

TEST REPORT & LUBRICITY TEST

The test is carried out by applying pressure with a torque wrench on to a test slug against a rotating test ring; whilst the test ring is partially immersed in a lubricant.

The corresponding friction between the test ring and the slug, indicated by a change in load of the drive motor, is a measurement of the lubricant's quality.

The wear scar formed on the test slug also provides a good visual indication, when compared with the datum, of the quality of the tested lubricant.

The object of the test is to determine the effect of pressure on the hardened steel slug with regards to friction and wear whilst using different combinations of base oils.

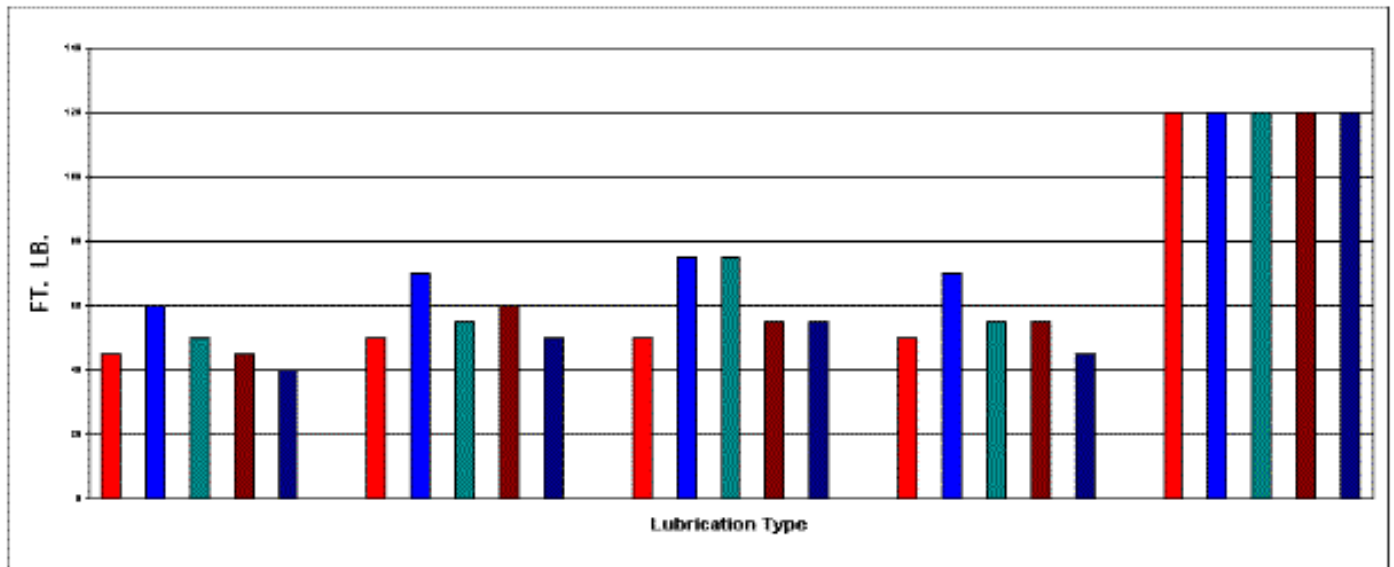
Test Ring & Test Slug:
Hardened Steel (Surface hardness 786 Vickers or 67 Rockwell approx.)
Ring Speed of:
350 rpm
Load Duration of:
10 seconds where possible

TEST BASE OILS:
Two 20/50W engine oils, Two EP 90 gear oils, and a fully synthetic 20/50W engine oil as reference fluids.
COMPARED WITH:
1) A neat alternative. 2) An additive package. 3) A comparison to other additives.

Lubricity Test Observations and Results

Pressure Applied Approx. 5Ft Lb Per Second						
Lubricant		Duration of Test	Wear Scar Length mm	Wear Scar Width mm	Pressure On Lubricant	
Base Oil	Additive				Breakdown	Seizure
Castro GTX	None	9 sec	6.25	2.75	40	45
Esso EP90	None	12 sec	5.50	2.50	55	60
Duckhams Hypo	None	10 sec	6.50	3.00	45	50
Esso Superlube	None	9 sec	6.90	3.10	40	45
Co-op 20/50	None	8 sec	7.40	3.20	35	40
Castro GTX	15% STP	12 sec	6.00	2.75	45	50
Esso EP90	15% STP	14 sec	5.25	2.25	65	70
Duckhams Hypo	15% STP	11 sec	5.50	3.00	50	55
Esso Superlube	15% STP	12 sec	5.75	2.90	55	60
Co-op 20/50	15% STP	10 sec	5.75	2.90	45	50
Castro GTX	15% Slick 50	10 sec	5.50	2.50	45	50

Esso EP90	15% Slick 50	15 sec	4.75	2.00	70	75
Duckhams Hypo	15% Slick 50	15 sec	4.75	2.00	70	75
Esso Superlube	15% Slick 50	11 sec	5.50	2.50	50	55
Co-op 20/50	15% Slick 50	11 sec	5.50	2.50	50	55
Castrol GTX	10% Molyslip	10 sec	6.00	2.75	45	50
Esso EP90	10% Molyslip	14 sec	5.25	2.25	65	70
Ducjhams Hypo	10% Molyslip	11 sec	5.50	3.00	50	55
Esso Superlube	10% Molyslip	11 sec	5.75	2.90	55	55
Co-op 20/50	10% Molyslip	10 sec	5.75	2.90	45	45
Castrol GTX	5% Activ8	60 sec	2.00	1.00	Not Reached	>120
Esso EP90	5% Activ8	60 sec	1.50	0.50	Not Reached	>120
Duckhams Hypo	5% Activ8	60 sec	2.00	1.00	Not Reached	>120
Esso Superlube	5% Activ8	60 sec	2.00	1.00	Not Reached	>120
Co-op 20/50	5% Activ8	60 sec	2.00	1.00	Not Reached	>120
Activ8 Neat	100%	60 sec	1.00	0.025	Not Reached	>120
Oil bath removed - Residual oil only		60 sec	1.50	0.05	Not Reached	>120
Component wiped dry		45 sec	2.00	1.00	Not Applicable	80



Note also that with Activ8 wiped dry no seizure occurred: only a stalling of the motor.

From the forgoing table and graph it can be seen that of all the standard and performance lubricants tested neat, only ACTIV8 Friction Reducer was able to withstand the 120 ft/lbs torque without any significant wear. It is also shown that even when ACTIV8 is added to normal engine oil in a very small ratio (1:20) the performance of the neat ACTIV8 can be reproduced. The difference between ACTIV8 and many off the shelf lubricant enhancers is that where they coat the metal parts in layers of uncontrolled thickness, ACTIV8 uses an active modifier that aided by the temperature produces a low friction molecular layer on the metal surface.

Also note that during the neat ACTIV8 tests, the excellent EP properties were also achieved : 1) When the lubrication tray was removed and only residual oil remained, and 2) When the residual oil was removed with a cloth. This would indicate that the molecular layer not only modifies the surface of the components but also penetrates just below the surface as well.

IN CONCLUSION: It can be seen that ACTIV8 Friction Reducer, due to it's unique operation, provides excellent extreme pressure properties not only when used neat but also when used in other base lubricants.

Date: 12th January 1993

MATERIAL SAFETY DATA

PRODUCT BRAND: **ACTIV8** Friction Reducer

Activ8 Lubricants Ltd.
 Millriggs Park
 Hightae
 DG11 1JL

SUPPLIED BY:

EMERGENCY PHONE: +44 (0) 1387811007

INTENDED USE: As a lubrication additive
PRODUCT COMPOSITION: Alkanes C14 - C17 Light Hydraulic oil Carrier 50/50

HAZARD IDENTIFICATION: Low Acute toxicity under normal conditions of handling and use. Slightly irritating to eyes. Repeated exposure to high levels may produce liver and kidney damage.

EXPOSURE ROUTE	SYMPTOM	TREATMENT
INHALATION	High concentrations may cause irritation.	Remove from exposure. Rest and in severe cases, or if recovery is not rapid, seek medical advice.
SKIN CONTACT	Prolonged or repeated exposure may result in slight irritation.	Drench skin with water. Remove contaminated clothing and wash before reuse. If irritation persists, seek medical attention.
EYE CONTACT	Slight irritation.	Irrigate thoroughly with water for at least 10 minutes. Obtain medical advice.
INGESTION	Large doses may cause stomach upset.	Wash out mouth with water. Do not induce vomiting. If patient feels unwell, seek medical attention.

FIRE FIGHTING MEASURES: Use extinguisher suitable for fire conditions. Self contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Hydrogen chloride may be evolved above 200° c.

SPILLAGE MEASURES - Clean up procedure: Use sand, earth or other suitable absorbent material. Dispose of according to local regulations.

ENVIRONMENTAL PRECAUTIONS: Do not allow material to enter drains, sewers or watercourses. Uncontrolled discharges must be reported to the appropriate regulatory body.

HANDLING: Avoid contact with eyes and prolonged skin contact. Store in original containers or lined mild steel tanks. Store below 40° c.

PHYSICAL AND CHEMICAL PROPERTIES:

Appearance	Light straw	Freeze pour point	-10° c	Vapour density	Heavier than air
Odour	Medium oil	Density @15°C	1.07		
Boiling point	>200° c	Solubility in water	Insoluble		

**DISPOSAL
CONSIDERATIONS:**

Substance: Disposal via authorized waste disposal contractor to approved waste site.

Container: As above. Do not puncture or cut up until purged of product.

**TRANSPORT
INFORMATION:**

This product is not regulated for road transport in the UK.

**OTHER
INFORMATION:**

This material is usually used as an extreme pressure oil additive. The information contained in this data sheet does not constitute a complete assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for his purpose.

**LEGAL
DISCLAIMER:**

The above information is based on the present state of our knowledge of the product at the time of publication. This information is given in good faith, no warranty is implied with respect to the quality or the specifications of the product. The user must satisfy himself that the product is entirely suitable for his use.