

**GOOD PROFIT METAL SURFACE TREATMENT CO., LTD**

**萬利達表面加硬有限公司**



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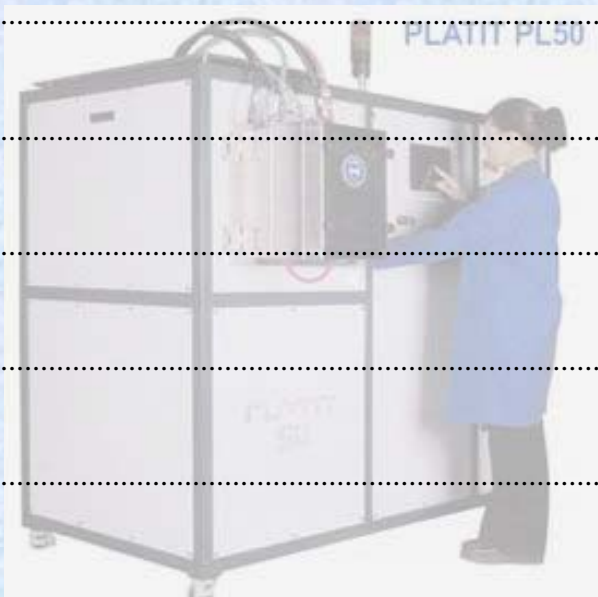
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## Company Profile 公司簡介

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### **GOOD PROFIT METAL SURFACE TREATMENT CO., LTD**

Located in No. 35 Building, Fifth Area, Cuigang Industrial Part, Huaide, Fuyong Town, Bao'an District, Shenzhen City, Guangdong, PR China. We are a professional coating service center in Shenzhen to provide the highest standard of modern coating technology service to our valued customers in China. Categorize of the highest standard coating can be divided into TiN, TiCN, TiAlN, AlTiN, DLC & CrN, etc. All work pieces can be coated such as drilling, turning, milling, tripping sawing, reaming broaching, Plastic injection molding, sheet metal stamping die and deep drawing, punching, forming, etc. The advantage of coating ensures an increase of tools life, hardness, toughness, heat resistance and reduce friction, wear of the work pieces. Truthfully, coating improves the productivity and profitability of your company.

### **萬利達表面加硬有限公司**

位於深圳市寶安區福永鎮懷德翠崗工業園五區 35 幢。為一所提供最高標準的專業塗層加工服務公司。所提供之專業塗層分別有氮化鈦、氮化碳鈦、氮化鋁鈦、**鋁氮化鈦**、**類金剛石塗層**及氮化鉻等。分別可應用於各類刀具、如翻磨滾齒刀，五金沖剪和深壓延、粉末冶金及鍛壓模具，熱塑及熱固性注塑模具、壓鑄模具，擠壓模具，金屬機械零配件等。經過處理之工件可增加其硬度、抗熱能力、耐磨性，減少磨擦力及防化學侵蝕。工件的壽命也可延長數倍，從而減少因工具耗損而需更換之時間，因而可提高生產能力，並可增加利潤。

## Coating Advantages 塗層的優點

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Coatings offer the highest standard of modern coating technology for tool steels (cold / hot work steel, high speed steel; HSS, PM, M42.....) and Tungsten Carbides (WC). All work pieces can be coated with a programmable coating thickness between 1 and 5  $\mu$  m. All batches are coating with absolute uniformity, ensuring the repeatability of the coating's quality.

塗層為刀具、模具及機械零件提供高標準的現代化塗層工藝，特別適用於冷作 / 熱作鋼，高速鋼，粉末鋼，及碳化鎢，所有不同形狀的工具，經電腦控制可製造出超硬塗層，厚度可由 1 微米至 5 微米，而且可以保證高度的一致性 & 重覆性。

### Cutting Tools 切削刀具

The hard coatings reduce the abrasive adhesive and crater wear on the tools for conventional wet, dry and high speed machining. Modern coating technology reduces ARC droplets and the friction between chip and tool.

硬塗層能夠在濕、乾及高速加工的環境下，增加刀具的抗磨性、抗粘性。

### Sheet metal stamping 五金沖壓模具

Coating technology ensures an increase in tool life through the reduce of friction on punches, molds and dies.

塗層工藝能降低沖頭及模具之間的磨擦力，從而增長模具之壽命。

### Metal Forming Die 五金成型模具

For forming applications such as extrusion, molding, deep-drawing, coining, hard coatings reduce friction, wear, built-up edges and striation. Re-polishing of functional surfaces is not necessary in most cases.

成型工藝例如擠壓、深拉及壓花，硬塗層能夠降低其摩擦、磨損及起邊。大部份的情況下，生產過程中的再拋光工序亦可免除。

### Plastic Injection Molding and Die Casting 注塑及壓鑄成型模具

The hard coatings increase productivity for plastic forming and Die-casting forming machine components with better release and lower tool wear. Low roughness and excellent surface texture improve part release and influence injection forces in the mold to allow shorter cycle times. For parts with a mirror finish, re-polishing after coating is recommended. Due to physical limitations, deep holes and slots are seldom coatable.

硬塗層能夠為塑膠成型、壓鑄成型及機械零件增加更高的脫模能力及降低磨損，從而提高生產力。此外，平滑及極好的產品表面經塗層後均能改善產品的質量及縮短周期，如要超光鏡面的話，塗層後亦可作再拋光處理。

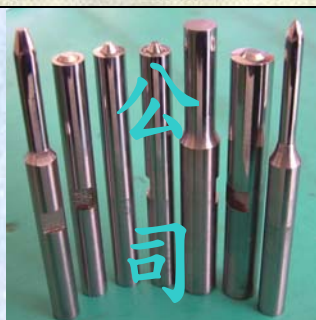
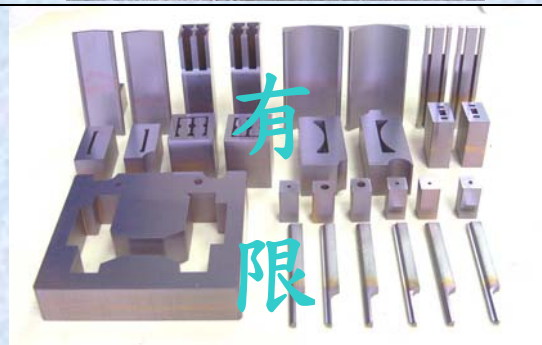
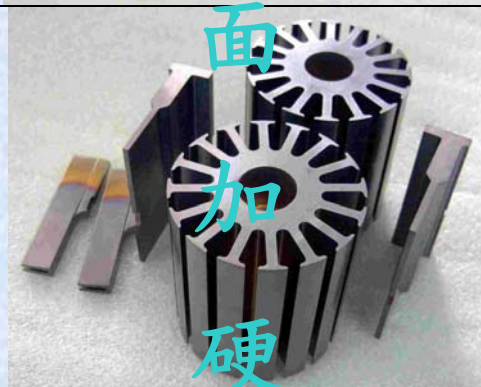
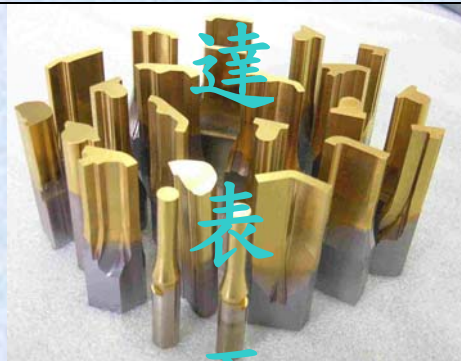
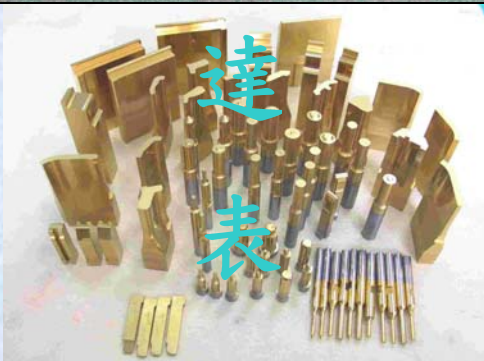
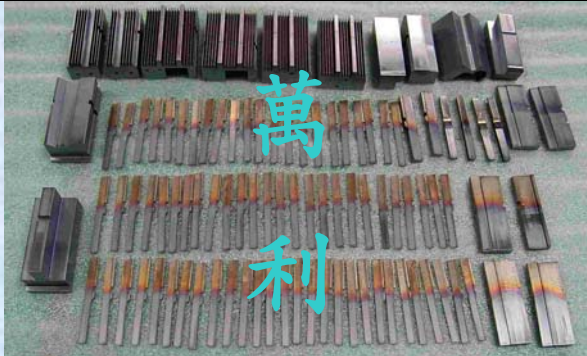
### Tribology 潤滑性

The hard coatings solve tribological problems with **mechanical** components that can be coated at temperatures of 200-500°C. Due to the hardness (up to 36 GPa), abrasive wear is reduced. This leads to higher reliability for dry operations and environmentally damaging lubricants can be replaced.

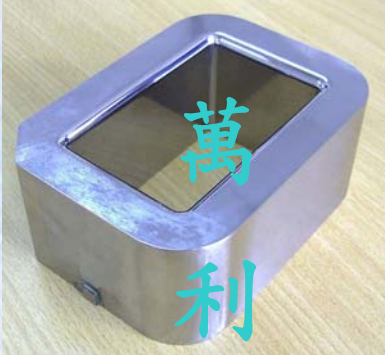
硬塗層能改善機械零件的潤滑問題，由於硬度高達 36GPa 或 3600Hv，磨損性可以降低。這樣可以在乾的情況下運作並免除使用破壞環境的潤滑劑。

Coating Usage Cases 塗層使用例子

Sheet Metal Stamping Die 五金沖壓模具



Sheet Metal Drawing Die 五金沖壓成型模具



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達表



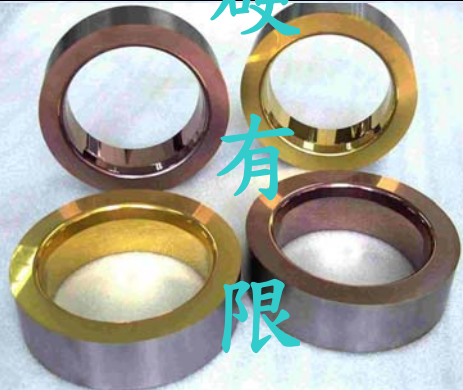
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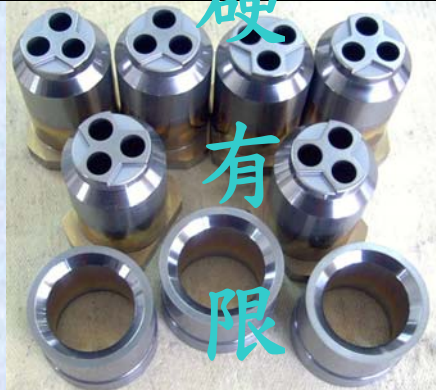
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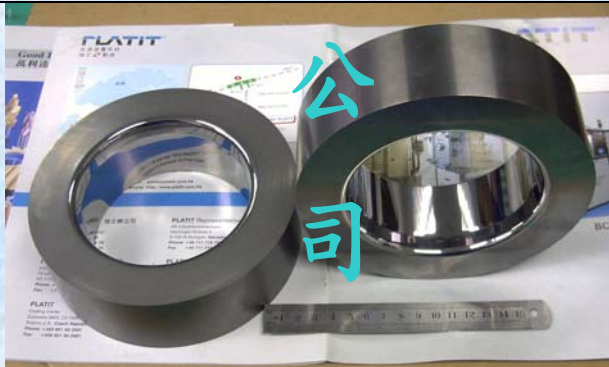
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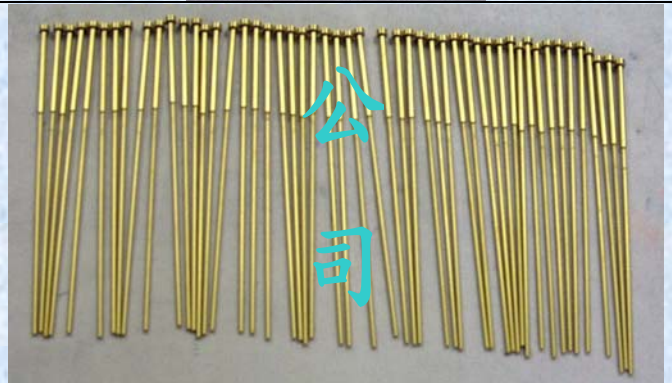
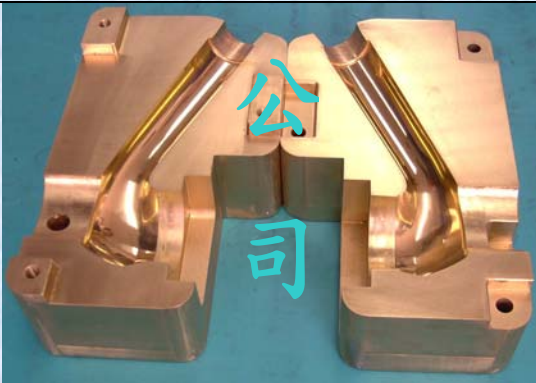
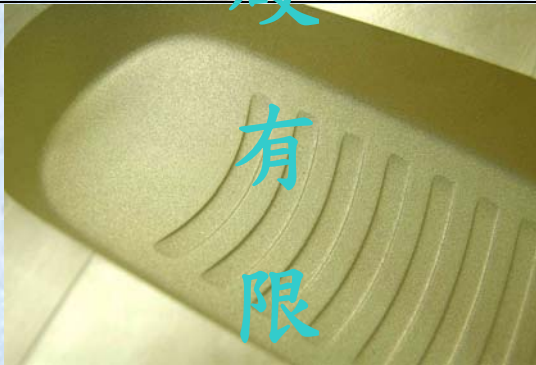
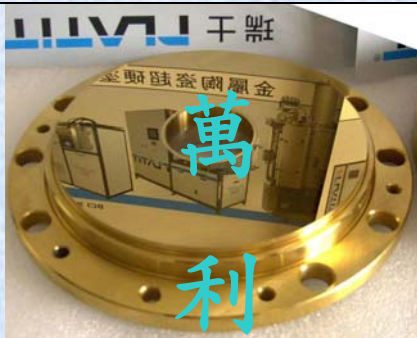


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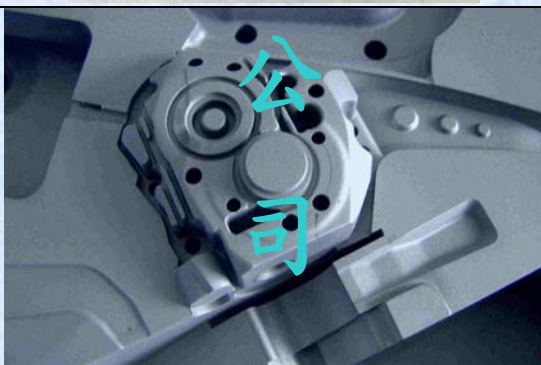
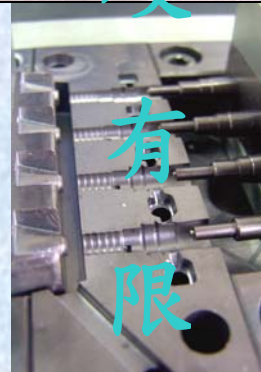
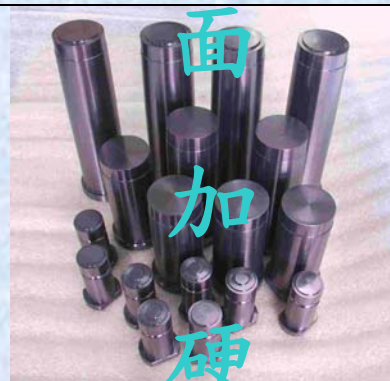
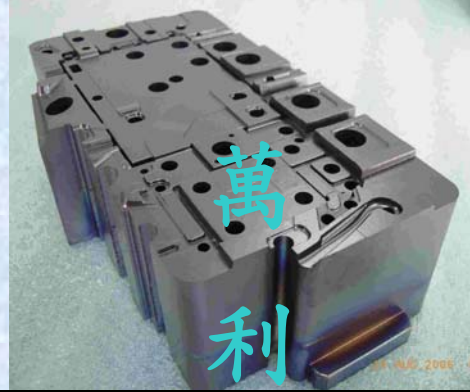


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Plastic Injecting Moulds and Die Casting Die 注塑及壓鑄成型模具



AL,Zn,Mag Die Casting Die 鋁、鋅、鎂合金壓鑄成型模具



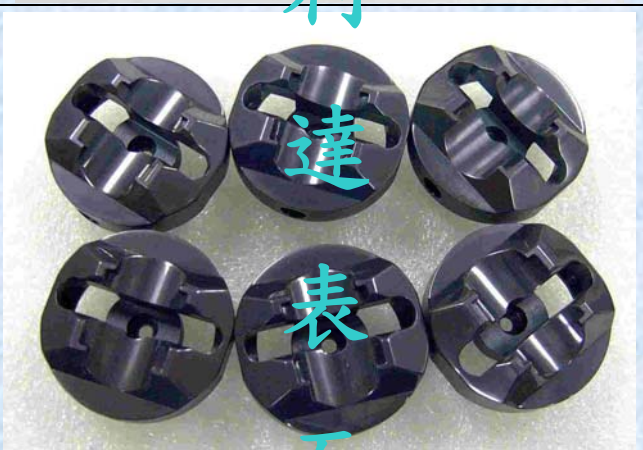
Cutting Tools 切削刀具

Mechanical components 機械零件



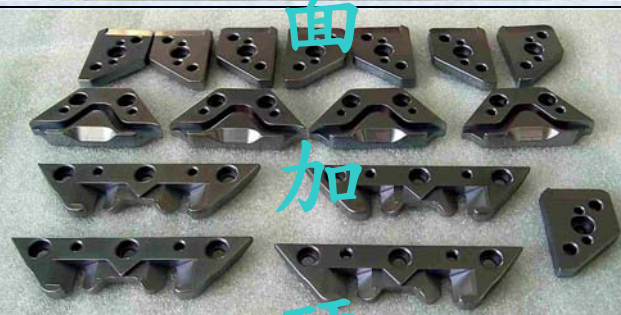
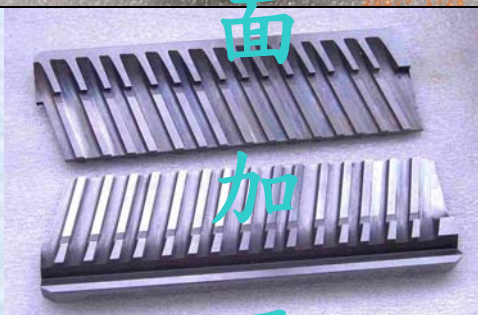
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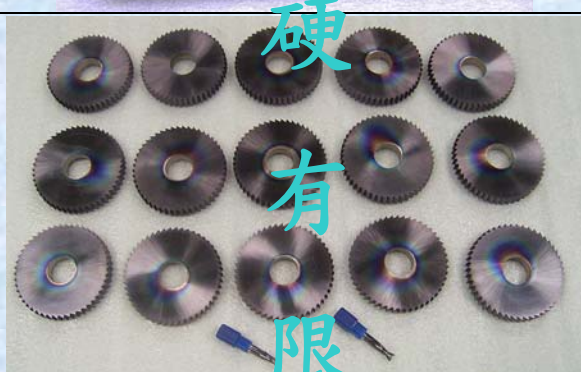
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## Coating Types 特殊塗層

Coating units offer an optimal coating for every application. The three “base” coatings – TiN, TiCN and TiAlN – currently make up more than 80% of the world’s coating market. Just choose a coating and set its parameters – the coating process is executed automatically.

硬塗層可以為不同的工業應用提供優質的改變，一般易言 TiN, TiCN 及 TiAlN 塗層均為市場所接受，佔全球塗層市場約八成。除了要選擇適當的塗層參數外，整個操作塗層機之過程便可全自動化生產。

### Basic Coatings 標準型塗層

TiN	氮化鈦	TiCN	氮化碳鈦	TiAlN	氮化鋁鈦
TiN coating which normally apply for cutting, forming, injection molding as well as tribological applications. 普通用途塗層適用於切削、成型及注塑模具。		TiCN coating special suitable apply for interrupted cutting, milling, tapping, stamping, punching and forming. 高韌性塗層特別適用於銑削、攻牙、沖壓、成型及滾齒。		TiAlN is the new high-performance coating special for high speed cutting, also suitable for dry machining. 高抗熱及高性能塗層；特別適用於高速加工（不需冷卻劑）。	

In addition, many optional coatings are available, which significantly improve performance for special applications. 除了廣為人知的標準塗層外，我司還可提供以下的特殊塗層服務。

### Special Coatings 特殊塗層




AlTiN	鋁氮化鈦	CrN	氮化鉻	CBC (DLC)	碳基塗層(類金鋼石塗層)
AlTiN is a special high-performance coating with very high aluminium content and very high heat resistance. Which is suitable for dry high speed machining and especially for hard machining. 這塗層含高鋁元素，具有極高的抗熱性及其硬度極適合用於高速加工之工具。		CrN coating for forming applications such as molds and dies, machine components, optimum release for forming tools. The low deposition temperature possible is around 200°C. 這是一種低溫塗層，約 200 °C，有容易脫模之特性。特別適合用於模具、機械零件。		CBC (DLC) gradient coating is self-lubrication on top of other coatings, evaporated in the same batch. 這是一種自潤滑極佳之塗層，通常用於超硬塗層表面。	

TiAlCN	氮化鋁碳鈦	TiCN-MP	氮化碳鈦 - MP
TiAlCN special for milling, hobbing, tapping, stamping, punching and Zinc, Magnesium, aluminum die casting die The characteristic for this coating is high toughness, high hardness and high heat resistance, also with low friction coefficient. 這塗層有高的韌性、硬性及抗熱性，而且其摩擦係數比較低。特別適合用於銑、滾齒、攻牙、沖壓、鋅、鎂、鋁合金壓鑄模具。		TiCN-MP coating apply for interrupted cutting, milling, tapping, stamping, forming and hopping. 這塗層有極高的韌性，刀具經塗層後，刀鋒穩定性高。極合用於銑、滾齒、攻牙、沖壓。	






## Coating Specifications 塗層規格

### Coating Properties 塗層特性

#### Basic Coating 標準塗層

	Colour 顏色	Nanogardients 納米硬度 [HV]	Thickness 塗層厚度 [ $\mu\text{m}$ ]	Friction (fretting) coefficient 摩擦系數	Max. usage temperature 最高應用溫度 [ $^{\circ}\text{C}$ ]	Symbol color 符號顏色
TiN 氮化鈦	gold 金	2400	1 - 4	0.55	600	
TiCN 氮化碳鈦	blue-grey 藍-灰	3700	1 - 4	0.2	400	
TiAlN 氮化鋁鈦	violet-black 紫-黑	3500	1 - 4	0.5	800	

#### Special Coatings 特殊塗層

AlTiN 鋁氮化鈦	black 黑	3800	1 - 4	0.7	800	
CrN 氮化鉻	metal-silver 金屬-銀	1800	1 - 4	0.3	700	
CBC (DLC) 碳基塗層(類金 鋼石塗層)	grey 灰	2000	0.5 - 4	0.15	400	
TiAlCN 氮化鋁碳鈦	burgundy -violet 紫	2800	1 - 4	0.25	500	
TiCN-MP 氮化碳鈦-多層	red-copper 紅-銅	3200	1-4	0.2	400	

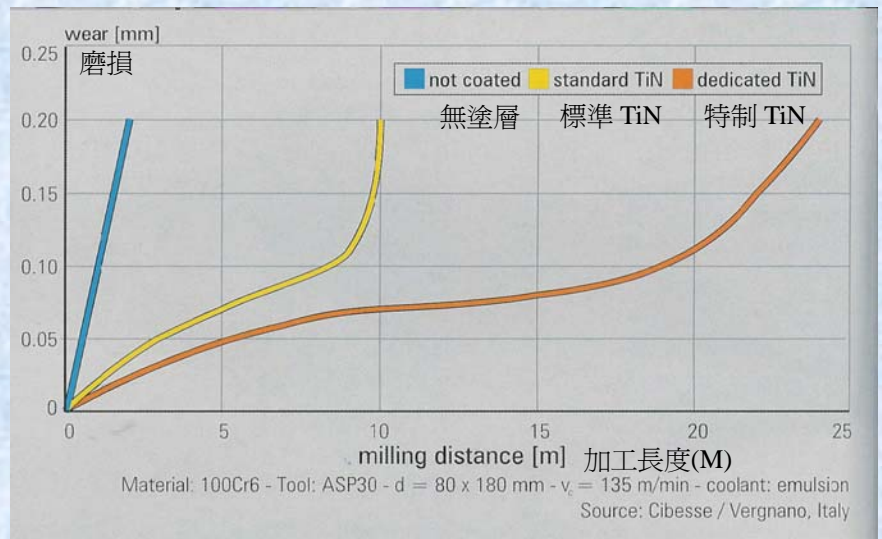
### Coating Usage Recommendations 塗層應用建議

	Drilling 鑽	Turning 車削	Milling 銑削	Tapping 攻牙	Sawing 拉削	Reaming Broaching 鉸孔	Injection Molding 注塑模具	Stamping Punching 沖壓模具	Deep Drawing 深拉模具	Forming Molding 五金成型 模具
Steels 鋼	TiAlN AlTiN	TiAlN AlTiN	TiCN-MP TiAlCN	TiCN-MP TiAlCN	TiCN-MP TiAlCN	TiCN-MP TiAlCN	TiN CrN	TiCN-MP TiAlCN	TiCN-MP TiAlCN	TiCN-MP TiAlCN
Cast Iron 鑄鐵	TiAlN AlTiN	TiAlN AlTiN	TiAlN TiCN-MP	TiAlCN TiCN-MP	TiCN-MP TiAlCN	TiAlCN TiCN-MP				
Super alloys (Ti, Ni, Mg, Ni) 合金	TiAlN AlTiN	TiAlN AlTiN	TiAlCN TiAlN	TiAlCN TiCN-MP	TiCN-MP TiAlCN	TiAlCN TiCN-MP	TiN CrN	TiAlCN TiCN-MP	TiCN-MP TiAlCN	TiCN-MP TiAlCN
Copper 銅	CrN	CrN	CrN	CrN	CrN	CrN	CrN	CrN	CrN	CrN
Bronze, Brass 黃銅	TiCN TiCN-MP	TiCN TiCN-MP	TiCN TiCN-MP	TiCN TiCN-MP	TiCN TiCN-MP	TiCN TiCN-MP	CrN TiN	TiCN TiCN-MP	TiCN TiCN-MP	TiCN TiCN-MP
Plastic 塑膠	TiN TiCN-MP	TiAlN AlTiN	TiAlN TiAlCN	TiN TiAlCN			TiN CrN			

Example 1 : Gear Hobbing  
例子 1 : 滾齒加工



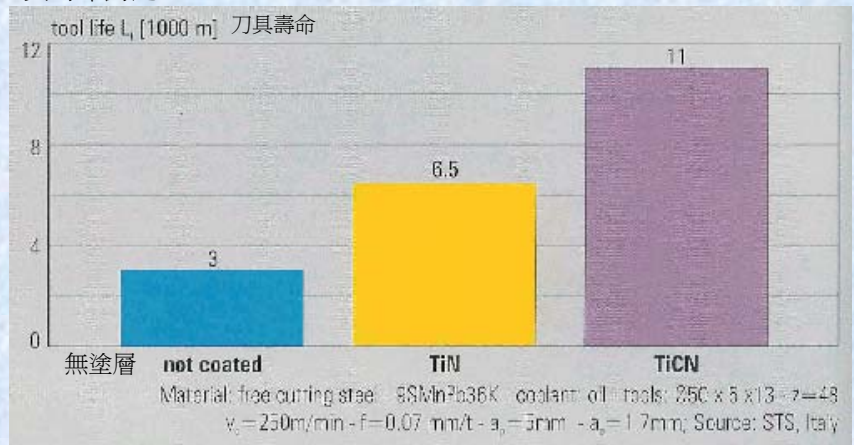
Wear Comparison  
磨損對比



Example 2 : Side Milling  
例子 2 : 邊銑削加工



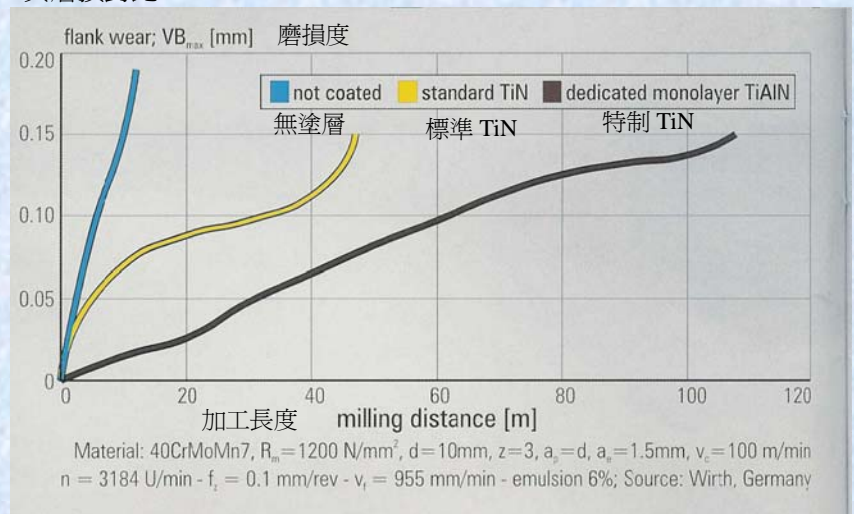
Tool Life Comparison  
工具壽命對比



Example 3 : Free-Form Milling  
例子 3 : 立體輪廓加工



Tool Wear Comparison  
工具磨損對比

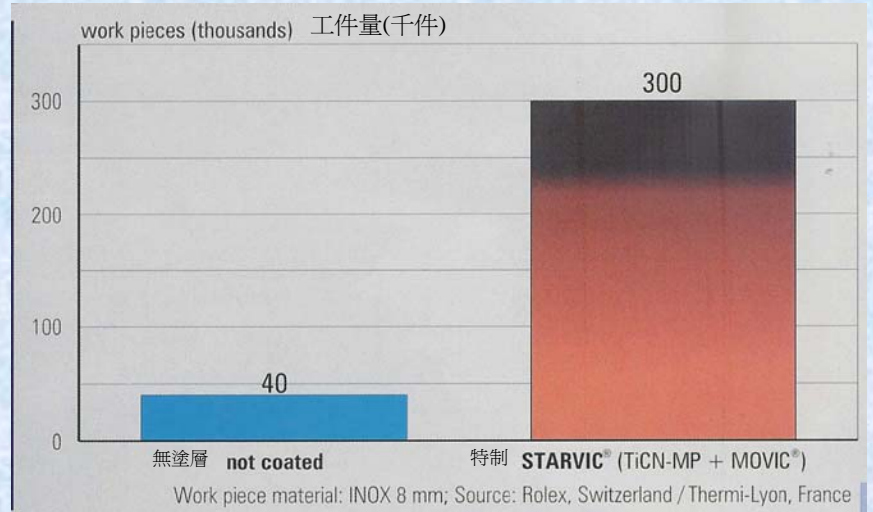


# Coating Applications 塗層應用

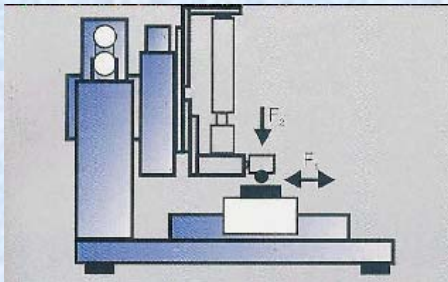
Example 4 : Punching  
例子 4 : 沖壓模具



Tool Life Comparison  
工具壽命對比

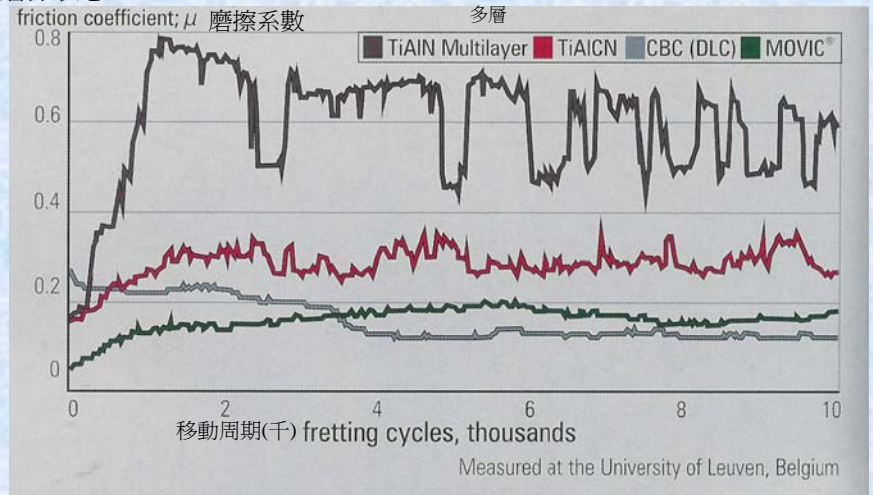


Example 5 : Fretting Test  
例子 5 : 磨損測試



- Fretting test conditions: 磨損測試條件:
- coating on tungsten carbide; K40UF 碳化鎢(K40UF)上的塗層
  - constant load: 2 N 設定重量: 2N
  - displacement: 100  $\mu$  m 移動距離: 100  $\mu$  m
  - f=10Hz; f=10Hz;
  - ceramic ball d=10mm 陶瓷球 d=10mm
  - T=23°C; 10%humidity T=23°C; 10%濕度

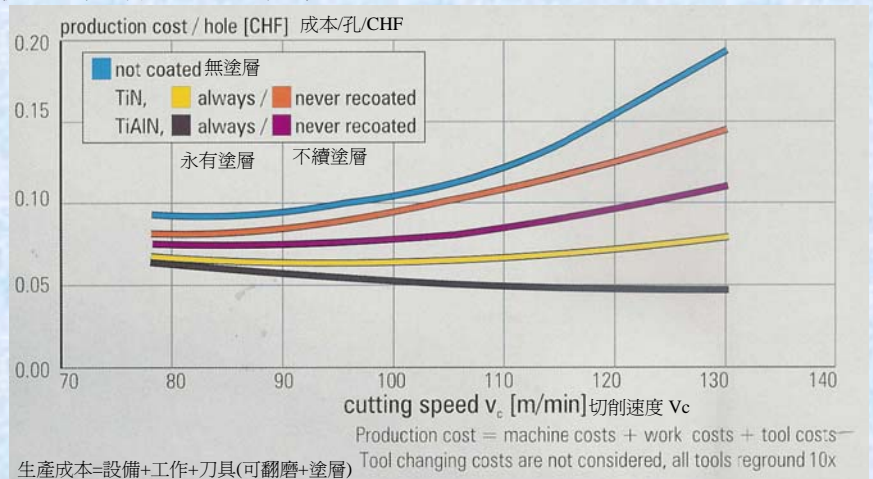
Friction Behavior of Coatings  
磨擦狀態



Example 6 : Cost Advantage  
例子 6 : 成本對比



Production Costs with Solid Carbide Drills  
使用碳化鎢鑽咀的生產成本



**We committed to provide the best Quality**

**PVD Coating Service**

**For**

**Mould and Die Industries**

**我們為模具工業提供最優質塗層服務**

**Thank You!**