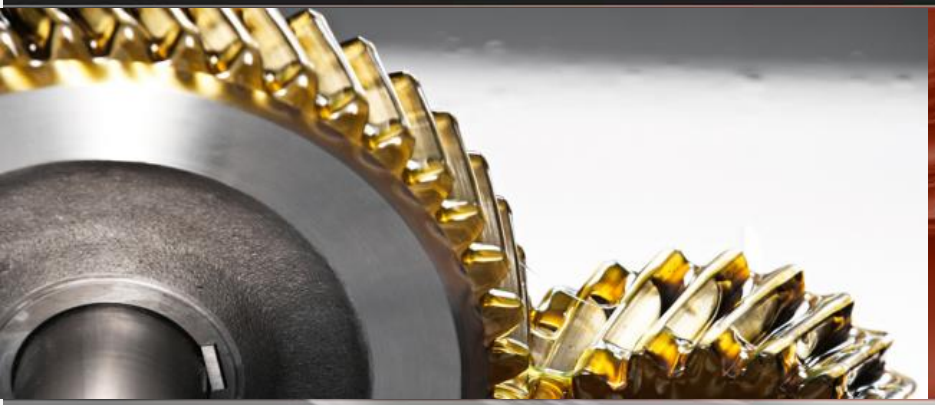
Steel Shield Technologies

Serving the Industry since 1985

ABF Technology Enlightens the World of Lubrication

"We do & fix what others can't!"



100% Made In USA

Aerial
Cable-Car Systems
Application

NP360

World's 1st Ionic-Maglev Lubrication Technology

MAKING A DIFFERENCE IN LUBRICATION

"It is our conviction that to be the best is not sufficient, we are here to make a new World Standard in Lubrication."

Company Vision & Commitment

- Steel Shield Technologies sole purpose is to manufacture premier quality metal treatments, additives, greases and lubricant oils that have been tested to exceed the normal parameters of extreme pressure and anti-wear products in the aftermarket, hereby offering matchless performance and unsurpassed protection against wear while saving maintenance costs, downtime, energy and improving overall functionality of your machineries.
- Steel Shield, Not Just Oil, It's Technology which makes a difference to the World of Lubrication.
- Steel Shield aims at helping customers to achieve the highest return on investment (ROI). Steel Shield is committed to strengthening business and global commerce through manufacturing and distributing, World-wide, the full line of ABF Technology products made in the USA, Singapore and Hong Kong.

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Steel Shield – The 1st Ever Ionic-Maglev Lubrication Technology in the World

1. THE CORPORATION & FACILITIES

Steel Shield Technologies Inc. (SST) with it's history traced back to 1985 when in USA, Pennsylvania the scientist Dr. George C Fennell in the research and development of high-end specialty lubricants for motor racing and industrial applications invented the unique ABF Formula – a New Technology in lubrications. Since then Dr. Fennell has been quickly earning his fame in the lubricants society and the product has become a must for the combat units of the US Armed Forces. SST is the only lubricant product in the World to guarantee firearms of any kind free from clogging barrels, feeds and magazines.

The Company's blending and manufacturing capabilities are state of the art and the ability to produce limitless volume of product is unsurpassed as well as the product quality. The equipment is all stainless steel including the flow lines, pipes and couplers. All pumps and gauges are digitally interpreted and of the highest quality and accuracy to ensure production of the most superior quality lubricants.

STEEL SHIELD TECHNOLOGIES was incorporated in 2012 in Hong Kong and is the official representative of Steel Shield Technologies (USA) to provide distribution and technical support for the entire Asia-Pacific Rim.

2. INVENTOR SCIENTIST – Dr. George C Fennell

Father of ABF Technology
Doctor of Astronomy and Astrophysics

Accreditation:

SAE (Society of Automotive and Aerospace Engineers) Member

ASNE (American Society of Naval Engineers) Member

NCMA (National Contract Management Association) Member

STLE (Society of Tribologists and Lubricant Engineers) Member

In 1985, Dr. George C Fennell, a former scientist in Astronomy and Astrophysics doing consulting and contract work in advanced lubrication and surface Tribology, formulated a revolutionary metal treatment oil additive which can activate “ABF” (Advanced Boundary Film) through a proprietary and unique “electro-chemical ionization” (ECI) process. He has been known in the industry as the “Father of ABF Lubrication”.

On the basis of ABF technology, a series of specialty lubricants have been developed to meet the stringent requirements of various purposes and working conditions, as to date is still the most advanced formula in lubrication.

Over the years, there have been countless people trying to resemble Dr. Fennell’s unique formula and advanced chemistries, none was found even remotely close. To this date, Dr. Fennell is still the leader in tribology and lubrication.

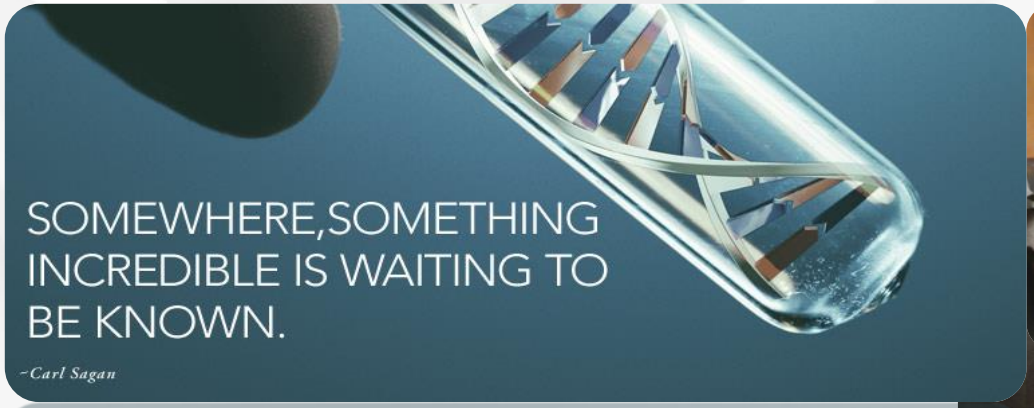
3. THE BIRTH OF STEEL SHIELD TECHNOLOGY

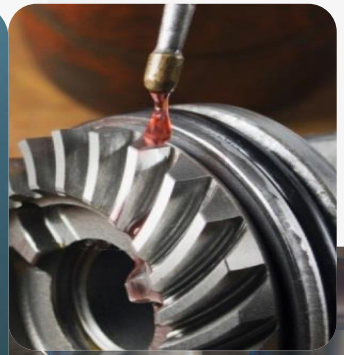
- During World War II, the German Science and Technology Research Institute was commissioned to develop a new lubricant technology in meeting the stringent demand for heavy duty military application such as artillery, armored vehicles, tanks, battleships and fighter-aircrafts to avail them in performing their maximum fighting capacity with minimal maintenance.

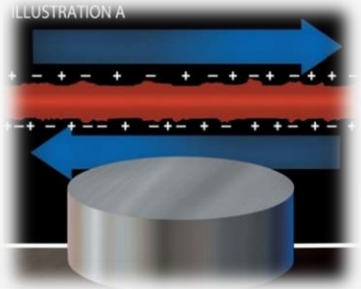
- The scientists proposed the concept of Zero friction, i.e. Farady's Law Like-Charge-Repel.

- Shortly after WW II, a great number of intelligent scientists migrated to the United States from Europe. One of them was the grandfather of Dr. George Fennell, who came to USA along with him a large volume of research data and material about Zero friction. The old scientist continued to pursue his scientific research and eventually in 1986 his grandson Dr. George Fennell came with a breakthrough in the technology. Through Electro Chemical Ionization (also known as Reactive Chemical Bonding) Dr. Fennell was able to realize Maglev between two metallic surfaces and to achieve a close to Zero Friction Coefficients.

- The great accomplishment was the result of relentless efforts of 3 generations scientists over half a century. In recognition of the excellent contribution of Fennell's family to the country, the US Government has named the street outside their old factory Fennell Avenue as a compliment.







Steel Shield –
Bio-Organo Lubrication Technology

1. ABOUT ABF TECHNOLOGY

BOUNDARY FILM LUBRICATION THROUGH ADVANCED HALOGENATION TECHNIQUES: OXIRANE ACID SCAVENGING AND ORGANO-METALLIC SUBSTITUTION

By GEORGE C. FENNELL

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:

$$Fs = SAr$$

Where Fs 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:

$$fs = S * Ar / W = S / Pp \text{ or } S / Pe$$

The boundary film shear resistance, S, is assumed equal to the plastic flow shear stress, Tp, 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.

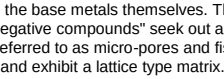
These results show that liquid lubricants act like plastic solids in the films between asperities. Therefore, S=Tp in the previous equation and the friction coefficient is Tp/Pp or Tp/Pe. Since Tp is a weak function of temperature and pressure, and Pp or Pe are independent of apparent contact load, the 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 weak organo-metallic derivatives while Lewis acids and protonic reagents initiate cationic reactions.

Ethylene Oxide Reagent



$$n\ H2C - CH2\ n$$

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.
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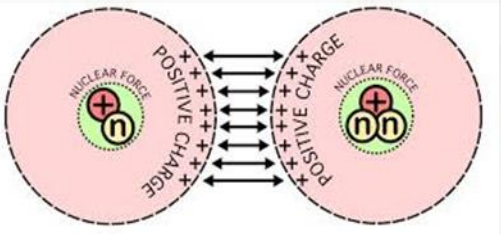
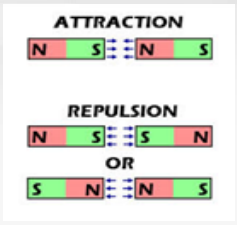
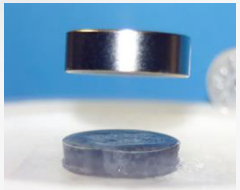
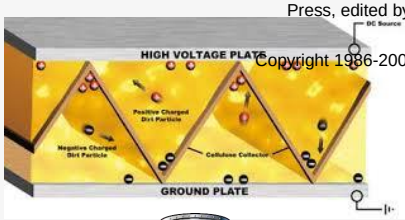
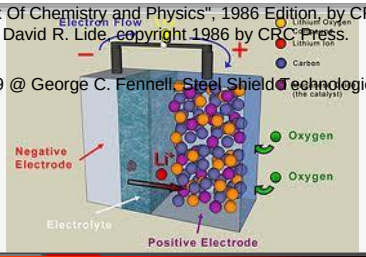










5. HOW ABF WORKS

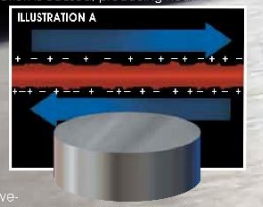
Steel Shield Technologies Has Redefined Lubrication.

Webster's Dictionary defines lubricants as substances capable of reducing friction, heat and wear when introduced between two solid surfaces. From the initial development and use of lubricants, chemical technology has constantly advanced to make them more effective. From changes in refinement processes to the development of additives, the concentration has always been to increase the ability of the lubricant to reduce the friction, heat and wear. **Steel Shield Technologies** has changed the approach to lubrication and, in essence, given new definition to the term. First, there are a few points to consider.

Metal Against Metal

The structure of all metals creates a surface characterized by a series of sharp peaks and valleys, some microscopic and some larger. As two metal surfaces contact each other and move in opposite directions, friction is caused, producing heat and metal deterioration. This friction-causing physical dynamic is heightened by the electromagnetic field created on the surfaces of each metal. The sharp peaks, known as asperities, and valleys, referred to as micro-pores and fissures, have opposite electro-magnetic charges. **Illustration A** shows a new metal with positive-charged asperities and negative-charged micro-pores and fissures. The constant interaction of these opposite-charged features works to weaken the structure of the metal, causing eventual deterioration of the surface of the part.

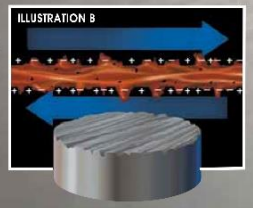
ILLUSTRATION A



Normal Lubricants Help

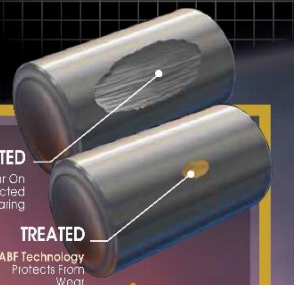
All lubricants help to slow this process to different degrees. **Illustration B** shows the results after a period of time of use of a typical oil lubricant. The constant friction and electro-magnetic interaction has caused the weakened metal to break off or chip away creating metallic debris in the lubricant leading to abrasive wear from wear metal particles. This fact is evidenced in the need to change the engine oil of automobiles frequently as the lubricant 'breaks down' due to the heat and metallic debris.

ILLUSTRATION B



ABF TECHNOLOGY™

Advanced Boundary Film Technology- There Is No Better Protection Against Wear.



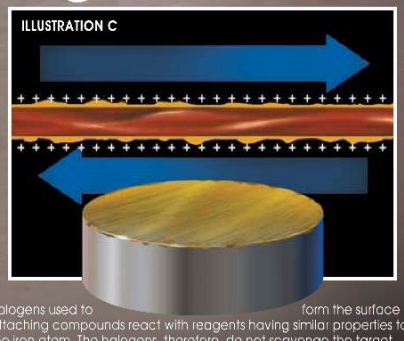
See Extreme Condition Lubrication Test At www.steelshieldtech.com

Steel Shield Technologies has redefined lubrication by breaking away from the standard approach to making the lubricant more effective through adjusting the refinement process or through the use of additives. Instead, **Steel Shield Technologies** approaches lubrication by improving the surface characteristics of the metal through the process of **Advanced Boundary Film** formation. This technological breakthrough is accomplished by addressing the naturally formed asperities, micro-pores and fissures and the electro-magnetic charges they create.

Steel Shield products consist of an advanced combination of halogens which react under thermal (heated) conditions to form electro-negative surface attaching compounds. They seek out and affix themselves to the lower surface areas, filling the micro-pores and fissures. As this process is working, the thermal conditions are effecting the asperities. Instead of breaking off because of a weakened metal state, the asperities gradually roll out or flatten. So while the micro-pores and fissures are filling up, the asperities are flattening for an end result of a metal surface that is greatly improved. Created in this process is a total positive state of polarity. When the metal surface polarity becomes uniform in charge, there is a reduction in friction due to the Faraday reaction of like-charges. This electrochemical process continues at the molecular level to form an **Advanced Boundary Film** on the surface of the metal. **Illustration C** shows the end result of the production of the **Advanced Boundary Film** and the resulting uniform positive polarity.

Another aspect of this advanced technology is the organo-metallic substitution which is the chemical process designed to inhibit halide formation. Here, the halogens used to form the surface attaching compounds react with reagents having similar properties to the iron atom. The halogens, therefore, do not scavenge the target metal surface to find iron with which to react, forming halides and creating a chemically corrosive wear syndrome. Instead, an organo-metallic complex is formed as the basis of the **Advanced Boundary Film.**

ILLUSTRATION C



Industrial Success Comes To The Consumer

Steel Shield Technologies is now bringing this breakthrough technology to the consumer after great success on the industrial level. The level of commitment to the Steel Shield product in the railroad industry is an indication of its performance in the most extreme conditions imaginable. This same technology is now available to you.

As has been explained, the **Advanced Boundary Film Technology** is a redefining approach to lubrication which provides outstanding benefits to the user.

Practical Elimination Of Metal-To-Metal Wear

Steel Shield Technologies addresses the three areas that cause the weakening and deterioration of the metal surfaces:

- The physical friction of rough surfaces
- The opposite electro-magnetic charges that exist on the metal surface
- The chemical reactions that produce corrosive agents.

Advanced Boundary Film Technology instead strengthens the metal and practically puts an end to metallic debris in the lubricant.

Reduced Operating Temperatures

Friction is reduced so significantly that the operating temperature in treated mechanisms is notably reduced. The end result is a stronger metal that maintains its original specifications and performance level. An example of the reduction of operating temperatures is found in the independent tests that show a drop of an average of 30 Fahrenheit degrees in treated automobile engines.

Increased Effectiveness Of The Lubricant

Whatever lubricant is used as the carrier of the **Steel Shield Technologies** additive, that lubricant is allowed to perform at its maximum efficiency. Lubricant flow will be enhanced with the elimination of rough metal surfaces; the reduction of heat and elimination of metal debris will protect the lubricant from "break down."

STEEL SHIELD™ TECHNOLOGIES

6. MAJOR BREAKTHROUGHS IN LUBRICATION TECHNOLOGY

1. Virtual Zero Friction - RCB Ionic levitation

Faraday's Law like-charges Repel & Dipole-Dipole Reaction

2. Dynamic Heat Transfer

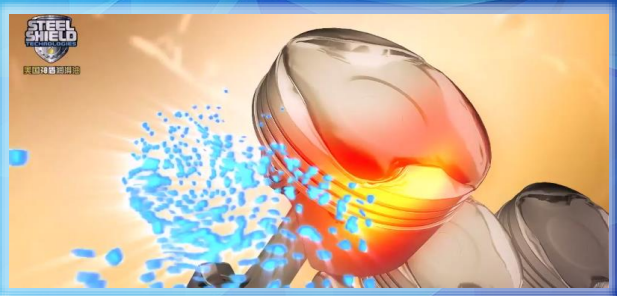
Lubricant accumulates at the hot spot automatically

3. Non Corrosive Cleansing

Metal sludge repelled via induction and removed

4. Metal Surface Re-hardening

From Shear Friction to Surface Lapping



5. Eliminate System Dysfunction

Not Just Oil, It's Technology

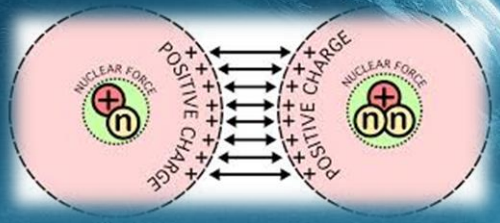
7. RCB Electrochemical Ionization

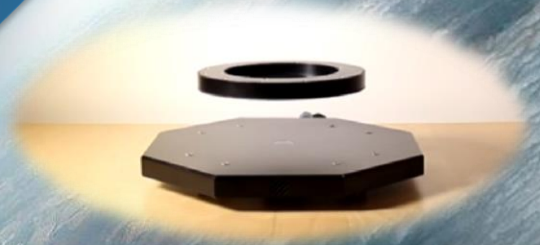
Metal Surface Positively Charged

Metals Repel Each Other

Magnetic Levitation

Near Zero Friction



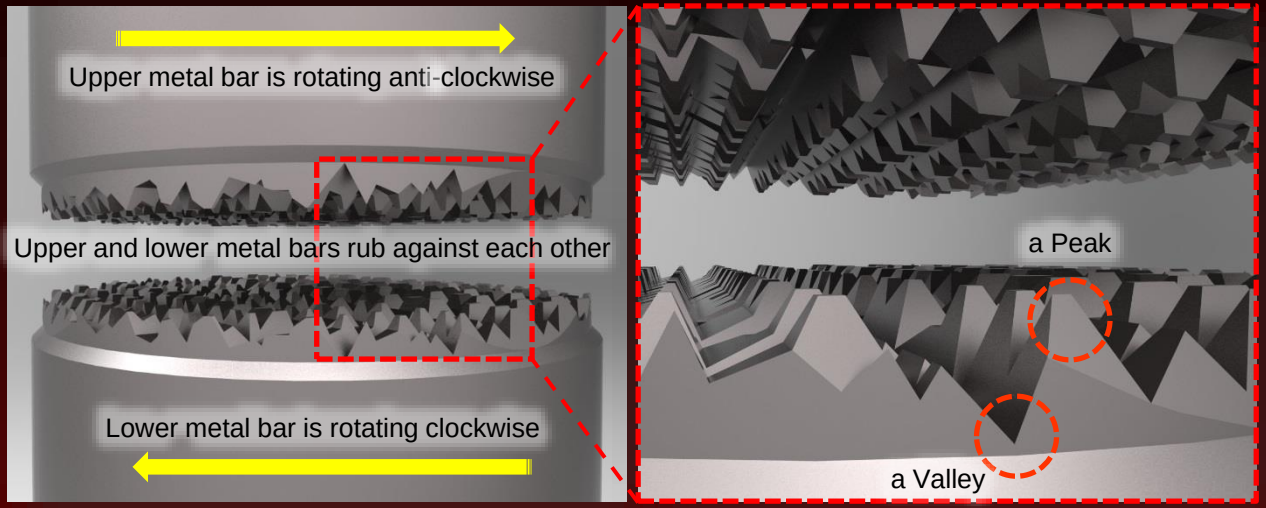


Positively Charged Metal Surface Repel Each Other

8. ABF TECHNOLOGY DETAILED EXPLANATIONS

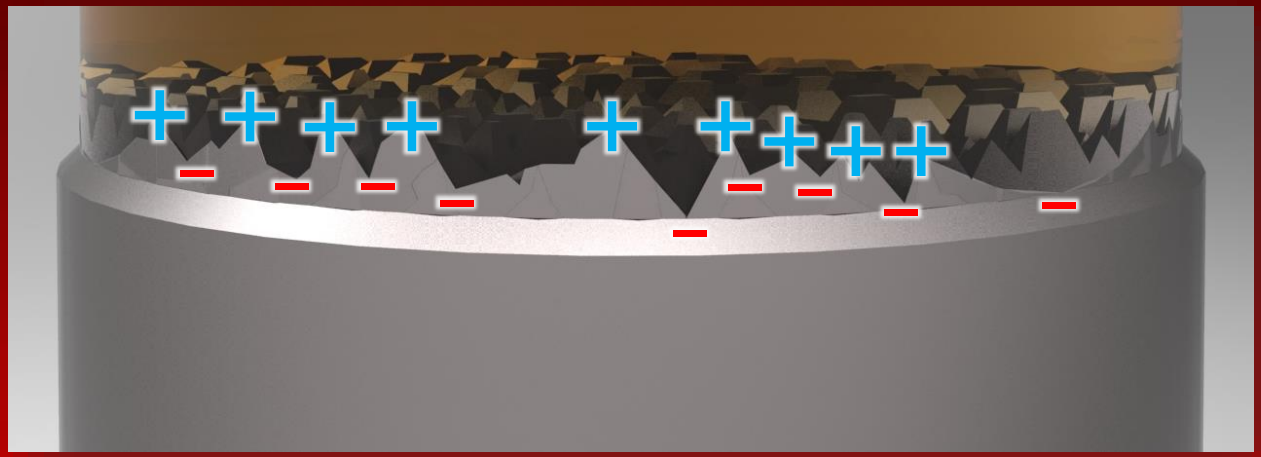
1. Metal Surface

Under microscope, metal surface characterized by series of peaks and valleys, Peaks (known as “asperities”), and Valleys (referred to as “micro-pores” and “fissures”)



2. Charges of the Metal Surface

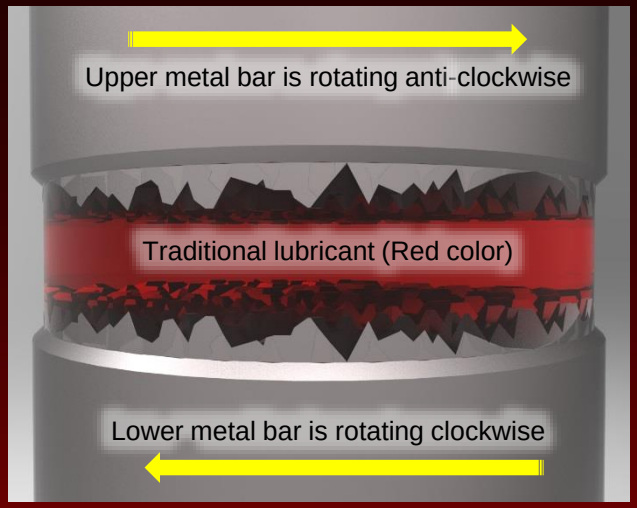
Peaks are positively charged and Valleys are negatively charged



8. ABF TECHNOLOGY DETAILED EXPLANATIONS

3. Traditional Lubricants

- Traditional lubricants help slow the process of heat and friction to some degree.
- When 2 metal surface contact each other and move in opposite directions, friction is caused, producing heat & metal deterioration.
- Constant friction & electromagnetic interaction causes the weakened metal to break off creating metallic debris & particles in the lubricants



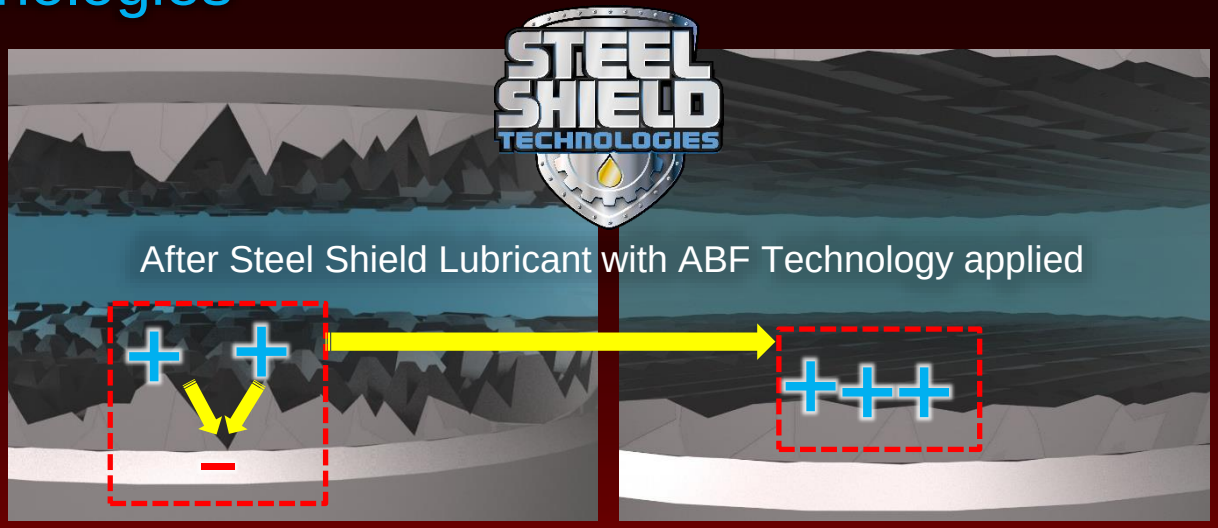
Lubricant additives damage metal surface

Metal Wear

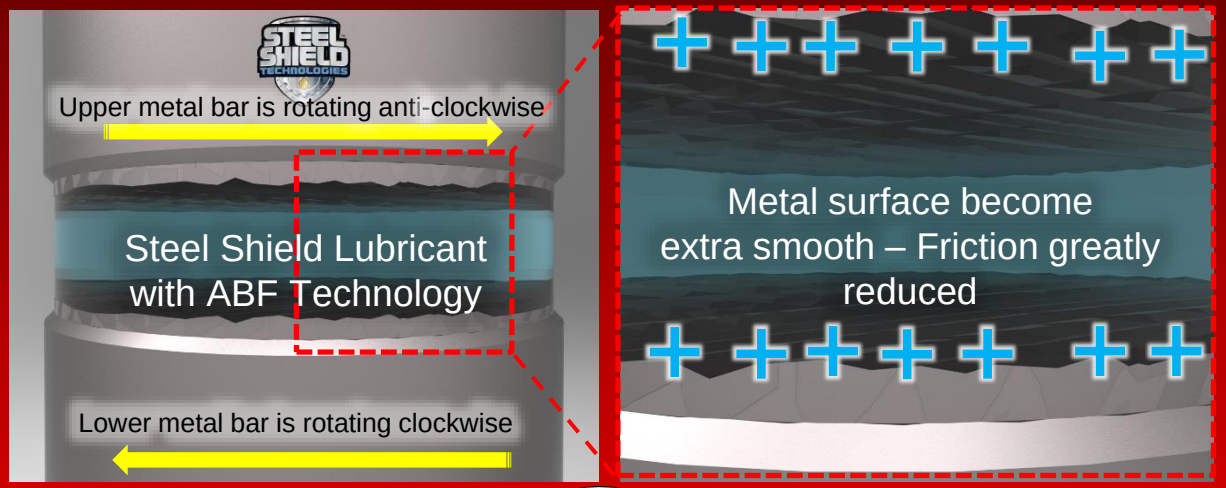
8. ABF TECHNOLOGY DETAILED EXPLANATIONS

4. Steel Shield Technologies

- Forms electro-negative surface attaching compounds to seek out & affix themselves to lower surface areas filling the micro-pores & fissures
- Asperities roll out or flatten creating greatly improved metal surfaces



- Created in this process is a total positive state of polarity
- When metal surface become uniform in charge, there is a reduction in friction due to Faraday reaction of like-charges



8. ABF TECHNOLOGY DETAILED EXPLANATIONS

5. Advanced boundary Film of Steel Shield

- Advanced methods of tribology that improve lubricity and load carrying capacity
- Reacts chemically under thermal conditions with the contacting metal surfaces to form a complex surface-attaching film of protection
- Surface smoothing is accomplished resulting in improved spread characteristics of the surfaces themselves
- Increases fluid film strength resulting in greatly reduced wear while imparting extreme pressure properties (EP)

Roller bearing

9. ADVANTAGES & TARGETED INDUSTRIES

CONCEPT

- Van der Waals Forces
- Dipole-Dipole Surface Reactions

ADVANTAGES

- Reduces Friction and Wear
- Provides Smoother Operation
- Improves Lubrication
- Non-Toxic and Helps Build Green Environment
- Improves Machinery Functionality
- Improves Fuel Economy
- Reduces Operating Temperatures
- Protects Moving Metal Parts
- Eliminates Cold Start Problems
- Reduces Maintenance & Downtime
- Extends Component Reliability & Parts Life

TARGETED INDUSTRIES

- Automotive & Racing, Airlines & Ground Equipment, Rail & Mass Transit, Shipping
- Gas, Oil & Energy Industries, Mining & Drilling
- Lifts, Air Conditioning & Cold Storage Systems
- Industrial, Agriculture, Construction & Naval Engineering
- Military & Law Enforcement units

10. SPECIALTY PRODUCT LINES

www.steelshieldtech.com.hk
www.facebook.com/steelshieldtech

11. AERIAL CABLE-CAR SYSTEM

NP360 Case Study

Previous Incidents of Service Interruption

NP360 Incidents

NO.	Date	Incident	Consequences / Maintenance
1	2006.06.17	A service interruption occurred causing some passengers being stranded in the cable cars	Leitner GmbH, the system manufacturer, made re-alignment to the system. The service was suspended for 23 days
2	2007.06.11	A cabin fell out from the cable during a brake test.	The service was suspended for 203 days till 2007.12.31
3	2009.11.18	A rescue carrier collided with the tower of the ropeway system	
4	2011.12.08 /18/22	Various mechanical faults found	NP 360 was suspended for service for 3 days
5	2012.01.25 (Chinese New Year holiday)	Some 800 passengers were stranded in cabins for 2+ hours under a temperature of 3℃.	NP 360 was closed for more than two months. All bearings on all bull wheels were replaced
6	2015.06.01	Maintenance move forward from September to May 6 due to increase in surface wear was found on the same track rope in late March near the Nei Lak Shan section. The major maintenance will still be performed as scheduled in September, where the rope shifting procedure will be done to the FOUR other track ropes, among other things. The May maintenance has taken care of TWO track ropes first. Since Ngong Ping 360 started running in 2006, the procedure has been done three times, with the last one in 2013.	★★★ With Steel Shield products, over HK$250,000,000 loss in revenue may be eliminated in those incidents (standard cabin fare HK$165 @ 5,300 rides a day).

Cause of the incident according to EMSD's investigation was the irregular spalling on the surface of the inner ring of the bull wheel bearings at the Airport Island Angle Station. The grease used on the bull wheel bearing was found containing excessive salt water content which had reduced the effectiveness of the lubrication and led to irregular spalling of the bearings and uneven wearing of the bull wheel lining. The bull wheel bearings were designed with a lifespan of 90K hours but it had only been used for some 25K hours at the time of the incident. The main cause of the issue is moist and humidity at the intermediate stations.

11. AERIAL CABLE-CAR SYSTEM

NP360 Case Study

Steel Shield's Solution to Prevent Incidences

Steel Shield product penetrates to the internal moving parts and shields against corrosion especially in extreme and harsh saltwater environments better than any other product to date. Steel Shield product re-hardens the metal surface and reduces coefficients of friction between the gears and other moving metal parts in the ropeway system such as reel and roller guides keeping them free from irregular wears to ensure operational safety.

Steel Shield Recommendations	
NO.	
1	Replace all grease with Steel Shield grease products
2	Check and re-grease all bearings of the ropeway system with Lithi-Shield NLGI-#2 / Reel Shield NLGI-#1 grease
3	Apply WRP on all wire ropes for water resistant and anti-corrosion
4	Apply Rust Converter Q2 on components where appropriate
5	Conduct scheduled grease analysis to monitor the moisture and metal content of the lubricating grease to regulate the re-greasing frequency according to the result
6	Review and tighten the procedure for inspection and replacement of the worn and damaged bull wheel linings

Steel Shield helps saving 32% ~ 64% maintenance costs annually, more importantly "Reliability is our first concern" we ensure your system reliability!

STEEL SHIELD TECHNOLOGIES

ABF TECHNOLOGY

Not Just Oil... IT'S TECHNOLOGY

12. AERIAL CABLE-CAR SYSTEM

San Diego Association of Governments Case Study

Cost Analysis

Summary of Annualized Cost Savings in Skyway Operation and Maintenance with Steel Shield products:

1. With reductions in maintenance costs, and extended maintenance intervals, a ropeway company can save overall operational costs from 7 to 12% or 32 to 64% in maintenance costs.

2. Investment in parts inventories can be reduced up to 50% and more.

3. Maintenance work hours reduced due to longer components life, so as labor costs.

4. Less downtime means higher income revenue to the ropeway company.

5. ABF Technology reduces mechanical and thermal frictions of the system in terms of smoother operation, higher efficiency and resource conserving.

12. AERIAL CABLE-CAR SYSTEM (Continue on next pa

San Diego Association of Governments Case Study

Cost Analysis

San Diego Association of Governments

Annualized Skyway Operation and Maintenance Costs Analysis - Untreated VS Treated By Steel Shield7

Item	Unit	Present Situation	After Using Steel Shield (Expected)		
			Reduction, %	Result	Remarks
Operation Schedule					
Operating Hours Per Year	h	5,040		5,040	
Non-Operating Hours Per Year	h	1,260		1,260	
Staffing During Operation					
Manager		2		2	
Mechanic		2		2	
Operator		4		4	
Attendant		4		4	
Total		12		12	
Staffing During Shutdown					
Mechanic		2		2	
Hours Worked Per Employee					
Total Hours	h	2,080		2,080	
Hours Available For Work	h	1,880		1,880	
Required Staffing Level (Man Hours)					
Manager	h	10,080		10,080	
Mechanic	h	12,600	15 ~ 30 %	8,820 ~ 10,710	Less machanic man hours are needed due to fewer maintenance
Operator	h	20,160		20,160	
Attendant	h	20,160		20,160	
Total	h	63,000		62,370	
Required Staffing Level (Manpower)					
Manager		5		5	
Mechanic		7	15 ~ 30 %	5 ~ 6	Less manpower is need due to reduction in mechanic man hours
Operator		11		11	
Attendant		11		11	
Total		34		33	
Labor Cost					
Manager (Base Wage: 30; Burden: 30%)	USD	405,600		405,600	
Mechanic (Base Wage: 28; Burden: 30%)	USD	529,984	15 ~ 30 %	370,989 ~ 450,486	Savings of USD79,498 ~ 158,995
Operator (Base Wage: 23; Burden: 20%)	USD	631,488		631,488	
Attendant (Base Wage: 10; Burden: 20%)	USD	274,560		274,560	
Total	USD	1,841,632		1,682,637 ~ 1,762,134	
Energy Cost					
Machine Power	kW	298.4		298.4	
Machine Power Consumption	kWh	1,503,936	8 ~ 12 %	1,323,464 ~ 1,383,621	Electricity consumption decreases due to reduced frictions
Energy Cost Rate	USD/ kWh	0.09725		0.09725	
Total Energy Cost	USD	146,258		128,707 ~ 134,557	Savings of USD17,551 ~ 11,701

12. AERIAL CABLE-CAR SYSTEM

San Diego Association of Governments Case Study

Cost Analysis

San Diego Association of Governments

Annualized Skyway Operation and Maintenance Costs Analysis - Untreated VS Treated By Steel Shield7

Item	Unit	Present Situation	After Using Steel Shield (Expected)		
			Reduction, %	Result	Remarks
Miscellaneous Annual Cost					
Uniforms (Cost Per Employee: 125)	USD	4,250		4,125	
Recruitment And Training (% of expected employee turnover: 0.25)	USD	8,500		8,500	
Rope Inspection	USD	5,000		5,000	
Lubricants And Other Disposable Maintenance Items	USD	35,000	25 ~ 50 %	17,500 ~ 26,250	Extended change interval = saving USD8,750 ~ 17,500
Consumable Parts (Elastomeric Components)	USD	50,000		50,000	
Carrier Repair Parts	USD	55,000	25 ~ 50 %	27,500 ~ 41,250	Less wear = savings USD13,750 ~ 27,500
NDT Services	USD	20,000		20,000	
Insurance & Indemnity	USD	125,000		125,000	
Annual Lift Inspection	USD	22,000		22,000	
Tools And Vehicle Cost	USD	150,000	15 ~ 30 %	105,000 ~ 127,500	Extended tools life = savings USD22,500 ~ 45,000
Office Supplies	USD	2,500		2,500	
Accounting And Payroll Services	USD	35,000		35,000	
Total Miscellaneous Cost	USD	512,250		422,250 ~ 467,250	
Annualized Interval for Major Repairs/Replacement - Reserve					
Rope Change	Interval (Years)	15	50 %	7.5	
Replacement Grips	Interval (Years)	15	70 %	10.5	
General Re-furbishment	Interval (Years)	20	75 %	15	
Gearbox Replacement	Interval (Years)	15	50 %	7.5	Extended Components life = less reserve required
Motor Replacement	Interval (Years)	15	50 %	7.5	
Office Equipment & Startup Supplies	Interval (Years)	8	na	8	
Facilities Maintenance	Interval (Years)	1	na	1	
Annualized Cost for Major Repairs/Replacement - Reserve					
Rope Change (USD 250,000)	USD	16,667	50 %	8,333	
Replacement Grips (USD 450,000)	USD	30,000	70 %	21,000	
General Re-furbishment (USD 2,000,000)	USD	100,000	75 %	75,000	
Gearbox Replacement (USD 400,000)	USD	26,667	50 %	13,333	Less repairs/replacement = save Reserve revenue
Motor Replacement (USD 85,000)	USD	5,667	50 %	2,833	
Office Equipment & Startup Supplies (USD 20,000)	USD	2,500	na	2,500	
Facilities Maintenance (USD 65,000)	USD	65,000	na	65,000	
Total Annualized Cost For Major Repairs	USD	246,500		187,999	
Summary					
Labor Cost	USD	1,841,632	4.32 ~ 8.63 %	1,682,637 ~ 1,762,134	
Energy Cost	USD	146,258	8 ~ 12 %	128,707 ~ 134,557	
Annualized Reserve for Major Repairs/Replacement	USD	246,500	23.73 %	187,999	
Miscellaneous Annual Cost	USD	512,250	8.79 ~ 17.57 %	422,250 ~ 467,250	
Total Operating Cost	USD	2,746,640	7.09 ~ 11.83 %	2,421,593 ~ 2,551,940	
Cost Per Hour of Operation	USD / h	545		480 ~ 506	average savings of 7.2 ~ 12% overall cost per hour

12. AERIAL CABLE-CAR SYSTEM
San Diego Association of Governments Case Study

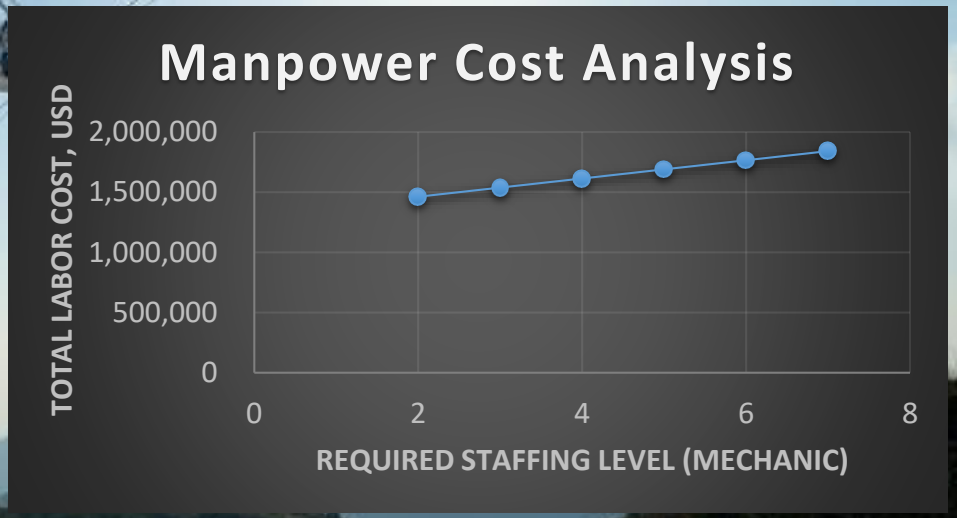
Cost Analysis

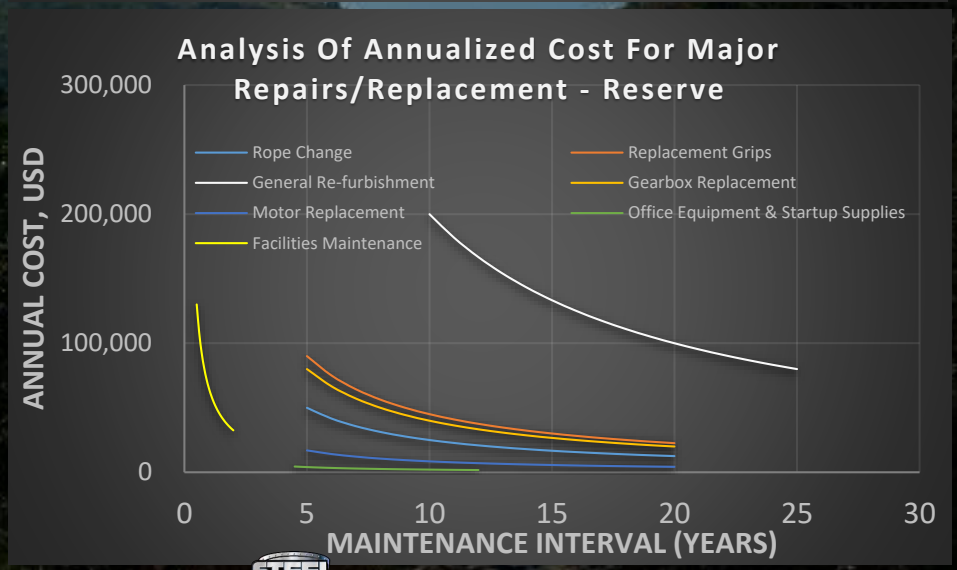
Summary of Manpower Cost Analysis:

1. Steel Shield betters manpower allocation
2. A dramatic cut in cost for better manpower resource management

Summary of Repair / Replacement Cost Analysis:

1. The facilities maintenance and the general refurbishment are very cost sensitive, and the refurbishment cost is among the largest in the total cost of repairs / replacement
2. Steel Shield products are proved to be very effective to reduce downtime and to extend the maintenance / refurbishment periods of the system
3. Steel Shield products keep machinery working like new at all times if used from start, and harden the metal surface of the components for extended durability and work safety





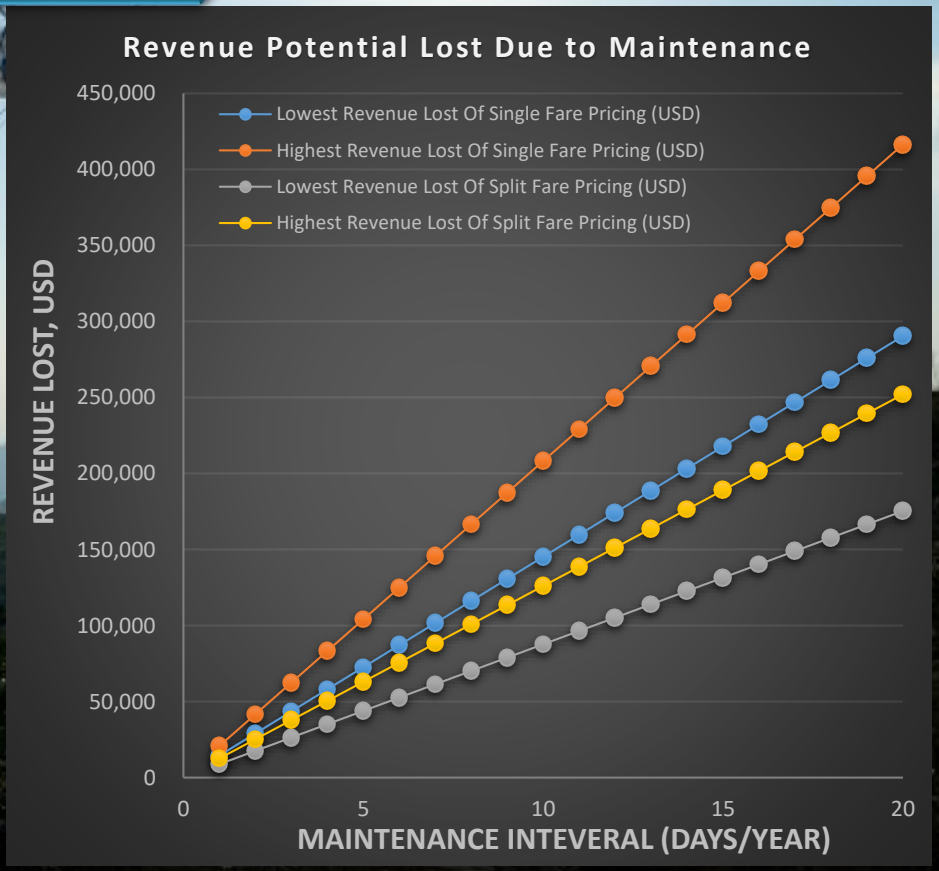
12. AERIAL CABLE-CAR SYSTEM

San Diego Association of Governments Case Study

Analysis of Revenue Potential Lost Due to Maintenance

Annual Farebox Revenue: Single Fare Pricing		
Skyway Annual Estimated Farebox Revenue - Single Fare Pricing	Low	High
Projected Ridership ($2.50 Fare)	750,750	1,080,750
Estimated Fare Revenue ($2.50 Fare)	1,900,000	2,700,000
* Projected Ridership ($5.00 Fare)	681,450	978,450
Estimated Fare Revenue ($5.00 Fare)	3,400,000	4,900,000
Total for Single Fare Pricing	5,300,000	7,600,000
Annual Farebox Revenue: Split Fare Pricing		
Skyway Annual Estimated Farebox Revenue - Split Fare Pricing	Low	High
Projected Resident Ridership ($2.50 Fare)	231,000	341,000
Estimated Fare Revenue	60,000	90,000
* Projected Visitor Ridership ($5.00 Fare)	519,750	739,750
Estimated Fare Revenue	2,600,000	3,700,000
Total for Split Fare Pricing	3,200,000	4,600,000

* Assumes a ridership reduction of 30 percent for resident trips; based on elasticity factors presented in TCRP Report 95, Transit Pricing and Fares: Traveler Response to Transportation System Changes



Summary of the Analysis:

1. The potential lost of revenue due to maintenance is ranged from 88,000 to 208,000 USD (for 10 days case) depends on the real situation, and the lost is linear to the maintenance interval
2. Steel Shield products can reduce maintenance / incidence significantly, and thus save costs

13. RECOMMENDED PRODUCTS FOR NP360

Lithi Shield

Reel Shield Grease

Steel Shield EPA

Not Just Oil...
IT'S TECHNOLOGY

Strike Shield

Spray Shield

Tool Shield

100% Made in USA
100% Import from USA

Drill & Tap Shield

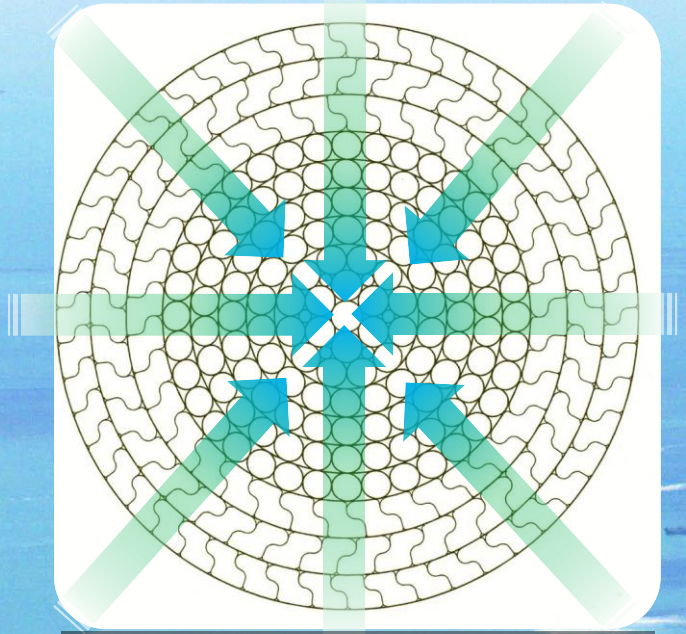
Q2 Rust Converter

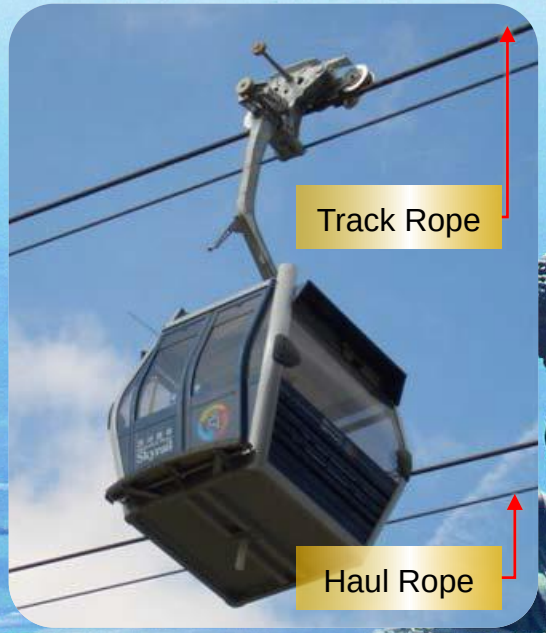
WRP - Wire Rope Protection

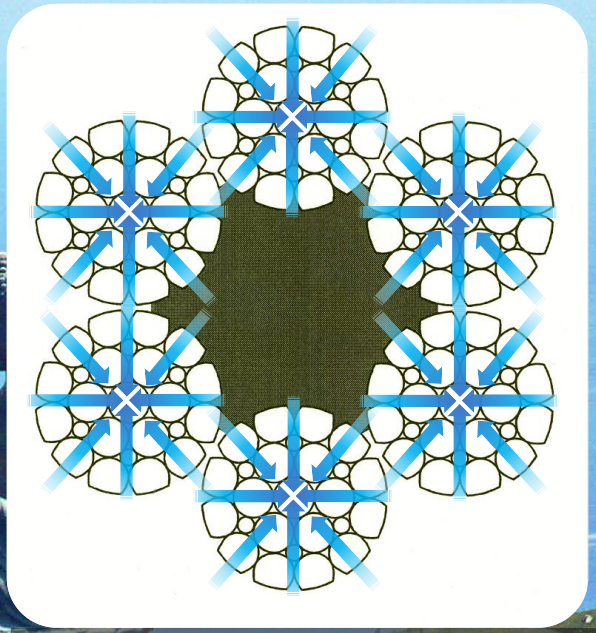
13. RECOMMENDED PRODUCTS FOR NP360

TRACK ROPE & HAUL ROPE SYSTEM

01. Track Rope & Haul Rope







Track Rope: Lubricant deeply penetrates into the core from all directions

Haul Rope: Lubricant deeply penetrates into the core of each strand from all directions

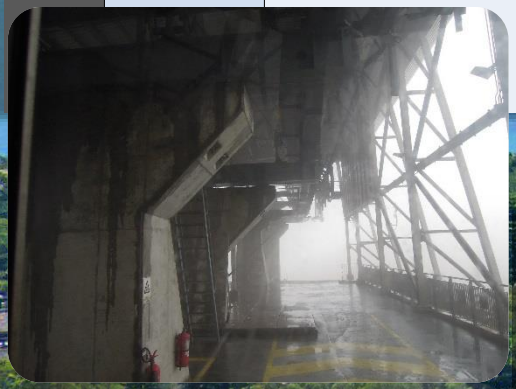
13. RECOMMENDED PRODUCTS FOR NP360

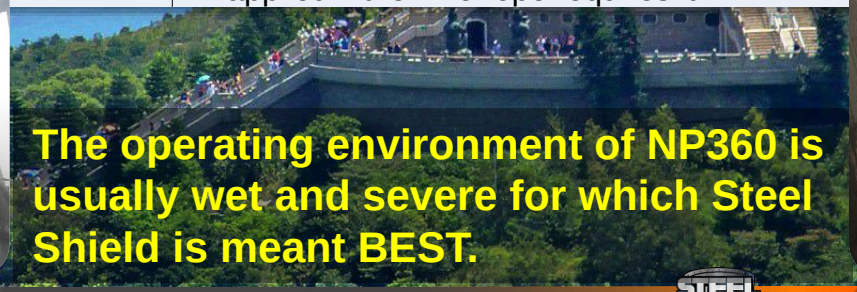
TRACK ROPE & HAUL ROPE SYSTEM

01. Track Rope & Haul Rope

Track Rope & Haul Rope

NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Track Rope	• Lithi-Shield * • WRP Wire Rope Protection *	• Penetrate to the core of the wire rope to prevent rupture of strands and rope break. Lithi-Shield and WRP Wire Rope Protection prevent excessive rubbing wear of strand on strand and metal fatigue. Surfaces in contact are lubricated and fatigue is reduced. They extend the period of re-lubrication. The speed of the initial oil impregnates from the core squeezes out and passes the inner strands can be slowed down to prevent fatigue happen • Friction between the wires and/or strands is reduced to minimize the effects of blending stresses • Adhere to wire and core, they stay on the rope and resist being thrown off when travelling around high speed pulleys • Weather resistant: resist water wash out Rapid displacement of moisture • Resistant to oxidation: extend oil life and prevent metal oxidation • Easy to apply: can be apply by machine, brushing or spraying • Able to withstand the full range of atmospheric temperatures: cracking of the outer covering can occur in cold weather if manufacturing precautions are not taken and this allows moisture to penetrate • After applying WRP Wire Rope Protection, o applied if the wire rope requires it
2	Haul Rope		





The operating environment of NP360 is usually wet and severe for which Steel Shield is meant BEST.

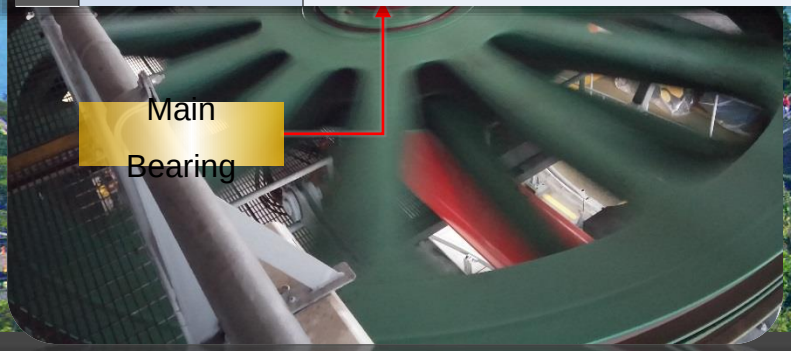
13. RECOMMENDED PRODUCTS FOR NP360

TRACK ROPE & HAUL ROPE SYSTEM

02. Haul Rope Tensioning Device

Haul Rope Tensioning Device

NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Drive Sheave / Return Sheave Bearings	• Lithi-Shield	• Lithi-Shield TOTALLY OUTPERFORMS the well recognized Japanese industrial grease Yamamoto EP Grease and the USA Atlas Chisel Lube (see test reports in later pages) • Extremely high weld point: 800kgf in 4-Balls Extreme Pressure Test (D2596) • Smooth out & harden metal surfaces with ABF Technologies • Greatly reduces metal debris as metal wears dramatically reduced • Protects bearings against water and substances
2	Hydraulic Tensioner	• Lithi-Shield	• (Same as described above) • Protects against extreme pressure in low speed applications • Protects drive shaft and cylinder under severe load
		• SST ECI HD-AP Hydraulic Oil • SST ECI TV T-Power Hydraulic Oil	• ABF Technology treats metal surfaces: Smooth out & harden metal surfaces • Stable and reliable lubricants which can be used under all operating conditions • High degree of load-carrying capabilities and anti-wear protections • Excellent anti-corrosions, anti-oxidations, anti-foaming and air-separation abilities



13. RECOMMENDED PRODUCTS FOR NP360

STATION FACILITIES & EQUIPMENTS

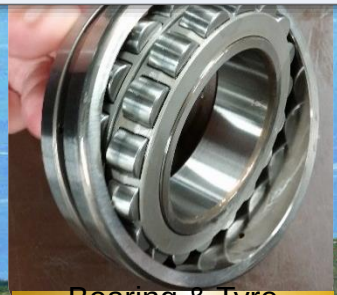
03. Station Equipment Bearings

Station Equipment Bearings			
NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Bearings in: Accelerators, Decelerators, Synchronization System, Turnaround / Forwarding Conveyor, Mechanical Drive, Tyre Hub	• Lithi-Shield	• (Same as described previously) • Extends bearing life and change intervals • Reduces downtime • Protects against corrosion, water, oxidation, dirt and much more • Protects against extreme loadings under high and low speeds with ABF Technology


Accelerator / Decelerator


Accelerator / Decelerator


Synchronization System


Bearing & Tyre Hubs


Turnaround / Forwarding Conveyor

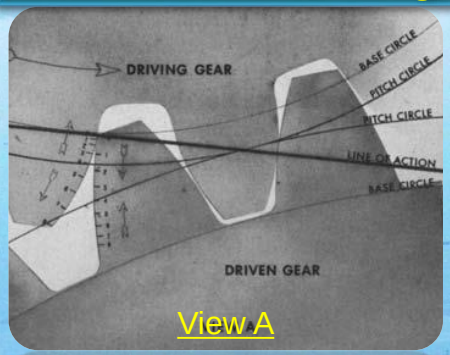

Mechanical Drive


Mechanical Drive

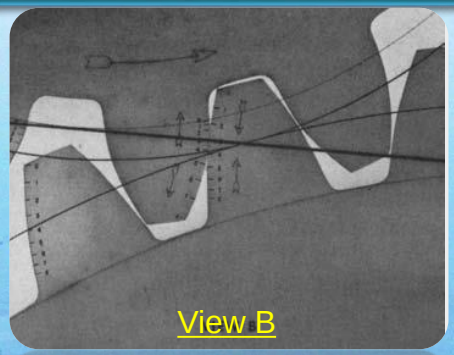
13. RECOMMENDED PRODUCTS FOR NP360

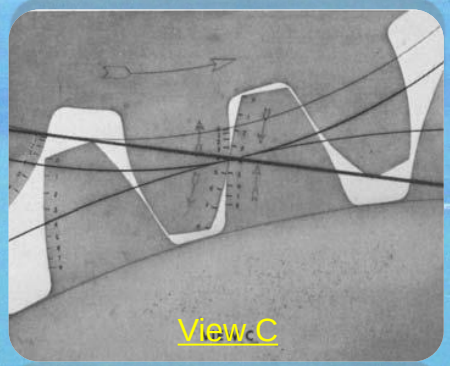
STATION FACILITIES & EQUIPMENTS

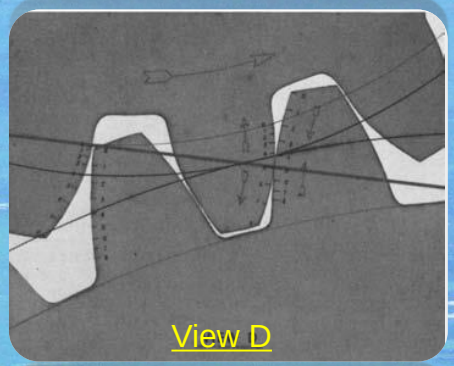
04. Understanding the Nature of Gear Actions & Wears

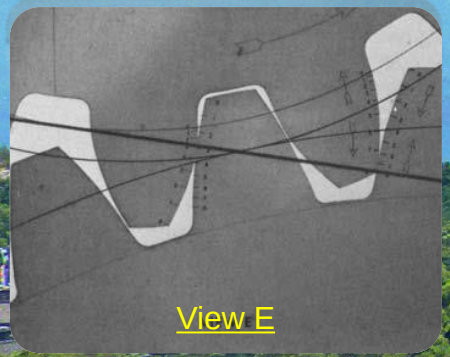


View A


View B


View C


View D


View E

As gear teeth mesh, they roll and slide together. The progression of contact as a pair of spur gear teeth of usual design engage as shown in the left figure. The first contact is between a point near the root of the driving tooth (upper gear) and a point at the tip of the driven tooth.

In view A, these points are identified as 0–0 lying on the line of action. At this time, the preceding teeth are still in mesh and carrying most of the load. As contact progresses, the teeth roll and slide on each other. Rolling is from root to tip on the driver and from tip to root on the driven tooth. The direction of sliding at each stage of contact is as indicated by the small arrows.

In view B, contact has advanced to position 3–3, which is approximately the beginning of "single tooth" contact when one pair of teeth pick up the entire the load. It will be seen that to reach this point of engagement, since the distance 0–3 on the driven gear is greater than the distance 0–3 on the driver, there must have been sliding between the two surfaces.

View C, position 4–4, shows contact at the pitch line, where there is pure rolling—no sliding. It should be noted, particularly, that the direction of sliding reverses at the pitch line. Also, sliding is always away from the pitch line on the driving teeth, and always toward it on the driven teeth.

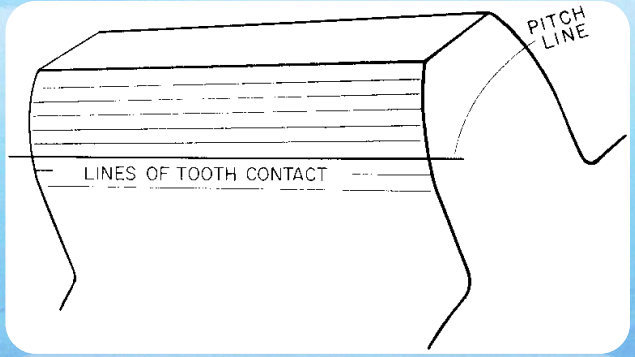
View D shows contact at position 5–5, which marks the approximate end of a single-tooth contact. As shown, another pair of teeth is about to make contact.

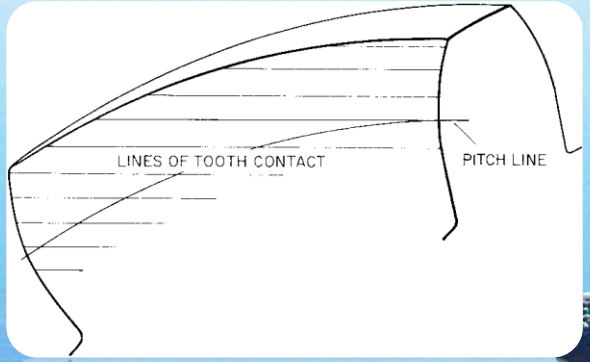
In view E, two pairs of teeth are in mesh, but shown at position 8–8, the original pair of teeth is about to disengage.

13. RECOMMENDED PRODUCTS FOR NP360

STATION FACILITIES & EQUIPMENTS

04. Understanding the Nature of Gear Actions & Wears





Notice : Never use lubricants contain Molybdenum DiSulfide (a solid additive) because it will RUIN the gear (metal) surface slowly during sliding actions.

It will be seen that rolling is continuous throughout mesh. Sliding, on the other hand, varies from a maximum velocity in one direction at the start of mesh, through zero velocity at the pitch line, then again to a maximum velocity in the opposite direction at the end of mesh.

This combination of sliding and rolling occurs with all meshing gear teeth regardless of type. The two factors that vary are the amount of sliding in proportion to the amount of rolling, and the direction of slide relative to the lines of contact between tooth surfaces.

With conventional spur and bevel gears, the theoretical lines of contact run straight across the tooth faces (the left picture). The direction of sliding is then at right angles to the lines of contact. With helical, herringbone, and spiral bevel gears, because of the twisted shape of the teeth, the theoretical lines of contact slant across the tooth faces (the right picture). Therefore, the direction of sliding is not at right angles to the lines of contact, and some side sliding along the lines of contact occurs.

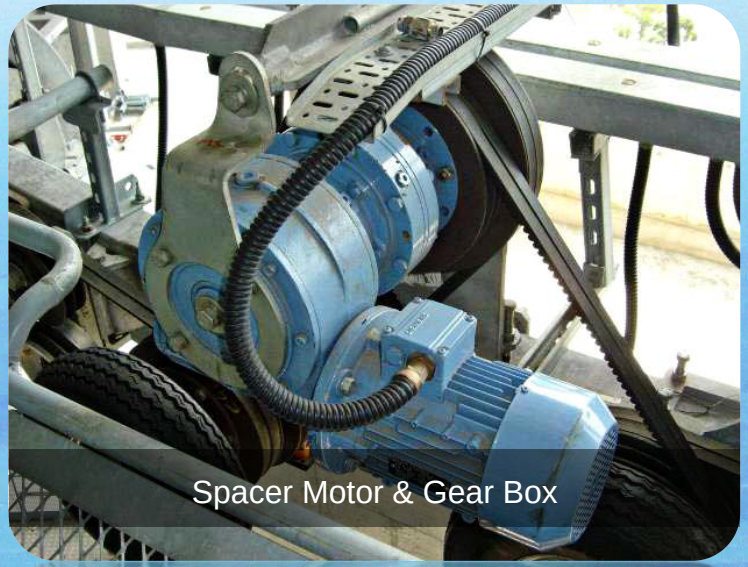
With worm gears, as with spur gears, the same sliding and rolling action occurs as the teeth pass through mesh. Usually, this sliding and rolling action is relatively slow because of the low rotational speed of the worm wheel. In addition, rotation of the worm introduces a high rate of side sliding. The combination of two sliding actions produces a resultant slide, which in some areas is directly along the line of contact.

In addition to the usual rolling action, hypoid gears have a combination of radial and sideways sliding that is intermediate between the motions of worm gears and spiral bevel gears. The greater the shaft offset, the more nearly the sliding conditions approach those found in worm gears.

13. RECOMMENDED PRODUCTS FOR NP360

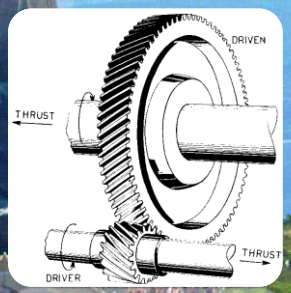
STATION FACILITIES & EQUIPMENTS

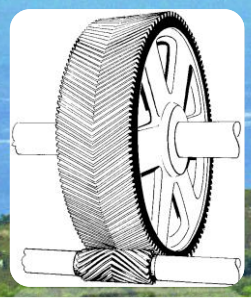
05. Station Equipment Gear Systems

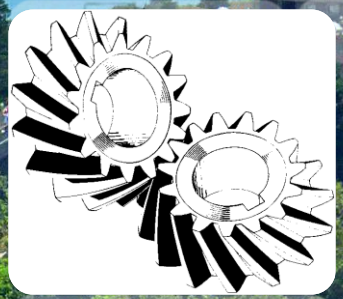


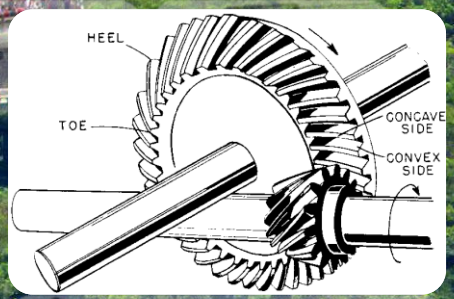
Spacer Motor & Gear Box

Planetary Gear System









From Left to Right & From Top to Down:
Spur Gear, Bevel Gear, Helical Gear & Pinion, Herringbone Gear & Pinion, Spiral Bevel Gear, Worm Gear, Hypoid gear

13. RECOMMENDED PRODUCTS FOR NP360

STATION FACILITIES & EQUIPMENTS

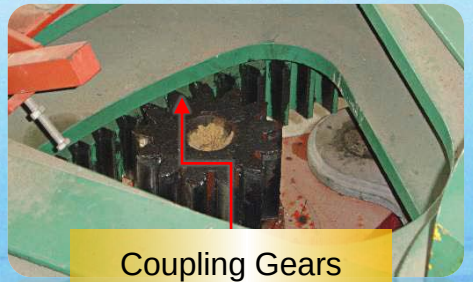
05. Station Equipment Gear Systems

Station Equipment Gears			
NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Spacer Motors & Gear Boxes: Spur Gears, Helical Gears, Worn Gears, Planetary Gears, Spiral Bevels Gears, etc.	• SST ECI HD-AP ATF DIII Auto-Transmission Fluid • SST ECI HD-AP EP-GL-5 Auto-Gear Oil • SST ECI HD-AP PTF Transmission Fluid • SST ECI POWER-AP PAG Gear Oil • SST ECI T-GEAR AP EP Gear Oil • SST ECI T-SHC AP EP Gear Oil	• Unique ABF Technology to treat metal surface: Metal & Gear surfaces become smoother and harder • Stable viscosity at operating temperature to assure distribution of oil to all rubbing surfaces and formation of protective oil films at prevailing speeds and pressures • Adequate low temperature fluidity to permit circulation at the lowest expected start temperature • Good chemical stability to minimize oxidation under conditions of high temperatures and agitation in the presence of air, and to provide long service life for the oil • Good demulsibility to permit rapid separation of water and protect against the formation of harmful emulsions • Antirust properties to protect gear and bearing surfaces from rusting in the presence of water, entrained moisture, or humid atmospheres • Non-corrosive nature to prevent gears and bearings from being subjected to chemical attack • Foam resistance to prevent the formation of excessive amounts of foam in reservoirs and gear cases

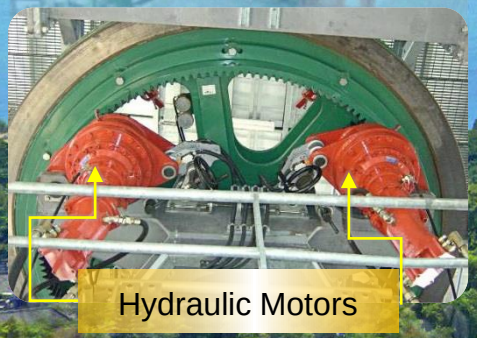
13. RECOMMENDED PRODUCTS FOR NP360

DRIVE & BRAKE EQUIPMENTS

01. Drive Group & Gearing System



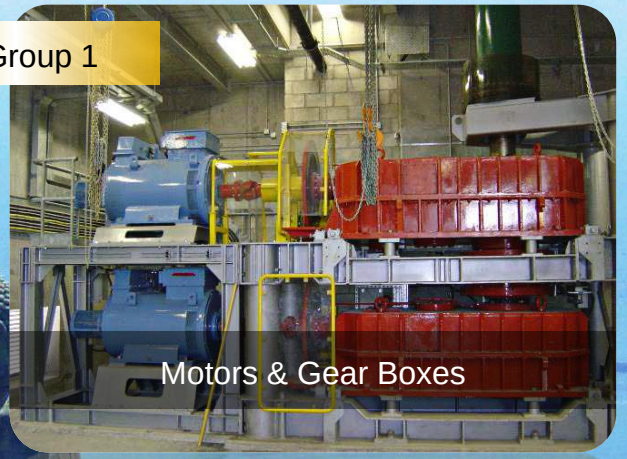
Coupling Gears



Hydraulic Motors

Drive Group 1

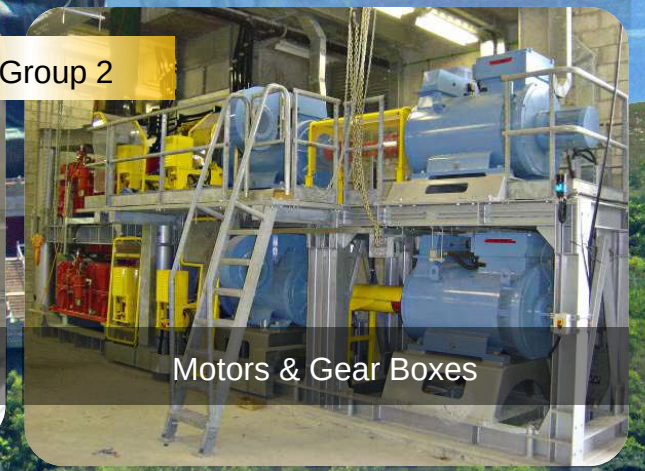
Drive Bull Wheel



Motors & Gear Boxes

Drive Group 2

Drive Bull Wheel



Motors & Gear Boxes

13. RECOMMENDED PRODUCTS FOR NP360

DRIVE & BRAKE EQUIPMENTS

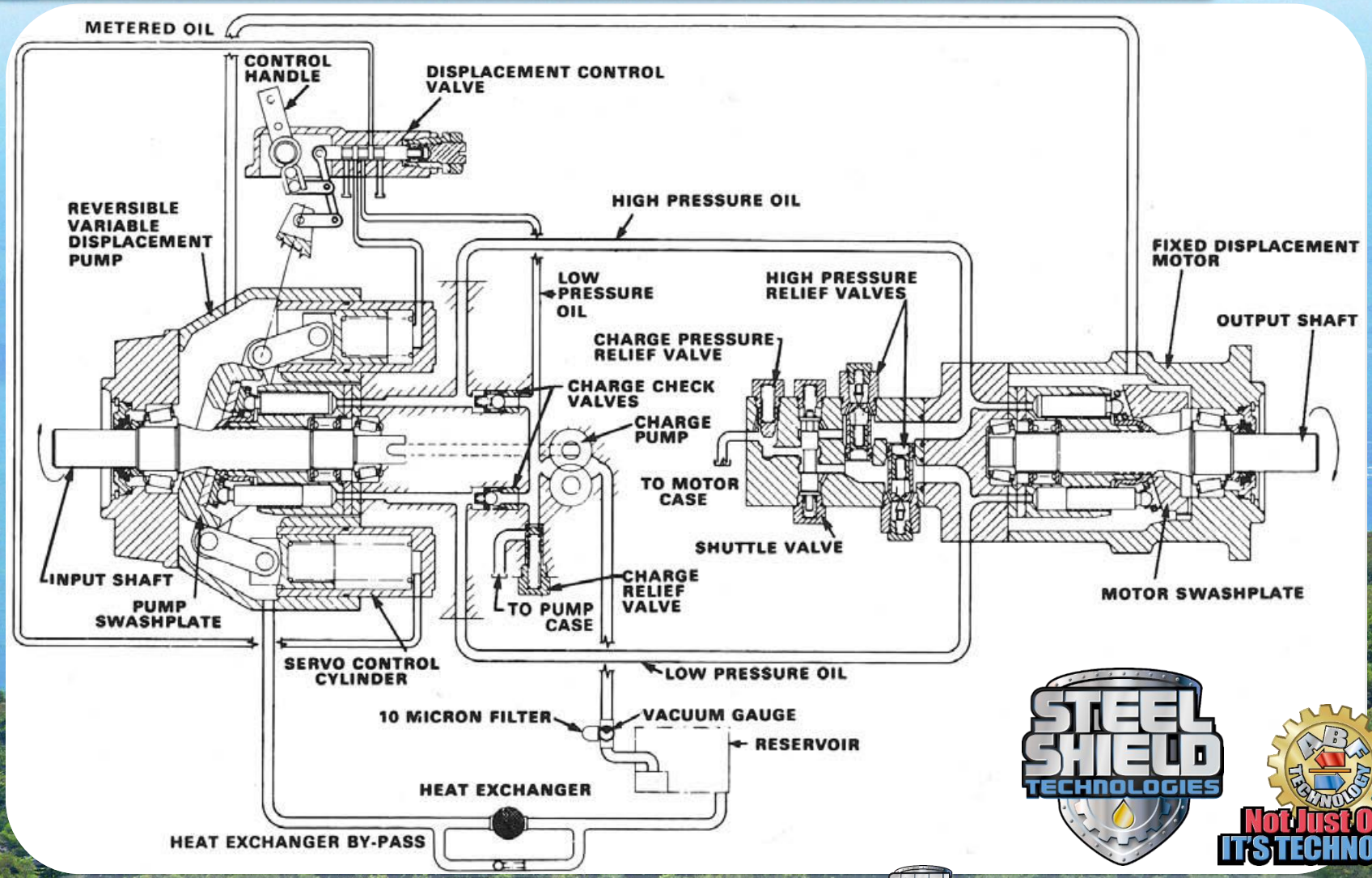
01. Drive Group & Gearing System

Drive Group & Gearing System			
NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Drive Bull Wheel Bearings	• Lithi-Shield (For Open System)	• (See previous section for reference)
		• Steel Shield EPA (For Circulated Lubrication System)	• ABF Technology enhances and improves system performance, greatly reduces maintenance costs and downtime • Excellent lubricant for extreme pressure applications • Metal surface becomes smooth and hardened, greatly reduced frictions • Dramatically reduces metal-to-metal wears (this ability can be proved through oil analysis of metal debris) • Anti-Corrosion, oxidation, demulsify, foaming abilities • Extreme stable over wide temperature range
2	Hydraulic Motors	• SST ECI HD-AP Hydraulic Oil • SST ECI TV T-Power Hydraulic Oil	• (See previous section for reference)
3	Hydraulic Motor Output Gears	• Lithi-Shield	• (See previous section for reference)
4	Drive Bull Wheel Coupling Gears	• Lithi-Shield	• (See previous section for reference)
5	Drive Group Gear Boxes Systems	• Steel Shield EPA • SST ECI HD-AP ATF DIII Auto-Transmission Fluid • SST ECI HD-AP EP-GL-5 Auto-Gear Oil • SST ECI HD-AP PTF Transmission Fluid • SST ECI POWER-AP PAG Gear Oil • SST ECI T-GEAR AP EP Gear Oil • SST ECI T-SHC AP EP Gear Oil	• (See previous section for

13. RECOMMENDED PRODUCTS FOR NP360

DRIVE & BRAKE EQUIPMENTS

02. How ABF Technology of Steel Shield Enhances the Hydraulic Motor System?



13. RECOMMENDED PRODUCTS FOR NP360

DRIVE & BRAKE EQUIPMENTS

02. How ABF Technology of Steel Shield Enhances the Hydraulic Motor Sys

Benefits of Steel Shield Lubricants Over Other Famous Brands

NO.	Main System	Components	Steel Shield Technologies	Results
1	High & Low Pressure Oil Tubes		• ABF Technology Dynamic Repel	1. Both metal oil tubes and metal debris are being positively charged by Steel Shield lubricant 2. Dirts and debris are being repelled by the metal pipe due to Faraday reaction of like charges 3. Dirts and debris flow away along the direction of lubricant flow 4. The entire system maintains clean and runs smooth 5. Efficiency of the hydraulic system greatly enhanced
2	Variable Displacement Pump (Input)	• Drive Pistons • Cylinder Barrel • Bearings	• ABF Technology Metal Treatment	1. Forms electro-negative surface attaching compounds to seek out & affix themselves to lower surface areas filling the micro-pores & fissures 2. Asperities roll out or flatten creating greatly improved metal surfaces 3. Created in this process is a total positive state of polarity 4. When metal surfaces become uniform in charge, there is a reduction in friction due to Faraday reaction of like-charges 5. Metal wears of bearing, pistons & cylinder barrels dramatically reduced 6. Huge reduction in maintenance costs
			• ABF Technology Dynamic Repel	• (Same as described in part 1 above)
3	Fixed Displacement Motor (Output)	• Drive Pistons • Cylinder Barrel • Bearings	• ABF Technology Metal Treatment	• (Same as described in part 2 above)
			• ABF Technology Dynamic Repel	• (Same as described in part 1 above)

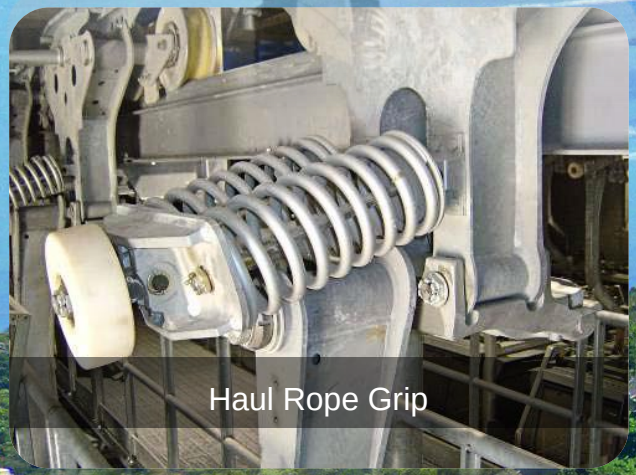
13. RECOMMENDED PRODUCTS FOR NP360

CARRIERS SYSTEM

01. Carrier Components


Carriage System

Hanger (J-Bar)


Haul Rope Grip

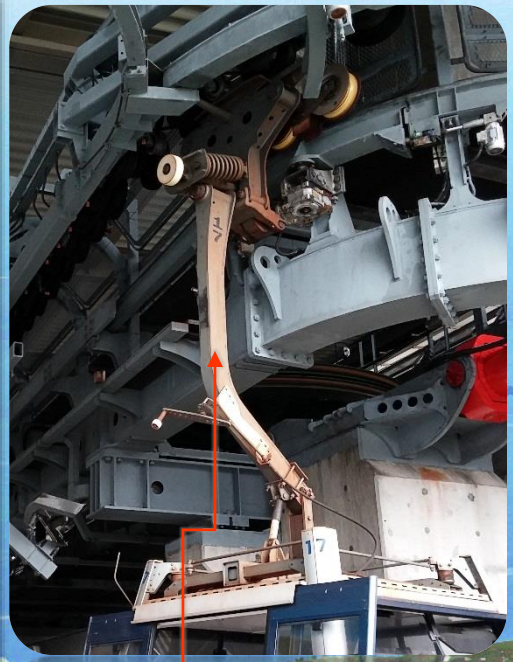

Carriage Wheel

13. RECOMMENDED PRODUCTS FOR NP360

CARRIERS SYSTEM

01. Carrier Components

Station Equipment Gears			
NO.	PART	STEEL SHIELD LUBRICANT / PRODUCT	BENEFITS / REASONS TO USE STEEL SHIELD PRODUCTS
1	Carriage System: Wheel Bearings, Joints, Shafts, Haul Rope Grip Movable Components, etc.	• Lithi-Shield	• This is an ultimate grease lubricant which TOTALLY OUTPERFORMS the well recognized Japanese industrial grease Yamamoto EP Grease and the USA Atlas Chisel Lube (see test reports in later pages) • Extremely high weld point: 800kgf in 4-Balls Extreme Pressure Test (D2596) • Smooth out & harden metal surfaces with ABF Technology • Greatly reduces metal debris as metal wears dramatically reduced • Protects bearings & metals against water, moistures and substances • Protects against rusting & corrosions
2	Hanger (J-Bar)	• Rust Converter Q2	• Terminate on-going oxidation (rusting) of iron • Does not require removing the rust off as part of the process • Anti-corrosion • Design for ocean / marine equipment • Easy to apply: use a roller or a brush (No prime coating is needed) • High wear well • Safety to use • Environmentally • Maintain / rebuild the confidence of customers by

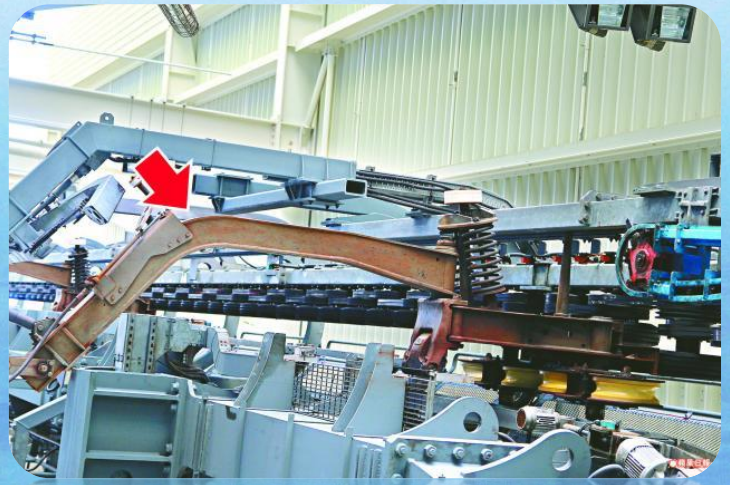


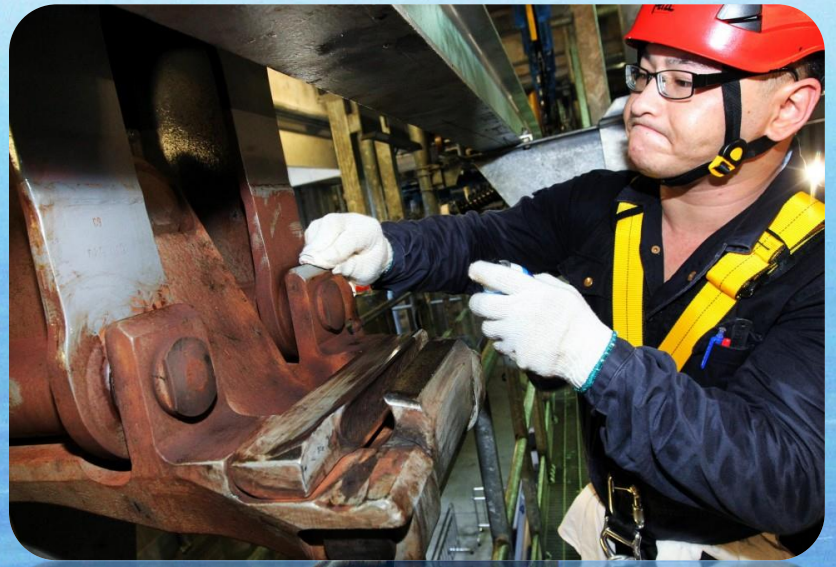
Q2 Rust Converter can stop on-going rusting of the hanger (J-Bar)

13. RECOMMENDED PRODUCTS FOR NP360

CARRIERS SYSTEM

01. Carrier Components





Traditional anti-oxidation oils / painting can only slow down the rusting process temporarily because they will fall off after some time. Q2 Rust Converter is the ultimate choice and only solution because it can stop rusting of metals. It is not just a coating!

Not just coating...
It's a converter!

Before using Q2After using Q2 After painting (any color)

4. LITHI SHIELD (NLGI #2)

PRODUCT SPECIFICATIONS

- NLGI Grade: No. 2
- Anti-wear metal treatment: Steel Shield

ASTM TESTS

• D-217	Penetration, Worked, 60s	265 - 295
• D-217	Penetration, Unworked	265 - 295
	Thickener Type	Lithium Complex
• D128	Thickener, %	8 - 11
	Color	Light Amber
	Texture	Smooth
• D-2265	Dropping point	500˚F
• D-445	Viscosity @ 40˚F, cst	220
• D-445	Viscosity @ 100˚F, cst	19
• D-2270	Viscosity Index	95
• D-92	Flash Point,˚F	464
• D-92	Fire Point,˚F	550
• D-2509	Timken OK load (lbs.)	60
• D-1743	Rust	Pass
• D-4048	Copper Corrosion	1B
• D-2266	4-Ball Wear Test, mm	0.68
• D-2596	4-Ball EP Weld Test, Kg Min.	800 / Pass
• D-5483	Oxidation Induction time @210℃, min	11.47
• D-1264	Water washout @ 79℃	2.7 %
	Mobility at 77˚F, g/min	576
• US Steel Mobility Test	Mobility at 60˚F, g/min	275.4
	Mobility at 40˚F, g/min	86.6
	Mobility at 20˚F, g/min	15.3
	Mobility at 0˚F, g/min	1.6

RECOMMENDED USED

- All extreme pressure applications
- Universal joints
- Rotating machinery
- Heavy equipment
- Conveyors
- Bearings
- Chassis fittings
- Pumps

GEAR SYSTEM REBUILDING & MAINTENANCE:

LITHI-SHIELD™ in Roller Bearings:

In newer style roller bearing type, LITHI-SHIELD surpasses any aftermarket greases in reliability, heat endurance and wear prevention.

LITHI-SHIELD™ in Armature Bearings:

The use of LITHI-SHIELD in the armature bearings of any industrial systems has reduced failures and wear significantly.

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI / HI
LS-T	8-94630-00181-6	Lithi-Shield Lithium Complex Grease – 59.14 mL/Case	24	9.25”X 6.5”X 4.75”	0.16 inch³	1.9 lb	40 / 8
LS-C	8-94630-00182-3	Lithi-Shield Lithium Complex Grease – 414 mL/Case	40	12”X 10.75”X 19.5”	1.45 inch³	42 lb	6 / 5
LS-LB	8-94630-00183-0	Lithi-Shield Lithium Complex Grease – 473 mL/Case	12	13.5”X 6.25”X 3.5”	0.17 inch³	15.2 lb	36 / 8
LS-5LB	8-94630-00184-7	Lithi-Shield Lithium Complex Grease – 2.365 L/Case	4	14.125”X 6.75”X 9.5”	0.53 inch³	23.4 lb	12 / 8
LS-P	8-94630-00185-4	Lithi-Shield Lithium Complex Grease – 16.5 L/Case	1			38 lb	
LS-K	8-94630-00186-1	Lithi-Shield Lithium Complex Grease – 56.8 L/Case	1			132 lb	
LS-D	8-94630-00187-8	Lithi-Shield Lithium Complex Grease – 189 L/Case	1			437 lb	

15. Reel Shield Grease (NLGI #1)

PRODUCT SPECIFICATIONS

- NLGI Grade: No. 1
- Anti-wear metal treatment: Steel Shield

ASTM TESTS

• D-217	Penetration, Worked, 60s	310 - 340
• D-217	Penetration, Unworked	310 - 340
	Thickener Type	Lithium Comple
• D128	Thickener, %	6 - 8
	Color	Light Amber
	Texture	Smooth
• D-2265	Dropping point	500℉
• D-445	Viscosity @ 40℉, cst	220
• D-445	Viscosity @ 100℉, cst	19
• D-2270	Viscosity Index	95
• D-92	Flash Point,℉	464
• D-92	Fire Point,℉	550
• D-2509	Timken OK load (lbs.)	60+
• D-1743	Rust	Pass
• D-4048	Copper Corrosion	1B
• D-2266	4-Ball Wear Test, mm	0.7
• D-2596	4-Ball EP Weld Test, Kg Min.	800 / Pass
• D-5483	Oxidation Induction time @180℃, min	95
• D-1264	Water washout @ 79℃	2.7 %
• US Steel Mobility Test	Mobility at 77℉, g/min	
	Mobility at 60℉, g/min	515
	Mobility at 40℉, g/min	257.1
	Mobility at 20℉, g/min	78.9
	Mobility at 0℉, g/min	5.4

RECOMMENDED USED

- Smoother Reel Operation
- Extends Reel Life
- Protects Against Corrosion
- Longer Conventional Casts

Reel Shield™ is the ultimate lubricant, cleaner, penetrant, and saltwater protectant which has been aggressively designed and formulated for the heavy Industry. Reel Shield™ lubricates and protects against extreme pressure and wear in all moving metal-to-metal parts, in all types of reel and drag systems. Reel Shield™ penetrates to the internal moving parts and shields against corrosion in extreme environments better than any other product to date. This distinguishes Reel Shield™ as the ultimate tool in the total care and maintenance of all tough tackle in both on shore and seawater equipment. Reel Shield™ has been especially tested in harsh saltwater conditions and proved to be superior in its performance.

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI / HI
LS-T		Reel Shield Lithium Complex Grease – 59.14 mL/Case	24	9.25”X 6.5”X 4.75”	0.16 inch³	1.9 lb	40 / 8
LS-C		Reel Shield Lithium Complex Grease – 414 mL/Case	40	12”X 10.75”X 19.5”	1.45 inch³	42 lb	6 / 5
LS-LB		Reel Shield Lithium Complex Grease – 473 mL/Case	12	13.5”X 6.25”X 3.5”	0.17 inch³	15.2 lb	36 / 8
LS-5LB		Reel Shield Lithium Complex Grease – 2.365 L/Case	4	14.125”X 6.75”X 9.5”	0.53 inch³	23.4 lb	12 / 8
LS-P		Reel Shield Lithium Complex Grease – 16.5 L/Case	1			38 lb	
LS-K		Reel Shield Lithium Complex Grease – 56.8 L/Case	1			132 lb	
LS-D		Reel Shield Lithium Complex Grease – 189 L/Case	1			437 lb	

16. Lithi Shield & Reel Shield Grease Compatibility Chart

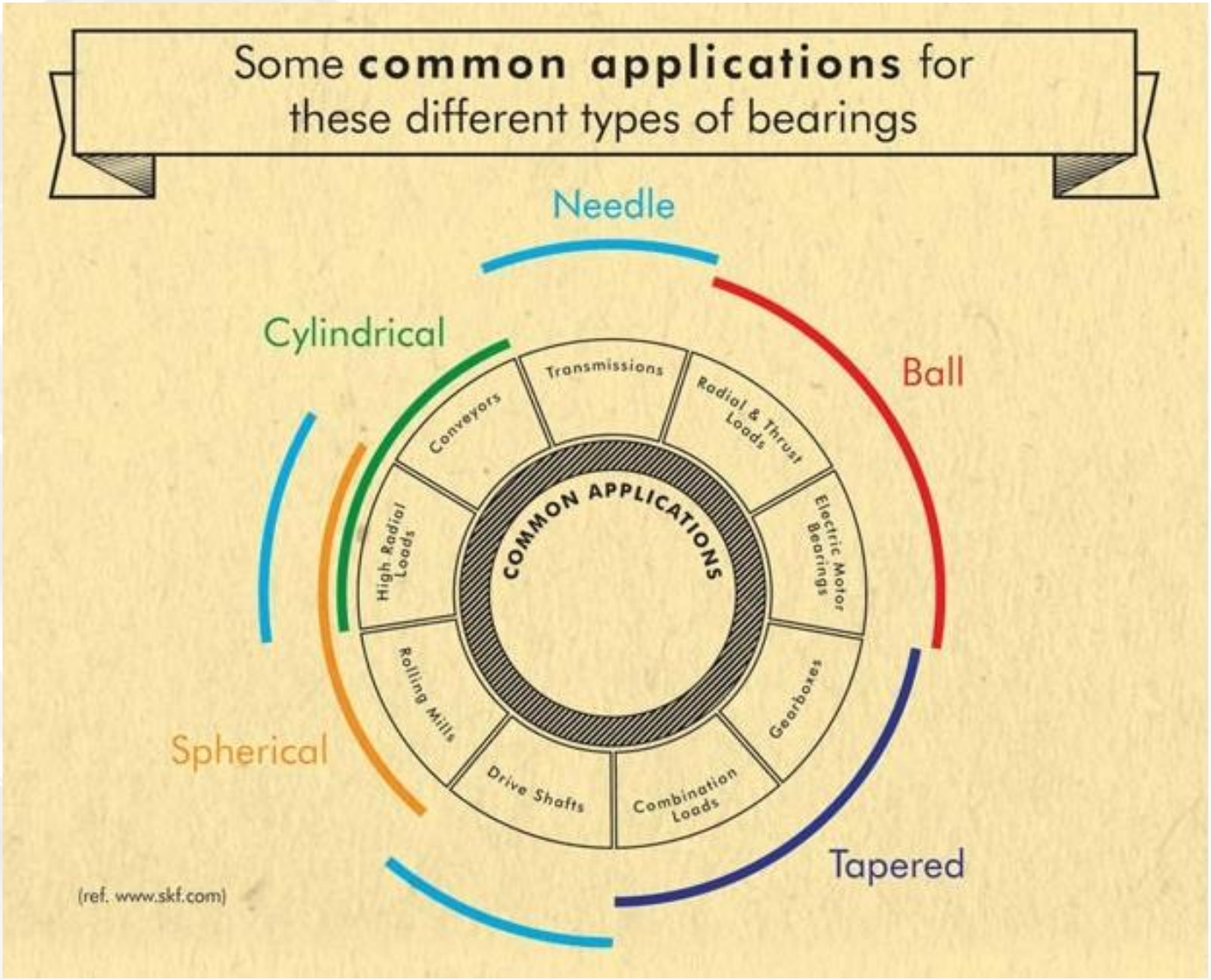
	Aluminum Complex	Barium Complex	Calcium Stearate	Calcium 12-Hydroxy	Calcium Complex	Calcium Sulfonate Complex	Clay (Non-Soap)	Lithium Stearate	Lithium 12-Hydroxy	Lithium Complex	Polyurea (Conventional)	Polyurea Shear (Stable)
Aluminum Complex	-	I	I	C	I	B	I	I	I	C	I	C
Barium Complex	I	-	I	C	I	C	I	I	I	I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

Relative Compatibility Rating

B = Borderline C = Compatible I = Incompatible

Note: This chart is a general guide to compatibility. Specific properties of greases can dictate compatibility. Testing should be done to determine if greases are compatible.

17. GREASE APPLICATIONS OF BEARINGS



17. GREASE APPLICATIONS OF BEARINGS

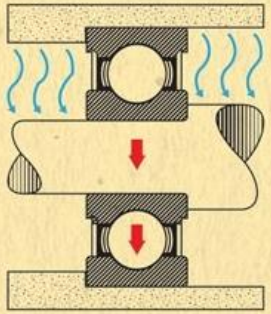
Remember, bearing type affects **grease life**.

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**.



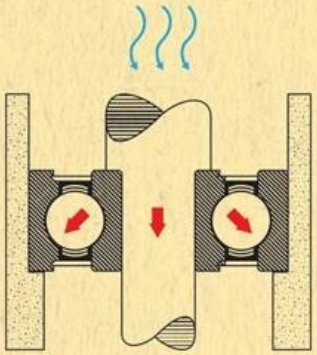
RADIAL LOAD

When the load is perpendicular to the shaft due to

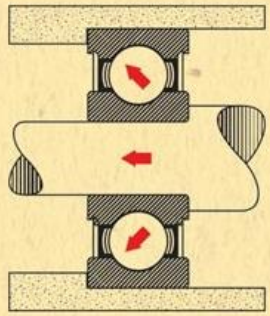
GRAVITY

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)

17. GREASE APPLICATIONS OF BEARINGS

HOW TO CHOOSE THE RIGHT GREASE?

A common OEM grease specification might be to use an NLGI No. 2 lithium grease of good quality. Using this information alone, one could select the right consistency and thickener type. Other considerations include thickener concentration, consistency, dropping point and operating temperature range, worked stability, oxidation stability, wear resistance, etc.

Base Oil Viscosity

A common mistake when selecting a grease is to confuse the grease consistency with the base oil viscosity. Because the majority of grease-lubricated applications are element bearings, one should consider viscosity selection for those applications. While most would not use an EP 220 gear oil for an oil-lubricated electric motor bearing, many people will use a grease containing that same oil for an identical grease-lubricated bearing. To determine minimum and optimum viscosity requirements for element bearings, one may use speed factors, commonly denoted as DN or NDm. Speed factors account for the surface speed of the bearing elements and are determined by the following formulas:

DN = (rpm) X (bearing bore)

NDm = rpm X ((bearing bore + outside diameter) / 2)

The NDm value uses pitch diameter rather than bore diameter because not all bearings of a given bore have the same element diameter, and thus have different surface speeds. Knowing the speed factor value and likely operating temperature, the minimum viscosity requirement can be read directly from charts like Figure 1.

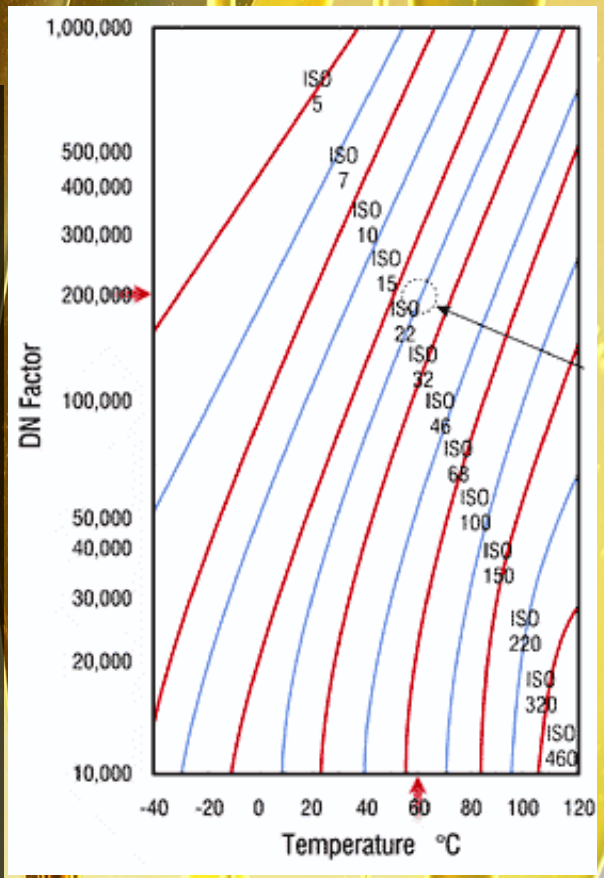


Figure 1

17. GREASE APPLICATIONS OF BEARINGS

HOW TO CHOOSE THE RIGHT GREASE?

Figure 1 assumes the base oils' viscosity index. To be more precise, one would need to use a chart that identifies the viscosity at operating temperature, then determine the viscosity grade from a viscosity / temperature chart for a given lubricant.

Additives and Base Oil Type

Figure 2 shows some common additive requirements by application. Most greases are formulated using API Group I and II mineral oil base stocks, which are appropriate for most applications. However, there are applications that might benefit from the use of a synthetic base oil. Such applications include high or low operating temperatures, a wide ambient temperature range, or any application where extended re-lubrication intervals are desired.

Additive	Journal Bearings	Ball Bearings	Thrust Bearings	Roller Bearings	Needle Bearings
Antioxidants	•	•	•	•	•
Antifoam Agents	•	•	•	•	•
Antiwear/EP		•	•	•	•
Rust Inhibitors	•	•	•	•	-
Extreme Pressure			-	-	
Demulsibility	•	•	•	•	-
VI Improvers	-	-	-	-	•
Corrosion Inhibitors	•	•	•	•	•
• Required, - Depends on application					

Figure 2

17. GREASE APPLICATIONS OF BEARINGS

HOW TO CHOOSE THE RIGHT GREASE?

Grease Consistency and Thickener Type

The NLGI has established a scale to indicate grease consistency which ranges from grades 000 (semifluid) to 6 (block grease). The most common NLGI grade is two and is recommended for most applications.

For bearings, speed factor and operating temperature can be used to determine the best consistency or NLGI grade for a given application. It may seem counterintuitive, but higher speed factors require higher consistency greases. Table 1 provides a general guide to selecting NLGI grade based on speed factor and operating temperature.

Numerous types of grease thickeners are currently in use, the most common types are simple lithium soaps, lithium complex and polyurea. Simple lithium soaps are often used in general-purpose greases and perform relatively well in most performance categories at moderate temperatures. Complex greases such as lithium complex provide improved performance particularly at higher operating temperatures. A common upper operating temperature limit for a simple lithium grease might be 250˚F, while that for a lithium complex grease might be 350˚F. Another thickener type that is becoming more popular is polyurea. Like lithium complex, polyurea has good high-temperature performance as well as high oxidation stability and bleed resistance. Thickener type should be selected based on performance requirements as well as compatibility when considering changing product types.

Operating Temperature	DN (Speed Factor)	NLGI No.*
-30 to 100°F	0 - 75,000 75,00 - 150,000 150,000 - 300,000	1 2 2
0 to 150°F	0 - 75,000 75,00 - 150,000 150,000 - 300,000	2 2 3
100 to 275°F	0 - 75,000 75,00 - 150,000 150,000 - 300,000	2 3 3

***Depends on other factors as well, including bearing type, thickener type, base oil viscosity and base oil type**

17. GREASE APPLICATIONS OF BEARINGS

HOW TO CHOOSE THE RIGHT GREASE?

Performance Properties

If an application operates continuously at room temperature, properties like dropping and upper operating temperature limits are not as important. If an application operates under heavy loads at low speeds, load carrying tests such as four-ball EP or Timken OK load should be considered. It is also important to review these specifications on a periodic basis to guard against specification creep. While improving a lubrication program can be a tough job, lubricant specification is relatively easy. Armed with a little bit of knowledge and a few widely available tools, it is possible to rest easier knowing that the right grease is being used.

With Steel Shield ABF Technology, the performance in stability, lubricity and interval of grease can be enhanced and improved to a much higher level.

18. HOW LITHI SHIELD DEFEAT MOBIL

STEEL SHIELD vs MOBILE LUBRICANTS

01. Advantages of Steel Shield LUBRICANTS?

WHY SHOULD WE SWITCH FROM MOBIL TO STEEL SHIELD?

Properties	Standard	Unit	Mobilgrease XHP 222	Lithi Shield
NLGI Grade			2	2
Thickener Type			Li-Complex	Li-Complex
4-Ball Weld Load	ASTM D2596	kg	315	800
Timken OK Load	ASTM D2509	lb	40	60

Results:

The 4-Ball Weld Load and Timken OK Load of Lithi Shield are 2.5 Times and 1.5 Times Higher Than Mobilgrease XHP222 Respectively.

When Lithi Shield is Used, The Following Results Can Be Expected:

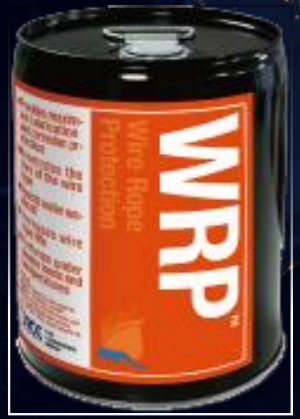
- Greatly Extended Machine Life
- Dramatically Reductions in Maintenance Costs & Machine Downtimes
- Reliability and Safety of Mechanical System Increase

Mobilgrease XHP 222 Reference: http://www.exxonmobil.com/marinelubes-en/products_auxiliary-machinery_greases_mobilgrease-xhp-222.aspx#

19. ADDITIONAL USA PRODUCTS FOR NP360

Q2 Rust Converter

WRP - Wire Rope Protection



100% Made in USA

20. Q2 RUST CONVERTER

Click to see demo video

Before After Q2 RUST CONVERTER

MSDS INFORMATION

- Vinyl Acrylic Resin (Non-Hazardous): <40%
- Skin contact: Prolonged contact can cause mild irritation and form dark colored stains
- Ingestion: Gastrointestinal irritant, nausea, diarrhea
- Eye contact: Severe Irritant
- Extinguishing Media: C02, Dry chemical, Foam
- Proprietary Mixed Acids (Non-Hazardous): <5%
- Inhalation: ASTM D-1475-90-8.63 lbs
  ASTM D-2369-90-63.30%
  ASTM D-3792-91-61.501%
  Volatile Organic Compound (VOC) 0.115 lbs./gal
- Special Fire Fighting Procedures: Use of respirator or self-contained breathing apparatus recommended

Physical Data

- Milky white color
- Physical state @ 77˚F: liquid
- pH, 5% solution in 3:1 IPA/water: 0.5
- pH Value：1.6
- Flash Point: 210˚F
- Density@77˚F, lb/gal：9.05
- Boiling point: 212˚F
- Bland odor
- Active content: 59%
- Pour point: 0˚F
- Specific Gravity @77˚F: 1.086
- Solubility: Soluble in water
- Evaporation rate: <1
- Specific Gravity (H20=1): 1.1

Applications

- Agricultural Equipment
- Aircraft
- Automobile Restoration
- Bar-B-Que Pits
- Bath Tubs
- Bicycles
- Boats
- Electrical Terminals
- Fleet Equipment
- Lawn Furniture
- Maritime Equipment
- Military Equipment
- Motorcycles
- Motor Homes
- Port and Harbor Equipment
- Snow Mobiles
- Tractors
- Trailers
- Trucks
- Yard Equipment

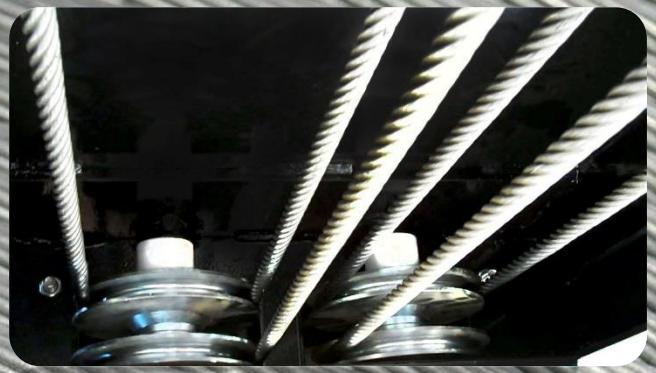
Q2 surface conditioner and primer converts rust into a protective polymeric coating. This is a necessary product to be used anywhere rust has appeared or is a problem. Q2 converts iron oxide to a black Ferro-organic coating that incorporates the rust as part of the coating. Apply with brush, roller or spray. For extremely bad rust or rust in cracks or crevasse, two coats may be needed to assure the complete conversion. A top coat will be needed where surface is dry and tack free. Apply an appropriate primer if your top coat is a latex based product to prevent bleed through. Q2 is not corrosive to human tissue and is very safe to use. Remove all rust scale or heavy rust before applications.

Application Procedure

1. Prepare: Remove flaking paint and scaly rust with brush or sand paper. It is not necessary to remove or pre-treat normal rusty areas.
2. Apply: May be applied by brush, roller, spray or by dipping rusty object in bath. Apply generously to rusted area and allow to dry. Rusty areas will turn black in 15 to 20 minutes. Re-apply, if necessary, to achieve a uniform, glossy finish.
3. Paint: Coating can serve as a primer or undercoating for paint . Suitable paint may be applied to surface in 4-6 hours.

21. WRP - WIRE ROPE PROTECTION

WRP - WIRE ROPE PROTECTION



MSDS INFORMATION

- Contains extreme pressure Calcium complex additives
- Contains NO solid lubricants such as PTFE, Silicon, Graphite, Molybdenum

Physical Data

- Increases wire rope life
- Provides maximum lubrication & corrosion protection
- The formation of non-tacky surface that resist dirt and abrasives
- Resists water wash out
- Rapid displacement of moisture
- Penetrates to the core of wire rope
- Performs under severe loads & in extreme temperatures
- Reduces wear caused by friction & corrosion
- Wet film lubricant

Applications

- Chain used in heavy industry
- Steel cable
- Wire rope
- Drive chain
- Dragline
- Linkage
- Open roller bearing

Application Procedure

- Apply WRP liberally by brushing or spraying until the surface of wire rope has a wet look
- WRP can be used at room temperature
- The guideline of usage amount is one 5 gallon pail can per 100m of ø30mm
- Let WRP penetrate to core of the rope before usage
- Apply outer grease coating if wire rope usage requires it

WRP - WIRE ROPE PROTECTION is designed for inner core lubrication of marine, mining and construction applications of all sizes of wire ropes. Its properties contain wetting agents, extreme corrosion inhibitors and EP properties. WRP has wetting properties that allow it to penetrate to the inner core of the rope and lubricate, while the grease allows the EP properties to reduce wear and friction of the strands to reduce wear and replacement intervals. The solvent evaporates, leaving behind a film of heavy-bodied lubricant that protects and lubricates each strand and resists leakage from the wire rope core.

WRP is suitable for any ropeway applications.

22. RECOMMENDED PRODUCTS FOR NP360 (CONTINUED)

Lithi Shield

Reel Shield Grease

Steel Shield EPA

Not Just Oil... IT'S TECHNOLOGY

Strike Shield

Spray Shield

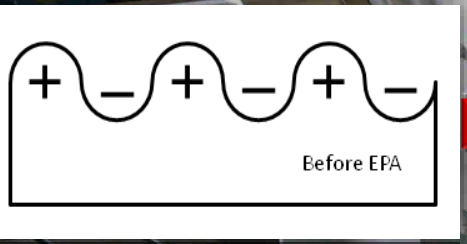
Tool Shield

100% Made in USA
100% Import from USA

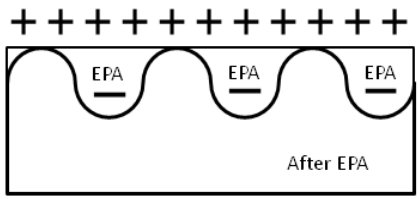
Drill & Tap Shield

23. STEEL SHIELD - EPA

Ionize metal surface → Re-harden metal surfaces & charged with positive ions → Farady's Law Like-Charge repel causing ionic levitation → Eject dirt, metallic debris, etc. → Greatly reduce friction; improve productivity

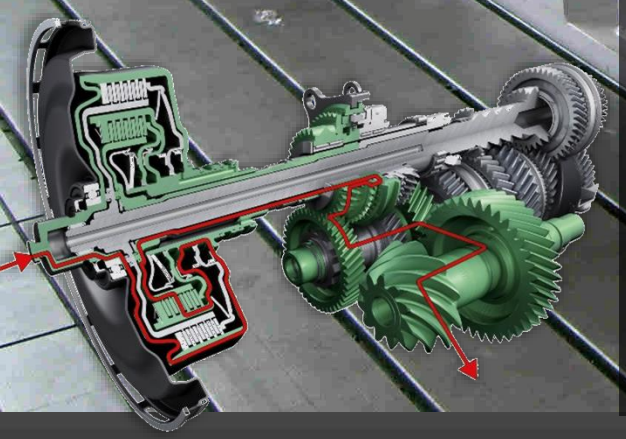


A series of sharp peaks and valleys of metal surface: Peaks are positively charged while the valleys are negatively charged



Applying EPA will effect a change of cation when the metal surface will be positively polarized:

- Surface lapping instead of chip-away endowing new hardness to the metal surface
- Ring opening, oxirane acid scavenging and corrosion inhibition
- Improved surface smoothness and rolling out of asperities



STEEL SHIELD Extreme Pressure Anti-Wear (EPA)™ is made by the latest and the most innovative technology which does not contain any solid additives. Utilizing the most Advanced Boundary Film (ABF) Technology, it protects moving metal parts from heat, friction and wear in engines, transmissions, differentials, transfer cases, hydraulic pumps and motors, gear boxes, and other enclosed lubrication systems, due to boundary conditions of frictional abrasion, extreme pressure torque, dry startup and shutdown.

Enhanced performance will greatly reduce maintenance and downtime, and effect significant energy savings through ABF Technology by lowering the operating temperatures, extending the life of component parts and increasing reliability and efficiency.

24. TOOL SHIELD

MSDS DATA

- Flash Point: 226℃
- Non-flammable
- Non-hazardous
- Synthetic Hydrocarbons

PHYSICAL DATA

- Boiling point: 238℃
- Evaporation rate: < 0.01
- Specific gravity: 1.07
- Insoluble in water
- Vapor pressure: < 1@25℃
- Medium to dark amber

RECOMMENDED USES

- Rotary-type air tools
- Piston-types air tools
- Impact wrenches
- Air ratchets
- Air sanders
- Air drills
- Air cutting tools
- Air grinders
- Air nailers
- Air staplers
- Automatic oilers
- Hand tools

APPLICATION DIRECTIONS

- Use in accordance with tool manufacturers' instructions.
- Tools may need to be lubricated daily, or several times a day, depending on the frequency and prolonged use of the tool.
- Contains NO volatiles or solvents.
- Contains synthetic hydrocarbons and advanced chemical additive technology. Non-toxic and environmentally friendly.

Greatly increase the metal surface hardness

Reduce friction, lower temperature, prevent oxidation of metal

Increase efficiencies of tools; Reduced maintenance cost

Achieve highly smooth, durable and silence operations

TOOL SHIELD™ is the ultimate protection for the moving metal parts for automotive and industrial tools. It protects moving metal parts from heat, friction & wear due to boundary conditions of frictional abrasion, extreme pressure torque, air line moisture and internal dirt. It works in all piston and rotary type air tools, stationary and hand-held power tools and many hand tools.

Increased power and performance and greatly reduced wear while removing dirt from tool are the results.

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI / HI
TS-1	8-94630-00141-0	Tool Shield – 1 oz. (29.5 mL)	24	6.875”X 3.875”X 4.625”	0.07 inch³	2.5 lb	48 / 12
TS-4	8-94630-00143-4	Tool Shield – 4 oz. (118 mL)	12	5.5”X 6.5”X 7.125”	0.16 inch³	3.8 lb	40 / 8
TS-16	8-94630-00144-1	Tool Shield – 16 oz. (473 mL)	12	10.75 X 10.75 X 8	0.54 inch³	15 lb	20 / 5
TS-128	8-94630-00145-8	Tool Shield – 1 Gallon (3.785 L)	4	9.25 X 12.5 X 14.5	0.97 inch³	34 lb	12 / 4
TS-5G	8-94630-00126-7	Tool Shield – 5 Gallon (18.93 L)	1			42 lb	
TS-15G	8-94630-00127-4	Tool Shield – 1 Gallon (56.78 L)	1			125 lb	
TS-55G	8-94630-00128-1	Tool Shield – 1 Gallon (208 L)	1			455 lb	

25. STRIKE SHIELD

MSDS DATA

- Flash point: 61℃ PMCC (Pensky –Martens closed-cup test)
- Non-hazardous
- Combustible
- Synthetic hydrocarbons
- Do not store or expose above 61℃
- Do not spray near sparks or open flames
- If swallowed, do not induce vomiting and call a physician immediately
- In case of contact with eyes, flush thoroughly with water for 15 minutes
- Avoid breathing of vapor and prolonged contact with skin
- Contains petroleum aliphatic hydrocarbons

PHYSICAL DATA

- Boiling point: 186 - 201℃
- Evaporation rate: < 0.01
- Specific gravity: 1.02
- Insoluble in water
- Vapor pressure: < 1@25℃
- Light to dark amber

RECOMMENDED USED

- Frozen or scaled nuts and bolts
- Sticky locks
- Squeaky hinges
- Sliding doors
- Linkages
- Shafts
- Bushings
- Sliding parts and mechanisms

APPLICATION DIRECTIONS

- Apply Strike Shield on surfaces that require penetrating and lubricating oil. Reapplication may be necessary on extremely rusted and corroded conditions.

STRIKE SHIELD™ is the ultimate penetrant to rapidly pierce rusted and corroded metal surfaces using a distinctive spreading action to break loose frozen mechanisms while at the same time applying an advanced lubricating film to the surfaces of the metal delivering the highest quality lubrication available in penetrating oil.

It leaves a unique layer of film on surfaces that prevents rust and corrosion along with driving out and dispersing moisture on ignition wires, electrical contacts, circuit boards and other electrical connections to provide protection against future corrosion in extremely tough conditions

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI/HI
STKS-4WS	8-94630-00104-5	Strike Shield – 4 oz. (118 mL)	12	6.625”X 7”X 5”	4 inch³	0.13 lb	56 / 7
STKS-16WS	8-94630-00105-2	Strike Shield – 16 oz. (473 mL)	12	10.125”X 10”X 7.625”	14 inch³	0.44 lb	20 / 5
STKS-128	8-94630-00109-0	Strike Shield – 1 Gallon (3.785 mL)	4	15.625”X 11.875”X 8.125”	33.5 inch³	0.17 lb	12 / 4
STKS-5G		Strike Shield – 5 Gallon (18.93 L)	1		42.5 inch³		
STKS-15G		Strike Shield – 15 Gallon (56.78 L)	1				
STKS-55G		Strike Shield – 55 Gallon (208 L)	1				

26. SPRAY SHIELD

MSDS DATA

- Flash Point: 226℃
- Non-flammable
- Non-hazardous
- Synthetic Hydrocarbons

PHYSICAL DATA

- Boiling point: 238℃
- Evaporation rate: < 0.01
- Specific gravity: 1.07
- Insoluble in water
- Vapor pressure: < 1@25℃
- Medium to dark amber

RECOMMENDED USES

- Metal mechanisms
- Metal-to-metal surfaces
- Chain drives
- Drag lines
- Bushings
- Pulleys
- Hinges
- Tools
- Sleeve bearings
- Open gears
- Steel cables
- Couplings
- Linkages
- Wheels
- Augers
- Rusty nuts & bolts
- Any automotive, industrial or commercial areas of lubrication that require an external heavy-duty spray lubricant for accessible and hard-to-reach areas

APPLICATION DIRECTIONS

- Apply Spray Shield to surfaces requiring lubrication. Reapplication may be necessary for extremely rusted or corroded situations.
- Contains NO volatiles or solvents.
- Contains synthetic hydrocarbons and advanced chemical additive technology.
- Non-toxic and environmentally friendly.

MACHINERY REBUILDING & MAINTENANCE:

SPRAY SHIELD™ is the ultimate multi-purpose lubricant that also penetrates metal surfaces while maintaining highest qualities in corrosive and extreme humidity environments. It penetrates into remote areas and delivers long-lasting lubrication in many different applications.

SPRAY SHIELD™ works quickly to provide excellent protection and long-lasting lubrication.

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI/HI
SS-1	8-94630-00146-5	Spray Shield – 1 oz. (29.5 mL)	24	6.875” X 3.875” X 4.625”	0.07 inch³	2.5 lb	48 / 12
SS-4	8-94630-00148-9	Spray Shield – 4 oz. (118 mL)	12	5.5” X 7” X 7.125”	0.16 inch³	3.8 lb	40 / 8
SS-16	8-94630-00149-6	Spray Shield – 16 oz. (473 mL)	12	10.75” X 10.75” X 8”	0.54 inch³	15 lb	20 / 5
SS-128	8-94630-00150-2	Spray Shield – 1 Gallon (3.785 L)	4	9.25” X 12.5” X 14.5”	0.97 inch³	34 lb	12 / 4
SS-5G	8-94630-00129-8	Spray Shield – 5 Gallon (18.93 L)	1			42 lb	
SS-15G	8-94630-00130-4	Spray Shield – 15 Gallon (56.78 L)	1			125 lb	
SS-55G	8-94630-00150-2	Spray Shield – 55 Gallon (208 L)	1				

27. DRILL & TAP SHIELD

MSDS DATA

- Flash Point: 226℃
- Non-flammable
- Non-hazardous
- Synthetic Hydrocarbons

PHYSICAL DATA

- Boiling point: 238℃
- Evaporation rate: < 0.01
- Specific gravity: 1.07
- Insoluble in water
- Vapor pressure: < 1@25℃
- Medium to dark amber

RECOMMENDED USES

- Direct cutting lube / coolant
- Additive to improve performance of insoluble oils
- Drilling
- Taping
- Machining
- Milling
- CNC
- Broaching
- Sharpening
- Wet grinding

APPLICATION DIRECTIONS

- Drill & Tap Shield™ can be used as a direct replacement for currently used cutting fluids and lubrication / coolants in a 100% undiluted application.
  NOTE: Drill & Tap Shield™ is not compatible with water glycol compounds or triphenol butylated phosphate oils.
- Contains NO volatiles or solvents.
- Contains synthetic hydrocarbons and advanced chemical additive technology. Non-toxic and environmentally friendly.

MACHINERY REBUILDING & MAINTENANCE:

DRILL & TAP SHIELD™ in Axle Grinder / Finisher – Axle-End Thread Tapping:

When used as the lubricant / coolant for axle grinding and finishing machines, DRILL & TAP SHIELD will provide improved final finishes of the axles to well within specified tolerances, which in some cases, were unachievable otherwise.

ITEM NO.	ITEM UPC#	ITEM DESCRIPTIONS	CASE PACK	CASE DIMENSIONS (W x H x D)	CASE CUBE	CASE WEIGHT	TI/HI
DTS-1	8-94630-00171-7	Drill & Tap Shield – 1 oz. (29.5 mL)	24	6.875”X 3.875”X 4.625”	0.07 inch³	2.5 lb	48 / 12
DTS-4	8-94630-00172-4	Drill & Tap Shield – 4 oz. (118 mL)	12	5.5”X 7”X 7.125”	0.16 inch³	3.8 lb	40 / 8
DTS-16	8-94630-00173-1	Drill & Tap Shield – 16 oz. (473 mL)	12	10.75”X 10.75”X 8”	0.54 inch³	15 lb	20 / 5
DTS-128	8-94630-00174-8	Drill & Tap Shield – 1 Gallon (3.785 L)	4	9.25”X 12.5”X 14.5”	0.97 inch³	34 lb	12 / 4
DTS-5G	8-94630-00175-5	Drill & Tap Shield – 5 Gallon (18.93 L)	1			42 lb	
DTS-15G	8-94630-00176-2	Drill & Tap Shield – 15 Gallon (56.78 L)	1			125 lb	
DTS-55G	8-94630-00177-9	Drill & Tap Shield – 55 Gallon (208 L)	1				

28. STEEL SHIELD PRODUCT COMPATIBILITY

▶In order to help you further understand and determine compatibility issues, we are publishing this three-part test to assist you in determining if oils or fluids are compatible with Steel Shield EPA (SST EPA) and other Steel Shield (SST) products while in the field. Doing these three steps can identify a compatibility issue within 95% accuracy.

▶First: Examine the material safety data sheet for the oil to which the SST EPA is to be added. Look for key words in Section 2, Hazardous Ingredients/Identity Information, which may indicate either product compatibility or incompatibility. Standard petroleum oils are usually referred to as “severely hydrotreated naphthenes” or “paraffinic base stocks”. Other key words are “contains mineral oil” or “synthetic hydrocarbons”. All of these oils have the characteristics of petroleum oil and are compatible with SST products.

▶Key words such as “alky-(compound), alkynol, glycol, alkanolamine, esters, mono esters, polyol or amines” are direct indications of additives and base fluids that are NOT compatible with SST products. For these chemicals, we will provide special SST products that is compatible but only upon request.

▶Second: A good test for compatibility is to mix equal amounts of the base oil in question and SST products. After both are thoroughly blended, allow the mixture to stand for 10 to 15 minutes. If no separation occurs, the likelihood of compatibility is very good. An occurrence of a radical separation indicates the oils are incompatible, and do not mix properly because of chemical differences.

▶Third: After the test above is completed to your satisfaction, the final phase is to perform a lubricity test. Run the base oil in question first to determine its lubricity and load carrying characteristics. Then, mix a proper ratio of SST product with the base oil and run the mixture on the Falex machine. Note the result. If a full-scale reading can be achieved without grinding or damaging the bearing, then you can safely assume the oil and SST product are compatible. However, if only a slight to moderate increase in lubricity can be achieved over the base oil by itself, it must be assumed that there is something present that is inhibiting the formation of the boundary film, which would indicate the base oil and SST product are NOT compatible.

▶When these steps are followed, compatibility issues can be solved in nearly every situation. However, if you have followed through with these steps and still are not able to make a definite decision on compatibility, please do not hesitate to contact our Technical Department to research and verify compatibility issues.

29. **STEEL SHIELD EPA COMPATIBILITY**

Item	Base Oil	Compatible with SST-EPA ?	SST Product to Use
1	Petroleum, Mineral Oil	• Yes	• SST-EPA
2	SHC (Synthetic Hydrocarbon) A. Alkylated Aromatics B. Olefin Oligomers e.g. Amsoil, Mobil 1, Castrol Syntec	• Yes	• SST-EPA
3	Halogenated Hydrocarbons A. Chlorotrifluoroethylene, Polytetrafluoroethylene, (PTFE). e.g. Insoluble cutting oil, radiation resistant oil, some heavy duty gear oil, load carrying oils.	• Yes	• SST-EPA
4	Glycol Synthetic Esters A. Alkanolamines B. Polyol Glycols e.g. Fire proof hydraulic fluids, cutting fluids, R-134A Refrigerant Oils, etc.	• No	• On Request
5	Organic Ester Synthetics A. VME - Vegetable Methyl Ester e.g. Some food grade oils, specialty biodegradable oils	• No	• On Request
6	Phosphate Esters A. Triphenol Butylated Phosphate B. Trisecyl Phosphate C. Tricresyl Phosphate e.g.Turbine Oils	• No	• On Request
7	Silicone Oils A. Methyl Silicone B. Phenyl Methyl Silicone C. Silicate Ester/Disiloxane	• No	• None
8	Synthetic Ether A. Polyphenyl Ether B. Chlorinated Diphenyl Ether C. Perfluorinated polyether	• No	• On Request

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.**

30. MADE IN SINGAPORE LUBRICANTS FOR NP360

SST ECI HD-AP ATF DIII Auto-Transmission Fluid

SST ECI HD-AP EP-GL-5 Auto-Gear Oil

SST ECI HD-AP PTF Transmission Fluid

SST ECI POWER-AP PAG Gear Oil

SST ECI T-GEAR AP EP Gear Oil

SST ECI T-SHC AP EP Gear Oil

SST ECI HD-AP Hydraulic Oil

SST ECI TV T-Power Hydraulic Oil

SST ECI AP COMPRESSO Air-Compressor Oil

Not Just Oil... IT'S TECHNOLOGY

Made in Singapore

100% USA Additives

31. SST ECI HD-AP ATF DIII Auto-Transmission Fluid

Ultra Quality Lubricants For Heavy Gearing Systems

Physical Data

Properties	Standard	Unit	Data
SAE Grade			DIII
Kinematic Viscosity @ 40℃	ASTM D445	cSt	34
Kinematic Viscosity @ 100℃	ASTM D445	cSt	7.6
Viscosity Index	ASTM D2270		176
Flash Point (COC)	ASTM D92	℃	170
Pour Point	ASTM D97	℃	-35

Benefits

- High shear stability
- Excellent low temperature performance
- Excellent modifying friction
- Superior thermal and oxidation stability
- Reduce deposit and maintain system cleanliness
- Good protection against corrosion and wear
- Eliminate spitfire effects to maintain the integrity of the gear components

Available Container Volumes

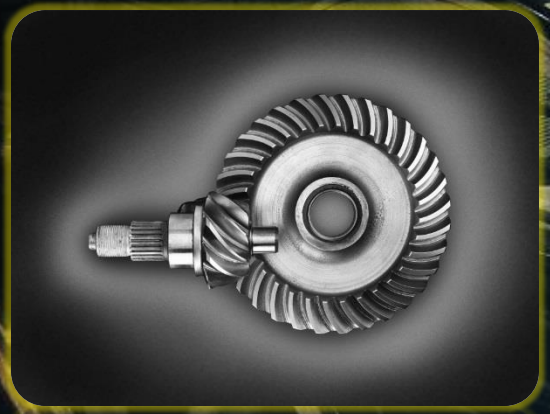
- 20L, 200L, 1000L

SST-ECI HD-AP ATF DIII is a state-of-the-art automatic transmission fluid made with the unique ABF technology especially for modern automatic gearboxes. The oil is blended with highly refined base oils and select additives to enhance oxidation stability, anti-friction, anti-wear and low temperature properties and low temperature fluidity. The oil meets and complies with the requirements of GM DEXRON IID, IIIG, IIIH, Ford MERCON, Caterpillar TO-2, Allison C-4.

SST-ECI HD-AP ATF DIII, heavy duty oil recommended for use in modern passenger cars and light trucks where Dexron III is required. It can also be used as hydraulic fluid in many automatic systems and Vickers pumps.

32. SST ECI HD-AP EP-GL-5 Auto-Gear Oil

Ultra Quality Lubricants For Heavy Gearing Systems



Physical Data

Properties	Standard	Unit	Data			
SAE Grade			90	140	80W90	85W140
Kinematic Viscosity @ 40℃	ASTM D445	cSt	197	450	156	425
Kinematic Viscosity @ 100℃	ASTM D445	cSt	18	30	15.4	30
Viscosity Index	ASTM D2270		96	95	100	97
Flash Point (COC)	ASTM D92	℃	212	222	205	222
Pour Point	ASTM D97	℃	-10	-9	-27	-18

Benefits

- Extending gear life
- Good oxidative and thermal stability
- Excellent rust and corrosion inhibition
- Exceptional load-carrying capability
- Outstanding protection against wear and shock
- Eliminate spitfire effects to maintain the integrity of the gear components

Available Container Volumes

- 20L, 200L, 1000L

SST-ECI HD-AP EP-GL-5 are premium grade automotive gear oils enhanced with unique ABF technology to out-perform any aftermarket products in extreme-pressure, anti-corrosion, anti-oxidation, de-mulsification and anti-foam properties. These oils are environmental friendly containing no lead, and meet the performance requirements of API GL-5, MIL-L-2105D, ZF TE-ML 05A, 7A, 12E, 16B, 16C, 16D, 17B, 19B, 21A and MAN 342 Type 2.

SST-ECI HD-AP EP-GL-5 are suitable for automotive hypoid gears, spiral bevel axles, steering boxes, heavy duty axles with final drive and other gears under severe operating conditions.

33. SST ECI HD-AP PTF Transmission Fluid

Ultra Quality Lubricants For Heavy Gearing Systems

Physical Data

Properties	Standard	Unit	Data				
SAE Grade			10W	30	40	50	60
Kinematic Viscosity @ 40℃	ASTM D445	cSt	42	97	141	228	318
Kinematic Viscosity @ 100℃	ASTM D445	cSt	6.5	11.3	14.7	19.2	24
Viscosity Index	ASTM D2270		105	98	97	95	95
Flash Point (COC)	ASTM D92	℃	205	210	215	225	230
Pour Point	ASTM D97	℃	-30	-25	-25	-9	-9

Benefits

- Reduced brake noise
- Excellent friction control
- Superior thermal and oxidation stability
- Good elastomer compatibility
- Prolong the life of brakes and transmissions
- Superior gear wear protection
- Eliminate spitfire effects to maintain the integrity of the system components

Available Container Volumes

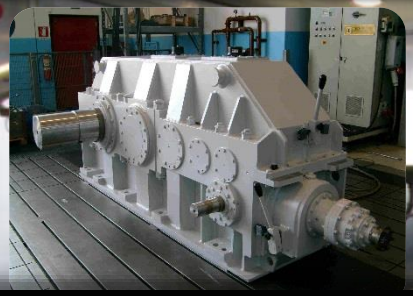
- 20L, 200L, 1000L

SST-ECI HD-AP PTF, a premium power transmission fluid designed for transmission and Drive Train Oil. The oil enhanced with ABF Technology possesses outstanding anti-wear, anti-rust and anti-oxidation properties, exhibits excellent friction control, less brake noise, good elastomeric compatibility. SST-ECI HD-AP PTF meets and complies with specification requirements of Caterpillar TO-4, Caterpillar TO-4M, Allison C-4, Komatsu 07.868.1, ZF TE-ML 01, 03C and API CF, CF-2, etc.

SST-ECI HD-AP PTF is recommended for use in modern Caterpillar transmissions, final drive, oil immersed brake and hydraulic systems fitted to heavy-duty off-road equipment. It can also be used as hydraulic fluid in some automatic systems and Vickers pumps.

34. SST ECI POWER-AP PAG Gear Oil

Ultra Quality Lubricants For Heavy Gearing Systems



Physical Data

Properties	Standard	Unit	Data			
ISO Grade			150	220	320	460
Kinematic Viscosity @ 40℃	ASTM D445	cSt	150	220	320	460
Kinematic Viscosity @ 100℃	ASTM D445	cSt	23	34	51	72
Viscosity Index	ASTM D2270		185	202	220	230
Flash Point (COC)	ASTM D92	℃	225	225	225	230
Pour Point	ASTM D97	℃	-30	-30	-30	-27
FZG Fail Loading Stage	DIN 51354-2		12+	12+	12+	12+

Benefits

- Improves efficiency
- Reduce downtime 200+%
- Extended oil drain interval
- Long term hydrolytic stability
- Low coefficients of friction and traction
- Good compatibility with seal materials
- Reduced foam forming tendency
- Excellent chemical and thermal stability
- Good filterability and air release property
- Reduce deposit and maintain system cleanliness
- Superior anti-oxidation and anti-rust properties
- Extends the life of system parts up to 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to system condition)

Available Container Volumes

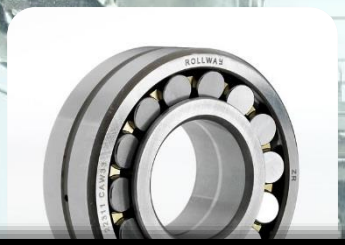
- 20L, 200L, 1000L

SST ECI POWER-AP PAG GEAR Oils are high performance synthetic gear oils blended with polyglycols and special additives. The oils of natural extremely high viscosity index, and low pour point possess excellent high and low temperature performance and long term hydrolytic stability, exhibit superior anti-oxidation, anti-wear, and anti-corrosion properties. Enhanced with Steel Shield ABF Technology of low coefficient of friction reduces power consumption and operation temperatures effectively. It outperforms any of the aftermarket gear oils.

SST ECI POWER-AP PAG GEAR Oils are recommended for worm reduction gear boxes under high temperature, high loads and wet working conditions. The oils are incompatible with most mineral and synthetic oils.

35. SST ECI T-GEAR AP EP Gear Oil

Ultra Quality Lubricants For Heavy Gearing Systems



Physical Data

Properties	Standard	Unit	Data						
SAE Grade			150	220	320	460	680	1000	1500
Kinematic Viscosity @ 40℃	ASTM D445	cSt	150	220	320	460	680	1000	1500
Kinematic Viscosity @ 100℃	ASTM D445	cSt	14.8	19	24	30	38	44	61.2
Viscosity Index	ASTM D2270		95	95	95	95	90	90	90
Flash Point (COC)	ASTM D92	℃	240	245	247	250	250	252	255
Pour Point	ASTM D97	℃	-10	-9	-9	-9	-6	-3	-3
Copper Corrosion	ASTM D130		1B	1B	1B	1B	1B	1B	1B

Benefits

- Extended oil drain interval
- Prolongs gear equipment life
- Reduce downtime 200% and more
- Superior load-carrying EP capability
- Reduce noise 3db~9db (conditional to system condition)
- Good thermal and oxidation stability
- Excellent anti-rust and anti-corrosion properties
- Outstanding protection against wear and shock
- Reduce deposit and maintain system cleanliness
- Improves efficiency in terms of usable output energy
- Extends the life of engine parts up to 300% (conditional to the physical status)

Available Container Volumes

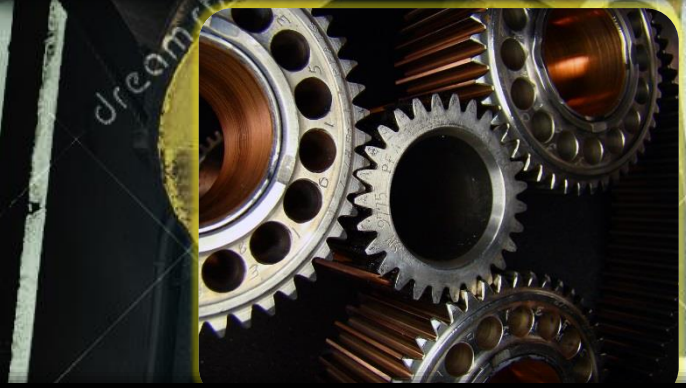
- 20L, 200L, 1000L

SST ECI T-GEAR AP EP are premium extreme pressure industrial gear oils containing anti-oxidation, anti-corrosion, anti-wear and anti-foam inhibitors. These oils meet the performance requirements of 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.

SST ECI T-GEAR AP EP are recommended for all types of industrial gear both enclosed and open. Also suitable for lubrication of systems containing worm gears, bearings, sliding parts, etc.

36. SST ECI T-SHC AP EP Gear Oil

Ultra Quality Lubricants For Heavy Gearing Systems



Physical Data

Properties	Standard	Unit	Data	
SAE Grade			75W90	75W140
Kinematic Viscosity @ 40℃	ASTM D445	cSt	110	193
Kinematic Viscosity @ 100℃	ASTM D445	cSt	15.5	26.3
Viscosity Index	ASTM D2270		154	171
Flash Point (COC)	ASTM D92	℃	200	200
Pour Point	ASTM D97	℃	-57	-36

Benefits

- Excellent shear stability
- Outstanding protection against wear and shock
- Reduce downtime 200% and more
- Anti-weld superior load-carrying EP capability
- Excellent anti-rust and anti-corrosion properties
- Extended oil drain interval
- Reduce deposit and maintain system cleanliness
- Prolongs gear equipment life up to 300% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to system condition)
- Outstanding good thermal and oxidation stability at high temperature
- Improves efficiency in terms of usable output energy and fuel economy

Available Container Volumes

- 20L, 200L, 1000L

SST ECI T-SHC AP EP Gear Oils are all season high performance synthetic extreme pressure industrial gear oils fortified with sulphur-phosphorous and ash-less dispersant additives and with ABF Technology to enhance anti-oxidation, anti-corrosion, de-mulsification, anti-wear and anti-foam properties. These oils meet the performance requirements of 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.

SST ECI T-SHC AP EP are recommended for all types of industrial gear both enclosed and open as well as automotive hypoid gear in manual transmissions, rear axles, differentials, transfer cases, overdrive units, oil lubricated wheel bearings, oil lubricated universal joints, steering gear boxes, etc., particularly under low temperatures and critically severe conditions.

37. SST ECI HD-AP Hydraulic Oil

Excellent Anti-Wear Abilities & Reduce Maintenance Costs

Physical Data

Properties	Standard	Unit	Data				
ISO Grade			32	46	68	100	150
Kinematic Viscosity @ 40℃	ASTM D445	cSt	30	45	67	98	145
Kinematic Viscosity @ 100℃	ASTM D445	cSt	5.3	6.7	8.6	10.9	14.5
Viscosity Index	ASTM D2270		99	99	98	97	96
Flash Point (COC)	ASTM D92	℃	212	220	228	245	250
Pour Point	ASTM D97	℃	-12	-12	-10	-10	-10

Benefits

- Good filterability
- Excellent protection against wear, rust and corrosion
- Good oxidation stability
- Improves efficiency in terms of smoothness
- Reduce downtime 300% and more
- Extends the life of hydraulic components upto 400% (conditional to the physical status)
- General purpose economy oils

Available Container Volumes

- 20L, 200L, 1000L

SST ECI HD AP Hydraulic Oil is a Heavy Duty general purpose anti-wear hydraulic oils formulated with enhanced ABF technology. The oils possess good anti-wear, anti-corrosion and anti-oxidation properties and meet Park Denison HF-0, HF-2 and DIN 51524 Part I, II specifications.

SST ECI HD AP Hydraulic Oil is recommended for use in most of the hydraulic systems, particularly for older machines that oil change is more often. They are not suitable for use in systems with silver plated components.

38. SST ECI TV T-Power Hydraulic Oil

Excellent Anti-Wear Abilities & Reduce Maintenance Costs

SST ECI TV T-Power Hydraulic Oil is a premium quality anti-wear hydraulic oils intended for industrial and mobile service application where anti-wear lubricants are required. The oils are formulated with enhanced ABF technology and high quality base oils that results in products that provides many features to improve and prolong equipment life.

APPLICATIONS:

- Most of the hydraulic systems under light to moderate operation conditions, particularly for older machines that oil change is more often
- System employing gear, vane, radial and axial piston pumps where anti-wear hydraulic oils are required
- System requiring a high degree of load-carrying capability and anti-wear protection
- System containing gears and bearings where mild and anti-wear characteristics are required

Physical Data

Properties	Standard	Unit	Data			
ISO Grade			32	46	68	100
Density @ 15℃		Kg / L	0.872	0.874	0.881	0.89
Kinematic Viscosity @ 40℃	ASTM D445	cSt	30.4	46	68.5	98.5
Kinematic Viscosity @ 100℃	ASTM D445	cSt	5.23	6.75	8.7	11
Viscosity Index	ASTM D2270		100	100	99	97
Flash Point (COC)	ASTM D92	℃	219	225	230	239
Pour Point	ASTM D97	℃	-20	-20	-18	-15

Benefits

- Improves efficiency in terms of smoothness
- Improves efficiency in terms of smoothness
- Extends the life of hydraulic components upto 400% (conditional to the physical status)
- Reduce downtime 300% and more
- Excellent anti-wear performance reducing pump wear and extending pump life
- Reduction of sludge and deposit formation in close tolerance components such as servo valves
- Exceptional corrosion protection reduces the negative effects of moisture on system components
- Good oxidation stability and good filterability

Available Container Volumes

- 20L, 200L, 1000L

39. SST ECI AP COMPRESSO Air-

Excellent Anti-Wear Abilities & Reduce Maintenance Costs

Physical Data

Properties	Standard	Unit	Data				
ISO Grade			32	46	68	100	150
Kinematic Viscosity @ 40℃	ASTM D445	cSt	29	46	68	97	150
Kinematic Viscosity @ 100℃	ASTM D445	cSt	5.4	6.8	8.5	11	14.8
Viscosity Index	ASTM D2270		108	105	97	97	97
Flash Point (COC)	ASTM D92	℃	215	220	230	245	248
Pour Point	ASTM D97	℃	-15	-12	-10	-10	-9

Benefits

- Reduce noise
- Excellent demulsifibility
- Excellent chemical stability
- Resistance to sludge deposit
- Energy Saving average 5~12%
- Improve efficiency
- Extend oil change interval
- Excellent thermal stability
- Extend the life of all metal parts
- Less downtime and save maintenance cost
- Good anti-oxidation and anti-rust properties

Available Container Volumes

- 20L, 200L, 1000L

SST ECI AP COMPRESSO Air-Compressor Oils are air compressor oils blended with highly refined mineral base oils together with Steel Shield ABF advanced technology additives. The oils reduce internal friction, protect metal parts, exhibit good oxidation stability, excellent rust and corrosion protection and demulsification properties, meet the requirements of DIN 51506 VD-L

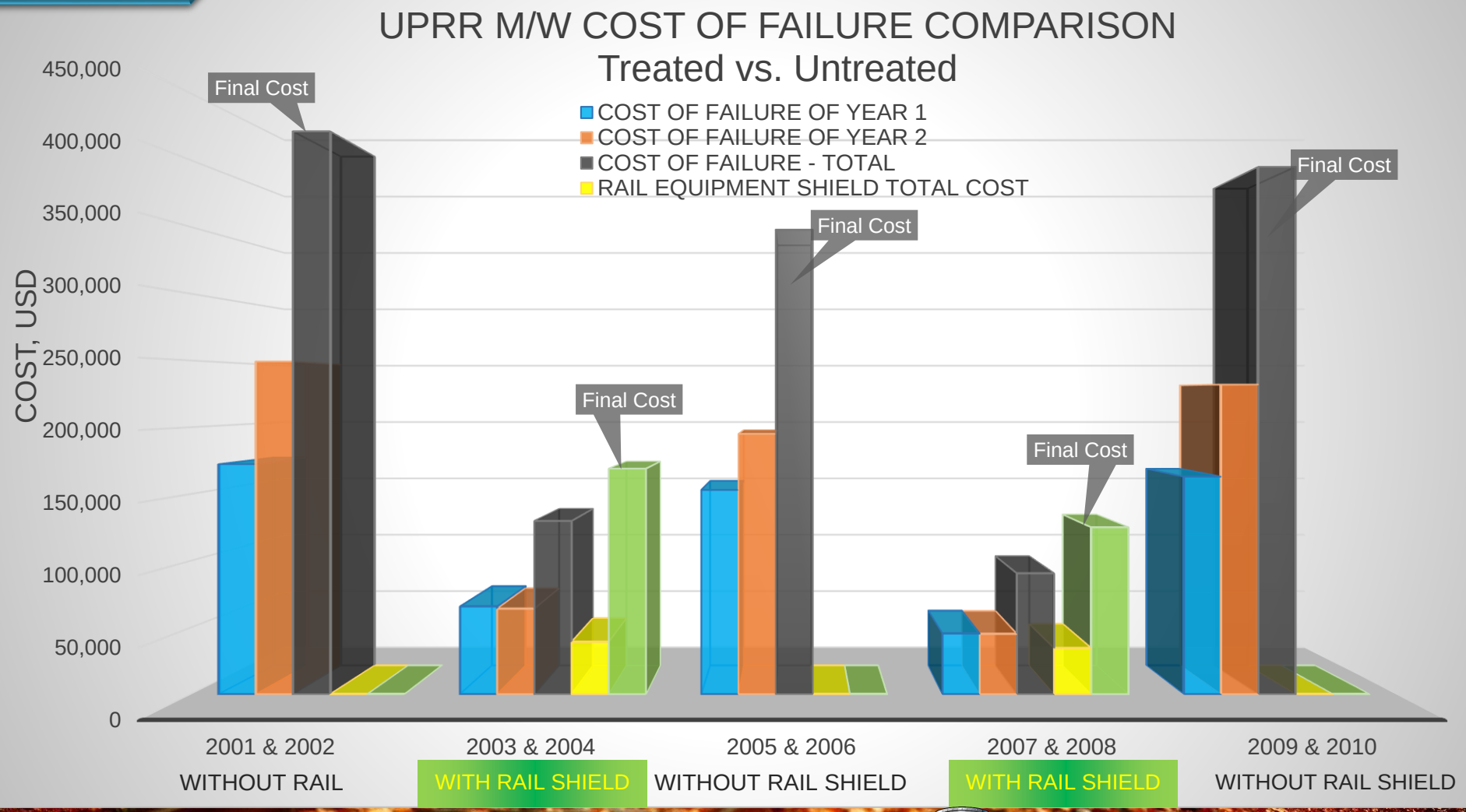
SST ECI AP COMPRESSO Air-Compressor Oils are recommended for the lubricating of rotary sliding vane, screw air compressors as well as reciprocating air compressors.

40. UNION PACIFIC RAILROAD REPOR

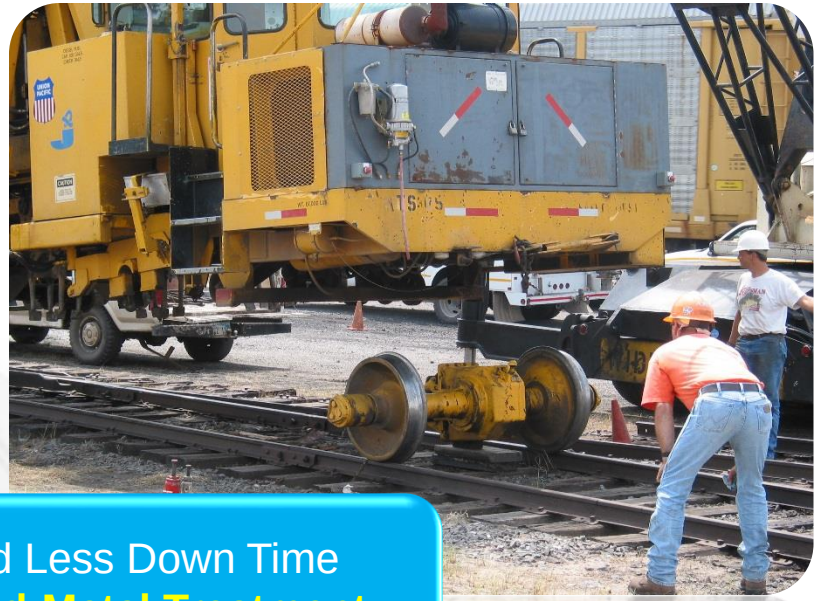
MUST READ

UPRR M/W COST OF FAILURE COMPARISON
TREATED VS UNTREATED

EXHIBIT A



40. UNION PACIFIC RAILROAD REPORTS



More Production and Less Down Time
Rail Equipment Shield-Metal Treatment
with ABF Technology is the Solution

40. UNION PACIFIC RAILROAD REPORTS

RAIL EQUIPMENT SHIELD WITH ADVANCED BOUNDARY FILM TECHNOLOGY

- Advanced methods of tribology that improve lubricity and load carrying capacity
- Reacts chemically under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection
- Surface smoothing is accomplished resulting in improved spread characteristics of the surfaces themselves
- Increases fluid film strength resulting in greatly reduced wear while imparting extreme pressure properties (EP)

BENEFITS OF USING RAIL EQUIPMENT SHIELD METAL TREATMENT

- Increases Train Velocity
- Improves On-Time Train Performance
- Extends Parts Life and Component Reliability
- Reduces Maintenance and Downtime
- Reduces Metal-To-Metal Wear
- Reduces Fuel Consumption
- Reduces Operating Temperatures
- Provides Smoother Operation
- Protects Moving Metal Parts

40. UNION PACIFIC RAILROAD REPOR

MUST READ

M/W EQUIPMENT CENTRAL REGION (POWER UNITS ONLY)

CASE STUDY 1

- Rail Equipment Shield-Metal Treatment (RES-MT) was not used in Power Units or any other M/W components in 2001 and 2002
- In January 2003 RES-MT was added to the Power Units as well as transmissions, hydraulic systems, gearboxes and differentials
- In 2004 RES-MT was used in the same capacity as 2003
- RES-MT was purchased and added to M/W equipment components even though Case Study 1 is only showing the savings for Power Units

Cost Saving Comparison of Union Pacific Railroad During 2001-2004

2001 & 2002 (Without RES-MT)		2003 & 2004 (With RES-MT)	
Cost of Failures	= $172,296 + $249,476 = $421,772 (average $210,886 per year)	Cost of Failures	= $65,722 + $64,021 = $129,742 (average $64,871 per year)
		Cost of RES-MT	= $21,195 + $18,000 = $39,195 (average $19,598 per year)
		Total Cost to Union Pacific	= $168,937 (average $84,469 per year)
		Savings to Union Pacific	= $252,835 (average $126,417 per year)
		Return on investment (ROI) with RES-MT	= $\frac{\$252,835 - \$39,195}{\$39,195}$ = 5.45 (545% Returned)

60% COST SAVED

* Return on investment: $\frac{\text{savings} - \text{cost}}{\text{cost}} = \text{ROI}$

40. UNION PACIFIC RAILROAD REPOR

MUST READ

UPRR COST SAVING ANALYSIS FROM 2005 TO 2008

CASE STUDY 2

- On January 1st of 2007 UPRR began using Rail Equipment Shield-Metal Treatment
- The following analysis is the data collected from UPRR (New Construction) 2007 and 2008 when Rail Equipment Shield-Metal Treatment was used in contrast with 2005 and 2006 when it was not

Note: All repair cost are averaged due to core damage and applications

All repairs are due to poor lubrication and excessive wear

Repair costs do not include man hours, downtime, rentals or delays

STEEL SHIELD TECHNOLOGIES

ABF TECHNOLOGY

Not Just Oil... IT'S TECHNOLOGY

COST SAVED

	Unit Repairs to	Cost Per Unit	Unit Repairs 2005		Unit Repairs 2006		Unit Repairs 2007		YTD Unit Repairs 2008	
			Units	Cost	Units	Cost	Units	Cost	Units	Cost
Total Cost of Units per Year	Engine	12,000.00	4	48,000.00	6	72,000.00	1	12,000.00	0	0
	Transmissions	11,000.00	3	33,000.00	4	44,000.00	0	0	1	24,000.00
	Differentials	1,300.00	2	2,600.00	4	5,200.00	1	1,300.00	0	0
	Hydraulic Pumps	4,000.00	10	40,000.00	8	32,000.00	4	16,000.00	5	14,000.00
	Valve Failures	935.00	3	2,800.00	3	2,800.00	0	0	2	2100
	Hydraulic Cylinders	600.00	12	7,200.00	15	9,000.00	6	3,600.00	5	3,800.00
	Hydraulic Motors	2,500.00	8	20,000.00	12	30,000.00	5	12,500.00	1	1200
	Total Cost of Repairs per Year			$153,000.00		$195,000.00		$45,400.00		$45,100.00

40. UNION PACIFIC RAILROAD REPOR

MUST READ

UPRR COST SAVING ANALYSIS FROM 2005 TO 2008

CASE STUDY 2

- UPRR started using Steel Shield Technologies Metal Treatment Jan 1, 2007
- UPRR purchased $20,394.00 of Rail Equipment Shield in 2007
- UPRR purchased $14,100.00 of Rail Equipment Shield in 2008

Year	2005	2006	2007	2008
Cost of Failures:	153,000.00	195,000.00	45,400.00	45,100.00
Cost of Rail Equipment Shield:			20,394.00	14,100.00
Total Cost:	153,000.00	195,000.00	65,794.00	59,200.00

Cost Saving Comparison of Union Pacific Railroad During 2005-2008

2005 & 2006 (Without RES-MT)		2007 & 2008 (With RES-MT)	
Cost of Failures	= $153,000 + $195,000 = $348,000 (average $174,000 per year)	Cost of Failures	= $45,400 + $45,100 = $90,500 (average $45,250 per year)
		Cost of RES-MT	= $20,394 + $14,100 = $34,494 (average $17,247 per year)
		Total Cost to Union Pacific	= $124,994 (average $62,497 per yea
		Savings to Union Pacific	= $223,006 (average $111,503 per ye
		Return on investment (ROI) with RES-MT	= $223,006 - $34,494 / $34,494 = 5

64% COST SAVED

* (Note) This savings does not include man hours, rentals, downtime costs or delays

40. UNION PACIFIC RAILROAD REPORTS

STORE STOCK ITEM NUMBERS

- 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

SUMMARY

- Rail Equipment Shield has increased train velocity, improved on-time train performance, extended parts life and component reliability and reduced maintenance and downtime by treating the metal surfaces to reduce friction, heat and wear
- After more than 8 years of use experience shows that Rail Equipment Shield has had no negative or detrimental effects
- It helps UPRR save 60~64% maintenance cost per year

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

STEEL SHIELD LARGELY OUTPERFORMS REPUTED GREASES MADE BY YAMAMOTO AND ATLAS

Report 1

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

STEEL SHIELD LITHI SHIELD

SwRI Code:	Sample ID: Sample Identification:		20003 Litho Shield	20004 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 grea tomo EP grease" Therefore, sample is co dered "outside the scope of the method".

WIN

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

SwRI Code:	Sample ID: Sample Identification:		20005 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 co scope of the method".

TEST ITEMS	Four-Ball Extreme Pressure Properties	Steel Shield Lithi Shield	Yamamoto EP Grease	Atlas Chisel Lube
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
High Pressure Loading	LNSL	80	63	50

41. 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

Report 2

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 (℃)	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 RESEA
INSTITUTE website:
www.swri.org

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

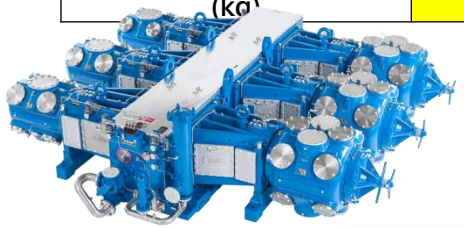
STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2783 FOUR BALLS TESTS

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

Report 2

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
Volume (Gallon)	1	1	1	1	1	1
Corrected Load (kgf)	70	109	NA	133	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

SOUTHWEST RESEA
INSTITUTE website:
www.swri.org

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2782 Timken, D2783 4-Ball & D6352 GC – Original Documents

Report 2

SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA ROAD 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

November 20th, 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 21st, 2014 and October 7th 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 13th and November 11th 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.

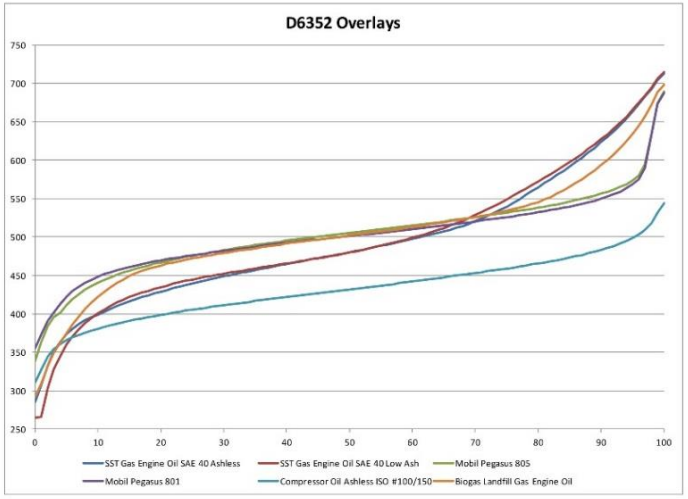
If there are any questions concerning these analyses, or if you need any additional testing on the samples, please contact me at (210) 522-2071. We appreciate the opportunity to be of service to your firm.

Sincerely,

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

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

Test Summary Report
November 20th, 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 ar 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
Page 16 of 16

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2782 Timken, D2783 4-Ball & D6352 GC – Original Documents

Report 2

Test Summary Report
November 20th, 2014
Steel Shield Technologies

SwRI Lab# 24564

SST Gas Engine Oil
5AE 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 20th, 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

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2782 Timken, D2783 4-Ball & D6352 GC – Original Documents

Report 2

Test Summary Report
November 20th, 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

Test Summary Report
November 20th, 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

41. SOUTHWEST RESEARCH INSTITUTE TEST REPORTS

STEEL SHIELD GAS ENGINE OILS AND COMPRESSOR OILS ASTM D2782 Timken, D2783 4-Ball & D6352 GC – Original Documents

Report 2

Test Summary Report
November 20th, 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 20th, 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

42. INSURANCE CERTIFICATE & CONFIRMATION OF NO INSURANCE CLAIM

ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 5/14/2014

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 (A/C, No, Ext): (724) 283-5670 FAX (A/C, No): (724) 283-1160
E-MAIL ADDRESS: jamie@bestinsurancebutler.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Cincinnati Insurance Companies	
INSURER B:	
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Steel Shield Technologies Inc
3351 Industrial Blvd /
Bethel Park PA 15102

COVERAGES CERTIFICATE NUMBER: coi 2014 - 15 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 LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC			ENP04242014	4/24/2014	4/24/2015	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $
A	X UMBRELLA LIAB OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			ENP04242014	4/24/2014	4/24/2015	EACH OCCURRENCE AGGREGATE	$ 1,000,000 $
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N N/A If yes, describe under DESCRIPTION OF OPERATIONS below						WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ $

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD

Over USD 2,000,000 Insurance

CERTIFICATE HOLDER

Steel Shield Technologies Inc.
3351 Industrial Blvd.
Bethel Park, PA 15102

CANCELLATION

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

ACORD 25 (2010/05)
INS025 (201005).01

Confidence Guarantee

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

September 18, 2013

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

To Whom It May Concern:

Please be advised that Steel Sheild 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 continously 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
Vice President

43. MAJOR CORPORATE CLIENTS

US ARMY

SIEMENS

UNION PACIFIC RAILROAD
(NEW YORK STOCK EXCHANGE NO.: UNP)

DJE 东江环保 Dongjiang Environment

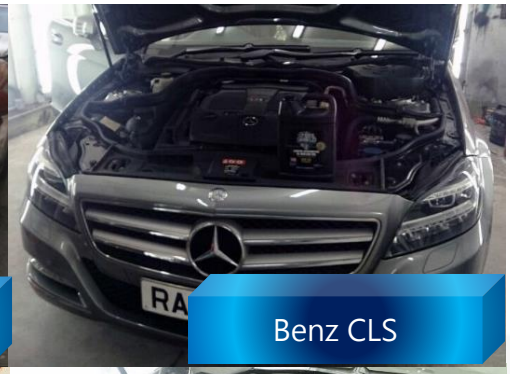
DONGJIANG ENVIRONMENT
(HONG KONG STOCK EXCHANGE NO.: 895)

44. SUPER CAR USERS

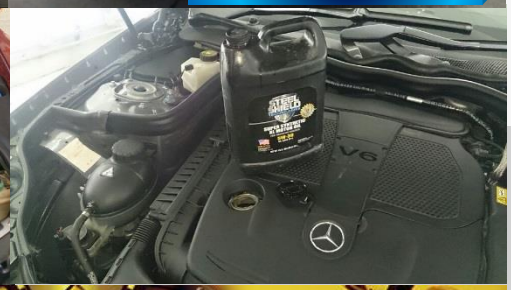
Super performance cars using Steel Shield help reducing engine noise, more power at the wheels, swift response, extends battery life and cleaner engine. These car owners were surprised to see the cars behaved just like NEW ! Cruising on the highways they gained an average 12-15% less fuel.

Maserati Quattroporte

Porsche Panamera 4S



Benz CLS



45. Compliments from the US ARMED FORCES

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

Original

Letters of Thanks and Compliments from the US Army "Weapon Shield was truly a life saver"

46. Letter from Siemens USA

SIEMENS VAI

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

SIEMENS Letter of Gratitude

Original

47. Letters from Union Pacific Railroad & PA Port Authority

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 protesting 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

The letter states that the Union Pacific Railroad uses Steel Shield product extensively. Steel Shield has been proved to be functional and cost-effective, and are highly

PORT AUTHORITY

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.

Sincerely,

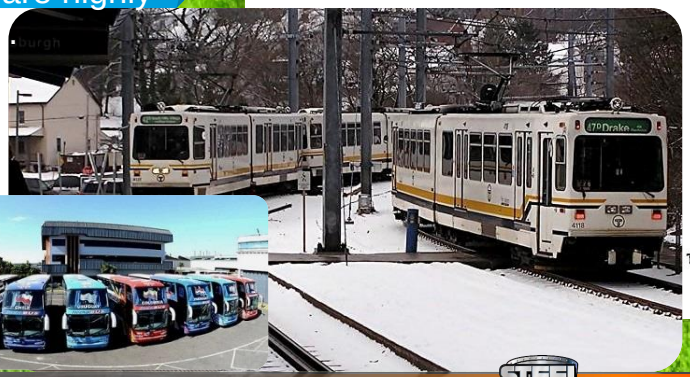
Mark P. Ferrari, C.P.M., A.P.P.
Manager of Contract Administration
Bus & Rail

This letter states that they save around USD 45 in maintenance cost for every USD 1 investment in Steel Shield products. Also, the vehicles malfunctions drop to

UNION PACIFIC

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. ~~1-(800) 443-7243 pin 888985~~
jfhendri@up.com



48. Letter from VOLVO China

中沃汽车有限公司

Original

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

中沃汽车有限公司

2013 年 11 月 8 日

电话:0571-86852031

Volvo Car Corporation

English

8th November, 2013

To: STEEL SHIELD TECHNOLOGIES
Unit K, 11/F, Leader Industrial Centre, Phase 2,
188-202 Texaco Road, Tsuen Wan, N.T., H.K.

Dear Ms. Eva Lam,

We would like to express our gratitude to STEEL SHIELD TECHNOLOGIES for providing Steel Shield lubricants for our vehicle horse power tests. In this test, our company applied Steel Shield lubricants to 4 Volvo cars (model: Volvo S80). We mounted the 4 cars on the horse power testing machines (Dyno-Shaft On-Vehicle Dynamometer) and conducted the tests individually.

The results indicate that, the 4 Volvo cars which had Steel Shield lubricants applied got horse power boosted by 8% - 12% compared with the same 4 cars without Steel Shield lubricants. Our company will be pleased to recommend Steel Shield to our customers.

Sincerely,

Volvo Car Corporation
R/M 1613, 2th Phase, Tongce Square,
3688 Jiangnan Road, Binjiang, Hangzhou, China
Tel.: 0571-86852031
www.sinoworldcars.com

This letter states that the horsepower of Volvo vehicles increased by 8% to 12% after using Steel Shield products.

49. MACAU GRAND PRIX AND EVENTS

61st Macau Grand Prix 〈2014〉

Exhibition & Events

50. STEEL SHIELD TECHNOLOGIES (USA HEADQUARTER)

Reception Area

Steel Shield Lubricant Storage Facility

Steel Shield Unique Additive Production Machine

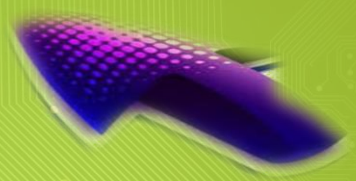
Steel Shield Unique Additive Production Machine

51. STEEL SHIELD TECHNOLOGIES

The Steel Shield Certificate

52. STEEL SHIELD VIDEO DEMONSTRATIONS

- Steel Shield ABF Technology – How it works?
- Steel Shield ABF Technology – Timken Demonstration.
- Steel Shield Technology Demo 1
- Steel Shield Technology Demo 2
- Steel Shield Tech Full Feature on Motorhead Garage
- Steel Shield Motorhead Garage Commercial
- Steel Shield Interviewed by the Guangdong Sport TV in the China International Lubricants and Technology Exhibition



Please click the links

53. Contact US

STEEL SHIELD TECHNOLOGIES

Company Address：
809B, 8/F., Block B,
Goodview Industrial Building,
11 Kin Fat Street, Tuen Mun, N.T., HK
Tel：+852 2545 8029
Fax：+852 2545 8030

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