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MATERIAL FOR PREPARING METAL FOR PAINTING

Alfred Douty, Elkins Park, Pa., assignor to American Chemical Paint Company, Ambler, Pa., a Corporation of Delaware

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This invention relates to the art of preparing metal for painting and is particularly directed to cleaning sheet metal such as is used in the manufacture of automobile bodies, fenders and the like.

It has been the practice to prepare metal for painting by cleaning it with various admixtures comprising a metal etching acid. Although these cleaners have proved of great commercial value they sometimes have a tendency to discolor the cleaned surface, which discoloration often develops into a decided corrosion unless the metal is immediately given a protective coating.

The object of this invention is to provide a material, for preparing metal for painting, that has less tendency to cause discoloration and to produce a finished surface that resists corrosion better than the materials and processes of the prior art. Further objects of this invention are to remove oil, grease, hand marks, acid runs, thin coatings of rust and scale and other extraneous matter from metal that is to be painted; to increase the adhesion between the painted finish and the metal; to prevent the development of defects in the painted finish and to generally improve the art of preparing metal for painting.

I have discovered that if the usual acid or acids employed in the cleaning compounds used for preparing metal for painting, be replaced wholly or in part by arsenic acid the cleaned metal has less tendency to become discolored and is less likely to rust than heretofore.

One of the best ways to produce the acid suitable for my material and process is to dissolve arsenic pentoxide (As_2O_5) in water, by the aid of heat if necessary, to form a 70% solution of arsenic acid (H_3AsO_4). Solutions of lesser strength may, of course, be employed but I find the 70% solution convenient to use.

To practice my invention, if the metal to be prepared for painting is free from oil or grease, I may simply treat the said metal with a solution of arsenic acid, using for example:

	Gallons
Water	32
Arsenic acid (70% solution)	9

This may be applied to the metal by dipping, brushing or spraying. After the solution has remained in contact with the metal sufficiently long to clean it satisfactorily, the spent solution is removed from the metal preferably by washing the metal in water, although drying with cloths may be done if desired. After the metal

has dried, after the removing step, it is ready to receive the painted finish.

If the metal to be prepared has a film of oil on it, it is well to add an oil solvent to the above admixture. Such oil solvents as the alcohols, esters, ketones, ethers, etc. may be employed or in fact any substance which will permit the admixture to penetrate the said oil film and enable the acid to contact with the underlying metal produces the desired result. Acetone, ethyl alcohol, methyl alcohol, propyl alcohol, butyl alcohol, amyl alcohol, ethyl-methyl ketone are probably most available for the purpose. I prefer to use either ethyl alcohol or butyl alcohol or mixtures of the two. A suitable admixture comprising the oil solvent would be:

	Gallons
Water	32
Arsenic acid (70% solution)	9
Ethyl alcohol (denatured)	30 75

This admixture may also be applied by dipping if desired but due to the alcohol content, less of it is lost by evaporation if large quantities are not exposed to the air; therefore it is preferably applied from a small volume of exposed material by a brush or spray gun. After the material is applied its action may be assisted by scouring with an abrasive such as steel wool or the like. When the cleaning action has progressed as far as desired, the spent admixture may be removed by washing with water or other solvent and the surface dried by cloths or by an air blow, or the metal may be placed in an oven heated sufficiently high to dry the metal in the desired time. An oven heated to 100° centigrade usually dries the metal in 15 minutes.

The removal of the admixture may be accomplished without the water wash if an absorbent material is added to the admixture, thus giving it a semi-selfdrying effect, in that, after a portion of the liquid ingredient has evaporated, the absorbent attracts the acid to itself and causes it to lose its wetness, so to speak, enabling it to be removed together with the deleterious products of its reaction on the metal, in a dry powder form by brushing or wiping the surface. Such absorbents as raw starch, flour, charcoal and clay are suitable for the purpose. Clays such as raw sienna, umber and ochre produce fair results but I prefer to use colloidal clay, that is clay which swells on mixing with water and I have noted that colloidal clay produces even a better result if its impurities are removed by washing with acid. The amount of absorbent material required will, of course, depend on its bulking factor but it can

be readily determined by experiment, keeping in mind that sufficient should be used to absorb the acid which remains on the metal so that it can be removed as a dry powder. The following receipt will illustrate the amount required when colloidal clay is employed:

Water -----	32 gallons
Arsenic acid (70% solution) -----	9 gallons
Ethyl alcohol (denatured) -----	30 gallons
Butyl alcohol -----	15 gallons
Colloidal clay -----	250 pounds

In case this admixture is too thick it may be thinned by adding more alcohol or more water. This admixture may be applied in any of the usual ways but I find generally, that it is best applied by spraying, using about one gallon of the admixture to every 300 square feet of metal coated. After the metal to be cleaned is coated with this material, the metal is placed in an oven heated to 100° centigrade, more or less, where it is permitted to remain till the coating is dry. This usually takes from five to twenty minutes, depending on weather conditions, ventilation, etc.

On removing it from the oven, it will be found that the applied cleaner has dried and may easily be removed by a brush, steel wool or even a dry rag, exposing a surface that after cooling to room temperatures, is in the proper condition for receiving finishing coatings of paint, varnish, japan or lacquer. Solutions of ortho arsenic acid have little or no attaching action on steel and do not leave thereon any discoloration, they attack and dissolve rust.

I claim:

1. A material for preparing metal for painting, being an admixture comprising ortho arsenic acid, an oil solvent and an absorbent material.

2. A material for preparing metal for painting, being an admixture comprising ortho arsenic acid and an oil solvent.

3. A material for preparing metal for painting, being an admixture comprising ortho arsenic acid, an alcohol and an absorbent material.

4. A material for preparing metal for painting, being an admixture comprising ortho arsenic acid, ethyl alcohol and colloidal clay.

ALFRED DOUTY.