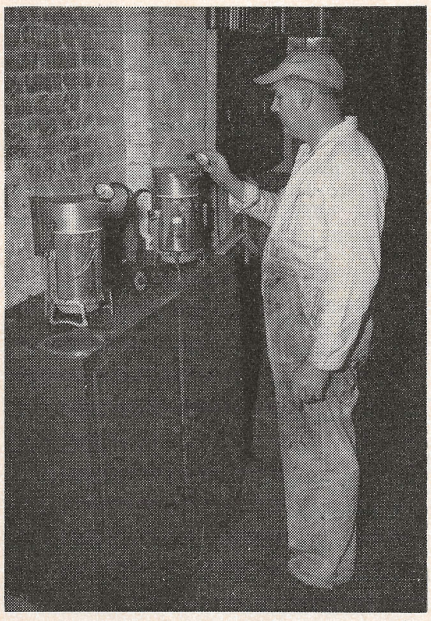
New Way To Spray

HOT SPRAY application of paint and lacquer as an automotive finish is gaining rapidly in popularity with the development of adequate heating equipment.

While it has been scientifically known for many years that heat could be used to lower the viscosity of paint and lacquer as well as, if not more advantageously, than thinners, yet it is only recently that the car, bus, and truck repainters have shown increasing interest.

Along with new heating equipment has come perfection of paint and lacquer formulas especially suited to hot spraying. As better materials come on the market, and better application methods are found, painting costs will be correspondingly reduced. Also better body finish will be obtained.



While automatic temperature controls may be part of electric heating units, it is advisable to check temperature of the paint and lacquer with a thermometer. A standard cooking thermometer will do the job well.

One of the big advantages of hot spraying is that temperature and humidity in the shop have very little effect on paint or lacquer spraying. This is not true in the case of cold spraying where the amount of thinner, nozzle and air pressure are adjusted to give best results at various temperatures.

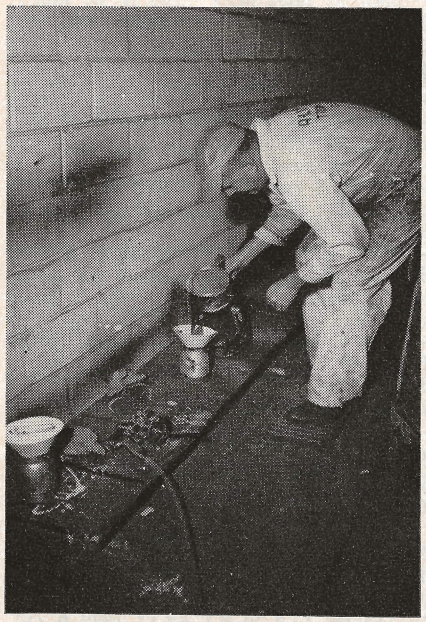
In hot spraying, the secret is the temperature of the paint itself. Experience so far is that differences in metal or room temperature are not too significant.

Of great importance in hot spraying, as in cold spraying, is technique and skill in application to obtain a high quality finish. How much paint to apply to the surface in one coat without sagging (excessive paint drips down in thick smears) is a determining factor. This skill can be acquired through practice.

One of the principal drawbacks to lacquer has been the limited amount of solids applied per coat, as compared to those desposited per coat of synthetic enamel. Recent developments in some formulations have increased solids to as high as 35 per cent, but most cold lacquers vary from 20 to 30 per cent.

The hot-spray process further increases deposit of solids on the metal surface by employing heat to reduce the viscosity instead of added thinner. The same principle is applied in the use of enamels. Thus, one big cost saving is in the amount of thinner required to be added to both paint and lacquer to obtain efficient spraying. In most cases with hot spray, paints are heated to temperatures varying between 160 deg. F. (71 C.) and 200 deg. F. (93 C.) with about 170 deg. F. (77 C.) as the general rule. At 160 deg. F. the viscosity is generally reduced to 1/3 or ¼ of the viscosity at 70 deg. F.

However, since there is a temperature drop, maybe upwards of 25 degrees, from the time the paint leaves the nozzle until it reaches the surface, both paint and lacquer are heated somewhat higher to offset this normal temperature drop.



Enamel or lacquer is poured from the heater container into the spray gun container. Loss of heat here is very small.

Another advantage in hot spraying is that since you use considerably less thinner than in cold spray there is less surface shrinkage. Shrinkage results from evaporation of the thinner and other volatile materials.

Since more solid particles reach the surface in hot spraying than in cold spraying with a given amount of paint and lacquer, there is less sag. Consequently a thicker coat can be applied. In fact, experience has been that just one coat is necessary, whereas with cold spray two or more coats

are required to obtain the same thickness of protective coating.

Other claimed advantages of hot spraying over cold spraying are faster drying, less air pressure required, over-spray and mist greatly reduced, production increased, faster gun action, smoother finish, higher gloss, reduced labor costs and increased quality.

Tests indicate that the loss of paint in cold overspraying is about 25 per cent, even under ideal conditions, and can run as high as 50 per cent, depending upon the paint mixture, temperature, air pressure, and skill of application.

Air pressure will vary slightly depending upon viscosity of the paint mixture and the film thickness desired. Air pressures upwards of 70 to 90 pounds (4.92 to 6.33 kg/cm^2) is used for cold spraying while only about 25 to 35 pounds (1.76 to 2.46 kg/cm^2) is necessary in hot spraying lacquer and from 35 to 45 pounds (2.46 to 3.16 kg/cm^2) in applying enamel.

Companies operating motor and electric trolley bus systems and motor carrier fleet owners have had surprising results with hot spray applications. Among the transportation companies taking the leadership is the Atlanta (Georgia) Transit Co. which operates motor and electric trolley buses in the city and in surrounding suburban areas. On an average more than 200 vehicles are painted during the year.

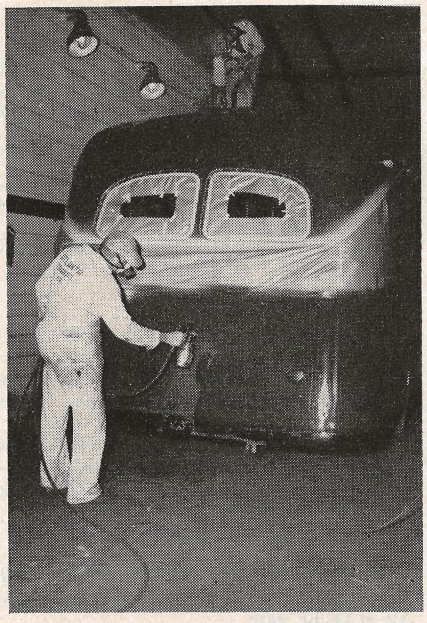
W. P. Maynard, superintendent of plant, says that savings of 20 per cent in paint and 80 per cent in thinner have been effected. In addition a higher gloss has been obtained, along with a tough finish.

Prior to using the hot spray method the company used one mist coat and two wet coats to obtain required depth. Now only one wet coat is necessary, although a light undercoat around the corners, joints and other curved surfaces is insurance against missed spots.

Here is how Atlanta Transit handles its buses when they are sent to the paint shop. All vehicles are first reworked in the body shop and then washed with strong soap to remove all oil, grease and dirt film. A thorough rinsing is important to insure a clean and detergent-free surface.

Windows and metal strips are masked. If more than one color is used on the bus, the smaller portion is sprayed first and from one and one-half to two hours allowed for drying before masking. Then the other color enamel or lacquer is sprayed. The vehicle is allowed to dry in the shop over night before being returned to scheduled service.

Experience has been that very little low bake converter is necessary in enamel. Otherwise oxidation is retarded and curing time extended. It was found that two ounces of low bake converter with about six ounces of high grade thinner when added to 4½ quarts of enamel gives a very good mixture for a high quality finish.



Hot lacquer or paint is applied in the usual way.

While the most satisfactory temperature for enamel is about 170 deg. F. (77 C.), no bad effects were apparent when the temperature was raised to 190 deg. F. (88 C.). It is best to raise the temperature slowly, taking about 45 minutes from room level to 170 deg. F. Rapid heating is not good anyway, and rapid heating of lacquer is likely to "kill" the suspension. Lacquer temperature should be about 150 deg. F. for best results.

Many fleet owners find that by using lacquer on fenders and other parts subject to frequent damage they can make repairs and hot spray enamel over the small area without the necessity of a complete paint job. The lacquer dries quickly and the vehicle can be returned to service in about two hours without severely damaging the lacquer. It is a one-coat proposition with good results.

Information for this report came from McGraw-Hill's Atlanta Bureau, from the Ditzler Color Division, Pittsburgh Plate Glass Co., from the Arco Co., and from the Martin Senour Co.

What a Paint Maker Says

The Ditzler Color Div., Pittsburgh Plate Glass Co., says:

1. Hot spray will not reduce your time of body preparation prior to spraying. Regardless of statements to the contrary, if the amount of material—by that we mean film thickness—of the finished job is the same as the film thickness of a cold sprayed job, the shrinkage will be approximately the same, and the sand scratches will show to the same extent. If, for instance, you are used to putting on two coats of cold lacquer to do a job and you follow the same technique to the point of putting two coats of hot lacquer on a job, obviously the results will be increased covering of sand scratches, and all of the other things that go with increased film thickness, since you are putting on more material per coat.

2. Hot spray is a painting process requiring less reducing thinner for lacquers or enamels.

3. Fewer coats are required when using the hot spray process.

4. Hot spray application will generally produce a better looking job.

5. There is generally less clean-up work when the hot spray process is properly used.

6. The hot spray process will show savings in labor and materials unless excessive amounts of high cost reducing thinners are used. This also means that materials must be measured — not "guessed at."

7. More time is necessary in preparation for a hot spray job, due to the length of time needed to bring material to the proper temperature.

8. More time must be allowed for drying of lacquers before compounding and polishing, because of the slower solvents used in the hot spray process.

9. No standard reduction can be given for all materials. Each material must be reduced according to its manufacturer's instructions.

10. Use of the heating equipment is justified for jobs requiring a quart or more of lacquer or enamel. For smaller jobs, use the cold spray process.

11. When using air dry enamel, try to finish the job with one-coat application; otherwise wrinkling may occur or, in the case of polychromatics, flooding will cause an off-color job.