

# TRIBOLOGIC



**PROJECT REPORT NO.: 5070/1**

**CLIENT: Bilt Hamber Laboratories,  
Billericay**

## **4 Ball Wear & Weld Load Tests**

### **1. INTRODUCTION**

A sample of lubricant identified as “Ferrosol Sample 1” was submitted to TRIBOLOGIC for determination of anti-wear and weld load properties using the 4-ball test procedure as defined by the IP 239 standard.

### **2. SAMPLE PREPARATION**

The sample was contained in 0.5 litre plastic screw capped bottle and prior to the start of testing approximately 50ml was transferred to a similar sized wide necked bottle. This sample was then left for 1 hour, to permit any of the lighter fractions in the solvent to evaporate, before the bottle was sealed with a lid. When the amount of sample was insufficient to fill the test cup the remaining sample was emptied out and the preparation procedure repeated, as above.

### **3. TEST PROCEDURE**

The method described in IP239/85 – Determination of Extreme Pressure and Antiwear Properties of Lubricants: 4-Ball Machine Method, Section 9.2 (components applicable to Welding Load) and 9.5 (Wear Tests), was used to determine the anti-wear characteristics of this fluid.

The tests were undertaken with the following operating parameters:-

Spindle speed = 1450 – 1500 rpm (as given in standard)

Wear tests:

Loads = 40 kgs  
Test Duration = 15 minutes  
Fluid Start Temperature = Ambient, approx 19°C.

Weld Load tests

Test Duration = 10 seconds

## 4. RESULTS

### 4.1. Wear Tests

<b>Fluid Ref.: Ferrosol – Sample 1</b>	<b>Mean Wear Scar Diameter (mm)</b>
	<b>40 kg load</b>
Initial test	0.352
Repeat test	0.338
Mean	0.35

Table 1 - Results obtained for mean wear scar diameter

### 4.2. Weld Load Tests

<b>Fluid Ref.: Ferrosol – Sample 1</b>	<b>Load (kg)</b>
Highest <i>non-welding</i> load	340
Welding Load	350

Table 2 - Results obtained for Welding Load

## 5. CONCLUSION

Wear and welding load tests have been carried out on a fluid, identified as “Ferrosol – sample 1”, in accordance with the procedure set out in the IP239 standard. The results of these tests are set out in Tables 1 & 2.

For TRIBOLOGIC

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