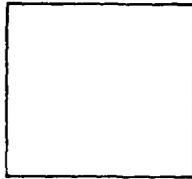


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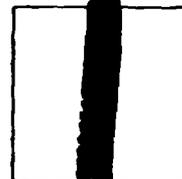
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Report No. 366/1
Watertown Arsenal

December 9, 1936

TESTS OF ALCOA THREAD LUBRICANT

The Alcoa Thread Lubricant is a product of the Aluminum Company of America. It is claimed to be effective in preventing seizing and corrosion of aluminum threaded parts which are taken apart frequently. The material is a thin paste, received for test in several small tubes. It is stated to have a base of zinc stearate. The vehicle is probably an organic ester, evaporating rapidly and having the characteristic fragrant odor.

Description of Tests

It was desired to apply this to such assemblies in the shops as would furnish a suitable test for the efficacy of the lubricant. The only materials immediately available for such tests were aluminum castings of the Fuze Setters, M5 and M6. It was also intended to use the aluminum elevating and traversing gear housings of the 3" A. A. Mounts as soon as they became ready for assembly.

Examination of the drawings and of the fuze setter showed that there were no instances of two threaded aluminum surfaces coming into contact with each other, the type of

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contact on which it was desired to test the lubricant.

The parts that were selected for the test are listed below.

<u>Piece</u>	<u>Description</u>	<u>Drq.No.</u>	<u>Piece No.</u>
Bolts, 4	1/2", steel	26519	BCAX1EE
Oiling Plug, 1	1/4" dia., steel	26520	A 8032
Sleeve, 1	2 1/2" dia., steel	26519	B126851
Screws, 2	1/4", steel	26520	A 29896

All of these parts are fitted into an aluminum casting which is the housing of the fuze setter. None of them is subject to any great load. The last two parts are for adjustments and will presumably be removed or at least loosened frequently in service.

The lubricant was applied to the threads of the above named parts of six fuze setters in the course of assembly operations. Six other fuze setters being assembled at the same time were not so treated.

All of these fuze setters were disassembled for adjustment and inspection about a month later. No difficulty was reported in loosening the threaded parts in any of the fuze setters of either the treated or untreated groups, nor was there noted any difference in the ease with which any of these pieces were removed.

A close examination of the parts to which the thread lubricant had been applied revealed a thin coating of the lubricant, which was tough and adherent and was not removed

even after some of the parts had been taken apart and put together several times.

Two months later the same group of fuze setters was subjected to final inspection which included a general disassembly of parts. Attention was given to those parts which are concerned in this report. As in the previous inspection, no signs of seizing or corrosion were noted in either the parts which had the lubricant and those which had not.

Because of the negative results further tests on other aluminum castings were considered unnecessary.

Conclusions

The thread lubricant furnishes a tough layer which prevents metal to metal contact, and probably would be effective in resisting corrosion and seizing although these tests have not demonstrated any such ability. The conditions under which the fuze setters are assembled are not conducive to corrosion or seizing. Threaded parts under test were of aluminum and steel or of aluminum and bronze. There are no threaded surfaces where aluminum comes into contact with aluminum - the condition which favors seizing. The parts that have been tested are not under heavy load and thus another condition which promotes seizing is not present. The condi-

tions favoring corrosion under which these fuze setters were assembled are not comparable to those encountered when the fuze setters are put in use exposed to the elements in the field.

The need for any anti-corrosion or seizing agent is not apparent when fuze setters are assembled and stored in-doors.

From the results of the tests and for the reasons given above, it is impossible without recourse to laboratory methods to come to any definite decision concerning the effectiveness of the thread lubricant or the advantages to be gained in using it when fuze setters are used under service conditions.

Respectfully submitted,

C. K. Allen
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1st Lt., Ordnance Dept.