

■ TB Coating

Technical Data

Tetrabond Diamond Coating TB超硬類鑽膜

A different type of DLC 並不是一般的類鑽膜

Super high lubrication & Super low friction coefficient

New PVD Nano Technology

The tool is long life to be surprised because TB hardness to near the the nature diamond coating
Swiss & Speed Tiger Technological Cooperation.

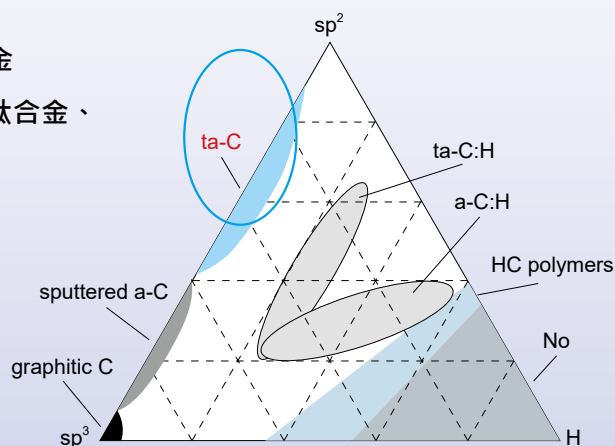
超高潤滑性·超低摩擦係數

最新奈米物理氣相沉積科技

超高硬度·超長壽命·惟有CVD鑽石薄膜可相比擬

泛虎與瑞士 Ionbond 技術合作開發

- Nano-composite coating which is improved the lubricative property without making the abrasive property lower by new coating material of nano-crystal.
- Excellent cutting is reached in machining non-ferrous materials, especially in aluminum with over six multiple in machining efficiency. Long tool life and precision machining in PCB boards, Brass, Titanium, Ceramics, Fiberglass etc.
- Dry cutting applicable, because of less cutting heat by improving friction property very much and wet cutting applicable.
- 奈米複合塗層採用奈米晶格靶材，大幅改善潤滑效果，有效的降低摩擦係數並且維持更好的耐摩耗性。
- 出色地應用在非鐵金屬加工，尤其是在鋁合金加工效率在6倍以上，並且在PCB板、銅、鈦合金、陶瓷形成超長刀具壽命和高品質加工。
- 摩擦係數大幅改善，形成較低的切削溫度，所以乾式切削可行，濕式切削亦可行。



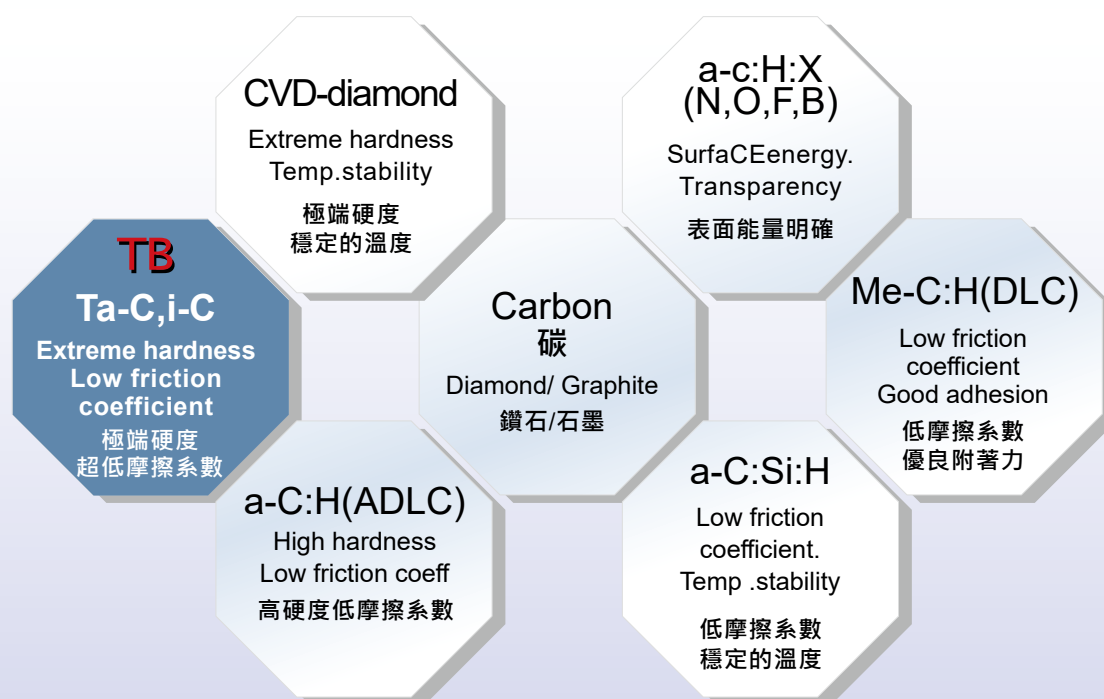
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TB超硬類鑽膜 系列

DLC coatings are generally deposited by five methods, each having different properties :
DLC 薄膜有5種不同的沉積方法，而每一個各有不同的特性：

		TB Ta:C	PVD a:CH	PVD Me:CH	CVD	PaCVD
Deposition temp	沈積溫度	under 150 C	under 200 C	under 200 C	over 900 C	under 200 C
Range of substrates	基材限制	Broad	Broad	Broad	Limited	Broad
Oxidation temp	氧化溫度	500-1000 C	350 C	300 C	700 C	300 C
Adhesion	附著力	Very good	Good	Very Good	Excellent	Good
Smoothness	平滑度	Good	Very good	Good	Good	Excellent
Hardness (GPA)	硬度	60-95	25	10-15	40-90	20-40
Coefficient of friction	摩擦係數	<0.1	<0.1	0.15	<0.4	<0.1
Hydrogenated	氫化	No	Yes or No	Yes	No	Yes
Metal content	金屬親和性	No	Yes	Yes	No	No

All DLC coatings are not equal : especially on Hardness and Oxidation
各種類鑽膜都有不同的特性，尤其是硬度和氧化溫度



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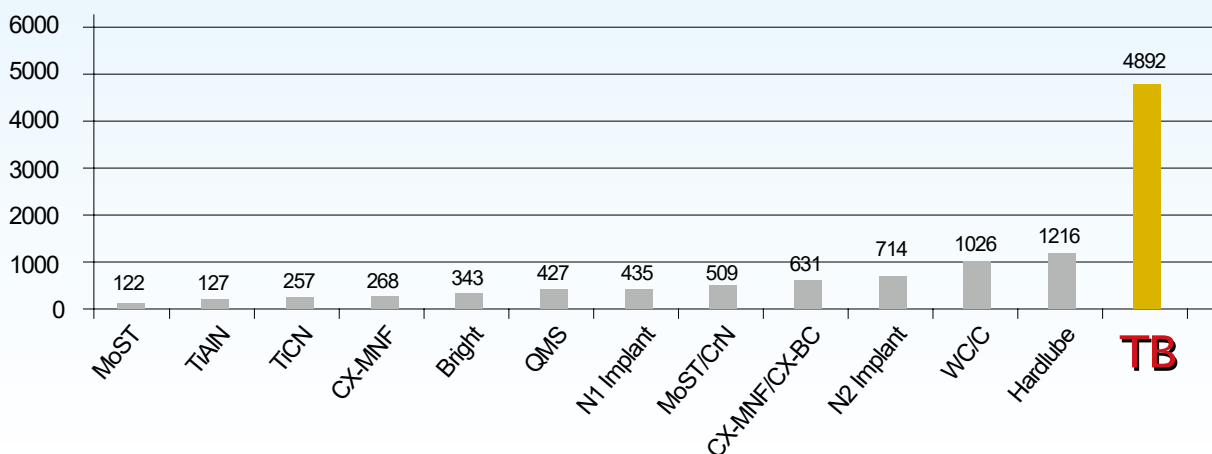
Performance and cost savings - Dry Drilling
節省成本和高性能－乾式鑽孔

Dry Drilling in A-319 Aluminum - pilot holes with cold-air 3500 rpm and 15 ipm / D13227A drills - Average number of holes.

鋁合金 (A-319) 乾式鑽孔－氣冷－3500rpm－15ipm/D13227A－平均鑽孔數

TB exhibits outstanding performance in machining aluminum!*

TB塗層在加工鋁件有著優異的表現



TetraBond Performance

TB 類鑽石完美的表現在非鐵材質的加工

TETRABOND is an excellent choice for machining non-ferrous materials such as:

TB 類鑽石薄膜非常出色的表現在機器加工非鐵金屬材質上

- High silicon content aluminum alloys 高矽鋁合金
- Aluminum magnesium matrix materials 鋁合金
- Titanium 6Al4V 鈦金屬
- Epoxy resins 環氧樹脂
- Fiberglass and composites 玻璃纖維和合成
- Plastic 塑膠
- Graphite 石墨
- Brass and bronze 黃銅和青銅
- Ceramics 陶瓷

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TETRABOND Advantages.

TB 薄膜的優勢

- No substrate preparation required 不必特別選擇基材
- Suitable for HSS and carbide cutter 適合高速鋼和碳化鎢工具
- Able to strip and recoat without damaging the substrate 沒有任何有害物質，非常環保，且容易再塗層
- Thin coating maintains sharp edges 非常薄的膜厚可以保持工具銳利

TETRABOND reduces manufacturing cost through:

TB類鑽石薄膜可以大幅降低製造業成本

Higher Speeds & Feeds 高轉速和高進給	→	Improve productivity 增加生產效率
Reduced Tool Inventory 減少庫存工具	→	Tool cost savings 降低工具成本
Longer Tool Life 較長的工具壽命	→	Reduced downtime 減少停機時間
Improved Part Quality 精良的工作品質	→	Less scrap 較少的毛邊

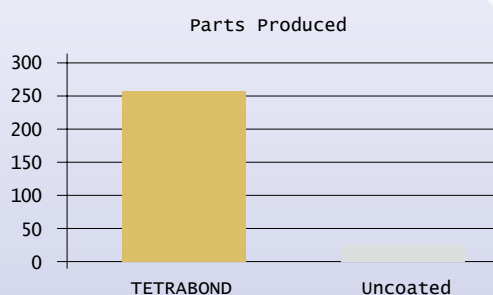
Performance and cost savings Rough turning Titanium 6AL 4V

性能和節省成本：鈦合金 6AL 4V的車削



Insert WNMG 431 T-F IC20 Work material : Titanium 6AL 4V
刀片WNHG431 T-F IC20、被切削材質：Titanium 6AL 4V

- Speed : 800 rpm → 轉速：800 rpm
- Feed : 0.011 fpr → 進給：0.011 fpr
- Depth of cut : 0.080 inches → 深度：0.080 英吋



TETRABOND coated tools achieved over eight multiple tool life over uncoated tools
相較其它無鍍層的刀具，TB塗層刀具效能多了8倍