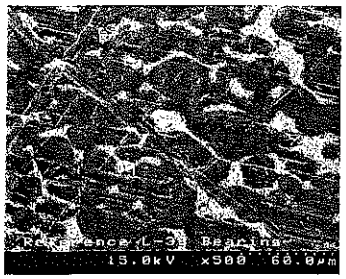

Image 1

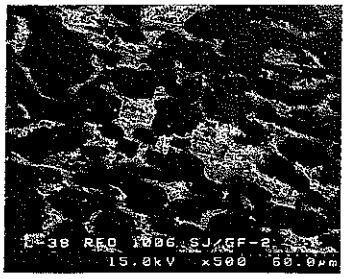

Image 2

Chlorinated Paraffin: Confusion, Contradiction

Chlorinated paraffin is the active chemical ingredient of one family of aftermarket lubricant additives. As an illustration of the confusion and conflicting claims in the ALA market, *Lubes'n'Greases* is presenting data made available to it on three of these products: Dura Lube Super Engine Treatment, MotorUp Engine Treatment and Prolong Engine Treatment.

Blue Coral/Slick 50 (which competes in the marketplace with tested products and whose Slick 50 Engine Treatment does not contain chlorinated paraffins) arranged for an L-38 engine test to be conducted on its product and on each of these three competing products.

The companies producing each of these products then presented data to *Lubes'n'Greases* supporting the performance claims for their product, including some engine and bench tests.

Conflicting claims and test data are not unknown in reporting lubricant engine tests. *Lubes'n'Greases* believes that it is in the public interest to make this data available for our readers.

The L-38 engine sequence test (ASTM D5119) evaluates an oil's ability to control copper/lead corrosion in an engine. It is a high-speed (over 3,000 rpm), high-temperature test, with a pass/fail rating. New connecting rod bearings are installed in the single-cylinder Labeco research engine test apparatus, and the test run for 40 hours. Afterward, the bearing's weight is measured; not more than 40 milligrams of weight can be lost, or the oil fails. The test costs about $6,000 per run.

Blue Coral/Slick 50, a wholly owned subsidiary of Pennzoil-Quaker State Corp., paid for the tests. Pennzoil-Quaker State has a big stake in the passenger car motor oil market and says it is concerned about the performance of its products when diluted with many aftermarket additives. With the two leading motor oil brands, it holds nearly 40 percent of the U.S. retail market.

An employee of Blue Coral/Slick 50 purchased each aftermarket additive and an API licensed SJ, SAE 10W-30 passenger car motor oil from a commercial vendor. Using the treat rate recommended on the containers, each aftermarket lubricant additive was blended in Blue Coral's lab into 4 quarts of the licensed engine oil. The blended products were provided to the testing laboratory and sustained a single test run during the summer of 1998. Its own product, Slick 50, underwent an L-38 test as well. For test stand validation, it first ran a sample of reference engine oil alone with no additive treatment.

The results of these tests are shown here:

SAMPLE	BEARING WEIGHT LOSS	RESULT
Reference oil	23.2 mg. loss	Valid data
Dura Lube	192.5 mg. loss	Fail
MotorUp	56.7 mg. loss	Fail
Prolong	1320.0 mg. gain	Fail
Slick 50	14.9 mg. loss	Pass

Under the Microscope

L-38 bearing surfaces after the test runs were magnified 500 times, photographed, and examined using scanning electron microscopy/x-ray microanalysis (SEM/EDX) at Case Western Reserve University's Center for the Surface Analysis of Materials Laboratory. W. Rocco Pistillo, senior product development chemist at Blue Coral/Slick 50, commented on the results.

Image 1 is an unused, new reference bearing.

Image 2 is a bearing with 23.2 mg. weight loss at the reference oil test conclusion. The bearing, Pistillo observed, "showed an intact surface composed of a continuous phase of copper [dark material] interspersed with discontinuous regions of lead [light regions]."

Image 3 shows a bearing surface after the Dura Lube test conclusion, with 192.5 mg. weight loss. It "portrayed very little of the lead phase left intact," Pistillo pointed out. "The lead has reacted and been transformed to lead chloride powder which then was flushed out of the bearing surface. This particulate matter was then free to circulate throughout the engine as part of the oil."

Dura Lube responded with results of three tests conducted at an independent test laboratory during the first seven months of 1998 using an API licensed SAE 10W-30 SJ lubricant and its additive, both supplied by Dura Lube. The additive was blended at 20 percent by volume by the laboratory.

In this test, the reported L-38 bearing weight loss was 37.2, a passing result, in contrast to the Blue Coral/Slick

Continued on page 3

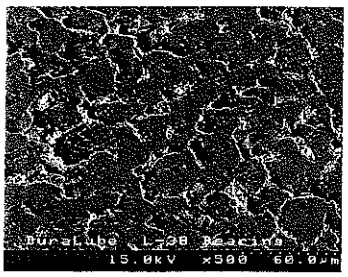

Image 3

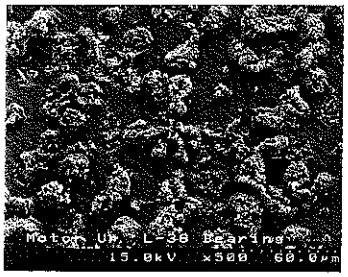

Image 4

Image 5