I N C O R P O R A T E D

1500 RHODE ISLAND AVE., N.W., WASHINGTON, D. C. 20005
PHONE: 202-462-6272

April 7, 1971

To Members of the NPVLA Labeling Committee & Scientific Committee:

The State of Virginia, Division of Regulatory Services, is in the process of revising and updating their "Paint Law Labeling Guide". In January 1971, Bill Ringle and Fred Johnson of the Labeling Committee, John Montgomery and I visited the Virginia authorities and discussed the rewriting of their Labeling Guide. The second draft of the proposed Labeling Guide has now been written and we are sending you a copy for your comments.

In a conversation with Arthur Hart, Supervisor of the Paint Regulatory Section, last week, I was informed that the State of Virginia intends to finalize the Labeling Guide and send it out about the middle of May. Mr. Hart stated that he would need our comments no later than May 1. The Labeling Committee will meet in Washington on April 28, and we would appreciate having your comments by that time so that they can be discussed by this Committee.

We are enclosing Mr. Hart's covering letter along with the proposed Labeling Guide and we ask that you give special attention to the definition of latex. Since many companies modify their exterior latex paints with resin emulsions other than emulsion polymers, we feel that the definition of Latex Paint should be broad enough to cover this type of formulation. The State of Virginia technical people feel that at least 50 percent of the vehicle solids should be an emulsion polymer if a company is going to use the name latex paint on its label. Some paint manufacturers have pointed out that certain exterior latex paints may contain more than 50 percent of a resin emulsion such as an alkyd and, therefore, less than 50 percent of the resin solids would be an emulsion polymer. We would especially like to have your comments on this matter and your suggestions concerning a definition for latex.

Please make any comments, corrections, or suggestions you wish and get them back to us no later than April 26. Thank you for your usual prompt cooperation.

Sincerely,

Roy Brown

Royal A. Brown
Technical Director

RAB/fmh
Enclosure

COMMONWEALTH OF VIRGINIA

MAURICE B. ROWE
COMMISSIONER

BILLY W. SOUTHALL
DIRECTOR

DEPARTMENT OF AGRICULTURE AND IMMIGRATION
DIVISION OF REGULATORY SERVICES
203 N. GOVERNOR STREET, ROOM 304
RICHMOND, VIRGINIA 23219

March 25, 1971

TO: William G. Ringle
Fred Johnson
Roy Brown
John Montgomery

Gentlemen:

Enclosed is a copy of our second draft to our proposed Virginia Paint Law Labeling Guide. We intended to supersede all "PL" notices of earlier dates but particularly PL-3A, 12A, and 15. A statement to this effect, perhaps on the cover, is needed.

We need to:

--Draw attention to paragraph B. 6. on Page 4 and show that pages 14-17 will be obsolete after June 30, 1971.

--Better define the asterisks which appear to the left of various terms and draw attention to paragraph A. 4. on Page 4.

--Show that this "Guide" supersedes all previous labeling instructions.

--Define Latex in B. 5. on Page 4.

--Define:

Halagenated Hydrocarbons
Cellulose Ester
Poly Amides Resin
Poly Amines Resin
Poly Styrene
Polyurethane Resin
Cadmium Red
Mercadium Red
Titanated Nickel
Titanated Yellow
Monasteral Blue
Monasteral Green

N11690.01

EPI 000728

Mr. Bricker is continuing to develop the needed definitions with the exception of the one for Latex. I will forward these definitions to you when they are available.

Please review this proposed "Guide" and let us have your comments. We want to be as complete as necessary. We hope to be able to distribute it when we mail Paint Renewal registration information in May.

Sincerely yours,

Arthur P. Hart, Supervisor
Paint Regulatory Section

ATH:mlh

Enclosure

cc: Mr. R. C. Bricker

Virginia Pesticide Law

Va. Seal

Labeling Guide

July 1971

Contents

Dept. Seal

VIRGINIA DEPARTMENT OF AGRICULTURE
Box 1163
RICHMOND, VA. 23209

INDEX

GENERAL LABELING INFORMATION

A. General Instructions

1. Several sections of the Virginia Paint Law and Regulations II and IV provide information relating to labeling and registration. All paint labels must contain the following information in the English language. Labeling must not be false or misleading and may not refer to registration under the Virginia Paint Law.

   a. Name and address of the manufacturer or person for whom manufactured. If the registrant's name appears on the label and the registrant is not the manufacturer, or if the name of the person for whom the paint was manufactured appears on the label, it must be qualified by appropriate wording, such as, "Packed For***", "Distributed By***", or "Sold By***", to show that the name is not that of the manufacturer.

   b. The name, brand or trademark under which the paint is sold.

   c. The net contents (in accordance with the Virginia Weights and Measures Law).

   d. An ingredient statement. A statement of the chemical name (or approved labeling term) and percentage by weight of each ingredient. In lieu of showing an ingredient statement on a container of less than one pint size (on spray paints - less than 11 ounces net weight), a label and statement showing the name and percent by weight of each ingredient in the paint may be filed with this office.

   e. The primary purpose for which the paint is intended. Example: Outside House Paint, Flat Wall Paint, Porch & Deck Paint, etc.

   f. Adequate directions for use, including directions for thinning and mixing the paint, and the name of the thinner to be used. Example: "...each gallon of paint should be reduced with one pint of turpentine", or "...do not thin".

2. Spray paint labeling requirements differ slightly. Please refer to number 1(d) above and B 5 below.

3. Although paint oil and turpentine do not require registration, certain labeling is required. See Section 59.1-179(4) of the Law and Regulation II B 3.

4. Section 59.1-178 (4) of the Law provides that certain approved terms may be used in lieu of chemical names in the ingredient statement. The terms appear on pages 6 through 14 of this guide. Those preceded by an asterisk must conform to the applicable American Society for Testing & Materials Specifications. Explanation or clarification listed to the right of the approved terms is for information only and should not be included in the ingredient statement.

5. Registration of all paints is required prior to sale or distribution in Virginia and application for such registration must be made on forms supplied by the Paint Section.

B. Terminology

1. Additives - See page 6.

2. Creosote Paint - The name "Creosote Paint" will not be permitted unless the paint contains enough creosote to give preservative qualities. White paint containing more than 3% creosote (ASTM) will not be considered white. Regardless of the percentage of creosote claimed, the terminology "White Creosote" may not be considered as part of the brand name or appear on the label. White paint containing 3% or less creosote may include on the front panel the statement "contains X% creosote" in smaller type than the brand name.

3. Fluorescent paints normally include resinous vehicles containing brillant dye. The name of the resin containing the dye shall be stated in the ingredient statement and followed immediately by the phrase "containing less than X% fluorescent dye". Example: Sulfonamine-amide-aldehyde resin containing less than 3% fluorescent dye; Sulfonamide triazine aldehyde resin containing less than 4% fluorescent dye.

4. Fungicidal and mildewcidal ingredients must be claimed in the ingredient statement using the chemical name of the compound if fungicidal and mildewcidal claims are made on the label. If claims are not made but compounds are added as preservatives, then the compound may be included as an "additive" as defined on page 6.

5. Latex - This term may not be used in the ingredient statement, but may be used elsewhere on the label provided it fits the following definition:

6. Pigment (organic) - Either the organic color terminology listed on pages 14 through 17 in this guide or the color index name and number as classified in the American Assocation of Textile Chemists and Colorists Color Index may be used in ingredients statements

until July 1, 1972. All new labels received for the 1972-73 registration year must have the color index name and number for all organic pigments. All labels will need to be corrected to include the color index name and number terminology by July, 1975. Example: Benzidine Yellow 3012

7. Propellant as a term may be listed in the ingredient statement for spray paints provided it is followed immediately with the chemical name or the approved labeling term for the compound used.

8. Tinting colors may be claimed as provided on page 6.

C. Other Labeling

1. Claims such as "washable", "fume resistant", etc. shall be factual. Labels bearing claims for "one coat coverage" shall include a spreading or coverage rate such as "covers 400 square feet on smooth surfaces."

2. Some paint labels should include precautionary labeling as required by Hazardous Substances Laws. Such required labeling which complies with the Federal Hazardous Substances Labeling Act will meet Virginia requirements.

3. Weights and Measures requirements - Labels complying with Model State Packaging and Labeling Regulation or FPLA will meet Virginia requirements.

Pages 3, 4 and this will be on two pages in final form - we hope).

Preferred Ingredient Statement Formats Which Comply With Va. Requirements

1. Aerosol Spray Paints

Non-Volatile	17.24%	
Titanium Dioxide Pigment (90% TiO_2)		8.00%
Soya Alkyd Phenolic Resin		9.24%
Volatile	82.76%	
Esters and Ketones		11.76%
Naphtha, Aromatic Hydrocarbons		21.00%
Propellant-Halogenated Hydrocarbons		50.00%
		100.00%

2. Varnish

Non-Volatile (Linseed-Alkyd Resin)	50.3 %
Volatile (Petroleum Distillate)	49.7 %
	100.0 %

3. Wall or House Paint

Pigment	31.2 %	
Titanium Dioxide (Type III)		17.32%
Zinc Oxide		4.93%
Hydrated Aluminum Oxide		1.47%
Silicates		7.49%
Vehicle	68.8 %	
Acrylic Resin		15.31%
Soya Oil		3.44%
Water		49.98%
Driers		.06%
		100.00%

4. Pigmented Roof Coating

Pigment	31.00%	
Aluminum Paste		31.00%
Vehicle	69.00%	
Non-Volatile (Asphalt Solids)		31.23%
Volatile (Mineral Spirits)		37.77%
		100.00%

5. Non-Pigmented Roof Coatings

Only the name of each ingredient must be shown on the label:

Example: Contains: Asphalt Solids, Asbestos, and Petroleum Distillate

6. Anti-Fouling Paint

Pigment	32.5 %	
Copper Powder		28.2 %
Magnesium Silicate		4.3 %
Vehicle	67.5 %	
Acrylic Resin		12.3 %
Rosin		4.5 %
Bis (tri-n-butyltin) Oxide		2.1 %
Aromatic Hydrocarbons		48.6 %
		100.0 %

Anti-Fouling Ingredients:	
Active	
Copper Powder	28.2 %
Bis (tri-n-butyltin) Oxide	2.1 %
Inert	69.7 %

The following products do not come under the provisions of the Virginia Paint Law as provided in Section 59.1-178 (1):

Artist Colors	Putty	Bulletin Colors
Wood Fillers	Waxes	Stains (Other than Varnish Stains)
Stucco	Polishes	
Colors-in-oil	Plaster	

MISCELLANEOUS TERMS

Additives	Additivies such as dispersing agents and surfactants specifically claimed on the label must be named in the ingredient statement. Those not claimed may be classified as "additives" but shall include only the solid portion, not to exceed 3% of the total vehicle. The volatile portion shall be included with other volatile ingredients.
Amino Acids	
Asphalt Solids	
Benzophenone Derivatives	
Casein	
Catalyst (use chemical name)	
Coal Tar	
Copper Resinate	
Cottonseed Pitch	
⁂ Creosote	
⁂ Creosote Oil	
Dextrine	
Dipentene	
Driers	
Ethylene Glycol	
Gilsonite	
Glue	
⁂ Hydrated Lime	
Lecithin	
+ Methonol	
Paraffin Oil	
Paraffin Wax	
Paris Green	
Pine Tar	
Pitch	
Plasticizer	A definite synthetic organic chemical compound used to overcome brittleness or to develop flexibility. This term shall not be used in lieu of other Approved Labeling Terms.
⁂ Portland Cement	
Protein	
Starch	
Tinting Colors	Colors used for tinting purposes may be added under this classification provided the total does not exceed 5% of the total pigment.
Water	
Zein	

+Presence of this ingredient may require hazardous substances labeling.

VEHICLE INGREDIENTS

Solvents and Thinners

Alcohol (specify if methanol) ---	Organic Solvents characterized by the hydroxyl group (OH).
Aliphatic Hydrocarbons ----------	Straight chain hydrocarbons derived from a paraffin base crude oil or the paraffin part of a mixed base crude oil.
Aliphatic & Aromatic Hydrocarbons ----------	A combination of Aliphatic and Aromatic as defined herein.
Aromatic Hydrocarbons ----------	Characterized by the benzene nucleus.
Coal Tar Thinners ----------	Aromatic Hydrocarbons derived from the condensed liquid from the destructive distillation of coal. Ex.: Hi-Flash Naphtha.
Coal Tar Distallates ----------	See Coal Tar Thinners.
Esters ----------	Chemical Compounds used as solvents having the general formula RCOOR, where R & R' are the same or different alkyl groups.
Glycol Ethers ----------	To describe solvents which have an alcohol (-OH) radical and an etheric oxygen linkage (-O) in the molecules.
Halagenated Hydrocarbons --------	
Hi-Flash Naphtha ----------	See Coal Tar Thinners.
Kerosene ----------	A fraction derived from the distillation of petroleum with an average boiling range of 150 - 250 degrees C.
Ketones ----------	Chemical Compounds used as solvents characterized by the carbonyl (C:O) group, having the general formula RCOR' where R & R' are the same or different alkyl groups.
* Mineral Spirits ----------	ASTM Petroleum Spirits.
Naphtha ----------	Petroleum Spirits of a relatively low boiling range. This term may be used to describe the different fractions such as V.M. & P Naphtha, Solvent Naphtha, etc.
* Petroleum Distillate	
Terpenes ----------	The name of the terpene in each instance must be shown. Ex.: Turpentine, Dipentine, Pine Oil, etc.
* Turpentine ----------	ASTM "Spirits of Turpentine".

Oils

(The true name of the oils must be shown; however, if modified, state the type of modification. Ex.: boiled linseed oil, limed tall oil.)

- Castor Oil
- Coconut Oil
- Cottonseed Oil
- Dehydrated Castor Oil
- Hempseed Oil
- Linseed Oil
- Menhaden Oil
- Oiticica Oil
- Perilla Oil
- Rapeseed Oil
- Safflower Oil
- Sardine Oil
- Soybean Oil
- Sunflower Oil
- Tall Oil
- Tung Oil
- Walnut Oil

Natural Resins and Gums

(The following terms may be used to designate the various natural resins and gums. Where there are subheadings, either the subheading or the main classification may be used.)

- Dammar
- East India
- Copal
  a. Manila
  b. Congo
  c. Kauri
- Accroides
- Elemi
- Mastic
- Natural Rubber
- Sandarac
- Rosin
- Shellac (Not a true natural resin since it is an exudation product of trees.)

NOTE: Natural Resins esterified with polyhydric alcohols such as glycerol may be labeled as: ***NAME OF RESIN, ***ester (Example, Copal: Copal Ester). In cases where the natural resin ester is modified or the natural resin is modified and the esterified, the name of the modifier must be given. (Example: Rosin Copal Ester).

#Synthetic Resins

Acrylic Resin	A synthetic resin made from derivatives of acrylic acid.
Alkyd Resin	A synthetic resin made from polyhydric alcohols and polybasic acids or anhydrides of the saturated types (i.e. Phthalic, Succinic) and generally modified with resins, fatty oils or fatty acids. The name of the modifier must be shown. (See also "Polyester Resin").
Butadiene-Styrene Resin	A synthetic resin made from various ratios of Butadiene and Styrene or their homologues.
Cellulose Ester	
Chlorinated Biphenyl	A synthetic resin derived from the introduction of chlorine into the molecules of hydrocarbons.
Chlorinated Paraffin	A resin made by the reaction of Chlorine on Paraffin.
Chlorinated Rubber	A product formed by the chlorination of rubber containing about 65% chlorine.
Coumarone-Indene Resin	A synthetic resin derived from coal tar hydrocarbons.
Epoxy Resin	A synthetic resin derived from a poly epoxide and epologyic alcohol.
Exter Gum	A resin made from rosin and a polyhydric alcohol. Ex.: Glycerol, pentaerythritol.
Maleic Ester Resin	A synthetic resin made from maleic acid or maleic anhydride and a polyhydric alcohol.
Maleic Resin	A resin made from a natural resin and maleic anhydride or maleic acid.
Melamine Resin	A synthetic resin made from melamine and an aldehyde.
Petroleum Resin	A synthetic resin produced by the polymerization of hydrocarbons of petroleum origin.
Phenolic Resin	A synthetic resin made from phenols and aldehydes.
Poly Amides Resin	

see note on page 10.

Poly Amines Resin	
Polyester Resin	A synthetic resin made from polyhydric alcohols and polybasic acids or anhydrides of the unsaturated type, i.e. maleic, fumaric, & citroconic - see also Alkyd Resin.
Poly styrene	
Polyurethane Resin	
Processed Rosin	Rosin that has been treated with heat or catalysts or both, with or without added chemical substances, so as to cause substantial change in the structure of the rosin acids, as isomerization, hydrogenation, dehydrogenation, or polymerization without substantial effect on the carboxyl group.
Rosin Salts	A resin obtained when rosin is fused with a metal salt to form the corresponding metallic resinate.
Rubber Resin	Resinous derivatives of natural and synthetic rubber.
Silicone Resin	A synthetic resin which is a compound chemically classed as organo-polysiloxanes.
Terpene Resin	A synthetic resin formed by the polymerization of terpenes, or polymerization of terpenes with other resin forming materials.
Urea Resin	A synthetic resin made from urea and an aldehyde.

Modification of the above terms (Synthetic Resins), as defined, may be labeled by giving the name of the resin and the name of the modifier. For example: An "Alkyd Resin" modified with linseed oil may be labeled as "Linseed-Alkyd Resin". A "Phenolic Resin" modified with ester gum may be labeled as "Ester Gum-Phenolic Resin".

#Synthetic Resins modified with oil fatty acids may be labeled by giving the name of the resin preceded by the name of the oils from wich the acids were obtained. Ex.: "Soya Alkyd", "Linseed-Soya Alkyd".

PIGMENTS

Black, Brown & Gray (except iron oxides)

Amorphous Graphite (see Graphite below)
* Bone Black
* Carbon Black
* Dropblack (ASTM Boneblack)
Graphite (natural allotropic carbon - may be produced synthetically)
* Lampblack
Mineral Black (a carbon black made from heavy black slate and containing approximately 43% fixed carbon, 38% volatile matter, and 10% ash)
* Sublimed Blue Lead (ASTM Blue Lead, Basic Sulfate)
Vegetable Black (produced by carbonization of vegetable matter)

Inorganic Blue

* Basic Sulfate Blue Lead
* Iron Blue
* Ultramarine Blue

Inorganic Green

* Chrome Green (ASTM Pure Chrome Green)
* Chromic Oxide Green (ASTM Chrome Oxide Green)
Chromium Oxide, Hydrated (approximately Cr_2O_3 $2H_2O$)
* Reduced Chrome Green

Inorganic Orange

* Chrome Orange
* Dark Chrome Orange (ASTM Chrome Yellow & Chrome Orange)
* Light Chrome Orange (ASTM Chrome Yellow & Chrome Orange)
Molybdate Orange (A mixture of Lead Chromate, Lead Molybdate and other Lead salts)

Inorganic Red (except iron oxides)

Cadmium Red

Cadmium Sulfoselenide - Abbv. Cadmium Sulfosel. (Cadmium Sulfide with selenium added in the process of manufacture to obtain shade.)

Cadmium Sulfoselenide Lithopone - Abbv. Cadmium Sulfosel. Lith. (Coprecipitated products of Cadmium Sulfide & Barium Sulfate with selenium added in the process to obtain shade.)

Mercadium Red

*Red Lead

Inorganic Yellow (except iron oxides)

*Basic Lead Silico Chromate

Cadmium Lithopone (The coprecipitated product of Cadmium Sulfide and Barium Sulfate with or without small amounts of Zinc Sulfide precipitated in the process to obtain shade.)

*Chrome Yellow (ASTM Chrome Yellow and Chrome Orange)

*Lemon Chrome Yellow (ASTM Chrome Yellow and Chrome Orange)

Litharge (PbO) (ASTM Chrome Yellow and Chrome Orange)

*Medium Chrome Yellow (ASTM Chrome Yellow and Chrome Orange)

Titanated Nickel

Titanated Yellow

*Zinc Yellow

Iron Oxides

*Black Synthetic Iron Oxide

*Burnt Umber

*Burnt Sienna

*Indian Red (ASTM Red and Brown Iron Oxide - Class I)

*Iron Oxide, CP (ASTM Red and Brown Iron Oxide - Class I)

*Ocher

*Pure Iron Oxide (ASTM Red and Brown Iron Oxide - Class I)

*Sesquioxide of Iron (Ferric Oxide)

*Raw Sienna

*Raw Umber

*Venetian Red (This should be broken down to show the percent Ferric Oxide.)

*Yellow Iron Oxide (ASTM Yellow Iron Oxide, Hydrated)

Metallic

* Aluminum Paste
* Aluminum Powder
* Copper Powder
* Copper Bronze Powder (ASTM Copper Powder)
* Gold Bronze Powder
  Metallic Lead, Flaked (This shall contain a minimum of 90% metallic lead)
* Zinc Dust

White (including extenders)

Alumina (Al_2O_3 - The oxide of Aluminum that occurs in nature as Corundum)
Aluminum Hydrate ($Al_2O_3.3H_2O$ or $Al_2O_3.H_2O$)
Asbestos
* Basic Lead Carbonate (ASTM Basic Carbonate White Lead)
* Basic Lead Sulfate (ASTM Basic Sulfate White Lead)
[1] Basic Silicate White Lead ($2PbSiO_3$-$Pb(OH)2$)
[1] Basic Silicate White Lead (48% PbO Type)

By analysis:			
	PbO		48%
	SiO_2	Maximum	49%
		Minimum	43%
	SO_3	Maximum	8%
		Minimum	4%

Need variation in composition Spec. to allow 303

Bentonite Clay (A mineral pigment compound mainly of Silicon Dioxide and Aluminum Oxide)
Calcium & Magnesium Carbonate (only for ground limestone)
China Clay (Chief constituent is Aluminum Silicate, also known as Kaolin & Porcelain Clay)
Emery
Gypsum (A atural hydrated Calcium Sulfate - $CaSO_4.2H_2O$)
Leaded Zinc Oxide (The percent of the Basic Sulfate White Lead shall be shown. Ex.: 35% Leaded Zinc Oxide)
* Lithopone (ASTM Zinc Sulfide Pigments)
* Mica (See also Silicates)
Pumice
Silica (Silicon Dioxide)
Silicates (This term may be used to describe various silicates and combinations of silicates as Aluminum & Magnesium Silicates, etc. It includes terms as China Clay, Diatomaceous Silica, Diatomaceous Earth, Kaolin, Mica, Porcelain, Clay, Pyrophyllite & Talc.)
* Titanium Calcium (ASTM Titanium Dioxide Pigments)
* Titanium Dioxide (ASTM grades, if do not conform, declare as "Titanium Dioxide Pigment (XX% TiO_2)").

[1] These pigments may not be referred to as "White Lead".

Organic Blue & Violet	Classification Code
Alizarine Blue	VIII-A-1
Anthraquinone Violet	VIII-B-4
Benzyl Violet	IV-A-7
Copper Phthl. Blue	IX-A
Crystal Violet	IV-A-8
Glacier Blue	IV-A-5
Indanthrene Blue	VIII-B-3
Methyl Violet	IV-A-6
Monasteral Blue	
Nigrosine	X-C
Peacock Blue Lake	V-B
Rhodaline Blue 6G	IV-A-2
Phthl. Blue	IX-D
Victoria Blue	IV-A-9
Victoria Pure Blue	IV-A-10

Organic Green	
Acid Green Lake	V-A
Brilliant Green	IV-A-3
Copper Phthl. Green	IX-B
Copper Phthl. Bluish-Green	IX-C
Indanthrene Green	VIII-B-3
Malachite Green	IV-A-1
Monasteral Green	
Pigment Green B	I-A
Victoria Green	IV-A-9

Organic Yellow & Orange	
Algol Yellow	VIII-B-1
Azo Nickel Yellow	III-C-10
Benzidine Yellow	III-A-3-e
Benzidine Orange	III-A-4-c
Chrome Yellow L	III-A-4-b
Dinitraniline Orange	III-A-1-d
Hansa Yellow	III-A-3-a,b,c & d
Hansa Yellow R	III-A-4-a
Indanthrene Orange	VIII-B-2
Naphthol Yellow S	II-A-1
Orthonitraniline Orange	III-A-1-f
Permanent Orange	III-A-1-d
Persian Orange	III-B-1-a
Quinoline Yellow Lake	VII-B-1
Thioflavin	IV-C-1
Tolidine Yellow	III-A-3-f
Tartrazine Yellow	III-B-f

Organic Red, Brown & Maroon	Classification Code
Amaranth Maroon	III-B-1-c
Alizarine Red	VIII-A-1
Anthosine Red	III-B-2
Arylide Maroon	III-A-2-b
Arylide Red	III-A-2-b
Azo Bordeaux	III-B-1-c
BON Maroon	III-C-8
BON Red	III-C-8
Chlorinated Para	III-A-1-c
[1] Chlorinated Para & BON Maroon	
[1] Chlorinated Para & lithol Rubine	
Eosin Lake	VII-A-1
Helio Bordeaux	III-C-6
Indanthrene Maroon	VIII-B-3
Lithol Maroon	III-C-1
Lithol Red	III-C-1
Lithol Rubine	III-C-2
Madder Lake	VIII-A-1
[1] Molybdate Orange & BON Maroon	
Para Brown	III-A-1-c
Para Red	III-A-1-b
Pigment Scarlet	III-B-1-d
Red Lake C	III-C-3
Red Lake D	III-C-4
Red Lake P	III-C-6
Red Lake R	III-C-7
Rhodamine B	IV-B-1
Rhodamine 6G	IV-B-2
Scarlet Lake	III-B-1-b
Thioindigo Toner	VI-A
Toluidine Maroon	III-A-2-a
Toluidine Red	III-A-1-a
Tuscan Red	X-A
Van Dyke Brown	X-B

[1] These are mechanical mixtures whose percentages vary somewhat with each batch to obtain the correct shade.

draft - 3/2/71 #1

CLASSIFICATION OF ORGANIC COLORS OR PIGMENTS

I. NITROSO GROUP - (-NO) group present. Preparation depends on reaction between phenols and nitrous acid.

Pigment made from Nitroso-b-naphthol reacted with iron salts and with or without precipitation on a suitable base such as Alumina Hydrate. (Pigment Green B)

II. NITRO GROUP - ($-NO_2$) group present. No apparent chromophore group aside from the nitro group itself. However, there is probably an equilibrium between the nitro and orthoquinonoid structure with the latter being primarily responsible for the color.

Pigment made by nitrating 1-Naphthol-2, 4, 7-tri-sulfonic acid precipitated on a suitable base as alumina hydrate with a solution of $BaCl_2$. (Naphthol Yellow S)

III. AZO GROUP - (-N=N-) "aza" group present. Fundamentally formed by the coupling of a diazonium salt with a phenolic or an amino compound.

A. The Pigment Type - Insoluble on formation and contains no salt forming groups.

1. No other distinguishing characteristics except as follows:

a. Made by coupling diazotized m-nito-p-toluidine with alkaline b-Naphthol. (Toluidine Red)

b. Made by coupling diazotized p-Nitroaniline with alkaline b-Naphthol. (Para Red)

c. Made by coupling diazotized p-Nitroaniline with alkaline b-Naphthol and treating with copper salts. (Para Brown)

d. Made by coupling diazotized 2, 4-Dinitroaniline with b-Naphthol. (Dinitroaniline Orange or Permanent Orange)

e. Made by coupling diazotized o-chloro-p-nitroaniline with b-Naphthol. (Chlorinated Paranitraniline)

f. Made by coupling diazotized o-nitroaniline with b-Naphthol. (Orthonitroaniline Orange)

2. Distinguished in that they are formed from a diazonium salt and Naphthol AS compounds or its homologues. Naphthol AS compounds and its homologues are those formed by reaction of b-hydroxy naphthoic acid and an aryl amine.

a. Made by coupling diazotized m-nitro-p-toluidine & the m-nitroanilide of b-hydroxy naphthoic acid. (Toluidine Maroon)

b. All compounds under III-A-2 except III-A-2-a. (Arylide Red & Arylide Maroon)

3. Distinguished in that they are formed from a diazonium salt & Acetoacetic Arylides. Acetoacetic Arylies are formed from an amino compound and acetoacetic ester.

a. Made by coupling diazotized m-nitro-p-toluidine with acetoacetanilide. (Hansa Yellow G)

b. Made by coupling diazotized p-chloro-o-nitroaniline with acetoacetanilide. (Hansa Yellow 3G)

c. Made by coupling diazotized o-nitroaniline with acetoacetanilide. (Hansa Yellow 5G)

d. Made by coupling diazotized p-chloro-o-nitroaniline with acetoacet-o-chlorcanilide. (Hansa Yellow 10G)

e. Made by coupling tetrazo compounds of benzidine derivatives with acetoacetanilide or its derivatives. (Benzidine Yellow)

f. Made by coupling diazotized o-tolidine and acetoacetic ester. (Tolidine Yellow)

4. Distinquished by the presence of the pyrazolone ring structure.

a. Made by coupling 2, 5, -dichloroaniline with 1-phenyl-3-methyl-5- pyrazolone. (Hansa Yellow R)

b. Made by coupling o-toluidine with 1-phenyl-3-methyl-5-pyrazolone. (Chrome Yellow L)

c. Made by coupling cichlorobenzidine with Phenyl Methyl Pyrazolone. (Benzidine Orange)

B. The Soluble Azo Type - Usually contains a sulfonic acid group making the dyestuff soluble & permitting conversion to the insoluble heavy metal salt. Usually precipitated on a suitable base as alumina hydrate with solution of $BaCl_2$.

1. No other distinguishing characteristics except as follows:

   a. Made by cbupling diazotized Sulfanilic Acid with b-naphthol. (Persian Orange)

   b. Made by coupling diazotized m-xylidine with 2-naphthol-3, 6-disulfonic acid. (Scarlet Lake)

   c. Made by coupling diazotized a-naphthylamine with 2-naphthol-3-6-disulfonic acid. (Azo Bordeaux)

   d. Made by coupling diazotized anthranilic acid with 2-naphthol-3-6-disulfonic acid. (Pigment Scarlet)

   e. Made by coupling diazotized naththionic acid with 2-naphthol-3-6-disulfonic acid. (Amaranth Maroon)

   f. Made by coupling diazotized aniline with 1-p-sulpho-phenyl-3-carboxy-5-pyrazolone. (Tartrazine Yellow)

2. Distinguished in that the dyestuff is an Anthosine type made by coupling diazo compounds with cichlorobenzoyl-K-acid. K-acid is: 1-amino-8-naphthol-4, 6-disulfonic acid. (Anthosine Red)

C. The Difficulty Soluble Azotyy Soluble Azo Type - Usually contains a sulfonic acid group which, although the sodium salt of the dye is difficultly soluble, may be converted into a heavy metal salt making the group very insoluble to organic solvents & oils. The lithols & others in this group may be resinated or unresinated. Most of the pigments are in the form of the Barium, Calcium, Strontium, Lead, Manganese, or Nickel products.

1. Made by coupling diazotized 2-naphthylamine-1-sulfonic acid with b-naphthol. (Lithol Red or Lithol Maroon)

2. Made by coupling diazotized p-toluidine-m-sulfonic acid with b-hydroxy naphthoic acid. (Lithol Rubine)

3. Made by coupling diazotized 2-chloro-5-toluidine-4-sulfonic acid with 2-naphthol. (Red Lake C)

4. Made by coupling diazotized Anthranilic acid with b-naphthol. (Red Lake D)

5. Made by coupling diazotized a-naphthylamine with 1-naphthol-5-sulfonic acid. (Helio Bordeaux)

6. Made by coupling diazotized p-nitroaniline-o-sulfonic acid with b-naphthol. (Red Lake P)

7. Made by coupling diazotized aniline with b-hydroxy naphthoic acid. (Red Lake R)

8. Made by azo coupling of various aromatic amines with b-hydroxynaphthoic acid other than III-C-2, & III-C-7. (BON Red & BON Maroon)

9. Nickel complexes of azo compounds with pyridine or its derivatives as part of the color producing structure. (Azo Nickel Yellow)

IV. BASIC DYE GROUP - This group is characterized by the treatment of various Basic Dyes (fugitive to light) with Phosphotungstic, Phosphomolybdic, or phosphotungstomolybdic acids to make permanent toners and lakes. The basic dyes are synthetic organic coloring matters with amino or substituted amino groups present.

A. Triphenylmethane Class

1. Made from dimethylaniline and benzaldehyde. Usually found in the oxalate form. (Malachite Green)

2. Made from o-chlorobenzaldehyde & dimethylaniline. (Rhoduline Blue 6G)

3. Made from diethylaniline & benzaldehyde. (Brilliant Green)

4. Made by heating aniline, o-toluidine, p-toluidine, & their hydrochlorides in nitrobenzene with iron & zinc chloride. Not a chemical individual. (Fuchsine)

5. Made from 2, 5-dichlorobenzaldehyde with mono-methyl-o-toluidine. (Glacier Blue)

6. Formed in the oxidation of dimethylaniline with Cupric chloride in a mixture of dimethylaniline, phenol, Sodium chloride & Copper Sulfate. (Methyl Violet)

7. Chiefly a mixture of the hydrochlorides of benzyl-pentamethyl-pararosaniline & hexamethyl-pararonsaniline. (Benzyl Violet)

8. Formed in the reaction of the dichloride of Michler's Ketone with dimethylaniline. (Crystal Violet)

9. Formed in the reaction of Michler's Ketone with phenyl-a-naphthylamine. (Victoria Blue & Victoria Green)

10. Formed in the reaction of tetraethyl-diamino-benzo-phenone with phenyl-a-naphthylamine. (Victoria Pure Blue

B. Xanthene Class

1. Formed in the reaction of Diethyl-m-aminophenol with phthalic anhydride. (Rhodamine B)

2. Formed in the reaction of mono-ethyl-m-aminophenol with phthalic anhydride & then reacting with ehtyl alcohol. (Rhodamine 6G)

C. Thiazine Class

1. Formed by heating p-toluidine with sulphur in the presence of lead oxide at high temperature. (Thioflavin)

V. ACID DYE GROUP - Made from dyestuffs largely of the di- & tri-phenylmethane classes. Contains amino or substituted amino groups & sulfonic acid groups. (Most contain more than one sulfonic acid group.)

A. Made by condensing benzaldehyde with n-benzyl-n-ethyl aniline & then sulfonating and made into a lake. (Acid Green Lake)

B. Made by condensing benzaldehyde-O-sulfonic acid with n-benzyl-n-ethylaniline & then sulfonating, oxidizing & converting to the ammonium salt and made into a lake. (Peacock Blue Lake)

VI. INDIGOID GROUP - Bear a structure similar to indigo.

The nitrogens in the indigoid structure replaced by sulphur. (Thioindigo Toner)

VII. XANTHENE DYE GROUP - Characterized by the Quinonoid structure.

A. Acid Type - Made by brominating the condensation reaction between phthalic anhydrice & resorcinol (Eosin Dye) & ppt. on Alumina hydrate with Lead Nitrate. (Eosin Lake)

B. Quinoline Type - Made from reaction of quinaldine with phthalic anhydride, addition of sulfonic acid group, & precipitation as the Barium Lake. (Quinoline Yellow Lake)

VIII. ANTHRAQUINONE GROUP - Characterized by the anthraquinone structure.

A. Non-Complex Quinones - (Consists of only one molecule of anthraquinone or its derivatives.)

Made from 2-anthraquinoesulfonic acid by fusion with caustic soda. Metallic salts give various colors. (Alizarine or Madder Red & Blue)

B. Complex Ring Quinones - In most cases consisting of 2 molecules of anthraquinone or its derivatives, linked together through nitrogen or carbon.

1. Made by heating a-amino-anthraquinone with benzoyl-chloride. (Algol Yellow)

2. Made by the condensation of a-aminoanthraquinone & b-chloroanthraquinone. (Indanthrene Orange)

3. Made by heating b-aminoanthraquinone or its derivatives with caustic potash. (Indanthrene Blue, Green, Violet)

4. Derived from Benzanthrone. (Anthraquinone Violet)

IX. PHTHALOCYANINE GROUP - Based structually on tetra-benzo-tetra-aza-porphin.

A. Made by the introduction of Copper into the basic structure in place of the internal hydrogens attached to nitrogen.

B. Made by the introduction of chlorine into the benzene rings of Copper Phthalocyanine Blue. (Copper Phthalocyanine Green)

C. Made by sulfonating the benzene rings of Copper Phthalocyanine Blue. (Copper Phthalocyanine Bluish-Green)

D. No metal introduced in place of the internal hydrogens. (Phthalocyanine Blue)

X. MISCELLANEOUS

A. A mixture in varying amounts of an organic color and Iron Oxide with Barium Sulfate often added to obtain the correct shade. (Tuscan Red)

B. Pigment of organic origin resulting from decomposition of vegetation, containing approximately 64% organic matter; 20% water; & aluminum oxide, iron oxide, calcium oxide, and/or alkali salts. (Van Dyke Brown)

C. A spirit soluble aniline blue-black dye. (Nigrosine)