Waterborne Has a New Friend: NITROGEN!

By now, all the major paint companies have moved all of their developmental resources to waterborne, and you'll eventually switch as well. Everyone *wants* to switch — they just don't want any problems. With all the benefits of waterborne the paint suppliers are touting (which are all true), the only "hitch" is the issue of dry time caused by high humidity. This is an especially sensitive subject for those of us in the Northeast, where it gets hot, hazy and HUMID every year. Many say living in the Northeast is wonderful because of our amazing change of seasons; however, if you're a painter spraying waterborne, this may be your toughest time of year. And if you're a production manager or a shop owner, hazy, hot and humid just STINKS.

So, why does humidity bring on these waterborne woes? Why does it take so long for waterborne to dry…and even longer as the humidity increases? The answer lies in understanding the dynamics of moisture content in the air. "Dew Point" is a term we always hear in weather reports, though not many of us understand its implications. The closer the *dew point* is to the actual *air temperature*, the higher the humidity and the less moisture the air molecule can absorb.

When dew point equals air temperature, we have 100-percent humidity. At this point, an air molecule can no longer absorb any moisture. At 90-percent humidity, an air molecule can only absorb 10 percent more moisture. Likewise, the lower the humidity, the more moisture an air molecule can absorb. If you can get the air molecule to an anhydrous/moisture-free state, the air molecule can absorb the maximum amount of moisture possible.

The reason we don't see moisture in the air when it's humid in the winter is because cooler air is denser than warmer air. The denser the air, the less area within the air molecule there is for the molecule to absorb moisture. Think of a cool air molecule as fat and happy, while a warm molecule is hungry to absorb.

We all have refrigerant dryers on our compressed air supply. Quite simply, what they do is squeeze the moisture out of the air through cooling. Again, the cooler an air molecule, the tighter/denser it is. Therefore, it has less space to absorb and hold moisture.

While the fact that cool air is drier because there's no room for moisture absorption makes sense, trying to dry waterborne - that is, absorb moisture – by blowing cool air from your compressor (which has passed through your refrigerant dryer) at the panel being painted can prove ludicrous. What we ultimately want is to blow *warm, hungry-for-moisture air*...but in an *anhydrous* state.

So what's an anhydrous material that can be warmed without absorbing moisture? NITROGEN! (Which, by the way, *is anhydrous by nature!)* That's why it's being used more and more in the production automobile tires and has been a standard in racing tires for years.

Many shops concerned with cycle times have realized that by spraying waterborne with nitrogen (as opposed to compressed air), their cycle times are ***NO LONGER AFFECTED BY HUMIDITY***. They have installed nitrogen machines that extract the nitrogen from the air and deliver it to the painter through a special hose.

NOTE: An air molecule is made up of 78 percent nitrogen and 21 percent oxygen, with the remaining one percent comprised of some trace gases. The nitrogen machine "extracts" the nitrogen from the air and delivers it to the painter. You don't have to buy nitrogen from your acetylene and oxygen supplier.

A quality nitrogen system has two key components:

1. The nitrogen (N2) "generator," which extracts the nitrogen from the compressed air supply and delivers the nitrogen (which is anhydrous) to the painter. An added benefit to the nitrogen is its finer atomization of paint. Visualize paint droplets as BBs with nitrogen versus golf balls with compressed air. There are fewer voids between the BBs than the golf balls, which translates to better coverage. Do you know why an HVLP gun gets better transfer of paint to the vehicle? The answer is better atomization. You'll get better coverage with more material onto the vehicle with each pass of the spray gun, effectively allowing a better transfer rate of paint to the vehicle and less wasted paint going into the exhaust filters. This means longer filter life and less material needed for complete color coverage. This is especially true with clears. Less overspray equates to a cleaner booth, and cleaner paint work.

2. The "HOT BOX" heating component, which is capable of heating the delivery nitrogen upwards of 200 degrees. Remember: Warmth is waterborne's friend. Anhydrous state + warmth = no more waterborne woes! This component offers greater post-flow (how the paint flows out after it lands on the panel surface), offering faster coverage with less passes by the painter. This gets the vehicle out of the the booth more quickly.

Like any equipment, the ROI of a nitrogen system should be examined along with the virtues. However, if your shop has converted – or is considering a conversion – to waterborne, using nitrogen as the delivery system will maximize its performance year-round. If you haven't converted yet, nitrogen works equally well with solvent.

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