

"Classification of House Paints"

Technical Bulletin No. 804 "Classification of House and Barn Paints" was issued by the United States Department of Agriculture in January, 1942. It offers a system of classification of such paints according to group, type and grade based on calculations of volume composition derived from label analyses declaration. The system is offered as an aid to the consumer in the selection of paints of quality suitable for the purpose intended. It is stated that even when analyses (by weight or volume) appear on the label, the consumer does not have sufficient knowledge of their significance to permit him to estimate the quality of the paint.

"Group" classifies paint according to pigment composition, viz. TLZ refers to a titanium-lead-zinc paint, L a lead paint such as lead-in-oil, TZ a lead-free titanium-zinc paint, etc. The phraseology becomes more obscure when the symbols used include S for zinc sulfide, F for iron oxide and C for other colored pigments.

If the vehicle contains 15% or more by volume of bodied oil, as would hold for most modern house paints, the group classification may be extended by adding the symbol (e), e.g. TLZ (e). This would identify the paint as an "enamelled paint", which is not a suitable designation. "Bodied oil paints" would be more descriptive, but is given only as an example of preferred nomenclature.

Label analyses, if given by weight, are recalculated to determine opaque pigments, extenders, oils, driers and thinners in terms of decimal fractions of a gallon (i.e. by volume). Opaque pigments of more than average opacity, such as titanium dioxide, zinc sulfide, etc. in the white pigments, and some colored pigments are given the benefit of a special "diluent allowance" in calculating the total pigment volume.

The paints are then classified into "type" according to how much lead and zinc appears in the pigmentation (shown as a numeral) and the ratio by volume of lead pigment to zinc oxide (shown as a letter). "Grade" is then signified in the sense of classifying the quality of the paint. "Grade" is rated from 1 as the highest to 5 (or 6) as the lowest. Each grade requires that opaque pigment volume (equivalent), total actual pigment volume, and total non-volatile (volume of pigment plus extenders plus volume of non-volatile binder) pass certain minimums. Thus, a modern house paint might be classified as:

Group TLZ (e) Type 4C Grade 2

It is our considered opinion that a sequence of symbols of this sort are no more intelligible to the average buyer than current label analyses, and in all probabilities, less intelligible. It is more than probable, however, that he will disregard the confusing "group" and "type"

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symbols and will focus all his attention on "grade," and assume that "Grade 1" is better than "Grade 2," and so on. Regardless of the intentions, this will be the natural and probable result.

Any system of classification based on formulation (and we can conceive of no system which would not be based on formulation) is restrictive on progress and research. The system as proposed in Technical Bulletin No. 804 is not only unnecessary but its premises have become obsolete and actually are scientifically unsound. In addition to being highly unfavorable in its possible influence on future research, it would in any final analysis misinform the public as to sound and valid criteria by which to judge the performance of paints. Thus it would fail in the very purpose for which it is intended.

It is apparent that this failure stems largely from a failure to conduct sufficiently exhaustive examinations and exposure tests over the past ten years or more to keep abreast of the advances in exterior paint technology. There is no recognition of the considerable improvement in appearance and durability characteristics accomplished during this period. It overlooks the improvement in flow, drying, reduction of dirt retention, maintained better appearance and greater durability arising from the use of larger amounts of bodied oils and lower binder resulting from the oil conservation order M-332 in 1943. In fact, grade is adversely affected by the rules of classification set up in Technical Bulletin No. 804 if the formula is set up to incorporate the factors of vehicle composition which have led to the improvement in house paints through the use of bodied oil vehicles. This is an example of the dangers of any system of classification based on composition as being restrictive on research. No one can predict what tangent research and development may take in finding new and novel formulations leading to better paints redounding to the benefit of the public.

The classification system set up in Technical Bulletin No. 804 gives misinformation and is technically unsound for several reasons, of which we will mention only a few. It is possible, for example, to formulate two TLZ paints of identical chemical composition (and therefore identical classification) which, dependent only on the selection of the zinc oxide used, would vary in durability from 1-1/2 - 2 years up to 5 years. Different extenders or different oils could affect performance equally as much. Calcium carbonate extenders as an example must be chosen with great care as their origin, reactivity, particle size, etc., have a considerable bearing on the durability of paints in which they are used, especially in white house paints.

There are certain well recognized types of formulation which would rate as Grade 1 paints although it is universally recognized that they are considerably inferior to modern paints which might rate "Grade 2" or "Grade 3" in the proposed classification. Pigmentations containing high percentages of lithopone or zinc sulfide pigments are not suitable for exterior house paint formulations because of checking, cracking or erosive tendencies, but could rate Grade 1 classification. Many other similar examples could be given and we are attaching photographs of three sets of panels which illustrate how paints of identical chemical composition may vary in quality because of different physical characteristics of only one of the components in each case. Therefore, a "Grade 1" classification would give no assurance of

service and satisfaction to consumers and could mislead purchasers depending on this government sponsored information.

The system is technically unsound - in its very first tenet it assigns a fixed opacity for each opaque pigment. It has been established that opaque pigments can easily vary 200 - 300% in hiding power, depending on their "hiding pigment volume concentration," i.e., the per cent of the total pigment, extender and vehicle solids volume occupied by the individual opaque pigments. Therefore, it is scientifically unsound to assign a single opacity figure for any given pigment.

The system is further unsound in that it equates active pigments on the basis of volume, whereas it is known that reactivity is related to surface area, crystal configuration, etc. It is not valid to say that all lead carbonates are equal, all zinc oxides equal, and so on.

Proper consideration of the tremendous volume of research and testing which has been carried out on all phases in exterior paint technology in the past ten years alone would show how unfortunate it would be for a government agency to further sponsor this system of paint classification. It will be to the advantage of the consuming public to withdraw further promotion of this idea.