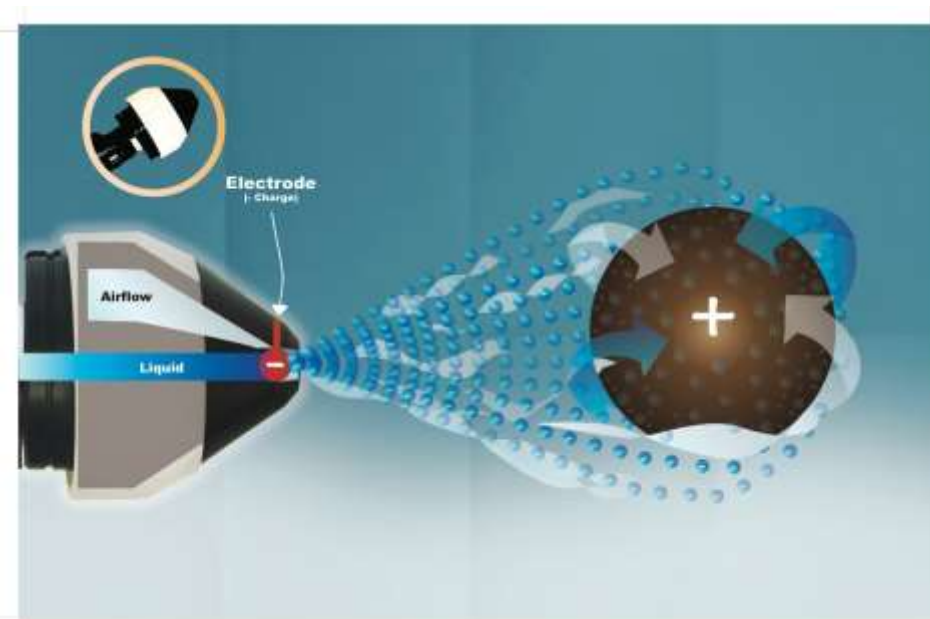


SC-ET HD Operator Training



What is Electrostatic Spraying?



Step 1: Separate liquid and air lines meet at the Maxcharge™ nozzle tip. The low pressure but high volume airflow quickly atomizes the liquid into uniform droplets. The small droplets then pass through an electromagnetic field. It is here that each droplet picks up a strong negative charge.

Step 2: The turbulent, high volume air stream carries the maximally charged droplets quickly towards the spray target. Because each droplet has the same strong, negative charge they spread out evenly to form a uniform spray cloud upon exiting the Maxcharge™ nozzle tip.

Step 3: Just like the pull of a magnet to a piece of metal the droplets become more strongly attracted to the target as they approach it. In fact, the force of attraction is up to 75x that of gravity allowing for complete coverage of hidden surfaces and inside crevices.

Safety Guidelines:

SAFETY FIRST-

- Use a GFCI (Ground Fault Circuit Interrupter) power outlet whenever possible.
- If an extension cord is necessary, use a three-wire extension cord with a 3-prong grounding type plug.
- Turn off sprayer before unplugging.
- Unplug sprayer when not in use.
- Always unplug by grasping the plug. Do not unplug by pulling on the cord.
- Never pull plug with wet hands.
- Do not pull or carry the sprayer by its power cord. Do not crimp the cord or cause it to be damaged by straining it around sharp edges. Keep power cord away from heat sources.
- Do not use the SC-ET sprayer with a damaged power cord.
- The compressor becomes hot to the touch during normal use. Do not touch the SC-ET compressor after it has been running.
- Stay clear of the hot compressor when making adjustments inside the SC-ET case or replacing the tank.
- The sprayer's compressor is equipped with a thermal overload switch. If it overheats, the compressor will stop running. Unplug the sprayer and let it stand for one hour with the door open. The unit should then be able to restart.
- Use protective clothing, eye protection and gloves when mixing chemicals to be sprayed with the SC-ET sprayer.
- Always use a respirator and eye protection when spraying with the SC-ET.
- Follow the chemical manufacturer's recommendations in handling, mixing, applying, storing and disposing of chemicals.
- Be aware of decontamination methods in case a person, clothing, or equipment is accidentally sprayed.
- Be aware of poisoning symptoms and know the appropriate first aid.
- Know the length of time needed to pass before allowing people and pets to go back into the sprayed area.

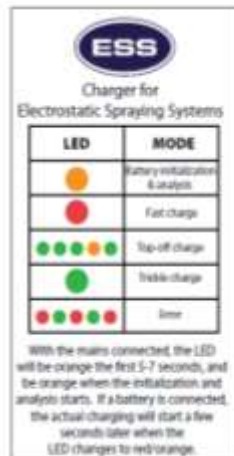
Safety Continued-

For operator safety, the power supply for the MaxCharge™ spraygun is entirely separate from the power supply for the sprayer's compressor. The spraygun is powered by 9-volt batteries in the handle of the SC-ET sprayer. This low-voltage charge is not enough to harm people. Some people report feeling a “tingle” or a slight stinging sensation when the spray from the spraygun falls on their bare skin.

Please notice all safety labels that are placed on the SC-ET HD.



Found on the compressor



Found on the Spraygun



If you use a pacemaker, use our electrostatic sprayer at your own risk.



This label is placed on top of the SC-ET Sprayer, near the quick connect sockets.

There will be a small shock when using our sprayers. To avoid this shock, place your thumb on the bolt at the top of the spraygun.

The SC-ET HD (Right View)



(Front View)

Extended Pull Handle

Tank Fill Cap

Carry Handle

1¼ Gallon Tank

Battery Cover

Heat Exchanger

Liquid and Air Connections

Carry Handle

Air Intake Filter

Hose

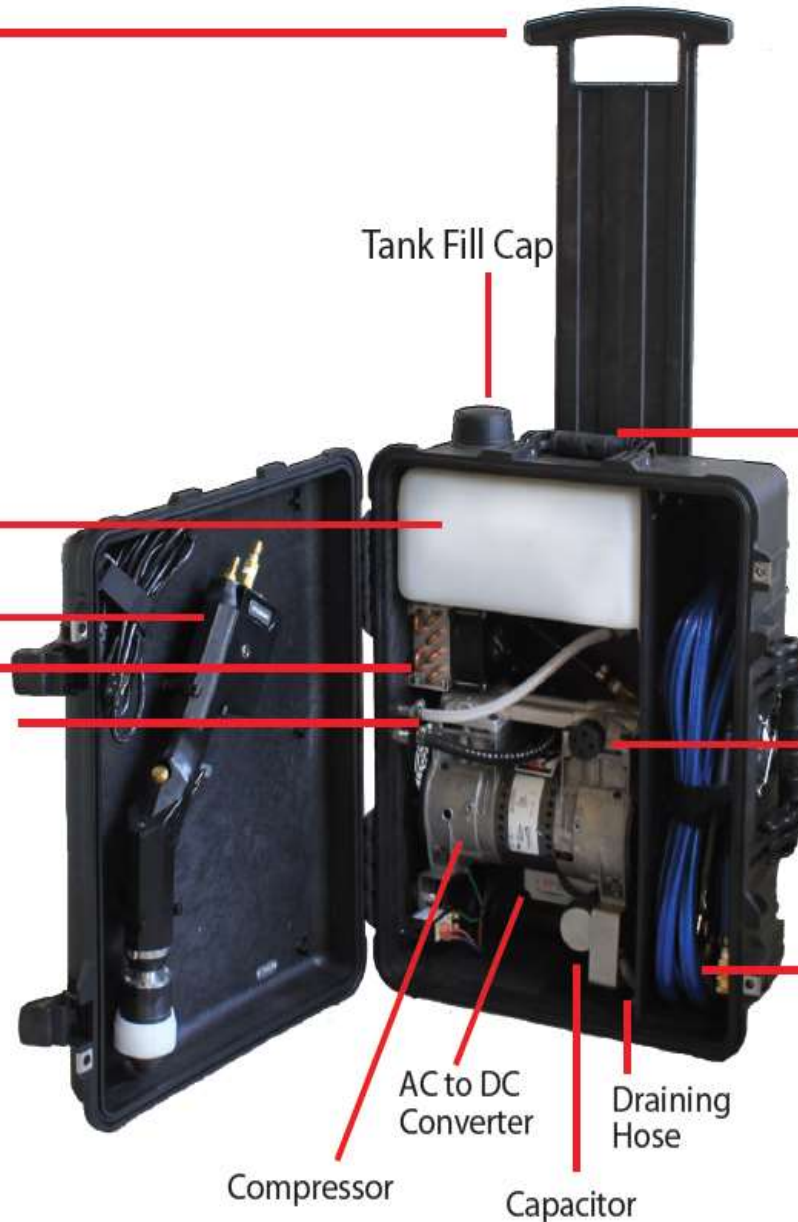
6 ft. or 15 ft.
(1.8 m. or 4.6m.)

AC to DC
Converter

Draining
Hose

Compressor

Capacitor



(Left View)

Extended
Pull Handle

Tank Fill Cap

Carry Handle

Liquid Connection
Air Connection

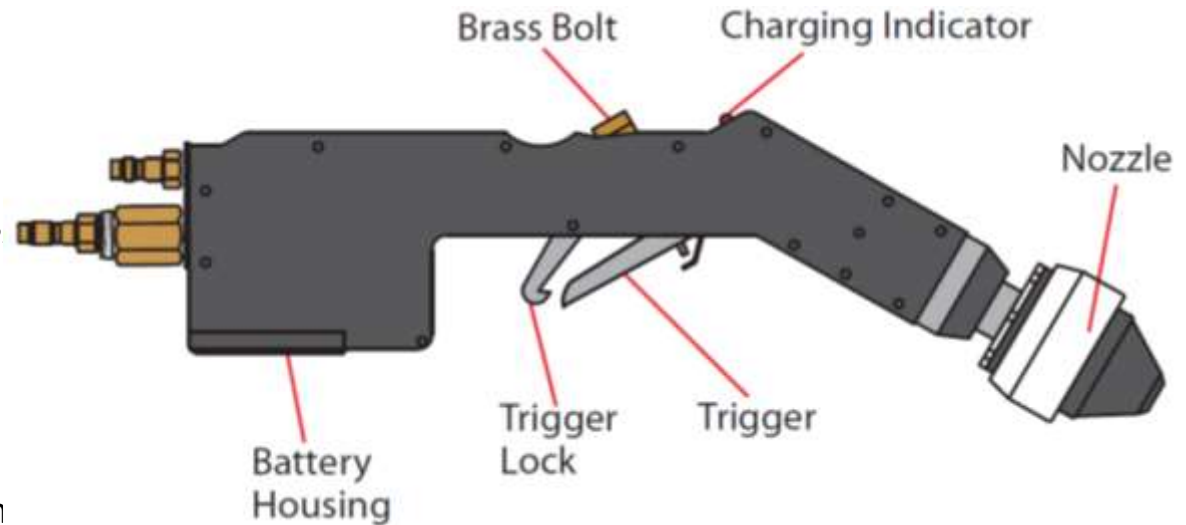
On/Off Switch



Getting to know your sprayer-

Spraygun-

- The spraygun is held by the operator during spraying. Activation of the trigger causes liquid to spray. The spraygun has the following user-serviceable parts: the liquid filter assembly, the nozzle assembly, and the batteries. Except for the batteries which are accessed by removing the battery cover, nothing inside the spraygun shell is user-serviceable.
- **Do not open the spraygun shell;** doing so will void the warranty on the spraygun.
- When the spraygun is not in use but the compressor is on, there will be a constant slight stream of air that is coming from the nozzle. This is a normal function with all of our sprayers.



Trigger-

The trigger turns the spray on and off. It can be continuously held for operation or it can be locked in place.

To engage/disengage the trigger:

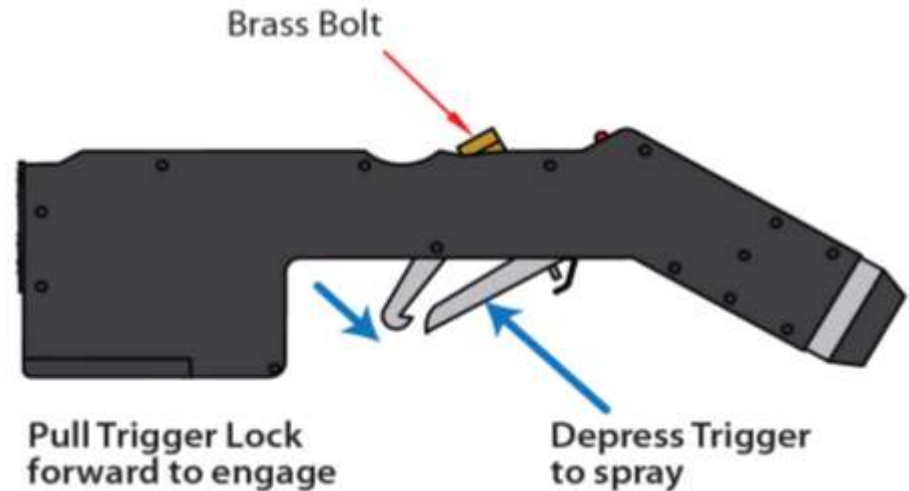
1. Depress the trigger up towards the body of the spraygun to start spraying.
2. To keep spraying, either keep holding the trigger or lock it in place by pulling up the lock and hooking the trigger.
3. To stop spraying when the trigger is not locked, let go of the trigger.

To clean the trigger:

Unthread the brass bolt on the top of the spraygun with a 5/8" socket wrench. Be careful not to lose the spring, plunger, copper washer, and small brass bushing inside the trigger. **Note how they fit inside so they may be replaced properly.**

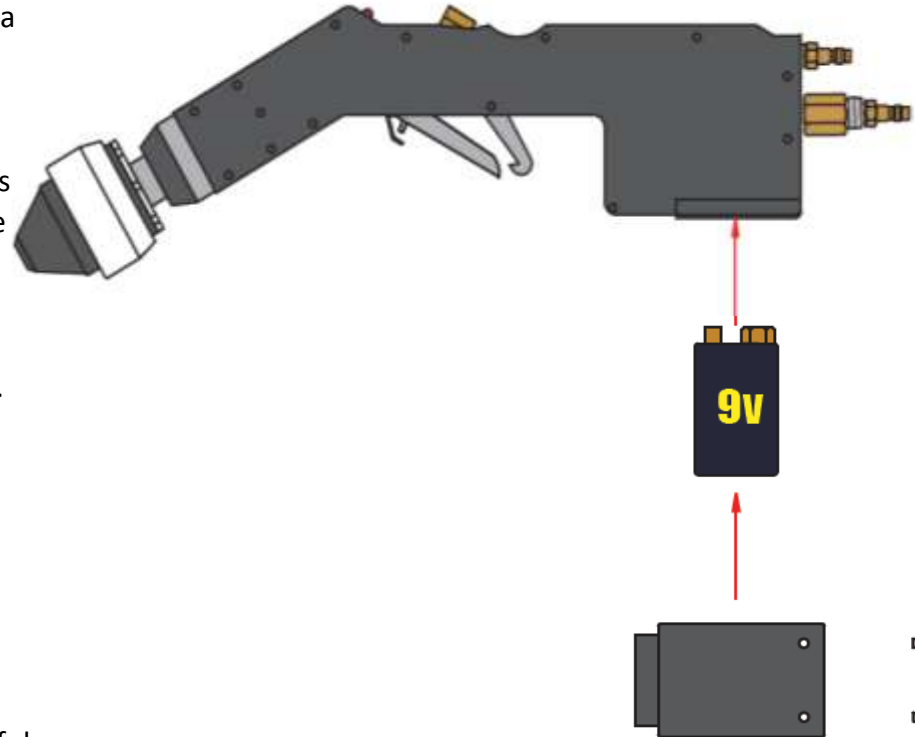
Check inside the trigger for blockage. Clean out any debris with compressed air or warm, soapy water.

Replace the spring and plunger; rethread the brass bolt into the top of the spraygun



Batteries-

The nozzle charging operates on two 9-volt rechargeable batteries which are located in the base of the spraygun. In average conditions, the batteries will last 10 to 15 hours of operation on a charge. They should be recharged when the charging indicator on top of the spragun shell doesn't glow when air is going through the spraygun. After approximately 800 to 1000 hours of service the battery pack will no longer be able to hold an adequate charge and will need to be replaced. Replace with Nickel-Hydride rechargeable batteries. Order the SC-1 Replacement Battery Pack from ESS, S/N # 4512.



To change the batteries:

1. Unscrew the two 6-32 x 1/2" Phillips head machine screws which hold the battery cover in place.
2. While holding the leads in one hand, gently disconnect the batteries from the leads. Be careful not to tear the leads off the wires or tear the lead wires out of the power supply.
3. Connect the fresh battery pack to the leads.
4. Replace the battery cover. Screw the two 6-32 x 1/2" Phillips head machine screws back in to secure the battery cover.
5. Charge the spraygun before attempting to use it.

Remember to charge the spraygun batteries after every work session!

Quick Connects-

Air connection

The quick connect for the air connection is on the outer left side of the SC-ET case, when the front of the case is facing you. The other end of the twin line hose connects to the air leader of the spraygun. The air leader of the spraygun is below the liquid leader and is easily recognizable because its connector is larger than the liquid connector – it is not possible to connect the air hose to the liquid leader. The air line hose is blue.

Liquid connection

The quick connect for the tank connection (liquid line) is also on the outer left side of SC-ET case. It is smaller and is above the air quick connect socket. The other end of the twin line hose connects to the air leader of the spraygun. The liquid line is blue.

Adapter

Each adapter will have a number imprinted on it. This number indicates the size of the flow disk. The standard flow disk size used at ESS is .30 and your unit is equipped with a number .30 flow disk. If a higher or lower flow rate disk is preferred, please contact an ESS employee.

There are four sets of quick connects (plug and socket) on the sprayer:

- Compressor (air) outlet
- Tank (liquid) outlet
- Spraygun air inlet
- Spraygun liquid inlet

In all cases, the plug is on the outlet side of the connection

To disconnect the quick connects at the spraygun leaders:

1. Slide the sleeve on the quick connect socket up
2. While holding the sleeve up, pull the socket off the quick connect plug

To connect the quick connects at the spraygun leaders:

1. Slide the sleeve of the quick connect socket up
2. While holding the sleeve up, push the socket onto the quick connect plug
3. Release the sleeve
4. Pull on the socket body to ensure that it is properly seated and cannot be pulled off the plug when the sleeve is down



Hose-

To maintain optimal use of your sprayers hose, please remember the following

- Do not kink or cut the hose.
- Inspect the hose regularly for cuts, ruptures, tears or breaks.
- Do not pull the case around with the hose.
- Use the handles to move the case from one place to another.

Should you notice anything wrong with your hose, please contact ESS to have this hose replaced.

Tank Cap-

The location of the tank's cap is on the top of the SC-ET. The tank should be thoroughly cleaned immediately after each use.



Draining the Tank-

The SC-ET tank needs to be drained of all liquids after each use.

Close-up of the tank valve:



Always make sure the tank valve is closed when the SC-ET is in use.

Tank valve closed:



Tank valve open:



To drain the tank after each use, push the tank valve into the open position and lock in place. This will expose the valve holes, and allow all remaining tank water to drain out.

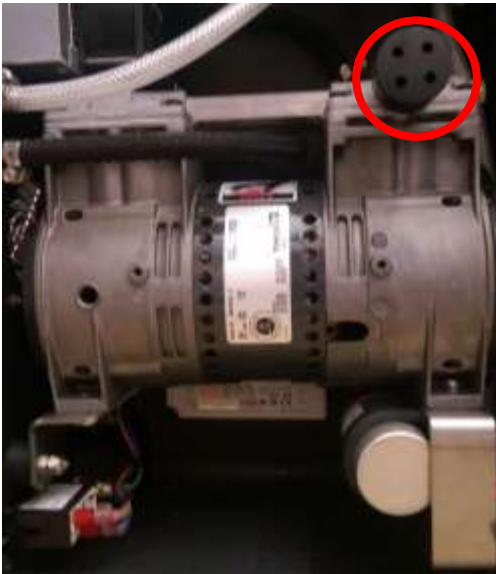
Heat Exchanger-

The SC-ET Heavy Duty utilizes a Heat Exchanger to lower the compressed air temperature. It is vital that the heat exchanger remains clean to ensure proper air flow.

The fan on the heat exchanger pulls air in through the top vent on the outside of the suitcase. Check for dust and dried chemical buildup on the heat exchanger fins behind the vent guard. It may be necessary to clean off blockages with a compressed air source or aerosol duster, blowing from the inside of the case outward. (The compressor has a thermal overload switch that will shut down the compressor if it overheats. If it shuts down, let the sprayer cool down for one hour with the door open)

Cleaning the air filter-

To clean the air filter, pull off the filter cap on the compressor. Inside, remove foam filter, and wash in warm, soapy water.



**Caution:
Compressor
becomes hot during
normal operation
DO NOT TOUCH!!**

How to spray with your SC-ET HD -

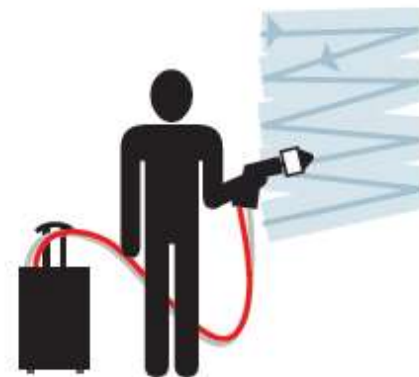
Spray Technique

As in spray painting, the goal is to achieve even coverage over the surface. The ESS MaxCharge™ spraygun is designed to help you do just that - by propelling the chemical spray with a gentle air flow, you can stay well away from the target surface and let the electrostatic attraction do the rest of the work.

Please note: the spray droplets are very, very fine - about 40 microns each. If you are used to working with a conventional sprayer, you may make the mistake of thinking the target is not wet enough because you do not see large beads of liquid. In fact, after a pass with the SCET's MaxCharge spraygun, the surface of the target should just barely glisten with moisture. The fine droplets will evaporate quickly.

Note: When using unfamiliar equipment or chemicals, always test on a small area before treating the entire surface. Do not use a chemical with the ESS sprayer if the label prohibits use in low-volume sprayers

- Before each job, ensure that your sprayer is in good working order
- The optimal spraying distance is at least 18 inches away from the target surface, however 36 to 48 inches may provide a more even coating. This gives the fine mist produced by the MaxCharge™ nozzle room to develop into a chaotic cloud that will be attracted to the target surface.
- Hold the spraygun at right angles to the target surface. Starting at the highest point and using zig-zag horizontal strokes about 1 meter (3 ft.) wide, spray down to the lowest point. Try to have each stroke overlap the previous stroke by about 50%.
- You can use vertical strokes if it suits the area better. Just make sure to work in a methodical pattern and let your strokes overlap.
- When moving to the next section, allow it to overlap the previous section by a few inches. Do not leave a gap.
- The target surface should just barely glisten with the spray. Do not over-saturate the surface; if you see runs or puddles it means you are wasting chemicals. Do check to make sure the newly-sprayed surface is very slightly damp.
- Be careful to keep the spraygun barrel as level as possible. If you allow the nozzle to point down too much, it may drip occasionally.
- Unlike spray painting, you don't have to stop the spray on every return stroke. Just engage the trigger lock and concentrate on the regular pattern of spraying.
- Periodically check to make sure the red light is illuminated on the spraygun.



Siphoning-

The SC-ET sprayer's design relies on siphoning of the liquid from the tank. If your spraygun is held above your head, the liquid will not spray properly. To get the best performance from your sprayer, hold the spraygun no higher than your shoulder.

Preparing a Tank Mix

The tank mix depends on two factors: water requirement and dosage. Water requirement is the amount of water needed to cover the given treatment area. Dosage is the amount of chemical which should be applied in a given treatment area.

First determine the water requirement for your sprayer over a known area. An easy way to determine water requirement is to spray a trial application with water. Put a gallon of clean water in the ESS SC-ET tank and thoroughly spray a known area. After spraying the known area, determine how much water was used from the amount left in the tank. This is the water requirement for the given area. Next measure the known area to determine how many square feet were sprayed. Write down both values for future reference.

_____ (gallons) Water Requirement
for _____ (size of known area in ft²)

Next determine the dosage. This is the amount of chemical you wish to dispense in a given area. Appropriate dosage depends upon chemical label recommendations, disinfection or sanitization goals, level of pest or disease infestation, past experience with particular chemicals, and other variables.

Because electrostatic spraying is a much more effective spraying method, ESS recommends that you experiment to find the optimum chemical concentration. Start spraying using the same chemical rate used in the past with other sprayers. Test to ensure that infective agent levels have been reduced to desired levels. At the next application, start reducing the amount of chemical used for each spray. Keeping the amount of water in the tank constant, cut the amount of chemical mixed in by 15 to 25% for each spray, testing after each experiment to see if the desired results are being accomplished. If you are planning to cut rates then it is very important to conduct these experiments to determine the optimum chemical concentration.

A note about operating temperatures

The MaxCharge nozzle should always be operated at temperatures above 10° Celsius (50° Fahrenheit). When the ambient temperature is colder than this, the evaporative cooling caused as the spray is atomized will freeze the nozzle opening. Nozzle freeze-up can also occur when the liquid to be sprayed is colder than 10° C (50° F).

Pre-Spray Check

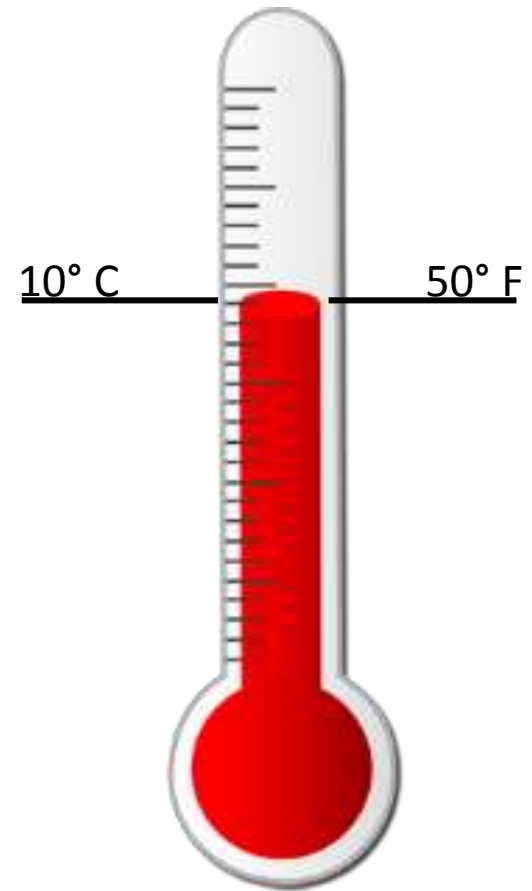
1. Inspect Nozzles - Check nozzle cover to make sure it is on hand tight (do not over tighten or use a wrench). Make sure the hood is seated firmly to the nozzle base and against the external o-ring.
2. Preparing the Tank Mix - If you will be spraying wettable powders it is a good idea to use a compatibility agent with the water and tank mix. Compatibility agents are chemicals mixed with the water that make mixing easier and keep heavy concentrations uniformly in suspension. Some brand name additives are COMPLIMENT™, UNITE®, and BALANCE™. Check with your local chemical supplier for others that are available.

A note about operating temperatures:

The MaxCharge™ nozzle should always be operated at temperatures above 10° Celsius (50° Fahrenheit). When the ambient temperature is colder than this, the evaporative cooling caused as the spray is atomized will freeze the nozzle opening. Nozzle freeze-up can also occur when the liquid to be sprayed is colder than 10° C (50° F).

IMPORTANT:

Water temperature must be at least 10° C (50° F). When the liquid and air meet in the nozzle, the temperature of the liquid decreases. As a result, water at temperatures below 10° C (50° F) may freeze and clog the nozzle.



Cleaning and Maintaining your SC-ET HD -

1. Clean the exterior of the sprayer with a damp cloth.
2. Clean the tank.
3. Disconnect the twin line hose from the spraygun air line and liquid line leaders.
4. Disassemble and clean the liquid filter. Be careful not to lose the flow disk.
5. Unthread the quick connect plug from the spraygun liquid line leader. Use a 7/16" wrench on the plug and an 11/16" wrench on the 1/8" NPT body.
6. Connect the quick connect plug to the grey hose of the twin line hose.
7. Fill the tank with 1/2 to 3/4 gallon (1 to 2 liters) of clean water.
8. Turn on the air compressor to flush the line with most of the of water. Turn off the air compressor.
9. Disconnect the quick connect plug from the twin line hose, then connect it into the spraygun liquid line leader.
10. Reassemble the liquid filter.
11. Turn on the air compressor and engage the trigger to flush the spraygun lines with the remaining water. Check the nozzle for a good spray pattern while flushing. Allow air to flow for 30 seconds after the water has been sprayed.
12. Apply silicone spray or similar lubricating oil to all quick connect fittings.

To clean the nozzle assembly-

1. Slide the hood over the nozzle cover.

2. Unscrew the cover from the nozzle base and remove the Teflon ring. Clean any debris from around the nozzle tip.

Note: There is a small o-ring in the nozzle around the base of the tip – take care that it doesn't fall off. If it does, clean it and press back into place. Also, take care not to damage the nozzle tip when the cover is removed.

3. Soak the ring, cover, and hood in a mild detergent solution. Use a small brush (soft or mild bristle) to clean the inside of the cover and the hole through it. Also, be sure to clean the hood. It is important to clean inside the hood and the two cavities. Rinse thoroughly.

4. Scrub the nozzle base with the detergent solution using a soft bristle brush. Clean the ceramic outlet. Be sure to thoroughly clean the base cavity and take care not to damage the nozzle tip. Rinse and make sure the small o-ring is in place.

5. Reassemble nozzle by placing the Teflon ring on the base and screwing the cover on **hand tight**. Next, slide the hood over the nozzle and seat it securely against the external o-ring. Wipe clean the exterior of all hoses and fittings connected to the nozzle.

The electrode cover should be hand tight. Never use pliers or other tools to tighten it. The insulating ring should be loose.

Post-Spray Check-

After each spray it is essential that hoses and spraygun be flushed with clean soapy water. This will help prevent chemical build-up that can clog lines and nozzles.

Yearly spraygun services -

Electrostatic Spraying Systems, Inc. offers and recommends yearly services on ESS sprayguns. For a nominal fee plus the cost of replacement parts, ESS will thoroughly clean the spraygun, replace any worn parts and recalibrate the electronics and nozzle. The Yearly Service also extends the spraygun warranty for another year. Consistent yearly service by ESS will increase spraying performance and prolong the life of the gun.

Contact ESS at (706) 769-0025 to schedule spraygun services. Then package the spraygun securely since it can be damaged in shipment. Ship the spraygun in its original packing material if possible. If the original packing is not available, wrap the spraygun in bubble wrap, place it in a strong cardboard box and surround the gun handle with foam packing. Include a return shipping address and a telephone number. A form is provided for you at the back of this manual.

Ship the spraygun via UPS or Parcel Post to:

Electrostatic Spraying Systems, Inc.
62 Morrison Street
Watkinsville, GA 30677

Yearly service will be conducted within one day of receipt by ESS. If any parts need to be replaced, the owner will be contacted for authorization before replacement. The spraygun will be returned via UPS, COD, or return shipping costs may be invoiced, contingent upon credit approval. ESS also accepts Visa and MasterCard.