#88

FORMULA CARD PREPARATION BULLETIN

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Issued by a committee composed of: R. A. Moore
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This committee was formed as a result of a discussion of this subject at the Lab Director's Meeting of 1955. The purpose was to prepare and issue detailed instructions for the preparation of PAINT formula cards; also, to define any of the terms that are used in connection with formula cards.

If adopted, this procedure will make it possible to have a uniform system for use by all laboratories issuing paint formulas.

The formula reference that will be used in this bulletin will be Form A137, the Ozalid Snap-Out Form, for producing factory batch slips as well as formula cards. (See page 2 for sample.) To keep the references in an orderly sequence, we have taken the captions as they generally appear on the snap-out form, which is the beginning point for the formulator.

General Instructions

Formulators must not write in any area of the ozalid form except the 4" x 6" space that is allowed for formula information. The blank space at the top of the form and the printed space at the right will be for use by the manufacturing divisions and any writing that appears in that space will interfere with ozalid reproduction of our formula.

REX CARD NO. DEPT.

NAME

QUALITY

PREV. No.	POUNDS	GALLONS	ALT. MAT'L.	MATERIAL
PARALLEL				
OUTPUT				
MFG. LOSS				
MILL				
RATE/HR.				
BLEED				
CAN				
DRUM				
FLASH PT.				
LABEL NO RED ☐ RED ☐				
LABEL ANALY				
LABEL CAUTION				
RYLTY: YES ☐ NO ☐				
RYLTY: X ☐ W ☐				
WT./GAL.				
GRIND				
VISC.				
SOLIDS				
FORML'R				
MFG INSTU.				

FORMULA RECORD

A-136

CONTROL LAB_____ CARD No._____ DATE_____ REX No._____

NAME_____

CUSTOMER_____ APPROVED_____

GLOSS:_____

COLOR:_____

APPLICATION:_____

SURFACE: 1_____

2_____

METHOD: BRUSH_____ SPRAY_____

DIP_____ ROLLER_____

REDUCTION: 1_____

2_____

UNDERCOATING:_____

BAKING TIME:_____

TEMP.:_____

TYPE OVEN_____

DRY TO TOUCH:_____ RUB:_____

TACK FREE:_____ STENCIL:_____

DRY:_____ HANDLE:_____

RECOAT:_____ WRAP:_____

SAND:_____ HARD:_____

SW TEST METHODS

WGT. PER GAL.:_____

VISCOSITY:_____

DRYING OR BAKING:_____

1_____ 2_____

COLOR:_____

GLOSS:_____

GEN'L APPEARANCE:_____

1_____ 2_____

STRAINING:_____

SPECIAL TESTS:_____

REASON FOR REVISION:_____

0007-PMC-000000118

1. Rex - It is the formulator's, group leader's, or lab director's responsibility to obtain the rex number for the product. This includes selection of correct classification. Procedure for assigning product number and entering in registers varies with laboratories; usually one person keeps the register posted. See R & P #106, Assignments, Products, Classified, dated Feb. 4, 1949, for further instruction.

2. Card No. - This caption is used to show the specific card number for the formula being issued. Formulators will use Card No. 1 for original development work, increasing the numbers consecutively for revisions as they are issued.

   Alternate Formulas can be issued under the same card number if the formulator has no objection to which formula is used. The proper way to designate an alternate is to use letters of the alphabet for designating each alternate formula as issued. An example is Card No. 2, Alt. A. In this case, both the regular and alternate formulas are considered to be active and all production departments may use either one of them.

   Local Variation Formulas are also identified under this caption. The proper way to identify local variation formulas is to use the letter assigned to your plant followed by a number. Examples of local variation formulas are Card No. 2, N-1 and Card No. 2, Alt. A, N-1. These would be the first local variation of Card No. 2 and Card No. 2, Alt. A issued by the Newark laboratory.

   Descriptive words, such as experimental and temporary are unacceptable under this caption.

3. Department - This caption is carried on the formula cards for use by those laboratories, particularly Chicago, that must show the department where the material is to be produced, such as Paint or Lacquer. It also appears on the formula cards for use of production points to record on the card the department where they normally produce the material, such as B or K Departments. This caption can be left open by formulators where the laboratory issuing the formula does not designate production department for manufacturing.

4. Name - The information that should appear in this caption is described in R & P #140, Names, Use of Proprietory Names and Trade Marks, issued Feb. 16, 1950. Since practically all of our products today are in the classified number system, there would be very few exceptions where the instructions as written in R & P #140 do not apply. If it is a S-W line goods, then the name of the line should be so stated in the name, such as SWP Gloss White.

5. Quality - This caption replaces captions in previous formulas "To Match." It is:

   A. The correct place to show any government or customer's specification number.
   B. The correct place to show a reference to a standard quality material.

   The word "standard" should not be used, but space can be left blank.

6. Previous No. - Particularly useful when there has been a cost estimate assignment or an experimental assignment number preceding a general (price list) classification number.

7. Parallel - If there are more parallels than can be shown in this one space, it is suggested that an asterisk be used with the words "see below" and then under Mfg. Instr., list the parallels to this. If there are only two and use is not made of the previous caption (Previous No.), then that caption can be crossed out and bracketed to show as parallel. If there is no parallel, write NONE in this space. See R & P #190, Assignments, Parallel, dated June 21, 1954, for further reference.

8. Output - Net yield after manufacturing loss. Usually, this is 100 gallons in paint formulas. Paste formulas are usually set up to yield 500 pounds after manufacturing loss. One exception to this rule at the present time is that Lacquer Department formulas have been and are still permitted to continue to show input figures.

9. Mfg. Loss - This is an estimated figure based on the best judgment of the formulator issuing formulas. Condition of the equipment that is being used to produce quantity size batches and volatility of materials will influence the formulator in selecting a good estimated manufacturing loss. The former rules on definite loss figure for the type of materials can no longer apply, due to the variables just mentioned.

10. Mill - Formulators must specify one type of equipment which is suitable for manufacturing use. The mill must be identified, such as 5 roller mill or 4 x 5 ball mill, Morehouse, etc. See H. E. Spitzer's Development Laboratories Letter No. 21, dated February 11, 1955, for further information.

11. Rate Per Hour - The Cost Department needs this information in conjunction with the preceding caption and the information should be recorded in gallons or pounds of finished product per hour on the specific type of equipment shown.

12. Bleed - If formulator has knowledge of bleeding characteristics, use this space. If not, leave blank. Limited space requires abbreviation or use of circle numbers. "Oil", "aromatic" or "water" are preferred over "yes." If instruction regarding bleed is complicated, use reference mark (* Asterisk) and explain fully under manufacturing instructions.

13. Can & 14. Drum - Reference to the container code bulletin dated January 19, 1955, for the identification of cans and drums, is to be recorded under these captions. This bulletin was distributed to all formulators to be included in the Formulator's Handbook.

15. Flash Point - The purpose of this caption is to furnish information to the factories for proper handling of finished products. Common sense must prevail. Some of the methods that can be used and are acceptable are: Under 80° F., under 100° F. and over 100° F., EST. 75° F. or ACT. 75° F.

16. Label; No Red. Red - Some people need and use this information and it is required that one of these two blocks be indicated. If the material is known to flash below 80° F., the recording would be red -- otherwise, no red.

17. Label Analysis - There is a reference on this subject, R & P #198, Products, Label Analysis & Statement of Composition, dated July 5, 1955, which will determine whether a label analysis is required for a product. When label analysis information is required, it is important that the identification of the label analysis be recorded. If no label analysis is required, show "No."

18. Label Caution - The responsibility for informing the production departments of the correct label cautions has been delegated to the laboratories. Full and complete instructions for selecting the label caution have been covered in R & P #191, Labels, Directions for use of Warning Labels, dated March 4, 1955.

19. Royalty: Yes, No; X, W. - On the next printing of the formula card, we are going to omit X and W, since the Lacquer Division in Chicago has expressed that they do not believe they are necessary for properly recording type of royalty required. We can not find current formula records where any department has been using these particular captions. The other two royalties, Yes and No, will be continued and can be used or not, depending upon formulator's knowledge concerning the product. If the formulator is aware that the formula is being made under some patent or license agreement, he should check Yes. If he thinks it is important to identify which patent or license, he can indicate with a reference mark and then explain it somewhere else on the card.

20. Wt/Gal - The accepted practice is to insert the theoretical weight per gallon, which is computed from total weight divided by total yield as determined from bulking figures and weights per gallon in the Formulator's Handbook.

21. Grind - Grind will be expressed in Hegman Gauge Units. Identification of grinds will be found in the Hegman Grind Gauge reading procedure issued in 1955. This method is also covered by IHT 441.0.

22. Viscosity - Multiple spaces are provided on the formula card, so that the viscosity can be expressed by the instrument used and the condition or time of test, such as 25 sec. #3 S-U Cup, 80-85 K.U. or 20 sec. #4 Ford at 77° F. reduced 25% with xylol.

23. Solids - Show theoretical solids. If customer-company relation requires limits, they should be stated; for example: 64-66% or 65% ± 1%.

24. Formulator - The formulator should sign with complete last name, rather than initials, even though it over-extends the space provided or to use the space immediately above.

25. Mfg. Instr. - This caption is self-explanatory. Formulators should put as much information under this caption as is possible that will aid the manufacturing divisions to produce the quality desired. If the manufacturing instructions are more complicated than can be recorded in this space, then a separate card should be prepared, properly identified, and issued along with the formula. Among the things that formulators could include are instructions on the handling of toxic materials, special base color instructions and instructions regarding special equipment cleaning, etc.

26. Composition - This caption covers instructions for entering the composition of the formula in the proper columns headed by Pounds, Gallons, Alt. Mat'l and Material. The arrangement of the columns by the alternate material and material was selected for convenience of the manufacturing divisions on the new ozalid form. The formulators should become acquainted with using the proper columns for registering the regular and alternate materials. They are also responsible for all of the entries appearing in these columns, even though some laboratories have formula clerks who convert estimated 100 gallon formulas to an exact 100 gallon formula.

Pounds and gallons figures for each item must be entered. Quantities of pounds and gallons, except gallons of pigments, shall be shown in whole numbers or fractions, such as 1/2, 1/4, 1/8, 1/16, etc., but never below 1/64. Fractions of gallons of pigments may be shown by the decimal system, using two decimal places if desired.

Since pigments are never added by volume, and this information is recorded on the card only for formulators and factory use for estimating purposes, the instructions are that this portion of the card should be X'd out after the card is prepared. This does not apply to bases, because there are some instances where bases are measured by volume.

There are some rare occasions when pounds and gallons do not properly describe the quantity of the material that is needed, such as in the case of a perfuming agent or mold inhibitor. In these cases, the measurement should be stated in either the weight or volume column with description of the measuring division and then underlined to be sure everyone knows that measurement is in grams, cc's or fluid ounces, etc.

Arrangement of items in the composition space is important. Currently, this constitutes the listing of the pigments in the order of their density. The lightest and fluffiest materials are entered first and heavier or denser materials are entered last. It is also very important that the "mix and paste" portions be separated from the "thin and shade" portions by drawing a line underneath. The purpose of this line is to identify for both the factory and accounting offices the portion of materials that is to be delivered to mixing floors or that require additional manufacturing cost. As far as possible, within the space permitted, alignment of whole numbers and fractions should be in good vertical arrangement, as it would be very easy for anyone to make an error.

The correct use of designations for shading bases will be as follows:

? - for bases when less than 2 pounds per 100 are used.

? (2-10) - show estimated pounds in parentheses where quantities used are between 2 to 10 pounds.

For tinting or shading colors in amounts of 10 pounds or more, use definite figures.

Exceptions to this procedure for entering composition is acceptable when formulators cannot describe the product by adherence to the system shown. In those cases, it is the formulator's responsibility to be sure that the variation is clear and easily understood.

27. Control Laboratory - Information going in this caption is the issuing laboratory for this particular formula and not the laboratory that controls this particular rex classification.

28. Card No. - Same as No. 2.

29. Date - This should be the date the formulator prepares the formula, not the date the formula clerk types or makes the permanent record.

30. Rex Number - Same as No. 1

31. Name - Same as No. 5.

32. Customer - Whenever a formula is developed for a specific customer, it should appear under this caption. If it is a line goods development, the preferred use would be Sherwin-Williams Trade Sales Division or Sherwin-Williams Branch Industrial, rather than Sherwin-Williams Company.

33. Approved - This caption is provided for signature by initials of the laboratory director or someone he has delegated to approve the issuance of formulas for each formulator.

34. Gloss - Show the gloss requirements under this caption either by descriptive words or measurement limits. For instructions and description of the 60° Glossmeter, see IMT 610.11.

35. Color - Do not use the words "match standard"; do use "match neutral oil standard #___", "match rex _____," or "customer sample" or such other words which will describe the basic color standard for the product. If there is no entry here, it will be assumed that it will match the standard color that has been established. Reference to color instrument readings are to be shown under Special Tests.

36. Application - Simply show the preferred method of application for which the goods were developed.

37. Surface - Use as descriptive words as possible, such as steel, wood, masonry, cold rolled steel, etc. Two spaces are provided in case there is more than one surface required.

38. Method of Application - The current form shows Brush, Dip, Spray and Roller. The next revision will have a provision for other methods. If there is a different method than provided in the present form, cross out one of the terms and insert the one that does apply.

39. Reduction - Show reducer and percent reduction for each application method.

40. Undercoater - Identify the coating over which this product will be applied in use or for test. If no undercoater is being used, enter NONE.

41. Baking Time - Time in oven at effective baking temperature.

42. Temperature - Indicate temperature for convection ovens or product surface temperature for infrared ovens. If necessary, divide above baking schedule into time and temperature zones.

In the next revision of the form, baking time and temperatures are going to be combined, but provisions are going to be made to include the type of oven.

43. Drying Time - Enter the correct figures for the various stages of drying appropriate for this product.

44. S-W Test Methods - We are trying to establish the testing of all of our products on S-W Test Methods. If there are some other authoritative test methods to be used other than S-W, cross out S-W and apply USN or whatever other reference is needed. Then under each of these items appearing below, insert the test method number that should be followed by the tester for obtaining values for this product that are recorded in other places on the card. The space to the right of the double line is for formulators to insert other characteristics and test methods that apply to a specific formula.

45. Straining - No entry is required if normal straining practices are acceptable. If there are customer requirements that would necessitate that special attention be given, then specify the method of straining that we know would be required.

46. Special Tests - Either state the special tests or draw attention to the need for special tests in this space, and list them on an additional card to be attached.

47. Reason For Revision - State the major change or changes made in the formula and a specific reason why the changes were made.

In the future, there are going to be some additional captions on the form which will be:

a. Date
b. Technical Development Rate
c. Instructions to clean equipment, which will read: "Before manufacturing, clean equipment with ( )."
d. An underscored line before the name "Formula Record", which can be filled in as Sherwin-Williams, Lucas, Acme, etc.
e. PVC, CPVC, Volume of Solids____%.
f. Provision is being made for "Exposure" to have blocks to check - Exterior, Limited Exterior or Interior.

These captions are mentioned in this bulletin because those formulators, who feel this information must be included now, will have to find existing captions that can be crossed out and this information substituted, until such time as new forms will be available.

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