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ENCLOSURE (B) 21

STUDIES ON OIL-PROOF PAINTS

by

CHEM. ENG. LIEUT.
M. OKAZAKI

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ENCLOSURE (B)21SUMMARY

Investigation of a suitable paint, lacquer, or varnish for the protection of rusting or corroding of the inside of drum-cans was undertaken. Synthetic resin lacquers having acrylic acid and cellulose acetate as chief components have the best qualities. They are easy to use, dry quickly, and are especially resistant to fuel oil such as aniline-containing gasoline. Other paints, having the usual synthetic resins or natural resins and vegetable resins as a base are not suitable for the above purpose. Although the acrylic resin lacquers dry quickly and are resistant to fuel oils, the supply is not plentiful in Japan, and this is the difficulty in the practical use of these paints.

I. INTRODUCTIONA. History of Project

The object of this investigation was to find a suitable paint or lacquer for the inside of drum-cans which would dry quickly, prevent corrosion of the can and contamination of contents when filled with such materials as aniline-containing gasoline.

B. Key Research Personnel Working on Project: Chem. Eng. Lt. M. OKAZAKI.

II. DETAILED DESCRIPTIONA. Description of Test Apparatus

The apparatus, used in the test, was an air-bath which was used for drying the painted steel strips.

B. Test Procedure

1. Twelve paints, selected from the literature and considered to have suitable characteristics, were examined in the following manner.

Steel strips (50mm x 20mm x 1.5mm) were coated with the paint or lacquer by dipping and were dried in glass bottles which were maintained at 120° - 160°C. in an air bath if necessary.

After drying, the strips were immersed in methanol, butanol, aniline, and aniline containing gasoline, for 50 days. At the end of this period, the condition of the painted surface was examined.

2. The four paints which were least affected by the various fuel oils were applied to the inner surface of steel drums, which had been used once. After drying at ordinary temperature, the cans were filled with gasoline containing 5% aniline and allowed to stand in the open air for two months. At the end of this period the condition of the paint and contamination of the fuel was observed.

C. Experimental Results

1. The four materials, selected as the best, were synthetic lacquers composed chiefly of cellulose acetate solvent and acrylic acid resins. These lacquers had superior qualities in regard to drying and resistance to fuel oil. Although they have thin films, these

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films are mechanically strong and are not objectionable.

2. It was found that white colored lacquers were best, since it was easier to observe the inside of the drum-cans.
3. Synthetic resins were less attacked by fuel oils than natural resins.
4. Cellulose acetate appeared to be a more satisfactory solvent than nitro-cellulose.
5. The lacquers examined had the advantage of drying much more rapidly than the paints and varnishes.
6. Water paints frequently cause rusting of the steel surface before drying, hence are not satisfactory.

III. CONCLUSIONS

- A. Lacquers composed of cellulose acetate solvent and acrylic acid resins were found to be the most satisfactory materials for protecting the inside of drum-cans against attack by gasoline with 5% added aniline.
- B. The supply of raw materials for these lacquers is scarce and will present a problem if they are to be used in industrial practice. Commercial use of these lacquers was no longer necessary, since the use of gasoline with added aniline was discontinued.