

## THE WATERBORNE WAVE

Waterborne refinishing technology is quickly becoming the “wave” of the future. Automotive paint products described as waterborne materials are products using water as one of the main ingredients. Instead of using petroleum-based resins and solvents, water-soluble ingredients and resins are used.

Waterborne automotive paint products are available to collision repair facilities for various applications such as primer-surfacer, primer-sealer, and basecoat applications. At this time, waterborne clearcoats are available at the OEM level only, mainly in Europe.

Waterborne refinishing products are being used more and more because they emit less volatile organic compounds (VOCs) than solvent-borne materials. The VOC level is reduced by almost one-half. VOCs contribute to depletion of the ozone layer, smog production, and adverse health effects. Legislation has been passed in several U.S. states and for all of Canada that requires lowering the amount of VOCs being emitted into the environment. In California, for example, it is estimated 20.7 tons of VOCs are emitted every day. The goal is to reduce that to 5.1 tons per day, a 75% reduction. Using waterborne materials helps provide compliance to these regulations, though the use of waterborne materials is not a requirement for compliance.

### SOME WATERBORNE AND SOLVENT-BORNE COMPARISONS

When comparing waterborne and solvent-borne products, the main difference is that water is used to replace a significant portion of the solvents as the carrier. Water evaporates from the basecoat, much like solvents evaporate from solvent-borne products. Waterborne materials still contain some solvents. Because a main ingredient is water, and the solvent content is lower, waterborne products pose less of a risk of flammable issues than solvent-based products. However, always use caution when working with any refinishing materials.

The solid content in some product lines is higher in waterborne products than in solvent-based products. A solvent-borne product may consist of 85% organic solvents and 15% solids, including pigment, metallics, and pearls. At least one waterborne product maker is using a system comprised of 70% water, 10% organic solvents, and 20% solid materials.

### APPLICATION DIFFERENCES

Spraying a waterborne basecoat is not much different than applying a solvent-borne basecoat. The recommended spraying overlap is different. Unlike the traditional 50% overlap used for solvent-

borne refinishing materials, most paint makers recommend using a 75%–80% overlap when spraying waterborne refinishing materials. Because of the higher solids content, fewer coats may be required. Waterborne coatings will result in less overall film thickness. When applied, waterborne basecoats are approximately half the thickness of traditional solvent-borne basecoats.

Waterborne basecoat appears different than solvent-borne basecoats just after it is applied. It looks very saturated and wet. Metallic colors may appear to be severely mottled. However, when the finish dries, the paint appears uniform. Air-acceleration equipment, such as an air multiplier, forces the water out of the basecoat. Air multipliers can be hand-held, on a stand, or wall-mounted. Spray guns should not be used as an air movement system. This can cause the basecoat material inside the gun to dry.

### CONVERTING TO WATERBORNE

Is your facility ready for waterborne? Switching from solvent-borne to waterborne systems will likely include both technical training and equipment conversions. Paint makers that offer waterborne products may offer specific training programs.

Equipment upgrades will typically

include a dedicated spray gun. Note that the same spray gun may be used for both waterborne and solvent-borne materials, but will require extensive cleaning when changing from one product type to the other. Spray gun cleaning material and equipment specific to waterborne materials is also required (see Figure 1).

Converting to waterborne systems may require upgrades to air compressors, and air filtration for the incoming spraybooth air. Compressors must be capable of providing the required volume of air. Additionally, the air used for spraying waterborne materials must be extremely clean. Filters must be capable of capturing very minute particles, along with trapping oil and water vapor.

Another consideration when using waterborne materials, which may require additional equipment upgrades, involves increasing air movement over the painted surfaces to provide efficient drying of waterborne finishes. Equipment such as hand-held air multipliers, spraybooth-mounted ceiling fans, or corner- or ceiling-mounted air multipliers can be used to increase the air movement in the spraybooth (see Figure 2).

## CONCLUSION

Using waterborne systems can be beneficial with helping to provide compliance to increasing VOC emissions regulations. When comparing waterborne to solvent-borne materials, there are differences in the chemical makeup, application overlap, and the number of coats applied.

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Figure 2– Cleaning a spray gun used to apply waterborne materials may require specific solutions (top) and equipment (bottom).



Figure 3– Hand-held air multipliers are one example of equipment that can be used to provide increased air movement to aid drying efficiency of waterborne materials.