

# Not All Oil is Same!



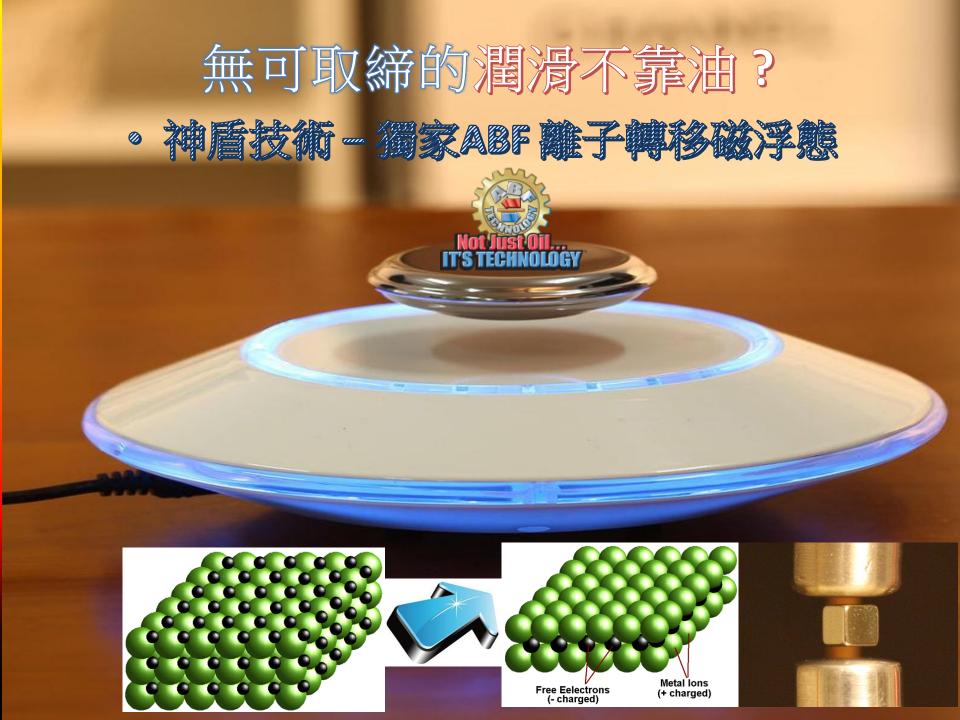
"Steel Shield 神盾" 讓世人知道不是所有潤滑油都是雙胞胎

# Steel Shield Technologies



since 1985

美國神盾



"Reliability is our first concern... there is no room for mechanical Dysfunction when customers have chosen Steel Shield." 神盾 竭盡全力確保機械無故障



此油非等閒... 實是一絕密科技!



# 公司背景

Steel Shield Technologies Inc 美國神盾創辦於 1985 年,父親Richard Fennell是董事長兼首席執行官,兄長Jay Fennell 是總裁和營銷經理,George 本人是執行副總裁兼技術總監。 美國神盾Steel Shield是官方唯一名稱,第四代配方。







**Jay Fennell** 



**George Fennell** 



**Carol Fennell** 



**Business Meeting – 1986** 







美國廠房擁最先進的製造技術和配套設施,全自動電腦監控和整合,設備精鋼打造,100%美國原料生產

# 發名家 - Dr. George C Fennell



Doctor of Astronomy and Astrophysics 天文學和天體物理學博士

Accreditation:

SAE (Society of Automotive and Aerospace Engineers)
Member

汽車與宇航工程師學會

ASNE (American Society of Naval Engineers) Member 美國海洋工程師學會

NCMA (National Contract Management Association)
Member

國家合同管理協會

STLE (Society of Tribologists and Linicant Engineers)

**□ 日常工程師學會** 

INTERNATIONAL.





1985 年 Dr. George C Fennell 秉承其父親及祖父在磁浮潤滑學的科研,成功開發"離子鍵轉移技術"(Electro-Chemical Ionization又名 Reactive Chemical Bonding )將金屬表層轉化為陽離子(正電荷),Faradys Law 同極相斥形成磁懸浮狀態的(ABF)無形保護牆。自始,被學界冠以"磁浮態之父"的美譽。



# Friction 摩擦



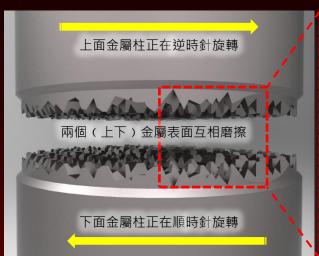
- 1.) Energy Loss 耗能
- 2.) Inefficient 效率低
- 3.) Heat 高熱
- 4.) Dysfunction 功能障礙
- 5.) Clogging 卡機
- 6.) Welding Up 燒結
- 7.) Fatal Damage 報廢

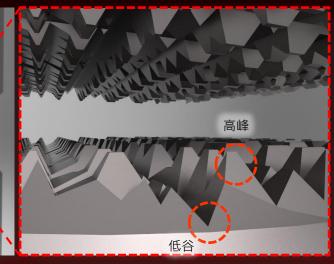


# ABF 磁浮潤滑技術基礎

# 1. 金屬表面

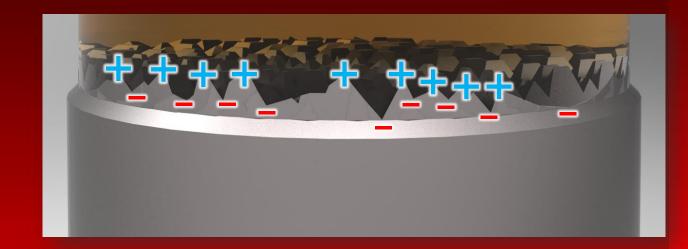
金屬表面是由"高峰"及 "低谷"組成,互動產生巨 大阻力,這就是磨擦阻力 的源頭。





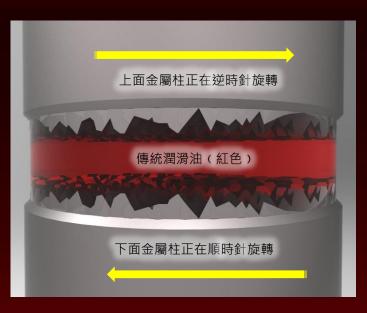
# 2. 表面的極性

"高峰"是帶正極的,而 "低谷"是帶負極的。



# 3. 傳統潤滑油

利用化學物質甚至軟金屬元素(moly 鉬)來改變油品的特性,短暫緩和金屬磨損,這類元素互相制衡甚至因交叉反應產生酸性物質,有腐蝕金屬件之嫌。傳統潤滑之所謂磨合(run in)"金屬平整功能",實質是要機件互相斬砍,讓凸出的部份被削平,金屬脫落做成部件的原公差值劣化。機件不停碰撞產生碎屑,混合潤滑油,磨損更嚴重。





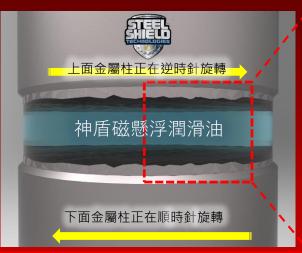




## 4. 神盾磁懸浮潤滑

離子鍵轉移激活,金屬表 面呈正極電荷狀態,法拉 第定律的一股同極互斥能 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, 不但不會改變金屬體原有 質量(mass) 和公差值 (measurement),而且 加固了金屬表層的堅硬度。







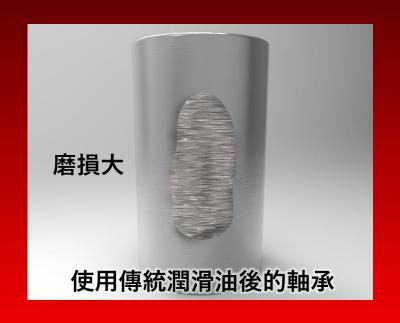


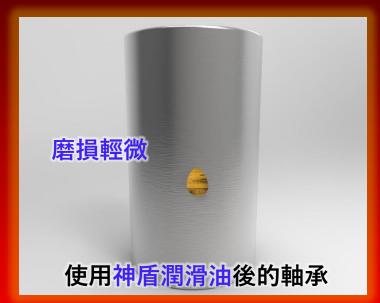
## 5. 神盾磁懸浮與傳統潤滑的抗磨對決

神盾不會改變或者提升潤滑劑(載體)的基本參數和功能,它獨有的離子鍵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,負載值與摩擦力之間呈幂函數關系,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担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







# 神盾磁浮潤滑五大突破

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. 動態追熱和保護功能

活性因子動態追熱

3. 無腐蝕誘導技術物理排污

磁誘導技術徹底清潔金屬碎屑

4. 金屬表層加固

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











Not Just Oil . It Is Technology !!!



#### MSNs for the Steel Shield products added to EESOH-MIS

products for weapons, weapon systems and military equipment running under harsh conditions and environments

US Air-Force Purchasing Items

NSN/LPN: 9150PHM00065498 NSN/LPN: 9150PHM00065496

MSN: 9150PHM00065498 MSN: 9150PHM00065496

CAGE: 4TXQ2 CAGE: 4TXQ2

Trade Name: STEEL SHIELD WEAPON SHIELD METAL TREATMENT Trade Name: WSG-EP1, WEAPON-SHIELD EP #1

**GREASE** 

NSN/LPN: 9150PHM00065584 NSN/LPN: 9150PHM00065578

MSN: 9150PHM00065584 MSN: 9150PHM00065578

CAGE: 4TXQ2 CAGE: 4TXQ2

Trade Name: STEEL SHIELD ANTI-WEAR EP METAL TREATMENT Trade Name: LITHI-SHIELD EP #2 GREASE

NSN/LPN: 9150PHM00065587N SN/LPN: 9150PHM00065590

MSN: 9150PHM00065587 MSN: 9150PHM00065590

CAGE: 4TXQ2 CAGE: 4TXQ2

Trade Name: STEEL SHIELD STRIKE SHIELD TOOL SHIELD

Trade Name: STEEL SHIELD TOOL SHIELD



# **Compliments from the US Military**



George C. Fennell, L.E. [gcfennell@s Friday, June 06, 2008 10:15 AM 'Mark W. Pushtick' FW: THANK YOU GEORGE FENNELL AND WEAPONSHIELD

From Alpha Company 2-13(etc. Histor. New Sections): It remembers thanks I thank you so wary much for produce the control of th

In short thank you so much from me, Eli, and from the Black Sheep



---- Original Message ....

From: Beck, Juson L MAJ 887 ESFS [mailto:jason.beck/@iraq.centcom.mil] Sent: Tuesday, February 24, 2009 9:45 AM To: Mark W. Pushnick

I wanted to send an excerpt from an e-mail I received from our weapons maintainers that have been using your product since it arrived here several weeks

n regards' to the Weapon Shield Inbrication, it is an outstanding product. We in regards in the weapon street unoneation, it is an outstanding product. We filled lested the product with our troops who are required to elean their unsigned heavy weapons daily. The feedback we received was all positive. They said the lubrication provided a thick protective cost and revisualized the metal on the weapons. Unlike other lubricants the Weapon Shield is more durable when used in drug to deather when the contraction of the street of n day-to- day operations involving sand and dust. We also had sister services runging from Army and Navy personnel try the lubrication. They too had nothing but good things to say. The needle lubricant applicators are perfect for maintenance and small cleaning kits. They allow for precise placement of lubrication in tight places and on smaller parts.

The Lithi-Shield grease is also an amazing product. Thus far we have used it on numerous heavy weapons. It also cased the process of installing 25 safety kits on the M-2 Machine Guns. The grease is also very durable and applies with ease. from the Combat Arms perspective, we believe this product to be very efficient and would recommend it to anyone wanting to use it.

Just wanted to say thank you again, your products are amazing and definitely better than anything we've tried. The Airmen are already asking where they can purchase the Weapons Shield Lube when they get back to the states. Thanks again



07 May 2008

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

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, Wespon Shield, was truly a "life saver".

In my first combet 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 gracing conditions of southwestern Afghanistan, our weapons were subject to severe heat, dart, and even potential rest the to the humblify in the area. Compared to the other oils that we received, Weapon Esided was the only product that strood up to the hathfelied overnment and did not cause the both of the weapons to become "gummy" or "sixio,". Weapon Shield actually acted as "shield" and as a dast prefet on as a dast prefet on as a dast prefet of the stroot of the

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 Sheeld. While conducting pre-deployment training at Fort Brage, I introduced my solders to take product. When it comes to eding to a tough sendence, young entitled men are some of the trapliest to twy into a new idea. Within days, all of the men were carrieged in the contract and were even backing bottles within their peaks.

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 Shaled brought us through over 25 fire lights with great success when other soldier's from different surface. Once occasion to parted with another suit, their: 50 call machine gan jammed: specific field. Once occasion to parted with another suit, their: 50 call machine gan jammed: per jammed in sold of the sold for of Weapon Shaled to them. They broke down their weapon, specified the shaled supplied the shaled subtractive field state to the friendight. In one massion take action review, my soldiers quickly commented on him their weapon would only by breast with in product.

The bottom line is this... In two combat tours to both Afghanistan and Irac, weapons resented with Weapon Shield, NEVEZ jammed. That saved lives... As a unit commander, any notel important of the weapon to the commander, any notel important of the weapon to the commander to any cost important of the weapon to the commander to any cust accomplishing that mission. In combat, the only option in perfect, If you are not, you can die. Weapon Shield was a given less than the commander to the PEREZICT overly time. Vistory to the commander to the comman

Sent: Tuesday, December 18, 2007 11:41 AM Te: George C. Fennell, L.E.' Subject: Weapon Shield Samples

Hi George

Many thanks for the samples of Weapon Shield that you sent to me.

I tested your product on various firearms while I was home on R&R and was really impressed. They all felt amouther after applying Weapon Shield, even an old Norinco 1911 that is not known for being a smooth pistoll

I've now returned to Irsq and over the last month have used your product on Glock and Browning paces, AKF3 and FAMI sight machine game. All the finames fell at lot smoother shart applying wheepon Shard. I all the load that Velevers belief used one of port granty due to the het generated yet wheepon shard and the last on those that Velevers of leded does not evaporate and disappear like other products that we have the running in the scale of the report of the disappear like other products that we have the running in the scale of the products that we have the running in the scale of the products that we have the running in the scale of the products that we have the running in the scale of the products that we have the running in the scale of the products that we have the running in the scale of the products that the products the products that the products the products that the products the products

I have given a couple of samples to other experienced shooters, instructors/operators in irsq and they have all given me very positive feetback. Good feedback for a new product in an old and competible includely in not always early corne by! It says a sol for Wespon Shleid that these experienced shooters have asked me for more of your month.\*!

Having spent 30 years in the freezms training industry and working on various high risk units i have used many, many products that proclemed to be the shooters salvatton! Weapon Sheld has impressed me and I will definitely be placing an order when I get out of the sendpit and back to my shooting school on a full time basis.

Once again, thank you for the samples! I will definitely be recommending Weapon Shield to my friends, colleagues and students. Regards

Adrian Rossiee Tactical Defence Institute (SA) +27 (0)84 606 3647 (Ina)+954 (0)79 0258 7857 atrianrossise@yahoo.com / adrian@tacticaldelense.co.za



#### SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

# STEEL SHIELD LARGELY OUTPERFORMS REPUTED GREASES MADE BY YAMAMOTO AND Petroleum Products Research Department ATLAS Petroleum Products Research Department

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

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

<sup>\*</sup> No oil separation occurred for grease sample "ya" herefore, sample is conthe scope of the method".

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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
			50

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

TEST ITEMS	Four-Ball Extreme Pressure Properties	Steel Shield Lithi Shield	Yamamoto EP Grease	Atlas To the Atlas
Loading Ability	Corrected Load	851.1	501.68	302.79
Anti-Wear Ability	Load Wear Index	92.27	66.73	41.23
High Temperature Loading	Weld Point	800	315	315

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Benefiting government, Industry and the public through inne

#### SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

# STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2782 TIMKEN TESTS

THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE - Timken ASTM D2782

#### Test Report 2014 / 11 / 20 Steel Shield Technologies

SwRI Lab No.	24564	23728	25252	23727	25250	25251
ASTM D2782 Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)	SST Gas Engine Oil SAE 40 Ashless Without EPA	Steel Shield Gas Engine Oil GECAT SAE40 Low Ash With EPA	Steel Shield EPA	Steel Shield Compressor Oil ISO #100 / 150	Mobil Pegasus 805 SAE 40 Gas Engine Oil	Mobil Pegasus 801 SAE 40 Gas Engine Oil
Volume (Gallon)	1	1	1	1	1	1
OK Load (lbs)	40	40	75	55	9	9
Score Load (lbs)	45	45	80	60	12	12
Temperature (°C)	38	38	38	38	38	38





### Products of the same class





Results

Steel Shield Wins:
Steel Shield outperforms Mobil in
OK LOAD parameter by 444 % and
in SCORE LOAD by 375 %.

The SwRI Timken Test report clearly testified Steel Shield products are FAR Superior than Mobil products of the same classes

#### SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

#### STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2783 FOUR BALLS TESTS

#### THE TEST REPORT FROM SOUTHWEST RESEARCH INSTITUTE - 4-Ball ASTM D2783

#### Test Report 2014 / 11 / 20 Steel Shield Technologies

SwRI Lab No.	24564	23728	25252	23727	25250	25251
ASTM D2783  Measurement of Extreme-Pressure Properties of Lubricating Fluids (4-Ball Method)	SST Gas Engine Oil SAE 40 Ashless Without EPA	Steel Shield Gas Engine Oil GECAT SAE 40 Low Ash With EPA	Steel Shield EPA	Steel Shield Compressor Oil ISO #100 / 150	Mobil Pegasus 805 SAE 40 Gas Engine Oil	Mobil Pegasus 801 SAE 40 Gas Engine Oil
Corrected Load (kgf)	70	109	NA	1	136	74
Load Wear Index (kgf)	35	46	NA	48	34	35
Weld Point (kg)	200	250	>800	250	200	200
Last Non Seizure Load (kg)	80	100	80	100	63	80





### Products of the same class

#### Results

**Steel Shield Wins:** 

**Steel Shield outperforms Mobil in the Weld** 

**Point (**oil strength in resistant to EP)

parameter by 129 % and in the Last Non

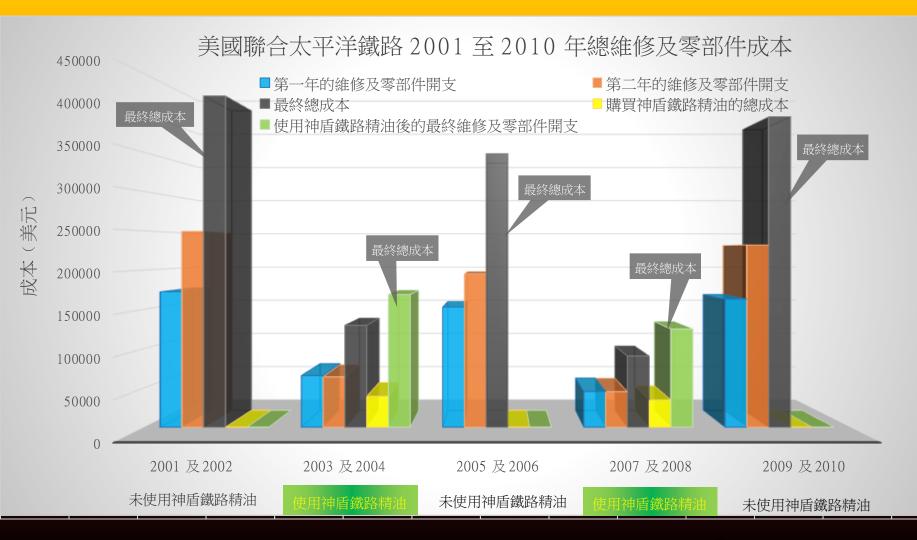
Seizure Load (wear performance in respect to load) by 159 %.

\*\*\*Remarks: 4-ball test is normally for heavy weight oil and grease.

The SwRI 4-Balls Test testified Steel Shield products are superior than Mobil products of the same classes

# 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粵部件成本比較 使用神盾前 對 使用神盾後





## 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
- 形成一層複雜的斥力保護牆於兩面金屬面之間
- 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,金屬件工作於適溫狀態,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



## 中央地區的 M/W 設備(動力組件)

## 專題報告一

• 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



#### 2001 至 2004 年美國聯合太平洋鐵路成本節省比較

	=00		
2001 及	2002(未有使用神盾油)	2003 及	2004(使用神盾油)
系統維修成本	= \$172,296 + \$249,476	系統維修成本	= \$65,722 + \$64,021
	= \$421,772		= \$129,742
	(每年平均 \$210,886)		(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)	= <u>\$252,835 - \$39,195</u>
			\$39,195
(以上為美元)		(以上為美元)	= 5.45 (545% 回報率) 60
* 註・以上節行	当的開支不包括丁資、和金、停機	時間或延誤	MARK TO SERVICE STATE

\* 註:以上節省的開支不包括工資、租金、停機時間或延 \* 投資回報:節省的開支 - 成本 = ROI

SHELD

### 美國聯合太平洋鐵路 2005 至 2008 年成本節省報告

### 專題報告二

・ 2005 至 2006 年

美國聯合太平洋鐵路維修成本(沒有使用神盾油)

・ 2007 至 2008 年

美國聯合太平洋鐵路採用神盾油的成本分析。

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





	维修點	維修點 每個單位的		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		
	ハ <b>エ</b>   シ   □	成本	單位	成本	單位	成本	單位	成本	單位	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
零部件的 年均維修	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
成本	閥門失效	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
	年均維修成本			\$153,000.00		\$195,000.00		\$45,400.00		\$45,100.00

### 美國聯合太平洋鐵路 2005 至 2008 年成本節省報告

### 專題報告

- 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

	20	005年	2006年	2007年	<mark>2008年</mark>
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 採用神盾鐵路潤滑劑)	2007 及 200	8(採用神盾鐵路潤滑劑)
系統維修成本	= \$153,000 + \$195,000	  条統維修成本	= \$45,400 + \$45,100
	= \$348,000		= \$90,500
	(每年平均 \$174,000)		(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) 64%
		使用神盾鐵路精油的投資回報 (ROI)	= <u>\$223,006 - \$34,494</u> \$34,494
(以上為美元)		(以上為美元)	= 5.46 (546% 回報率)

### 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

- RES-MT-55G
- RES-MT-300G

# 310-4441-0

# 310-4444-0

# 310-4446-0

### 總結

- 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60%以上的維 護成本。



## **CONTACT US**

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