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Armour & Co.
Tall Oil
"DULUX" Int. Floor Enamel
Brush "Duco"

Oct 6 '53

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MEMORANDUM REPORT #M-156

NEO-FAT D-142 & NEO-FAT S-142
ARMOUR AND COMPANY

REFERENCE COPY

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Philadelphia Laboratory
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These materials are fractionally distilled fatty acids from Tall Oil. Neo-Fat D-142 contains 94% fatty acids, 6% rosin acids and has an Iodine No. of 130. Neo-Fat S-142 contains 88% fatty acids, 12% rosin acids and also has an Iodine No. of 130.

Neo-Fat D-142 was first investigated in May 1942 when Armour & Company submitted a gallon sample of these fatty acids and one quart of an alkyd resin solution prepared from Neo-Fat D-142 at 46% oil content and 50% solids. Dr. Paul Robinson reported on May 19, 1942 that the comparison of the D-142 alkyd resin made by Armour vs. linseed oil and soya oil resins of like oil content showed a definite deficiency in drying speed, although satisfactory overnight hardness. He stated "Technically, it would be perfectly possible to use this material in alkyd resins of the drying type. Neo-Fat D-142 would appear to be a very useful material in the event that linseed and soya oils should become very short. Its use would, however, entail definite quality sacrifices, particularly in the matter of drying rates."

At that time an RC-351 type resin was made in accordance with Bureau of Ships Specification 52-R-13. In this case the Neo-Fat D-142 was blended with 50% of bodied soya oil at 62% oil content and the final resin appeared to be satisfactory for meeting the specification. Also an alkyd resin comprising 3 parts of D-142 and 2 parts of VO-114 at 55% oil content with 2% excess glycerine was made satisfactorily but this resin was never tested in finished products.

In his memorandum of December 13, 1942, Mr. H. F. Ether points out that all of the previous work with Neo-Fat D-142 was done on a glycerol basis and that it was likely that the deficiency in drying characteristics reported previously could be overcome by the use of PE.

In January 1946, Neo-Fat D-142 was made into a 60% oil PE alkyd resin replacing the soya bean fatty acids. This resin was then tested in Brush "Duco" by Mr. B. L. Mansi and found to dry satisfactorily. In February 1947, this enamel was examined after 12 months shelf storage and was found to be very soft overnight with a definite tack. It also had excellent color and gloss retention being equal to soya/PE for color and definitely better

in gloss retention. When the dry instability was noted, this enamel was again prepared increasing the drier content 50% and also decreasing the amount of inhibitor by 50%. In both cases after 6 months shelf storage there was no improvement in dry stability with the dry being poor compared to the RC-411, soya acids/PE, formulation.

In April 1947, both Neo-Fat S-142 and D-142 were made into alkyd resins of the PRCP-47679 type replacing the soya acids by the Neo-Fat acids. PRCP-47679 is a 60% soya acids/PE Alkyd resin used as the vehicle for the proposed "DULUX" Floor Enamel.

These Neo-Fat alkyd resins were then pigmented on the P-100-P-81039, Light Stone "DULUX" Interior Floor Enamel, formula by the writer. Initial hardness, flexibility and adhesion over bare steel were satisfactory as were the flexibility and adhesion of films aged 6 months. However, brushouts of these enamels over bare steel and pearlboard showed considerable flooding and were still tacky after 8 hours dry, whereas the control was tack-free at 4 hours. Increase of the drier content improved the dry only slightly. Since the enamels did not contain Co drier, 1% of Co was added with a further increase in the Pb and Mn driers. Again the improvement in initial dry was insufficient to be satisfactory. However, after 5 1/2 months shelf storage, samples of these latter enamels were again brushed out and showed no appreciable loss in dry stability.

In view of the above deficiencies, we see no immediate satisfactory application of these Neo-Fat acids to our current business. However, the properties outlined should be kept in mind for future possible application.

Details for this work may be found in:

Notebook #2999 - Pages 92, 93
Notebook #3208 - Pages 138-141, 181
Notebook #3321 - Pages 4, 32, 33.

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