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FABRICS AND FINISHES DEPARTMENT

CHEMICAL DIVISION

PARLIN LABORATORY

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PROJECT J-2023

SUBJECT: EVALUATION OF BCM (RG-800) AS A FINISH INGREDIENT

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No. 933 by Messrs. O.L. Hargis &
W.K. Morfett

No. 990 by G.G. Murphy

NOTEBOOK NO. 2303

PREPARED BY: G.G. MURPHY

APPROVED BY: G.J. WELZ

E. J. Welz

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PARLIN LABORATORY REPORT NO. 997

PROJECT NO. J-2023

SUBJECT: EVALUATION OF BCM (RC-800) AS A FINISH INGREDIENT

I - INTRODUCTION

This report covers the results of field tests on the RC-800 finishing system as proposed in Parlin Laboratory Release Letter No. 439. Tests were conducted jointly with Sales at the following accounts:

- (a) Heywood-Wakefield Company, Gardner, Mass.
- (b) White Furniture Co., Mebane, N.C.
- (c) W.W. Kimball Company, Chicago, Ill.
- (d) Philco Radio and Television Corp. Philadelphia, Pa.

II - OBJECTIVES

The objectives of the field testing program were:

(1) To determine whether the furniture industry is sufficiently interested in the improved quality obtainable with the RC-800 finish to accept its increased costs. This information is to serve as a basis for reaching a decision as to whether further work with RC-800 or along similar lines, is warranted.

(2) To check in the field the laboratory performance of the RC-800 finish.

III - SUMMARY AND CONCLUSIONS

The RC-800 finish was successfully applied under production conditions at Heywood-Wakefield, White and Kimball and was demonstrated in the Philco Laboratory to their chief chemist.

The tests at Heywood-Wakefield and White were made in direct comparison with Type "A" furniture "DULUX" on birch and mahogany furniture respectively. The test at Kimball was made on mahogany versus type "D" furniture "Duco". The test at Philco was made versus types III and "H" furniture "Duco" and also versus the competitive nitrocellulose type finish which Philco is now using.

The results of the above field tests may be summarized as follows:

(1) The superior quality and appearance of the RC-800 finish compared to the best available lacquer and force dry synthetic finishes is recognized by these customers.

(2) The major drawback to its acceptance by these customers is its higher cost due to:

- (a) higher processing cost which was as much as one-third more
- (b) higher cost per gallon
- (c) lower solids at spraying viscosity as compared to furniture "DULUX" (27-30 versus 42%).

(3) Under current market conditions in which the demand for furniture, pianos, radios and television sets equals or exceeds the supply, these customers indicated that they were not interested in paying a premium for RC-800, but that they are very definitely interested in it if it were obtainable at no increased cost to them.

(4) In general these field tests have confirmed the results obtained in the laboratory. However in all tests, the processing was not quite as difficult as anticipated. Also the improved clarity, appearance and "feel" of the RC-800 finish were of even greater interest to the trade than had heretofore been estimated. While the mar and scratch resistance obtained at Heywood-Wakefield were slightly inferior (probably due to use of their stain) to what was expected, the RC-800 finish was still superior to "DULUX".

(5) Although the RC-800 finish has been applied successfully at the various plants in which it was tested, additional work is required to make it available commercially.

(6) RC-800 is an entirely new ingredient in the furniture finishes field. What has been possible with it lends some hope of uncovering other film formers of equally interesting properties, but which may be cheaper.

(7) Only accelerated tests have been possible upon which to appraise the durability of the RC-800 finish. This should be supplemented by some field usage before continuous large-scale exploitation is contemplated.

IV - ACTION TAKEN

Parlin Laboratory Research Report No. 990 was submitted to Management under date of June 15, 1950. This covered the laboratory work immediately preceding the field test program discussed in the current report No. 997. The current report No. 997 and the previous report No. 990 should assist Management in arriving at a decision regarding the advisability of doing any further work with RC-800 as a furniture finish.

V - PATENTS

Mr. W.K. Moffett's Patent U.S. 2,498,091 issued February 21, 1950. This covers the composition field tested.

It is our understanding that for the time being the Polychemicals Department has refrained from publishing abstracts in the Official Gazette of Sperati Case 2 and Anderson and Ramler Case I which Polychemicals are abandoning. The former discloses numerous linear polymers which may be combined with RC-800, whereas the latter deals with the preparation of polymerizable dimethacrylate compositions.

VI - EXPERIMENTAL

Joint reports by Sales and the Laboratory of the field tests covered by this report follow.

Our most recent rating chart of RC-800 versus type "A" "DULUX" and type "H" "Duco" is included.

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8/14/50

RATING CHART

FURNITURE FINISHES UTILIZING RC-800

<u>Properties</u>	<u>TYPE A</u> <u>"DULUX"</u>	<u>TYPE H</u> <u>"DUGO"</u>	<u>RC-800</u>
1. Cold Check	6	9	10
2. Durability (oven)	10	9	10
3. Humidity	10	10	10
4. Water Resistance	10	8	10
5. Alcohol Resistance	10	5.5	10
6. Solvent Resistance	10	0	10
7. Heat Resistance (212°F)	10	4	10
8. Scratch Resistance	10	8	9.5
9. Mar Resistance	10	6	9.5
10. Resistance to Color Change	10	8.5	6
11. Print Resistance	8.5	8	10+
12. Clarity	6.5	8.5	10
13. Sanding	8	7.5	5
14. Rubbing	8	8	5
15. High Polish	8	8.5	9
16. Shrinkage	7	8	9
17. Spraying Solids	42%	26.2%	30%
18. Cost/gal.	1.79	1.66	2.80 (80% RC-800) 3.07 (1.00 RC-800) 3.32 (1.20 RC-800)
19. Cost/lb. solids	0.54	0.85	1.19 (80% RC-800) 1.30 (1.00 RC-800) 1.41 (1.20 RC-800)
20. Pounds RC-800/gallon			1.03

NOTE:

1. As a result of the field tests, the following ratings given above have been increased over the rating given on page 21 of Parlin Laboratory Report No. 990.
 - (a) Clarity increased one point
 - (b) Sanding increased one point
 - (c) High polish increased one-half point
2. Costs are as of 8/4/50 and are calculated as cost to Industrial Sales in drums in maximum size batches.
3. Cost of "DULUX" includes cost of accelerator.
4. The RC-800 clear is packaged in two containers and costs given above represent the cost of the blend as used.

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Parlin, New Jersey
April 14, 1950

MR. RUSSELL MORGAN

RC-800 FIELD TEST
HEYWOOD-WAKEFIELD COMPANY
GARDNER, MASS.

The writers visited the subject concern on April 10 - 13 for the purpose of field testing the RC-800 furniture finish as proposed in Parlin Laboratory Release Letter No. 439.

To make possible a worthwhile appraisal of this finish by a manufacturer of hardwood furniture, pieces of furniture and large panels in the various stains in use were coated with the RC-800 finish and their standard "DULUX". These items were finished (1) in accordance with the system recommended in the above-mentioned release letter for comparison with the customer's standard production using type A "DULUX" over sanding sealer and (2) employing modifications in the stain and topcoat drying time duplicating the customer's standard finishing schedule.

Examination of the finished furniture brought out the following points:

1. Greatly improved clarity, "life" and feel.
2. Because of the improved clarity customer's light shades appeared slightly off color.
3. Improved build with two coats of the RC-800 topcoat and deficient build with one coat were very noticeable.
4. Somewhat inferior leveling.
5. Occasional blisters when 1366 was used as the sealer where the wood was unusually porous, especially on bleached wood. This was also true of the standard "DULUX" over 1366.
6. Comparative rubbing tests indicated approximately 35 percent more labor required.

Customer's laboratory tests of the finished panels brought out the following points:

1. Abrasion Resistance - 1250 strokes versus 450 strokes for "DULUX" using a ten pound sateen covered weight and water and "Dutch" Cleanser as the abrasive.

2. Alcohol Resistance - Neither finish affected by 95 proof alcohol. 190 proof alcohol has no effect on the RC-800 finish but lifts the "DULUX".
3. Resistance to Live Steam - Does not whiten initially as much as "DULUX" but "DULUX" recovers completely whereas the RC-800 finish shows a stain which requires rubbing to remove. "DULUX" softened more than the RC-800 finish.
4. Resistance to Ink - Regular writing ink shows no effect on either finish. Indelible ink lifts "DULUX" and permanently stains the wood. With the RC-800 finish no lifting occurs and the stain can be removed by rubbing.
5. Solvent Resistance - "DULUX" unaffected by acetone. The RC-800 finish is not lifted but a ridge is left outlining the puddle. The acetone flowed out extensively on the "DULUX" and consequently evaporated much more quickly than on the RC-800 finish where it remained in a small pool for a much longer time.
6. Impact Resistance - A one pound ball falling from a height of four feet cracked both films but the RC-800 finish cracked to a greater extent.
7. Scratch Resistance - The RC-800 finish was more difficult to break into but no major difference in difficulty of continuing the scratch once the film was ruptured.
8. Mar Resistance - The RC-800 finish showed slightly better resistance when struck with the edge of a large coin.
9. Heat Resistance - Both films were unaffected when a 500 cc. beaker of boiling water was placed on the finish and allowed to cool.
10. On the basis of scratch tests on four sets of panels no appreciable improvement in scratch resistance could be shown from drying the stain overnite.
11. Film properties indicated the Heywood-Wakefield baking schedule to be adequate for the RC-800 type finish.

Due to unexpected and unavoidable circumstances, Mr. William B. Stearns, General Superintendent, was unable to be present for a final appraisal of the RC-800 type finish and left this in the hands of Mr. Emile Richards, Finishing Superintendent.

On the basis of the above-described field tests and in answer to specific questions put to him, Mr. Richards offered the following comments:

1. That the RC-800 finish is of definite interest to them and that this test was very successful as a first showing of a radically different type of finish.
2. That primarily because of its outstanding clarity, "liveliness" and feel it would improve the saleability of their furniture.
3. That because of the serious deficiency in the build of one coat of the RC-800 finish at its present solids, and their lack of facilities to apply two coats, the build of the RC-800 system would have to be improved to equal that of their present "DULUX" before they could consider using it.
4. That in view of the demand of most school furniture buyers for a finish flexible enough to ribbon, they would probably not be interested in the RC-800 finish even though it shows outstanding wear resistance. In addition Heywood-Wakefield does not have baking facilities in their school furniture department nor the volume at this plant which would warrant its installation.

Mr. Richards summed up their position by stating that under present conditions, to be of further interest, the RC-800 finish would have to be no greater in cost than their present system. He further stated that they feel that their furniture prices now are as high as the market will stand.

CLYDE G. MURPHY

GUY H. EGAN

CGM:GMM

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