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Independent Review of the Fuji HVLP Spray Gun System

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Having owned and used a Fuji Q3 High Volume Low Pressure (HVLP) spray for a year now, I will tell you about some of the virtues and vices I have found in applying clear finishes to furniture with it.

The Technology of HVLP spraying is the same principle as a conventional high-pressure spray painting system - it is just the numbers that are different. Instead of using a piston or diaphragm pump to fill an air-receiver tank up to 100psi or more, HVLP systems use a multi-stage centrifugal compressor, similar to a vacuum cleaner, which only compresses the air to about 5 psi. Even so, at 1800 watts, the Q3 HVLP compressor has plenty of power, which it uses to shift a huge volume of around 100 cfm continuously without the need for a tank. Compare this to the meagre 5 to 10cfm from a conventional high-pressure system.



The net result of this is that all the airways need to be larger to let all the air rush through and avoid pressure loss. The bore of the hose is 19mm rather than the typical 6 to 8 mm of a high-pressure airline, the body of the spraygun is fatter than a conventional one and the air holes around the nozzle are larger for letting more air out at a lower velocity. This means that when the spray leaves the gun, it does not carry so far and also it does not bounce off the surface as much. Both these factors result in more coating deposited on the intended surface and less into the air and surroundings. The efficiency of HVLP, at 70 to 90%, is around twice that of conventional compressed air spraying systems that only manage to deposit around 40% of the material where it is wanted.

The business end of a spray kit is the spray gun. The body of the gun is pressurised from the hose with some of the air pressure bled off down a tube and non-return valve to pressurise the liquid container. This pushes liquid up the feed pipe to the nozzle. The nozzle itself is a small orifice, closed by a tapered needle through it, pressed in place by a spring at the rear. When you squeeze the trigger, the needle is partially withdrawn, allowing liquid to flow around it and out through the nozzle. Around the outside of the liquid nozzle is an alloy air-cap, which has a pair of horns drilled with airways. These spread the jet from the nozzle into a fan shaped spray, producing a cigar shaped deposit on the surface.

You can turn the air cap. With the horns set vertical, the spray pattern is horizontal and vice-versa. With the air cap, set at 45° the supply to the horns is shut off by the sprung plate behind, resulting in a small circular spray. The Fuji Gun The Fuji gun is an impressive device made from polished aluminium alloy castings.

The trigger on the new gun, as well as stopping the liquid when it is released, also stops the air. This reduces heating of the gun on longer jobs making it more comfortable to handle and avoids clogging of the aircap with rapidly dried finish. The handle is now clad in insulating material, again to improve comfort. The Fuji aircaps have an excellent surface finish. This improves airflow and makes them easier to clean.

The aircap, nozzle and needle come as a set which you can change for different nozzle sizes. The standard nozzle is 1.4mm, but for clear finishing on furniture, it is better to change to the fine 1mm set. All the wetted parts are made from stainless steel.



The gun design also makes it easier to adjust the needle packing and eliminates the risk of spraying liquid inside the airways of the gun if the packing leaks. The aluminium liquid cup holds around a litre, which is enough to spray a lot of furniture. It is secured by a cast alloy yoke to the cap and fluid feed tube with a quick release cam. The cup on the old gun was Teflon lined, to make it easier to flush out at the end of a job, but this is now only available to special order because apparently it caused problems with some solvents. The feed tube is bent forward inside cup to reach the front. Previously, when you tilted the gun forward to spray a horizontal surface, this tube would run dry with quite a bit of liquid left in the cup. The new version is bent to reach further into the cup, so avoiding this problem. There are also optional small cups available with separate lids, which is a good feature for small spraying jobs.



The external screw-ring that secures the air cap is made from a black Nylon - I would have preferred metal so I queried this with Fuji told me they had drop-tested the gun on concrete and the ring survived up to the eighth drop.

HVLP does not have many adjustments compared to high-pressure systems, but when I first set up the Fuji, I followed the advice to practise on scrap before spraying any decent furniture. There are just two adjustments - liquid flow and airflow. The finish comes out fast unless you throttle the liquid flow to a low setting and at first it is easy to make the mistake of overspraying leading to runs or 'orange peel'. Increasing the airflow increases the dispersion of the finish, which can leave it speckled. Having said this, from the outset I found HVLP is a lot easier to control than my previous attempts with high-pressure sprays.

The filter is a coarse foam block that slides in the side of the case. I shake it out in front of the extractor frequently to reduce the risk of dust in the finish or clogging up the gun. The heavy-duty



hose supplied is nearly eight metres long, far more than adequate for any furniture work I envisage. Compressing air produces heat and the hose quickly warms up in use. By the time it gets to the spraygun, it is moderately cool, but at the compressor end, the hose becomes quite soft and could easily be kinked. The first 200mm is shrouded in a stiff tube to prevent this. You need to avoid kinking the rest of it through suitable layout. I set my compressor up on the lower shelf of a kitchen type cabinet, with space to coil up the hose alongside, ready for use. The filter intake on the right hand side must not be obstructed, but having it recessed in a cabinet reduces the dust it collects.



A viscosity cup is provided to measure the liquid. You fill it to the brim then see how many seconds it takes to empty through the hole the bottom - simple.

According to Fuji, the third stage of the Q3 compressor reduces the noise level. While somewhat louder than a my workshop vacuum cleaner, it the same type of noise and quite gentle compared to, say, a router in full voice.

Finishes I decided from the outset that I would only use my Fuji gun for water-based products. This is because I do not have a proper spray-booth with explosion-proof extract and all the other paraphernalia you need for safely spraying solvent-based products. Another advantage of a water-based finish is that you can clean the gun by flushing through with copious supplies of water. You will not need to worrying about compatibility with cleaning different solvents. However all traces of water based finish must be removed as once it dries it is very hard to remove. Whatever finish you use, spraying requires a liquid that is less viscous than you would want for brushing. Fuji recommend you experiment with thinning for each type of coating. They say that sometimes the coatings manufacturer can help you in this regard if you tell them you are spraying with a turbine HVLP system. As a general rule, if there is no mention of spraying on the can, Fuji suggest you try about 25% thinning and go from there.

An HVLP system is comparable in price with a good quality high-pressure spray system, though you could get a basic high-pressure system for much less. The Fuji Q3 is well made from good quality components and recent improvements show they have responded actively to customer experience. HVLP is simple to operate and quite forgiving - I have not had a failed finish yet.

News:

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