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Marshall Laboratory
March 30, 1945

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Memorandum #14-4

LABORATORY MEMORANDUM FOR ALL MEMBERS

FLINT PROCESS GRINDING

REFERENCE COPY

NOT FOR CIRCULATION

During the course of laboratory work in testing various grinds by the Flint process, Dr. H. Danian and the writer established and correlated data on the formulation of the roll stock. It was found that in most cases, the proper pigment/binder ratio for roll stock was directly related to the solids of the grinding vehicle and the oil absorption of the pigment. The permissible variation in roll stock consistency is so small that often a number of trials are necessary to obtain a satisfactory mill base. Use of the attached tables has appreciably simplified the formulation of roll stock for these mill bases.

The first chart attached lists the proper pigment/binder ratio of the roll stock with resin of various solids content. This chart was based on W-17 (or W-23) TiO_2 and is valid for other pigments of comparable oil absorption characteristics. The second chart was established by grinding various pigments in a 50% solids resin (RC-206) and indicates the pigment/binder of the roll stock under varying conditions of oil absorption of the pigment. By shifting the axis of one of the curves, maintaining the slope constant, the proper roll stock composition can be predicted for most pigments in the normal resins. For instance, W-17 ground in a 50% solids alkyd forms the proper roll stock at 7.75/1 equal pigment/binder while with a 60% solids alkyd a pigment binder of 5.5/1 is satisfactory. By shifting the axis of the curve for oil absorption of the pigment by the indicated amount, it was found that a pigment with oil absorption of 100 should be formulated at a pigment/binder equals 3.1.

The table attached to this memorandum gives the approximate oil absorption of various pigments commonly used in the laboratory.

It was noted that W-372 and the cerium pigments do not conform to these principles. Also, the use of a wetting agent such as soya lecithin or the use of a grinding vehicle containing materials which act as wetting agents (such as long oil ester alkyds or blown oils) necessitated appreciable increase in the pigment/binder ratio of the roll stock and these formulas cannot be predicted from these charts.

Highly thermoplastic resins such as the vinyls also do not conform to these charts.

PHILADELPHIA LABORATORY

R. L. Williams
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LLM/sac

APPROXIMATE OIL ABSORPTION OF PIGMENTS

<u>CODE</u>	<u>#Oil/100#Pig.</u>
W-9	25
W-16	32
W-17	29
W-20	23
W-25	29
W-28	28
W-41	25
W-44	116
W-52	23
W-55	33
W-57	21
W-63	29
W-70	42
W-90	25
W-154	30
W-201	341
W-205	212
W-284	52
W-308	91
W-326	128
W-331	125
W-369	18
W-372	27
W-380	102
W-381	33
W-382	34
W-384	35
W-501	41
W-508	52
W-514	44
W-515	92
W-580	100
W-582	145
W-602	51
W-630	85
W-676	21
W-679	37
W-701	93
W-754	21
W-843	33
W-865	97
W-875	95
W-880	101

10/

9/

8/

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19ment / der of Roll Stock

Flint Process Grinding
(2 Roll Mill)

Composition of Roll Stock for
W-17 and Resin (Alkyd, Urethane,
or Melamine)

40%

50%

60%

70%

80%

Solids of Grinding Vehicle

KEUFFEL & ESSER CO. N. Y.

111 M
3-23-48

