



Engine & Driveline Treatment

Revision 2008-07-23



Product information and test results for Green Performance Engine and Drive Train Treatment.
7/21/2008

What is Green Perform™ Engine & Driveline Treatment

First of all, I would like to explain how Metal Conditioners work and why they are such a great asset to daily operations of engines, gearboxes and hydraulic systems. Motor oils, transmission fluids, hydraulic Oils and gear oils are flowing lubricants that provide a film barrier between metal surfaces pressing or rubbing together. It is recognized that the greater the film strength, or EP rating, the better the oil and or lubricant. However, in extreme pressure metal-to-metal areas, the film strength of oil is seriously thinned and is often completely squeezed out due to clearances and sub-micron barriers that create heat and friction.

A quality Metal treatment is designed to interact with metal surfaces in a molecular and chemical process to create a protective buffer on the surface of the metal. This is not a film or coating over the metal. Molecules in the metal treatment are polarized and actually bond with the metal surface. The layer of Metal Treatment molecules is activated by extreme pressure and heat, meaning that the metal treatment performs best right where it is needed most! The result significantly reduces harmful friction and heat.

High oil temperatures accelerate oxidation of the engine oil and the formation of acids, peroxide, carbon residue, sludge and varnish formations. As oil temperature rises, oxidation takes place, the oil becomes increasingly corrosive, and oil viscosity decreases resulting in a loss of lubrication. Some metal conditioners help reduce heat so that the oil can maintain maximum protection, performance, and film strength.

It is important to know what your Metal Conditioner contains and what it does not contain such as harmful chemicals, Teflon's, Metal or Plastic Elements found in most of today's technologies.

PTFE's or Teflon - is a great product but not for an extreme pressure application such as an engine. However, metal-to-metal contact can cause flakes that are not a safe option for engines applications. Be careful with products based on this technology. Clogging of essential filters and lubrication flow can become a serious problem. PTFE resins can leave harmful deposits and residue. Solid particles also break down with heat rather than helping reduce temperatures.

Unstable chlorinated-paraffin ("CP") - presents the potential for corrosion when heated. Chlorinated Paraffin lubrication is very effective, but in the heated conditions of an engine, the short-chain molecular properties (C10/C13) can break down, forming hydrochloric acids which in return mix with the engine oil creating pitting, corrosion and oxidized metals.

Solvents - can also be known as lubricants. They generally contain mineral oils, which decrease the viscosity of the flowing lubricant. Solvents may be cleaners, and a cleaner engine offers some improvement in performance, but solvents or cleaners do not provide lubrication protection and or film strength (EP additives) and can change the viscosity of the motor or gear oil. More importantly solvents breakdown lubricity and can cause heat.

Viscosity Stabilizers - sometimes replacing a gallon or more of oil does not contain the essential additive packages in today's premium motor oils and are actually robbing the engine of those cleaning and anti-

oxidant benefits. Although these stabilizers are a great option for reducing oil consumption, they can cause damage if changing the physical properties of the engine oil.

Boron, Zinc, and Graphite technologies - do not provide extreme pressure friction protection. They break down rather than provide protection from harmful heat and can introduce harmful solid particles into the lubrication system of the engine.

The difference between Green Perform™ Engine & Driveline Treatment and other Products

Many products on the market place are synthetic reagent with reactive ions targeted toward ferrous-based metals. Their action is through carbon diffusion of ionic atoms into ferrous atomic spacing. They work by using short-chains molecule structure (C10-C13) even bonded, to achieve its final results of treating the metal.

During their reactive cycle the load zone of ferrous based metals is affected in direct proportion to the amount of Time (T)x Heat (H)x Pressure (P) derived in any given friction/ferrous environment.

Although there are many Metal Treatments on the market today, technology has come a long way in the last 3 years and some new advances have risen to achieve optimal results without reducing reliability. Most products have no additive packs or detergent packs of any sort. Most Metal Treatments have 5 main properties in their physical makeup; none of these properties are the same physical properties as engine, gear or hydraulic oils. Current lab testing results show that when adding Chlorinated Paraffin or Chlorinated Olefins to a base engine oil, no physical damage will occur, but chemical makeup of the oil will change allowing OEM specs of Phosphorus, Zinc, Magnesium, Calcium and other important detergents to be reduced by volume, which in return will not pass OEM factory specs. Also these types of additives can cause acid formations which in return, cause internal component damage and pitting.

A new formulation has come into play called Green Perform™ Engine & Driveline Treatment (Metal Treatment) which is designed using medium to long chain molecule structures (C14-C17) double bonded, to achieve better results than its predecessors on the market place. Green Perform™ Engine & Driveline Treatment has added stabilizing anti-oxidant formulation and very unique metal deactivators to assure that Green Perform™ Engine & Driveline Treatment performs well in engine applications and gear oil applications - not changing the chemical make-up of the oil that the Green Perform™ Engine & Driveline Treatment is being added to. The oil acts like a delivery truck carrying the Green Perform™ Engine & Driveline Treatment to the asperities of the metals and forming a covalent, galvanic bond to the metal allowing a 5 to 8 micron penetration into the metal, creating a smooth-less friction absorbing metal.

Green Perform™ Engine & Driveline Treatment does not layer the metal or put a film over the top of the metal, Green Perform™ Engine & Driveline Treatment penetrates into the metal working with ferrous particulates within the oils environment, treating the metal, not the oil.

Green Perform™ Engine & Driveline Treatment has been ASTM tested and also independently tested to assure our product works

With over 20 ASTM and SAE tests being performed on Green Perform™ Engine (& Drive Train Treatment), end users in the Automotive, Trucking, Mining, Marine and Rail industry can be assured that Green Perform™ Engine & Driveline Treatment is working hard to reduce down time maintenance.



ENGINE & DRIVELINE TREATMENT

www.greenperform.com/engine

Rev. 2008-07-23

Utilized in today's extreme work environment, Green Perform™ Engine & Driveline Treatment has been used in Diesel Engine applications, Gasoline Engine applications as well as gear box and manual transmissions. Reducing frictions means reducing heat, so that you will see more productive equipment with less chance for a mechanical failure.

Call us today to find a distributor near you, so you can start saving money on your equipment today.

Mix Ratio for Green Perform™ Engine & Driveline Treatment

Oil Gallons	Oil Quarts	Green Perform Gallons	Green Perform Ounces
	1		1.5
1	4		6
1.5	6		9
2	8		12
4	16		24
5	20	1.00	30
6	24	1.00	36
7	28	1.50	42
8	32	1.50	48
9	36	1.75	54
10	40	2.00	60
11	44	2.00	66
12	48	2.25	72
13	52	2.50	78
14	56	3.00	84
15	60	3.25	90

Metric Conversion: 5.6 liters of oil, use 266 ml of Green Perform

41 liters of oil, use 1892 ml or 1.9 liters of Green Perform

Note: For Manual Transmissions and Differential

Change Gear Oil and add to Unit at same ratio above

Warning:

1) Do not use in Automatic Transmissions

2) If you have previously used a metal conditioner, drain and replace lubricating fluid before adding Green Perform™ Engine Treatment.

3) Do not over treat.



CERTIFICATE OF ANALYSIS

CLIENT

Green Performance Systems, Inc
2492 Cedar Creek Rd
Ayr, ON N0B 2E0
Canada

PRODUCT: Green Perform
Engine & Drive Train Treatment
MARKS: NONE
DATE RECEIVED: 02/11/2008
LAB NO: HH0410-1202-P
SUBMITTED BY: Manufacturer

METHOD	TEST PROCEDURE	RESULT	SPECIFICATIONS	
			MIN.	MAX.
D-130	Copper Corrosion	1 b	1 a	4 d
D-92	Flash Point, °C/F	370/698	XXX	XXX
D-892	Foaming Tendency, Sequence I	XXX	XXX	XXX
	Foam Volume, mL, @ the end of 5-min blowing period		20	Pass
	Foaming Volume, mL, @ the end of 10-min settling period		0	Pass
D-4172	Four Ball-Wear, mm (w/mineral oil)	0.64	XXX	XXX
D-5800	Noack Volatility, wt. %	6.2	XXX	XXX
D-97	Pour Point, °C	- 31	XXX	XXX
D-2272	Rotating Bomb Oxidation, minutes	15	1	60
D-665	Rust Prevention (Pass or Fail)	Pass	Pass	Pass
D-445	Viscosity, cSt @ 100 °C	8.07	XXX	XXX
Ethyl	Lead Corrosion, 2% solution, ppm	13	10	30
	Copper Corrosion, 10% solution, ppm	< 1	1	20
D-4929-07	Chlorine % In Hydrocarbon Lubricant	0.00%	XXX	XXX
D-2896	Base Number of Petroleum "TBN"	6.3	XXX	XXX
SAE-J2643	Effects on Vulcanized Rubbers "Volume Change"	1.6%	1%	5%



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METHOD	TEST	RESULT
D-3233	Falex Pin & V-Block 4,500 lb Gauge Pre-Heat to 120 °F	Unable to attain load load 4,500 lb. load

Load, lbs	Starting Torque	Final Torque	Comments
300 lbs @ 3 min	5 lb - in	7 lb - in	
500 lbs @ 1 min	10 lb - in	10 lb - in	
750 lbs @ 1 min	13 lb - in	13 lb - in	
1,000 lbs @ 1 min	16 lb - in	16 lb - in	
1,250 lbs @ 1 min	20 lb - in	20 lb - in	
1,500 lbs @ 1 min	22 lb - in	23 lb - in	
1,750 lbs @ 1 min	28 lb - in	29 lb - in	
2,000 lbs @ 1 min	30 lb - in	31 lb - in	
2,250 lbs @ 1 min	32 lb - in	33 lb - in	
2,500 lbs @ 1 min	34 lb - in	35 lb - in	
2,750 lbs @ 1 min	36 lb - in	36 lb - in	very slight loss of load
3,000 lbs @ 1 min	38 lb - in	37 lb - in	very slight loss of load
3,250 lbs @ 1 min	42 lb - in	41 lb - in	
3,500 lbs @ 1 min	46 lb - in	45 lb - in	
3,750 lbs @ 1 min	49 lb - in	52 lb - in	slight loss of load
4,000 lbs @ 1 min	54 lb - in	56 lb - in	slight loss of load
4,250 lbs @ 1 min	57 lb - in	57 lb - in	loss of load

Comments:

"This product is a great metal conditioning product. It will allow for less ferrous wear and higher load rates to be added to lubricating oil in a stand-alone option. A very user-friendly product.

Amos Mwangi

CHEMIST

Date issued:
02/11/2008

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Green Perform Engine & Driveline Treatment
Chemical Name: Oil, n.o.s. CAS#: Mixture
Common Name: Petroleum oil

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

COMMON NAME	CHEMICAL NAME	CAS NO.	%
Distillates, petroleum, hydrotreated heavy naphthenic		64742-52-5	60-80
Antimony alkyldithiocarbamate		Confidential	10-20
Molybdenum Dialkyldithiophosphate		Confidential	10-20

Contains no other ingredients now known to be hazardous as defined by OSHA 29 CFR 1910.1000(z)

SECTION 3 HAZARD IDENTIFICATION

Principle Hazards: Prolonged or repeated skin contact may cause dermatitis. See section 11 for complete health hazard information.

Threshold Limits: The PEL (OSHA) and the TLV (ACGIH) is 5 mg/m³ for oil mists.

Primary Routes of Exposure:

- EYE** May cause eye irritation if splashed into eyes.
- SKIN** Repeated or prolonged contact with skin may cause irritation which may lead to various skin disorders. Avoid prolonged skin contact.
- INHALATION** Inhalation of vapor or oil mist from this product may cause mild irritation of the respiratory system. Use in well ventilated areas.
- ORAL** Ingestion may cause nausea, diarrhea and stomach discomfort.

SECTION 4 FIRST AID MEASURES

ORAL DO NOT INDUCE VOMITING. If conscious, give 2 glasses of water. Get immediate medical attention.

EYE Flush with water at least 15 minutes. Get medical attention if eye irritation develops or persists.

SKIN Wash immediately with soap and water. Remove soiled clothing. Get medical attention if irritation develops. Launder contaminated clothing.

INHALATION Remove exposed person to fresh air. If breathing is labored, administer oxygen and obtain immediate medical attention. If irritation persists or if toxic symptoms are observed, get medical attention.

SECTION 5 FIRE FIGHTING MEASURES

Note: The complete MSDS is available in separate document.