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DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON

Letter
Circular
64

(May 9, 1922)

SHINGLE STAINS

Shingle stains are used primarily for the coloring and staining of wood shingles. They are cheap and have come into use mainly on account of their supposed preservative qualities and the pleasing aesthetic effects which can be obtained with them. Shingle stains differ from wood stains that are used to accentuate the difference in grain of the wood in that they are intended to uniformly color the wood but not to obscure its texture. This is obtained by the use of a very fine pigment ground in and thinned with such vehicles as will take it into the pores of the wood so that it will not chalk or wash out excessively.

Shingle stains should not cake or change color in the container and when stirred up should settle very slowly. They should assume their permanent color in a short period of exposure after application. Shingle stains can be had in almost any desired color but those which apparently have given the best service are the various shades of red, brown, and green. Silver gray is one of the most popular colors. This stain when first applied has a very unsatisfactory appearance but on weathering for several months a very pleasing gray color similar to that of old weathered cypress shingles is developed.

Shingle stains usually consist of pigments ground in vehicles of oils and driers and thinned with suitable volatile solvents. Some stains contain no pigment whatever but consist of a good grade of refined coal tar creosote oil with or without thinners. Inorganic pigments unaffected by exposure to the weather and by contact with coal tar creosote oil only should be used. Aniline and other organic colors fade rapidly on exposure and are very unsatisfactory. It is essential that the pigment be of extreme fineness and of maximum color strength and that no fillers or extenders be used. The pigment in the form of a paste ground in linseed or soya bean oil is generally used. Zinc oxide is used for the whites and gray shades, chrome green for the various shades of green, and the iron oxide pigments for reds and browns.

The vehicle usually consists of linseed or soya bean oil and japan drier mixed with coal tar or water-gas tar creosote oil. Sometimes paraffine oil is substituted for a portion of the creosote oil. Coal tar creosote oil free from tar acids and tarry matter and containing no substances which will crystallize or settle out at 0°C (32°F) is preferable. It should not darken materially on exposure or react with the pigments used.

For the light colored stains, such as silver gray, a highly refined light amber creosote oil with a specific gravity at 15.5°C (60°F) of about 1.000 and yielding no distillate below 100°C (212°F) and approximately 75 per cent of distillate between 200°C (392°F) and 300°C (572°F) should be used. There are, however, some light colored stains on the market which contain no creosote oil but which are flavored or perfumed with a small amount of straw colored cresylic acid. For the darker stains, such as moss green, brown, red, etc., an oil of dark reddish brown color but having about the same gravity and distillation limits as the light colored oil is used. These oils are quite volatile and although penetrating wood readily in most cases they have very little preservative qualities.

Where preservative qualities are of prime importance and appearance secondary, highly refined coal tar creosote oils with a specific gravity at 15.5°C (60°F) of not less than 1.08 applied cold either by brushing or spraying or hot by dipping are more satisfactory. Some dark colored shingle stains on the market are creosote oils of this character with or without volatile thinners.

Where thinners are necessary to insure very rapid drying or if it is desired to cheapen the product, solvent naphtha, benzol, kerosene, gasoline, and mineral spirits are used.

Shingle stains give better results when applied by dipping. This, of course, can only be done in the case of new work. Shingles already in place may be brushed or sprayed with the stain.

Samples analyzed at this Bureau seem to indicate the following general formula:

	Per cent
Pigment (by weight)	6 to 20
Drying oil and japan drier (by weight) ...	0 to 17
Creosote oil and thinners (by weight)	64 to 92

Uebele (Paint Making and Color Grinding - 1913) gives the following formulas for stains for dipping shingles. He states that shingles treated with these stains are still in good condition after seven years of exposure.

(1) Deep Green Stain (Chrome Green Type)

15 lbs. C.P. chrome green in oil
1 gal. benzine japan drier
4 gal. creosote oil
4 gal. heavy benzine

(2) Mineral Red Stain (Venetian Red Type)

17 lbs. red oxide (95 per cent) ground in oil
1 gal. benzine japan drier
4 gal. creosote oil
4 gal. heavy benzine

(3) Walnut Brown Stain

13 lbs. burnt Turkey umber in oil
1/2 gal. benzine japan drier
1/2 gal. 160° benzol
5 gal. creosote oil
3 gal. heavy benzine

(4) Silver Gray Stain

20 lbs. zinc white in bleached linseed oil
1/8 lb. lampblack
1/2 gal. pale liquid drier
1/2 gal. straw colored cresylic acid
8 gal. heavy benzine

None of these formulas, however, have been tested at this Bureau.