



Automotive Painting With Waterborne Paints

Application Overview



In order to reduce the amount of air pollutants from paint vapors, numerous areas in the United States and Europe are considering enacting legislation for the mandatory use of waterborne paints and coatings. As opposed to current types of solvent based paints, waterborne paints use water as the primary solvent and therefore have a lower volatile organic compound (VOC) content than other types of paints. Waterborne coatings reduce VOC emissions and worker exposure to hazardous air pollutants. VOCs that are emitted from solvent based paints react with other gases to form ozone in the lower atmosphere. This reaction forms smog and contributes to air pollution and to global warming. The use of waterborne paints can also reduce the amount of hazardous solid waste generated, depending on the type of material used. And, waterborne paints are also nonflammable, so they reduce the risk of fire.

Waterborne paints were introduced in the 1990s and have been used successfully in numerous countries and areas around the world - both in OEM applications and in repair facilities.

There are many applications using compressed air in the Automotive Service and Repair Industry. An example of these applications are automotive painting facilities using waterborne paints.

By some standards, the air compressor might be considered to be a necessary evil – a piece of equipment that is costly to buy and to run, and one that does not contribute directly to profits. However, this is not the case. Compressed air is the heart of the automotive painting facility. When installed and operated properly, **the air compressor can actually help lower your energy costs and increase your productivity and profitability.** The important tips below have been prepared to help painting facility owners and operators make the right decisions in selecting an air compressor and to minimize the cost impact of its installation and use.



Paint Composition

Waterborne paints have a higher transfer efficiency, so more paint is applied to the vehicle. These types of coatings can be applied using conventional spray guns or a high volume, low pressure spray gun. Waterborne paints are composed of synthetic resins and pigments that are kept dispersed in water by surfactants. They contain small amounts of coalescing solvents and dry by evaporation of the water. The coalescing solvents allow the resin particles to fuse together (coalesce) as the water evaporates to form a continuous, high quality, durable coating.

Under current regulations, all combination of coatings cannot exceed a specific limit of VOCs per gallon. Under the proposed regulations, each paint component (primer, surfacer, sealer, color, clear coat, bed liner, etc.) will have to meet its own VOC limits.



The Benefits of Using Waterborne Paint

There are many benefits to using waterborne paints:

- VOC emissions are reduced significantly.
- Waterborne paints are generally easier to apply and to clean up.
- Waterborne paint offers good to excellent surface properties (gloss, rub resistance, anti-sealing, etc.)
- Waterborne paints allow overspray to be recovered and recycled.
- Disposal requirements for waterborne paint waste may be reduced (depending on local laws).
- Dried waterborne paint waste may be disposed of in landfills as non-hazardous waste.
- Health and safety requirements for workers are significantly reduced or eliminated.

The Disadvantages of Using Waterborne Paint

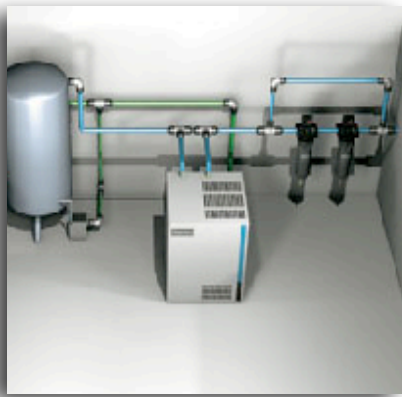
While there are many advantages of using waterborne paints, there are also disadvantages:

- A lower chemical and solvent resistance.
- Reduced temperature resistance.
- Waterborne paints are sensitive to humidity. Low humidity can cause coatings to dry too fast, creating craters in the final coating. In contrast, high humidity can cause very slow drying times, resulting in sagging of the coating.
- The quality of the application is dependent on surface cleanliness. The water in the paint has high surface tension and can cause poor flow characteristics.
- Lower abrasion resistance.

The Paint Shops Need For High Quality Air

One of the most important factors in getting the water to evaporate in waterborne coatings is air movement. Shops using these coatings will have to increase the quality and volume of the air and its movement while increasing the surface temperature of the coatings in order to maintain these high quality coatings.

Because of this requirement for high quality air, the compressed air systems in painting facilities will have to be maintained or upgraded to ensure a dependable supply of clean air. Moisture or oil in compressed air can have negative effects on the drying times, finish quality and durability of these coatings. A properly sized compressor, with a refrigerant or desiccant type air dryer and correct filtration will be necessities for the application of high quality coatings.



Air Quality

- Oil vapor in the compressed air supply can ruin a paint finish, requiring a re-spray and incurring additional costs.
- Corrosion in pipes causes increased system contamination, air leaks, wasting compressed air and increasing electrical costs.
- Corrosion in air tools causes a loss of performance and eventual failure, resulting in increased maintenance costs.
- Atlas Copco recommends the fitting of a refrigerant dryer and two stage high efficiency oil filtration. Site conditions may vary therefore we recommend customers contact your local atlas Copco representative for a full site survey

Sizing Your System For An Adequate Supply Of Air

The size of a compressor should be based, not on the total sum of the air operated equipment in use, but on the sum of the Average Free Air Delivery (FAD) of the equipment being used. To calculate this number, multiply the FAD cfm of the piece of equipment times the Utility Factor (in percent) for that piece of equipment, times the number of users to give you the Total Average FAD.

For example, if the FAD cfm of a spray gun is 10.6, the utility factor is 70%, and the total number of users is 5, then the Total Average FAD is 37 (10.6 x 70% x 5 = 37 cfm).

Note: In an automotive body shop applications air sanders and grinders can consume large amounts of air. and it is important that the air compressor and air receiver have sufficient capacity to stop any sudden pressure drops which will adversely affect the paint finish.



Shop Space

With so much equipment to accommodate, it can be difficult to find space in your shop for all of it. To solve this dilemma, Atlas Copco has compact air compressor packages with sound dampening canopies that incorporate a dryer and filtration component into one unit. These units are fitted on top of a horizontal air receiver and take up less than 10 sq. ft. of floor space. The added benefit of these pre-packaged, standalone systems are that the installation costs are lower and the individual items of equipment are pre-piped and pre-wired. This packaged solution is not only more cost effective, but it is more energy efficient as well.

Atlas Copco produces all of its components in house, on the most advanced production lines, in the world's largest compressed air factory. This way, only Atlas Copco can ensure 100% quality.



Installation

For those who would prefer to install their own piping system, but do not have the equipment for fitting copper or steel pipe, Atlas Copco has developed a system of easy to install aluminum pipe, AIRnet™, which is light, and easy to fit. AIRnet's™ large range of fittings lets you customize an air system to your specific needs.



Energy Efficient Compressors

The capital cost of a compressor installation is low when compared to the energy costs over the lifetime of the compressor. So it is important to choose a compressor that is correct for your application.

Piston Compressors

Piston compressors are the oldest and most common type of compressor. They are versatile, efficient and reliable. Most work with a start/stop control and are suitable for intermittent air demand. Because of their basic design with high oil carryover compared to a screw compressor, piston compressors are the best solution for applications that do not require a high air quality.



Rotary Screw Compressors

Rotary screw compressors work with an on-load/off-load control with a timed stop. These units are flexible and highly efficient for a wide range of applications. Air and condensate treatment equipment can be integrated into the compressor package reducing the cost and space necessary for installation. Atlas Copco's GX and GA Series of Rotary Screw Compressors are suitable for customers who have a constant air demand and a requirement for high quality air or low noise levels.

In Summary

This is a brief introduction of what to consider when purchasing an air compressor. Atlas Copco is focused on the customer and provides the best possible know-how and technology. Our products are backed by 135 years of experience. This commitment to the customer has made Atlas Copco the number one compressor manufacturer in the world. Put Atlas Copco's know-how to work for you.

