

February 10, 1933

SWANN CHEMICAL COMPANY

AROCLOR FOR EXTREME PRESSURE LUBRICATION

APPLICATIONS:

The term "Extreme Pressure Lubrication" or "E-P Lubrication" relates to the lubrication of mechanisms that are operated under very high loads and torques. Examples of such mechanisms are found in the gear systems of the present day automobile. These systems are known as hypoid gears. Ordinary petroleum lubricating oils and greases fail when they are used for the lubrication of gears of this type. The failures are due to a lack of strength of the films of lubricant between the gear teeth.

It has been to supply necessary film strength that the extreme pressure lubricants have been developed. Since mineral oils alone have been found unsatisfactory, efforts have been made to find suitable compounds or mixtures to blend with the mineral oils that would give increased film strengths. Of chief importance among the products studied have been the chlorine and sulfur bearing organic derivatives. They have been found to add greatly to the film strength of the petroleum oils upon admixture.

The film strength of an ordinary untreated mineral oil is some 5,000 to 7,000 pounds to the square inch of surface. When this same oil has been treated with a chloro or sulfur body, its film strength is increased to the extent of something like five times.

The use that Aroclor would have in the extreme pressure lubrication field would be as a treating agent for mineral oils, that is, as an agent to be admixed with mineral lubricants to increase the film strengths. Those chiefly interested in such applications would naturally be the oil companies. All of the leading companies in the United States have already had samples of Aroclor and some have conducted fairly extensive studies of its applicabilities.

There may be some smaller oil companies or manufacturers of lubricants who have not heard of Aroclor, and there may be some companies who have special lubricating problems. Such companies can be approached as new prospects by the salesmen.

COMPETITION:

This application is so new that no definite lines of competition have been developed. However, many companies are investigating the subject. Such investigations will undoubtedly result in some competitive mixtures. Salesmen should follow up all leads in this field and report promptly anything of value in order that our staff may keep a close check on all competitive mixtures that may be offered to the trade.

ADVANTAGES:

A considerable amount of work has been done involving the use of Aroclor mixtures but insofar as tests have gone, the results are not conclusive. None of the work referred to has been done at Anniston, so that little information is available to our staff interested in the possibilities of Aroclor in this field.

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PROCEDURE:

In any application that requires an E. P. Lubricant, secure all information available, including -

- 1) Kind of mechanism to be lubricated.
- 2) Minimum and maximum temperatures at which it may be operated.
- 3) Maximum pressure on films.
- 4) Method of applying lubricant.

RESTRICTIONS:

A compound or mixture suitable for mixing with mineral oil to confer on it extreme pressure lubricating characteristics must have the following properties:

- 1) The compound must be miscible with Mineral Oil.
- 2) The compound must have no corrosive action upon bronze or mild steel.
- 3) A treated oil must have a film strength of 15,000 pounds, as tested by the Almen pin test.
- 4) The treated oil must show no tendencies toward separation of its constituents.
- 5) The compound must be stable at 150°C. (302°F.).
- 6) A treated mineral oil must ~~not~~ show an appreciable drop in load carrying capacity when used in gear systems.

Insofar as is known at the present time, there are no patents restraining the use of Aroclor as a constituent of extreme pressure lubricants. There is, however, good reason to believe that patent applications have been filed by one or more of the large oil companies covering this application. It would be desirable therefore to advise a prospective customer that patent applications are probably pending.

REFERENCES:

All matters referring to extreme pressure lubrication should be referred without delay to L. M. Aycock in New York, sending copy of letter to T. S. Foley in Birmingham.

F. P. Cummings

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