# Steel Shield Technologies

Serving the industry since 1985

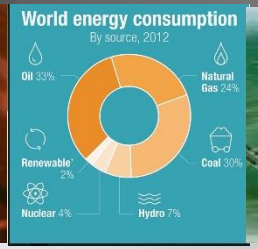
ABF Technology enlightens the world of lubrication

World's No.1 ionic levitation Lubrication Technology

100% Made In USA

## Industrial Application

# Power Plants


# 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 Only ionic levitation lubrication technology in the World*



**Steel Shield Industrial Application Recommendations**

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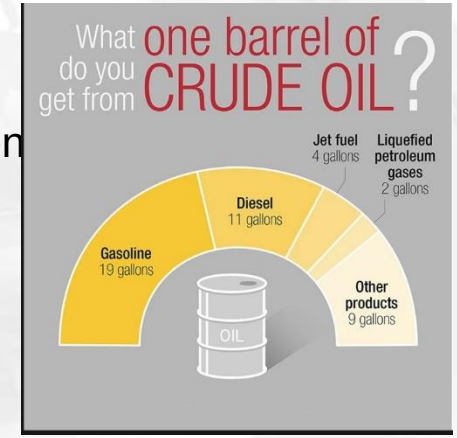
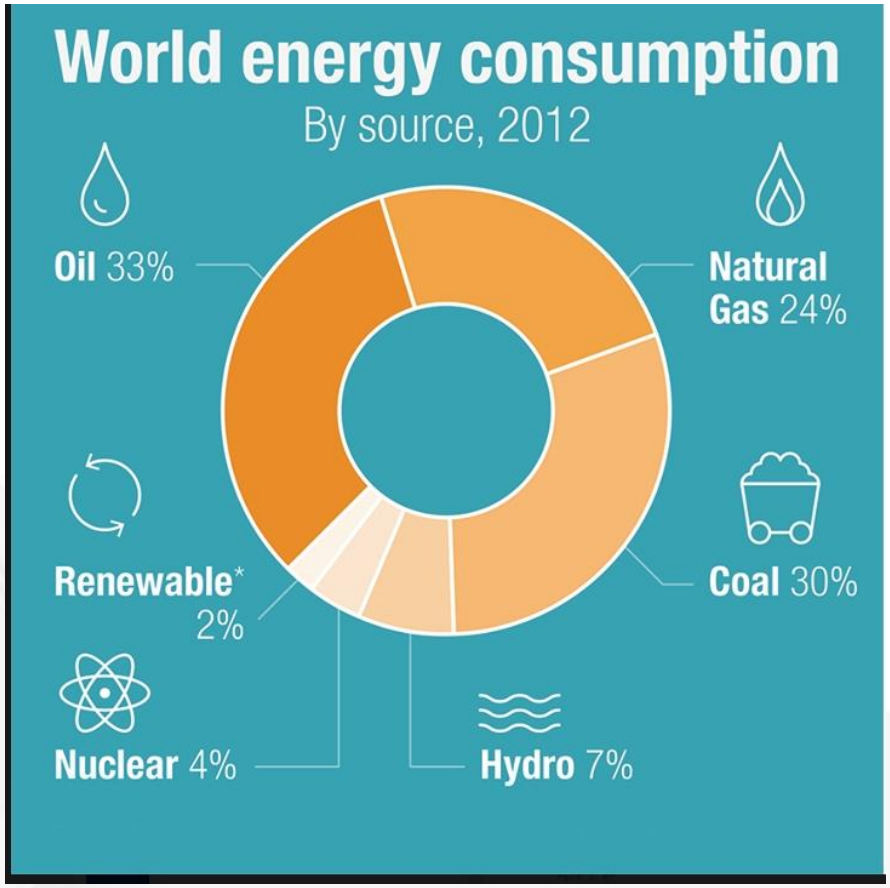



# 1. THE CORPORATION & FACILITIES

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 fire arms 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

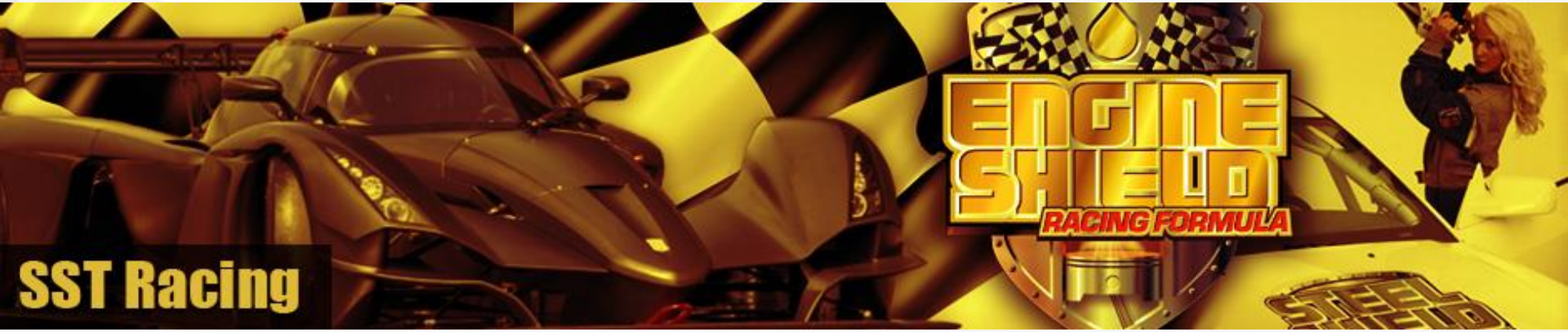
Accreditation**:**

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.



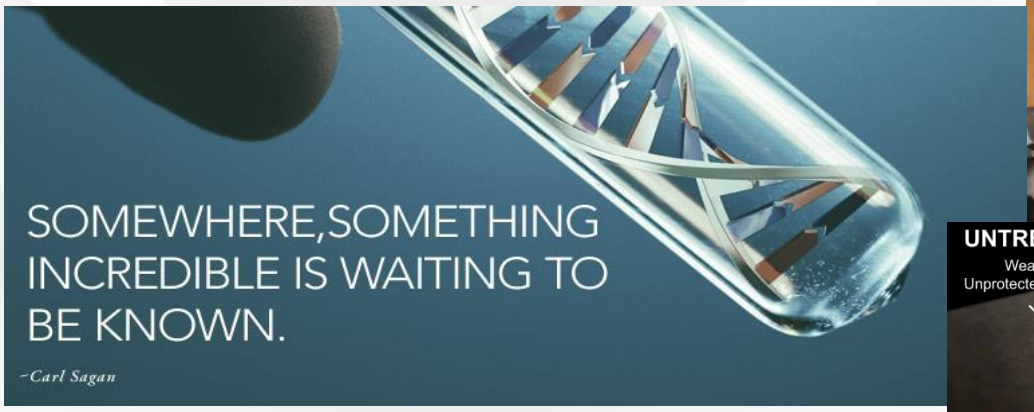
# 3. THE BIRTH OF ABF TECHNOLOGY

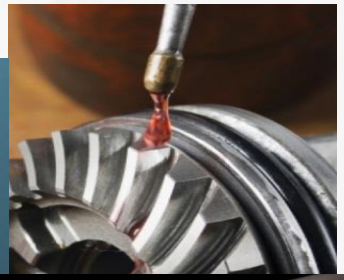
- During World War II, the German Science and Technology Research Institute was commissioned to develop a new lubricant technology in meeting the stringent demand for heavy duty military application such as artillery, armored vehicles, tanks, battleships and fighter-aircrafts to avail them in performing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

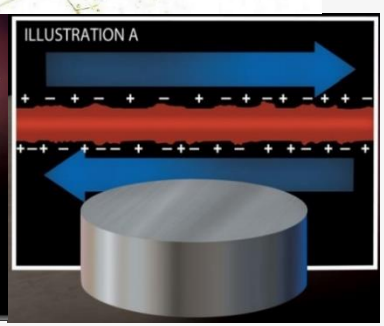
- The scientists proposed the concept of Zero friction, i.e. Farady's Law Like-Charge-Repel.

- 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*

# 4. 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 some organo-metallic derivatives while Lewis acids and protonic reagents initiate cationic reactions.

```
        O
      /   \          Ethylene Oxide Reagent
n H2C  -  CH2 n
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The lubricity, load carrying capacity, surface improvement, and wear reduction are greatly improved while corrosive aspects of halogenation are virtually eliminated.


References:

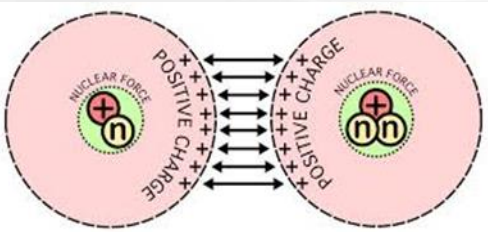
(1) CRC "Handbook Of Lubrication, Theory And Practice", Volumes 1 & 2, by E. Richard Booser, Ph.D., Society of Tribologists and Lubrication Engineers (STLE), copyright 1992, Eighth Printing.

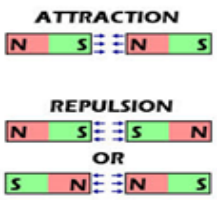
(2) "Organic Chemistry" 4th Edition, by Robert Morrison, Ph.D. and Robert Boyd, Ph.D., copyright 1983 by Allen & Bacon.

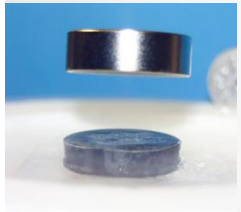
(3) "Lubrication - A Tribology Handbook", edited by M.J. Neale OBE, BSc(Eng), published by Society of Automotive Engineers (SAE), copyright 1993, Butterworth-Heinemann, Ltd.

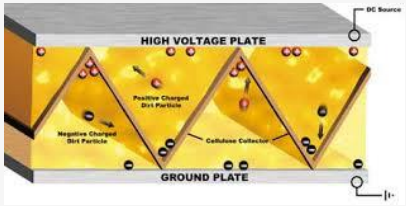
(4) CRC "Handbook Of Chemistry and Physics", 1986 Edition, by CRC Press, edited by David R. Lide, copyright 1986 by CRC Press.

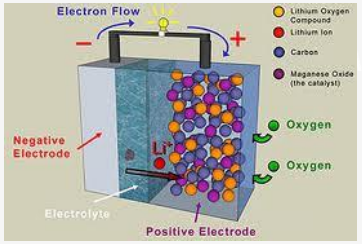




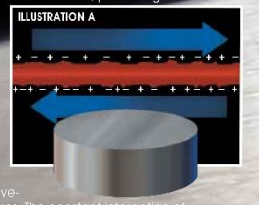
# 5. HOW ABF WORKS

# 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.

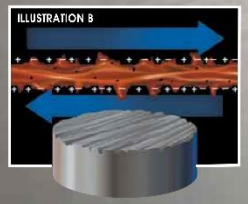
## Metal Against Metal

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.

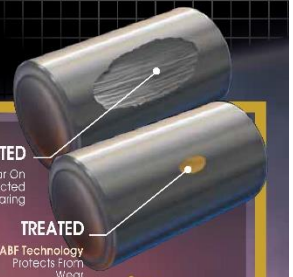



## Normal Lubricants Help

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.




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

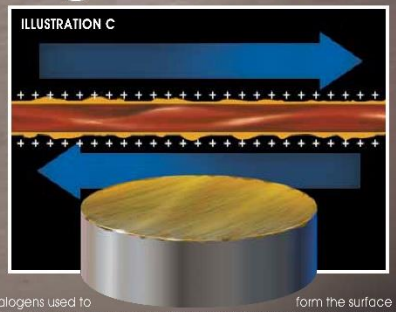



See Extreme Condition Lubrication Test At www.steelshieldtech.com

**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**.




## 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.

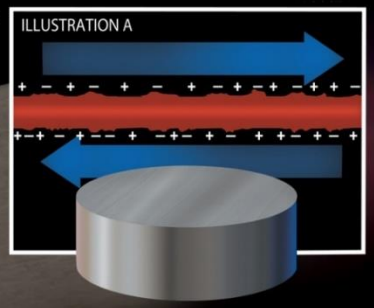
## Increased Effectiveness Of The Lubricant

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."

# 6. ABF TREATS THE METAL NOT THE OIL

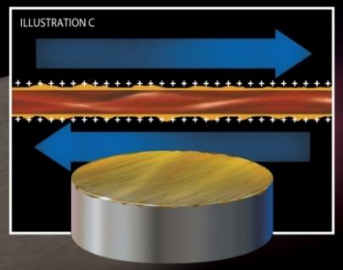
## Metal Surfaces

- Surfaces characterized by series of peaks and valleys
- Peaks (known as "asperities") are positive charged
- Valleys (referred to as "micro-pores" and "fissures") are negative charged



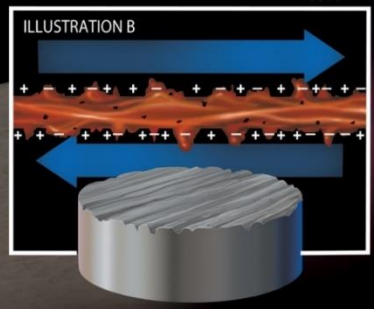

## Surfaces Treated With… Advanced Boundary Film

- 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 surfaces become uniform in charge, there is a reduction in friction due to Faraday reaction of like-charges




## Metal Surfaces & Lubricants

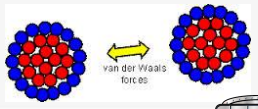
- Most lubricants help slow the process of heat & friction to some degree
- When two metal surfaces contact each other & move in opposite directions, friction is caused, producing heat & metal deterioration
- Constant friction & electro-magnetic interaction causes the weakened metal to break off creating metallic debris & particles in the lubricant

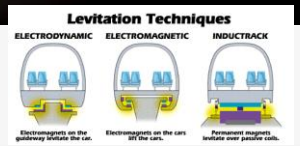



## Advanced Boundary Film

NOT JUST OIL… IT'S 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)



# 7. 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, Light & Heavy Rail, Shipping
- Gas, Oil & Energy Plants, Mining & Drilling
- Lifts, Air Conditioning & Cold Storage Systems
- Industrial, Agriculture, Construction & Naval Engineering
- Militaries

# 8. SPECIALTY PRODUCT LINES

[redacted]


[redacted]

www.steelshieldtech.com.hk

www.facebook.com/steelshieldtech

# 9. POWER PLANTS

A power plant is also known as a power station, powerhouse or generating plant. At the center of nearly all power plants is a generator (a rotating machine) that converts mechanical power into electrical power by creating relative motion between a magnetic field and a conductor. Most power plants in the world burn fossil fuels (Thermal Power) such as coal, oil, landfill & bio gas to generate electricity, and some (Renewable Energy) use nuclear power, solar, wind, wave, hydroelectric, biomass etc.

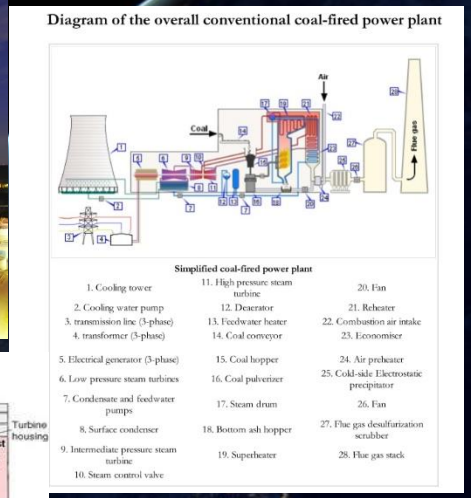
The power generated by a power station is measured in multiples of the watt, typically kilowatts, megawatts or gigawatts. Gas-fired power plants can achieve 50% conversion efficiency while coal and oil plants achieve around 30–49%.

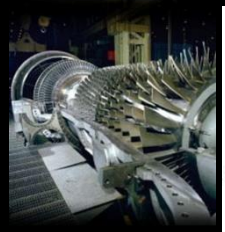
THERMAL POWER – coal, oil, bio & landfill gas
Mechanical power is produced by a heat engine that transforms thermal energy, often from combustion of a fuel, into rotational energy. Most thermal power are steam power. The steam drives a steam turbine and generator that then produces electricity. The efficiency of a steam turbine is not directly a function of the fuel used. For the same steam conditions, coal, nuclear and gas power plants all have the same theoretical efficiency.

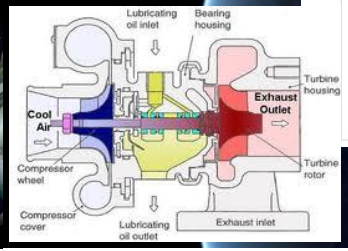
1.) A coal-fired power plant produces heat by burning coal in a steam boiler, others like gas-fired plants may use a combustion turbine.
2.) Steam turbine plants use the dynamic pressure generated by expanding steam to turn the blades of a turbine. Almost all large non-hydro plants use this system. About 90% of all electric power produced in the world is by use of steam turbines.
3.) Gas turbine plants use the dynamic pressure from flowing gases (air and combustion products) to directly operate the turbine.
4.) Combined cycle plants have both a gas turbine fired by natural gas, and a steam boiler and steam turbine which use the hot exhaust gas from the gas turbine to produce electricity.
5.) Microturbines, Stirling engine and internal combustion reciprocating engines are low-cost solutions. Internal combustion engines are used to provide power fuelled by diesel oil, heavy oil, natural gas, and opportunity fuels, such as landfill gas, digester gas from water treatment plants and waste gas from oil production

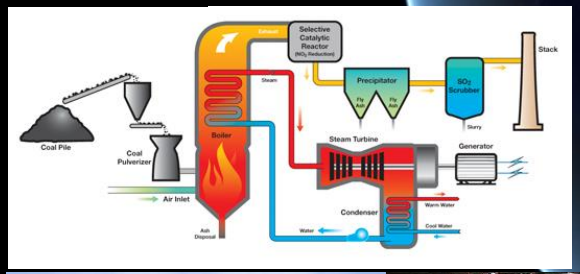
RENEWABLE POWER – nuclear, hydro, solar, wind, marine, osmosis, biomass
1.) Nuclear power plants use a nuclear reactor's heat that is transferred to steam which then operates a steam turbine and generator.
2.) Hydro plants use dams built to impound a reservoir of water and release it through one or more water turbines, connected to generators, and generate electricity.
3.) Solar power plants use solar cells directly or by focusing the sunlight to boil water and produce steam which turns the generator. They use either parabolic troughs or heliostats to direct sunlight onto a pipe containing a heat transfer fluid, such as oil. The heated oil is then used to boil water into steam, which turns a turbine that drives an electrical generator. The central tower type of solar thermal power plant uses hundreds or thousands of mirrors, depending on size, to direct sunlight onto a receiver on top of a tower. Again, the heat is used to produce steam to turn turbines that drive electrical generators.
4.) Wind power use wind turbines to generate electricity in areas with strong steady winds. Most modern turbines today use a three-bladed, upwind design. With larger turbines (on the order of one megawatt), the blades move more slowly than older, smaller, units, which makes them less visually distracting and safer for airborne animals.
5.) Biomass-fuelled power plants may be fuelled by waste from sugar cane, municipal solid waste, landfill methane, or other forms of biomass.

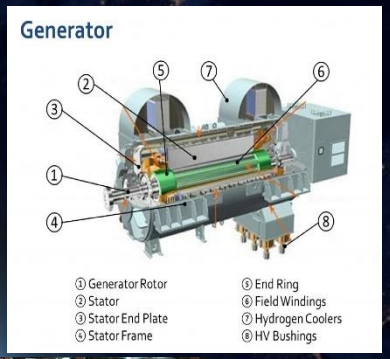
# 10. COAL-FIRED POWER PLANTS






1) Air-Compressor Oil
2) Back-Up Generator Oil
3) Boiler Gear Oil
4) Coal Conveyors Oil
5) Coal Pulverizers Oil
6) Coal Yard Vehicle Oil
7) Cooling Tower Oil
8) Preheater Oil
9) Soot Blower Oil
10) Steam Loop-Feed Water Pumps Oil
11) Turbine Oil

**Steel Shield Products Recommendation:**

**1.) SST-ECI CAT GC gas compressor oil**

**2.) SST Air Compressor oil**

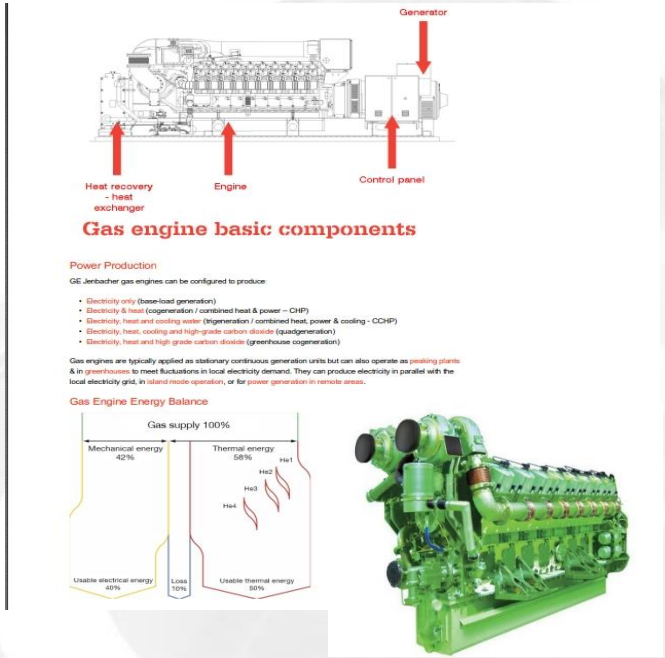
**3.) SST Motor oil**

**4.) SST Hydraulic oil**

**5.) SST Chain Oil**

**6.) SST Specialty Line Lubricants & Grease.**

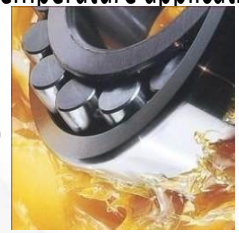
# 11. GAS-FIRED POWER PLANTS




- Greases for demanding applications

- Grease for extreme-temperature applications

- Gear and bearing oils



- Oils for booster pumps and air compressors

- Hydraulic fluids

- Oils for gas turbines

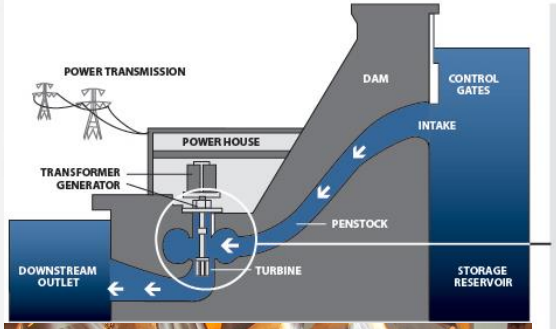
- Oils for landfill & biogas gas engines

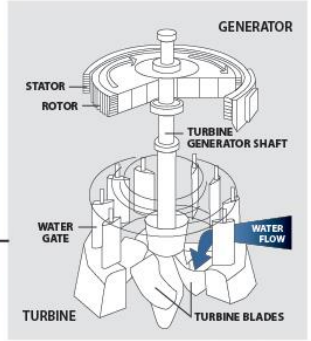
- Diesel engine oil for severe applications

**Steel Shield Products Recommendation**

1.) SST ECI GECAT Gas Engine Oil
2.) SST Hydraulic Oil
3.) SST Air Compressor Oil
4.) SST Motor Oil
5.) Steel Shield EPA
6.) Steel Shield Grease
7.) Steel Shield Spray Shield
8.) Steel Shield Strike Shield
9.) Steel Shield Transmission Shield

# 12. HYDRO-POWER PLANTS




Steel Shield Technologies having been serving the industry for 28 years we care for green planet and believe good environmental lubricant should not have to compromise equipment reliability or functionality. We supply environmental friendly and biodegradable lubricants not only powerful but non-toxic. With ABF technology we help saving for our customers substantial maintenance costs whilst improving equipment productivity.

## Steel Shield Products & Application

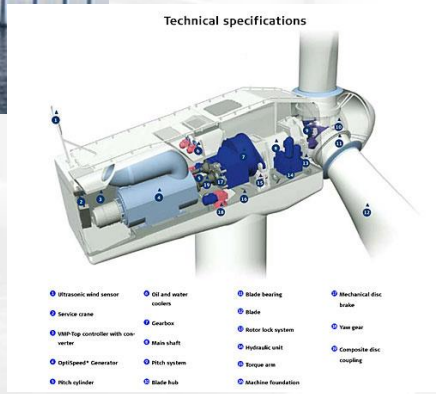
- Lithi-Grease for Archimedes Screw Bearing
- Transmission Shield for loaded toothed cylindrical, helical and hypoid, wheel and worm gears
- Steel Shield EPA for Anti-wear and anti-rust gear
- Steel Shield EPA for Turbine & Generator Bearings
- Steel Shield Hydraulic oils
- Steel Shield Turbine Oil (make to order)

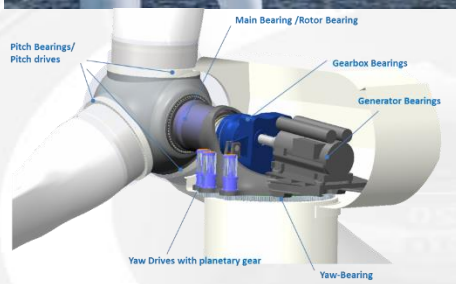
Wet environment applications including cooling towers, steam, hot and chilled water, effluent, chlorinated water and sludge.

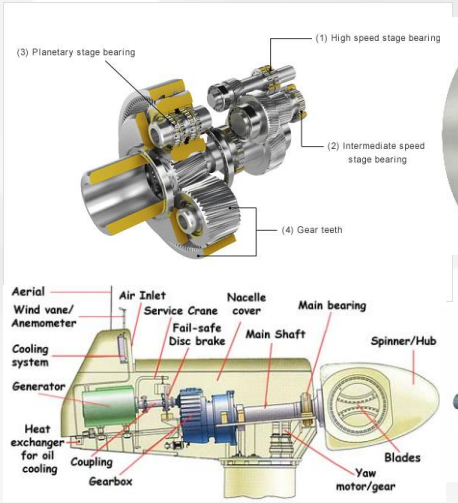
## BENEFITS

- Extended oil life and drain intervals
- Reduces oil consumption and labor costs
- Outstanding resistant to aging and oxidation
- Leaves no deposit in the hydraulic system
- Excellent air & water isolation capability
- Improves equipment functionality & reliability
- Reduces downtime and saves maintenance costs as much as 50% and more.

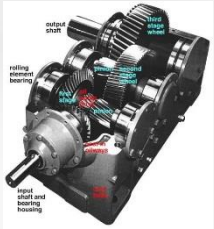
# 13. WIND-POWER PLANTS







"Pay me NOW or Surely Pay me MORE Later" is certainly true when it comes to Wind Turbine Maintenance.
Wind turbines are generally located in remote areas where the weather condition is harsh and highly variable. As a result, there is high mechanical stress on wind turbines unmatched in any other form of power generation.

The "fix it when it breaks" emergency maintenance is the least efficient and most costly. The reactive approach to catastrophic failure of a gearbox, generator or bearing for a single wind turbine can result in very expensive removal and replacement. Failure of a gearbox can cause damage to other components as well.

In 2010 in Germany a study funded by the government with data collected from 1,500 wind turbines indicated the following results;

| Component breakdown | Days out per failure |
|---|---|
| Hydraulics | 1.3 days |
| Yaw System | 2.5 days |
| Brakes | 3 days |
| Gearbox | 6.3 days |
| Generator | 5.8 days |
| Drive System | 6 days |

Comparative Maintenance Costs (US$/HP/Year)
Reactive:$ 17.00
Preventive: $ 13.00 (= 24 % reduction from Reactive Maintenance)
Predictive: $ 9.00 (= 47 % reduction from Reactive Maintenance)

We at Steel Shield can save for you the 47% generally obtained by using predictive maintenance with ABF Technology.

APPLICATIONS

- Blade Bearing
- Yaw Gear & Bearing
- Gearbox
- All Bearings

## Steel Shield Recommendation

1.) Lithi-Grease, EPA for bearings
2.) Transmission Shield for gears
3.) Strike Shield, Spray Shield for routine maintenance

# 14. STEEL SHIELD ECI GECAT GAS ENGINE OIL

ABF, it resembles the effect of magnetic levitation, is the only technology that can achieve friction free working environment for any mechanical interaction in a machinery. It gives the gas engine 100% protection against piston scuffing, scoring and ring & liner wear.

Steel Shield ECI GECAT is a state-of-the-Art gas engine oil engineered to outperform any of the aftermarket oils and to meet the rigorous demands of high output four-cycle engines operating under high load and high temperature conditions.

ECI GECAT is made from the highest quality base stocks with ABF technology that provides Not Only exceptional oxidation stability, nitration resistance and thermal stability but minimizing and eliminating the formation of carbon deposits, lacquer and sludge resulting in cleaner engines, longer oil life and reduced maintenance costs. It exhibits excellent resistance to foaming, good demulsibility and protection against corrosion. Formulated with very low levels of zinc and phosphorus allowing GECAT to work seamlessly with engines equipped with catalytic converters. It meets a wide range of OEM requirements making it an excellent choice where high-speed four-cycle engines from various OEMs are used.

**Recommended for :**

- GE-Jenbacher, Caterpillar, Superior, Waukesha, Mitsubishi and other turbocharged, naturally aspirated, medium to high speed four-cycle engines requiring a low and/or mid ash oil
- Engines experiencing valve face and seat wear
- Lean-burn and stoichiometric four-cycle engines
- Engines equipped with catalytic converters
- Applications using alternate fuels containing low levels of sulfur or chlorine
- In field gathering operations where sour gas (low levels of H2S) is used as fuel

**Features and Benefits :**

- Excellent Oxidation and Nitration Resistance
- Cleaner engines
- Improves oil drain interval and filter life
- Improves engine efficiency and productivity
- Super Anti-wear and Anti-scuff protection
- Minimizes scoring, scuffing and wear of pistons and liners
- Utmost protection in fully loaded engines
- 50% and more maintenance & labor costs reduction
- Superior protection of valve train components
- Low levels of combustion chamber ash
- Prolongs spark plug life
- Highly Effective Corrosion Protection
- Protects internal engine components from water, coolant and acidic materials
- Neutralizes acids formed from combustion or oil degradation
- Excellent Detergent / Dispersancy Performance
- Reduces engine operation noise level up to maximum 9 dB

# 15. GECAT No.1 & 2 SPECIFICATION

**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

## SST-ECI GECAT No.1 HD-AP SAE-30 / 40 LOW-ASH GAS ENGINE OILS
## ( Mysella XL )

GECAT No.1 is a Heavy Duty low-ash natural gas/bio-gas engine oils formulated with highly refined mineral oils and select additives to control wear, oxidation, nitration and bearing corrosion. Enhanced with Steel Shield ABF Technologies the oil demonstrates excellent performance in variety of engines such as Caterpillar, Deutz- MWM, Jenbacher, Guascor, etc. These oils exceed the performance requirements of API CF and Caterpillar Series 3.

**BENEFITS**
- Ultimate performance against oxidation and nitration
- Strong TBN retention
- Good protection against corrosion and wear
- Reduce deposit and maintain engine cleanliness
- Extended oil drain interval
- Reduce downtime 300% and more
- Extends the life of engine parts upto 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to engine condition)
- Improves efficiency in terms of usable output energy

**APPLICATION**
GECAT No.1 is recommended for use in new generation spark-ignition, highly rated, both 2-cycle and 4-cycle gas engines requiring low-ash contents.

**TYPICAL SPECIFICATION**

| | | | |
|---|---|---|---|
| SAE Grade | | 30 | 40 |
| Kinematic Viscosity, | | | |
| @ 40°C, cSt | ASTM D445 | 100 | 138 |
| @ 100°C, cSt | ASTM D445 | 11.1 | 14.2 |
| Viscosity Index | ASTM D2270 | 98 | 99 |
| Flash Point (COC), °C | ASTM D92 | 220 | 235 |
| Pour Point, °C | ASTM D97 | -20 | -20 |
| TBN, mgKOH/g | ASTM D2896 | 5.0 | 5.0 |
| Sulphated Ash, %wt | ASTM D874 | 0.45 | 0.45 |

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

IMPORTANT Reminder: In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.

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**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

## SST-ECI GECAT No.2 LD-TV SAE-40 LOW-ASH GAS ENGINE OILS
## ( Mysella XL )

GECAT No.2 Light Duty SAE-40 is a low-ash natural gas/bio-gas engine oils formulated with highly refined mineral oils and additives to control wear, oxidation, nitration and bearing corrosion. The oil is enhanced with Steel Shield ABF technology for excellent performance.

Landfill / biogas Engine
The oil demonstrates excellent performance in engines such as Caterpillar, Guascor, Jenbacher, Deutz- MWM etc. The oil qualifies for API CF/SF.

**BENEFITS**
- Ultimate performance against oxidation and nitration
- Strong TBN retention
- Good protection against corrosion and wear
- Reduce deposit and maintain engine cleanliness
- Extended oil drain interval
- Reduce downtime 200+%
- Extends the life of engine parts upto 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to engine condition)
- Improves efficiency in terms of usable output energy

**APPLICATION**
GECAT No.2 SAE-40 is recommended for use in new generation spark-ignition, highly rated, both 2-cycle and 4-cycle gas engines & gas compressors requiring low-ash contents.

**TYPICAL SPECIFICATION**

| | | |
|---|---|---|
| SAE Grade | | 40 |
| Density @ 30 °C Kg/l | ASTM D1298 | 0.886 |
| Kinematic Viscosity, | | |
| @ 40°C, cSt | ASTM D445 | 146.80 |
| @ 100°C, cSt | ASTM D445 | 14.52 |
| Viscosity Index | ASTM D2270 | 97 |
| Flash Point (COC), °C | ASTM D92 | > 218 |
| Pour Point, °C | ASTM D97 | ≤ -15 |
| TBN, mgKOH/g | ASTM D2896 | 4.80 |
| Sulphated Ash, % (m) | ASTM D874 | 0.40 |
| Boiling Point, °C | | 228 |

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

**IMPORTANT Reminder: In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.**

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# 16. GECAT No.3 & 4 SPECIFICATION

**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

## SST-ECI GECAT No.3 HD-AP/ST SAE-40 MID-ASH GAS ENGINE OILS
## ( Pegasus 805 )

GECAT No.3 is a Heavy Duty Mid Ash Gas Engine Oil formulated with highly refined mineral oils and selected additives to control wear, oxidation, nitration and bearing corrosion. Enhanced with Steel Shield ABF Technologies the oil demonstrates excellent performance in a variety of engines including but not limited to Caterpillar, Deutz-MWM, Jenbacher, Guascor and Waukesha. The oil exceeds the performance requirements of API CF and caterpillar series 3.

**BENEFITS**

- Ultimate performance against oxidation and nitration
- Strong TBN retention
- Good protection against corrosion and wear
- Reduce deposit and promote engine cleanliness
- Extended oil drain interval
- Reduce downtime 300% and more
- Extends the life of engine parts upto 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to engine condition)
- Improves functional efficiency in terms of output energy
- Exceptionally resistant to viscosity increase
- Strong resistance to TAN increase

**APPLICATION**

GECAT No.3 is recommended for use in spark-ignition 4-stroke, highly rated stationary gas engines requiring medium-ash contents.

**TYPICAL SPECIFICATION**

| | | |
|---|---|---|
| SAE Grade | | 40 |
| Kinematic Viscosity, | | |
| @ 40°C, cSt | ASTM D445 | 123 |
| @ 100°C, cSt | ASTM D445 | 13.7 |
| Viscosity Index | ASTM D2270 | 105 |
| Flash Point (COC), °C | ASTM D92 | 235 |
| Pour Point, °C | ASTM D97 | -12 |
| TBN, mgKOH/g | ASTM D2896 | 6.3 |
| Sulphated Ash, %wt | ASTM D874 | 0.51~0.71 |

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

**IMPORTANT Reminder:** In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.

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**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

## SST-ECI GECAT No.4 HD-AP SAE-30 / 40 ASH FREE GAS ENGINE OILS
## ( Pegasus 801 )

GECAT No.4 is a Heavy Duty ash free natural gas engine oils formulated with highly refined paraffinic base oils and special select ash free additives. Enhanced with Steel Shield ABF Technologies these oils demonstrate excellent control of deposits, wear, bearing corrosion, oxidation and nitration. They can meet the requirements of Ajax, Clark, Cooper-Bessemer and Fairbanks-Morse 2-cycle naturally aspirated and turbo-charged engines fuelled by natural gas.

**BENEFITS**

- Superior oxidation and nitration stability
- Strong TBN retention
- Minimizing spark plug fouling and pre-ignition
- Exceptional control of deposit, wear and bearing corrosion
- Reduce deposit and maintain engine cleanliness
- Extended oil drain interval
- Reduce downtime 300% and more
- Extends the life of engine parts upto 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to engine condition)
- Improves efficiency in terms of usable output energy

**APPLICATION**

GECAT No.4 is recommended for use in 2-cycle, spark-ignition industrial gas engines where ashless oil is required.

**TYPICAL SPECIFICATION**

| | | | |
|---|---|---|---|
| SAE Grade | | 30 | 40 |
| Kinematic Viscosity, | | | |
| @ 40°C, cSt | ASTM D445 | 102 | 138 |
| @ 100°C, cSt | ASTM D445 | 11.5 | 13.8 |
| Viscosity Index | ASTM D2270 | 99 | 98 |
| Flash Point (COC), °C | ASTM D92 | 225 | 238 |
| Pour Point, °C | ASTM D97 | -20 | -20 |
| TBN, mgKOH/g | ASTM D2896 | 2.2 | 2.2 |
| Sulphated Ash, %wt | ASTM D874 | < 0.1 | <0.1 |

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

**IMPORTANT Reminder:** In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.

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# 17. ECI HD HYDRAULIC OIL

**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

## SST-ECI HD-AP Hydraulic Oil No.32/46/68/100/150

ECI HD 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.

### BENEFITS

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

### APPLICATION

ECI HD 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.

### TYPICAL SPECIFICATION

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

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

**IMPORTANT Reminder:** In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.

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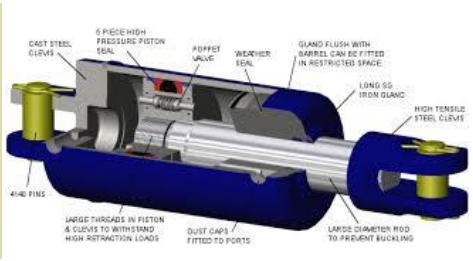


# 18. ECI CAT GC COMPRESSOR OIL

**Steel Shield Technologies (Asia Pacific) Limited**
美國離子能源有限公司

**SST-ECI CAT-TV GC SAE-40 LOW-ASH GAS COMPRESSOR OILS**
**( Mysells XL )**

**DESCRIPTION**

CAT-TV GC SAE-40 is a low-ash gas compressor oil where engine and compressor have a common lubrication system. It's formulated with highly refined mineral oils and additives to control wear, oxidation, nitration and bearing corrosion. The oil is enhanced with Steel Shield ABF technology for excellent performance.

The oil demonstrates excellent performance in 4-strokes gas engines operating compressors on gas collection and transmission networks such as Caterpillar etc. The oil meets the requirement of API CF/SF.

**BENEFITS**

- Ultimate performance against oxidation and nitration
- Good protection against corrosion and wear
- Reduce deposit and maintain compressor cleanliness
- Extended oil drain interval
- Reduce downtime 200+%
- Extends the life of engine parts upto 400% (conditional to the physical status)
- Reduce noise 3db~9db (conditional to compressor condition)
- Improves efficiency

**APPLICATION**

CAT-TV GC SAE-40 is recommended for use in new generation gas compressors requiring low-ash contents.

**TYPICAL SPECIFICATION**

| | | |
|---|---|---|
| SAE Grade | | 40 |
| Density @ 30 °C Kg/l | ASTM D1298 | 0.886 |
| Kinematic Viscosity, | | |
| @ 40°C, cSt | ASTM D445 | 125 |
| @ 100°C, cSt | ASTM D445 | 13.28 |
| Viscosity Index | ASTM D2270 | 97 |
| Flash Point (COC), °C | ASTM D92 | > 218 |
| Pour Point, °C | ASTM D97 | ≤ -15 |
| Sulphated Ash, % (m) | ASTM D874 | 0.40 |
| Boiling Point, °C | | 228 |

Whilst these characteristics are typical at current production, it may vary in the future subject to Steel Shield's final production specification.

**IMPORTANT Reminder: In case of an oil change, we recommend the system be flushed for precaution of any possible cross effects between the new and the old oils of different make, and to maximize the performance and lifetime of the new oil.**

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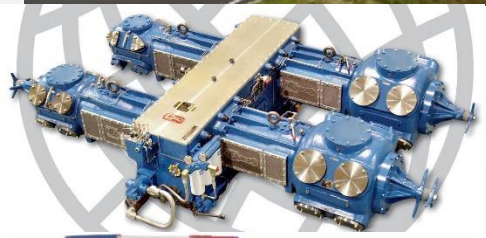
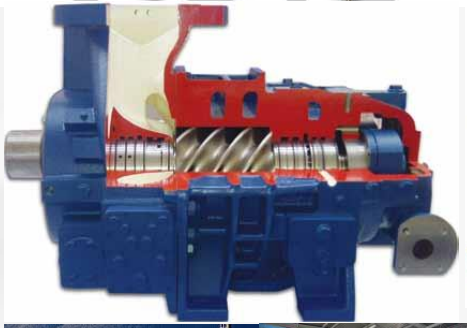
香港新界荃灣德士古道 188-202 號立泰工業中心 二期 11 樓 K 室 Tel（電話）: 2545 8029 Fax（傳真）: 2545 8030










# 19. Railroad & Mass Transit System

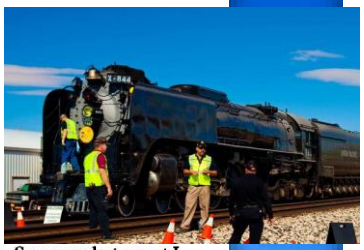
Joe Hendricks
6455 East Commerce
Kansas City, MO 64120
MMEO Central Region

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-

are highly

d.

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: 888905.~~
jfhendri@up.com


**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:

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

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 is an official

# 20. STEEL SHIELD EPA

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD EPA™

### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**STEEL SHIELD Extreme Pressure Anti-Wear (EPA)™** is the ultimate protection for the moving metal parts for industry. 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. Increased performance and greatly reduced maintenance and downtime are the results. These performance goals are achieved through **ABF Technology** by lowering the operating temperatures, extending the life of component parts and increasing reliability.

### ATTRIBUTES

- Protects Moving Metal Parts
- Extends Parts Life And Component Reliability
- Dramatically Reduces Wear
- Smoother Operation
- Improves Lubrication
- Reduces Maintenance And Downtime
- Reduces Friction
- Reduces Operating Temperatures

STEEL SHIELD EPA™

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226˚C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238˚C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25˚C
- Medium To Dark Amber

### RECOMMENDED USES

- Engines
- Transmissions
- Differentials
- Hydraulic Systems
- Open Gears
- Gear Boxes
- Gear Reducers
- Gear Couplings
- Electric Motors
- Heavy Machinery
- Weaponry Systems

DIRECTIONS

*Gasoline And Diesel Engines:* Add 2 oz. per quart of oil.
*Auto Transmissions:* Add 1 oz. per quart of fluid.
*Manual Transmissions & Differentials:* Add 2 oz. per quart of gear lube/oil.
*Gear Boxes:* Add 2-3 oz. per quart. *Hydraulics:* Add 1 oz. per quart of fluid.
Contains no volatiles or solvents. Contains synthetic hydrocarbons and advanced chemical additive technology. Non-toxic and environmentally friendly.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| EPA-MT-16 | 8-94630-00161-8 | Steel Shield EPA - Metal Treatment - 16 Oz. | 12 | 8.75"w x 8"h x 8"d | .33 | 7.50 | 25/7 |
| EPA-MT-32 | 8-94630-00162-5 | Steel Shield EPA - Metal Treatment - 32Oz. | 12 | 9.75"w x 9.5"h x 13.25"d | .71 | 28.80 | 12/5 |
| EPA-MT-128 | 8-94630-00163-2 | Steel Shield EPA - Metal Treatment - 1 Gallon | 4 | 9.5"w x 12.5"h x 14.5"d | .99 | 33.60 | 12/4 |
| EPA-MT-5G | 8-94630-00164-9 | Steel Shield EPA - Metal Treatment - 5 Gallons | 1 | | | 45.00 | |
| EPA-MT-15G | 8-94630-00165-6 | Steel Shield EPA - Metal Treatment - 15 Gallons | 1 | | | 133.00 | |
| EPA-MT-55G | 8-94630-00166-3 | Steel Shield EPA - Metal Treatment - 55 Gallons | 1 | | | 485.00 | |
| EPA-MT-300G | 8-94630-00167-0 | Steel Shield EPA - Metal Treatment - 300 Gallons | 1 | | | | |

# 21. LITHI-SHIELD

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD™ TECHNOLOGIES



### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**LITHI-SHIELD™** is the ultimate in extreme pressure anti-wear lithium complex grease. It exceeds all other lithium complex greases due to the addition of **ABF (Advanced Boundary Film)Technology**, extreme pressure and anti-friction additives added to its formula. **LITHI-SHIELD™** treats, seals and smooths metal surfaces to dramatically reduce friction, as well as friction related heat and wear. **LITHI-SHIELD's™** unique formulation allows it to exceed the performance of other greases while using smaller quantities. In fact, **LITHI-SHIELD™** exhibits great oxidation resistance, over twice that of its nearest competitor.

### ATTRIBUTES

- Provides Maximum Protection Against Wear And Extreme Pressure
- Adheres To Metal Exhibiting Top Performance In Roll Stability
- Provides Constant Lubrication To All Areas
- Offers The Maximum In Friction Reduction
- Resists Water Washout

LITHI-SHIELD™

## LITHI-SHIELD™

ABF TECHNOLOGY

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### PRODUCT SPECIFICATIONS

- NLGI Grade..... No. 2
- Color.....Light Amber
- Thickener Type ..... Lithium Complex
- Anti-Wear Metal Treatment... Steel Shield EPA

### ASTM TESTS

| | | |
|---|---|---|
| D-2265 | Dropping Point | 556˚F |
| D-2266 | 4-Ball Wear Test | 0.66mm |
| D-2596 | 4-Ball Weld Test | 800 Kg/Pass |
| D-2509 | Timken OK Load-Lbs | 60 |
| D-5483 | Oxidation Resistance Induction Time at 210˚C, min | 11.47 |
| D-1264 | Water Washout @79˚C | 2.7% |

### RECOMMENDED USES

- All Extreme Pressure Applications
- Universal Joints
- Rotating Machinery
- Heavy Equipment
- Railroad Equipment
- Mining Equipment
- Boat Trailers And Marine Applications
- Conveyors
- Bearings
- Chassis Fittings
- Pumps
- CV Joints
- Axles

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| LS-T | 8-94630-00181-6 | Lithi-Shield Lithium Complex Grease - 2 oz. Tub | 24 | 9.25'w x 4.75'D x 6.5'H | 0.16 | 1.9 | 40/8 |
| LS-C | 8-94630-00182-3 | Lithi-Shield Lithium Complex Grease - 14 oz. Crtg | 40 | 12'w x 19.5'D x 10.75'H | 1.45 | 42.0 | 6/5 |
| LS-LB | 8-94630-00183-0 | Lithi-Shield Lithium Complex Grease - 1 lb Tub | 12 | 13.5'w x 3.5'D x 6.25'H | 0.17 | 15.2 | 36/8 |
| LS-5LB | 8-94630-00184-7 | Lithi-Shield Lithium Complex Grease - 5 lb Tub | 4 | 14.125'w x 9.5'D x 6.75'H | 0.53 | 23.4 | 12/8 |
| LS-P | 8-94630-00185-4 | Lithi-Shield Lithium Complex Grease - 35 lb Pail | 1 | | | 38.0 | |
| LS-K | 8-94630-00186-1 | Lithi-Shield Lithium Complex Grease - 120 lb Keg | 1 | | | 132.0 | |
| LS-D | 8-94630-00187-8 | Lithi-Shield Lithium Complex Grease - 400 lb Drum | 1 | | | 437.0 | |

# 22. TRANSMISSION-SHIELD

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD™ TECHNOLOGIES

TRANSMISSION SHIELD™


TRANSMISSION SHIELD™

### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**TRANSMISSION SHIELD™** is the ultimate protection for the moving metal parts in your automatic and manual transmission. Utilizing the most Advanced Boundary Film (ABF) Technology, it protects moving metal parts from wear and damage due to boundary conditions of frictional abrasion, extreme pressure torque, dry startup and abrasive shutdown. Other benefits include smoother shifting, reduced friction and increased oil flow, reduced maintenance and downtime, extended transmission parts longevity and reduced operating temperatures an average of 30 to 50 Fahrenheit degrees.

ABF TECHNOLOGY™

### ATTRIBUTES

- Protects Moving Metal Parts
- Extends Parts Life
- Dramatically Reduces Wear
- Smoother Shifting
- Reduces Temperatures An Average Of 30 Fahrenheit Degrees
- Improves Lubrication
- Reduces Maintenance
- Reduces Friction
- Improves Oil Flow
- For Automatic And Manual Transmissions

## TRANSMISSION SHIELD™

ABF TECHNOLOGY

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226˚C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238˚C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25˚C
- Medium To Dark Amber

### PERFORMANCE

- Reduces Wear
- Increases Horsepower
- Reduces Costly Repairs
- Smoother Shifting
- Reduces Operating Temperatures
- Increases Fuel Savings
- Reduces Friction
- Improves Oil Flow
- Reduces Maintenance
- Increases Transmission Life
- Reduces Metal Debris In Oil
- Reduces Chain Stretching

TRANSMISSION SHIELD™

DIRECTIONS

Remove the dip stick and add one 8 ounce bottle of Transmission Shield™ through the fill tube. For larger transmissions, add 1 ounce per quart. For manual transmissions and differentials, add 2 ounces per quart for gear lube / oil. Use at every oil change for maximum performance. Contains no volatiles or solvents. Contains synthetic hydrocarbons and advanced chemical additive technology. Non-toxic and environmentally friendly.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| TMS-MT-8 | 8-94630-00106-9 | Transmission Shield Metal Treatment - 8 oz. | 12 | 8.75"w x 8"l x 8"h | .33 | 7.50 | 25/7 |

# 23. TRUCK-SHIELD

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD TECHNOLOGIES

TRUCK SHIELD™

REDUCES FUEL CONSUMPTION

TRUCK SHIELD™


### ATTRIBUTES

- Lower Fuel Consumption
- Practical Elimination of Metal-To-Metal Wear (Dry-Start Prevention)
- Reduces Maintenance and Downtime
- Smoother and Quieter Operation
- Reduces Operating Temperatures
- Extends Parts Life and Truck Component Reliability

### Setting The Standards In Extreme Pressure & Anti-Wear Through ABF Technology

**TRUCK SHIELD™** is the ultimate protection for the moving metal parts for trucks. Utilizing the Advanced Boundary Film (**ABF**)Technology, it protects moving metal parts from wear and damage due to boundary conditions of frictional abrasion and extreme pressure. Other benefits are increased fuel savings, increased performance, reduced maintenance costs and downtime due to lowering operating temperatures that extends component life from light trucks to heavy trucks and equipment.

ABF TECHNOLOGY

www.steelshieldtech.com

## TRUCK SHIELD™

ABF TECHNOLOGY

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226˚C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238˚C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25˚C
- Medium To Dark Amber

### PERFORMANCE

- Reduces Wear
- Increases Horsepower
- Reduces Costly Repairs
- Reduces Operating Temperatures
- Increases Fuel Savings
- Reduces Friction
- Improves Oil Flow
- Reduces Maintenance
- Increases Engine Life
- Reduces Metal Debris In Oil

### DIRECTIONS

*Diesel and Gasoline Engines:* Add 2 oz. per quart of oil initially; 1 - 2 oz. per quart of oil every oil change.
*Automatic Transmissions:* Add 1 oz. per quart automatic transmission fluid
*Manual Transmissions & Differentials:* Add 2 oz. per quart of gear lube / fluid.
*Hydraulics:* Add 1 oz. per quart of fluid.
*Power Steering:* Add 1 oz. per quart of fluid.
Contains synthetic hydrocarbons and advanced chemical additive technology. Non-toxic and environmentally friendly.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| TRK-MT-32 | 8-94630-00168-7 | Truck Shield Metal Treatment - 32 oz. | 12 | 9.75"w x 9.5"h x 13.25"l | .71 | 28.80 | 12/5 |
| TRK-MT-128 | 8-94630-00169-4 | Truck Shield Metal Treatment - 1 Gallon | 4 | 9.5"w x 12.5"h x 14.5"l | .99 | 33.60 | 12/4 |
| TRK-MT-5G | 8-94630-00170-0 | Truck Shield Metal Treatment - 5 Gallon | 1 | | | 45.00 | |
| TRK-MT-15G | 8-94630-00119-9 | Truck Shield Metal Treatment - 15 Gallon | 1 | | | 133.00 | |
| TRK-MT-55G | 8-94630-00158-8 | Truck Shield Metal Treatment - 55 Gallon | 1 | | | 485.00 | |

ABF TECHNOLOGY

Not Just Oil... IT'S TECHNOLOGY

MADE IN U.S.A.

# 24. SPRAY-SHIELD

SPRAY SHIELD™

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD™ TECHNOLOGIES


SPRAY SHIELD™

### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**SPRAY SHIELD™** is the ultimate multi-purpose lubricant that also penetrates metal surfaces while maintaining highest qualities in corrosive and extreme humidity environments. **SPRAY SHIELD™** 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.

ABF TECHNOLOGY™

### ATTRIBUTES

- Offers Quick, Long-Lasting Lubrication
- Provides Protection Against Rust & Corrosion
- Creeps Into Remote, Inaccessible Areas
- Provides Free-Flowing Protection
- Penetrates To Loosen Seized & Corroded Metal Mechanisms

SPRAY SHIELD™

## SPRAY SHIELD™

ABF TECHNOLOGY™

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226°C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238°C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25°C
- Medium To Dark Amber

### RECOMMENDED USES

- Metal Mechanisms
- Metal-To-Metal Surfaces
- Chain Drives
- Open Gears
- Drag Lines
- Steel Cables
- Bushings
- Couplings
- Pulleys
- Linkages
- Hinges
- Wheels
- Tools
- Augers
- Sleeve Bearings
- 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.

### 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.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| SS-1 | 8-94630-00146-5 | Spray Shield Metal Treatment - 1 oz. | 24 | 6.875"W x 4.625"D x 3.875"H | .07 | 2.5 | 48/12 |
| SS-4 | 8-94630-00148-9 | Spray Shield Metal Treatment - 4 oz. | 12 | 5.5"W x 7.125"D x 7.0"H | .16 | 3.8 | 40/8 |
| SS-16 | 8-94630-00149-6 | Spray Shield Metal Treatment - 16 oz. | 12 | 10.75"W x 8.0"D x 10.75"H | .54 | 15.0 | 20/5 |
| SS-128 | 8-94630-00150-2 | Spray Shield Metal Treatment - 1 Gallon | 4 | 9.25"W x 14.5"D x 12.5"H | .97 | 34.0 | 12/4 |
| SS-5G | 8-94630-00129-8 | Spray Shield Metal Treatment - 5 Gallon | 1 | | | 42 | |
| SS-15G | 8-94630-00130-4 | Spray Shield Metal Treatment - 15 Gallon | 1 | | | 125 | |
| SS-55G | 8-94630-00150-2 | Spray Shield Metal Treatment - 55 Gallon | 1 | | | 455 | |

# 25. TOOL-SHIELD

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD TECHNOLOGIES


TOOL SHIELD™

### ATTRIBUTES

- Improves Tool Power & Performance
- Protects Moving Metal Parts
- Repels Air Line Moisture
- Dramatically Reduces Metal-To-Metal Wear
- Stops & Inhibits Rust
- Cleans & Removes Internal Dirt
- Extends Tool Life
- Smooths Tool Operation
- Lubricates, Cleans & Protects

### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**TOOL SHIELD™** is the ultimate protection for the moving metal parts for automotive and industrial tools. Utilizing the most Advanced Boundary Film (ABF) Technology, it protects moving metal parts from heat, friction and 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. **TOOL SHIELD™** contains ABF (Advanced Boundary Film) for increased lubricity and boundary film lubrication.

ABF TECHNOLOGY

## TOOL SHIELD™

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226˚C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238˚C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25˚C
- Medium To Dark Amber

### RECOMMENDED USES

- Rotary-Type Air Tools
- Piston-Type Air Tools
- Impact Wrenches
- Air Ratchets
- Air Sanders
- Air Drills
- Air Cutting Tools
- Air Grinders
- Air Nailers
- Air Staplers
- Automatic Oilers
- Hand Tools

### DIRECTIONS

Use in accordance with tool manufacturer's 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.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| TS-1 | 8-94630-00141-0 | Tool Shield Metal Treatment - 1 oz. | 24 | 6.875'w x 4.625'D x 3.875'H | .07 | 2.5 | 48/12 |
| TS-4 | 8-94630-00143-4 | Tool Shield Metal Treatment - 4 oz. | 12 | 5.5'w x 7.125'D x 6.5'H | .16 | 3.8 | 40/8 |
| TS-16 | 8-94630-00144-1 | Tool Shield Metal Treatment - 16 oz. | 12 | 10.75'w x 8.0'D x 10.75'H | .54 | 15.0 | 20/5 |
| TS-128 | 8-94630-00145-8 | Tool Shield Metal Treatment - 1 Gallon | 4 | 9.25'w x 14.5'D x 12.5'H | .97 | 34.0 | 12/4 |
| TS-5G | 8-94630-00126-7 | Tool Shield Metal Treatment - 5 Gallon | 1 | | | 42 | |
| TS-15G | 8-94630-00127-4 | Tool Shield Metal Treatment - 15 Gallon | 1 | | | 125 | |
| TS-55G | 8-94630-00128-1 | Tool Shield Metal Treatment - 55 Gallon | 1 | | | 455 | |

# 26. STRIKE-SHIELD

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD TECHNOLOGIES


STRIKE SHIELD™

### ATTRIBUTES

- Offers Extremely Fast Penetration and Lubrication into Remote Rusted /Corroded Areas Especially For Industrial and Marine Applications That Have Seized Metal Mechanisms
- Provides a Quick Durable Long Lasting Lubricating Film to A Variety of Different Areas Including Mechanisms In Extreme Salt Water Environments
- Inhibits Rust and Oxidation on Metal Contacts and Surfaces In All Weather Conditions
- Maximum Performance as a Moisture Displacement on Wet Electrical Switches/Boards and Electronic Systems
- Helps Start Damp Engines By Dispersing Moisture On Ignition Wires And Electrical Systems
- Protects Circuit Boards From Corrosion In All Weather Conditions Including Salt Spray
- Repels Dirt and Dust Build-Up
- Mild and Pleasant Fragrance

STRIKE SHIELD™

### Setting The Standards In Extreme Pressure & Anti-Wear Through ABF Technology

STRIKE SHIELD™ is the ultimate penetrant to rapidly pierce rusted and corroded metal surfaces using a distinctive spreading action to break lose 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. STRIKE SHIELD™ leaves a unique layer of film on surfaces that helps prevent 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. STRIKE SHIELD™ delivers an all in one product that is a fast acting penetrant, extremely durable lubricant and long-lasting rust and corrosion protectant even in tough industrial and harsh salt water environments.

ABF TECHNOLOGY™

www.steelshieldtech.com

## STRIKE SHIELD™

ABF TECHNOLOGY™

Steel Shield Technologies' mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield**'s characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 61˚C PMCC
- Synthetic Hydrocarbons
- Non-Hazardous
- Combustible

### PHYSICAL DATA

- Boiling Point : 186-201˚C
- Evaporation Rate : <0.01
- Specific Gravity : 1.02
- Vapor Pressure : <1@25˚C
- Light to Dark Amber

### RECOMMENDED USES

- Frozen or Scaled Nuts and Bolts
- Sticky Locks
- Squeaky Hinges
- Sliding Doors
- Wheels
- Conveyors
- Cables
- Linkages
- Shafts
- Bushings
- Sliding Parts and Mechanisms
- Any Automotive, Marine, Farming, Industrial or Commercial Application That Requires a Fast Acting Penetrate, Lubricant and Moisture Displacement All Combined in One Product

### DIRECTIONS

**Apply Strike Shield™ on surfaces that require penetrating and lubricating oil. Reapplication may be necessary on extremely rusted and corroded conditions.**
**Demoisturant: Wipe excess moisture off of wires and contacts, spray Strike Shield™ on surfaces, and then wipe excess off with a clean dry cloth.**
**CAUTION: COMBUSTIBLE.** Do not store or expose to temperatures above 140°F. When used on electrical systems, make sure electrical system is not live or energized. Contains petroleum aliphatic hydrocarbons. Do not spray near sparks or open flames. If swallowed, do not induce vomiting. Call a physician immediately. Use with adequate ventilation. Avoid breathing of vapor and prolonged contact with skin. Deliberate inhalation of the contents can be harmful or fatal. In case of contact with eyes, flush thoroughly with water.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| STKS-4WS | 8-94630-00104-5 | Strike Shield Penetrating Oil - 4 oz. | 12 | 6.625"w x 5.0"D x 7.0"H | .13 | 4.0 | 56/7 |
| STKS-16WS | 8-94630-00105-2 | Strike Shield Penetrating Oil - 16 oz. | 12 | 10.125"w x 7.625"D x 10.0"H | .44 | 14.0 | 20/5 |
| STKS-128 | 8-94630-00109-0 | Strike Shield Penetrating Oil - 1 Gallon | 4 | 15.625"w x 8.125"D x 11.875"H | .87 | 33.5 | 12/4 |
| STKS-5G | | Strike Shield Penetrating Oil - 5 Gallon | 1 | | | 42.5 | |
| STKS-15G | | Strike Shield Penetrating Oil - 15 Gallon | 1 | | | 126.5 | |
| STKS-55G | | Strike Shield Penetrating Oil - 55 Gallon | 1 | | | 461.0 | |

ABF TECHNOLOGY™
Not Just Oil... IT'S TECHNOLOGY

MADE IN U.S.A.

# 27. DRILL & TAP

## The Ultimate Protection Against Metal-To-Metal Wear

STEEL SHIELD™ TECHNOLOGIES

DRILL & TAP SHIELD™


DRILL & TAP SHIELD™

### Setting The Standards In Anti-Wear & Extreme Pressure Through ABF Technology

**DRILL & TAP SHIELD™** is the ultimate protection for metal working tools. Utilizing the most Advanced Boundary Film (ABF) Technology, it protects cutting tools from heat, friction and wear. It works by the application of multiple metal working technologies that include ionic bonding agents, metal film strength reducers and lubricity enhancement agents. This, along with unique extreme-pressure additives and the addition of ABF (Advanced Boundary Film) Technology, produces proven results that surpass all other products in the marketplace.

ABF TECHNOLOGY™

### ATTRIBUTES

- Extends Cutting, Drilling, Tapping & Machine Tool Life
- Reduces Tool Head & Metal Surface Temperatures
- Increases Cutting Speeds
- Increases Cutting Feed Rates
- Increases Production Rates
- Produces Smoother & Finer Metal Surfaces
- Provides More Metal Extraction Per Cut

## DRILL & TAP SHIELD™

ABF TECHNOLOGY™

**Steel Shield Technologies'** mechanism of operation is based upon advanced methods of Tribology that improve lubricity and load carrying capacity. This, in turn, improves surface characteristics while simultaneously creating a stable chemical **Advanced Boundary Film** on the contacting metal surfaces of whatever equipment in which it is added. The process of **Advanced Boundary Film** formation is achieved through a unique combination of long-chain halogenated hydrocarbons and other proprietary additives that are highly stable and non-corrosive to the equipment's metal parts, and pose no threat to the environment or waste oil recovery systems. **Steel Shield** reacts chemically, under thermal conditions with the contacting metal surfaces, to form a complex surface-attaching film of protection. **Steel Shield's** characteristics are "electro-negative", which causes it to seek out and affix itself to the metallic surface areas. During this process, surface smoothing is accomplished, resulting in improved spread characteristics of the surfaces themselves. The final state of the opposing metal surfaces increases the fluid film strength even more, resulting in greatly reduced wear while imparting extreme pressure (EP) properties to the opposing metal surfaces. The result is a virtual elimination of frictional wear and significant cooling of the entire lubricated area yielding higher energy savings and reduced metallic debris and acids in the oil. This is extensively proven through elemental oil analysis and Ferrography of the used oil, before and after the use of **Steel Shield's Advanced Boundary Film Technology.**

### MSDS DATA

- Flash Point : 226˚C
- Non-Hazardous
- Non-Flammable
- Synthetic Hydrocarbons

### PHYSICAL DATA

- Boiling Point : 238˚C
- Evaporation Rate : < 0.01
- Specific Gravity : 1.07
- Insoluble In Water
- Vapor Pressure : <1@25˚C
- Medium To Dark Amber

### RECOMMENDED USES

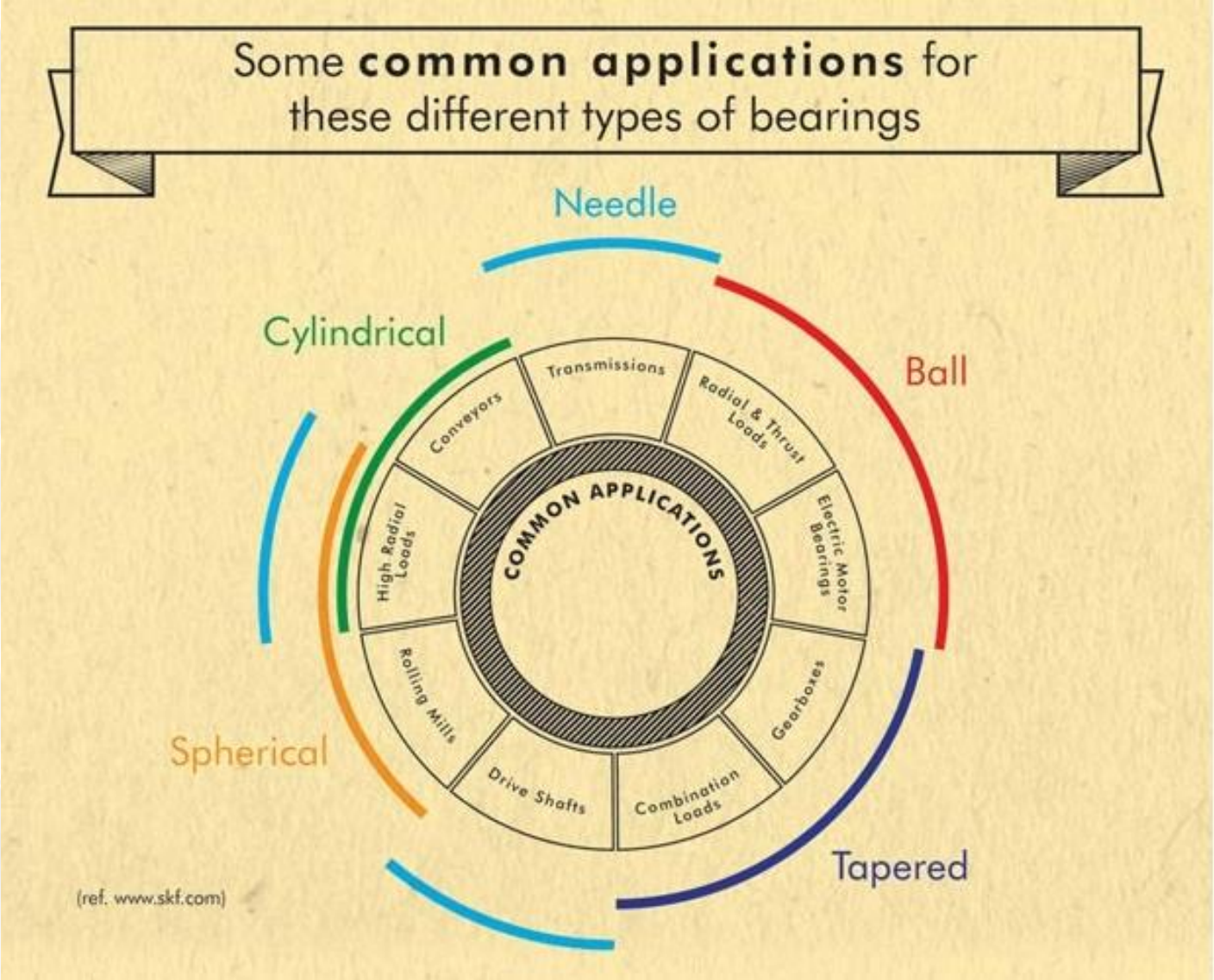
- Direct Cutting Lube/Coolant
- Additive To Improve Performance Of Insoluble Oils
- Drilling
- Tapping
- Machining
- Cutting
- Milling
- CNC
- Broaching
- Sharpening
- Wet Grinding

### 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.

| ITEM NUMBER | ITEM UPC# | ITEM DESCRIPTION | CASE PACK | CASE DIMENSIONS | CASE CUBE | CASE WEIGHT | TI/HI |
|---|---|---|---|---|---|---|---|
| DTS-1 | 8-94630-00171-7 | Drill & Tap Shield Metal Treatment - 1 oz. | 24 | 6.875'w x 4.625'D x 3.875'H | .07 | 2.5 | 48/12 |
| DTS-4 | 8-94630-00172-4 | Drill & Tap ShieldMetal Treatment - 4 oz. | 12 | 5.5'w x 7.125'D x 7.0'H | .16 | 3.8 | 40/8 |
| DTS-16 | 8-94630-00173-1 | Drill & Tap Shield Metal Treatment - 16 oz. | 12 | 10.75'w x 8.0'D x 10.75'H | .54 | 15.0 | 20/5 |
| DTS-128 | 8-94630-00174-8 | Drill & Tap Shield Metal Treatment - 1 Gallon | 4 | 9.25'w x 14.5'D x 12.5'H | .97 | 34.0 | 12/4 |
| DTS-5G | 8-94630-00175-5 | Drill & Tap Shield Metal Treatment - 5 Gallon | 1 | | | 42 | |
| DTS-15G | 8-94630-00176-2 | Drill & Tap Shield Metal Treatment - 15 Gallon | 1 | | | 125 | |
| DTS-55G | 8-94630-00177-9 | Drill & Tap Shield Metal Treatment - 55 Gallon | 1 | | | 455 | |

# 28. GREASE APPLICATIONS OF BEARINGS



# 28. GREASE APPLICATIONS OF BEARINGS

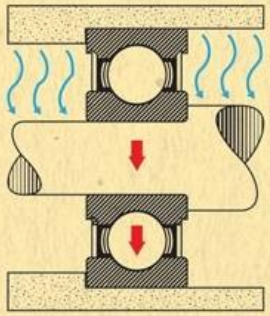
## *Remember*, bearing type affects **grease life**.

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**.



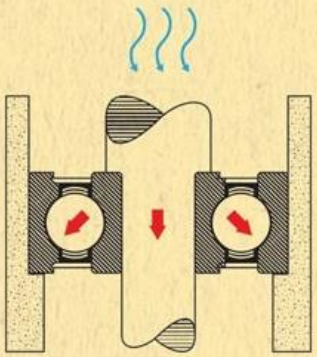
**RADIAL LOAD**

When the load is perpendicular to the shaft due to

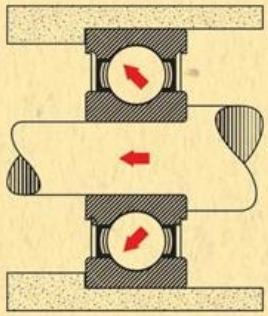
GRAVITY

**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)

# 28. 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.

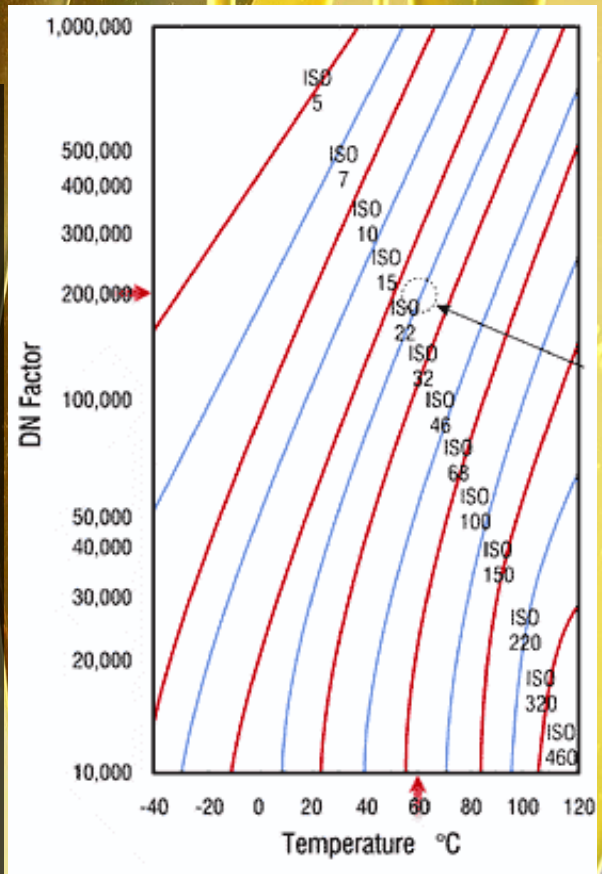



Figure 1

# 28. 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

# 28. 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<br>75,00 - 150,000<br>150,000 - 300,000 | 1<br>2<br>2 |
| **0 to 150°F** | 0 - 75,000<br>75,00 - 150,000<br>150,000 - 300,000 | 2<br>2<br>3 |
| **100 to 275°F** | 0 - 75,000<br>75,00 - 150,000<br>150,000 - 300,000 | 2<br>3<br>3 |

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

# 28. 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.

# 29. SwRI Grease TEST REPORTS

## STEEL SHIELD LARGELY OUTPERFORMS REPUTED GREASES MADE BY YAMAMOTO AND ATLAS

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[illegible]atomo EP grease" [illegible]herefore, sample is co[illegible]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[illegible] scope of the method".

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[illegible]enefiting government, Industry and the public through Inno[illegible]

Steel Shield Lithi Shield


| 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 | LNSL | 80 | 63 | 50 |

# 30. SwRI Motor Oil TEST REPORTS

## ASTM D2783 FOUR-BALL METHOD TEST REPORTS - ORIGINAL DOCUMENTS

SOUTHWEST RESEARCH INSTITUTE®

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

July 1, 2013

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

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

Dear Mr. Fennell:

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

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

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

Sincerely,

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

OMRRAGA13 68584
Page 2 of 2

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

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

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

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OMRRAGA13 68584
Page 2 of 2

# 31. World Wide Product Liability Insurance and Confirmation of NO 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.

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PRODUCER
Best Insurance Agency
340 S. Main St., P.O. Box 670
Butler PA 16003-0670

CONTACT NAME: Jamie McDonald
PHONE (AC, No, Ext): (724)283-5670 FAX (AC, 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<br>X COMMERCIAL GENERAL LIABILITY<br>CLAIMS-MADE X OCCUR<br>GEN'L AGGREGATE LIMIT APPLIES PER:<br>X POLICY PRO-JECT LOC | | | ENP04242014 | 4/24/2014 | 4/24/2015 | EACH OCCURRENCE | $ 1,000,000 |
| | | | | | | | DAMAGE TO RENTED PREMISES (Ea occurrence) | $ 100,000 |
| | | | | | | | MED EXP (Any one person) | $ 5,000 |
| | | | | | | | PERSONAL & ADV INJURY | $ 1,000,000 |
| | | | | | | | GENERAL AGGREGATE | $ 2,000,000 |
| | | | | | | | PRODUCTS - COMP/OP AGG | $ 2,000,000 |
| | | | | | | | | $ |
| | AUTOMOBILE LIABILITY<br>ANY AUTO<br>ALL OWNED AUTOS<br>SCHEDULED AUTOS<br>HIRED AUTOS<br>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<br>EXCESS LIAB CLAIMS-MADE<br>DED RETENTION $ | | | ENP04242014 | 4/24/2014 | 4/24/2015 | EACH OCCURRENCE | $ 1,000,000 |
| | | | | | | | AGGREGATE | $ |
| | | | | | | | | $ |
| | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY<br>ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N (Mandatory in NH)<br>If yes, describe under DESCRIPTION OF OPERATIONS below | N / A | | | | | 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 101, Additional Remarks Schedule, if more space is required)

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 (2010/05)-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

**Confirmation of No Insurance Claim**

# 32. Testimonials

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

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

# 33. Testimonials

## 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.

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

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

# 34. MAJOR CUSTOMERS


US ARMY


SIEMENS


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

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

# 34. 60th MACAU GRAND PRIX SPONSORSHIP AND OTHER ACTIVITIES HIGHLIGHTS

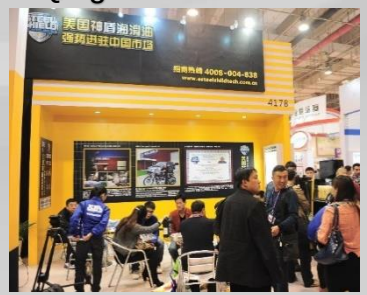
61th Macau Grand Prix 〈2014〉

Hong Kong Motorcycle Festival

3 hours motorcycle race in


Lubricant Exhibition in Guangzhou

Qingdao Exhibition



Chongqing Exhibition

# 35. Contact us

## STEEL SHIELD TECHNOLOGIES

Company Address：
Workshop 9, 8th/Floor, Goodview Industrial Building,
No.11 Kin Fat Street, Tuen Mun, HK
Tel：+852 2545 8029
Fax：+852 2545 8030
Email： steelshieldtech@yahoo.com
Website：www.steelshieldtech.com.hk
Facebook: www.facebook.com/steelshieldtech
Weibo：www.weibo.com/steelshield

Not Just Oil... IT'S TECHNOLOGY

Confidence Guarantee

***Produce of USA***

***Singapore & Hong Kong***