

# HVLP TRAINING MANUAL

*High Volume  
Low Pressure  
Equipment*



**CAPspray**<sup>®</sup>  
THE FINISHING TOOL™

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# Introduction

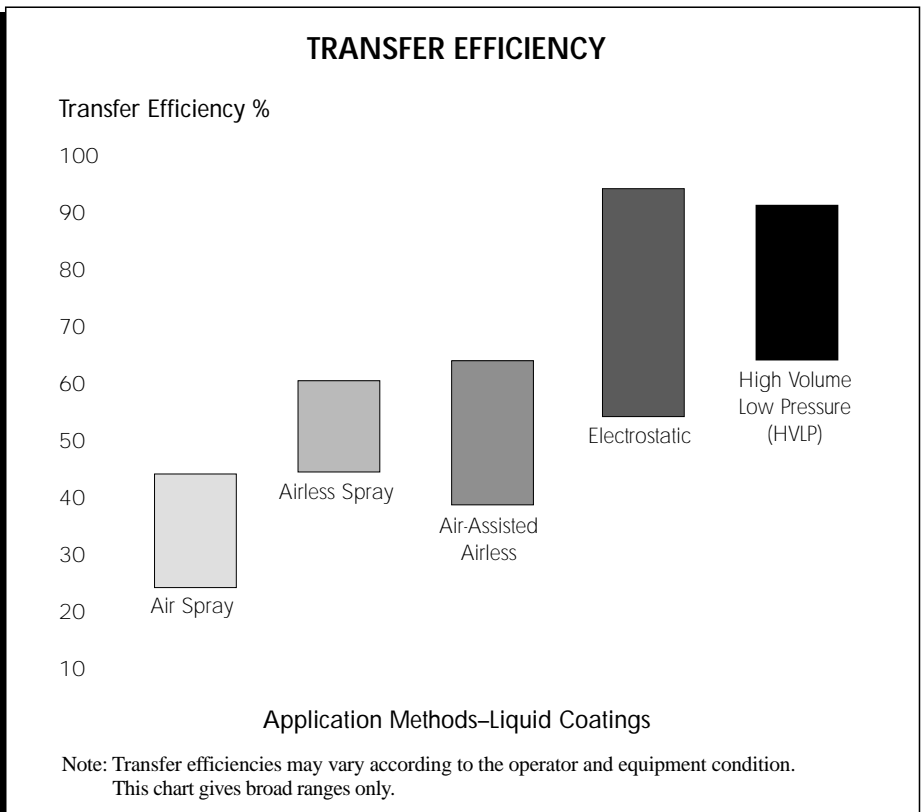
The contractor market for HVLP spray systems is the fastest-growing market segment in the spray equipment industry. As you'll soon realize, HVLP sprayers represent a tremendous opportunity to help painters become more competitive and profitable. Used primarily for finishing work, HVLP sprayers work hand-in-hand with airless equipment to help contractors reduce the time and material necessary to complete a job.

The key is minimized overspray. HVLP systems atomize coatings by means of low air pressure (2-10 PSI) (pounds per square inch) and high air volume (10-25 CFM) (cubic feet per minute), so the user can expect transfer efficiency ranging from 65-90 percent. The result is:

- *Less time masking and prep work*
- *Less material waste*
- *Less time cleaning up*
- **MORE PROFITS**

In addition, the high transfer efficiency of HVLP assists contractors to comply with new clean air laws designed to reduce volatile organic compounds (VOC) emissions. HVLP paint sprayers help protect the environment—and painters—by reducing overspray and bounceback.

This manual will give an overview of HVLP technology and uses; it will also focus on the specific features and operation of Sherwin-Williams/CAPspray® HVLP equipment.



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# Spraying Methods

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## **HVLP**

Two types of HVLP systems dominate the painting contractor market: portable turbines and direct hook-up guns. The two systems use completely different air sources, but atomize material in similar manners.

### **Portable Turbine**

Most commonly found in the painting contractor market for portable applications, this type of HVLP system uses a centrifugal blower motor as the air source.

### **Direct Hook-up Guns**

Direct hook-up guns require an air compressor as the air source. The guns will generally require from 10-25 CFM. These guns are primarily used in stationary booth applications.

### **Direct Hook-up High Flow Regulator Guns**

High flow regulator guns utilize an attached, high flow regulator, which increases air flow and reduces air pressure to achieve HVLP results.

Regulators deliver a more precise pressure setting than direct hook-up guns because the regulator is adjustable right at the gun.

## **Conventional Air Spray**

Conventional air spray atomizes material at high air pressure (35 to 80 PSI) and moderates air flow. The negative aspect of conventional air spray is excessive overspray and bounceback that results from high air pressure. Conventional air spray creates excessive turbulence at the air cap, which contributes to excess overspray. Bounceback results from the material being discharged from the nozzle, moving to the substrate at a very high velocity and bouncing off the substrate. The advantage of this method is ultra-fine atomization and a high rate of application. Conventional systems are used on finishing work ranging in size from small jobs to production lines. They generally are found in stationary applications. Required components are an air compressor, air hose and conventional spray gun.

## **Airless Sprayers**

Airless sprayers atomize coatings by forcing the paint through a small tip opening at very high fluid pressure. Working fluid pressures range from 1200 to 3600 PSI. Airless spray transfer efficiency is higher than conventional air spray (see chart on page 1), and offers the ability to spray the widest variety of coatings.

Airless sprayers typically are portable with gas, electric and air operated available. The primary application is production work. These systems are capable of covering large areas in a short amount of time. When used properly—correct fluid pressure, hose length and tip size—airless systems handle the widest range of applications. As a result, it is rare to find a commercial painting contractor who does not own or need airless spray equipment.

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# Spraying Methods

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## ***Air-Assisted Airless***

Air-assisted airless sprayers offer fine finish capabilities combined with a medium production rate. Air-assisted technology uses a combination of airless and air spray. Fluid pressure ranges from 700 to 900 PSI, with air intermixed at 15 to 30 PSI. The systems typically are found in stationary and portable fine finish production applications. Transfer efficiency for air-assisted airless ranges from 40 to 65%.

## ***Electrostatic Spray***

Electrostatic spray systems charge the paint at the tip. The charged particles move within the electrostatic field, which is attracted to the grounded object, forming an even coating on its entire circumference. When used properly, the result can be high transfer efficiency with uniform mil thickness.

A variety of electrostatic systems are available, including conventional airless and air-assisted. Applications include chain link fences, wrought iron, lockers, and metal office furniture.

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# When to use HVLP Equipment

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HVLP equipment is classified as a finishing tool. It is not designed to be used for covering large, flat surfaces, except when using specialty coatings, such as multi-spec, or where overspray may be hazardous.

HVLP systems are designed to cut labor time, minimize waste, and improve the final finish on the substrate. In addition to enhancing profitability, in many states HVLP is compliant with the most stringent transfer efficiency requirements. For this reason, you can expect the HVLP sprayer market will continue to grow at an accelerated pace.

### **HVLP Applications Include:**

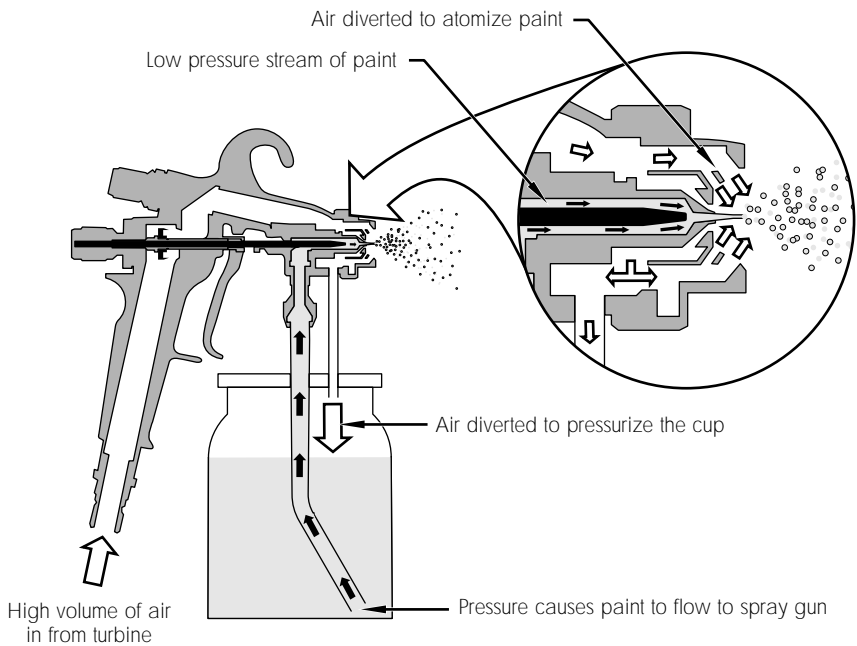
<i>Touch-up</i>	<i>Implement equipment</i>	<i>Gutters</i>
<i>Dentil molding</i>	<i>Six-panel doors</i>	<i>General maintenance</i>
<i>Crown molding</i>	<i>Appliances</i>	<i>Wicker furniture</i>
<i>Cabinets</i>	<i>Porcelain</i>	<i>Shelving</i>
<i>Door jambs</i>	<i>Furniture</i>	<i>Pipes</i>
<i>Elevator doors</i>	<i>Lockers</i>	<i>Multi-color finishes</i>
<i>Frames</i>	<i>Shutters</i>	<i>Louvered doors</i>
<i>Bi-fold doors</i>	<i>Dividers</i>	<i>Overhangs</i>

### **HVLP Features:**

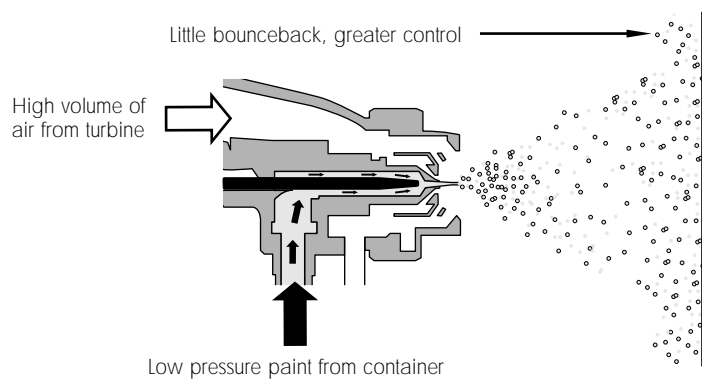
<i>High transfer efficiency</i>	<i>Portability</i>
<i>Minimal bounceback</i>	<i>Reduces material consumption by 40%</i>
<i>Sprays most materials</i>	<i>Three spray patterns available</i>
<i>Reduced prep and clean-up</i>	<i>Works from 15-amp service</i>
<i>Affordable</i>	<i>Cuts labor time</i>
<i>Inexpensive to maintain</i>	<i>Sprays patterns from 1/4" to 12"</i>
<i>Controlled spraying</i>	<i>Low fluid pressure means low wear</i>
	<i>Moisture-free atomizing air</i>

# How Does HVLP Work?

A pressure vessel (1-quart cup, 2-quart cup, or pressure pot) supplies paint to the gun, where a large amount of low pressure air intersects with the paint stream breaking the paint into small particles. This process is called atomization.



Since the pressures are much lower, the atomized paint has less bounceback. This means less overspray, greater transfer efficiency and better control.



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# How to Acquaint the Painter with HVLP

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The most effective way to show the advantages of HVLP equipment is to demonstrate it. Contractors will see how they can save labor hours, use less paint and increase profits.

HVLP sprayers are not for every painter. Be certain they are involved with the appropriate finishing application. Then match the correct unit size and tip size to the type of materials they use.

After you have determined the answers to these questions, consider more specific criteria:

- *Will the system be used in a stationary or portable application?*
- *Does the painter need a one-quart cup system, a two-quart, or a 2 1/2-gallon material capacity for continuous use?*
- *Will the painter need extra maneuverability with the gun?*
- *Is maximum hose length a consideration?*
- *How often will the painter use the sprayer?*

The significance of answers to these and other questions are discussed in the following portion of the handbook. However, the demonstration remains the most critical component. We can guide you through a demonstration, but you still must put paint in the cup, be prepared, and be confident. Under those conditions, the equipment will sell itself.

Before operating a Sherwin-Williams CAPspray HVLP spray system, please review the owner's manual. The manual includes all of the information needed to properly operate and maintain HVLP equipment.

Also keep in mind these basic safety considerations:

- *Always spray in a well-ventilated area. Always comply with appropriate local, state and national codes governing ventilation, fire prevention, and operation.*
- *Never spray near sparks, open flames or hot surfaces. Some coating materials are highly flammable.*
- *Before each use, check all material hoses (if you are utilizing them) for cuts, leaks, abrasions, cover bulging or movement of couplings. If any of these conditions exist, replace the hose immediately. Never repair a paint hose.*

# HVLP System Components

As with most sprayers, three distinct components make up an HVLP system: air source, air hose, and HVLP spray gun. There are several variations of these components depending upon the manufacturer. We will deal primarily with Sherwin-Williams CAPspray equipment.

## Air Source

The air source is the heart of the system. It provides the CFM and PSI required to atomize coatings. Depending on the type of gun and the application requirements, there are two types of air sources—air compressor and turbine.

### Air Compressor

Air compressors are used as the air source when using either direct hook-up guns or high-flow regulator systems. Because of high CFM requirements with HVLP direct hook-up guns, the minimum compressor size recommended is 5 HP. Due to the overall size and electrical requirements of 5 HP air compressors, portability is limited. In most cases, direct hook-up guns which require an air compressor as the air source are confined to stationary applications.

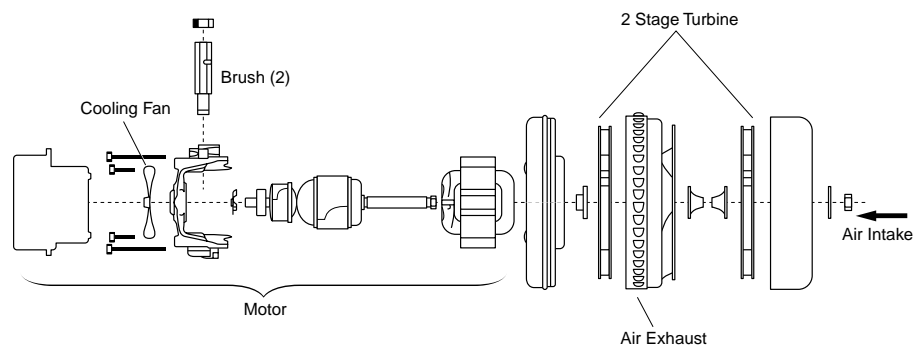
### Turbine

The turbine is the most common air source found in the painting contractor market. A turbine is a high-speed centrifugal blower motor which provides the gun with high CFM flow at low air pressures. Because of the high RPM—20,000 RPM in some cases—the air is frictionally heated. This eliminates all moisture from the atomizing air. The high RPM also increases the atomizing air temperature by as much as 80 degrees, reducing flash time and helping to minimize blushing. All CAPspray turbines are commercially rated, heavy-duty and designed for continuous use.

### By-Pass Turbine with Tangential Discharge

The tangential discharge turbine is used in the by-pass configuration, using separate cooling and intake fans. This turbine comes from the manufacturer with a built-in air outlet. This type of turbine is found in the 5100, 8100 and 9100 units.

Although there are many variations and uses, the main function of a turbine in HVLP equipment is to generate a high volume of air at air pressures less than 10 PSI. A critical element in determining the amount of air pressure that a turbine can generate is the number of *stages*. A stage, within a turbine, can be viewed as an individual compression chamber. The greater the number of stages within a turbine, the higher the PSI the turbine is able to produce—the more PSI the turbine produces, the heavier the viscosity of material that can be sprayed.





# HVLP System Components

Please note that while air flow (CFM) and pressure (PSI) are both important in determining the turbine's ability to atomize coatings, **pressure is the key**. All manufacturers rate their turbines in the range of 50-170 CFM.

Whether the turbine produces 50 or 170 CFM, it will still have enough air flow to support the gun. The gun only uses about 25 CFM. Therefore, CFM as a measure of performance can be misleading. Pressure determines the velocity of the air moving through the air cap. This creates the turbulence at the nozzle, and in turn atomizes the coating. The more pressure, the higher the velocity and the better the ability to break up more viscous coatings.

## Air Hose

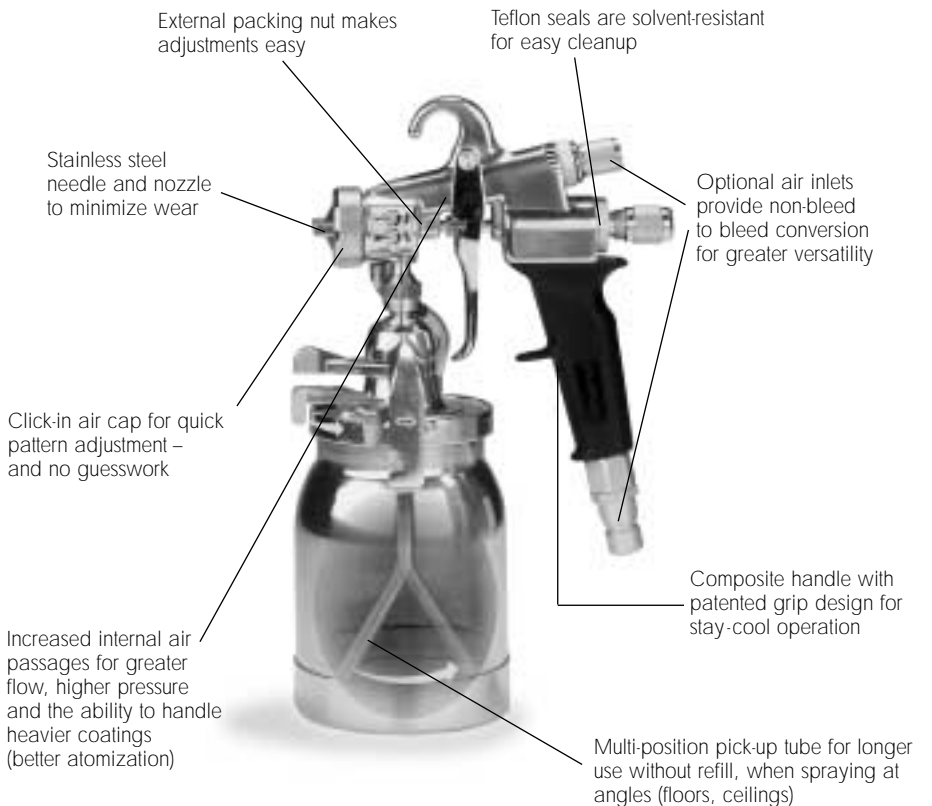
The air hose often is ignored, but it is a key element of the HVLP system. Its function—transferring air from the power source to the gun—cannot be overlooked. The CAPspray hose is specifically designed to withstand heat and solvents, while remaining lightweight and pliable.

## Hose Length

To determine the maximum air hose length with a turbine, use this general rule of thumb: double the length of hose that comes standard with the turbine. Example: If 15 feet of hose comes with the turbine, the painter can use a maximum hose length of 30 feet. Just screw the hoses together to extend the length.

## Maxum I™ HVLP Spray Gun

The Sherwin-Williams CAPspray® Maxum I™ Non-bleeder Gun is the most versatile, painter-friendly HVLP gun available on the market.



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# HVLP System Components

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## **Maxum I HVLP Spray Gun**

(continued)

### **Non-Bleeder Gun vs. Bleeder Gun**

### **Optional Air Inlet**

HVLP guns differ from conventional air spray guns in two main areas: One difference is the size of the internal air ports. Conventional gun air port openings are approximately ¼". HVLP guns need more air and use openings ⅜" in size. That makes the air ports more than 6 times as large as those in conventional guns. Keep in mind that HVLP atomizes with a high volume of air and low pressure.

The second major difference is the manner in which the material is moved from the cup out of the nozzle. HVLP units pressurize the cup, *forcing* material to the nozzle. A conventional gun creates a vacuum to *siphon* material to and through the nozzle.

The term non-bleeder means that when the user releases the trigger of the gun, the air flow stops. With a two-stage trigger, the user will first feel air coming from the air cap; trigger further and material flow will begin. With a bleeder gun, air flows continuously; the trigger only starts and stops the paint flow.

The Maxum I Gun offers two air inlet locations: one on the bottom of the handle for non-bleeder set up and the second directly behind the air control valve. To set up the gun in bleeder spray mode, remove the air control knob and replace it with the air inlet fitting from the bottom of the gun. Close the air inlet fitting with the plug supplied with the gun. The air hose can now be attached to the gun. When using this location, the gun becomes a bleeder gun by always discharging air. This location is particularly helpful spraying inside lockers or cabinets.

Another area to utilize the top air inlet is to improve atomization with very heavy materials. This can be done by bypassing the air valve so air is directly channeled to the air cap.



Patented conversion feature allows you to change to a bleeder gun if the job requires it.

# Maxum I HVLP Spray Gun Adjustments

## Air Control Valve

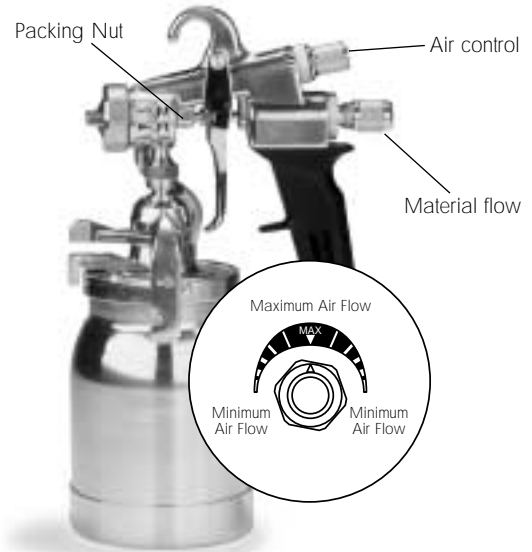
To produce the highest-quality finish possible, the spray gun requires the proper air and material adjustments. You control the air flow with the air control valve, located at the rear of the gun.

Note the notch that is cast into the control knob on the valve. Air flow is at its fullest when the knob is set at the 12:00 position. Rotating the valve 180° either direction cuts off the air.

The air control valve is used when spraying with light viscosity materials or in confined areas, such as cabinets or lockers. When spraying light material, full air is not needed. Restrict the valve until you achieve proper atomization without excess overspray.

## Material Flow Adjustment

The amount of paint fed from the cup out the nozzle is controlled by the material adjustment knob located at the heel of the gun, just above the handle. To *decrease* paint flow, turn the fluid adjustment knob *clockwise*. To *increase* the paint flow, turn the knob *counter-clockwise*. A little experimentation will give you the correct combination of paint and air necessary to achieve the desired finish and fan size. The material adjustment can also be used to set a specific trigger pull, so the same pattern size and material flow are consistently obtained on each pass.

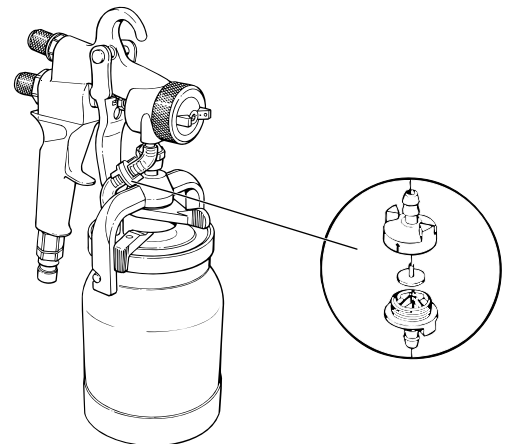


## External Packing Nut

The external packing nut, located directly in front of the trigger, is used to adjust the packing so a seal is maintained around the needle.

## One-Way Valve

The one-way valve, or serviceable check valve, is designed to allow air into the cup, putting the material under pressure, yet not releasing the cup pressure. CAPSspray's one-way valve prevents paint from seeping up the air tube into the air passages of the gun. It also eliminates any delay in material flow when the gun is triggered.



CAPSspray's one-way valve is easily detached for cleaning purposes. The valve simply rotates to open for cleaning and contains a disk that can be removed and cleaned with soap and water for waterborne materials or a compatible solvent for other materials.

# Maxum I Air Cap Adjustments

## Air Cap

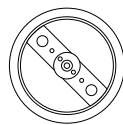
CAPsray's exclusively designed guided air cap makes it virtually impossible for the painting contractor to misalign. This translates to better spray pattern control.

The air cap determines the spray pattern. It is crucial the air cap remains clean and free of dried paint.

## Spray Pattern

The Sherwin-Williams CAPsray HVLP gun offers a choice of three spray patterns: horizontal flat, vertical flat and round. To select the desired pattern, simply rotate the two air cap "ears" until they click into the desired position.

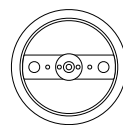
An up and down position gives you a horizontal pattern. When the ears are side by side, you will get a vertical pattern. And when the ears are diagonal, the pattern is round. **Never trigger the gun while adjusting the spray pattern.**



Diagonal Cap Position



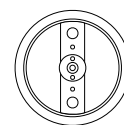
Round Spray Pattern



Horizontal Cap Position



Vertical Spray Pattern



Vertical Cap Position



Horizontal Spray Pattern

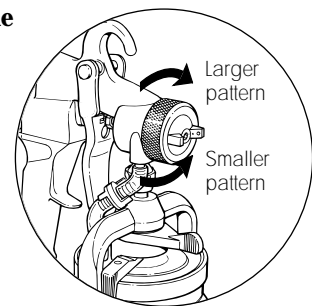
## The Fan Size

To change fan size, change the distance from the surface to the gun nozzle. The closer you are to the surface, the smaller the pattern becomes. Moving back increases the fan size.

Trigger pull will also vary the fan size. The greater the trigger pull, the greater the material flow and fan size.

Another way to adjust fan size is to move the air cap in (clockwise) for a larger pattern or out (counter-clockwise) for a smaller pattern.

When getting started, the air cap should be flush with the fluid nozzle. This will give you the full range of pattern size control.

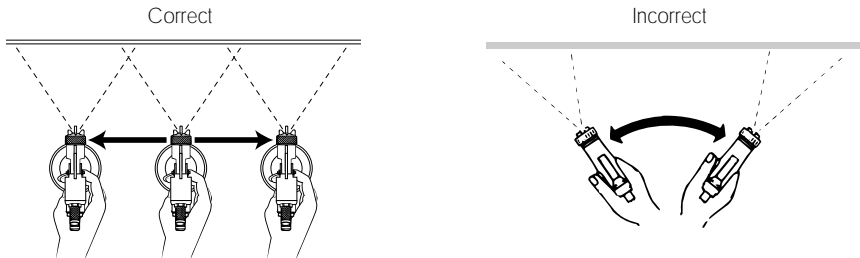


Spray pattern width is adjustable from 1/4" to 12".

# Spray Techniques

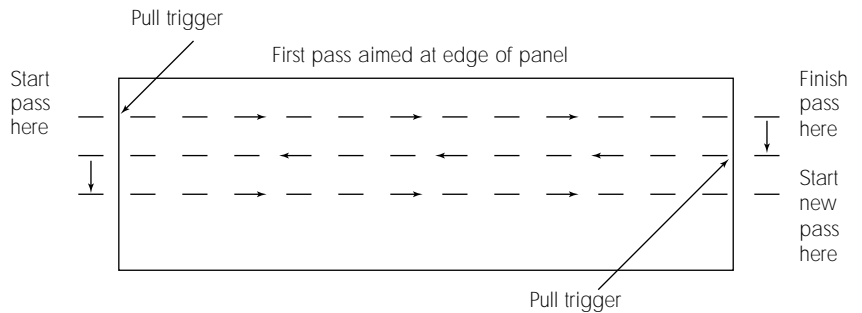
## Spraying Techniques

Position the spray gun perpendicular to and 1 to 8 inches from the spray surface. Spray parallel to the surface and use controlled, smooth passes at an even speed. Start by applying a thin coat of material on the first pass and allow it to tac before applying a second, slightly heavier coat.



## How to Make the Correct Pass

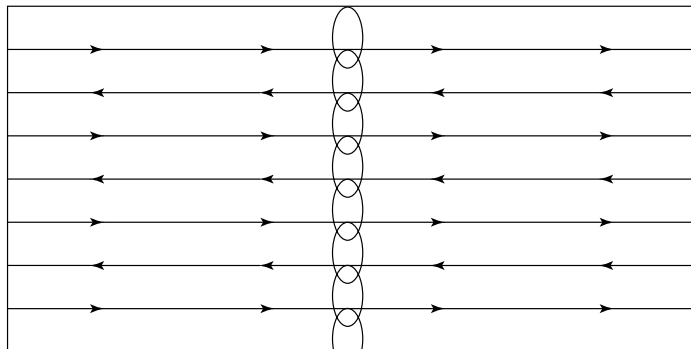
When spraying, trigger the spray gun before starting your pass, and release trigger before stopping the pass. The best results will occur when making passes about 20 inches. Keep the gun perpendicular to the surface and overlap passes approximately 50% to obtain the most consistent, professional finish.



The CAPspray gun is not “all on” or “all off.” With practice, trigger pull and spraying distance can also be used to change the pattern size. The ideal distance for HVLP spraying is 1-8 inches from the substrate. **Remember**, the closer you stay, the more control you have.

## Overlapping Each Pass

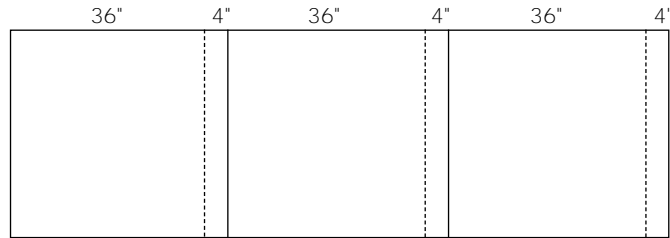
The edges of each spray pattern fade slightly. To maintain even coverage, overlap each stroke.



# Spray Techniques

## Spraying Large Areas

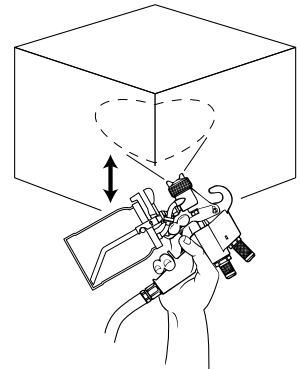
Spray a long panel or wall in sections. Use horizontal or vertical strokes. Keep stroke length to 3 feet. Spraying a longer pattern may cause uneven coverage and excessive overspray. Overlap each section by 4 inches. Narrow panels are best sprayed using vertical strokes to help prevent too much overlapping.



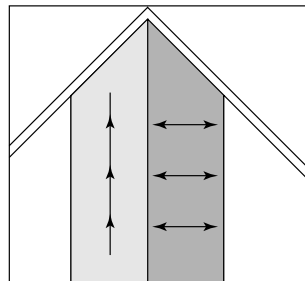
## Spraying the Outside Edges of Corners

Hold the gun directly facing the corner edge so that the surfaces which form the corner are sprayed along the edge.

Spray horizontally for vertical edges, and spray vertically for horizontal edges.



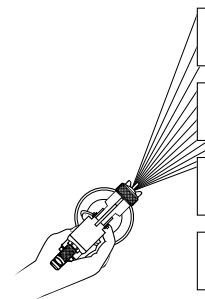
## Spraying the Inside Edges of Corners



Each surface that forms the corner should be sprayed separately. Spray one surface vertically. Spray the other surface with short, even, horizontal strokes. When spraying each surface, overlap slightly into corner.

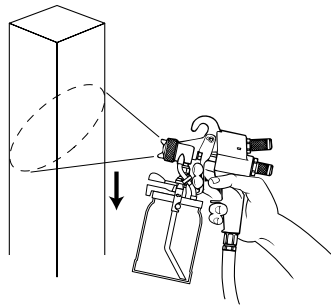
## Spraying Slender Work

Picket fences are sprayed with single strokes, made vertically at an angle. This motion will cover the front and one edge. Spray the other side of each picket at the opposite angle. Place a piece of cardboard behind the fence to catch overspray.



# Spray Techniques

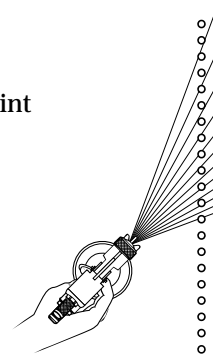
## Spraying Square Posts or Steel



Adjust the material adjustment knob to the desired spray width. Spray two adjacent surfaces at the same time.

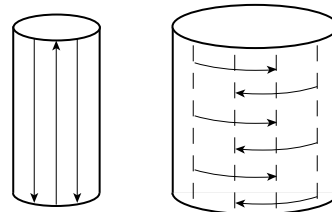
## Grills and Wire Fences

Hold the gun at a sharp angle. Deflect the paint passing through the grill or fence with a flat surface. This will help coat the other side.



## Spraying Round Work

For cylinders up to three feet high or wide, spray vertically. For larger cylinders, such as storage tanks, spray horizontally. For small pipe work or tubular furniture, use the round spray pattern set to the proper diameter.

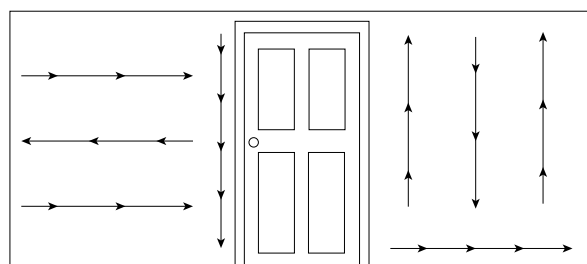


## Cutting In

Cutting a line “in” is a technique best explained with an example.

Suppose you are spraying horizontally on a wall, and you are approaching a door frame. Do not spray horizontally to the edge of the door frame. LEAVING THE AIR CAP HORNS SET AT HORIZONTAL, CUT IN BY MOVING THE GUN IN A VERTICAL FASHION.

This hides the pattern created by cutting in. Feather the spray or reduce paint flow to gun before cutting in. Use horizontally after spraying vertically, leave air cap horns for vertical spray.



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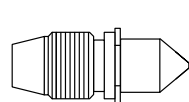
# Choosing a Projector Set

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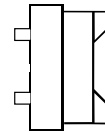
## Projector Set

The projector set determines what materials and viscosities can be sprayed from the gun. A larger projector set has a larger nozzle opening, allowing you to spray thicker, heavier materials.

A projector set consists of a needle assembly, fluid nozzle and air cap.



Fluid Nozzle



Air Cap

The Maxum I spray gun comes standard with a #3 guided projector set. You should choose a projector set based on two things: type of material to be sprayed and finish desired. The chart below will help you make the correct choice.

Part Number	Projector Set Size	Orifice Size Inches	Type of Coating
0276254	#2	.031 in.	Fine Finish
0276227	#3	.051 in.	All-Purpose
0276228	#4	.070 in.	High Output
0276229	#5	.086 in.	Heavy Viscosity Material
0276245	#6	.097 in.	Heavy Viscosity Material and Texture Finishes



# Projector Set Recommendation Chart

<b>Material</b>	<b>Percent Reduction</b>	<b>Smallest Unit Recommended</b>	<b>Projector Set Recommended</b>	<b>Projector Set Orifice Size (in.)</b>
<i>Pro Mar 200</i>	10-15%	9100	4 to 5	.070 to .086
<i>Pro Mar 400</i>	10-15%	9100	4 to 5	.070 to .086
<i>Super Paint</i>	5-15%	8100	3 to 4	.051 to .070
<i>Classic 99</i>	5-15%	9100	3 to 4	.051 to .070
<i>Ceiling Paint</i>	5-10%	5100	3 to 4	.051 to .070
<i>DTM Water Base Acrylic</i>	0-5%	5100	3 to 4	.051 to .070
<i>Chem Lack</i>	2-4%	9100	3 to 4	.051 to .070
<i>Metal Latex</i>	5-10%	9100	4 to 5	.070 to .086
<i>Style Perfect</i>	10-15%	8100	3 to 4	.051 to .070
<i>Classic 99 Alkyd</i>	5-15%	5100	3 to 4	.051 to .070
<i>Industrial Enamel</i>	5-15%	5100	3 to 4	.051 to .070
<i>Quick Dry Enamel</i>	5-15%	5100	3 to 4	.051 to .070
<i>DTM Alkyd</i>	2-5%	5100	3 to 4	.051 to .070
<i>Polane</i>	Mfg. Rec.	5100	2 to 3	.031 to .051
<i>Water Base Epoxy</i>	5%	9100	3 to 4	.051 to .070
<i>Nitrocellulose Lacquer</i>	Mfg. Rec.	5100	2 to 3	.031 to .051
<i>Opex Production Lacquer</i>	10%	5100	3 to 4	.051 to .070
<i>Water White Lacquer</i>	10%	5100	3 to 4	.051 to .070
<i>Multi Spec</i>	0%	8100	4 to 5	.070 to .086
<i>Tile Clad</i>	10-15%	9100	4 to 5	.070 to .086
<i>Polyurethane</i>	0%	5100	3 to 4	.051 to .070
<i>Sealer</i>	0%	5100	3 to 4	.051 to .070
<i>Latex Primer</i>	5-10%	5100	3 to 4	.051 to .070
<i>Incredicoat</i>	5-10%	8100	3 to 4	.051 to .070

Notes: All "water like" coatings require no thinning.

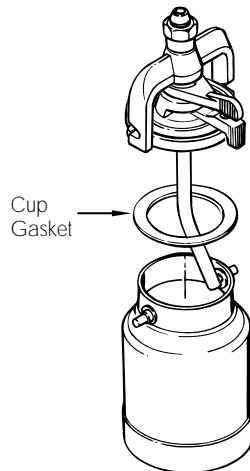
Because of variations in material, recommendations in this chart should be used as starting points. You may achieve acceptable results using different combinations.

# Cleaning Your Equipment

## Spray Gun

It is important to clean your spray gun thoroughly after each use.

1. Empty the spray material from cup.
2. Pour a small amount of the appropriate solvent in the cup and attach the cup to the spray gun.
3. Shake and spray the gun in a well-ventilated area. Back-flushing of the system is not necessary, so do not restrict the nozzle when cleaning.
4. Repeat the steps above until the solvent appears clear.
5. Wipe the exterior of the cup and the spray gun with the appropriate solvent until it is clean.
6. Make sure the air holes and material passages are completely clean. Never use metal tools or picks to clean the air cap or nozzle.
7. Thoroughly clean the check valve and hoses. Do not soak check valve hoses in hot solvents. Failure to clean check valve will result in problems the next time you use the gun.



It is a good idea to lubricate any threaded parts on the sprayer with petroleum jelly when you put them back together. This helps keep them working properly. However, do not use any lubricants containing silicone, which can cause problems when used with some paints.

The cup gasket must be replaced periodically due to normal wear. It is important to inspect the gasket during each cleaning.

If material leaks from around or through the packing nut, tighten the packing nut slightly. Squeeze the trigger to see if the leaking has stopped. If it has not, continue to tighten the packing nut until the leaking stops. Be careful not to over-tighten the packing nut or the needle will stick in the packing. If adjusting the packing nut does not stop the leak, replace the packing.

## Filter

1. Remove the filter as shown.
2. Use air to blow material residue from the filter, or tap the particles out. For material that is not easily blown or knocked loose, try soapy water or mineral spirits. Allow filter to dry before placing back in unit. Filters should not be cleaned with highly flammable solvents. If the filter does not come clean using these methods, install a new filter.
3. Once the filter is cleaned, insert it back into the end from which it was removed. Note that the two-stage filter found on the gun atomizing air chamber needs to go in with the green side on the inside.



# HVLP Spray Equipment Troubleshooting

Problem	Cause	Solution
Little or no material out of nozzle.	<p>Out of paint. Air cap screwed clockwise too far. Check valve plugged. Material viscosity too heavy.</p> <p>Nozzle plugged. Cup or pot lid is loose.</p> <p><b>Pressure Pot System:</b> Fluid hose clogged.</p> <p>Regulator not adjusted. Pot gasket worn. Pick-up tube bottomed out on gallon can. No air pressure in pot.</p>	<p>Fill cup or pot with paint. Adjust air cap. Clean or replace check valve assembly. Thin material. Try Paint Mate as an additive for latex. Clean nozzle. Tighten cap lever or pot wing nuts.</p> <p>Clean by flushing with water or solvent, or replace hose. Adjust regulator properly (10-15 psi). Replace. Pour paint into pot or shorten tube. Inspect air tube or pot gasket; clean or replace.</p>
Paint leaking from front of gun.	<p>Needle or nozzle worn. Needle sticking.</p> <p>Improper needle or nozzle size. Loose nozzle. Loose packing nut. Needle not closing properly.</p>	<p>Replace. Adjust needle packing; check for bent needle. Replace with correct size for material. Tighten. Tighten. Loosen packing nut, replace needle spring, remove dried paint from needle.</p>
Paint leaking from packing nut.	Packing damaged.	Replace.
Poor spray pattern.	<p>Air holes in air cap ears are clogged. Nozzle is clogged. Damaged nozzle or needle. Air cap screwed in too far. Gun too far from surface.</p>	<p>Remove and clean air holes. Clean with appropriate solvent. Remove and replace. Adjust air cap to proper setting. Move gun closer (within 6").</p>
Pulsating spray pattern.	Loose or damaged packing.	Adjust or replace packing.
Pattern off center; heavy to one side.	<p>Air cap holes plugged. Gun not held perpendicular to surface. Damaged air cap.</p>	<p>Clean holes in cap. Position gun correctly. Replace.</p>
Pattern heavy in the middle.	Too much fluid pressure.	Reduce pressure.
Gun spitting paint.	<p>Check valve not operating properly. Material too thick.</p>	<p>Clean or replace valve assembly. Thin material. Try Paint Mate as an additive for latex.</p>
Paint build-up on air cap.	Improper adjustment of the cap.	Adjust per manual instructions.
Excessive overspray.	<p>Gun too far from surface. Air pressure too high.</p> <p>Material too thin.</p>	<p>Move closer. Reduce air pressure to level that adequately atomizes coating. Add unthinned material.</p>
Restricted or no air flow.	<p>Air control valve turned off. Air filters clogged.</p>	<p>Adjust air control valve. Clean or replace filters.</p>

# HVLP Spray Equipment/Finish Troubleshooting

Problem	Cause	Solution
Filter warning light on.	Air filters clogged.	Clean or replace filters.
No trigger pull.	Material adjustment knob too tight.	Turn counter-clockwise.
Unit has no power.	Blown fuse.	Check and replace fuse.
Cup doesn't retain power.	Worn cup gasket. Cup ears bent.	Replace. Straighten (do not over-tighten).
Excessive arcing/sparking.	Worn turbine brushes. Damaged commutator.	Replace brushes. Replace turbine.
<b>Finish Troubleshooting:</b>		
Orange peel.	Paint drying too fast. Gun too far from surface. Material too heavy.	Use slower solvent or retarder. Move closer. Reduce viscosity. Try Paint Mate as an additive for latex.
Dry spray with lacquer.	Solvent flash too fast.	Add retarder to slow flash time.
Runs and sags.	Material too thin. Moving gun too slow. Too much material.	Add unthinned material. Speed up passes. Reduce material flow by adjusting material adjustment knob.
Pinholing and solvent pops.	Trapped solvents.  Pigment settling. System contamination.	Apply material in lighter coats allowing solvents time to evaporate. Possible bad product. Replace. Thoroughly clean all parts.
Fish eyes.	Possible silicone contamination.	Use solvent to clean all parts.
Blistering.	Moisture in/on spray surface. Incompatible topcoats or undercoats.	Dry surface completely. Ensure coatings' compatibility.
Lumpy, coarse surface.	Dirt on spray surface.	Thoroughly clean surface.
Mottled surface finish.	Too much thinner. Poor spray technique.	Reduce thinner. Always square gun with spray surface.

Note: For fast-drying automotive materials and some lacquers, prepare material to be sprayed according to manufacturer's recommendation. The hot air produced by the turbine quickly dries the solvents required to thin these materials. We recommend that you thin these materials 5% to 10% more than the recommended instructions of the manufacturer, or use a retarder.

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## Sherwin-Williams CAPspray 5100 SMIS No. 176-5064

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A compact unit for mid-size jobs, the 5100 offers the painter a great deal of versatility in the type of work, yet is compact and completely portable. Increased performance allows the contractor to spray stains, sealers, lacquers, oil-based and finish-grade latex. A rugged, two-stage by-pass turbine delivers ample air pressure and volume to handle higher viscosities better than any comparable unit. The 5100 features a lightweight, tough cast aluminum and steel housing, center mounted handle for easy carrying, and an integrated gun/cup holder. Cart mounting is optional.

The 5100 offers the painting contractor many options for a variety of jobs. For residential work: cabinets, doors and woodwork, appliances, porcelain, wicker, louvers, etc. For commercial work: elevators, metal cabinets, woodwork, equipment, multi-color finishes, dividers, etc. And for the maintenance painter, the 5100 will make short work of lockers, metal structures, equipment, framing, metal dividers, pipes and many more items.

### **Features:**

- *Maxum I spray gun, which includes a 1-quart cup with multi-position pick-up tube*
- *15-foot high-flex air hose*
- *Two-stage tangential by-pass turbine*
- *Portable unit or power pack with carrying handle*
- *Integrated cup holder*
- *Built-in noise reduction system*

### **Specifications:**

- *Number 3 guided air cap system for most coatings. Number 3 provides .051-inch orifice size.*
- *5 PSI*
- *9.0 AMPS (15 AMP circuit, 110V)*
- *Weight: 18 lbs.*

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## Sherwin-Williams CAPspray 8100 SMIS No. 176-5072

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The 8100 is ideal for jobs that require continuous spraying and the ability to handle difficult-to-atomize materials. It sprays stains, clear coats, lacquers, oil-based epoxies and multi-color coatings. Also applies most water-reducible coatings, including waterborne lacquer and finish-grade latex.

The large or small contractor taking a wide variety of jobs will benefit from the 8100. Meant for continuous use, the 8100 will become an invaluable painting partner for residential, commercial or maintenance painting. Meant for large jobs, the 8100 comes with 30 feet of air hose (can be upgraded to 60 feet) giving the contractor a great deal of maneuverability.



### Features:

- *Maxum I spray gun, which includes 1-quart cup with multi-position pick-up tube*
- *Filter warning light tells you when to clean or change air filters*
- *30-foot high-flex air hose*
- *Three-stage tangential turbine*
- *Integrated cup holder*
- *Tough metal housing*
- *Built-in noise reduction system*
- *Optional cart mounting*

### Specifications:

- *Number 3 guided air cap system for most coatings. Number 3 provides .051-inch orifice size.*
- *6 PSI*
- *10.5 AMPS (15 AMP circuit, 110V)*
- *Weight: 22.5 lbs.*

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# Sherwin-Williams CAPspray 9100 SMIS No. 176-5080

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The 9100 is the most powerful portable turbine system available. It has an exclusive, 4-stage tangential turbine that produces the kind of performance needed to spray continuously and to atomize coatings with a minimal amount of reduction. Sprays stains, clear coats, lacquers, oil-base, and multi-color coatings. Also applies most water-reducible coatings, including waterborne lacquer and finish-grade latex.

The 9100 offers you versatility, since it mounts directly to the Portable Cart and uses up to 60 feet of air hose. With the quiet, patented, noise-reduction system, you can use the 9100 in places where other turbine systems would be too noisy. And the integrated gun holder prevents gun damage when transporting or storing.

### Features:

- *Maxum I spray gun, which includes 1-quart cup with multi-position pick-up tube*
- *Filter warning light tells you when to clean or change air filters*
- *30-foot high-flex air hose*
- *Four-stage tangential by-pass turbine*
- *Integrated cup holder*
- *Built-in noise reduction system*



### Specifications:

- *Number 3 guided air cap system for most coatings. Number 3 provides .051-inch orifice size.*
- *8 PSI*
- *12.4 AMPS (15 AMP circuit, 110V)*
- *Weight: 23.5 lbs.*

# Sherwin-Williams Portable Cart SMIS No. 176-5098

The Portable Cart is compatible with the 5100, 8100 or 9100 for complete mobility around job sites. Built-in air compressor and 2½-gallon pressure pot allows fast, continuous spraying for larger jobs. Higher fluid PSI results in faster application rates with the pressure pot.



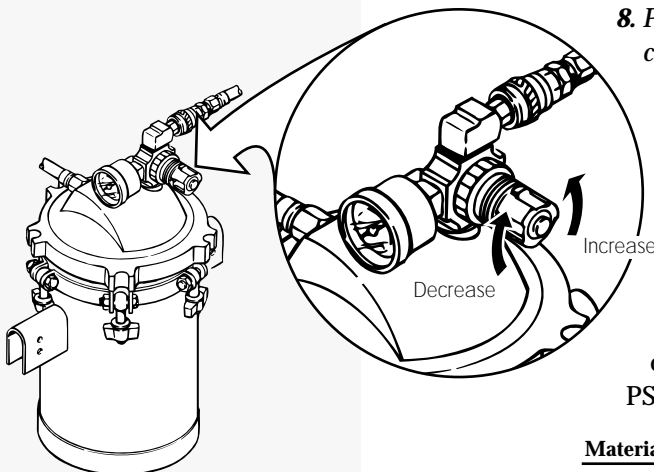
## Features:

- *Lightweight construction*
- *Semi-pneumatic tires (no flats)*
- *30-foot fluid hose*
- *Fold-down handle for storage or transporting*
- *Compressor filtered for longer life*
- *Wide cart for better stability*

## Set-up for the Portable Cart is fast and simple.

1. *Convert the spray gun from the Maxum I cup gun to a pressure gun (see cart manual).*
2. *Mount the cart bracket to the bottom of the turbine as shown in the diagram on p. 23.*
3. *Plug turbine power cord into cart outlet.*
4. *Connect the compressor air hose into the pressure pot inlet.*
5. *Attach the material hose to the material outlet fitting of the pressure pot, and to the material inlet of the gun.*
6. *Attach the turbine air hose to the air outlet fitting of the turbine, and to the air inlet fitting on the handle of the gun.*
7. *Place up to 2.5 gallons of paint into the pressure pot.*

*Note: When using a 1-gallon can in the pressure pot, make sure the pick-up tube does not bottom out on the can, obstructing the flow of paint to the gun. In this instance the pick-up tube must be reduced by ¼". If using a pot liner, pour the paint directly into the liner and secure the pressure pot lid.*



8. *Plug the cart power cord into a 110-volt power supply. Turn cart and turbine power switches to ON position.*
9. *Adjust the power regulator to approximately 6 PSI for light-viscosity materials (lacquers or stains). Use 8 to 15 PSI for heavier paints (enamels to latex).*

The correct pressure setting is critical when using the pressure pot. Always start with the lowest possible setting depending on your material viscosity.

The fluid pressure is adjusted by the regulator located on the lid of the pressure pot. Turn clockwise for higher PSI and counter-clockwise for lower PSI.

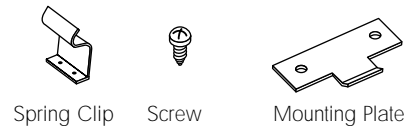
<u>Material Viscosity</u>	<u>Gauge Setting Fluid Pressure</u>
<i>Light</i>	<i>3-10</i>
<i>Medium</i>	<i>6-15</i>
<i>Heavy</i>	<i>10-25</i>



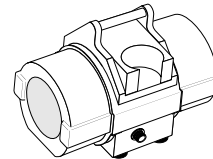
# Mounting Models 5100, 8100 or 9100

## Mounting a Turbine on Your Cart

Your cart mounting hardware includes two spring clips, four screws and a mounting plate.

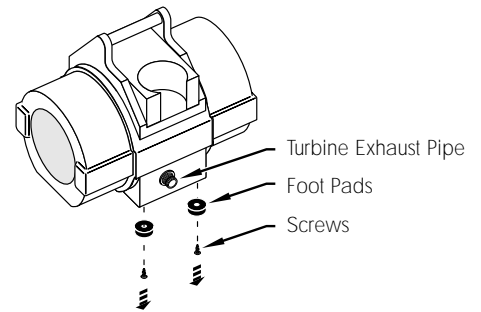


If your turbine looks like this: you will need to use the mounting plate only.

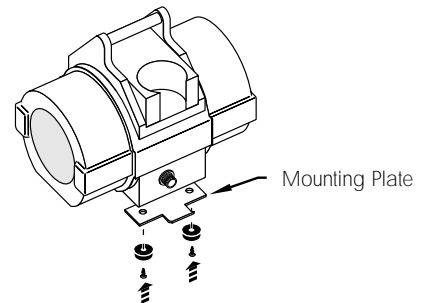


## Attaching the Mounting Plate

1. Remove the two screws and foot pads from underneath the turbine exhaust pipe side of the turbine.

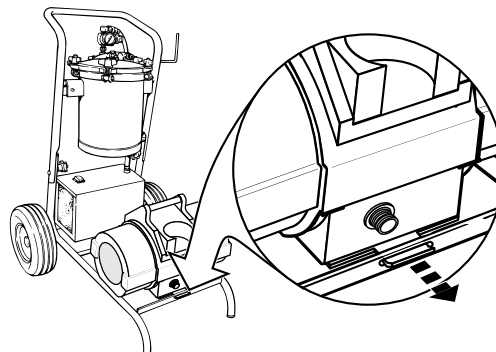


2. Insert the screws through the foot pads and mounting plate and thread them into the housing. Tighten securely. Be sure to keep the curved edge of the plate pointing up.



## Placing the Turbine on the Cart

1. Insert the curved edge of the mounting plate through the slot on the front edge of the cart base and set the unit down on the cart.



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# Sherwin-Williams CAPspray 3100

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The 3100 is designed to be used in conjunction with any HVLP unit. It consists of a compressor, two-quart cup and connecting hoses. A 30-foot air hose provides air from the compressor to the two-quart cup, and a 6-foot fluid hose feeds material from the cup to the gun. Air to the gun is supplied by the host HVLP turbine.

The 3100 doubles the reservoir capacity of standard HVLP guns and reduces arm and hand fatigue by removing the reservoir from the gun. This also provides greater freedom to paint inside cabinets and in other areas.



## **Features:**

- *2-quart pressure cup assembly*
- *30-foot air hose*
- *6-foot fluid hose*
- *Integrated cup holder*
- *Can be used with any HVLP unit*

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## Assistance/Warranty

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### ***When a Customer Needs Help***

For ordering, application, technical and service information, Sherwin-Williams store personnel can speak directly to SprayTech technical specialists by calling toll free:

***1-800-U-CALL-SW (1-800-822-5579)***

Contractor customers with questions concerning applications, technical or service information can call toll free:

***1-800-292-4637***

### ***Tough Customer™ Guarantee***

The Tough Customer™ Guarantee is an exclusive in the spray equipment industry. This maintenance warranty covers all parts and repairs, including labor, for one year from the date of purchase. The contractor simply needs to send in the convenient registration card that accompanies each unit. Store personnel assist the contractor in completing the Free-Maintenance I.D. card.

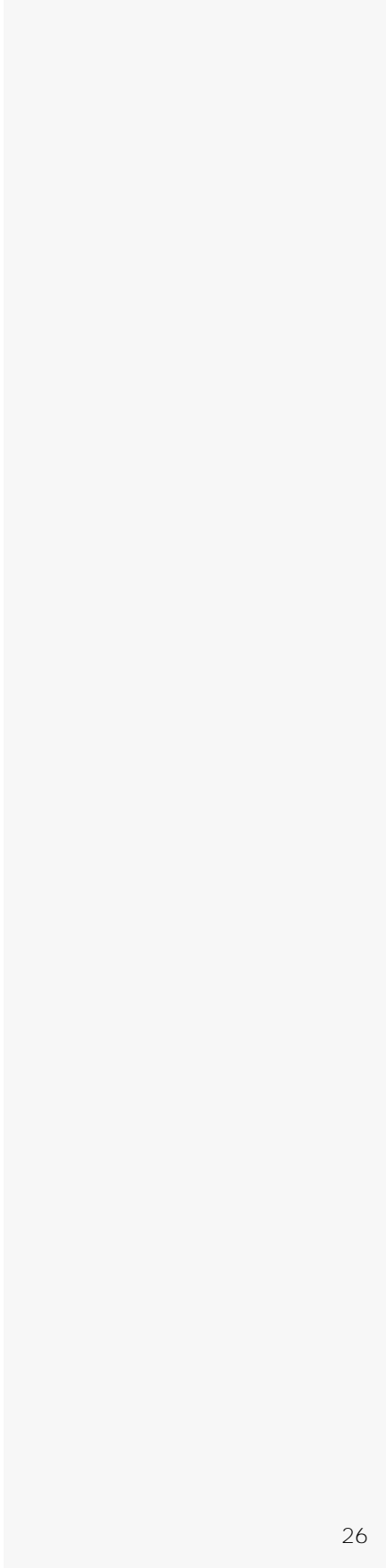
Tough Customer™ does not cover unit clean-up, hoses, filters, check valves, gaskets, projector sets or packings or repairs for misuse or neglect.

CAPspray also offers a one-year limited warranty covering defects in material or workmanship. See the equipment owner's manual for details.

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# Notes

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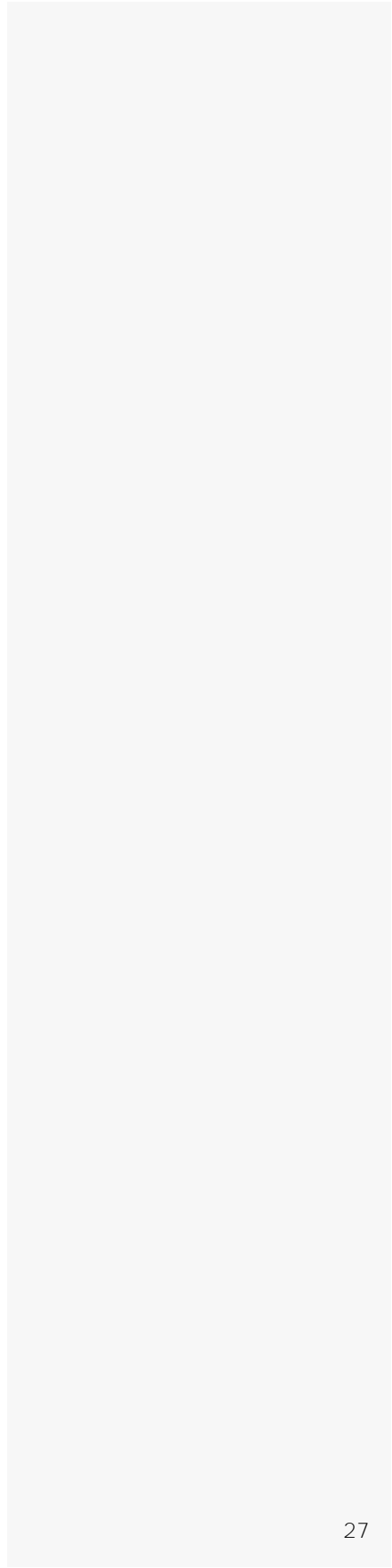


Lined writing area consisting of 30 horizontal lines.

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# Notes

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Lined writing area consisting of 26 horizontal lines.

