbing

- 可用于淬火后的齿轮(60HRC) 的精加工
- 适合难以研磨的轴、小模数的高精度加工
- 凭借双层涂层和硬质合金母材实现长寿命

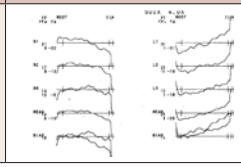
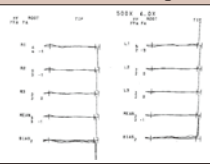
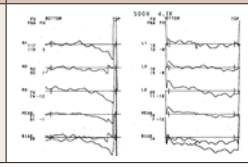
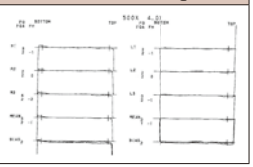
- Hobbing of hardened gear is possible
- Suitable for high accuracy gear hobbing of the shaft and small module which was difficult in grinding
- Achieved longer tool life by Dual coat and hard metal

加工示例	Work Piece

加工前 Before

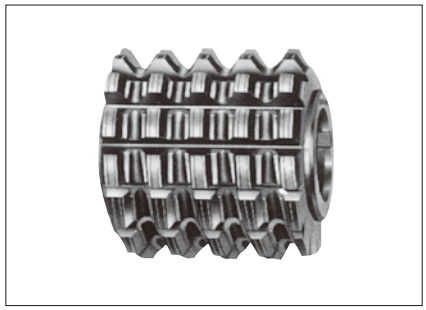
加工后 After

加工精度	Accuracy

	超硬加工前 Before Hard Hobbing	超硬加工后 After Hard Hobbing		超硬加工前 Before Hard Hobbing	超硬加工后 After Hard Hobbing
齿形 Profiles Error			齿向误差 Lead Error		

被削工件 Workpiece			滚刀参数 Hob Specifications			切削条件 Cutting Condition		
模数	Module	2	外径	Outside Dia.	50mm	切削速度	Cutting Speed	8.0mm/rev
齿数	Number of Teeth	6	全长	Overall Length	100	进给速度	Feed	0.6mm/rev
压力角	Pressure Angle	20°	头数	Threads	1	切削方法	Cutting Method	同向切削 Climb Cutting
齿宽	Tooth Width	28mm	沟槽数	Flutes	12	冷却剂	Coolant	–
材质	Material	SCM420(60HRC) 渗碳						

矩形花键滚刀
Parallel Side Spline Hobs Standard Dimensions



加工矩形花键轴的滚刀
This hob is used to manufacture parallel side spline.

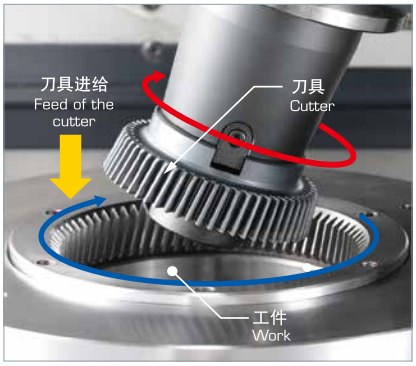
小直径带柄滚刀
Small Diameter Hobs with Multi-Gashes

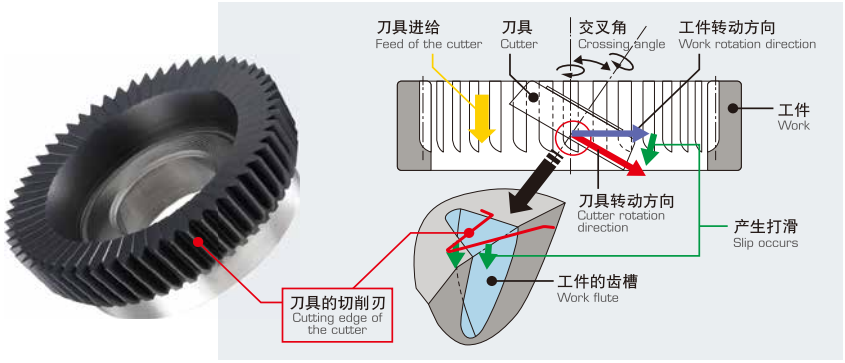
可进行高效率（滚刀高速转动）的加工，提升生产率。多槽设计还可帮助抑制滚刀的磨耗
This type of hob can endure super high-speed cutting and increase productivity. Other way multi-gashes cab reduce hob's wear.

旋刮刀
Skiving Cutter

旋刮加工的机械原理 | Mechanism of SKIVING process

在工件与刀具之间创造交叉角让其产生滑动，从而进行创成加工的加工方法
Apply crossed axes angle to workpiece and cutter, gear generating machining by sliding





旋刮加工的特征 | Characteristics of SKIVING process

齿轮加工法的特征比较
Comparison of characteristics of gear processing method

		滚刀加工 Hobbing	拉刀加工 Broaching	插齿加工 Gear Shaper machining	旋刮加工 Skiving
加工品质 Cutting	生产率 Productivity	◎	◎	△	○
	加工精度 Processing accuracy	○	◎	○	◎
	换刀效率 Step up	○	△	○	○
	热处理后加工 After the heat treatment processing	○	×	×	○
设备 Machinery	初期投资 Initial investment	○	△	○	○
	复合加工的适应性 Combined processing suitability	△	×	×	◎
工具费用 Tool cost	初始 Initial cost	○	×	○	○
	运行 Running cost	◎	◎	○	○
对象工件 Work	外齿轮 External gear	◎	×	◎	○
	内齿轮 Internal gear	×	◎	◎	◎
	盲孔形状（阶梯） Blind shape (with stepped)	×	×	◎	○
	齿形、齿线修正 Correcting profile and lead	△	×	×	◎

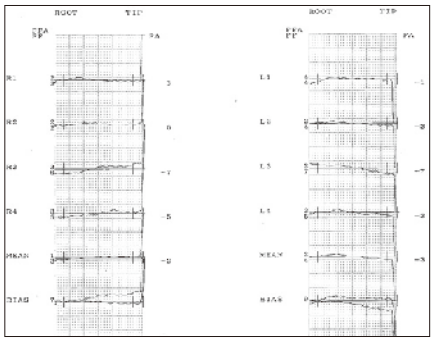
适合用于少量多种类生产
- 加工能力是插齿加工的 2 倍以上
- 可加工盲孔形状
- 可修正齿形齿线
- 内齿轮、外齿轮均可加工
- 可使用复合加工机加工

Suitable for a wide-variety small-lot production
- The processing efficiency for shaper machining
- To enable processing work of blind hole shape
- To enable correcting profile and lead
- Both internal gear and external gear can be machined
- Suitable to machining by combined processing machine

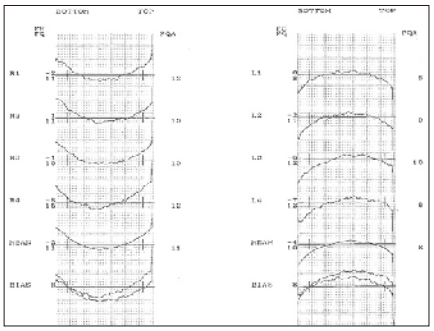
◎：优异 ○：一般 △：差 ×：不适用 ◎ : Excellent ○ : Good △ : Worse × : Not Used

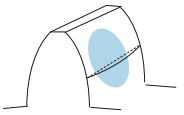
旋刮加工事例 内齿轮的加工精度 | Processing Example by SKIVING CUTTER (Processing accuracy of Internal Gear)

齿形 加工时间：90 (s) 齿形误差 :7μm（新 JIS-6 级）
Profile Time: 90(s)/Tooth Profile Error: 7μm/New JIS 6 grade



齿线 鼓形加工
Thread Helix Crowning





可修正齿向
To enable correcting lead
↓
每齿修正
To correct tooth contact
↓
提高齿轮性能
Improve the performance of the gear

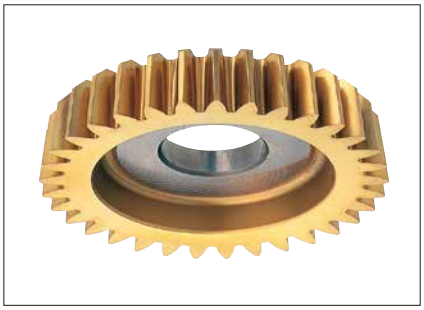
工件参数（内齿轮） Work specifications (Internal gear)		
MxPA		m1.5xPA20°
齿数	No. of teeth	内 70
螺旋角	Helix angle	20° RH
材质	Work material	SCM420
齿宽	Tooth width	25mm

刀具规格 Cutter specifications		
齿数	No. of teeth	30
螺旋角	Helix angle	SPUR
材质	Work material	FAX55
涂层	Coating	Hyper DuAl GP 前刀面有涂层 With coating on cutting face

加工条件 Cutting condition		
刀具转速	Cutter rotation	1600/1600rpm
打滑速度	Sliding speed	148/148m/min
进给量	Feed amount	0.05/0.05mm/rev
切削油	Cutting oil	油性 Oiliness
交叉角	Crossed axes angle	20°

圆盘型插齿刀 Ⅰ型
Disk Type Shaper Cutters Type Ⅰ

平齿轮加工用插齿刀。
This type of cutter is used in cutting spur gears or splines.

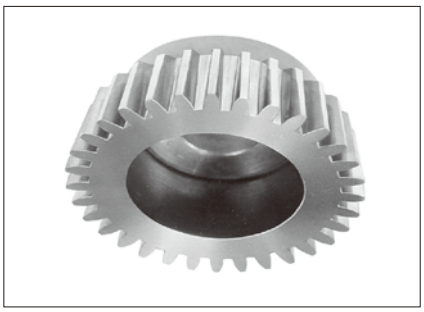


圆盘型插齿刀 Ⅱ型
Disk Type Shaper Cutters Type Ⅱ

加工斜齿轮的插齿刀。
This type of cutter is used in cutting helical gears.

碗型插齿刀
Deep Counterbore Type Shaper Cutters

用于加工内齿轮、阶梯齿轮的刀具。
This type of cutter is used in cutting internal gears or shoulder gears.



柄式插齿刀
Shank Type Shaper Cutters

用于加工小直径内齿轮、花键孔的刀具。
This type of cutter is used in cutting internal gears of small diameter and spline holes.

剃齿刀
Shaving Cutters

剃齿刀是刀具的齿槽中有多个锯齿形沟槽的齿轮齿面精加工用工具。
Shaving cutter is the gear cutting tool that have many serrated grooves at the tooth flanks.

剃齿前加工面
Before Shaving

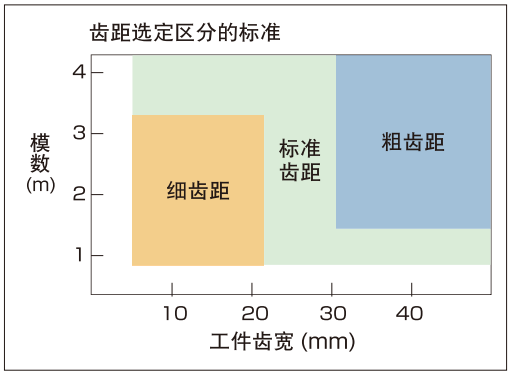
剃齿后加工面
After Shaving

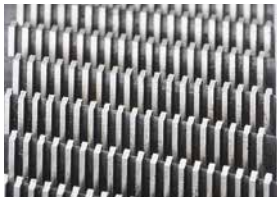
高性能剃齿刀
High Performance Shaving Cutter

- 根据工件特性，选定适合的齿距，从而改善工件加工数和锋利度
  细齿距：增加有效齿数，提高加工数
  粗齿距：增强切入性，提升锋利度
- 采用新钢种作为剃齿刀材料，从而实现长寿命

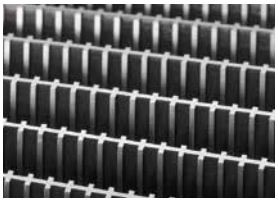
- Select the optimum serration pitch according to the characteristics of the work to improve the number of steps in work process and finish.
  Fine pitch: Improved work process by increasing number of effective teeth
  Coarse pitch: Improved bite to increase cutting power of teeth
- Used new steel shaving cutter material to produce a long service life

高性能剃齿刀
High Performance Shaving Cutter



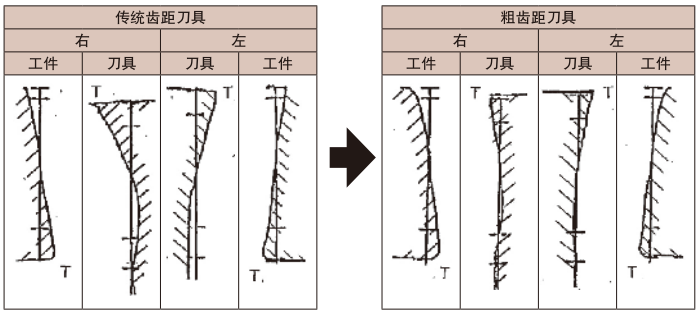


细齿距剃齿刀
Fine pitch serration shaving cutter



粗齿距剃齿刀
Coarse pitch serration shaving cutter

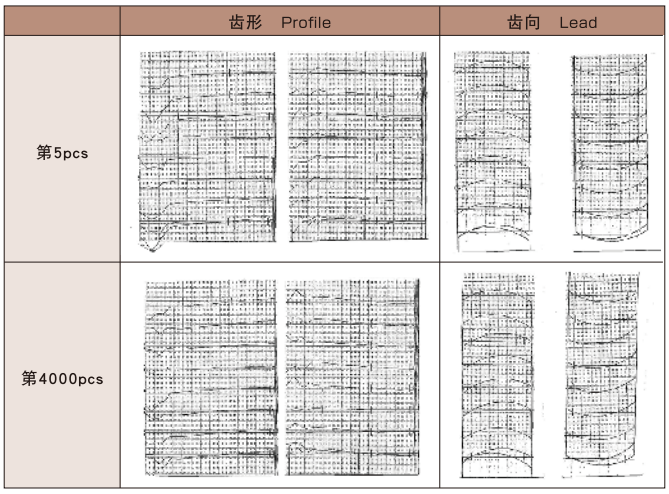
粗齿距加工事例
Example of coarse pitch serration



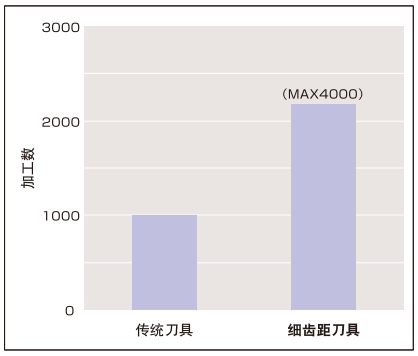
被削工件
M2.2 × PA17.5° × NT38 × HA32° LH
× 齿宽 30

通过变更齿距提升加工精度

细齿距加工事例
Example of fine pitch serration



寿命比较



被削工件
M1.8 × PA17° × NT52 × HA31° LH
齿宽 20

搓齿板
Forming Racks

搓齿板是上下（左右）一套使用的，具有如下特长。
・可在数秒内完成加工，效率远高于滚刀加工。
・相比使用传统的滚轮式滚压加工，加工精度更高。
Forming Racks are used in pairs to roll the teeth into the workpiece, and have next features.
· Rolling is generally completed in a few seconds and is a far more efficient than hobbing.
· This method can achieve better accuracy than cylindrical dies rolling.

加工实例 Example Workpieces

使用搓齿板的搓齿加工被广泛用于渐开线花键、渐开线细齿、螺纹、蜗杆等的量产加工。
Forming Rack is for large volume production of parts with involute spline, involute serration, thread, worm and others.


花键＋螺纹
Spline + Thread


蜗杆螺纹
Worm Screw


油槽（螺旋角 0°）
Oil Groove


少齿数齿轮
Number of The Small Teeth Gear


油槽（螺旋角 30°）＋花键
Oil Groove + Spline


蜗杆
Worm

Hyper Shot 搓齿板
Hyper Shot Forming Rack


Hyper Shot 搓齿板
Hyper Shot Forming Rack

- 通过特殊表面处理提升耐磨性和润滑性，从而实现MQL加工
- 无论是传统的油性还是MQL加工，都能确保长寿命
- Special surface treatment improves in wear resistance and lubrication, and realize MQL roll forming.
- Longer tool life in both condition of conventional oil coolant and MQL roll forming.

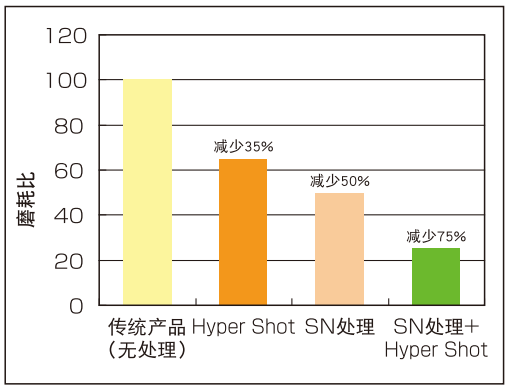
采用先进的表面质改处理
发挥优异的性能
Excellent performance by epoch-making surface modifying technology

・利用传统的 SN 处理和 Hyper Shot 的相乘效果，使硬度和韧性得到飞跃性提升
・考虑到搓齿加工的机理采用了表面改质处理和新设计方式，实现长寿命化
· Greatly improved hardness and toughness by synergy effects of SN treatment and Hyper Shot.
· The surface modifying technology and new design method considering the mechanism of rolling process achieve longer tool life.

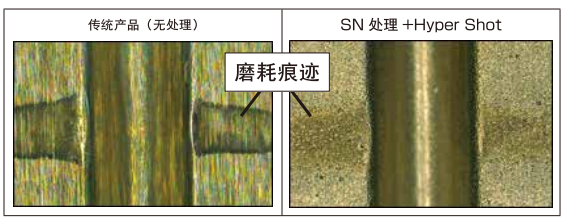
PFM-915X
可进行 MQL 加工的高精度 NC 搓齿机的换刀作业可轻松完成
利用 NC 刀座装置（选配件），可用同一套搓齿刀加工齿数不同的花键

High-precision NC roll forming machine can do MQL work Change-out procedure is easy
NC rack holder (option) makes it possible to work splines with different number of teeth on same rack

磨损试验结果



基于代用试验的磨损比较



Hyper Shot
相比传统搓齿刀：**寿命延长至1.5倍以上**

SN处理+Hyper Shot
相比传统搓齿刀：**寿命延长至4倍以上**

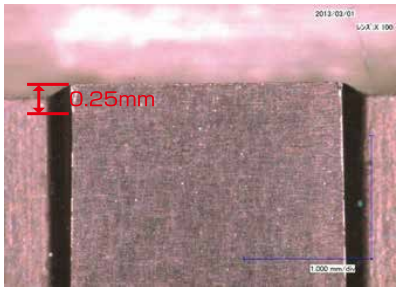
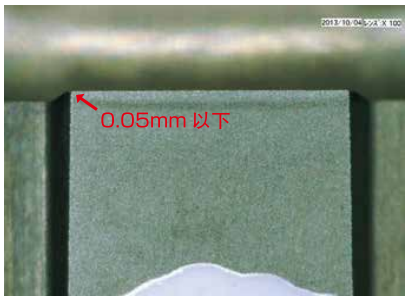
DuAl GX 涂层拉刀

DuAl GX Coated Broach

- 通过分析切削原理，查明磨损产生的过程，为使用水溶性切削油进行拉刀加工优化涂层
- GX【Generation eXceed：跨时代的】
- 针对使用水溶性切削油的加工进行设计
- 注重凝结、刃尖磨损、刮擦磨损对策
- 采用具有出色润滑性和粘合性的涂层

- Analyze the cutting mechanism and clarify the wear growth process. Optimized coating for broaching in water-soluble cutting fluid.
- DuAl GX(Generation eXceed)
- Great performance with water soluble cutting.
- Good at adhesive wear, corner wear, scratch wear.
- Better improved lubricity and adhesive coat.

加工事例　Applications

DuAl EX	DuAl GX
加工 7,000 个	加工 10,000 个
	

不仅能增加加工数（1.4 倍）、延长使用寿命，还能减少磨损

参数　：m1×PA30°　×NT24
冷却剂　：水溶性切削油　被削材：SCM420

各种涂层的推荐使用领域　Recommended area of various coating

切削油 / 被削材	油性	水溶性（雾状）
	快削材	难削材
高效能 高精度		DuAl GX
	DuAl EX	
通用 低成本	TiN	
	氮化	

拉刀用表面处理的性能比较　Comparison of performance of surface treatment for broach

	氮化	TiN	DuAl EX	DuAl GX
耐磨性	△	○	◎	◎
膜韧性	-	○	○	◎
耐热性	-	△	○	○
耐粘性	△	○	○	◎
稳定性	-	◎	○	◎
加工用途	油性	油性＆水溶性	油性＆水溶性	水溶性
被削材	未处理材	未处理材	未处理材＆难削材	未处理材＆难削材
膜成分	-	TiN 类	TiAl 类	AlCr 类
硬度	-	2300 ～ 2500	2300 ～ 2500	2400 ～ 2600

◆镀层膜的特长
・提高拉刀加工所必需的膜特性的专用涂层膜
・在各种加工条件下，都能发挥出色稳定性的涂层膜
　根据磨耗形态，选定优异涂层 → 为工具费的削减做贡献

DuAl EX 涂层拉刀

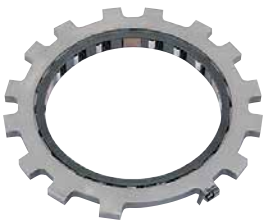
DuAl EX broach

- 利用特别针对拉刀开发的DuAl EX涂层，稳定加工精度，提升耐磨性
- 无论是使用水溶性切削油还是非水溶性切削油都能确保长寿命
- 在MQL加工中也能发挥稳定的加工性能

- Cutting accuracy is more consistent and wear resistance is improved with DuAl EX Coat the perfect coating for broach work
- Long life with both water-soluble and non-water-soluble cutting fluids
- Stable and reliable performance under MQL broaching

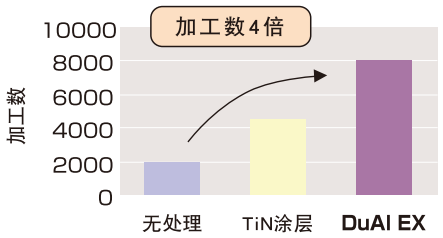
加工用途 Applications

变速器、转向器等的零部件加工
Making parts for transmissions, steering systems, etc.



性能和加工示例 Performance

非水溶性切削油 Water insoluble cutting oil

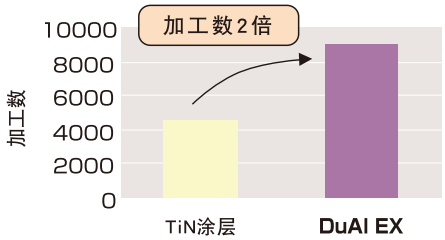


加工数 8,100 个后（加工长 324m）的侧面磨耗

DuAl EX 涂层拉刀

被削材	SCM20
工件参数	m1×PA30°×NT40 大径：43.5　小径：40
切削长度	40mm
切削油	非水溶性切削油

水溶性切削油 Water soluble cutting fluid



加工数 9,000 个后（加工长 180m）的侧面磨耗

DuAl EX 涂层拉刀

被削材	SCr420
工件参数	m1×PA37.5°×NT25 大径：27　小径：25
切削长度	20mm
切削油	水溶性切削油

超硬拉刀加工
Hard Broaches

- 高硬度材的高精度加工
  该技术将彻底消除硬度50～60HRC的加工品的热处理形变，因此，有望实现过去难以做到的异形孔的精加工，同时，也将实现零部件的高精度化和稳定化。
- 高效率加工
  使用组合式超硬拉刀和超硬拉床，将以60m/min的切削速度进行高速加工。实际切削加工时间不足1秒
- MQL加工
  使用微量的雾状冷却液，有利于环境，且无需清洗工作、无需进行切屑脱油处理和废液处理

- Highly precise broaching of the high hardness materials(50-60HRC).
- Sectional carbide broach and hard broaching machine are used, and a high speed broaching in cutting speed 60m/min.
  Practical cutting time is less than for one second.
- Environment-Friendly with MQL system. No need for work piece washing out and dealing with waste fluid.

超硬拉刀
Hard Broach

加工示例
Sample

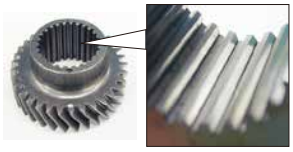
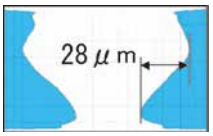
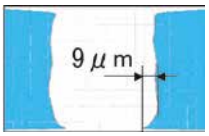
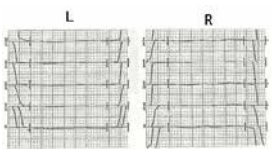
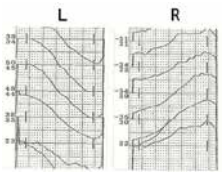
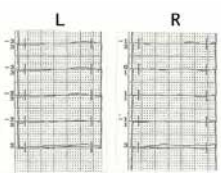
HW-5008

加工用途	Applications

汽车的齿轮零部件等的渐开线花键孔的齿面、CVT 球槽、各种异形孔等的大直径和齿面精加工
Involute spline hole (gear part for autos), CVT ball groove, various variant holes

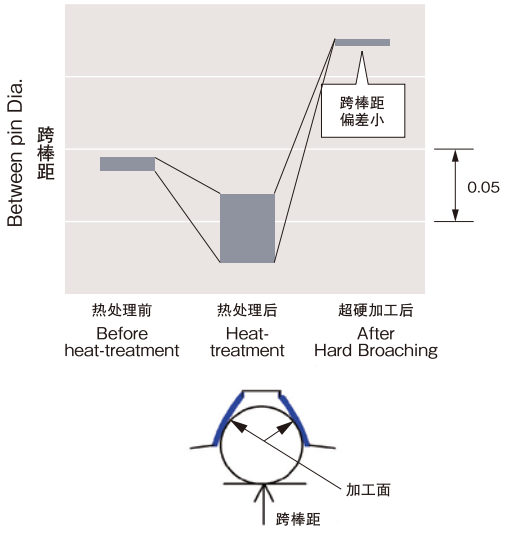
特长	Features

齿面比较
Comparison of finished teeth

	超硬加工前 Before	超硬加工后 After
Appearance 加工工件外观		
Squareness 直角度		
Profile 齿形		
Lead 齿向		

加工参数	Work
齿数：24	No.of teeth
齿直角模数：1	Normal Module
齿直角压力角：45°	Normal Pressure Angle
基准分度圆直径：24.000	Pitch Dia.
基圆直径：16.971	Dia.
大径：25.46	Major Dia.
小直径：23.76	Minor Dia.

跨棒距
Between pin Dia.



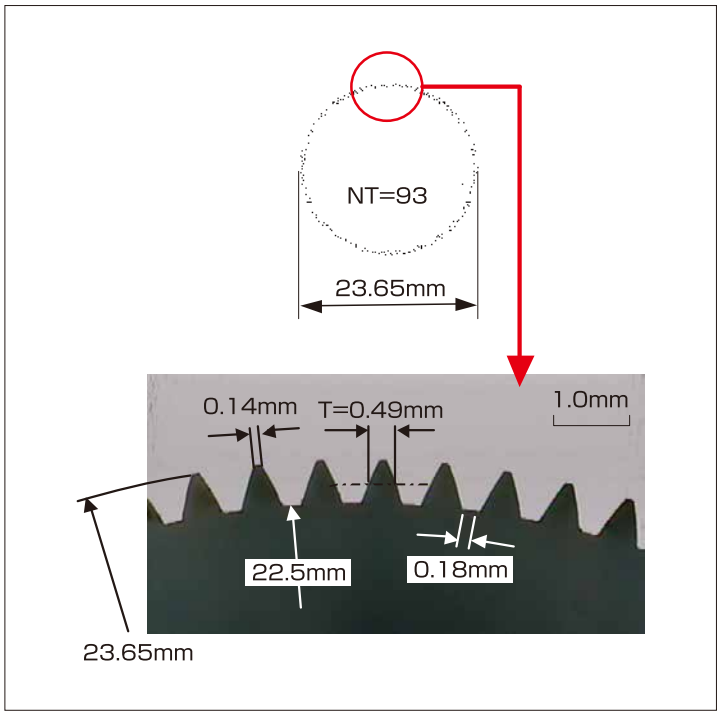
微小模数工件加工用拉刀
Micro Module Broaching

- 适合微小模数的高精度加工
- 也支持齿高2.25m的标准齿轮的加工

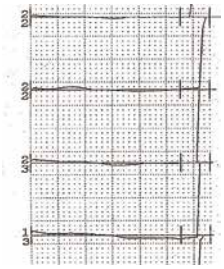
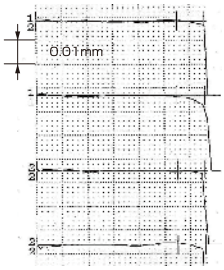
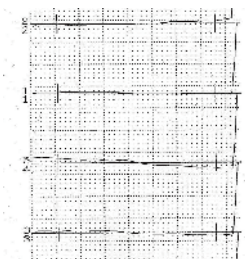
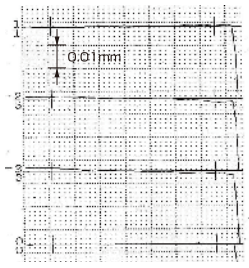
●Best for highly accuracy broaching of a micro module
●Apply to a standard gear of whole depth 2.25m

加工用途	Applications

对应减速机的行星齿轮等紧凑化的零部件
Compactification of planetary gear



NBV-3-6 MNC

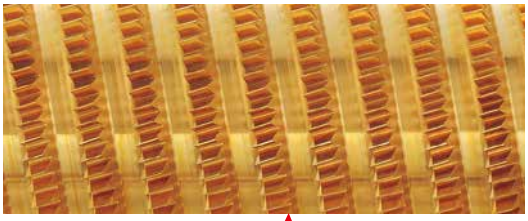
齿形精度 Profile error		齿向精度 Lead error	
左 Left	右 Right	左 Left	右 Right
			

切削条件 Cutting condition					
机械	Machine	立式 NBM 5008	切削油	Cutting Oil	雾状（UNICUT JINEN） Mist
被削材	Work	SCM 435	拉刀全长	Broach Length	900mm（刃长 290mm）
切削速度	Cutting speed	3m/min	切削负载	Pulling Load	8.8KN（0.9Ton）

螺旋槽式螺旋拉刀
Off-normal Gullet Helical Broach

- 考虑螺旋角、切削阻力、切削量等因素，采用能以稳定的状态切削的刀槽螺旋角
- 可实现传统产品难以达到的齿轮精度
- 减少切削载荷和切削振动，从而增加寿命

- Off-normal Gullet Helical Broach is the best broach to ensure accuracy of internal helical gears.
- The angular design of gullet provides the best balanced cutting.
- Improve accuracy of workpiece and tool life.



组合式
Assembly type

一体式
Solid type

加工用途	Applications

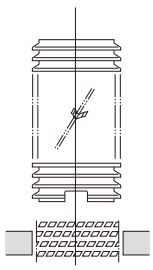
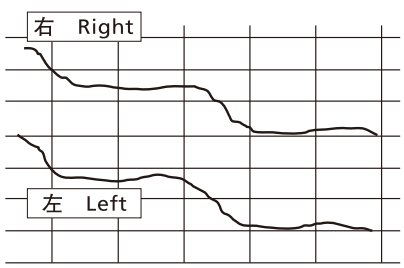
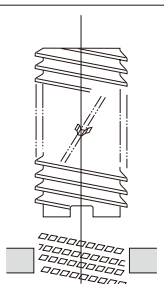
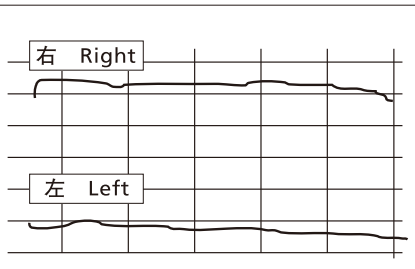
自动变速机内齿轮的加工
Internal Helical gears of Automatic Transmission

内齿轮
Internal helical gear

将精加工齿设计为螺旋式刃槽，可大幅提升工件的齿向精度

特长	Features

齿向精度的比较
Comparison of Lead Error

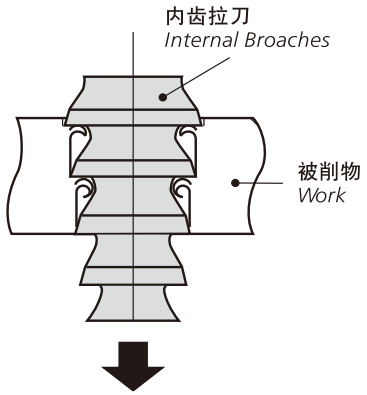
	刀槽 Gullet	齿向精度的比较 Comparison of Lead Error
Conventional Gullet 轴直角刀槽		
Off-normal Gullet 螺旋式刀槽		

内齿拉刀加工 | Internal Broaching

内齿拉刀可将被削物的内侧精加工成所需的形状。通常，被削物上有事先钻开的底孔，将内齿拉刀插入该孔就可进行加工。

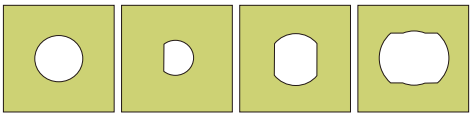
As for the internal broach, shape of indispensability can finish the inside of the cover crops. A lower hole is opened to the cover crops beforehand and usually machines it through an internal broach in this hole.

内齿拉刀加工
Internal Broaching Process



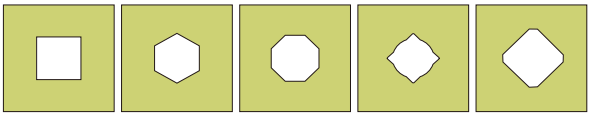
内齿拉刀的加工示例 Work piece sample

圆拉刀 Round Broach

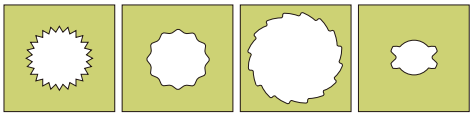


特殊花键拉刀 Special Spline Broach

方拉刀 Square Broach

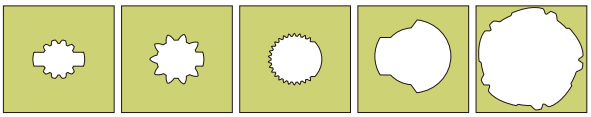


山形细齿拉刀 Serration Broach



矩形花键拉刀 Parallel Side Spline Broach

特殊形状拉刀 Special Shape Broach

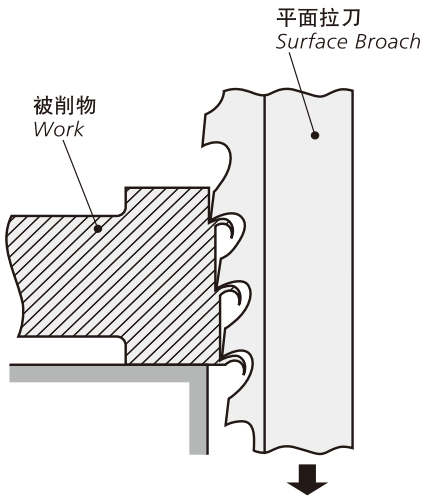


平面拉刀加工	Surface Broaching

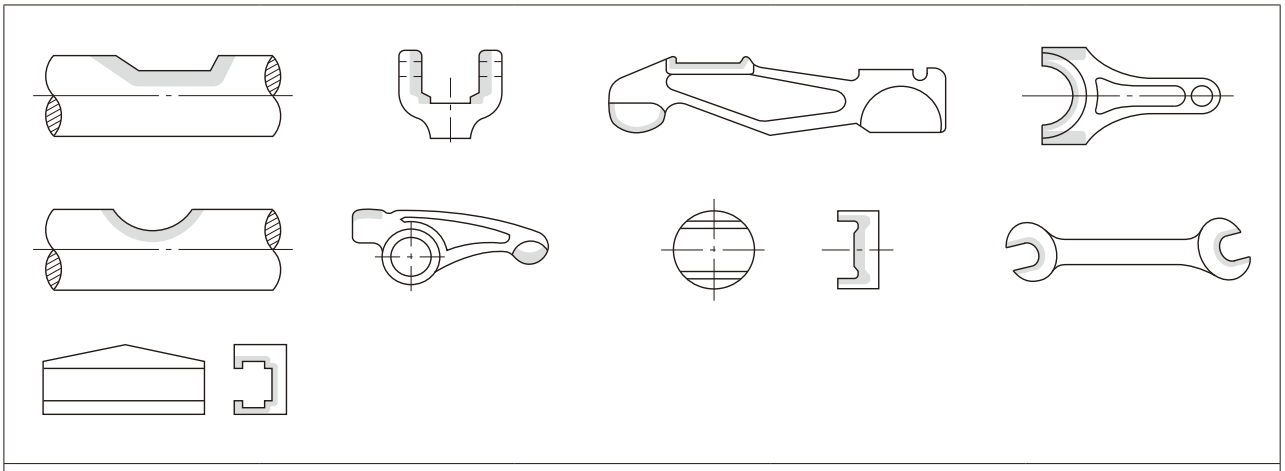
平面拉刀可将被削物的表面精加工成所需的形状。粗加工和精加工可同时进行，因此相比铣刀加工，具有生产率高的特长。

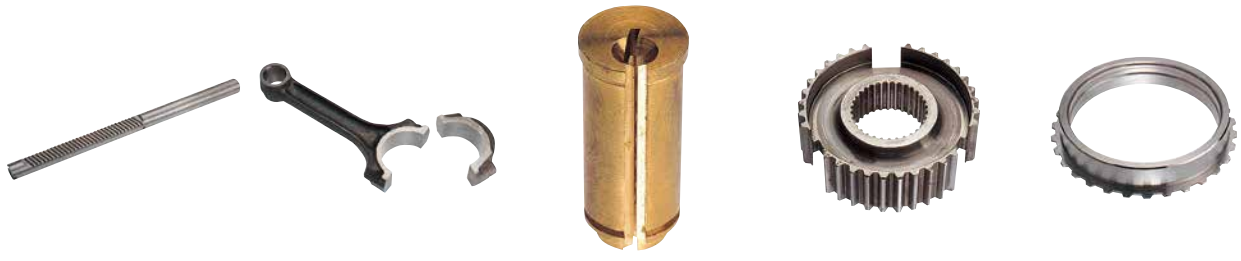
Used to remove metal from an external surface to produce a flat or contoured surface. It is more economical than milling cutter because of broaches allows roughing and finishing operation be continued.

利用平面拉刀的加工
Surface Broaching Process



平面拉刀的加工示例　Workpiece Sample





中国的再研磨服务

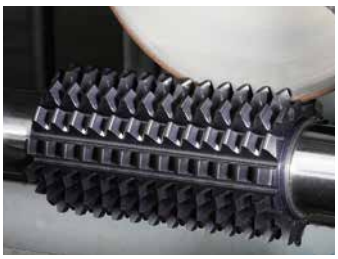
如要咨询海外网点的相关信息，请直接联系当地的海外网点或本公司的海外营业人员。

公司名称 那智不二越（江苏）精密机械有限公司（NJI）
地址 江苏省张家港市经济技术开发区（南区）南园路39号
邮编 215618
电话 0512-3500-7616
传真 0512-3500-7615

NJI的工具事业的介绍

生产品种 ： 搓齿板、硬质合金钻头
再研磨服务 ： 拉刀・滚刀（再研磨）、搓齿板（新品・再研磨）
硬质合金钻头（新品・再研磨）






注：
*本样册中的产品图片及内容仅作示意，实物产品效果（包括但不限于外观、颜色、尺寸）可能略有差异，请以实物为准。
*本样册中的数据为理论值，均来源于不二越内部实验，于特定测试环境下所得（请见各项具体说明），实际使用中可能因产品个体差异、使用条件和环境因素不同略有不同，请以实际使用的情况为准。
*The pictures and contents of the products in this sample book are only for illustration. The effects of the physical products (including but not limited to appearance, color and size) may vary slightly. Please refer to the physical products.
*The data in this sample book are theoretical values, which are derived from the internal experiments in NACHI. The data obtained under the specific test environment (see the specific instructions). The actual use may vary slightly according to the individual differences of the products, the use conditions and environmental factors. Please take the actual use as the criterion.

不二越（中国）有限公司

URL: http://www.nachi.com.cn

上海市青浦区诸光路1988号国家会展中心A座5层 邮编: 201702
Tel: 021–6915–2200 Fax: 021–6915–5427

•北京分公司
北京市朝阳区朝外大街乙12号 昆泰国际大厦O–1111室 邮编:100020
Tel: 010–5879–0181 Fax: 010–5879–0182

•重庆分公司
重庆市渝北区黄山大道中段67号信达国际D座405室 邮编：401120
Tel: 023–8816–1967 Fax: 023–8816–1968

•沈阳分公司
辽宁省沈阳市沈河区悦宾街1号方圆大厦第3层304室 邮编:110000
Tel: 024–3120–2252 Fax: 024–2250–5316

•广州分公司
广州市高新技术产业开发区科学城南翔二路72号易翔科技园第1栋2楼 邮编:510670
Tel: 020–8200–6163 Fax: 020–8200–6163

•武汉分公司
湖北省武汉市武汉经济技术开发区东风三路东合中心D栋402室 邮编:430056
Tel: 027–8473–1747

•宁波分公司
浙江省宁波市鄞州区启新路128号八骏湾G座 邮编:315040
Tel: 0574–8813–5499

•长春事务所
吉林省长春市绿园区景阳大路3333号明翰国际大厦1827室 邮编:130062
Tel: 0431–8939–5595 Fax: 0431–8939–5595

NACHI-FUJIKOSHI (CHINA) CO.,LTD
Established : 2004 Products : Cutting Tools, Bearings, Hydraulic Equipment, Special Steels, Machine Tools and Robots

CATALOG No. T2305C-2
2020.12.V-JXCM-JUXIAN