

REPORT

TRUESDAIL LABORATORIES, INC.



CHEMISTS - METALLURGISTS - ENGINEERS
RESEARCH - DEVELOPMENT - TESTING

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CLIENT Apollo Sprayers International, Inc.
17233 Newhope Street, Suite F
Fountain Valley, CA 92708
Attention: John Darroch

DATE 11/28/84

P.O. NO. Letter 10/30/84

MATERIAL Dunn - Edwards # 10-2 Black Enamel
T - 1 Paint Thinner

LABORATORY NO. 03061

SPECIFICATION TLI letter 8/10/84

INVESTIGATION Transfer Efficiency of commercial spray gun.

Equipment:

1. Apollo Spray Gun Model ASG-100 w/std. 2mm tip
2. Apollo Sprayer Model # 500
3. Apollo Sprayer Model # 700
4. Apollo Sprayer Model # 800
5. O-Hans Electric Balance 300.00g/3000.0g
6. Aluminum Foil, Reynolds Heavy Duty
7. Viscosity cup, Zahn # 2 type
8. Stop watch
9. Assorted Beakers
10. Thumb tacks
11. 24" 1/2 NPT pipe
12. Thermometer

Procedure:

Dunn-Edwards # 10-2 Black Enamel (250 ml) was mixed with Dunn-Edwards # T-1 Paint Thinner (75 ml) in a 600 ml beaker. This was poured into a Zahn #2 type viscosity cup with a finger covering the outlet hole. A stopwatch was used to time the flow of the paint from the cup back into the 600 ml beaker. The stopwatch was stopped at the first break in the paint stream (24.43 seconds, 71.8°F). This mixture was then transferred to a paint cup of an Apollo sprayer. This sprayer when attached to the yellow double filter air pump is sprayer Model # 800. The same spray gun is Model # 700 with a red single filter pump and Model # 500 with a small blue and black pump.

A roll of heavy duty aluminum foil was weighed to 0.1 g in the first four tests and to 0.01g in all subsequent tests. A square piece (18" x 18") of foil was then tacked to a laboratory wall and sprayed excluding edges, with the previously weighed Apollo sprayer (to 0.1g). This foil was then reweighed within 20 seconds from when it was sprayed. The Apollo sprayer was reweighed as well and the data recorded. The foil was then thumb tacked to a wall and allowed to dry for six (6) days. This procedure was repeated several times using each air pump. During one test a white card was placed above the spray nozzle. Paint was sprayed 6" from the foil surface and no bounce back was detected on the card.

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Procedure continued...

A piece of aluminum foil (18" x 6") was wrapped around a 24" long 1/2 pipe (0.85" diameter). The pipe was then sprayed using the Model #800 & #700 Apollo sprayers approximately 6" from the pipe. Foil, gun, wet paint and dry paint data were recorded as above. Tests on pipe were denoted with a "P".

Data:

<u>Test #</u>	<u>Foil weight (grams)</u>	<u>Wet Foil weight (grams)</u>	<u>Dry Foil weight (grams)</u>	<u>Initial gun weight (grams)</u>	<u>Final gun weight (grams)</u>
800-1	41.2	-----	48.63	1478.3	1458.4
800-2	31.4	-----	33.87	1458.4	1452.2
800-3	12.3	13.5	12.99	1452.2	1450.8
800-4	13.0	-----	13.99	1450.8	1448.0
800-5	12.7	15.2	14.08	1448.0	1444.8
800-6P	5.05	5.80	5.63	1444.8	1442.8
800-7	12.05	-----	14.52	1442.8	1436.8
800-8	13.04	19.57	15.94	1436.8	1429.0
800-9	11.92	16.81	14.25	1429.0	1422.7
800-10	13.66	19.34	16.19	1422.7	1415.8
800-11	12.52	19.60	14.99	1415.8	1407.2
500-12	12.06	16.33	14.07	1407.2	1401.7
500-13	13.22	16.92	14.96	1401.7	1397.0
700-14	13.59	19.68	16.32	1397.0	1389.4
700-15	14.07	21.05	16.95	1389.4	1380.6
700-16	39.7	54.57	46.57	1380.6	1362.1
700-17P	3.95	8.22	4.13	1361.3	1360.4

Calculations:

$$\text{Wet transfer (\%)} = \frac{\text{Weight of foil wet (20 sec.) - weight of foil}}{\text{Final gun weight - Initial gun weight}} \times 100$$

$$\text{Dry transfer (\%)} = \frac{\text{Weight of foil dry (6 days) - weight of foil}}{\text{Final gun weight - Initial gun weight}} \times 100$$

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Results:

<u>Test I.D.</u>	<u>Wet Transfer Efficiency (%)</u>	<u>Dry Transfer Efficiency (%)</u>
800-1	----	37.3
800-2	----	39.8
800-3	85.7	49.3
800-4	----	35.4
800-5	78.1	43.1
800-7	----	41.2
800-8	83.7	37.2
800-9	76.5	37.0
800-10	83.5	37.2
800-11	<u>82.3</u>	<u>28.7</u>
Average	81.6	38.6
S. Dev.	3.6	5.4
500-12	77.6	36.5
500-13	<u>78.7</u>	<u>37.0</u>
Average	78.2	36.8
S. Dev.	0.8	0.4
700-14	80.1	35.9
700-15	79.3	32.7
700-16	<u>80.4</u>	<u>37.1</u>
Average	79.9	35.2
S. Dev.	0.6	2.3
800-6P	38.5	29.7
700-17P	<u>35.6</u>	<u>20.0</u>
Average	37.1	24.9
S. Dev.	2.1	6.9

Summary of Results:

Foil Center	79.9	36.9
Pipe	<u>37.1</u>	<u>24.9</u>
Average	58.5	30.9

Respectfully submitted,

TRUESDAIL LABORATORIES,



Tom J. Parsons, Supervisor
Mechanical Testing

