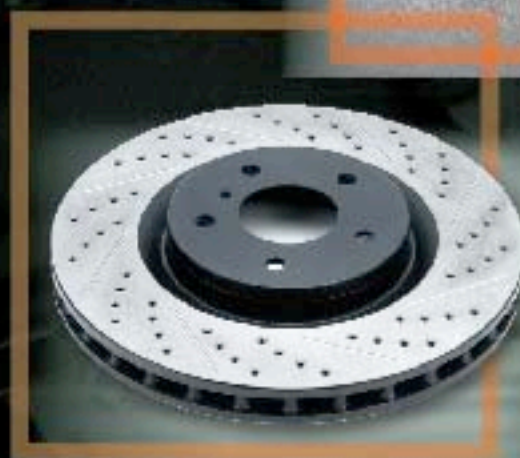


# ZICOLLUM™ 无铬水性锌铝涂料系统

## ZICOLLUM™ Chromium-Free Zinc & Aluminum Coating System



傳統的鋅鉻塗料技術雖然為我們提供了防腐性能優良的表面處理產品，但同時也危害著人類健康和自然環境。傳統鋅鉻塗料含致癌物質六價鉻，此物質不僅存於其塗料中，也包含在其塗層內，對使用者和接觸者直接構成健康危害及潛在威脅。隨著世界各國對環保的關注及歐美對六價鉻的規限，傳統的鋅鉻塗料市場正在迅速萎縮，甚至在某些應用領域中已被淘汰。

為響應清潔生產及環保電鍍大趨勢，我們將環保產品作為研發的重點和方向，隆重推出可以取代傳統鋅鉻塗料的環保型金屬防腐新技術 --- **ZICOLLUM™** 無鉻水性鋅鋁塗裝系統。

**ZICOLLUM™** 塗料系統的塗料和塗層均不含任何形式的鉻元素（不含六價鉻和三價鉻），也不含有毒的金屬如鎳、鉛、鋇和汞等。與傳統的鋅鉻塗料系統相比，**ZICOLLUM™** 塗料系統採用納米包覆技術，將超細鋅、鋁薄片直接迭合包裹在特殊的成膜材料中，在金屬基材表面固化成防腐蝕性極高的無機膜層。

**ZICOLLUM™** 塗料系統包含 **ZICOLLUM™** 塗料、**ZICOLLUM™** 納米封閉劑及 **ZICOLLUM™** 塗裝工藝技術三個部分；整個生產過程（包括原材料採購、塗料製造及塗覆產品加工）全不使用任何有毒或有害的溶劑，真正實現了清潔生產。

**ZICOLLUM™** 塗料系統既具備傳統鋅鉻塗料系統的優點，同時又能滿足世界各國和汽車等行業對環境保護日益嚴格的法規要求（例如 ROHS、EOLVD 和 WEEE），絕對是傳統鋅鉻塗料系統的最佳代替產品。

In recent year, the global encompasses of numerous environmental issues, and strict laws are increasingly being enacted to restrict toxic substances. Among others, the use of hexavalent chromium, a substance has been widely used as an effective coating for preventing rust, is likely to be restricted and phased out under the new environmental regulations adopted mainly in the U.S. and Europe. In respond to this trend, we have recently developed the **ZICOLLUM™** Chromium-Free Zinc & Aluminum Coating system – an enhanced nano-technology based on the traditional rust-preventive coating ruled for the past 30 years in the real world application.

**ZICOLLUM™** Coating system has the advantages of the traditional zinc & chromium coating system, but is completely FREE of chromium (neither HEXAVALENT nor TRIVALENT) throughout the entire process. The traditional zinc & chromium coating system is a water-based dispersant containing metallic aluminum, zinc flakes, chromic anhydride, glycol, etc.; while **ZICOLLUM™** is a free of all dangerous substances, including nickel, cadmium, lead, barium and mercury.

**ZICOLLUM™** Coating system includes three parts: **ZICOLLUM™** Coating, **ZICOLLUM™** Nano-Sealer and **ZICOLLUM™** Coating Techniques; which all comply with the recent environmental regulations and are therefore the perfect substitution of the traditional zinc & chromium coating system.



## 不同塗層組合的驗霧測試結果比較

### Salt spray test results comparison of different ZICOLLUM™ coating combinations

	ZICOLLUM™ 塗層組合 Coating combinations	厚度 (微米) Thickness (µm)	鹽霧測試結果 (小時) SST Results (hrs)
一塗一烘 1 Coating 1 Burning	一塗一烘 1C1B	4.3	144
	一塗一烘 + 溶劑封閉 1C1B + Solvent Sealer		300
	一塗一烘 + 水性封閉 + 溶劑封閉 1C1B + Water Sealer + Solvent Sealer		1100
兩塗兩烘 2 Coatings 2 Burnings	兩塗兩烘 2C2B	8.7	432
	兩塗兩烘 + 水性封閉 2C2B + Water Sealer		900
	兩塗兩烘 + 溶劑封閉 2C2B + Solvent Sealer		1200
	兩塗兩烘 + 水性封閉 + 溶劑封閉 2C2B + Water Sealer + Solvent Sealer		2160

## 外表美觀 Beautiful Appearance

塗層表面細膩，光澤極強；除銀白色的塗層外，亦可擁有不同色彩的表面。

Capable of forming a bright and fine argentous metallic surface; different color surfaces are also available for selection.

## 塗層薄 Thin Coating

不含有機樹脂的塗料可令塗層薄至 2 ~ 3 微米，而標準厚度一般為 8 ~ 10 微米；薄而均勻的塗層不會在緊固件槽或內孔部位造成嚴重積聚。

The resin-free coating can be as thin as 2 ~ 3 micron; the standard thickness of the coating is usually 8 ~ 10 micron; the thin and uniform coating film rarely accumulate in the inner & grooves of the screws;

## 環保 Environmental-friendly

低 VOC 排放，絕對符合國際標準。

Low VOC emission, comply with the international regulations.

## 耐腐蝕 / Corrosion Resistance

按照不同需求，塗層可分別通過 240 – 2000 小時不等的鹽霧測試。

Based on different requirements, the coating is capable of passing 240 – 2000 hours of Salt Spray Test.

## 耐熱 Heat Resistance

塗層的防腐能力在持久的高溫中仍能保持不變（如 300°C 烘 3 小時），並可接受各種加熱方式，既彈性又節能。

The corrosion resistance level of the coating remains unchanged even after heating for 3 hours at 300°C; and it's suitable for various heating treatments, flexible and energy saving.

## 抗雙金屬腐蝕 Corrosion Resistance to Bimetallic

ZICOLLUM™ 塗層中的鋁薄片能消除一般鋅層於接合鋁或鋼時所產生的典型雙金屬微電池。

The aluminum flakes in ZICOLLUM™ coating are capable of eliminating the typical bimetallic cells created during the bonding between the zinc layer and the aluminum or steel.

## 抗有機溶劑 Organic Solvent Resistance

塗層屬無機，能抵抗各種有機溶劑。

The inorganic coating resists to all organic solvents.

## 無氫脆 No Hydrogen Embrittlement

整個塗覆過程不需經過酸洗及任何電化學過程，底材不會出現氫脆現象。

No acid pickling or electroplating process requires throughout the entire process; the substrate is therefore safeguarded against Hydrogen Embrittlement.

## 黏度低 Low Viscosity

ZICOLLUM™ 屬納米水性塗料，可滲透工件的每個層面，不易疊積。

ZICOLLUM™ is a nanotech water-based coating capable of penetrating into all surfaces without any accumulation.

## 投資成本少 Low Investment

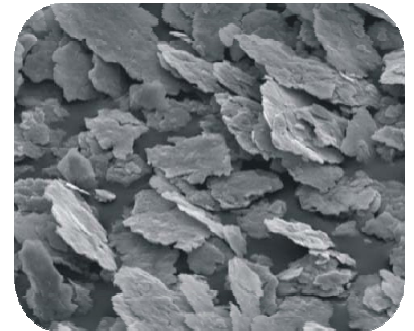
可在傳統鋅鉻塗料系統的生產線上直接使用、無須改造或更換生產設備；且塗料不含任何危險溶劑，生產設備不但無需達到防爆要求，儲存倉庫也不需要採用設有空調的專用庫房，直接降低固定資產投資；

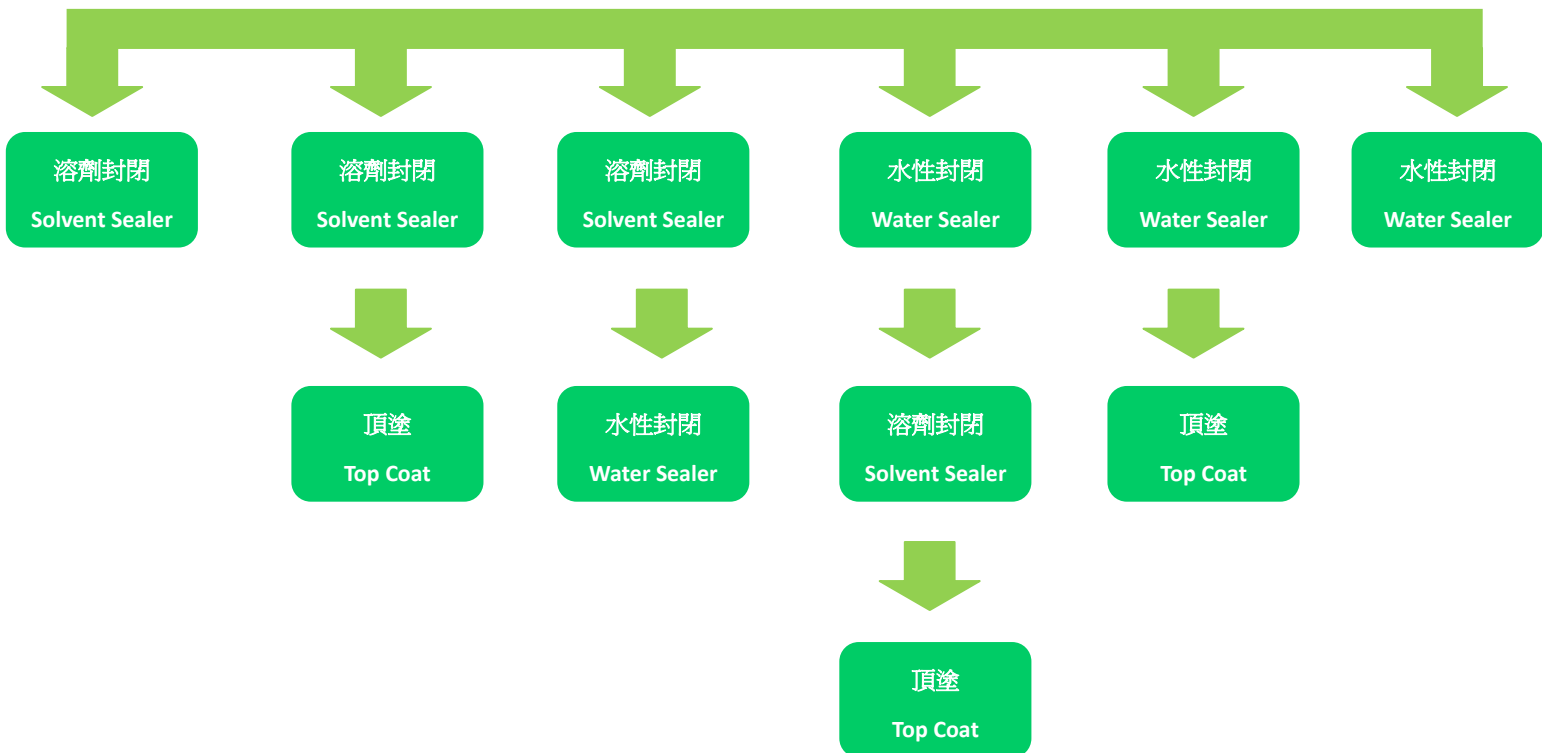
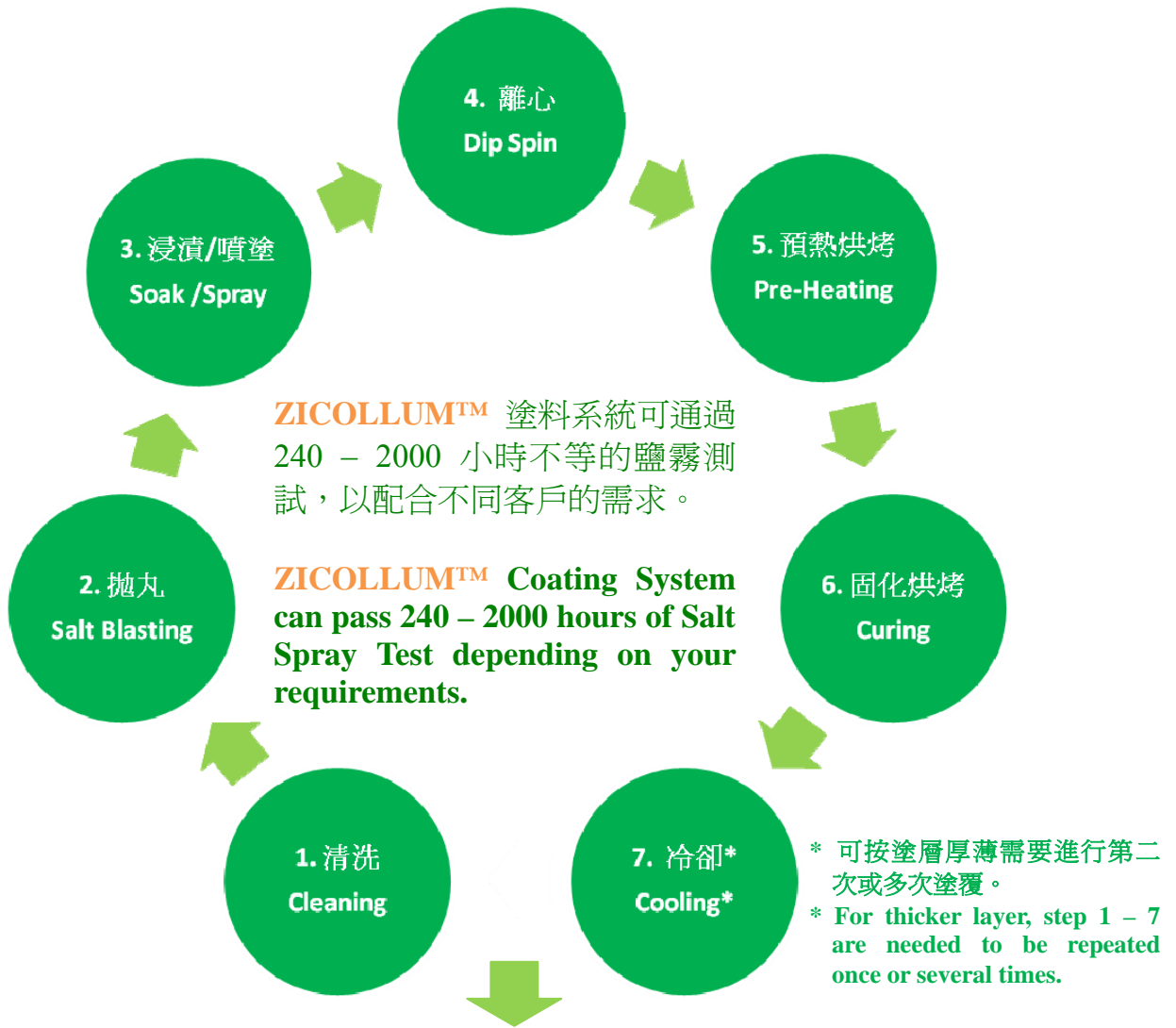
Applicable on the production line of traditional zinc & chromium coating system; replacement of existing production line is not necessary. Besides, the process is free of all dangerous substances, no special requirement for the facilities of the production line and storage; directly minimize users' investment.

## 生產成本低 Low Production Cost

塗料效能高、消耗低，並且無須補充特殊稀釋劑；塗層的結合力優良，工件無需於前處理時進行拋丸；既節省能源，又能有效地降低生產成本。

The high performance coating materials require no special thinner; salt blasting before treatment is also not necessary due to the strong bonding of the deposits; minimize both energy consumption and production cost.





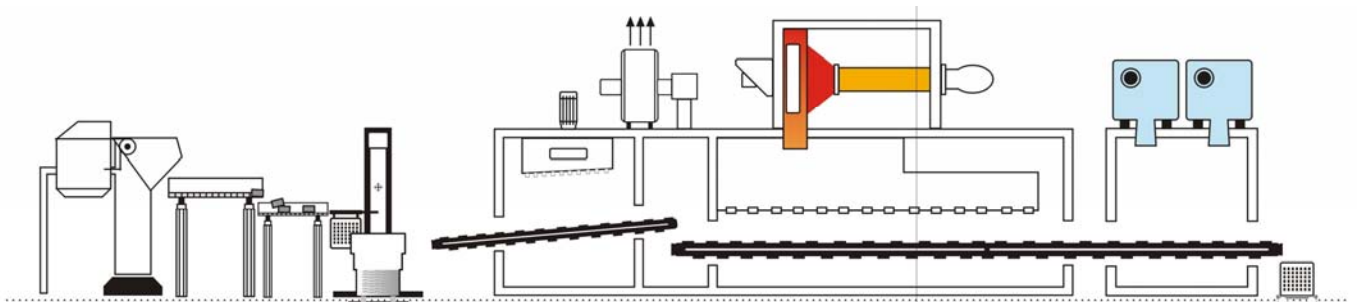
# 產品優點

# Advantages

產品名稱 Product	外觀 Appearance	特質 Characteristic	操作條件 Working Condition
ZICOLLUM™ 塗料 ZICOLLUM™ Coating GMT 320/ 600	銀白色糊狀物 Silvery White Slurry	<ul style="list-style-type: none"> <li>● 水溶性無鉻塗料 Water-soluble &amp; Chromium-free Coating</li> <li>● 無氫脆 Free of hydrogen embrittlement</li> <li>● 耐蝕性及耐熱性高 High Resistant to corrosion &amp; heat</li> <li>● 厚度：8 – 10µm Thickness: 8 – 10µm</li> </ul>	<ul style="list-style-type: none"> <li>● 預熱：100°C / 11 min Pre-heating: 100°C/11 min</li> <li>● 固化：350°C / 20 min Curing: 350°C / 20 min</li> </ul>
ZICOLLUM™ 水性封閉劑 ZICOLLUM™ Water Sealer CFP	無色液體 Colourless Liquid	<ul style="list-style-type: none"> <li>● 加熱或烘烤後不需額外進行噴塗 No spray coating needed after heating or curing</li> <li>● 不含鉻(VI)及(III) Free of Chromium (VI) &amp; (III)</li> <li>● 優良結合力 Excellent adhesion power</li> <li>● 厚度：1 – 2µm Thickness: 1 – 2µm</li> </ul>	<ul style="list-style-type: none"> <li>● 浸泡溫度：16 – 49°C Immersed temperature: 16 – 49°C</li> <li>● 浸泡時間：3 – 10min Immersed time: 3 – 10min</li> <li>● 烘乾：100 - 150°C / 15mins 以上 Curing: 100 - 150°C / 15mins or more</li> </ul>
ZICOLLUM™ 溶劑封閉劑 ZICOLLUM™ Solvent Sealer 310/ 413/ 613	黃色液體 Yellowish Liquid	<ul style="list-style-type: none"> <li>● 易燃 Flammable</li> <li>● 透明液體不影響底色 Colourless Liquid, suitable for any colour deposits</li> <li>● 提升工件的防腐能力 Enhance corrosion resistance</li> <li>● 厚度：1 – 2µm Thickness: 1 – 2µm</li> </ul>	<ul style="list-style-type: none"> <li>● 浸泡溫度：15 – 35°C Immersed temperature: 15 – 35°C</li> <li>● 浸泡時間：1 – 10min Immersed time: 1 – 10min</li> <li>● 烘乾：100°C / 10 min Curing: 100°C / 10 min</li> </ul>
頂塗 Top Coat 208/ 211/ 215	無色液體 Colourless Liquid	<ul style="list-style-type: none"> <li>● 加熱或烘烤後不需額外進行噴塗 No spray coating needed after heating or curing</li> <li>● 不含鉻(VI)及(III) Free of Chromium (VI) &amp; (III)</li> <li>● 優良結合力 Excellent adhesion power</li> <li>● 厚度：1 – 2µm Thickness: 1 – 2µm</li> <li>● 磨擦系數：0.08 – 0.15 Friction Coefficient: 0.08 – 0.15</li> </ul>	<ul style="list-style-type: none"> <li>● 浸泡溫度：16 – 49°C Immersed temperature: 16 – 49°C</li> <li>● 浸泡時間：3 – 10min Immersed time: 3 – 10min</li> <li>● 烘乾：100 - 150°C / 15mins 以上 Curing: 100 - 150°C / 15mins or more</li> </ul>

# 工藝流程

# Work Flow



基材 → 清洗 → 拋丸 → 浸漬/噴塗 → 離心 → 預熱烘烤 → 固化烘烤 → 冷卻  
 Substrate → Cleaning → Salt Blasting → Soak/Spray → Dip Spin → Pre-Heating → Curing → Cooling

為滿足不同客戶的需求，ZICOLLUM™ 塗料系統設有大、中、小型生產線以供選擇：中小型生產線一般適用於實驗室或小批量生產之工廠；而大型生產線則按客戶需求度身訂造整套系統，包括設計、製造及安裝。我們更提供全方位的技術指導及完善的售後服務。

To fulfill different customers' requirements, ZICOLLUM™ Coating System has production lines in various production scales: small- to medium-size production lines are usually suitable for laboratory production or small-scale production. For mass production, we tailor make the entire system from design, manufacture to installation according to the customer's requirements. We also provide all-round technical support and after-sales services.

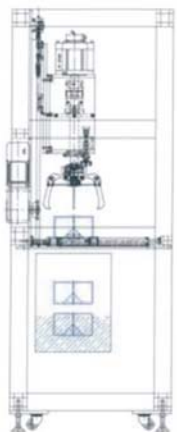
## 大型生產線

## Production Line for Mass Production

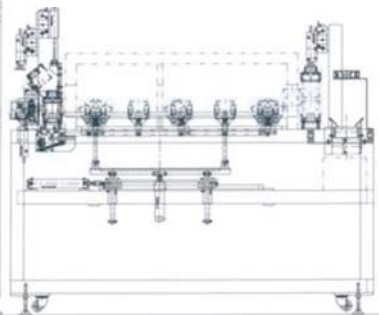


## 中小型生產線

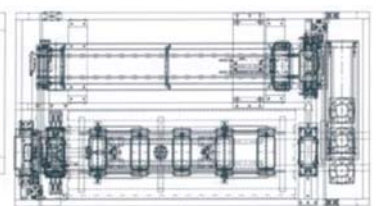
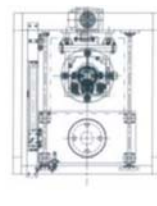
## Small- and Medium-sized Production Line



離心機  
Dip Spin Machine



烘烤機  
Oven



防腐能力比較：經過 240 小時中性鹽霧測試結果  
Corrosion Resistance after 240 hours of Salt Spray Test



ZICOLLUM™  
塗料系統

熱浸鋅工藝  
Hot-dipped galvanized

電鍍鋅工藝  
Zinc Electroplating

其他參數比較

Comparison of other Parameters

	ZICOLLUM™ 塗料系統	熱浸鋅工藝 Hot-dipped galvanized	電鍍鋅工藝 Zinc Electroplating
水洗 Water Wash	沒有 No	有 Yes	有 Yes
廢水 Waste Water	沒有 No	有 Yes	有 Yes
Coating 原理 Coating Principle	化學結合 Chemical Combination	金屬結合 Metal Bonding	金屬結合 Metal Bonding
塗膜厚度 Thickness	6 – 10 $\mu$ m	20 – 30 $\mu$ m	100 – 300 $\mu$ m
鹽霧測試 Salt Spray Test (Red Rust)	2000h	240h	480h
AL, AG 電鍍腐蝕效果 AL, AG Electric Corrosion	優良 Very Good	優 Good	優 Good
Bolt 締結性 Bolt Binding	優良 Very Good	優良 Very Good	優 Good
氫脆性 Hydrogen Embrittlement	沒有 No	有 Yes	有 Yes
塗布後塗裝性 Paint Ability	優良 Very Good	沒有 NIL	沒有 NIL
摩擦系數 Friction coefficient	0.1 – 0.3	0.3 以下 Below 0.3	0.25 以下 Below 0.25
產業分佈 Applicable Industries	汽車、建築、土木、電氣、 電子、國防工業、其它物類 Automotive, Construction & Building, Electrical appliances, Electronic, National Defense & Others	汽車、建築、土木、電氣、 其它物類 Automotive, Construction & Building, Electrical appliances & Others	建築、土木、大型構造 物 Construction & Building

# Know How, Can Do.



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