



# 美國離子能源

**Steel Shield Technologies**  
美國神盾活性磁懸浮潤滑油  
創業於 1985

**30** 載所向披靡  馭懸浮越頂峰



100% 美國技術  
100% 美國原料

## 工業應用簡介 Industrial Applications

世界唯一實現機件零磨擦的終極潤滑油

此油非等閒...實是一絕密科技!



# 重點簡介

Steel Shield— 世界唯一的磁懸浮潤滑技術

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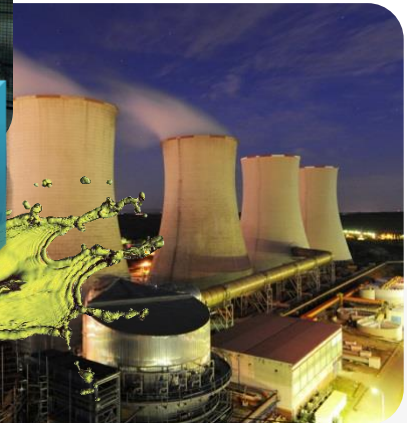
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神盾齒輪及液壓系統潤滑油重點推介



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# 1. 公司背景

Steel Shield Technologies (SST) 美國離子能源在美國賓夕法尼亞州創辦，並可追溯至 1985 年，專門從事賽車和工業方面的特種潤滑劑研究和開發。SST 擁有自家獨立廠房，自家生產配方獨有的活性因子，嚴格監控和整合產品的生產流程，產品優異質量得到保證。

SST 神盾產品 1985 年成功研發，自始掀起全球潤滑油世界換代新紀元！產品問世之始已經得到美國國防部的採用，至今仍然屹立不搖，而且一直被各大油品開發商和制造商模仿與意圖破解，時至今日未有一成功案例，市售的類似磁性產品只是東施效顰，子虛烏有，SST 神盾技術始終是獨一無二的！

Steel Shield Technologies (Asia Pacific) Ltd. 於1996年於香港註冊成立，並自 2012 年擴展以至獨家掌管亞太區所有業務。

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About Us



## 2. 神盾技術發明家 – Dr. George C Fennell



### 磁浮態之父

天文學和天體物理學博士

所屬組織：

SAE 汽車與宇航工程師學會

ASNE 美國海洋工程師學會

NCMA 國家合同管理協會

STLE 摩擦學和潤滑工程師學會

SOMEWHERE, SOMETHING  
INCREDIBLE IS WAITING TO  
BE KNOWN.

SAE  
INTERNATIONAL



1985 年，Dr. George C Fennell，秉承其父親及祖父在高階潤滑與表面摩擦學的科研，成功發明一革命性的金屬優化劑的方程式，通過專有和獨特的“離子轉移”技術（RCB 又名 ECI）它可以將金屬表層轉化為正極，進而產生磁懸浮效果的“高階邊界膜”（ABF）保護層。自那時開始，被潤滑科學界冠以無腐蝕鹵化高階邊界膜潤滑“磁浮態之父”的美譽。

這是現今最先進的潤滑技術，體現了數代科學家從夢想到實現近半世紀不懈追求和發展的研究和對科學的堅持的成果。為了滿足各種用途的具體要求，在 ABF 的基礎上，Dr. George C Fennell 研發了一系列的特種潤滑油製品。

多年來自神盾（Steel Shield）正式推出市場開始，市場上出現了無數的仿冒者試圖分解和仿製神盾產品，但由於其獨特的配方和先進的有機代謝技術，至今未有成功者。因此迄今為止，Dr. George C Fennell 仍然是潤滑科學領域的領導者。

### 3. 神盾磁懸浮潤滑技術的誕生

- 二次世界大戰，烽煙四起，由於戰爭需要，德國科學院提出解決重型武器例如裝甲車、坦克車、戰艦等高負荷、低維護、續航力強等等嚴苛潤滑需求的課題。
- 實現零摩擦必須借助 Magnetic Field Effect 磁場效應，應用 Like-Charge-Repel 同極相斥原理的方式。提出磁懸浮這個概念是早在二次世界大戰時期，但當時僅僅提出了一個磁懸浮的潤滑新概念。
- 二戰結束大量科學家從歐洲等國移民到美國，其中有位愛爾蘭籍的 Fennell 福諾博士，帶著大量研究資料在美國定居並且繼續進行這項技術的科學研究，“持之以恆”最終由其第三代傳人美國物理學博士 Dr. George C Fennell 喬治福諾於一九八五 (1985) 年取得了突破，成功研發出“磁懸浮”的 RCB 離子鍵轉移技術，創造了世紀獨一無二的 Zero Friction 零摩擦配方的 ABF「邊界膜保護層」潤滑技術。
- 它的研製發展過程凝聚了三代科學家的不懈追求，經歷了近半個世紀，由概念到實踐並不斷改良的演變。美國政府為表彰 Fennell 家族在美國工業界卓越不凡的貢獻，破天荒地將當時工廠外的一條街道命名為 Fennell 大道，以褒揚離子磁懸浮潤滑的發明者。



Steel Shield – 應用生化科技的潤滑油



# 3. 神盾磁懸浮潤滑技術的誕生

Steel Shield Technologies' mechanism of operation is based upon Tribology methods that improve lubricity and load carrying capacity by improving surface characteristics and creating a stable chemical, corrosion controlled halide-based boundary film. Steel Shield's active components react with each other and the contacting asperities of the metallic surfaces to provide five mechanisms of improvement.

1. Advanced chemical boundary film formation through reactive chemical bonding.
2. Ring opening, oxirane acid scavenging and advanced corrosion inhibition.
3. Organo-metallic substitution of surface metal and free radical reactionaries.
4. Improved surface smoothness and rolling out of irregular contacting asperities.
5. Re-conditioning and molecular reconstruction of the original contacting metal surfaces.

The process of advanced boundary film formation is accomplished with an advanced combination of halogens that are controlled and rendered non-corrosive to the base metals of the system and pose no threat to the ozone layer or waste oil recovery systems due to their origins and long chain molecular lengths. These halogens initially react under thermal conditions with the organo-metallic reagents to form surface attaching compounds, thereby limiting and controlling the formation of halides from the base metals themselves. These surface attaching reagents or "electro-negative compounds" seek out and affix themselves to the lower surface areas referred to as micro-pores and fissures, as all metals are crystalline in structure and exhibit a lattice type matrix. This complex process also incorporates Van der Waal forces and dipole-dipole surface reactions. During this process, surface lapping and asperity (irregular microscopic contacting and opposing surfaces) roll-out is also achieved, yielding improved spread characteristics of the surfaces themselves. Due to the increase of film strength by the filling of the micro-pores and fissures, along with thermal modification of the asperities, the resulting effect is a gradual rolling out or flattening of the metal asperities rather than a breaking off or chip-away process, which would create metallic debris in the lubricant leading to abrasive wear from wear metal particles. The resulting improvement in the opposing metal surfaces further increases the fluid film strength, which is dependent on the degree of surface roughness and viscosity.

Viscosity, however, is a lesser consideration when incorporating boundary additives or halogenation techniques.

In general, boundary friction and wear consists of two components, a shear or adhesion component and a plowing or deformation component. Considering the following equation:

$$F_s = S \cdot A_r$$

Where  $F_s$  is the shear component, which predominates except when asperities sink too deeply into a boundary lubricant film or a soft opposing surface. When movement or sliding occurs, the shear friction force depends on the shear resistance per unit area,  $S$ , of any "boundary film" in the real load-supporting area between asperities. Dividing by the load,  $W$  gives the shear contribution to the friction coefficient, becoming independent of total load and apparent area of contact:

$$f_s = S \cdot A_r / W = S / P_p \text{ or } S / P_e$$

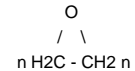
The boundary film shear resistance,  $S$ , is assumed equal to the plastic flow shear stress,  $T_p$ , of an ideal elastic, plastic solid. Such a solid gives shear stress independent of strain and strain rate at strains sufficiently large enough to cause plastic flow. The conditions that produce the "glass transition" from liquid to plastic-like behavior are dependent on the viscosity of the material at normal temperatures and pressures and the variation of viscosity with temperature and pressure. In other words, glass transition depends strongly on chemical composition.

These results show that liquid lubricants act like plastic solids in the films between asperities. Therefore,  $S = T_p$  in the previous equation and the friction coefficient is  $T_p/P_p$  or  $T_p/P_e$ . Since  $T_p$  is a weak function of temperature and pressure, and  $P_p$  or  $P_e$  are independent of apparent contact load, the frictional coefficient for a given combination of lubricant and sliding surfaces tends to be independent of operating conditions.

Elasto-hydrodynamic lubrication (ELH) on an asperity scale deposits film material between sliding surfaces in "micro-rheodynamic" (micro-RHD) lubrication. As one surface slides, each asperity carries with it an aggregation of SST additive. Sufficient pressure and temperature is developed within the film to elastically deform the asperity and to force the extreme pressure reagent between the surfaces or into the micro-pores and fissures. During this time, high thermal conditions involving pressure and asperity contacts initiate a re-conditioning of the surfaces utilizing the existing oil to quench and cool the surfaces in the same process. A thermal restructuring of these asperity contact areas creates a deviation from the normal crystalline structure of the metal, expanding it into an austenitic crystalline pattern, which is more evenly structured and allows the SST additive to bond to the actual lattice of the metal, endowing it with new and unique properties upon cooling.

Organo-metallic substitution is a technique developed and designed to inhibit the process of halide formation from the base metals of the system under reaction. For example, instead of the halogen reacting with the iron in the system to form iron halides, a boundary surface salt, it reacts with a reagent having very similar properties to the iron atom itself, thereby forming a organo-metallic complex without scavenging the target metal surface itself, and depleting the metal in a chemically corrosive wear syndrome.

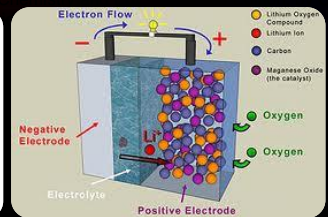
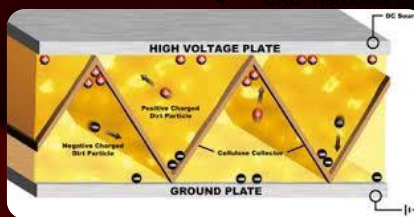
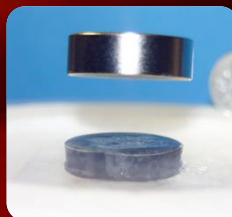
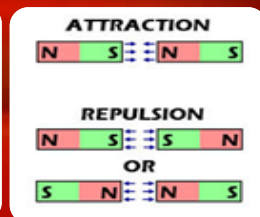
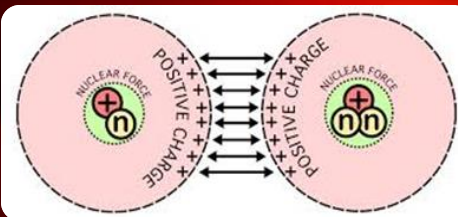
The process is very similar or analogous to the saponification of organo-metallic compounds in the manufacturing of greases. During this reaction or saponification, compounds react at a certain catalytic temperature and exchange characteristic components to form new compounds. These new chemical compounds are then used to aid in a boundary regime by providing an added protection to the actual surfaces being lubricated. Ring opening oxirane acid scavenging and corrosion inhibition is another chemical technique used to neutralize acids and inhibit oxidation and corrosion. This technique involves the use of specifically engineered complex ethylene oxide; oxirane rings, that possess reactive reagents which will cause a cleavage of the ring when encountering acids or strong alkaline. These reactions occur in the presence of both anionic- and cationic-type catalysts. Anionic catalysts can include alkoxide ions, hydroxides, metal oxides, and some organo-metallic derivatives while Lewis acids and protonic reagents initiate cationic reactions.



The lubricity, load carrying capacity, surface improvement, and wear reduction are greatly improved while corrosive aspects of halogenation are virtually eliminated.

## References:

1. CRC "Handbook Of Lubrication, Theory And Practice", Volumes 1 & 2, by E. Richard Booser, Ph.D., Society of Tribologists and Lubrication Engineers (STLE), copyright 1992, Eighth Printing.
2. "Organic Chemistry" 4th Edition, by Robert Morrison, Ph.D. and Robert Boyd, Ph.D., copyright 1983 by Allen & Bacon.
3. "Lubrication - A Tribology Handbook", edited by M.J. Neale OBE, BSc(Eng), published by Society of Automotive Engineers (SAE), copyright 1993, Butterworth-Heinemann, Ltd.





# 4. 美國神盾磁懸浮概念、優點、應用

## 概念

- 打破舊傳統 開創新紀元
- 讓潤滑有生命
- 潤滑非靠油 磁浮才是硬道理

## 優點

- 磁懸浮零磨擦保護組件
- 自動追蹤高溫部位強力散熱
- 排走千年污垢
- 環保、減排
- 提升機器裝備產能
- 大幅節省能源
- 機件顯著降溫
- 抗金屬氧化
- 絕佳冷啟動保護
- 顯著延長機件壽命



## 應用

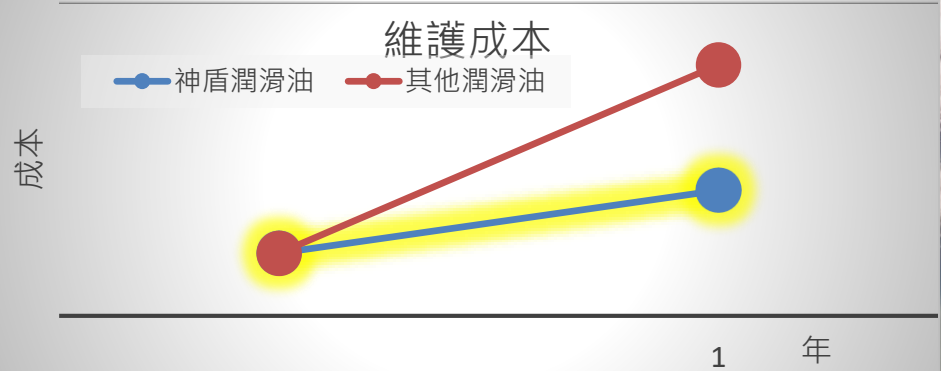
- 應用範圍廣
- 海陸空輕重型機械設備



# 5. 使用美國神盾磁懸浮油所得的最終益處

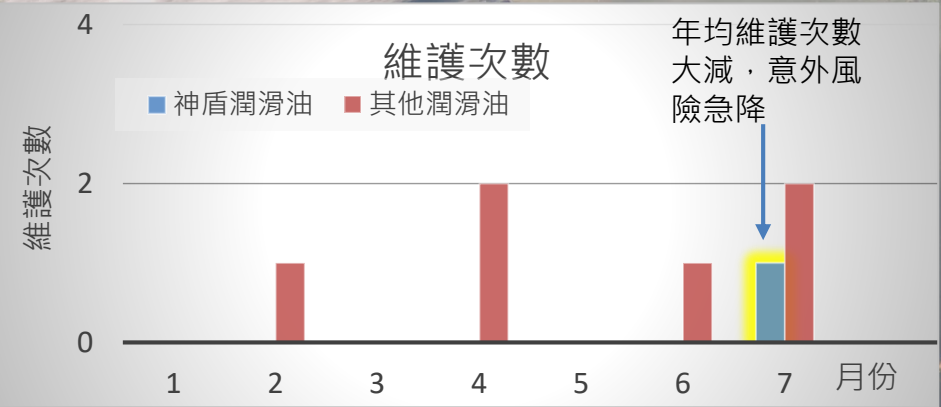
## 成本大降

- 維護次數大幅減少
- 機件耐久度大增，維修費大減
- 因停機而產生的營運成本大減



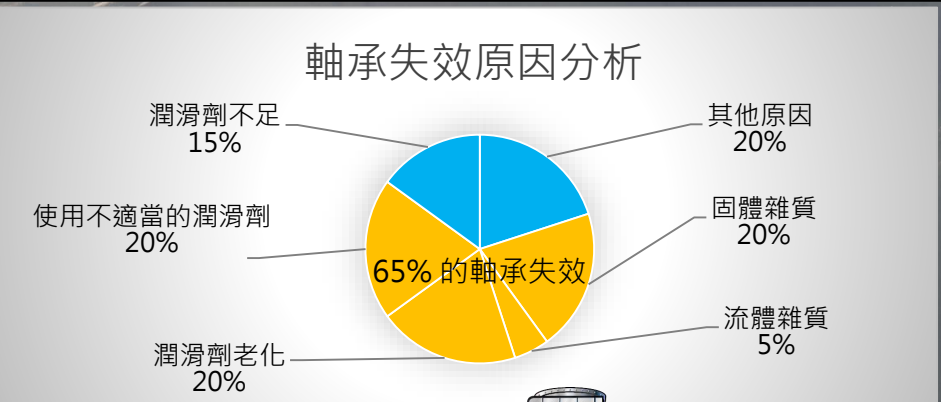
## 安全提升

- 機械事故大減
- 減少生產、運作時出現的故障
- 因維護次數大減，工作人員因維修機械而發生的意外的風險亦大減



## 更加可靠

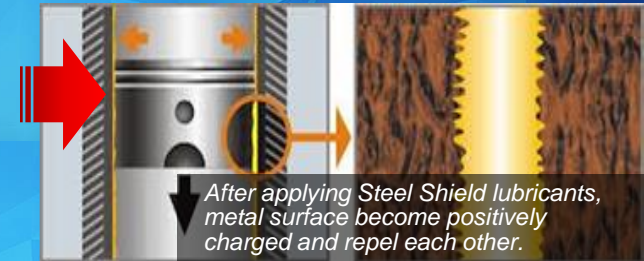
- 65% 的軸承失效能透過使用神盾而從中減少
- 神盾絕不含損害機件的固體添加劑
- 令機件保持清潔、產生更少金屬雜質
- 令客戶更安心、得到客戶的信任



# 6. 神盾 ABF 磁浮潤滑五個重大突破

## 1. 虛擬零摩擦 – RCB 離子磁懸浮

法拉第定律同極相斥，偶極反應原理



## 2. 獨具動態熱轉移大法

獨具活性因子動態追熱功能

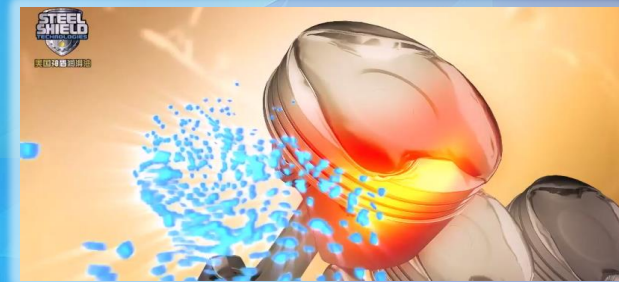
緊迫及凝聚於高溫點

## 3. 無腐蝕誘導技術物理排污

獨具磁誘導技術徹底清潔金屬碎屑

## 4. 獨具金屬表層加固技術

縱向剪切轉為定向擠壓改善表層金屬剛度



## 5. 運動中保護，降低系統故障

潤滑非靠油，磁浮才是硬道理

Not Just Oil · It's Technology



# 7. RCB 離子鍵轉移

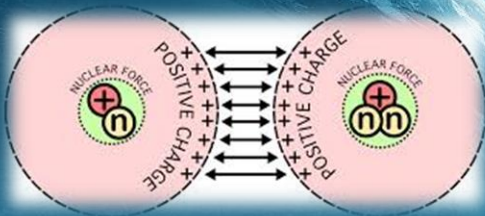


轉化金屬  
觸碰面為正極

同極相斥效應

懸浮狀態

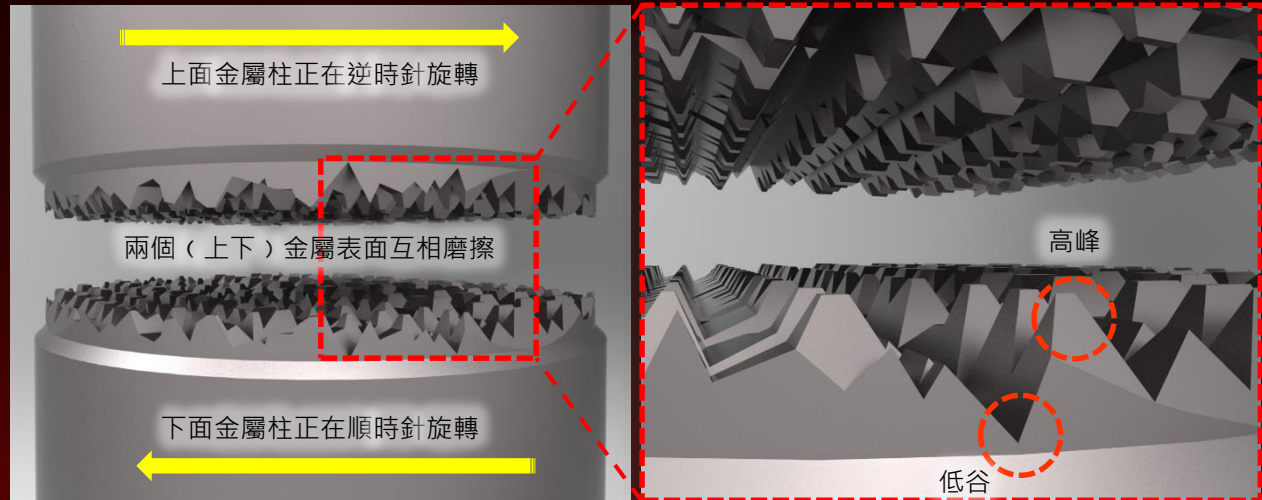
零摩擦



# 8. 詳解 ABF 磁浮潤滑的重要技術基礎

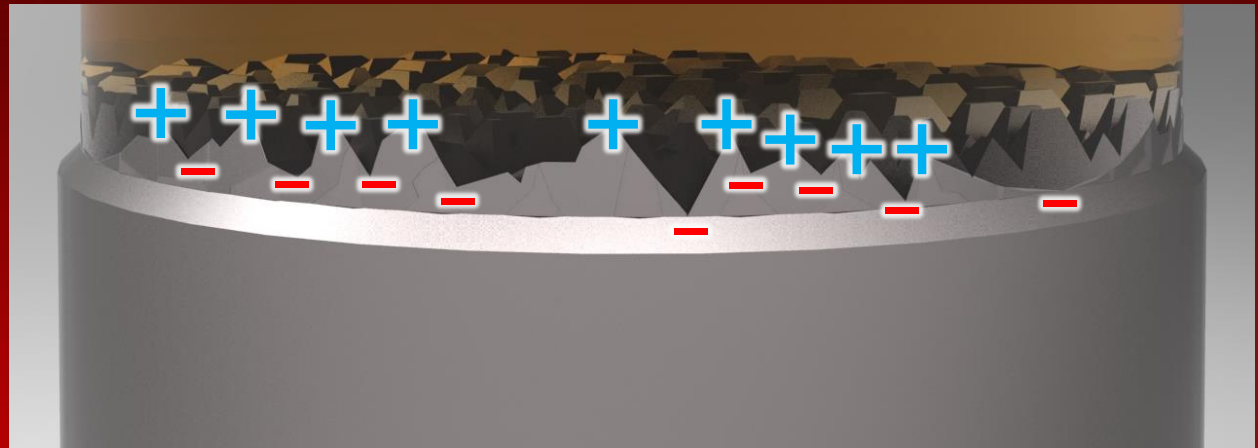
## 1. 金屬表面

兩面金屬互相磨擦時產生巨大阻力，在顯微鏡下，可看到金屬表面是由“高峰”及“低谷”組成，這就是磨擦阻力的源頭。



## 2. 表面的極性

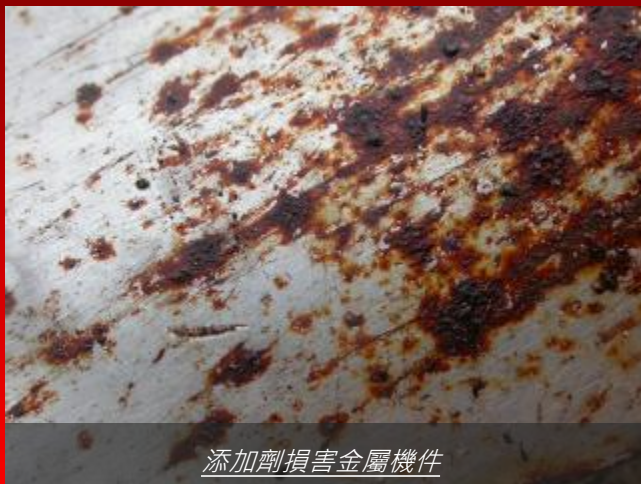
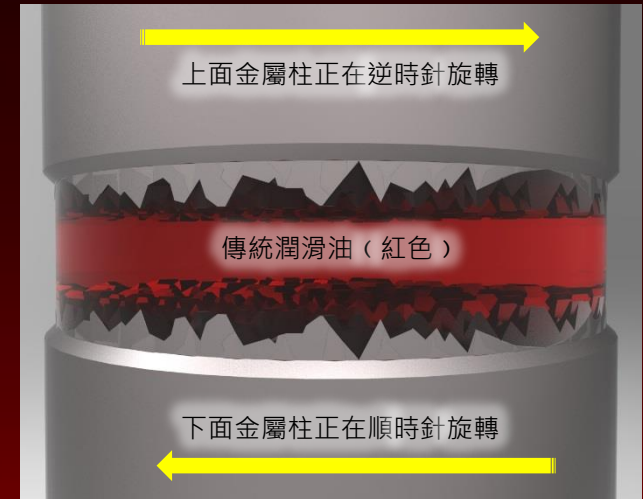
“高峰”是帶正極的，而“低谷”是帶負極的。



# 8. 詳解 ABF 磁浮潤滑的重要技術基礎

## 3. 傳統潤滑油

無論配方有多完美，都只是利用化學甚至軟金屬元素來改變油品的特性，只能短暫緩和金屬磨損，而且這類元素大多含有不明物質，長期使用有腐蝕機件之嫌，加速金屬解體。傳統潤滑之所謂“金屬平整功能”，就是要機件互相斬砍，讓金屬表面凸出的部份被削平，做成部件的原有質量下降和公差值的改變。機件不停碰撞產生碎屑，正是潤滑油變得越來越多雜質的主因，形成磨損惡性循環的後果。

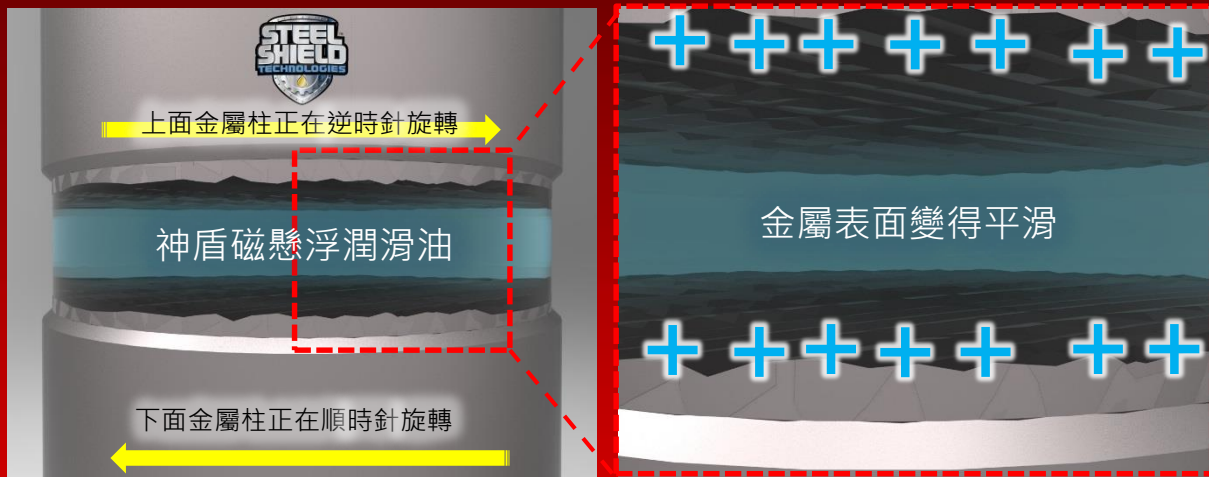


# 8. 詳解 ABF 磁浮潤滑的重要技術基礎

## 4. 使用神盾磁懸浮潤滑油

透過離子轉移使到金屬表面呈現正極狀態，法拉第定律同極互斥的一股能量於兩面互動金屬面之間形成，這能量會對突出的金屬部分進行徑向擠壓，往周邊微孔和裂縫推填並且撫平其表面，跟常規的縱

向剪切方式完全相反，不但不會做成任何金屬本質和公差值改變，而且加固了金屬表層的強度。



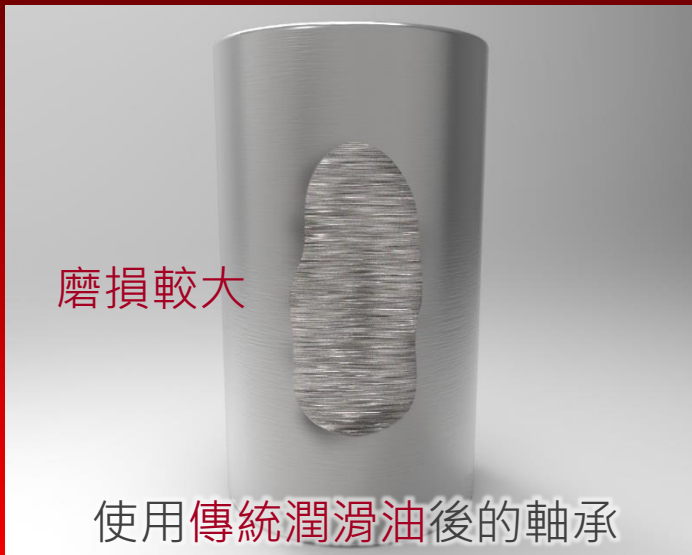
# 8. 詳解 ABF 磁浮潤滑的重要技術基礎

## 5. 神盾磁懸浮潤滑油與傳統潤滑油的抗磨對決

神盾不會改變或者提升潤滑劑的基本參數和功能，但是它獨有的離子轉移技術確實的改變了兩面金屬的互動常態，產生磁懸浮效應。在磁浮狀態下，負載值与摩擦力之間呈冪函數關係，即在負載達到一定值后，增加負載量對摩擦力值的實質改變是“零”，摩擦力值趨向一恒定值。此時表明，在摩擦接口上，負載已基本上由離子磁場所完全承擔并使摩擦接口保持一定的間隙，而潤滑劑此時的僅有功能只起傳熱作用吧了！



軸承





# 9. 美國神盾產品總目錄



# 10. 美國神盾工業用產品目錄

Lithi Shield



Lithi Shield Grease



Steel Shield EPA



Strike Shield



Spray Shield



Tool Shield



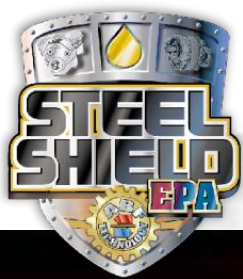
Drill & Tap Shield



Not Just Oil...  
IT'S TECHNOLOGY



100% 美國制造  
100% 美國進口



# 11. EPA 神盾極壓精油



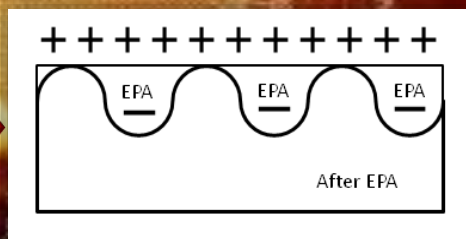
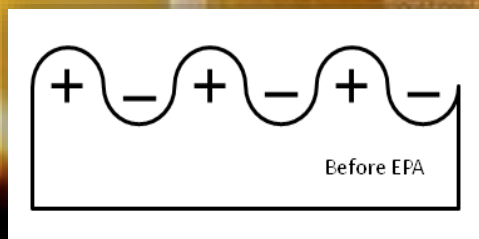
金屬表層離子化

平整金屬表面、並正極化

同極相斥效應 - 金屬之間「零」接觸

強排效果 - 帶走灰塵、金屬碎屑

減少磨擦、機件運轉更順暢



金屬粗糙表面放大圖  
高峰帶正電；谷底帶負電

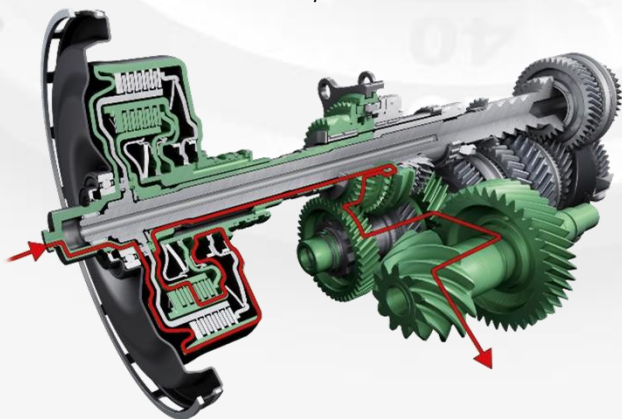
添加神盾 EPA 精油後，金屬表面全部帶正電，而且也變平整：

- ▶ 金屬碎屑被正極化，被排斥
- ▶ 原本黏附在機件表面上的舊潤滑油油膜被清走
- ▶ 神盾 EPA 精油最後依附在金屬表面，令金屬磁懸浮

神盾磁懸浮 EPA 潤滑油是一種先進科技及創新概念研製而成的活性配方，絕不含固體物質。它含大量正電離子，經由填平金屬表面的微細凹孔，以達到大大減低磨擦的功效，而磨擦減少帶來的立即利益是：省電。

因此它會使金屬表面變得更加平滑，同時也轉化成全面正極化。根據同極相斥的原理，金屬與金屬表面之間會產生一道幾不可見的空隙，從而使金屬之間接觸減至近乎零。

正電離子也會將灰塵微粒和金屬碎屑轉化成正極，因與金屬表面同極相斥，使其無法寄附於金屬表面，促使系統的導管內壁潔淨暢通，可同時增強功能及節省用電。





# 12. Tool Shield 神盾工具精油

## 材料安全資料

- 燃點：226°C
- 無公害
- 不易燃
- 合成碳氫化合物

## 物理資料

- 沸點：238°C
- 不溶於水
- 蒸發率：< 0.01
- 氣化壓力：< 1@25°C
- 比重：1.07
- 中至深琥珀色

## 推薦使用

- 旋轉式氣動工具
- 氣動切割工具
- 往復式氣動工具
- 氣動砂輪機
- 衝擊型扳手
- 氣動釘槍
- 氣動棘輪扳手
- 氣動釘裝機
- 氣動打磨機
- 自動注油器
- 氣動鑽機
- 手動工具

## 用法說明

- 按照工具製造商的說明書來使用。需要根據工具的使用頻率和是否長期使用，來決定每天潤滑一次還是數次
- 不含揮發物或溶劑。含合成的碳氫化合物和先進技術的有機金屬代謝優化劑。無毒、環保

大大強化金屬表面堅硬度

減少磨損、熱力、預防金屬部件氧化

提高工具設備有效功率、  
維修費用大幅下降

運作更暢順、耐用、寧靜



神盾工具精油是汽車業和工業類的工具設備的活動金屬件最強大的保護盾。

邊界膜保護層是一股隱形的離子能量，避免金屬直接碰撞，摩擦磨損、極壓扭矩、空氣管路水分和內部污垢所引起的熱量和摩擦磨損，使工具設備免受傷害。

它適用於所有的往復式、旋轉式氣動工具、固定式和掌上型電動工具、大部分的手動工具。神盾工具精油有去除污垢功能，提高工具設備的有效功率、性能，並大大減少了磨損。

產品編號	產品代碼	產品型號	裝箱數	箱子尺寸 (W x H x D)	箱子體積	箱子重量	TI / HI
TS-1	8-94630-00141-0	神盾工具精油 - 1 盎司 (29.5 毫升)	24	6.875" X 3.875" X 4.625"	0.07 inch <sup>3</sup>	2.5 lb	48 / 12
TS-4	8-94630-00143-4	神盾工具精油 - 4 盎司 (118 毫升)	12	5.5" X 6.5" X 7.125"	0.16 inch <sup>3</sup>	3.8 lb	40 / 8
TS-16	8-94630-00144-1	神盾工具精油 - 16 盎司 (473 毫升)	12	10.75 X 10.75 X 8	0.54 inch <sup>3</sup>	15 lb	20 / 5
TS-128	8-94630-00145-8	神盾工具精油 - 1 加侖 (3.785 升)	4	9.25 X 12.5 X 14.5	0.97 inch <sup>3</sup>	34 lb	12 / 4
TS-5G	8-94630-00126-7	神盾工具精油 - 5 加侖 (18.93 升)	1			42 lb	
TS-15G	8-94630-00127-4	神盾工具精油 - 1 加侖 (56.78 升)	1			125 lb	
TS-55G	8-94630-00128-1	神盾工具精油 - 1 加侖 (208 升)	1			455 lb	



## 產品規格

- NLGI 級別：2
- 抗磨金屬處理：神盾 EPA

## ASTM 測試結果

• D-217	潤滑膏圓錐鑽透測試, Worked, 60s	265 - 295
• D-217	潤滑膏圓錐鑽透測試, Unworked	265 - 295
	增稠劑種類	鋰基潤滑脂
• D128	增稠劑, %	8 - 11
	顏色	Light Amber
	材質	Smooth
• D-2265	滴點	500°F
• D-445	40°F時的黏度, cst	220
• D-445	100°F時的黏度, cst	19
• D-2270	黏度指數	95
• D-92	閃燃點, °F	464
• D-92	燃點, °F	550
• D-2509	泰姆肯測試 - 無磨損極壓負荷性能 (lbs.)	60
• D-1743	潤滑脂防腐蝕性能測定法	Pass
• D-4048	蒸氣脫脂級三氯乙烷規格	1B
• D-2266	四球磨損測試, mm	0.68
• D-2596	四球黏結測試, Kg Min.	800 / Pass
• D-5483	抗氧化誘導時間 210°C · 最低	11.47
• D-1264	水沖洗 @ 79°C	2.7 %
	77°F時的流動性, g/min	576
	60°F時的流動性, g/min	275.4
• 美鋼流動性試驗	40°F時的流動性, g/min	86.6
	20°F時的流動性, g/min	15.3
	0°F時的流動性, g/min	1.6

## 推薦使用

- 所有極壓應用
- 萬向接頭
- 所有轉動機械
- 所有重型機械
- 所有鐵路設備
- 所有船舶機械的應用
- 所有類型的傳送帶
- 所有類型的軸承
- 車身底盤、起落架裝置
- 所有類型的泵
- 傳動軸
- 所有軸類組件



# 13. Lithi-Shield (NLGI #2)

大大強化金屬表面堅硬度

減少磨損、熱力、  
預防金屬部件氧化

營運成本、維修費用  
大幅下降

運作更暢順、耐用、  
寧靜



神盾鋰基潤滑脂 LITHI-SHIELD 是世紀最強的抗高壓抗磨複合鋰基潤滑脂的總冠軍。

LITHI-SHIELD 的活性分子能夠迅速封閉、平整金屬表面來降低工作熱量，讓活動的金屬件可於近乎「零摩擦」最佳狀態下運作，保護金屬免於解體。邊界膜保護層是一股隱形的離子能量，避免金屬直接碰撞，這使它超越了所有其他複合鋰基潤滑脂的性能表現。只要少量的神盾鋰基潤滑脂，性能就可以超越其他潤滑脂。神盾鋰基潤滑脂的抗氧化性相當卓越，比其它最接近的競爭對手高出兩倍以上。

產品編號	產品代碼	產品型號	裝箱數	箱子尺寸 (W x H x D)	箱子體積	箱子重量	TI / HI
LS-T	8-94630-00181-6	神盾鋰基精油潤滑脂 - 59.14 毫升/桶	24	9.25" X 6.5" X 4.75"	0.16 inch <sup>3</sup>	1.9 lb	40 / 8
LS-C	8-94630-00182-3	神盾鋰基精油潤滑脂 - 414 毫升/桶	40	12" X 10.75" X 19.5"	1.45 inch <sup>3</sup>	42 lb	6 / 5
LS-LB	8-94630-00183-0	神盾鋰基精油潤滑脂 - 473 毫升/桶	12	13.5" X 6.25" X 3.5"	0.17 inch <sup>3</sup>	15.2 lb	36 / 8
LS-5LB	8-94630-00184-7	神盾鋰基精油潤滑脂 - 2.365 升/桶	4	14.125" X 6.75" X 9.5"	0.53 inch <sup>3</sup>	23.4 lb	12 / 8
LS-P	8-94630-00185-4	神盾鋰基精油潤滑脂 - 16.5 升/桶	1			38 lb	
LS-K	8-94630-00186-1	神盾鋰基精油潤滑脂 - 56.8 升/桶	1			132 lb	
LS-D	8-94630-00187-8	神盾鋰基精油潤滑脂 - 189 升/桶	1			437 lb	

# 14. Reel-Shield Grease (NLGI #1)

## 產品規格

- NLGI 級別：1
- 抗磨金屬處理：神盾 EPA

## ASTM 測試結果

• D-217	潤滑膏圓錐鑽透測試, Worked, 60s	310 - 340
• D-217	潤滑膏圓錐鑽透測試, Unworked	310 - 340
	增稠劑種類	鋰基潤滑脂
• D128	增稠劑, %	6 - 8
	顏色	Light Amber
	材質	Smooth
• D-2265	滴點	500°F
• D-445	40°F時的黏度, cst	220
• D-445	100°F時的黏度, cst	19
• D-2270	黏度指數	95
• D-92	閃燃點, °F	464
• D-92	燃點, °F	550
• D-2509	泰姆肯測試 - 無磨損極壓負荷性能 (lbs.)	60+
• D-1743	潤滑脂防腐蝕性能測定法	Pass
• D-4048	蒸氣脫脂級三氯乙烷規格	1B
• D-2266	四球磨損測試, mm	0.7
• D-2596	四球黏結測試, Kg Min.	800 / Pass
• D-5483	抗氧化誘導時間 180°C · 最低	95
• D-1264	水沖洗 @ 79°C	2.7 %
	77°F時的流動性, g/min	
	60°F時的流動性, g/min	515
• 美鋼流動性試驗	40°F時的流動性, g/min	257.1
	20°F時的流動性, g/min	78.9
	0°F時的流動性, g/min	5.4

## 推薦使用

- 滑輪運作
- 大幅延長滑輪壽命
- 保護金屬免受侵蝕
- 捕魚工具投擲得更遠
- 大幅延長捕魚鉗子、工具及其他設備的使用壽命



大大強化金屬  
表面堅硬度

營運成本、維修費用  
大幅下降



減少磨損、熱力、  
預防金屬部件氧化

運作更暢順、耐用、  
寧靜

神盾滑輪全能潤滑脂 REEL SHIELD GREASE 是現世紀最優秀的專門為滑輪設計和配製的潤滑劑，清潔和海水防護劑。

高效潤滑和保護任何類型的滑輪和牽引系統的活動金屬件，防止其受到高壓破壞和磨損。迄今為止，神盾滑輪全能潤滑脂對滑輪內部活動部件的滲透能力和在極端環境下的防海水腐蝕能力都比任何其他產品更好。這突顯出神盾滑輪全能潤滑脂，無論淡水或者鹹水環境中，都是全面保養和維護滑輪的最佳工具。神盾滑輪全能潤滑脂通過了嚴苛的海洋實地測試，事實證明其性能對比其它產品優越而且超凡。

產品編號	產品代碼	產品型號	裝箱數	箱子尺寸 (W x H x D)	箱子體積	箱子重量	TI / HI
LS-T		神盾鋰基精油潤滑脂 - 59.14 毫升/桶	24	9.25" X 6.5" X 4.75"	0.16 inch <sup>3</sup>	1.9 lb	40 / 8
LS-C		神盾鋰基精油潤滑脂 - 414 毫升/桶	40	12" X 10.75" X 19.5"	1.45 inch <sup>3</sup>	42 lb	6 / 5
LS-LB		神盾鋰基精油潤滑脂 - 473 毫升/桶	12	13.5" X 6.25" X 3.5"	0.17 inch <sup>3</sup>	15.2 lb	36 / 8
LS-5LB		神盾鋰基精油潤滑脂 - 2.365 升/桶	4	14.125" X 6.75" X 9.5"	0.53 inch <sup>3</sup>	23.4 lb	12 / 8
LS-P		神盾鋰基精油潤滑脂 - 16.5 升/桶	1			38 lb	
LS-K		神盾鋰基精油潤滑脂 - 56.8 升/桶	1			132 lb	
LS-D		神盾鋰基精油潤滑脂 - 189 升/桶	1			437 lb	

# 15. 神盾鋰基潤滑脂及神盾滑輪全能潤滑脂產品兼容性表

	Aluminum Complex	Barium Complex	Calcium Stearate	Calcium 12-Hydroxy	Calcium Complex	Calcium Sulfonate Complex	Clay (Non-Soap)	Lithium Stearate	Lithium 12-Hydroxy	Lithium Complex	Polyurea (Conventional)	Polyurea Shear (Stable)
Aluminum Complex	-	I	I	C	I	B	I	I	I	C	I	C
Barium Complex	I	-	I	C	I	C	I	I	I	I	I	B
Calcium Stearate	I	I	-	C	I	C	C	C	B	C	I	C
Calcium 12-Hydroxy	C	C	C	-	B	B	C	C	C	C	I	C
Calcium Complex	I	I	I	B	-	I	I	I	I	C	C	C
Calcium Sulfonate Complex	B	C	C	B	I	-	I	B	B	C	I	C
Clay (Non-Soap)	I	I	C	C	I	I	-	I	I	I	I	B
Lithium Stearate	I	I	C	C	I	B	I	-	C	C	I	C
Lithium 12-Hydroxy	I	I	B	C	I	B	I	C	-	C	I	C
Lithium Complex	C	I	C	C	C	C	I	C	C	-	I	C
Polyurea (Conventional)	I	I	I	I	C	I	I	I	I	I	-	C
Polyurea (Shear Stable)	C	B	C	C	C	C	B	C	C	C	C	-

相對的兼容性等級

B = 界線

C = 兼容

I = 不兼容

附注：這個表是通用的兼容性指引，特定的潤滑脂能相容。但必須做測試以確保不同產品能互相兼容。





# 16. Strike Shield 神盾強效萬能精油

## 材料安全資料

- 燃點：61°C PMCC (Pensky – Martens closed-cup 測試)
- 無公害
- 可燃
- 合成碳氫化合物
- 儲存室溫不得高於 61°C
- 吞入：不要試圖嘔出，立即就醫
- 眼部接觸：用清水沖洗 15分鐘
- 皮膚接觸：用肥皂與水徹底清洗
- 小心放置，遠離兒童

## 物理資料

- 沸點：186 - 201°C
- 蒸發率：< 0.01
- 比重：1.02
- 不溶於水
- 氣化壓力：< 1@25°C
- 中至深琥珀色

## 推薦使用

- 釋放黏結的螺母和螺栓
- 釋放黏結的鎖
- 吱吱作響的鉸鏈
- 滑動部件如門窗、活頁裝置等
- 齒輪裝置、凸輪
- 輸送帶裝置、聯動裝置
- 電纜裝置
- 傳動及機械交換系統
- 任何類型的汽車、航運、農業、工業、商業等的設備需要有效快速滲透、潤滑、防腐防銹、去濕除塵、長效全能的保護劑

## 用法說明

- 噴灑或者塗抹於有需要的部件或者部位上，有需要時抹去多餘的。對於銹蝕極嚴重的，需要重複使用
- 注意：儲存溫度不得高於 61°C，不能在通電電路上噴灑，遠離火源，含石油脂肪煙

滲入銹蝕最嚴重的零件終止銹蝕

營運成本、維修費用大幅下降

潤滑、清潔、除濕、除塵、防銹、防護

運作更暢順、耐用、寧靜



神盾強效萬能精油 STRIKE SHIELD 是現世紀最優秀而且萬能的潤滑劑、清潔劑、除濕劑、除塵劑、防銹劑和防護劑。

在最嚴苛和惡劣的工作環境，特別是潮濕的地方 (如海洋) 作業，24 小時無間斷提供保證不失效的保護。噴灑於任何因潮濕或生銹以至失效的機械系統的故障部位，就能快速有效地滲入即使是銹蝕最嚴重的零件上，鬆動銹皮以釋放運轉機械，能徹底終止銹蝕。

在潮濕的電子、電路系統中它能快速地徹底清除水份。在印刷電路板上輕輕噴上一層，用刷子刷去多餘的油，就能去除腐蝕，它那層極薄的離子能量保護油膜能有效防止後續腐蝕。

產品編號	產品代碼	產品型號	裝箱數	箱子尺寸 (W x H x D)	箱子體積	箱子重量	TI / HI
STKS-4WS	8-94630-00104-5	神盾強效萬能精油 – 4 盎司 (118 毫升)	12	6.625" X 7" X 5"	4 inch <sup>3</sup>	0.13 lb	56 / 7
STKS-16WS	8-94630-00105-2	神盾強效萬能精油 – 16 盎司 (473 毫升)	12	10.125" X 10" X 7.625"	14 inch <sup>3</sup>	0.44 lb	20 / 5
STKS-128	8-94630-00109-0	神盾強效萬能精油 – 1 加侖 (3.785 升)	4	15.625" X 11.875" X 8.125"	33.5 inch <sup>3</sup>	0.17 lb	12 / 4
STKS-5G		神盾強效萬能精油 – 5 加侖 (18.93 升)	1		42.5 inch <sup>3</sup>		
STKS-15G		神盾強效萬能精油 – 15 加侖 (56.78 升)	1		126.5 inch <sup>3</sup>		
STKS-55G		神盾強效萬能精油 – 55 加侖 (208 升)	1		461 inch <sup>3</sup>		







# 17. Spray Shield 神盾強力除濕去銹精油

## 材料安全資料

- 燃點：226°C
- 無公害
- 不易燃
- 合成碳氫化合物

## 物理資料

- 沸點：238°C
- 不溶於水
- 蒸發率：< 0.01
- 氣化壓力：< 1@25°C
- 比重：1.07
- 中至深琥珀色

## 推薦使用

- 金屬機械
- 鋼纜
- 金屬滑動面
- 接頭
- 鏈條動力裝置
- 聯動裝置
- 滑道
- 輪子
- 槓桿
- 螺旋鑽
- 滑輪
- 生銹的螺母和螺栓
- 鉸鏈
- 汽車、工業或商業領域中，任何需要外部高效除銹和去濕噴霧潤滑劑來對隱蔽部位進行處理的
- 工具
- 輪軸軸承
- 開放式齒輪裝置

## 用法說明

- 在需要潤滑的表面上使用神盾強力除濕去銹精油。處理極嚴重生銹或腐蝕的情況，應重複多次使用神盾強力除濕去銹精油
- 不含揮發物或溶劑。含合成碳氫化合物和先進技術的有機金屬代謝優化劑。無毒、環保

潤滑、除濕、去銹



保護機件、  
徹底終止  
銹蝕

營運成本、  
維修費用  
大幅下降

神盾強力除濕去銹精油（噴劑）是全能的強力除濕去銹兼潤滑劑之王。

應用範圍廣泛，就算在最惡劣的腐蝕和潮濕環境中，也能以最高效滲透到設備的金屬部件進行除銹和去濕。

神盾強力除濕去銹精油，能夠滲透到極難接觸的內部和隱蔽的區域，提供快速、可靠、持久的除銹、去濕和潤滑作用。

產品編號	產品代碼	產品型號	裝箱數	箱子尺寸 (W x H x D)	箱子體積	箱子重量	TI / HI
SS-1	8-94630-00146-5	神盾強力除濕去銹精油（噴霧）- 1 盎司 (29.5 毫升)	24	6.875" X 3.875" X 4.625"	0.07 inch <sup>3</sup>	2.5 lb	48 / 12
SS-4	8-94630-00148-9	神盾強力除濕去銹精油（噴霧）- 4 盎司 (118 毫升)	12	5.5" X 7" X 7.125"	0.16 inch <sup>3</sup>	3.8 lb	40 / 8
SS-16	8-94630-00149-6	神盾強力除濕去銹精油（噴霧）- 16 盎司 (473 毫升)	12	10.75" X 10.75" X 8"	0.54 inch <sup>3</sup>	15 lb	20 / 5
SS-128	8-94630-00150-2	神盾強力除濕去銹精油（噴霧）- 1 加侖 (3.785 升)	4	9.25" X 12.5" X 12.5"	1.46 inch <sup>3</sup>	11.5 lb	10 / 2
SS-5G	8-94630-00129-	神盾強力除濕去銹精油（噴霧）- 5 加侖 (18.93 升)	1	18.5" X 18.5" X 18.5"	6.39 inch <sup>3</sup>	57.5 lb	4 / 1



美國離子能源

# 18. EPA 神盾極壓精油相容性

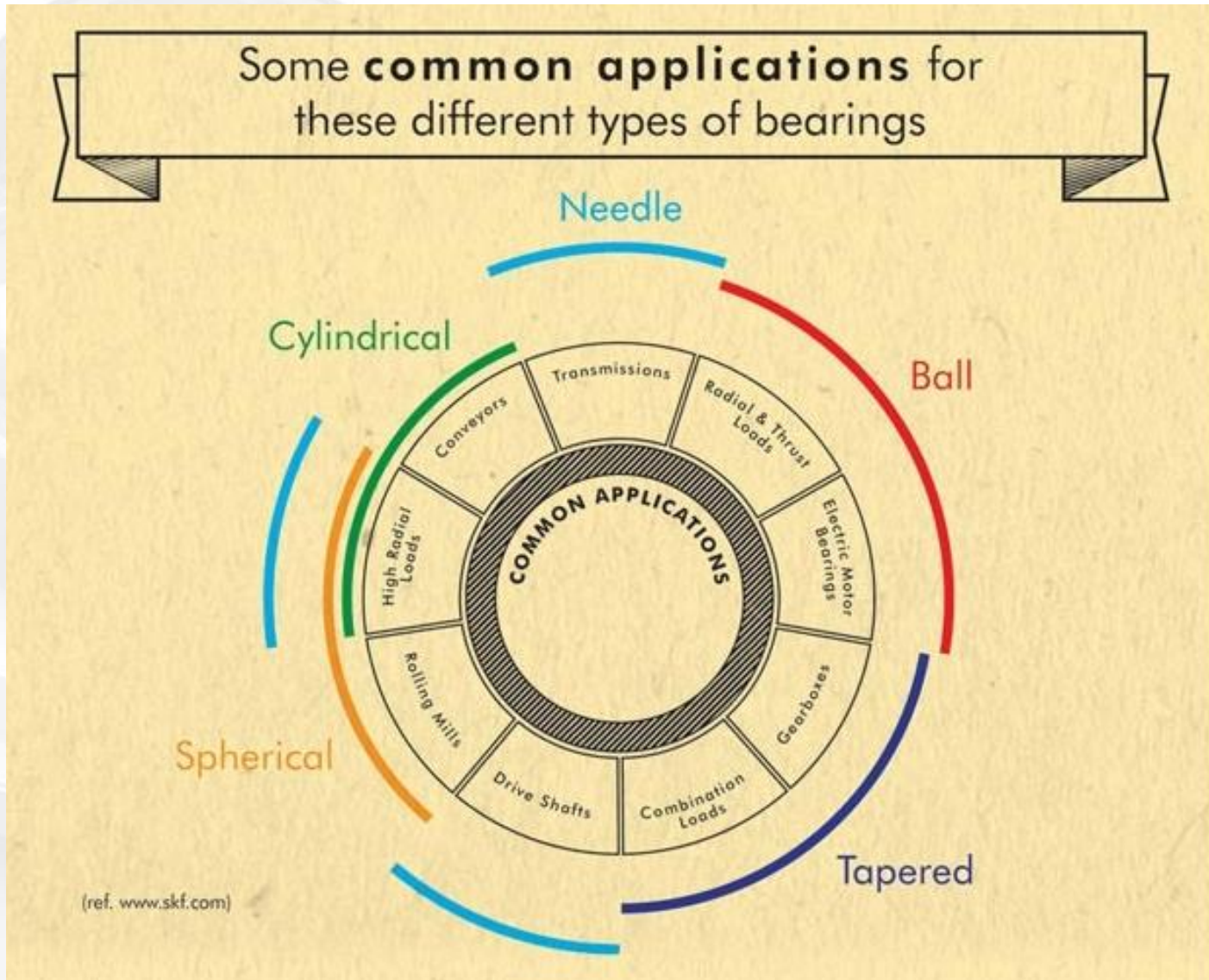
項目	底油	與神盾 EPA 相容 ?	神盾產品應用
1	Petroleum, Mineral Oil	否	神盾 EPA
2	SHC (Synthetic Hydrocarbon) A. Alkylated Aromatics B. Olefin Oligomers e.g. Amsoil, Mobil 1, Castrol Syntec	是	神盾 EPA
3	Halogenated Hydrocarbons A. Chlorotrifluoroethylene, Polytetrafluoroethylene, (PTFE). e.g. Insoluble cutting oil, radiation resistant oil, some heavy duty gear oil, load carrying oils.	是	神盾 EPA
4	Glycol Synthetic Esters A. Alkanolamines B. Polyol Glycols e.g. Fire proof hydraulic fluids, cutting fluids, R-134A Refrigerant Oils, etc.	否	因應要求
5	Organic Ester Synthetics A. VME - Vegetable Methyl Ester e.g. Some food grade oils, specialty biodegradable oils	否	因應要求
6	Phosphate Esters A. Triphenol Butylated Phosphate B. Trisecyl Phosphate C. Tricresyl Phosphate e.g. Turbine Oils	否	因應要求
7	Silicone Oils A. Methyl Silicone B. Phenyl Methyl Silicone C. Silicate Ester/Disiloxane	否	沒有
8	Synthetic Ether A. Polyphenyl Ether B. Chlorinated Diphenyl Ether C. Perfluorinated polyether	否	因應要求

Keywords to look for on MSDS or Product Description/Technical Sheets

"Glycol" "Alkanolamine"  
"Ether" "Ester"  
"Phosphate" "VME" "Phenyl/Phenol"  
"Silicate"  
"Boron Oxide \*\*"

- Boron Oxide is a common additive to Alkanolamine cutting fluids

# 19. 神盾潤滑脂在軸承系統的選用方法



# 19. 神盾潤滑脂在軸承系統的選用方法

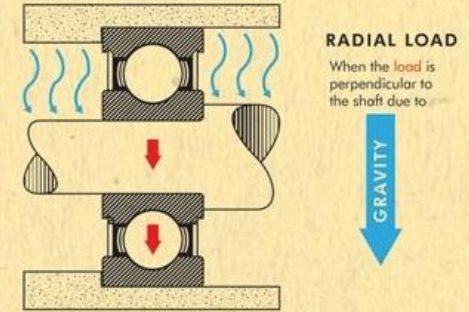
Remember, bearing type affects **grease life**.

Larger bearings and high-speed bearings translate to short grease life. High DN grease is required.

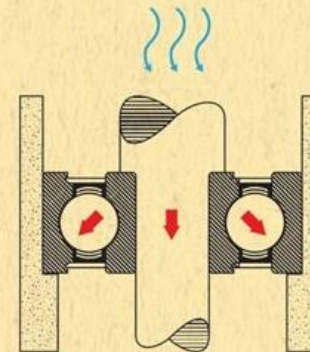
BEARING TYPE	RELATIVE TYPE OF GREASE
Deep-groove, single-row ball bearing	1
Angular contact, single-row ball bearing	0.625
Self-aligning ball bearing	0.77 - 0.625
Thrust ball bearing	0.2 - 0.17
Cylindrical, single-row roller bearing	0.625 - 0.43
Needle roller bearing	0.3
Tapered roller bearing	0.25
Spherical roller bearing	0.14 - 0.08

(ref. Booser, Bloch, ML)

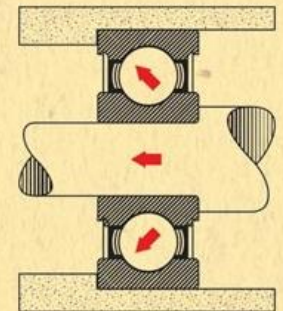
Bearings also work under different kinds of **loads**.



..... **AXIAL OR THRUST LOAD** .....  
(When the load is parallel to the shaft)



Axial load in a vertical pump or electric motor due to gravity



Axial load in a horizontal pump

(ref. www.skf.com)

# 19. 神盾潤滑脂在軸承系統的選用方法

## 如何選擇合適的潤滑脂？

最常見的 OEM 潤滑脂規格是 NLGI-2 號鋰基脂。除了等級 (consistency) 和增稠劑類型 (thickener type)，其他考慮因素包括增稠劑濃度 (thickener concentration)，滴點 (dropping point)，工作溫度 (operating temperature range)，工作穩定性 (working stability)，氧化安定性 (oxidation stability)，耐磨性等 (wear

### 基礎油粘度

一個常見的錯誤是把油脂等級 (grease consistency) 與基礎油粘稠度 (base oil viscosity) 混淆了。大多數使用此類潤滑脂的是滾動軸承 (element bearings)，所以應該以粘度 (base oil viscosity) 來選擇。雖然大多數人不會選擇 EP220 齒輪油應用於油式電機軸承 (oil lubricated)，但是很多人會選擇含有 EP220 油的油脂於脂式軸承 (grease lubricated)。要確定滾動軸承要求的最小和最佳粘度，可以通過速度系數 (speed factor) 來求出，通常以 DN 或 NDm 來表示。速度系數反映滾動軸承的表面速度，由下列程式來計

$$DN = (\text{轉速}) \times (\text{軸承孔直徑})$$

$$NDm = \text{轉速} \times ((\text{軸承內徑} + \text{外徑}) / 2)$$

計算 NDm 值要使用軸齒直徑而不是孔徑因為相同孔徑的軸承不代表具有相同的滾動直徑，因此具有不同的表面速度。知道了速度系數的值和工作溫度

，最低粘度要求可從右面的圖表 1 直接讀出。

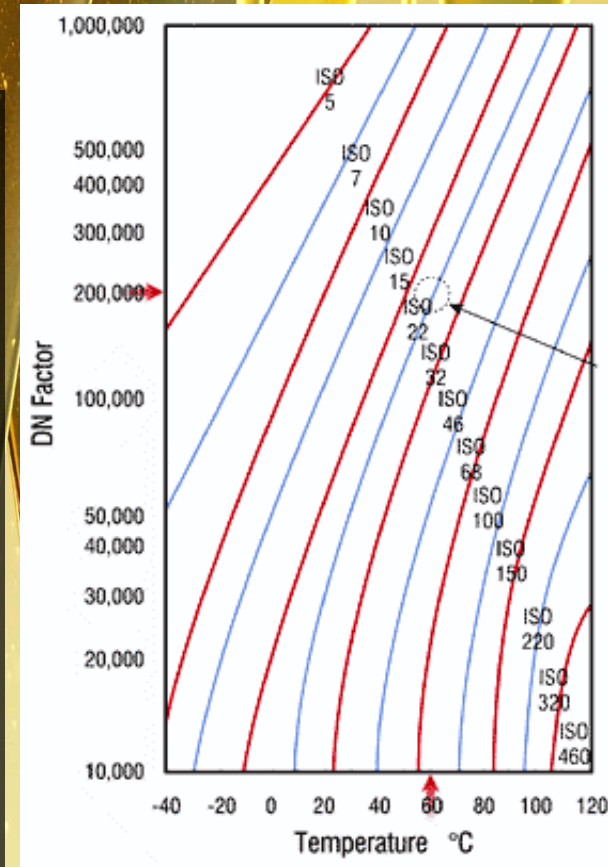


圖 1

# 19. 神盾潤滑脂在軸承系統的選用方法

## 如何選擇合適的潤滑脂？

雖然圖 1 能夠假定基礎油的粘度指數，為了更精確，我們還需要用一個粘度 / 溫度圖表來確定潤滑劑的黏度。

### 添加劑和基礎油類型

圖 2 顯示了一些常見的添加劑類型。大多數潤滑脂使用 API 第 I 類和 II 類礦物油為基礎油，符合大多數應用需要。但是，對一些特殊的應用要求，使用合成基礎油可能有較好的效果。這些包括工作溫度範圍要求極寬的情況或者需要特長的潤滑油更換時數的機械。

添加劑	軸頸軸承	球形軸承	推力軸承	滾子軸承	滾針軸承
抗氧化劑	•	•	•	•	•
抗發泡劑	•	•	•	•	•
抗磨劑		•	•	•	•
抗銹蝕劑	•	•	•	•	-
極壓劑			-	-	
抗乳化劑	•	•	•	•	-
粘度指數改善劑	-	-	-	-	•
抗腐蝕劑	•	•	•	•	•

• 必需的                      - 因應使用狀況而定

圖 2

# 19. 神盾潤滑脂在軸承系統的選用方法

## 如何選擇合適的潤滑脂？

### 潤滑脂等級和稠化劑類型

NLGI 已經建立了一個規範來表示不同的等級從 000 (半流體) 開始至 6 級 (塊脂)。最常見的NLGI等級是II 適合大多數應用要求。

對於軸承，通過速度系數和操作溫度可以選定最佳的 NLGI 等級。有時候更高的速度系數會要求使用較高等級的潤滑脂。右面的表 1 提供基於速度系數和工作溫度的一般指導性 NLGI 等級選擇。

目前正在使用的油脂增稠劑 (grease thickener) 有許多類型，最常見的是鋰皂 (Lithium Soaps)，複合鋰 (Lithium-Complex) 和聚脲 (Polyurea)。鋰皂通常用於通用型潤滑脂和適合一般適中溫度下工作。在較高的操作溫度要求下複合鋰有效好的性能表現。鋰皂脂的最高工作溫度約 250 °F，而複合鋰脂則可以達到 350°F。正變得越來越流行的另一種增稠劑類型是聚脲，像複合鋰一樣擁有良好的高溫性能，高氧化穩定性和耐滲漏性。考慮改變產品增稠劑類型前，要注意性能要求和相容性。

工作溫度	DN (速度指數)	NLGI 號 *
-30 至 100°F	0 - 75,000	1
	75,00 - 150,000	2
	150,000 - 300,000	2
	300,000	2
0 至 150°F	0 - 75,000	2
	75,00 - 150,000	2
	150,000 - 300,000	3
	300,000	3
100 至 275°F	0 - 75,000	2
	75,00 - 150,000	3
	150,000 - 300,000	3
	300,000	3

\* 亦要視乎其他因素，如軸承種類、增稠劑種類、底油粘度與種類等

# 19. 神盾潤滑脂在軸承系統的選用方法

如何選擇合適的潤滑脂？

## 性能特性

如果在室溫環境下使用，高工作溫度和滴點特性完全可以不用理會。如果在低轉速和重負載下使用，建議使用四球測試（4-ball）或鐵姆肯（Timken OK Load）來幫助選擇適當的產品。更重要的是要實行一套持之以恆的定期審查機制確保使用中的潤滑油維持在較好的質量狀態。要改善整套潤滑方案可以是一個艱鉅的任務，但是選擇適當規格的潤滑油並不難。要提高潤滑性能表現當然不是一件簡單和輕鬆的事，只要認識多一點潤滑油知識，憑藉一些工具，你可以無憂和正確地選出最適合你的設備的潤滑劑產品。

神盾ABF技術，不但可以提高工作穩定性和潤滑性，而且產品時效更長。





# 20. 神盾新加坡生產齒輪系統潤滑油產品目錄

神盾 SST ECI T-SHC AP  
EP



神盾 SST ECI POWER-AP  
PAG



神盾 SST ECI T-GEAR AP  
EP



神盾 SST ECI HD-AP ATF  
DIII



神盾 SST ECI HD-AP EP-  
GL-5



神盾 SST ECI HD-AP PTF



100% 新加坡制造

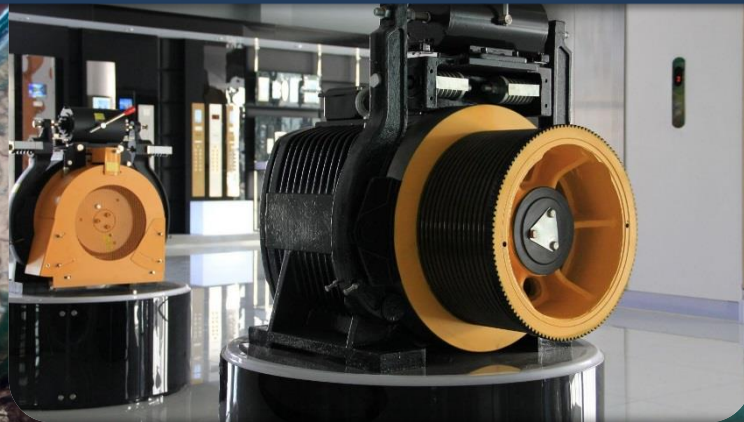


100% 美國原料

神盾齒輪油是高等級油，適用於各種高速衝擊負荷、高速低扭矩或低速高扭矩下的各類齒輪系統，例如雙曲線齒輪等等。

# 21. 神盾 SST ECI T-SHC AP EP 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



**Not Just Oil...  
IT'S TECHNOLOGY**

## 物理資料

特性	標準	單位	結果	
SAE 級別			75W90	75W140
在 40°C時的粘度	ASTM D445	cSt	110	193
在 100°C時的粘度	ASTM D445	cSt	15.5	26.3
粘度指數	ASTM D2270		154	171
閃點 (COC)	ASTM D92	°C	200	200
傾點	ASTM D97	°C	-57	-36

## 產品優點

- 極佳剪切穩定性
- 減少 200% 及更長的停機維護時間
- 優秀的抗磨及零部件防震能力
- 極高負載及金屬防燒結能力
- 優秀的防銹蝕及防侵蝕特性
- 大大延長每次吸油相隔時間
- 保持系統清潔及減少沉積物產生
- 延長齒輪系統壽命最多至 300% (視乎物理狀況而定)
- 降低 3 至 9 分貝的噪音 (視乎系統狀況而定)
- 在高溫下保持優異的熱穩定性及抗氧化性
- 大幅提升系統的有效輸出功率及提高燃料經濟性

## 可提供容量

- 20L, 200L, 1000L

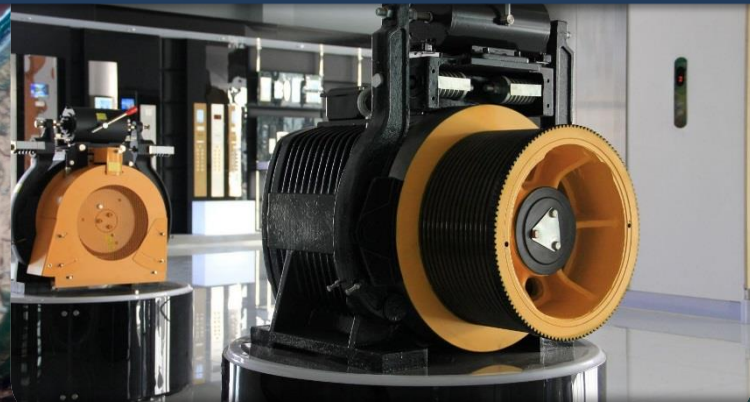
神盾 SST ECI T-SHC AP EP 齒輪油是全天候的高性能抗極壓全合成油。油品及獨家 ABF 技術製成，並添加了硫磷及無灰份分散劑，大大加強了抗氧化、抗侵蝕、抗乳化、抗磨及抗泡沫等。

本潤滑油已經獲得了以下認證及合乎以下效能標準：API, GL-5, MT-1 and SAE J2360, MIL-PRF-2105E, Scania STO 110, Mack GO-J, etc., and particularly for hypoid gears under severe operating conditions.

神盾 SST ECI T-SHC AP EP 齒輪油適用於所有類型的開放及密封式工業用齒輪，包括手動變速系統的雙曲面齒輪、後軸承、差速系統、傳動系統、過速裝置、輪軸承、轉向齒輪系統、萬向節等，在低溫運作環境及極之嚴苛的操作環境下，能發揮優秀的表現。

# 22. 神盾 SST ECI POWER-AP PAG 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



## 物理資料

特性	標準	單位	結果			
ISO 級別			150	220	320	460
在 40°C時的粘度	ASTM D445	cSt	150	220	320	460
在 100°C時的粘度	ASTM D445	cSt	23	34	51	72
粘度指數	ASTM D2270		185	202	220	230
閃點 (COC)	ASTM D92	°C	225	225	225	230
傾點	ASTM D97	°C	-30	-30	-30	-27
FZG Fail Loading Stage	DIN 51354-2		12+	12+	12+	12+

## 產品優點

- 減少沈澱物, 保持系統清潔
- 延長每次吸油週期
- 減低磨擦系數及牽引
- 優秀的抗氧化及抗銹蝕性能
- 與油封物料相容
- 長效的水解穩定性
- 良好的過濾性及空氣釋放性
- 減低泡沫形成的傾向性
- 降低最長超過 200% 的停機維護時間
- 延長零組件壽命達 400% (要視乎物理情況)
- 降低 3db 至 9db 的噪音 (要視乎系統狀況)
- 大幅改善系統效能

## 可提供容量

- 20L, 200L, 1000L

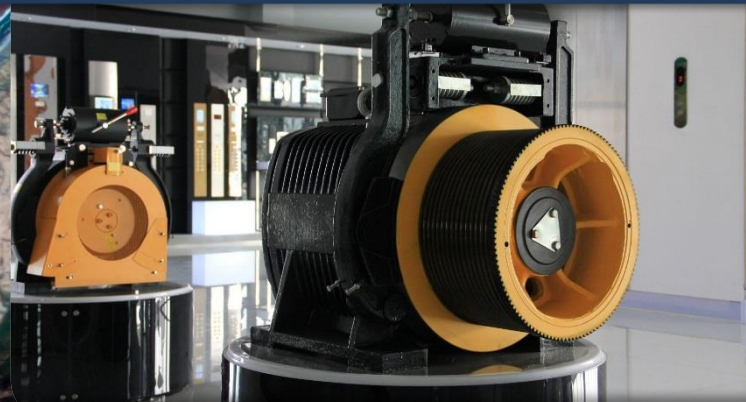
神盾 SST ECI POWER AP PAG 齒輪油是全天候的高性能抗極壓全合成油。油品及獨家 ABF 技術製成，有極高粘度指數及低傾點，使潤滑油在高溫及底溫運作環境下都有極佳表現。並且大大加強了抗氧化、抗侵蝕、抗乳化、抗磨、抗泡沫及長效水解穩定性等能力。ABF 技術能減低磨擦系數以達致系統但耗能及增加工作溫度效能，因此，神盾的能力大大超越了市面上的著名品牌。

本潤滑油適用於所有蝸齒輪組系統，及推薦於高溫、高負載、潮濕等環境中使用。



# 23. 神盾 SST ECI T-GEAR AP EP 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



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## 物理資料

特性	標準	單位	結果						
ISO 級別			150	220	320	460	680	1000	1500
在 40°C時的粘度	ASTM D445	cSt	150	220	320	460	680	1000	1500
在 100°C時的粘度	ASTM D445	cSt	14.8	19	24	30	38	44	61.2
粘度指數	ASTM D2270		95	95	95	95	90	90	90
閃點 (COC)	ASTM D92	°C	240	245	247	250	250	252	255
傾點	ASTM D97	°C	-10	-9	-9	-9	-6	-3	-3
銅腐蝕測試	ASTM D130		1B	1B	1B	1B	1B	1B	1B

## 產品優點

- 減少沈澱物, 保持系統清潔
- 延長每次吸油週期
- 減低磨擦系數及牽引
- 優秀的抗腐蝕及抗銹蝕性能
- 優秀的抗氧化及高溫穩定性
- 保護機件對抗磨損及震動
- 延長齒輪壽命
- 超強的抗極壓性能
- 降低最長超過 200% 的停機維護時間
- 延長發動機壽命達 300% (要視乎物理情況)
- 降低 3db 至 9db 的噪音 (要視乎系統狀況)
- 大幅改善系統效能

## 可提供容量

- 20L, 200L, 1000L

神盾 SST ECI POWER AP PAG 齒輪油是全天候的高性能抗極壓全合成油。油品及獨家 ABF 技術製成，並添加了抗氧化、抗侵蝕、抗乳化、抗磨及抗泡沫等改善劑。

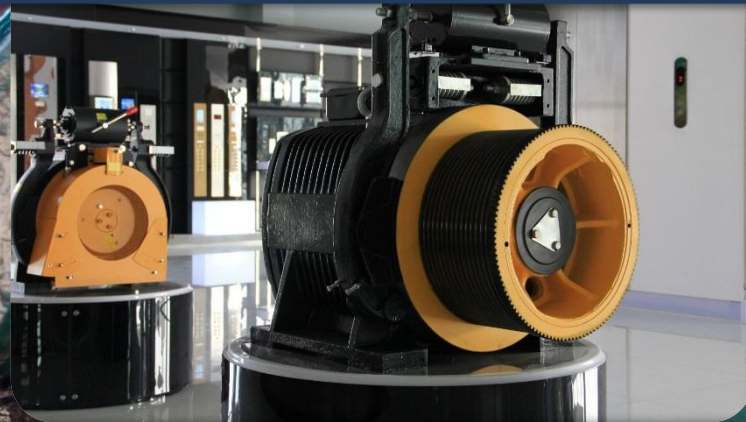
本潤滑油已經獲得了以下認證及合乎以下效能標準：ISO 12925-1:1996 Category CKD, AISE 224, ANSI/AGMA 9005-E02, DIN 51517 Part 3, Cincinnati Lamb P-59 series, Textron David Brown S1.53 101 and pass FZG 12th stage test, etc.

本潤滑油適用於有開放式及密封式的齒輪組系統，可用於蝸齒輪、軸承及各種滑動系統。



# 24. 神盾 SST ECI HD-AP ATF DIII 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



**Not Just Oil...  
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## 物理資料

特性	標準	單位	結果
SAE 級別			DIII
在 40°C時的粘度	ASTM D445	cSt	34
在 100°C時的粘度	ASTM D445	cSt	7.6
粘度指數	ASTM D2270		176
閃點 (COC)	ASTM D92	°C	170
傾點	ASTM D97	°C	-35

## 產品優點

- 極佳剪切穩定性
- 優勢的低溫流動性能
- 優秀的抗磨及零部件防侵蝕能力
- 大幅改善磨擦系數
- 保持系統清潔及減少沉積物產生
- 在高溫下保持優異的熱穩定性及抗氧化性
- 防止噴火效應以保持齒輪系統的完整性

## 可提供容量

- 20L, 200L, 1000L

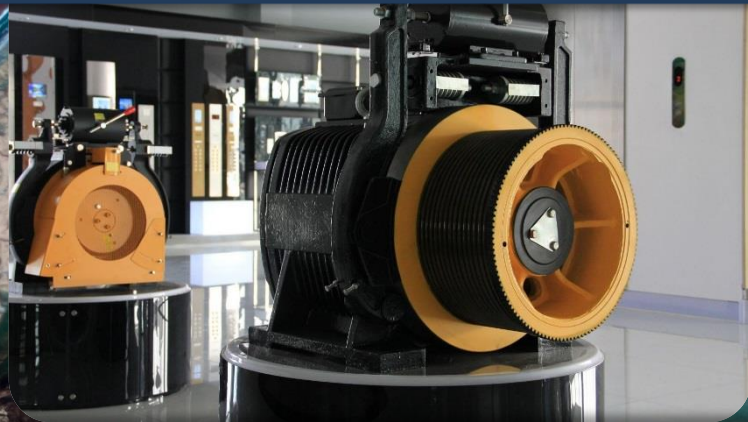
神盾 SST ECI HD-AP DIII 齒輪油是最新技術的自動變速系統油。油品及獨家 ABF 技術製成，採用優質底油及添加了抗氧化、抗侵蝕、抗乳化、抗磨及抗泡沫等改善劑，大大改善了抗氧化穩定性及底溫流動性能。

本潤滑油已經獲得了以下認證及合乎以下效能標準：GM DEXRON IID, IIIG, IIH, Ford MERCON, Caterpillar TO-2, Allison C-4。

神盾 SST ECI HD-AP DIII 齒輪油適用於所有類型需要 Dexron III 規格的客車及而輕型車輛。油品亦推薦使用於所有類型的自動傳動系統及 Vickers pumps，作液壓油使用。

# 25. 神盾 SST ECI HD-AP EP-GL-5 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



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## 物理資料

特性	標準	單位	結果			
			SAE 90	SAE 140	SAE 80W90	SAE 85W140
SAE 級別						
在 40°C 時的粘度	ASTM D445	cSt	197	450	156	425
在 100°C 時的粘度	ASTM D445	cSt	18	30	15.4	30
粘度指數	ASTM D2270		96	95	100	97
閃點 (COC)	ASTM D92	°C	212	222	205	222
傾點	ASTM D97	°C	-10	-9	-27	-18

- 大幅提高系統負載能力
- 保護機件對抗磨損及震動
- 優秀的抗腐蝕及抗銹蝕性能
- 在高溫下保持優異的熱穩定性及抗氧化性
- 防止噴火效應以保持齒輪系統的完整性
- 延長齒輪壽命

## 可提供容量

- 20L, 200L, 1000L

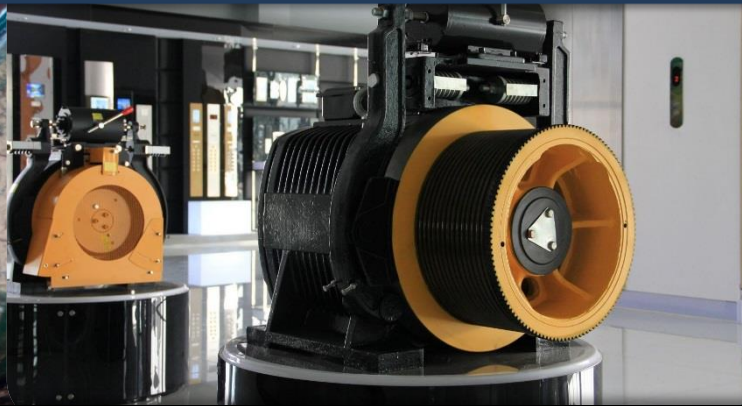
神盾 SST ECI HD-AP EP-GL-5 齒輪油是市面上最強的自動變速系統油。油品及獨家 ABF 技術製成，採用優質底油及添加了抗極壓、抗氧化、抗侵蝕、抗乳化、抗磨及抗泡沫等改善劑，大大改善了穩定性。

本潤滑油不含任何鉛份，對環境友好，並已經獲得了以下認證及合乎以下效能標準：API GL-5, MIL-L-2105D, ZF TE-ML 05A, 7A, 12E, 16B, 16C, 16D, 17B, 19B, 21A and MAN 342 Type 2。

神盾 SST ECI HD-AP EP-GL-5 齒輪油適用於所有類型的交錯軸齒輪、螺旋斜面軸、轉向系統、裝有傳動系統的重型軸及於嚴苛環境下工作的齒輪。

# 26. 神盾 SST ECI HD-AP PTF 齒輪油

Ultra Quality Lubricants For Heavy Gearing Systems



**Not Just Oil...  
IT'S TECHNOLOGY**

## 物理資料

特性	標準	單位	結果				
			SAE 10W	SAE 30	SAE 40	SAE 50	SAE 60
SAE 級別			SAE 10W	SAE 30	SAE 40	SAE 50	SAE 60
在 40°C時的粘度	ASTM D445	cSt	42	97	141	228	318
在 100°C時的粘度	ASTM D445	cSt	6.5	11.3	14.7	19.2	24
粘度指數	ASTM D2270		105	98	97	95	95
閃點 (COC)	ASTM D92	°C	205	210	215	225	230
傾點	ASTM D97	°C	-30	-25	-25	-9	-9

## 產品優點

- 有效控制系統的磨擦系數
- 保護機件對抗磨損及震動
- 減少制動噪音
- 與彈性體物料相容
- 在高溫下保持優異的熱穩定性及抗氧化性
- 延長制動系統及傳動系統壽命
- 防止噴火效應以保持齒輪系統的完整性

## 可提供容量

- 20L, 200L, 1000L

神盾 SST ECI HD-AP PTF 齒輪油是高性能傳動油。油品及獨家 ABF 技術製成，並添加了抗氧化、抗侵蝕、抗乳化、抗磨及抗泡沫等改善劑，亦有效控制系統的磨擦系數、達致減少制動噪音及與彈性體物料相容。

本潤滑油已經獲得了以下認證及合乎以下效能標準：Caterpillar TO-4, Caterpillar TO-4M, Allison C-4, Komatsu 07.868.1, ZF TE-ML 01, 03C and API CF, CF-2, etc.

本潤滑油適用於有高性能傳動系統，包括 Caterpillar 系統、浸入的制動系統及裝有液壓系統的重型越野機械。油品亦推薦使用於所有類型的自動傳動系統及 Vickers pumps，作液壓油使用。

# 27. 神盾新加坡生產液壓系統潤滑油產品目錄



神盾 SST ECI TV T-POWER

神盾 SST ECI HD-AP



100% 新加坡制造



100% 美國原料

神盾液壓系統油是高等級油，適用於各種類型、負載及高低溫操作環境，而且絕不含固體添加劑，是最新及最強的潤滑科技。



# 28. 神盾 SST ECI TV T-POWER 液壓系統油

Ultra Quality Lubricants For Heavy Hydraulic Systems



## 物理資料

特性	標準	單位	結果			
ISO 級別			<b>32</b>	<b>46</b>	<b>68</b>	<b>100</b>
在 40°C 時的密度		Kg / L	0.872	0.874	0.881	0.89
在 40°C 時的粘度	ASTM D445	cSt	30.4	46	68.5	98.5
在 100°C 時的粘度	ASTM D445	cSt	5.23	6.75	8.7	11
粘度指數	ASTM D2270		100	100	99	97
閃點 (COC)	ASTM D92	°C	219	225	230	239
傾點	ASTM D97	°C	-20	-20	-18	-15

## 產品優點

- 極佳的抗磨能力，減低油泵磨損及延長機件壽命
- 特殊的抗腐蝕保護，減低水氣對機件的負面影響
- 大幅增加系統效能
- 大幅增加液壓系統組件壽命最高達 400% (要視乎系統狀況)
- 減少沉質物及油泥產生，特別是工差嚴謹的伺服電動機閥門
- 優秀的抗氧化及過濾特性
- 減少停機維護時間最多超過 300%

## 可提供容量

- 20L, 200L, 1000L

神盾 SST ECI TV T-POWER 液壓系統油利用獨家 ABF 技術製成，極具抗磨性。配合高品質底油，使機件壽命大大延長。

神盾 SST ECI TV T-POWER 液壓系統油適用於：

- ▶ 所有類型的輕至中度負載的液壓系統，特別是需要經常換油的舊式系統
- ▶ 所有需要使用抗磨液壓油的齒輪系統、及葉片式、軸向或莖向的活塞泵
- ▶ 所有需要抗磨保護的高負載系統
- ▶ 所有需要極佳抗磨保護的齒輪及軸承系統

# 29. 神盾 SST ECI HD-AP 液壓系統油

Ultra Quality Lubricants For Heavy Hydraulic Systems



## 物理資料

特性	標準	單位	結果				
ISO 級別			<b>32</b>	<b>46</b>	<b>68</b>	<b>100</b>	<b>150</b>
在 40°C時的粘度	ASTM D445	cSt	30	45	67	98	145
在 100°C時的粘度	ASTM D445	cSt	5.3	6.7	8.6	10.9	14.5
粘度指數	ASTM D2270		99	99	98	97	96
閃點 (COC)	ASTM D92	°C	212	220	228	245	250
傾點	ASTM D97	°C	-12	-12	-10	-10	-10

## 產品優點

- 極佳的抗磨、抗腐蝕及抗腐蝕能力
- 優秀的抗氧化及過濾特性
- 大幅增加系統效能
- 減少停機維護時間最多超過 300%
- 大幅增加液壓系統組件壽命最高達 400%
- 最經濟的強效通用液壓油 (要視乎系統狀況)

## 可提供容量

- 20L, 200L, 1000L

神盾 SST ECI HD-AP 液壓系統油利用獨家 ABF 技術製成，極具抗磨性。配合高品質底油，使油品具有強大的抗磨、抗腐蝕及抗氧化性。

本潤滑油已經獲得了以下認證及合乎以下效能標準：Park Denison HF-0, HF-2 and DIN 51524 Part I, II specifications。

神盾 SST ECI HD-AP 液壓系統油適用於所有類型的液壓系統，特別是需要經常換油的舊式系統（不包括鍍銀的金屬組件）

# 30. 美國西南研究院之產品測試報告

## 神盾 Lithi-Shield 大幅度戰勝著名品牌 Yamamoto 及 Atlas 潤滑脂

Petroleum Products Research Department  
 Test Summary Report  
 Steel Shield Technologies  
 Purchase Order # 114  
 October 25, 2013

### 神盾鋰基潤滑脂

SwRI	Sample ID:		20003	20004
Code:	Sample Identification:		Litho Shield	Yamamoto EP grease
D1264	Water Washout of Grease			
	Avg. Grease Washed Out	Wt %	1.32	0.66
	Test Temp.	°C	79	79
	Dry Temp.	°C	77	77
D1742	Oil Separation from Lubricating Grease	mass %	2.04	* Note
D2265	Dropping Point	°C	258	307
	Oven Temp.	°C	288	316
D2266	Wear Characteristics (Four-Ball Method)			
	Scar Diameter	kgf	0.75	0.47
D2596	Four-Ball Extreme Pressure Properties			
	Corrected Load	kgf	851.1	501.68
	Load-Wear Index	kgf	92.27	66.73
	Weld Point	kgf	800	315
	LNSL	kgf	80	63

\* No oil separation occurred for grease sample "Yamamoto EP grease", therefore, sample is considered "outside the scope of the method".

**全勝**

Petroleum Products Research Department  
 Test Summary Report  
 Steel Shield Technologies  
 Purchase Order # 114  
 October 25, 2013

SwRI	Sample ID:		20005
Code:	Sample Identification:		Atlas Chisel lube
D1264	Water Washout of Grease		
	Avg. Grease Washed Out	Wt %	1.11
	Test Temp.	°C	79
	Dry Temp.	°C	77
D1742	Oil Separation from Lubricating Grease	mass %	** Note
D2265	Dropping Point	°C	302
	Oven Temp.	°C	316
D2266	Wear Characteristics (Four-Ball Method)		
	Scar Diameter	kgf	0.71
D2596	Four-Ball Extreme Pressure Properties		
	Corrected Load	kgf	302.79
	Load-Wear Index	kgf	41.23
	Weld Point	kgf	315
	LNSL	kgf	50

\*\* No oil separation occurred for grease sample "Atlas Chisel Lube", therefore, sample is outside the scope of the method".

**Lithi Shield**  
 神盾鋰基潤滑脂

指標	四球測試法	Lithi Shield 神盾鋰基 潤滑脂	Yamamoto EP Grease	Atlas Chisel Lube
承受重壓	修正負荷	851.1	501.68	302.79
磨損承受力	負荷磨損指數	92.27	66.73	41.23
高熱負荷	燒結負荷	800	315	315
高壓負荷	最大無卡咬負荷	80	63	50

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Benefiting government, industry and the public through innovation.



# 30. 美國西南研究院之產品測試報告

## 測試報告總結 — 神盾戰勝殼牌及美孚一號潤滑油

美國西南研究所的測試報告已經明確的告訴所有消費者，神盾 Steel Shield Technologies 產品是名乎其實的王者。

泰姆肯 (Timken) 主要測試對象是黏度低於 5000 cSt@40°C 的潤滑劑。油品摩擦率的高低必然反映於溫度上，在既定的工作溫度中 (維持於攝氏 38 ~ 39 度之間) 測試潤滑油能夠承受的最高負載，能直接反映出其抗摩指數是否優異。比較結果如下：

神盾超級航母 (Super-XL 5W30) 與美孚一號 (Mobil 5W30) 在無磨損極壓負荷性能 (Okay Load) 中比較出的得分是 45 磅與 12 磅，在最高(咬死)負載壓力 (Score Load) 方面的結果是 50 磅和 15 磅，即 **神盾比美孚於耐壓和抗磨優勝350%**。

神盾全護 (XHD-7 15W40) 與殼牌 (Shell R-3T 15W40) 比較的成績是 35 磅與 21 磅 (OK Load) 和 40 磅與 24 磅 (Score Load)，**神盾比殼牌於耐壓和抗磨優勝170%**。

這證明了神盾不但能夠承受高負載工作，它的抗磨擦能力非常優異，能夠大幅度提升機械系統的有效輸出功率。

至於四球儀 (4-ball)，主要用來測試高黏度的潤滑劑和抗磨添加劑。我們這次使用四球測試，是希望通過測試來指出神盾潤滑油並不需要依賴高黏稠度也可以擁有媲美潤滑脂的高抗磨負載能力。四球測試最重要的指數是它的 LWI 和燒結負荷，一般認為數值越高性能越好，事實是常規配方的潤滑劑是以高黏稠度來換取抗磨，油品的黏稠度越高，其有效功率越低是必然的事實。這次測試我們可以看到神盾潤滑油的 Super-XL 5W30 和 XHD-7 15W40 的修正負荷是 228Kgf 和 139Kgf，相比美孚一號和殼牌的 53Kgf 和 55Kgf，大幅度領先的成績是鐵一般的事實。而 LWI 是 47Kgf 比 42Kgf 和 40Kgf 比 42Kgf，表面看來好像相差不多，但是燒結負荷 (Weld Point) 猶如一面照妖鏡，315Kg 和 250Kg 相比 200Kg 已經說出了事實。

這就是神盾真科技，無油潤滑的超級性能。

權威實證

泰姆肯 (Timken) 測試，神盾潤滑油遠勝美孚一號及殼牌同級產品

四球測試 (4-ball test)，神盾潤滑油同樣遠勝美孚一號及殼牌同級產品

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测试规格: 美国 ASTM 标准



Benefiting government, industry and the public through innovative science and technology

# 30. 美國西南研究院之產品測試報告

## 泰姆肯測試 (ASTM D2782 Timken Method) – 中文譯本

美國西南研究院測試報告 – 泰姆肯測試機ASTM

THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE – Timken ASTM

中文譯本

測試報告

2013年5月15日

Steel Shield Technologies

測試報告編號#17274、17276

ASTM D2782 潤滑油極壓性能測試法 (泰姆肯測試法)	神盾(超級航母) 5W-30 規格：1美式加侖	美孚一號Mobil 1 5W-30 規格：1美式加侖
無磨損極壓負荷性能	45	12
最高(咬死)負載能力	50	15
溫度(測試溫度標準)	39	38

權威實證

泰姆肯 (Timken)  
測試，神盾潤滑  
油遠勝美孚一號  
及殼牌同級產品

神盾全勝：

神盾比美孚耐壓和抗磨優勝

350%；

比殼牌優勝 170%



測試報告編號#17275、17277

ASTM D2782 潤滑油極壓性能測試法 (泰姆肯測試法)	神盾(全護) SAE 15W-40 規格：1美式加侖	殼牌Shell SAE 15W-40 規格：1美式加侖
無磨損極壓負荷性能	35	21
最高(咬死)負載能力	40	24
溫度(測試溫度標準)	38	38



美國西南研究院：  
[www.swri.org](http://www.swri.org)

# 30. 美國西南研究院之產品測試報告

## 四球測試 (ASTM D2783 Four-Ball Method) – 中文譯本

美國西南研究院測試報告 – 高溫壓力測試ASTM  
 THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE – 4-Ball ASTM  
 中文譯本

測試報告  
 2013年7月1日  
 Steel Shield Technologies

測試報告編號#18051、18049

ASTM D2783 潤滑油極壓性能測試法 (四球測試法)	神盾(超級航母) 5W-30 規格：1美式加侖	美孚一號Mobil 1 5W-30 規格：1美式加侖
修正負荷	228	53
負荷磨損指數	47	42
燒結負荷	315	200
最大無卡咬負荷	80	100



測試報告編號#18502、18050

ASTM D2783 潤滑油極壓性能測試法 (四球測試法)	神盾(全護) SAE 15W-40 規格：1美式加侖	殼牌Shell SAE 15W-40 規格：1美式加侖
修正負荷	139	55
負荷磨損指數	40	42
燒結負荷	250	200
最大無卡咬負荷	80	100



權威實證

四球測試 (4-ball test) · 神盾潤滑油同樣遠勝美孚一號及殼牌同級產品

美國西南研究院：  
[www.swri.org](http://www.swri.org)

# 30. 美國西南研究院之產品測試報告

## 泰姆肯測試 (ASTM D2782 Timken Method) – 英文原件

### SOUTHWEST RESEARCH INSTITUTE®

6229 CULBERN ROAD 78238-5166 • P.O. DRAWER 28530 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

May 15, 2013

George Fennell  
Steel Shield Technologies  
3351 Industrial Blvd  
Bethel Park, PA 15102-2543  
Phone: 1-800-390-1535  
Email:

Re: Fuel Analysis Results  
Project L08.05.11.11831.01.001  
SwRI WO# 68291  
PO# 102

Dear Mr. Fennell:

Analyses have been completed on your samples in accordance with the tests requested. Five samples were received in good condition on May 1<sup>st</sup>, 2013 in good condition. Four samples were received in one gallon plastic containers and one sample was received in a one quart plastic bottle. No testing was requested on the sample received in the one quart bottle. Testing took place between May 6<sup>th</sup> and May 10<sup>th</sup> 2013. Test results and sample identifications are shown in the table attached.

Analyses were performed according to the listed ASTM test procedures with no modifications or deviations. Precision should be consistent with those stated in the ASTM test procedures. Sample aliquots were taken in accordance with the various ASTM test procedures. The analyses above pertain only to the sample received by Southwest Research Institute and represent only that sampling lot. This report shall not be reproduced except in full without the express written permission of Southwest Research Institute.

If there are any questions concerning these analyses, or if you need any additional testing on the samples, please contact me at (210) 522-2071. We appreciate the opportunity to be of service to your firm.

Sincerely,



Robert R. Legg  
Fuels Laboratory Manager  
Fuels & Lubricants Research Department  
Office of Automotive Engineering



Benefiting government, industry and the public through innovative science and technology



#### Test Summary Report May 15<sup>th</sup>, 2013

Steel Shield Technologies

SwRI Lab# 17274

Steel Shield Super Synthetic  
5W-30  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)	
Okay Load, lbs .....	45
Score Load, lbs .....	50
Temperature, °C .....	39

SwRI Lab# 17275

Steel Shield XHD-7  
SAE 15W-40  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)	
Okay Load, lbs .....	35
Score Load, lbs .....	40
Temperature, °C .....	38

ORRLBEO3 Steel Shield (a).docx  
Page 2 of 3



#### Test Summary Report May 15<sup>th</sup>, 2013

Steel Shield Technologies

SwRI Lab# 17276

Shell Rotella T  
SAE 15W-40  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)	
Okay Load, lbs .....	21
Score Load, lbs .....	24
Temperature, °C .....	38

SwRI Lab# 17277

Mobil 1  
5W-30  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)	
Okay Load, lbs .....	12
Score Load, lbs .....	15
Temperature, °C .....	38

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Page 3 of 3

# 30. 美國西南研究院之產品測試報告

## 四球測試 (ASTM D2783 Four-Ball Method) – 英文原件

SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA ROAD 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 584-5111 • WWW.SWRI.ORG

July 1, 2013

George Fennell  
Steel Shield Technologies  
3351 Industrial Blvd  
Bethel Park, PA 15102-2543  
Phone: 1-800-390-1535  
Email: gcfennell@steelshieldtech.com

Re: Fuel Analysis Results  
Purchase Order# 103  
SwRI WO# 68584

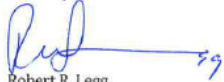
Dear Mr. Fennell:

Analyses have been completed on your samples in accordance with the tests requested. Four samples were received in good condition on June 17, 2013 in good condition. The samples were received in one gallon plastic containers. Testing took place by June 29, 2013. Test results and sample identifications are shown in the table attached.

Analyses were performed according to the listed ASTM test procedures with no modifications or deviations. Precision should be consistent with those stated in the ASTM test procedures. Sample aliquots were taken in accordance with the various ASTM test procedures. The analyses above pertain only to the sample received by Southwest Research Institute and represent only that sampling lot. This report shall not be reproduced except in full without the express written permission of Southwest Research Institute.

If there are any questions concerning these analyses, or if you need any additional testing on the samples, please contact me at (210) 522-2071. We appreciate the opportunity to be of service to your firm.

Sincerely,



Robert R. Legg  
Fuels Laboratory Manager  
Fuels & Lubricants Research Department  
Office of Automotive Engineering

OMRRAGA13 68584  
Page 2 of 2



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**Test Summary Report**  
Steel Shield Technologies  
Purchase Order # 103  
July 1, 2013

	LabNum		18049	18050	18051	18052
	Sample Code		Mobil 1	Shell Rotella	Steel Shield 5W30 gasoline	Steel Shield 15W-40 diesel
	LabNum		18049	18050	18051	18052
<b>D2783</b>	<b>CorrLoad</b>	<b>Kgf</b>	53	55	228	139
	<b>WearIdx</b>	<b>Kgf</b>	42	42	47	40
	<b>WeldPt</b>	<b>kg</b>	200	200	315	250
	<b>LNSL</b>	<b>kg</b>	100	100	80	80

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OMRRAGA13 68584  
Page 2 of 2



# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油泰姆肯測試 (ASTM D2782 Timken) – 中文譯本

美國西南研究院測試報告 – 泰姆肯測試機 ASTM  
 THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE – Timken ASTM D2782  
 中文譯本

測試報告  
 2014年11月20日  
 Steel Shield Technologies

測試報告編號	24564	23728	25252	23727	25250	25251
ASTM D2782 潤滑油極壓性能測試法 (泰姆肯測試法)	神盾 SST 燃氣機油 SAE 40 無灰 不含 EPA 精油	神盾 SST 燃氣機油 SAE 40 低灰 含 EPA 精油	神盾 EPA 極 壓精油	神盾壓縮機油 ISO #100 / 150	美孚飛馬 805	美孚飛馬 801
規格 (美式加侖)	1	1	1	1	1	1
無磨損極壓負荷性能 (lbs)	40	40	75	55	9	9
最高(咬死)負載能力 (lbs)	45	45	80	60	12	12
溫度(測試溫度標準) (°C)	38	38	38	38	38	38



同級產品



權威實證

神盾全勝：  
 神盾的無磨損極壓負荷性能比美孚優勝至少 4.44 倍；  
 而最高（咬死）負載能力則比美孚優勝至少 3.75 倍

泰姆肯 (Timken)  
 測試，神盾潤滑油  
 遠勝美孚飛馬 801  
 及 802 同級產品

美國西南研究院：  
[www.swri.org](http://www.swri.org)



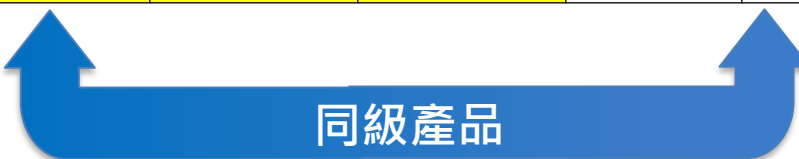
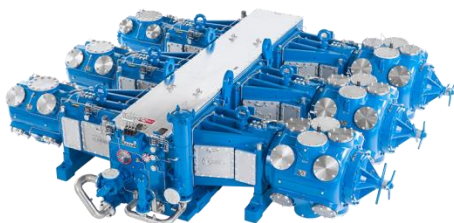
# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油四球測試 (ASTM D2783 4-Ball) – 中文譯本

美國西南研究院測試報告 – 高溫壓力測試 ASTM  
 THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE – 4-Ball ASTM D2783  
 中文譯本

測試報告  
 2014年11月20日  
 Steel Shield Technologies

測試報告編號	24564	23728	25252	23727	25250	25251
ASTM D2783 潤滑油極壓性能測試法 (四球測試法)	神盾 SST 燃氣機油 SAE 40 無灰 不含 EPA 精 油	神盾 SST 燃氣機油 SAE 40 低灰 含 EPA 精油	神盾 EPA 極壓 精油	神盾壓縮機油 ISO #100 / 150	美孚飛馬 805	美孚飛馬 801
規格 (美式加侖)	1	1	1	1	1	1
修正負荷 (kgf)	70	109	NA	1		
負荷磨損指數 (kgf)	35	46	NA	48	34	35
燒結負荷 (kg)	200	250	>800	250	200	200
最大無卡咬負荷 (kg)	80	100	80	100	63	80



權威實證

神盾全勝：  
 神盾的燒結負荷比美孚優勝最多 1.25 倍；  
 而最大無卡咬負荷則比美孚優勝最多 1.59 倍

四球測試 (4-ball test)，神盾亦比美孚飛馬 801 及 802 同級產品優勝

美國西南研究院：  
[www.swri.org](http://www.swri.org)



# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油 ASTM D2782 Timken、 D2783 4-Ball & D6352 GC — 英文原件

### SOUTHWEST RESEARCH INSTITUTE®

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November 20<sup>th</sup>, 2014

George Fennell  
Steel Shield Technologies  
3351 Industrial Blvd  
Bethel Park, PA 15102-2543  
Phone: 1-800-390-1535  
Email:

Re: Fuel Analysis Results  
SwRI WO# 71111  
PO# 120

Dear Mr. Fennell:

Analyses have been completed on your samples in accordance with the tests requested. Twelve samples were received in good condition between July 21<sup>st</sup>, 2014 and October 7<sup>th</sup> 2014 in good condition. Eleven samples were received in one gallon plastic containers and one sample was received in a one quart plastic bottle. Sample Identification and testing requesting is shown in the table on the following page. Testing took place between October 13<sup>th</sup> and November 11<sup>th</sup> 2014. Test results and sample identifications are shown in the table attached.

Analyses were performed according to the listed ASTM test procedures with no modifications or deviations. Precision should be consistent with those stated in the ASTM test procedures. Sample aliquots were taken in accordance with the various ASTM test procedures. The analyses above pertain only to the sample received by Southwest Research Institute and represent only that sampling lot. This report shall not be reproduced except in full without the express written permission of Southwest Research Institute.

If there are any questions concerning these analyses, or if you need any additional testing on the samples, please contact me at (210) 522-2071. We appreciate the opportunity to be of service to your firm.

Sincerely,



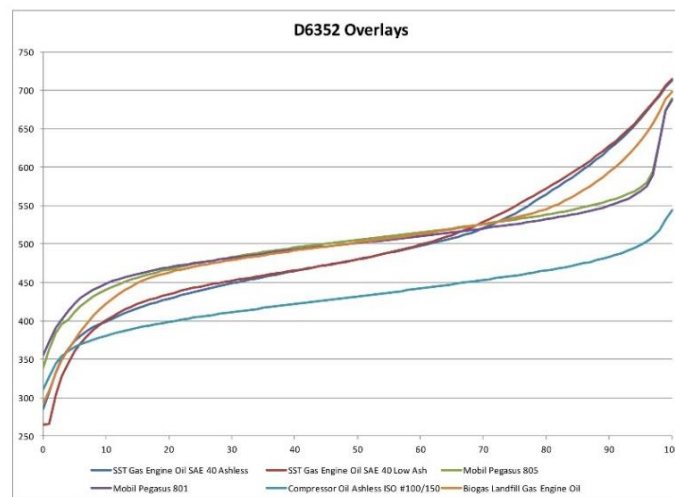
Robert R. Legg  
Fuels Laboratory Manager  
Fuels & Lubricants Research Department  
Office of Automotive Engineering



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Test Summary Report  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies



In comparing the curves and D6352 chromatography, it is observed that samples SST Gas Engine oil SAE 40 Ashless and SST Gas Engine Oil SAE 40 Low Ash are very similar with the exception that the Low Ash oil appears to have an added component that is somewhat lighter than the rest of the oil. The bulk of this oil is lighter than the others; however it does have a larger proportion of heavier compounds. In general it has broader array of hydrocarbons than the other oils. The Mobil Pegasus 801 and Mobil Pegasus 805 are essentially the same oil with the same boiling distribution. They both are a narrower cut reducing the amount of lighter and heavier hydrocarbon species. The Biogas Landfill Gas Engine Oil has a distribution in between the SST Gas Engine Oils and the Mobil Pegasus Oils. The Ashless Compressor oil is a significantly lighter oil than the rest of the samples.

ORRLAKE4 Steel Shield (a).docx  
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# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油 ASTM D2782 Timken、 D2783 4-Ball & D6352 GC — 英文原件



**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 24564

SST Gas Engine Oil  
SAE 40 Ashless  
1 Gallon Plastic Jug

**ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)**

Okay Load, lbs .....	40
Score Load, lbs .....	45
Temperature, °C .....	38

**ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)**

Corrected Load, kgf .....	70
Load Wear Index, kgf .....	35
Weld Point, kg .....	200
Last Non Seizure Load, kg .....	80

**ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700 °C by GC**

IBP 285.3	20% 428.8	40% 464.8	60% 497.5	80% 564.9
1% 306.2	21% 431.1	41% 466.4	61% 499.2	81% 570.0
2% 333.2	22% 433.3	42% 467.9	62% 501.1	82% 575.1
3% 351.6	23% 435.4	43% 469.4	63% 503.0	83% 580.6
4% 364.1	24% 437.2	44% 470.9	64% 505.0	84% 586.2
5% 373.5	25% 439.2	45% 472.4	65% 507.1	85% 591.8
6% 380.5	26% 441.2	46% 474.0	66% 509.3	86% 597.5
7% 386.7	27% 443.1	47% 475.6	67% 511.8	87% 603.5
8% 391.9	28% 444.9	48% 477.1	68% 514.5	88% 609.8
9% 396.0	29% 446.7	49% 478.6	69% 517.3	89% 616.3
10% 399.1	30% 448.6	50% 480.2	70% 520.4	90% 623.3
11% 403.0	31% 450.5	51% 481.8	71% 523.7	91% 630.3
12% 406.6	32% 452.1	52% 483.4	72% 527.3	92% 637.6
13% 410.2	33% 453.7	53% 485.1	73% 531.2	93% 645.6
14% 413.5	34% 455.2	54% 486.8	74% 535.3	94% 653.8
15% 416.5	35% 456.9	55% 488.5	75% 539.6	95% 662.7
16% 419.1	36% 458.5	56% 490.2	76% 544.2	96% 672.9
17% 421.8	37% 460.1	57% 492.0	77% 549.2	97% 682.4
18% 424.3	38% 461.7	58% 493.8	78% 554.5	98% 692.4
19% 426.5	39% 463.2	59% 495.7	79% 559.7	99% 704.3
				FBP 713.1



**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 23728

Biogas Landfill Gas Engine Oil  
SAE 40 (Gecat SAE 40 Low Ash)  
1 Gallon Plastic Jug

**ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)**

Okay Load, lbs .....	40
Score Load, lbs .....	45
Temperature, °C .....	38

**ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)**

Corrected Load, kgf .....	109
Load Wear Index, kgf .....	46
Weld Point, kg .....	250
Last Non Seizure Load, kg .....	100

**ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700 °C by GC**

IBP 291.8	20% 462.9	40% 491.3	60% 512.8	80% 545.5
1% 308.9	21% 465.1	41% 492.4	61% 514.0	81% 548.7
2% 331.8	22% 467.0	42% 493.5	62% 515.2	82% 552.3
3% 349.1	23% 468.8	43% 494.7	63% 516.5	83% 556.3
4% 362.7	24% 470.4	44% 495.8	64% 517.8	84% 560.5
5% 374.7	25% 472.0	45% 496.9	65% 519.1	85% 565.1
6% 385.9	26% 473.6	46% 497.9	66% 520.4	86% 569.9
7% 396.5	27% 475.1	47% 498.9	67% 521.8	87% 575.0
8% 406.2	28% 476.5	48% 499.9	68% 523.1	88% 580.8
9% 415.0	29% 477.8	49% 500.9	69% 524.5	89% 586.8
10% 422.4	30% 479.1	50% 502.0	70% 526.0	90% 593.2
11% 429.0	31% 480.4	51% 503.0	71% 527.5	91% 599.9
12% 434.9	32% 481.6	52% 504.0	72% 529.0	92% 607.5
13% 440.2	33% 482.9	53% 505.1	73% 530.7	93% 615.4
14% 444.7	34% 484.2	54% 506.1	74% 532.4	94% 624.3
15% 449.2	35% 485.4	55% 507.2	75% 534.2	95% 633.7
16% 452.5	36% 486.6	56% 508.2	76% 536.1	96% 644.5
17% 455.4	37% 487.8	57% 509.3	77% 538.1	97% 656.4
18% 458.3	38% 489.0	58% 510.5	78% 540.4	98% 671.9
19% 460.7	39% 490.1	59% 511.7	79% 542.8	99% 688.2
				FBP 697.9



# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油 ASTM D2782 Timken、 D2783 4-Ball & D6352 GC — 英文原件



**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 25252

SST-EPA

1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)

Okay Load, lbs .....	75
Score Load, lbs .....	80
Temperature, °C .....	38

ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)

Corrected Load, kgf .....	
Load Wear Index, kgf .....	
Weld Point, kg .....	>800
Last Non Seizure Load, kg .....	80

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ORRLAKE4 Steel Shield (a).docx  
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**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 23727

Compressor Oil Ashless

ISO #100/150

1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)

Okay Load, lbs .....	55
Score Load, lbs .....	60
Temperature, °C .....	38

ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)

Corrected Load, kgf .....	133
Load Wear Index, kgf .....	48
Weld Point, kg .....	250
Last Non Seizure Load, kg .....	100

ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700 °C by GC

IBP	310.0	20%	398.6	40%	421.7	60%	442.0	80%	465.5
1%	326.9	21%	400.0	41%	422.7	61%	443.1	81%	466.9
2%	344.5	22%	401.4	42%	423.6	62%	444.1	82%	468.4
3%	354.0	23%	402.7	43%	424.6	63%	445.3	83%	469.9
4%	360.6	24%	404.0	44%	425.6	64%	446.4	84%	471.5
5%	365.4	25%	405.2	45%	426.6	65%	447.5	85%	473.2
6%	369.2	26%	406.4	46%	427.6	66%	448.7	86%	474.9
7%	372.5	27%	407.7	47%	428.6	67%	449.8	87%	476.7
8%	375.5	28%	408.9	48%	429.6	68%	450.9	88%	478.7
9%	378.2	29%	410.1	49%	430.6	69%	452.0	89%	480.7
10%	380.6	30%	411.2	50%	431.6	70%	453.1	90%	483.0
11%	382.8	31%	412.4	51%	432.6	71%	454.2	91%	485.6
12%	384.9	32%	413.4	52%	433.6	72%	455.4	92%	488.3
13%	386.9	33%	414.5	53%	434.6	73%	456.6	93%	491.4
14%	388.9	34%	415.5	54%	435.7	74%	457.8	94%	494.9
15%	390.7	35%	416.6	55%	436.7	75%	459.0	95%	498.8
16%	392.4	36%	417.7	56%	437.7	76%	460.2	96%	503.3
17%	394.0	37%	418.7	57%	438.8	77%	461.5	97%	509.1
18%	395.6	38%	419.7	58%	439.9	78%	462.8	98%	517.6
19%	397.1	39%	420.7	59%	440.9	79%	464.1	99%	531.3
								FBP	544.3

ORRLAKE4 Steel Shield (a).docx  
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# 30. 美國西南研究院之產品測試報告

## 神盾燃氣機油及壓縮機油 ASTM D2782 Timken、 D2783 4-Ball & D6352 GC — 英文原件



**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 25250

Mobil Pegasus  
805  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)

Okay Load, lbs .....	9
Score Load, lbs .....	12
Temperature, °C .....	38

ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)

Corrected Load, kgf .....	136
Load Wear Index, kgf.....	34
Weld Point, kg .....	200
Last Non Seizure Load, kg.....	63

ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700 °C by GC

IBP	338.1	20%	467.0	40%	495.3	60%	515.0	80%	538.2
1%	363.1	21%	468.9	41%	496.4	61%	516.1	81%	539.6
2%	384.2	22%	470.6	42%	497.4	62%	517.1	82%	541.0
3%	396.2	23%	472.3	43%	498.3	63%	518.1	83%	542.6
4%	401.9	24%	474.0	44%	499.3	64%	519.2	84%	544.2
5%	410.8	25%	475.6	45%	500.3	65%	520.3	85%	545.9
6%	419.2	26%	477.1	46%	501.3	66%	521.4	86%	547.7
7%	426.0	27%	478.6	47%	502.2	67%	522.5	87%	549.7
8%	431.6	28%	480.0	48%	503.2	68%	523.6	88%	551.8
9%	436.1	29%	481.5	49%	504.1	69%	524.7	89%	554.1
10%	440.5	30%	482.9	50%	505.1	70%	525.8	90%	556.5
11%	444.1	31%	484.2	51%	506.0	71%	526.9	91%	558.9
12%	447.6	32%	485.6	52%	506.9	72%	528.1	92%	561.8
13%	450.8	33%	486.9	53%	507.9	73%	529.3	93%	565.0
14%	453.5	34%	488.2	54%	508.9	74%	530.5	94%	568.7
15%	456.1	35%	489.4	55%	509.9	75%	531.7	95%	573.2
16%	458.5	36%	490.6	56%	510.9	76%	533.0	96%	580.2
17%	460.8	37%	491.8	57%	511.9	77%	534.2	97%	594.4
18%	463.0	38%	493.0	58%	512.9	78%	535.5	98%	634.2
19%	465.1	39%	494.1	59%	514.0	79%	536.8	99%	674.3
								FBP	689.6



**Test Summary Report**  
November 20<sup>th</sup>, 2014  
Steel Shield Technologies

SwRI Lab# 25251

Mobil Pegasus  
801  
1 Gallon Plastic Jug

ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)

Okay Load, lbs .....	9
Score Load, lbs .....	12
Temperature, °C .....	38

ASTM D2783 Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)

Corrected Load, kgf .....	74
Load Wear Index, kgf.....	35
Weld Point, kg .....	200
Last Non Seizure Load, kg.....	80

ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700 °C by GC

IBP	355.5	20%	469.5	40%	492.3	60%	510.0	80%	532.2
1%	372.7	21%	470.9	41%	493.3	61%	511.0	81%	533.6
2%	391.1	22%	472.3	42%	494.3	62%	511.9	82%	535.1
3%	401.9	23%	473.7	43%	495.2	63%	512.9	83%	536.5
4%	413.3	24%	475.0	44%	496.2	64%	513.9	84%	538.1
5%	422.1	25%	476.2	45%	497.0	65%	514.9	85%	539.7
6%	429.3	26%	477.4	46%	497.8	66%	516.0	86%	541.4
7%	435.4	27%	478.5	47%	498.7	67%	517.0	87%	543.2
8%	440.6	28%	479.7	48%	499.5	68%	518.0	88%	545.2
9%	444.6	29%	480.8	49%	500.4	69%	519.1	89%	547.4
10%	448.3	30%	481.9	50%	501.2	70%	520.2	90%	549.9
11%	451.6	31%	483.1	51%	502.1	71%	521.3	91%	552.7
12%	454.2	32%	484.2	52%	503.0	72%	522.4	92%	555.8
13%	456.7	33%	485.2	53%	503.8	73%	523.5	93%	559.1
14%	459.0	34%	486.3	54%	504.7	74%	524.7	94%	563.1
15%	461.0	35%	487.3	55%	505.5	75%	525.9	95%	568.2
16%	462.9	36%	488.4	56%	506.4	76%	527.1	96%	575.2
17%	464.7	37%	489.4	57%	507.2	77%	528.3	97%	590.1
18%	466.5	38%	490.3	58%	508.1	78%	529.6	98%	633.5
		39%	491.3	59%	509.0	79%	530.9	99%	673.0
								FBP	687.9

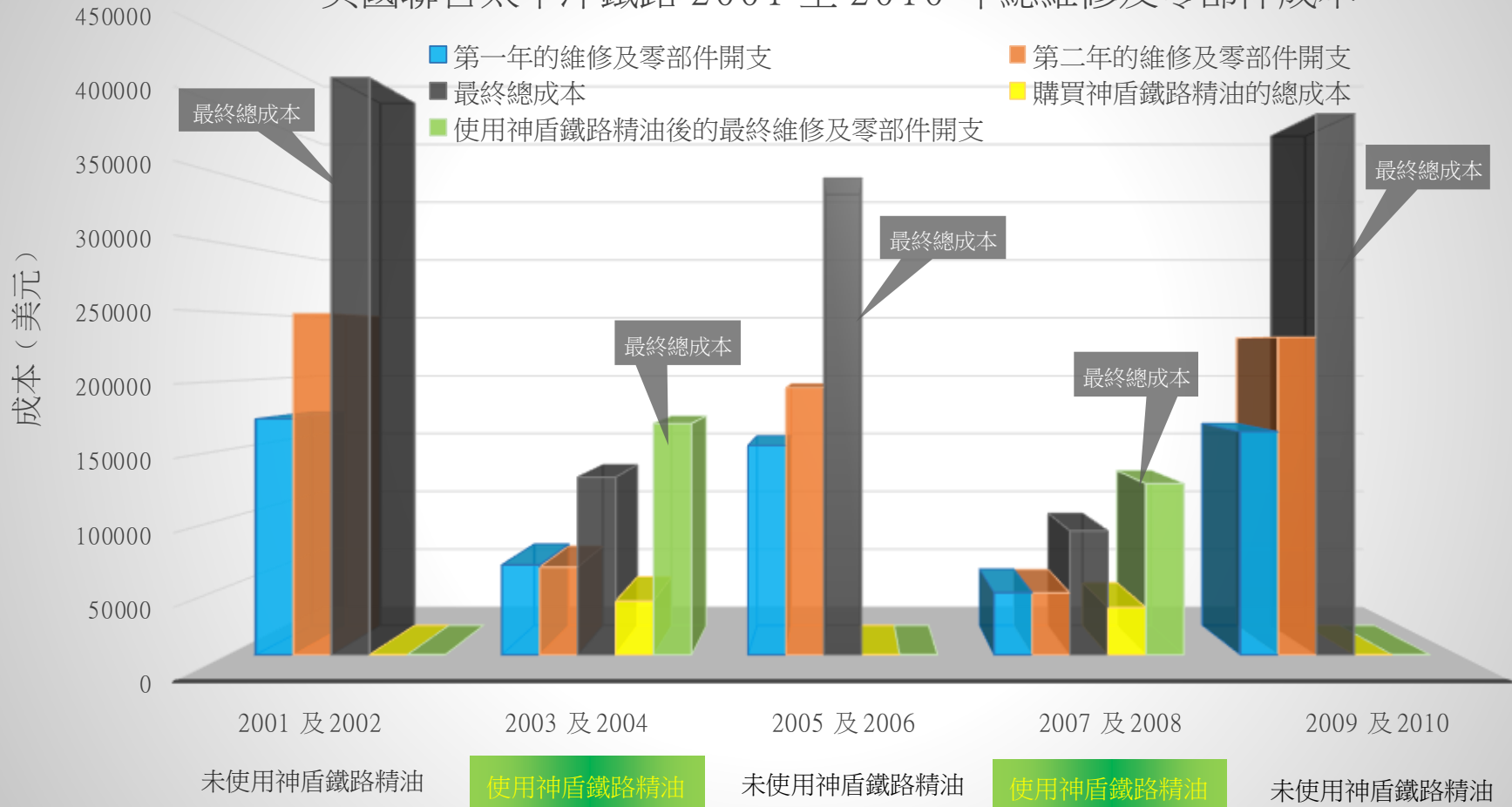


# 31. 美國聯合太平洋鐵路成本節省報告

美國聯合太平洋鐵路總維修及零部件成本比較  
使用神盾前 對 使用神盾後

**必讀**

美國聯合太平洋鐵路 2001 至 2010 年總維修及零部件成本



# 31. 美國聯合太平洋鐵路成本節省報告



大幅提升產能及降低維護時間  
使用 ABF 技術的神盾鐵路潤滑劑  
是您唯一的選擇！





# 31. 美國聯合太平洋鐵路成本節省報告

## 使用高級邊界膜技術的神盾鐵路潤滑劑

- ABF離子轉移磁浮技術，高效提升潤滑及負載能力
- 利用熱力條件與金屬接觸面產生化學作用，形成一層複雜的保護層於兩面金屬面之間
- 經 ABF 技術處理後的金屬面變得極之平滑，而金屬的各種特性亦同時被優化
- ABF 技術讓工作溫度下降，潤滑油膜強度加固，使金屬磨損減少，抗極壓性能亦被提升

## 使用神盾鐵路潤滑劑所得到的益處

- 增加列車行駛速度
- 列車到站更準時
- 延長零部件壽命及可靠性
- 減少維修及停機時間
- 減少金屬互相磨擦
- 節省能源
- 降低運作溫度
- 機件操作時更順暢
- 保護活動組件



# 31. 美國聯合太平洋鐵路成本節省報告

## 中央地區的 M/W 設備 (動力組件)

### 專題報告一

必讀

- 在 2001 及 2002 年，未有使用神盾鐵路潤滑劑於任何動力組件或其他 M/W 零部件
- 在 2003 及 2004 年，採用神盾鐵路潤滑劑於動力組件包括傳動系統、液壓系統、齒輪系統及差速系統



Not Just Oil... IT'S TECHNOLOGY

### 2001 至 2004 年美國聯合太平洋鐵路成本節省比較

2001 及 2002 (未有使用神盾鐵路精油)	2003 及 2004 (使用神盾鐵路精油)
系統維修成本 = \$172,296 + \$249,476 = \$421,772 (每年平均 \$210,886)	系統維修成本 = \$65,722 + \$64,021 = \$129,742 (每年平均 \$64,871)
	神盾鐵路潤滑劑成本 = \$21,195 + \$18,000 = \$39,195 (每年平均 \$19,598)
	聯合太平洋鐵路總成本 = \$168,937 (每年平均 \$84,469)
	聯合太平洋鐵路節省的開支 = \$252,835 (每年平均 \$126,417)
	使用神盾鐵路油的投資回報 (ROI) = $\frac{\$252,835 - \$39,195}{\$39,195}$ = 5.45 (545% 回報率)
(以上為美元)	(以上為美元)



節省 60% 成本

\* 註：以上節省的開支不包括工資、租金、停機時間或延誤

\* 投資回報：節省的開支 - 成本 = ROI  
成本



# 31. 美國聯合太平洋鐵路成本節省報告

## 美國聯合太平洋鐵路 2005 至 2008 年成本節省報告

### 專題報告二

必讀

- 2005 至 2006 年，美國聯合太平洋鐵路維修成本（沒有使用神盾鐵路潤滑劑）
- 2007 至 2008 年，美國聯合太平洋鐵路採用神盾鐵路潤滑劑的成本分析。

註：所有核心損壞及應用的維修成本為平均數  
所有維修均為潤滑失效及過度磨損所引致  
維修成本並不包括工資、停機時間、租金或延誤



Not Just Oil...  
IT'S TECHNOLOGY



	維修點	每個單位的成本	2005 年的維修單位		2006 年的維修單位		2007 年的維修單位		2008 年的維修單位	
			單位	成本	單位	成本	單位	成本	單位	成本
零部件的 年均維修 成本	動力系統	12,000.00	4	48,000.00	6	72,000.00	1	12,000.00	0	0
	變速系統	11,000.00	3	33,000.00	4	44,000.00	0	0	1	24,000.00
	差速系統	1,300.00	2	2,600.00	4	5,200.00	1	1,300.00	0	0
	液壓系統油泵	4,000.00	10	40,000.00	8	32,000.00	4	16,000.00	5	14,000.00
	閘門失效	935.00	3	2,800.00	3	2,800.00	0	0	2	2100
	液壓系統汽缸	600.00	12	7,200.00	15	9,000.00	6	3,600.00	5	3,800.00
	液壓系統發動機	2,500.00	8	20,000.00	12	30,000.00	5	12,500.00	1	1200
	<b>年均維修成本</b>			<b>\$153,000.00</b>		<b>\$195,000.00</b>		<b>\$45,400.00</b>		<b>\$45,100.00</b>



# 31. 美國聯合太平洋鐵路成本節省報告

美國聯合太平洋鐵路 2005 至 2008 年成本節省報告

必讀

專題報告二

- 2007 年，美國聯合太平洋鐵路購買了 USD \$20,394 神盾鐵路潤滑劑
- 2008 年，美國聯合太平洋鐵路購買了 USD \$14,100 神盾鐵路潤滑劑



	2005 年	2006 年	2007 年	2008 年
系統失效成本	153,000	195,000	45,400	45,100
神盾鐵路精油成本			20,394	14,100
總成本	153,000	195,000	65,794	59,200

2005-2006 與 2007-2008 年度美國聯合太平洋鐵路成本節省比較

2005 及 2006 (未有採用神盾鐵路潤滑劑)	2007 及 2008 (採用神盾鐵路潤滑劑)
系統維修成本 = \$153,000 + \$195,000 = \$348,000 (每年平均 \$174,000)	系統維修成本 = \$45,400 + \$45,100 = \$90,500 (每年平均 \$45,250)
	神盾鐵路精油成本 = \$20,394 + \$14,100 = \$34,494 (每年平均 \$17,247)
	聯合太平洋鐵路總成本 = \$124,994 (每年平均 \$62,497)
	聯合太平洋鐵路節省的開支 = \$223,006 (每年平均 \$111,503)
	使用神盾鐵路精油的投資回報 (ROI) = $\frac{\$223,006 - \$34,494}{\$34,494}$ = 5.46 (546% 回報率)
(以上為美元)	(以上為美元)



Not Just Oil... IT'S TECHNOLOGY

節省 64% 成本

\* 註：以上節省的開支不包括工資、租金、停機時間或延誤



# 31. 美國聯合太平洋鐵路成本節省報告

## 美國太平洋鐵路神盾產品編號

- RES-MT-16oz # 310-4437-0
- RES-MT-128oz # 310-4440-0
- RES-MT-5G # 310-4441-0
- RES-MT-55G # 310-4444-0
- RES-MT-300G # 310-4446-0



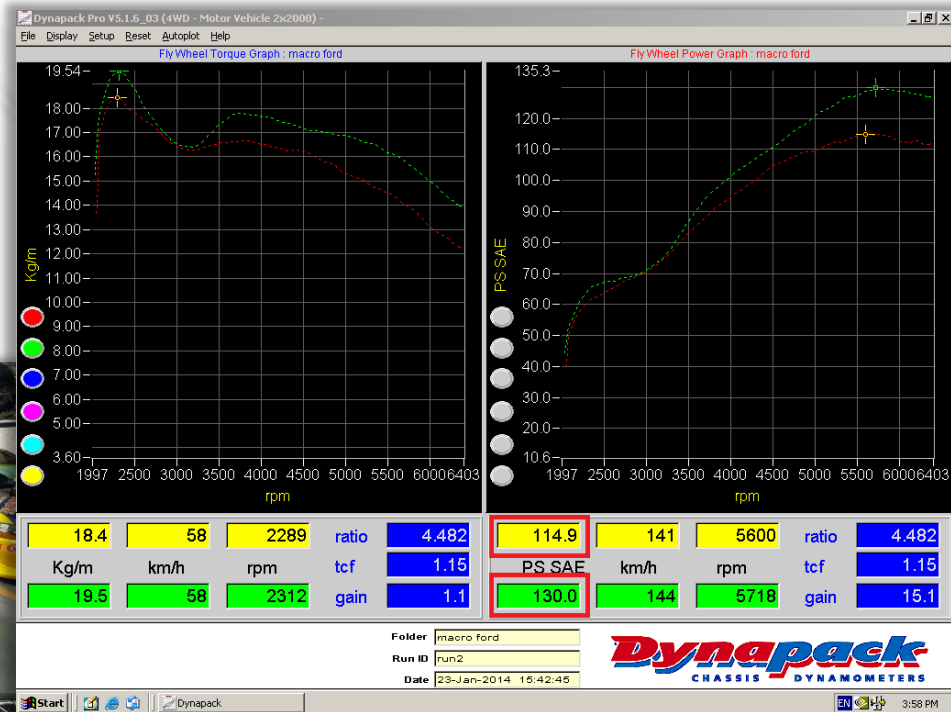
## 總結

- 美國神盾潤滑劑能夠提高列車行駛速度、使列車到站更準時、延長零部件壽命及可靠性，及減少維修及停機時間，因為神盾 ABF 技術非靠油，它讓兩面反向互動的金屬表面產生質的優化，讓離子磁浮能量替代常態潤滑油的流體潤滑以減少金屬互相磨擦及工作溫度。
- 美國太平洋鐵路對美國神盾潤滑劑進行以年計算的長時間測試，證實神盾對所有金屬部件有正面效益，值得信賴。
- 美國神盾潤滑劑幫助美國聯合太平洋鐵路每年平均節省70% 以上的維護成本。



# 32. Dyno 專業汽車馬力輸出測試

以下是一輛福特 Focus 2.0L 汽車使用專業汽車馬力測試機 Dyno 的測試報告。結果顯示，在沒有任何機件改動的情況下，單單只是使用神盾磁浮潤滑油後，引擎最高馬力由 114.9 增加至 130，**暴增了超過 13%**！



# 33. 保險証書及從來沒有索償申請證明



**ACORD** **CERTIFICATE OF LIABILITY INSURANCE** DATE (MM/DD/YYYY) 9/16/2013

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Best Insurance Agency 340 S. Main St., P.O. Box 670 Butler PA 16003-0670	CONTACT NAME: Jamie McDonald PHONE: (724) 283-5670 FAX: (724) 283-1160 FAC. No. Ext.: (724) 283-5670 FAX: (724) 283-1160 EMAIL: Jamie@bestinsurancebutler.com ADDRESS: Jamie@bestinsurancebutler.com
INSURED Steel Shield Technologies Inc 3351 Industrial Blvd Bethel Park PA 15102	INSURER(S) AFFORDING COVERAGE INSURER A: Essex Insurance Co. INSURER B: INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES CERTIFICATE NUMBER: 001 2013 - 14 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR. ALTR.	TYPE OF INSURANCE	ADDITIONAL INSURER	POLICY NUMBER	POLICY EFF. DATE (MM/DD/YYYY)	POLICY EXPI. DATE (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR		2CR7218	4/24/2013	4/24/2014	EACH OCCURRENCE \$ 2,000,000 DAMAGE TO RENTED PREMISES (EA occurrence) \$ 50,000 MED EXP (Any one person) \$ Excluded PERSONAL & ADV INJURY \$ 2,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ Included
A	GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO. <input type="checkbox"/> SECT. <input type="checkbox"/> LOC					
A	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS		2CR7218	4/24/2013	4/24/2014	COMBINED SINGLE LIMIT (EA accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	UMBRELLA LIAB EXCESS LIAB DED. RETENTION \$					EACH OCCURRENCE \$ AGGREGATE \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY EMPLOYEE OR PART-TIME EXECUTIVE OFFICER MEMBER EXCLUDED? (Mandatory in NY) If yes, describe under DESCRIPTION OF OPERATIONS below					WC STATL. LIMITS \$ OTH. ER \$ E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)  
Operations of the Named Insured.

CERTIFICATE HOLDER: Steel Shield Technologies (Asia Pacific) Ltd.  
Mr. Andies Wan  
22nd Floor, W. Business Centre  
4 Kam Hong Street  
N. Point, Hong Kong

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE: *Raymond A. Rosenbauer*

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Best Insurance Agency  
340 S. Main St., P.O. Box 670  
Butler, PA 16003-0670  
(724) 283-5670 (724) 283-1160 Fax  
Email: Ray@Bestinsurancebutler.com

September 18, 2013

Steel Shield Technologies (Asia Pacific) Limited  
22<sup>nd</sup> Floor, W. Business Centre  
4 Kam Hong Street  
North Point, Hong Kong

To Whom It May Concern:

Please be advised that Steel Shield Technologies Inc, manufacturer of specialty lubricants and greases, located in Bethel Park, Pennsylvania, USA, has had no claims, claim related incidents or notices of loss under any General Liability policy issued by our office. We have provided them with General Liability coverage continuously since April 24, 2008

If you have any questions or need further information please feel free to contact me. I will be happy to be of further assistance.

Sincerely,  
*Raymond A. Rosenbauer*  
Raymond A. Rosenbauer  
Vice President

高達 \$2,000,000  
美元的保險額

從來沒有索償申請證明



07 May 2008

Mark W. Pushnick  
President & CEO  
Steel Shield Technologies, Inc  
3351 Industrial Blvd  
Bethel Park, PA 15102-2543  
親愛的馬克：

# 34. 重要客戶感謝信

「美軍認可指定潤滑油」  
信心之選



美國軍隊表揚信  
“令子彈永遠不卡槍的保命油”

你好！

我必須對您和您公司 Steel Shield Technologies 表達我最誠摯的謝意。有了您和你們產品的支援，才讓我在全球反恐戰役中出色地完成任務。

火盾產品，毫不誇張的說，確實是戰場 “life saver” 活命丹！

2003年底我第一次去阿富汗的時候，並不瞭解火盾產品。從國內出發時，他們為我準備了補給包裹，我的個人用槍使用的正是火盾產品。與此同時，參戰車輛卻是使用另外一款潤滑油。很快，我就意識到，火盾產品確實要優於其他潤滑油。

在西南阿富汗戰場上，惡劣、潮濕的環境使我們的武器長時間受到高熱、塵土、甚至生鏽的威脅。與其他潤滑油相比，火盾產品是唯一能夠適應環境，並且在使用之後，武器不會出現突然扳機被卡住無法動彈情況的潤滑油。火盾，不僅幫助我們的武器有效地防塵，同時也真正表現出其戰場護盾的作用！

2007年，我一收到被派往伊拉克戰場的消息，就立刻打電話給我爸爸，要求他幫我準備火盾產品。在布拉格堡進行戰前訓練時，我向我的士兵推薦了火盾產品。當我向這些頑固的士兵推薦火盾產品時，那些新征入伍的士兵們成了最難說服的一群人。但是，不久之後，所有的人都開始使用火盾產品。其中一部分，甚至儲備了一些在他們的包裹中！

在我們到達伊拉克之後，我所帶領的小分隊已經把火盾產品列為戰鬥準備清單中的必備項。每一部車，每一個人，都必須配有火盾產品，這已經成為我們分隊的標準操作規程！

Mark W. Pushnick  
President & CEO  
Steel Shield Technologies, Inc  
3351 Industrial Blvd  
Bethel Park, PA 15102-2543

07 May 2008

Mark,

I wanted to take time to express my sincere thanks to you and Steel Shield Technologies, Inc. for your support while I was deployed overseas in support of the Global War on Terrorism.

Your product, Weapon Shield, was truly a “life saver”.

In my first combat tour to Afghanistan in late 2003, not knowing much about your product, I began to use it for my personal weapon and my crew-served vehicle weapon as a just another oil that I received in my care packages from home. I soon became educated on how this product was head and shoulders above the rest.

In the grueling conditions of southwestern Afghanistan, our weapons were subject to severe heat, dust, and even potential rust due to the humidity in the area. Compared to the other oils that we received, Weapon Shield was the only product that stood up to the battlefield environment and did not cause the bolt of the weapons to become “gummy” or “sticky”. Weapon Shield actually acted as a “shield” and as a dust repellent.

When I found out that I was deploying back to Iraq in 2007, one of my first calls was to my father to get my hands on Weapon Shield. While conducting pre-deployment training at Fort Bragg, I introduced my soldiers to this product. When it comes to selling to a tough audience, young enlisted men are some of the toughest to buy into a new idea. Within days, all of the men were carrying this product and were even hoarding bottles within their packs.

When we got to Iraq, Weapon Shield bottles became a part of the combat packing list as assigned by my Detachment Sergeant. Weapon Shield was now the Standing Operating Procedure, a small bottle on each man and tube of grease in each truck.

Weapons Shield brought us through over 25 fire fights with great success when other soldier’s from different unit’s weapons failed. On one occasion on patrol with another unit, their .50 cal machine gun jammed. One of my gunners tossed a bottle of Weapon Shield to them. They broke down their weapon, applied the shield and quickly got back into the firefight. In our mission after action review, my soldiers quickly commented on how their weapons would only be treated with this product.

The bottom line is this... In two combat tours to both Afghanistan and Iraq, weapons treated with Weapon Shield, NEVER jammed. That saved lives. As a unit commander, my most important job was to complete this mission while bringing all of my soldiers home. Weapon Shield was a great contributor to my unit accomplishing that mission. In combat, the only option is perfect. If you are not, you can die. Weapon Shield was PERFECT every time. Victory!

Craig A. Hickerson  
MAJOR, Infantry  
USAR

英文原件

中文譯本





# 34. 重要客戶感謝信

2008年12月10日

中文譯本

Mark W. Pushnick  
行政總裁  
美國離子能源  
3351 Industrial Blvd

Mark,

本公司十分感謝貴公司推薦給我們的一系列潤滑油產品。毫無疑問，美國神盾磁浮潤滑油的超卓性能給本公司帶來了震撼，實非迄今在市面上所使用過的其他同類產品所能媲美。

本公司現正使用的「神盾鋰基精油潤滑脂」，在極高溫的工況狀態下仍能保持高效能，為我們的設備提供保障和強大支援。自此我們的溶爐設備，特別是軸承不會因承受過度高溫而出現故障，所有問題才徹底解決。以往這些軸承平均每季度都需要停機替換，這無疑對我們來說在物料成本和停產所引起的損失上帶來沉重的代價。現在本公司所有焊接器械和經常需要使用潤滑脂的設備上都悉數使用。「神盾鋰基精油潤滑脂」比我們以往使用過的任何一種潤滑脂都優勝，因此我們堅持經常使用。

因為「神盾鋰基精油潤滑脂」的優秀體驗，本公司開始引入「神盾EPA極壓精油」，應用於各種金屬處理設備上。經使用後，再沒發生重大停機故障，不但令機器運作更暢順，而且寧靜。使用「神盾強效金屬加工精油金屬處理劑」能大幅度降低工具鑄造成本，所以成為本公司絕大部分機械師的至愛。另「神盾強力除濕去銹精油」被本公司維修部門大量使用，其表現也是我們曾經使用過的同類產品中最優秀的。本公司對於貴公司一系列產品的性能予以高度評價和肯定，對我們在生產成本控制和停機維護方面作出了重大的實質貢獻，其突出的成本效益比令我願意全無保留的推薦給他人。

Bob Cavill  
維修部主管  
美國西門子工程有限公司  
2901 Industrial Blvd.  
Bethel Park, PA 15102  
412-851-6700



SIEMENS  
VAI

英文原件

December 10, 2008

Mark W. Pushnick  
President & CEO  
Steel Shield Technologies, Inc.  
3351 Industrial Blvd.

Mark,

I would like to take this opportunity to thank you for introducing us to Steel Shield Technologies line of lubricants and Metal Treatment products. The performance of your products has been overwhelmingly superior to any other lubricants or metal treatments we have used in the past.

We are currently using the Lithi-Shield grease in our shop and it has proven to work very well in our high temperature applications. We have experienced absolutely no down time due to bearing failure on our high temp furnace since we began using the Lithi-Shield grease. In the past all bearings were replaced on a quarterly basis causing a significant amount of downtime and material cost. We also use the grease in our automated welding equipment and anywhere else frequent greasing is needed. It has out performed our previously used grease in every application and we use it as often as possible.

Because of the performance of the Lithi-Shield grease we started using Steel Shield EPA in all of our metalworking equipment. Since its introduction to our machines we have not experienced a significant breakdown of any kind and it has left them running smoother and quieter than ever. The Steel Shield Drill and Tap fluid is also used our shop and has significantly decreased our tooling costs and become a favorite of most of our machinists. The Spray Shield product is used by our maintenance department and it is proving to be superior to anything used here in the past. We are very happy with the cost and performance of Steel Shield Technologies products and I highly recommend them. I am continually looking for ways to reduce costs and downtime Steel Shield products have been a great contributor to our success.

Bob Cavill  
Maintenance Department Supervisor  
Siemens VAI Services, LLC  
2901 Industrial Blvd.  
Bethel Park, PA 15102  
412-851-6700



# 34. 重要客戶感謝信

Joe Hendricks  
6455 East Commerce  
Kansas City, MO 64120  
MMEO Central Region

10/01/2003

Marla Carrow  
6455 East Commerce  
Kansas City, MO 64120

RE: MT-10

Marla:

I want to update you on our progress with the MT-10 product. Sense my last report I have applied MT10 to all of my service units. We use the product in our engines, transmissions, gearboxes and hydraulic tanks thus protecting the entire systems. The product performed as expected. Our failures with these components have decreased even more. Now we are able to work on equipment from the preventative maintenance side instead of a breakdown mode.

We have had cases that I can attribute directly to MT10 and were able to save the company thousands of dollars on the spot. This product proves itself worthy over and over and should be used by all departments to get the maximum savings for the Union Pacific.

Sincerely

Joe Hendricks  
Manager M/W Equipment Operations CR  
816-245-2733

全美最大鐵路公司 “聯合太平洋”  
多次對本公司發表書面感謝

信內述明神盾磁浮潤滑油  
在聯合太平洋鐵路公司廣  
泛被使用。神盾產品已不  
斷被證實為物超所值，備  
受全力推薦。

PORT  
AUTHORITY

美國匹茲堡港務局  
表揚信

August 14, 2002

Mark Pushnick  
President  
Mark Pushnick Enterprises  
3351 Industrial Blvd.  
Bethel Park, PA 15102-2543

Re: Return on Investment of MT-10 Metal Treatment

Dear Mr. Pushnick:

As you are probably aware, Port Authority of Allegheny County's experiences with MT-10, has been very good. We have been using this product in the gearboxes of our light rail vehicles for approximately 8 of the last 9 years now. One year we discontinued the use of MT-10 and experienced a sharp decline in gearbox reliability and since have resumed the use of its application.

We regularly have oil analysis performed, by an independent testing laboratory and the results of the analysis have indicated that the use of MT-10 has significantly lowered the wear metals that we previously experienced prior to its use. The MT-10 has appreciably extended the service life of our existing gearboxes.

Based on the costs we were incurring prior to the use of the MT-10 product verse the costs we are currently incurring, we have realized a Return On Investment (ROI) of approximately \$45 saved for every \$1 expensed or 45:1 ratio. The most significant factor was the increase in reliability as well as availability. The vehicles were able to perform when needed and the missed trips were lowered to approximately 10% of past history.

As you are also aware, we continue to use the Power Cut (PC-10) and Power Lift (PL-10) grease with similar experiences.

If you have any questions or I can be of any further assistance, feel free to contact me at (412) 566-5149.

信內述明每投入 1 美元購買  
神盾磁浮潤滑油，就使他們  
節省 45 美元維修開支。  
車輛失誤比率下降至只有原  
來的 10%。

Sincerely,

*Mark P. Ferrari*

Mark P. Ferrari, C.P.M., A.P.P.  
Manager of Contract Administration  
Bus & Rail



Joe F. Hendricks  
Mgr. M/W Equipment Operations  
Central Region  
UNION PACIFIC RAILROAD  
6455 E. Commerce Ave., Kansas City, MO 64120  
ph. (816) 245-2733 c. (816) 804-6880  
pgr. 4-6880-143-7243 pm-888986  
jfhendri@up.com



美國離子能源

# 34. 重要客戶感謝信

中沃汽车有限公司



中沃汽車感謝信

信內述明測試顯示神盾磁浮潤滑油為 Volvo (國內稱沃爾沃) 汽車提升馬力達 12% , 備受推崇 !

致：美国离子能源有限公司

香港荃湾德士古道 188-202 号

立泰工业中心二期 11 楼 K 室

感谢 贵司提供神盾润滑油予我司作汽车马力输出测试。于是次测试当中，我司将神盾润滑油使用于 4 辆沃尔沃 Volvo 汽车 [型号：沃尔沃 S80 ]，并将 4 辆汽车分别放上汽车马力输出测试机 (Dyno-Shaft On-Vehicle Dynamometer) 进行测试。测试结果显示，4 辆进行测试的沃尔沃 Volvo 汽车在使用神盾润滑油之后，所输出的马力比起未有使用之前增加了 8%—12%。我司非常乐意向客户推荐神盾润滑油。

顺祝

商祺



地址：杭州市滨江区江南大道 3688 号通策广场 2 幢 1613 室

电话：0571-86852031

[Http://www.sinoworldcar.com](http://www.sinoworldcar.com)

# 35. 神盾用戶層面廣闊



美國軍方



西門子股份公司



全美國最大鐵路網絡—  
聯合太平洋鐵路  
(紐約交易所上市編號：UNP)



東江環保股份有限公司  
香港上市編號：895

# 36. 贊助格蘭披治大賽及其他活動花絮

## 第 60 屆澳門格蘭披治大賽〈2013〉



## 香港摩托車節



# 36. 贊助格蘭披治大賽及其他活動花絮

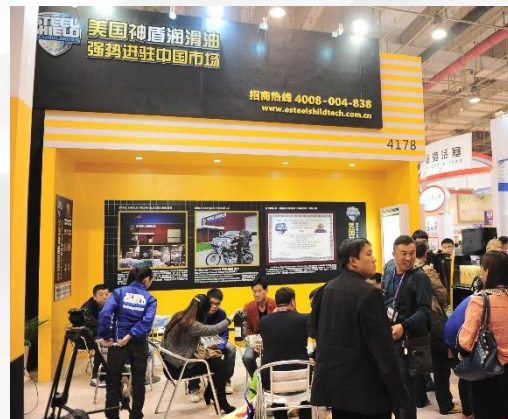
## 珠海 3 小時摩托車耐力賽



## 廣州潤滑油展



## 青島展覽會



## 重慶展覽會



# 37. 美國神盾潤滑油總部



公司接代處



潤滑油貯存設施



磁懸浮潤滑油獨特配方的生產設備



磁懸浮潤滑油獨特配方的生產設備

## 38. 美國離子能源 (香港)

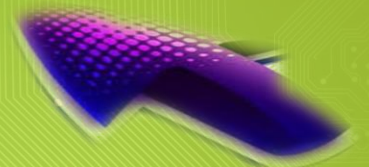


公司各款式的磁懸浮潤滑油



# 39. 神盾產品網上影片示範與測試

- [Steel Shield ABF Technology – How it works?](#)
- [Steel Shield ABF Technology – Timken Demonstration.](#)
- [Steel Shield Technology Demo](#)
- [Steel Shield Tech Full Feature on Motorhead Garage](#)
- [Steel Shield Motorhead Garage Commercial](#)
- [Steel Shield 神盾潤滑油磁力懸浮演示片段](#)
- [廣東體育頻道在中國國際潤滑油品展覽會採訪神盾潤滑油的視頻](#)



[請點擊連結](#)



# 40. 聯絡我們

## Steel Shield Technologies 美國離子能源

公司地址：  
香港, 屯門, 建發街11號,  
好景工業大廈, B座, 8樓 809B 室

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電郵：steelshieldtech@yahoo.com

公司網址：[www.steelshieldtech.com.hk](http://www.steelshieldtech.com.hk)  
Facebook: [www.facebook.com/steelshieldtech](http://www.facebook.com/steelshieldtech)  
微博：[www.weibo.com/steelshield](http://www.weibo.com/steelshield)



100% 美國技術

100% 美國原料



Not Just Oil...  
IT'S TECHNOLOGY

