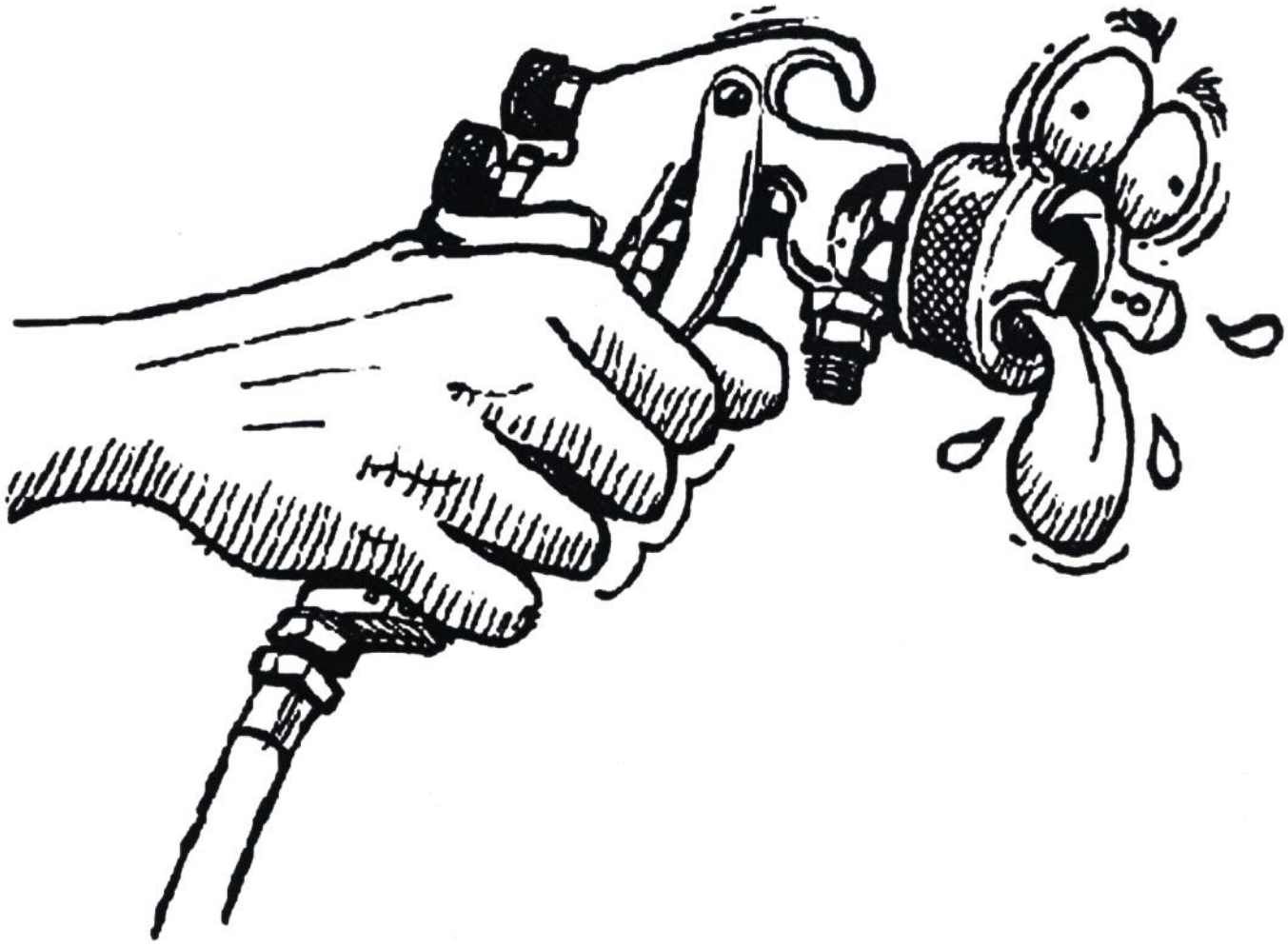
Don't Starve Your Spray Gun for Air!

Tips on How to Avoid One of the Leading Causes of a Less than Perfect Finish – PRESSURE DROP!



The flawless finish you set out to achieve is now an orange peel disaster. What went wrong?

Pressure drop, loss of air pressure in the system, is the most likely cause. What starts out at the air filter/regulator unit as a shout, is barely a whisper by the time it enters the spray gun. The result is orange peel in the finish and a time consuming redo.

DEVILBISS®

What causes pressure drop?

- air hose that is too small in diameter
- air hose that is too long
- restrictive quick disconnects
- too many Q.D.s in the system
- low performance air regulators

Combine a couple of these and you magnify the problem. One weak point may cause a minor loss of air pressure, add one more and you have a major problem.

How to Avoid Pressure Drop

This illustration is meant to depict areas where pressure loss can occur.

Actual losses in pressure are dependent on the variables of hose length, hose diameter, CFM, as well as the number and design of the quick disconnects.

This illustration depicts pressure loss with NON-DeVilbiss quick disconnect using 1/4" x 20' hose @ 15 CFM.

Using The Right Air Hose

Let's first look at hose diameter. With a smaller and more restrictive passage, less air gets through the line. Using a 1/4" hose means less pressure at the gun end than when using a 5/16" hose. Use of a 5/16" hose results in less pressure than if you use a 3/8" hose. It's simple. Small diameter hose, less pressure.

Air Hose Pressure Loss

		57% more area than the 1/4" hose	125% more area than the 1/4" hose
I.D.	1/4"	5/16"	3/8"
O.D.	1/2"	5/8"	11/16"

(This drawing shows the increased capacity of using a larger hose diameter.)

"Right diameter" doesn't mean that you have to use the biggest hose you can get, because hose length is also a factor. As air is forced through the line, pressure starts to drop off the farther the air has to travel. You can use the smaller 5/16" diameter when hose length is relatively short. Increase the distance that the air has to travel, and you have to increase the hose diameter.

The illustration above shows the loss in pressure over a system. A beginning pressure of 75 psi from the air filter/regulator unit is reduced to 68 psi after going through a typical quick disconnect. Traveling through 20' of 1/4" hose @ 15 cfm, air pressure drops to 48 psi before going through another Q.D., and drops again to just 41 psi at the point it enters the spray gun after going through another quick disconnect. That 41 psi **is not** sufficient to produce 10 psi at the air cap which may be necessary.

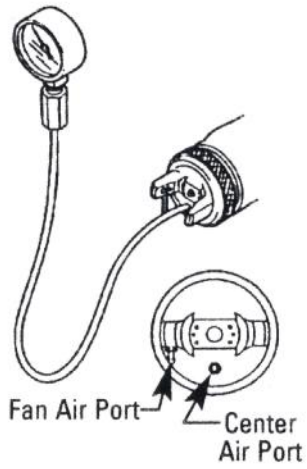
Understanding HVLP

HVLP, with its obvious advantages and recent major improvements in capabilities, depends on sufficient air pressure at the cap for optimum performance. A pressure drop problem can result in insufficient air entering the spray gun to produce the necessary pressure at the cap.

With HVLP it is particularly important to use nonrestrictive, shorter lengths of hose. We recommend no smaller than 5/16" or 3/8" I.D., and good quality high flow quick disconnect fittings. Also, using wall-mounted regulators, rather than gun-mounted regulators or cheater valves, will produce better results.

Air Cap Test Kits Pay Off

Using an air cap test kit takes the guesswork out of analyzing the amount of air available. If you know the amount of air pressure at the air cap, you know if you have enough air to atomize the material being sprayed.



192137 (GTI-5033-2000)
Air Cap Test Kit

**Air cap test kits may be required by some air quality agencies. The cap should not be used when finishes are being applied.*

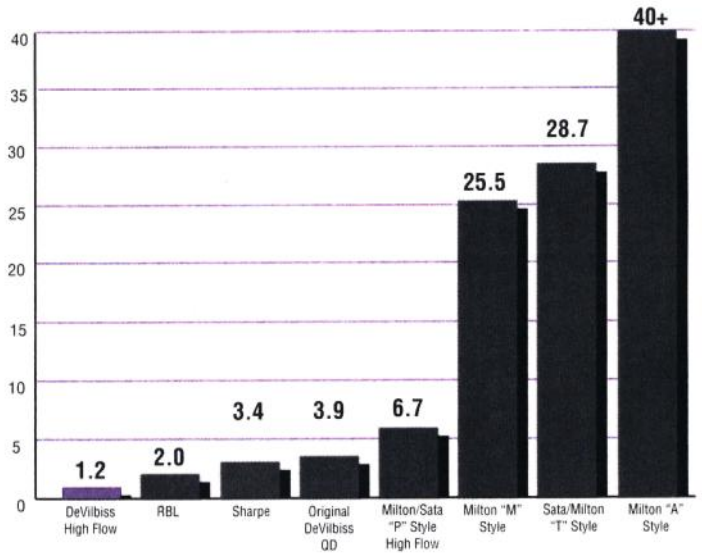
Don't Let Q.D.s Be Your Downfall

Did you notice that "quick disconnect" fittings are part of our sample system? We all know how convenient it is to have a number of Q.D.s throughout a system for quick, easy detachment of hoses. But even the best Q.D. on the market will result in some amount of pressure loss. So, with this in mind, we recommend that Q.D.s be used sparingly throughout a system.

In addition, specific brands of Q.D.s are more efficient in maintaining air pressure. That's why it is strongly recommended that when you set out to buy Q.Ds compare the performance, not just price. Tests show some of the inexpensive brands on the market can easily cause a loss of 10-20 psi. The same is true for Q.D.s as for other tools and equipment that you depend on to get the job done – it doesn't pay to buy cheap.

Review the chart below and on the following page to see for yourself – **DeVilbiss has the least pressure drop of any of the seven brands!**

Pressure Drop Comparison at 50 PSI inlet at 25 SCFM



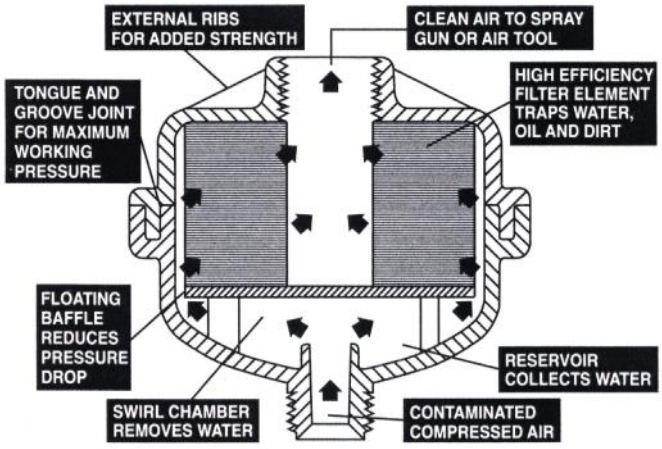
The chart above shows test data at 25 SCM using:
DeVilbiss high flow HC-4720 coupler, HC-4419 stem.
RBL 611 coupler, 612 stem.
Sharpe 8320 coupler, 8330 stem.
Original DeVilbiss P-HC-4120 coupler, P-HC-201 stem.
Milton/Sata "P" style 1804 coupler, 1810 stem.
Milton "M" style S715 coupler, S727 stem.
Sata/Milton "T" style 784 coupler, 786 stem.
Milton "A" style S775 coupler, S777 stem.

Use only High Flow Disposable Air Line Filters

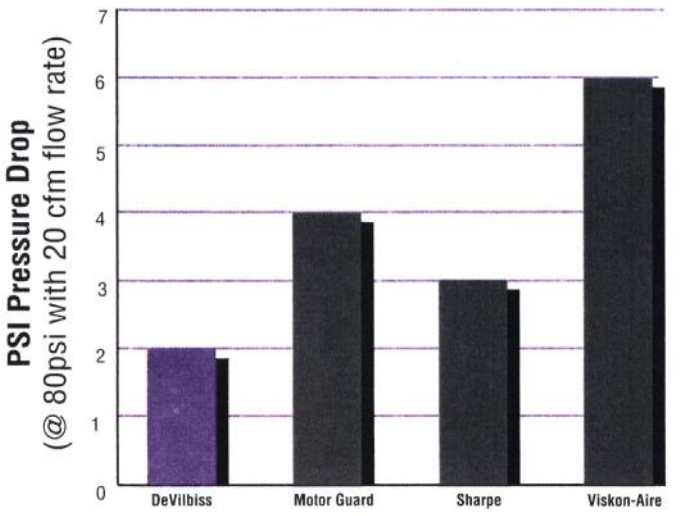
An air line filter is the final defense in filtering out remaining minute particles of water, oil or dirt before they enter the spray gun. Unfortunately, many filters on the market create severe levels of pressure drop.

It is important then to choose a filter with the least pressure drop, in order to maintain the best spray performance.

DeVilbiss Whirlwind™ high performance air line filters meet the criteria for clean air and efficient air flow. Disposable, yet extremely durable, Whirlwind filters are ideal for all spray guns ... conventional or HVLP.



Pressure Drop Comparison of Popular Disposable Air Filters



The chart above records testing data at 80 PSIG, 20 SCFM

Select a Quality, High Flow Filter/Regulator

Many air regulators on the market restrict air flow, and can create excessive pressure drop. Check the gauge under static (no flow) conditions, then again with the spray gun in use. If there is significant drop in pressure, the regulator may be too restrictive.

For flexibility, DeVilbiss CleanAir™ air control units let you equip your shop for specific needs. "Tornado" action separator rings swirl incoming air to remove water and the high efficiency 5 micron filter element provides extremely fine particle filtration. Large internal air passages ensure minimal pressure drop.

Select an air regulator capable of flowing enough air for your spray gun.

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