

PRATT & LAMBERT-INC.

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TECHNICAL ACTIVITIES

1955

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In retrospect, 1955 was a year of technical expansion with respect to both the physical facilities of the laboratory as well as its breadth of attack on research problems. To provide added work space, two new laboratories, an office, and a storeroom, were built for the Varnish Department on the second floor of Building 3. The space vacated by that department on the top floor of Bldg. 3 was remodeled and is now providing added facilities for the Architectural Enamel & Paint Laboratory. These structural changes were made at a cost of \$10,660. In 1955, we undertook 20% more research problems than we did in 1954; we investigated 35% more raw materials; and exposed 37% more experimental paints on test fences. Virtually all of this added research effort was in the architectural field.

Exposure studies initiated in 1955 at our Swormville test fence have filled our racks to capacity and we now face the problem of leasing more land to take care of 1956 tests. In 1955, we doubled the number of exposures we normally make in Florida. Increased weather testing activity resulted from the need for information on exterior finishes made from tube colorants. Most colors in our exterior lines have been standard for a number of years. The sudden desire for information on dozens of new colors in house paint and possibly in other exterior lines has, therefore, created a flurry of testing.

The enactment of new labeling regulations for lead-containing paints by the New York City Board of Health caused us to make a critical examination of our caution labeling practices. As a result of this study, twenty three standard cautions were developed to fit all the raw material combinations we might use in making paint. Both health and fire hazards were considered. Next, machinery was set up to key each listed item with its appropriate caution. Finally, acceptance of our proposed labeling plan was obtained from certain interested agencies, such as the Virginia Department of Agriculture and Immigration and the Buffalo Fire Department. An appreciable amount of time was required to complete the details of this seemingly simple program.

The Technical Department has also been responsible for the annual registration of those products that qualify as economic poisons in the four states now having Economic Poisons Laws. The annual registration of all listed items in Virginia is likewise a laboratory responsibility. These activities, like the caution labeling program, consume time and entail a lot of correspondence without providing anything tangible to show for the effort.

GENERAL RESEARCH

Early in 1955, polyurethane foam seemed to offer bright promise as a local outlet for a large volume of polyester resin. During the

year, prospects for developing this market grew progressively dimmer. Dunlop Tire & Rubber Co., our most likely prospect, cancelled plans to construct a pilot plant for making polyurethane foam and has seemingly lost interest in the development. Hewitt-Robins, Inc. intends to make polyurethane foam in New Jersey, but this location eliminates the economic advantage we might have in a local operation. O-Cel-O has never been an encouraging prospect and its plans are as vague as they were a year ago. We have spent \$3690 on polyester foam work.

Our work on foams has not been wholly wasted as interest is now developing in polyurethane for making smooth paint films with unusual chemical resistance. We have also investigated another film former that has unusual resistance. It is an epon ester that makes a better collapsible tube finish than any similar product made from purchased epon esters.

As insurance, an offset was developed for the very complex alkyd vehicle that is used by Rockford Paint Mfg. Co. in making our tube colorants--in the event that we may wish to manufacture colorants ourselves. The work cost \$3027. We found the Rockford vehicle to be an unusually good grinding liquid with properties superior to X894, our own general purpose alkyd grinding liquid. Alkyds are inherently poor grinding media and our X894 stock pastes have been a source of trouble in factory tinting operations (because of slow color development). It looks as though our offset for the Rockford vehicle can be used advantageously in P&L stock pastes and that we can save from \$3000 to \$12,500 per year in the process, depending on how completely we substitute the vehicle for X894. This is a good example of serendipity; i.e. finding a solution to a problem without trying to do so.

A timesaving procedure was developed in 1955 for determining Stormer viscosity. Heretofore, all paint samples have been conditioned in water baths to a standard temperature of 77°F. before viscosity was determined. Temperature conversion tables have now been developed so that viscosity can be determined at the temperature of the sample (whatever it may be) and then converted to the reading that it would have had, if the temperature were 77°F. Since we make thousands of viscosity determinations, the time and labor-saving features of the conversion tables are obvious. It took a year to accumulate the data for the tables, but it was a one-time expenditure of effort. The older system required endless repetition of effort.

TRADE SALES DEVELOPMENTS

The P&L Tube System was our major trade sales development in 1955. While the basic principles underlying the tube system were well understood, long hours of painstaking and repetitious color work had to be handled in the laboratory before the system could be launched. After the bases were formulated in the proper strengths, 1850 color mixes were made in New Lyt-all Flowing Flat. An initial screening by Mr. Fischer eliminated 1150 of these colors. The final selection of 186 colors was made by the Color Committee from

the remaining 700 colors. New control techniques had to be developed for the bases. One phase of the control problem--determining how much carbon dioxide gas to introduce in each can--was a major research project in itself. The entire tube project to date represents an investment of \$11,686 in laboratory work. Supplemental weather tests on House Paint and other lines that might become components of the tube system at a later date will result in an expense of about \$2000 during the present year.

A paralleling project of considerable magnitude was the reformulation of Vitralite Enamel Eggshell Colors so they would yield intermix colors the same as, or close to, New Lyt-all Flowing Flat intermix colors. Again, this entailed tedious trial and error color work. The completed project represents a \$6646 investment.

Intermixes have caused us a great deal of trouble. Conceived as a means of expanding the color possibilities of our standard lines, they are based on an unsound principle (i.e. that the consumer can mix two colors that are not accurately controlled in tinting strength and obtain the intermix color shown in a color card). It is hoped that intermixes can ultimately be eliminated now that we have a tube system.

Resurgent sales interest in latex paint caused us to expand laboratory activities in this field. Of \$9117 spent on latex paint work in 1955, half went into exterior masonry paint and a quarter each went into interior wall finish and Primafil White. Our ability to develop Primafil White was possible only because of extensive general work that had already been done in the latex field.

The publicity given to "dripless" paint in consumer magazines led us to develop Gel-Enamel Eggshell at a cost of \$1108. We also developed an offset for the purchased vehicle contained in this product in the event that we might wish to obtain a manufacturing license under the Washburn patent. Our resin would enable us to make Gel-Enamel Eggshell for 12 cents per gallon less than we now make it and also pay a 5 cents royalty fee to Washburn. However, this saving could become a reality only if our sales volume were high (in excess of 10,000 gallons). Production of Gel-Enamel Eggshell amounted to 2100 gallons in 1955. In spite of its disappointing acceptance, Gel-Enamel Eggshell represents a unique attack on the brushing and settling problem.

Vitralite Enamel White Gloss was improved in hiding at a laboratory cost of \$1020. Considerable effort was also devoted during 1955 to reproducing the purchased alkyd now used in that item. It now appears that we have an offset, the production of which would save us from \$10,000 to \$13,000 per year. However, we have neither the production capacity nor the right equipment (solvent reflux) to undertake the job. It is appropriate to consider the purchase of another alkyd kettle as the kettle might pay for itself in a comparatively short period of time. Added alkyd facilities would also make us less vulnerable to the effect of a fire if it occurred in our one Dowtherm kettle. We would gain the intangible benefit of an exclusive Vitralite vehicle.

Two flat varnish problems--the bodying of "61" Floor Varnish and the settling of "38" Pale Trim Varnish--seem to have been brought under control at a laboratory cost of \$2632. Of two 1955 complaints involving the bodying of "61" Floor Varnish, neither was justified. There were no 1955 complaints on the settling of "38" Pale Trim Varnish, although one batch has given preliminary evidence of settling in periodic laboratory inspections. From ten to twenty complaints per year have been registered on these two varnishes in recent years.

The stigma attached to lead-containing finishes triggered two research problems in 1955. Analytical procedures for determining small amounts of lead are notably deficient in accuracy. Research work failed to uncover any better procedures than the ones which have been in use for years. It seemed worth while to determine whether a lead-free line of Effecto colors could be developed. Such a line was formulated at a cost of \$853, but proved to be of no sales interest because of high cost and poor color permanency.

The pinholing tendencies of Alkatite Floor Finish when brushed on concrete surfaces were greatly minimized (they seem to have been overcome). This work cost \$894.

INDUSTRIAL DEVELOPMENTS

Of the thousand or so industrial finishes that were custom-made in 1955, space permits a discussion of only a few of these developments.

The metal decorating trade provided us with our biggest outlet for industrial finishes in 1955. We produced 192,000 gallons of these finishes in the U. S. and 36,000 gallons in Canada. 140,500 gallons or 73% of our U. S. production went to one customer, the American Can Co. Most of this business is represented by White, GX1305, or tinted enamels made from GX1305. We are the only source on these enamels at the Fairport and Hudson plants of American Can Co. and are a preferred source for the finish used on pressurized containers at the Hillside plant. Special control tests (fabrication and boiling water resistance) are made on every batch that we make. The American Can Co. is pleased with our service and with the uniformity of our product, but is forever trying to force prices downward. The possibility of losing this large volume of business because of price is always a nagging thought.

Other metal decorating customers include Brooklyn Metal Decorating Co. (30,000 gallons), Fein Tin Can (8000 gallons), and Hazel-Atlas (8000 gallons). A perennial problem at Brooklyn Metal Decorating Co. has been the development of a satisfactory wet ink or wet print varnish. We have gotten nowhere on this problem because a trial plant test requires an interruption in production. Samples of our varnish have been held 4 to 8 months before a production test could be conveniently arranged. It is the nature of these varnishes to have poor package stability. As a result, our samples have failed to perform as well as fresher varnishes made by competitors and used in regular production. Brooklyn Metal

Decorating Co. now refuses to make new tests unless our varnish has worked satisfactorily at some other plant.

\$3362 were spent in laboratory work in the metal decorating field during 1955. Approximately half of this went toward research. \$1235 was spent on specific sales problems for the American Can Co.

The business machine field probably provides us with our second largest outlet for industrial finishes. Total sales amounted to 85,000 gallons in 1955, of which 50,000 gallons went to International Business Machines. Wrinkle finishes represent the bulk of IBM purchases, but most of our laboratory work has been concerned with the development of a new type of vinyl finish to simulate pigskin in appearance.

The vinyl problem has a three-year history, and we have spent about \$10,000 in solving it. It has gone through many stages. As initially conceived, the problem was to produce a vinyl wrinkle finish. Then, we were asked to make the texture smooth enough to permit a machine operator to write on paper in contact with the finish. Next came a demand for greater film thickness (4 mils) and a finish that would match Armitage Armorhyde. As soon as we had made such a finish, the sights were raised to 10 mils film thickness. 10 mils is 3 to 4 times the thickness of the average industrial finish. We discovered patent complications. After negotiating a tentative arrangement with Armitage to manufacture under their patents, our sales organization lost interest because of the high royalties demanded by Armitage. Next came the "anything goes" stage, when the problem was simply to develop a finish that would retain its new look for as long as possible. As soon as we submitted such a finish, IBM returned to its previous objective and demanded a rough textured finish at 10 mils thickness. New samples were developed, following which IBM asked that the finish be smooth and fine textured at 16-18 mils film thickness. No work is currently being done on the problem.

The following tabulation summarizes sales and laboratory effort in the business machines field:

<u>Customer</u>	<u>1955 Sales in Gals.</u>	<u>1955 Lab. Expenditures</u>
IBM	50,000	\$3303
Royal Typewriter	27,000	1959
Ozalid	2,000	486
Masell	6,000	268
Other	-	632
	<u>85,000</u>	<u>\$6648</u>

Since most of the foregoing sales represented wrinkle finishes, a brief review of that field follows. 1955 sales of wrinkle finishes amounted to 77,500 gallons in the U. S. and 5500 gallons in Canada. 1955 gallonage exceeded 1954 gallonage by about 8%. Wrinkle finish sales to Royal Typewriter are expected to show a substantial increase in 1956 because of our improved relations with that company.

Eastman Kodak Co. (Camera Works) now purchases most of its wrinkle finish from our company; 10,000 gallons were purchased in 1955. Ozalid adopted wrinkle finishes in 1955 in place of hammered metal finishes because cost savings of \$10 to \$25 per machine (photo copying) could be attained. Ozalid selected P&L wrinkle finishes because they wanted their machines to look like IBM equipment. Laboratory work on wrinkle finishes cost \$3614 in 1955.

The Carborundum Co. purchased 47,000 gallons of various adhesives and sizes in 1955 as compared with 35,000 gallons in 1954. 1955 laboratory work cost \$1158. The primary laboratory goal is to make even better adhesives using blends of new types of resinous raw materials.

Collapsible tube coating volume dropped from 7700 gallons in 1954 to 6900 gallons in 1955. We have little U. S. collapsible tube business at the present time; Canadian production represented 75% of our 1955 sales. Canadian production showed nearly a 50% increase over 1954 production.

The following tabulation lists some of our larger industrial customers for whom laboratory work was done in 1955:

Customer	Nature of Business	1955 Sales in Gallons	1955 Cost of Laboratory Work
Heintz Mfg. Co.	Radio, TV cabinets	19,900	\$1681
Zenith Metal	Kitchen cabinets	13,000	710
Reznor	Metal work	6,400	292
Union Fork & Hoe	Garden tools	8,200	303
Western Electric (and subcontractors)	Telephone equipment	20,700	449
Haartz-Mason	Football covers	6,300	758
Storkline	Nursery furniture	5,100	104
Gilbert & Bennett	Brake linings, screens	10,600	*
Rittling	Space heaters	7,400	*
Taylor Instrument	Temperature recorders	5,400	249
Talon	Zippers	8,000	591
American Sanitary Partition	Steel partitions	6,500	172
Houdaille-Hershey	Shock absorbers	7,000	257
Ecco	Water coolers	*	932
Fedders-Quigan	Air conditioners	*	1101
General Electric	Electric fans	*	581
Jeavons Japanning	Custom finishers	*	719
Markel Electric	Lighting fixtures	*	1293
Philco	Radio, TV cabinets	*	2138
Dunlop Tire & Rubber	Automobile tires	*	403
Naval Air Matl. Center	Zinc chromate primer	9,700	1278

*Not determined or not readily available.

COMPLAINTS

18% fewer complaints were registered in 1955 than in 1954, but there were considerably more justified complaints. Details follow:

<u>Year</u>	<u>Total No. Complaints</u>	<u>Per Cent Justified Complaints</u>
1955	401	36
1954	487	27
1953	515	35

The basic causes for 1955 complaints were as follows:

<u>Classification</u>	<u>Cause</u>	<u>No.</u>	<u>Per Cent of Total</u>
Justified	Package change	68	17
	Faulty formula (1)	46	11
	Faulty quality control	27	7
	Faulty manufacturing procedure	<u>5</u>	<u>1</u>
	Subtotal	146	36
Not Justified and Indeterminable	Presumably due to faulty application (2)	86	22
	Presumably due to faulty surface preparation (3)	57	14
	All other	<u>112</u>	<u>28</u>
	Subtotal	255	64
Total		401	100

- (1) Included in this category were complaints on the peeling of New Lyt-all Flowing Flat Cocoa Brown and Bone White, bubbling of Alkatite Floor Finish, and drying and gloss of House Paint 310 Blind Green. Formulas for all these items were revised in 1954 or 1955, because of their faulty performance.
- (2) Included in this category were complaints on the sagging and wrinkling of House Paint, flashing and streaking of New Lyt-all Flowing Flat, and specky work.
- (3) Included in this category were complaints on peeling of House Paint and Alkatite Cement & Stucco Paint, flashing of House Paint, drying problems.

<u>Division</u>	<u>No. Justified Complaints</u>	<u>Cash Settlements</u>	<u>Merchandise Settlements</u>		<u>Total Value of Settlements</u>
		<u>Only</u>	<u>Policy</u>	<u>Est. Value*</u>	
Canadian	7	\$ 168	\$ 25	\$ 78	\$ 271
Central	16	1872	293	221	2386
Eastern	32	149	-	1310	1459
Industrial	50	-	-	-	-
Western	<u>42</u>	<u>1196</u>	<u>1527</u>	<u>728</u>	<u>3451</u>
	147	\$3385	\$1845	\$2337	\$7567

*Based on assumption that average billing cost plus freight and package totals \$2.51 per gallon

1955 cash settlements were 42% higher than 1954 cash settlements. The value of 1954 merchandise settlements was not calculated, so no comparison between 1954 and 1955 merchandise settlements can be made.

The Western Division with 29% of the company's justified complaints made 52% of the cash settlements. It disbursed more money in policy settlements than it did in settling justified complaints. The Central Division with 11% of the justified complaints made 42% of the cash settlements. The Eastern Division with 22% of the justified complaints made 3% of the cash settlements, but 56% of the merchandise settlements.

It would seem that the various sales offices have differing philosophies relative to the settling of complaints. The Eastern Division apparently takes a firm attitude and settles as many complaints as possible with merchandise. The Central and Western Divisions display more liberal attitudes and seemingly lean toward cash settlements. The Canadian Division appears to have been the most successful in settling complaints with minimum expense to the company.

LABORATORY EXPENSE

0007-PTL-000997

Laboratory activities cost the parent company \$331,180 in 1955, or 4% more than in 1954. The money was spent as follows:

	<u>1955</u>	<u>1954</u>
Research	\$101,640	\$ 88,200
Sales Problems (Laboratory Requisitions)	76,610	77,500
Manufacturing Services	<u>152,930</u>	<u>151,500</u>
	\$331,180	\$317,200

Most of the increase in research expenditures went into architectural enamel and wall coating work.

In terms of production, research and development cost the company 4.15 cents per gallon (see footnote) in 1955, and 4.00 cents per gallon in 1954. Manufacturing services cost 4.15 cents in 1955 and 4.25 cents in 1954. It cost \$5.16 to test each batch of varnish and enamel made at Buffalo in 1955 as compared with \$5.20 in 1954. It cost \$7.13 to test each incoming raw material shipment in 1955 as compared with \$7.07 in 1954.

Note: All figures presented in this paragraph refer only to Buffalo (main plant and lacquer plant) production. They exclude research and other expenses applicable to products made at Fort Erie and subsidiary plants.

PERSONNEL

Separations	<u>1955</u>	<u>1954</u>	<u>1945</u>
Dissatisfaction with rate of pay or job opportunities	6	3	17
Resigned for other reasons (marriage, pregnancy, health, education)	11	8	-
Discharged	1	4	3
Transferred to other departments	<u>1</u>	<u>1</u>	<u>3</u>
	19	16	23
Average number of employees	64	62	51
Separation rate	30%	26%	45%

With one exception, all separated employees had been with the company less than a year.

One laboratory assistant, who had been on leave of absence since June 1954 to undergo treatment for tuberculosis, returned to work January 3, 1956.

M. S. Armstrong returned to work on a part-time basis beginning October 6, 1955, after an absence of nine months. He is now working almost full time. He has been given no administrative assignment, but is serving as a general consultant.

The most serious detriment to increased laboratory effectiveness is the national shortage of qualified research workers. We should be developing more young technical personnel than we now are, but we cannot attract the right kind of worker.

NEW EQUIPMENT

0007-PTL-000998

The following equipment was acquired in 1955 to replace existing worn-out equipment:

Still (for making distilled water)	\$ 297
4 Paint Conditioners	623
Office Furniture	<u>1365</u>
	\$2285

SUMMARY

	<u>1955</u>	<u>1954</u>
New Products Developed	1,382 ✓	1,361
Sales Problems Submitted to Laboratory	1,510 ✓	1,596
Sales Problems Reported	1,489	1,539
New Research Problems Undertaken	58	48
Research Problems Completed	58 ✓	39
New Raw Materials Investigated	475 ✓	350
Raw Material Shipments Tested	2,835 ✓	2,689
Batches Tested - Buffalo Control Labs.	19,314 ✓	19,071
- Ft. Erie Control Lab.	2,861 ✓	2,777
Service Calls by Technical Personnel	133 ✓	141
Technical Department Bulletins Issued	40 ✓	45
Paint Manufacturing Bulletins Issued	33 ✓	33
Label Bulletins Issued	65 ✓	42

0007-PTL-000999

February 29, 1956