**Introduction to Spray Guns**

Spray equipment manufacturers provide a multitude of fluid needle, fluid nozzle and air cap combinations.

Commonly called gun setups, these options are generally designed for applying specific types of refinish products, such as undercoats, basecoats and clears. It can be difficult to determine the exact gun set-up to apply a new product. Understanding a simple ratio is the best way to determine the **performance** of a particular gun set-up.

**FLUID-TO-AIR RATIO**

This ratio balances the amount of paint coming out of the fluid nozzle with the amount of atomizing air being supplied by the air cap. This ratio is the key performance factor for any type of spray equipment.

In the technical development of products, there is a recommended amount of fluid flow—known as fluid ounces per minute—based on the percentage of solids volume of a product once it is reduced and ready to spray. This information can be found on the product’s information bulletin PDS.

Manufacturers will also indicate how many fluid ounces per minute can be obtained with a particular gun setup. By using these two sources of information, you can choose a gun setup for any spray gun and it will be appropriate for the product you are spraying.

The balance between paint fluid flow and atomization is too important to be left to chance or random guessing.

Proper gun setup is important because it can affect the final appearance of the material being applied.

With too much fluid and not enough atomizing air, the paint can:

* run, sag and curtain
* Leave too much film build
* Create excess solvent/water in film
* Dry and cure more slowly

With too much atomizing air and not enough fluid, the paint can:

* Orange peel, no flow
* Leave too little film build
* "flashdry" trap solvents
* Haze, dieback and solvent pop

**ATOMIZATION**

Paint atomization means breaking up a paint liquid into droplets or spray mist. Different spray gun types (HVLP, RP, Conventional, gravity fed, siphon fed, pressure fed) will vary dramatically in the amount of air pressure required to produce good atomization.

HVLP spray guns use a high volume of air at low pressure to carry the paint droplets to the painting surface. While conventional spray equipment is measured at the gun handle, HVLP spray guns are measured at the cap. To meet compliant area regulations, air cap pressure cannot exceed 10 psi.

Reduced Pressure (RP) or Compliant spray guns combine the characteristics of both conventional and HVLP. The paint is atomized at a high pressure but has the transfer efficiency of an HVLP-type spray gun.

**Atomization** is a critical element that helps determine how any finished automotive paint job will look. Poor atomization will cause a host of problems, such as texture or orange peel in sealers and clearcoats.

Variables that affect droplet size and atomization include:

* Size of the openings in the fluid tip and air cap.
* Larger openings allow more flow and faster build.
* Smaller openings allow more control and smoother finishes.
* Air pressure at the air cap.
* Influences droplet size.
* Controls pattern
* Effects transfer efficiency
* Fluid (paint) delivery system.
* Controls fluid flow