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NEWSLETTER OF THE INSTITION OF DIAGNOTSIC ENGINEERS – MAY/JUNE 1997

1. LIQUID MAINTENANCE The Ultimate Friction Reducing Eliminator

Over 20 years in the offshore oil industry has exposed the author to many failures of both heavy and light equipment, unscheduled overhauls and the permanent problems of corrosion due to the salt water environment. Most engineers or mechanics continually wished they had the miracle cure that could allow equipment to run smoother, more efficiently, and for longer hours before they were expected to perform major surgery again.

The accountants that control how much financial assistance this machinery can be given in a given period, believe that this wish, is actually reality, the financial assistance is reduce as the equipment gets older. More lines are added to the engineers or mechanics job description, and the problem is solved.

Introducing new products that could help the engineer's or mechanics which become closer to reality are the majority of the time extremely hard to have accepted by a system set in its ways.

The Super Lubricant exists and has existed for a number of years, and has been tested by a variety of industries around various parts of the globe with results that are conclusive, in a complete variety of applications.

The Lubricant is the result of re-engineered hydrocarbon molecules, simply added to oil, these tiny molecules impregnate interior surfaces, smooth out any roughness and creates a durable substrate film which almost eliminates frictional drag and wear, up to and beyond the limits of standard industrial tests. A favourable side effect, when this is introduced into an engine the fuel consumption can be reduced by up to 10% and emissions are also reduced.

Polytetrafloeraethylenes, PTFE's/Teflon or Molybdenum Disulphide are not present in the lubricant at all, so its heat reactive molecules leave no sediment or clogging agents. They assimilate with any oils including synthetics, and rapidly migrate onto friction faces to provide stable lubrication wet or dry. Surface wear reduction is as high as 90%.!

2. Examples of Proven Use

A Formula 2 team competing for the Championships experienced a major problem with the drive shaft for the pressurized oil system in the Hewland gear box. Unable to obtain a spare in time for the race, the shaft was welded and the gearbox liberally treated with ZX1. The shaft sheared again after the first lap, which meant no oil was in face being circulated around the gearbox, the car continued for the remaining 44 laps and won the race. As all the teams were aware of this particular problem, ZX1 was a much discussed product by all teams after the race concluded.

As steel container secured with a standard well known brand of padlock, had been shipped ashore and stored by the sea for a period. The key almost off twisted to unlock this lock. A request was placed for a set of bolt cutter to remove the lock, a can of this lubricant was delivered instead, and we spray it into the key slot on the padlock, counted t ten and opened the padlock normally with the key.

Two engine ton shackles being used to secure equipment had been in the same location for eight years. Believing they would have to be cut off, an attempt was made to remove the pins. Three men with a cheater pipe on a wrench were unable to move it. The spray lubricant was applied and after ten minutes, one man removed both shackle pins with a two foot bar.

A European Air Force had a major problem with helicopter gearboxes, overheating to the point where they could not be certified for use. This Super Lubricant was added to the gearboxes of the helicopters, the overheating problem was overcome, and the gearboxes were certified.

A well known brand of tarmac laying machine, which normally requires major overhauls after 4 months due to excessive temperatures on major bearings (up to 200 degrees C) the introductions of the Super lubricant Grease, has increase this by 6 months to 10 months between overhauls.

A Knitting machine, after being lubricated with a well know 3 in 1 oil, had to be cleaned of fibres from the carriage, and re-lubricated, after every 4 jumpers were produced. After introducing and using the Super Lubricant, this machine has not produced 32 jumpers without needing to be cleaned and re-lubricated.

Extralube ZX1™ is not an oil additive; it is classified as a Mono Molecular Surface Modifier, The oil it is added to, is merely used as a transporting agent, which allows the ExtralubeZX1™ to form a substrate film on the metal parts, a film which is approximately 1 micron thick. If a compete accurate, surface area of an engine for example could be determined, and that amount of ExtralubeZX1™ added to the oil to form a 1 micron film on this surface after the engine was operated for ten to fifteen minutes, no more ExtralubeZX1™ would be active in the engine oil.

ZX1 can be used on all types of equipment, with the exception f metal to metal surfaces which require friction to operate as designed e.g. older types of automatic transmissions.

Over the years many solutions, additives and sprays have been place on the world market claiming to perform all types of miracles with fuel economy, added engine life, cooler operating temperatures, but to name a few. However, none of these have become worldwide household

names, and performances never seemed to match the claims quoted by the advertising campaigns. On today's market the following are similar mono molecular products with similar claims:

Activ8, 1XL, Megalube, MBL Premix, FX-1, Lube-SFR, Z-1R, Hyperform, Ac-90 and Duralube to name a few.

Sometimes ago simultaneous testing was carried in front of a team of journalists of twenty two similar products, not necessarily all of the above mentioned, ZX1 proved to be the top performer with Duralube being the closes performer.

There are three standard methods of testing for the above properties, and ExtralubeZX1™ its associated products have been tested, by all these standard tests.

The result of all these tests listed below, have proved with no doubt that this product offers exactly what it states.

1. ATSM D3233-73 Falex Method

SAMPLE IDENTITY	FAILURE LOAD (lbf)
Castrol RS	1250
Castrol RS + ExtralubeZX1™ 5%	3600

The Falex tests were carried out to standard procedure. This starts at 50° C then is elevated by the frictional work expended in the test. Obviously the longer the test goes on the higher the temperature becomes. So for the Castrol RS test the final temperature was 85-90 ° C, whilst the 5% test ExtralubeZX1™ temperature ended at 150 -175 °C.

2. IP 239/85 Dobson Method – Four Ball Machine

Sample	Initial Seizure Load (kg)	Weld Load (kg)	Average Load (kg)	Nearest Standard Load (KG)	Mean Hertz Load Use (kg)	Mean Hertz Load Determine (kg)
Castrol RS	126	450	288	250	225	50.28
Castrol RS + 5% ExtralubeZX1™	140	620	380	355	180	58.64

Below are the details of the wear scar measurements for the Mean Hertz load determination:

Sample	Compensatio	1	2	3	4	5	6	Ave	n

	n DIA at M.H.L. (mm)								
Castrol RS	0.61	3.45	3.2	2.69	2.73	2.60	3.59	3.04	0.2
Castrol RS + 5% ExtralubeZX1™	0.565	2.18	2.33	2.46	2.31	2.28	2.58	2.36	0.24

N= Compensation Diameter divided by the Average Wear Diameter (Ave)

The manufacturers were not completely contented with the results of these tests, although they definitely proved the advantage of introducing this oil any lubrication system, a further test was ordered using 100% Extralube ZX1™.

The result was exactly what had been hoped for:

Weld Load in Excess of 800 kg – no detectable weld at Machine Limit

Initial Seizure Load 70 kg

Mean Hertz Load Dobson 10^3.62

Friction and wear Test

Test Temperature 100 ° C

Test Load 180 kg

Typical Friction μ 0.09

Average Ball Scar Wear 1.08mm

Extralube ZX1 had in fact beaten the test and proved that in fact is the ultimate friction reducer.

3. Timken Lubricity Tester

The first test witnessed by the author, was the journal being in an oil bath containing well-known synthetic motor oil, the tester stalled when 55 ft/lbs was applied. The roller showed extensive wear, and the journal was badly scared. The oil bath was removed, a thin film of ExtralubeZX1™ was placed on the journal and the roller (mixed with the motor oil left on the parts)

A load of 55 ft/lbs was applied and the machine started and ran!!, the maximum loading of 150ft/lbs was applied, without stalling, shock loads being intermittently applied, also failed to stall the test machine. Wear on both the journal and the roller were seen to me minimal compared to the initial wear observed.

The second test witnessed by the author was done after the journal was cleaned with a strong solvent and emery paper. This is necessary to completely remove any trace of Extralube ZX1™, as this lubricant in fact adheres to the metal with amazing ease.

A well-known spray penetrate, was constantly sprayed on the journal whilst the test machine was rotating, the tester stalled once 30 ft/lbs of load was reached. The journal and the roller showed excessive wear. Extralube C60 Spray lube was then sprayed once onto the same surface, and the tester ran with the maximum loading of 150 ft/lbs being applied without stalling. Both the journal and the roller showed minimal wear compared to the initial test.

The test equipment was once again cleaned and the roller was lined up with the scoring on the journal caused by the initial test. Extralube ZX1™was applied and 40-50 ft/lbs was applied constantly to the scored area. After 5-10 minutes the scored area could not be seen to change from a rough surface to a somewhat polished area.

Although will not Extralube ZX1™ claim to repair any damage done, it is obvious that if this lubricant is added after minimal damage is done, the equipment involved would probably operate for a longer period, than if nothing had been added.

Countless tests have been performed using an array of lubricants that are readily available on the open market, all ending with similar results.

4. Toxicity Tests

Test	Method	Results
Total PCB content	GC-ECD	< 1 ppg
Dioxins (ppt)	GC-MS	Toxic equivalent value a maximum of 45°
Furans (ppt)	GC-MS	Toxic equivalent value a maximum of 45°
Phosphorous mg/kg	P.E.S	< 1 mg/kg
TEQ Value	Calculate d	53.3

To add some perspective to the results the typical dioxin equivalent of milk is 6ppt (TEQ), the committee on Toxicology recommends that the dioxin content of milk should not exceed 10ppt (TEQ). The dioxin content of garden soil falls typically within the range 1-20 ppt (TEQ).

Considering the presumed u e of this oil combination, the above results indicate no human health problem is likely to ensue.

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