PAINTCON '93

FINISH WORLD CLASS!

LIQUID COATINGS

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WATERBOURNE SPRAY-SYSTEM ELECTROSTATIC CHARGING TIPS

PRESENTED BY

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"Finish World-Class Seminar"
Paintcon '93

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WATERBORNE SPRAY-SYSTEM ELECTROSTATIC CHARGING

Determining how waterborne electrostatic systems differ from solventborne electrostatic systems.

1. Waterbased coatings electrostatically charge very differently than solvent-based materials.

2. Solventborne coatings can store the electrostatic charge in the coating material. When atomized, the material can carry the electrical charge to the part being coated.

3. Because water is such a good conductor of electricity, the electrostatic charge will bleed off to ground rather than through the atomized coating as with solventborne coatings. The result is no electrostatic wrap.

4. With waterborne coatings, the paint will conduct the charge back through the supply hose to the grounded pump supply. This substantially lowers the transfer efficiency of your electrostatic system.

5. When spraying with waterborne coatings electrostatically, the fluid line connecting the paint supply to the spray gun acts as a conductor of electricity, therefore, the fluid system, and everything connected to it, needs to be isolated from ground so the coating will conduct electricity like solvent-based materials.

6. With waterborne coatings, you must insure that the path of least resistance for the electrical charge is through the atomized coating and not the fluid line.
What methods are available for isolating a waterborne electrostatic system: safety, reliability and required maintenance.

**Direct Charging Systems . . .**

1. Direct charging is the best method of charging the paint. Pumps, fluid lines, spray guns and everything connected to these components will be charged.

2. Safety equipment including caging, grounding devices or safety interlocks are necessary to prevent operators from electrical shock. For small, simple (one) gun systems, this can be a relatively reliable system.

3. The larger the system, the larger the capacitance to store electrical energy.

4. To avoid voltage leaks that cause decreased transfer efficiency, the system must be kept free of overspray, dirt, moisture and paint leaks.

5. The larger the system, the more difficult it is to find voltage leaks.

6. The larger the system the greater the investment to isolate each wetted part.
External Charging Systems . . .

1. An external charging device, such as a probe, needle, pin or ring is used to charge the atomized paint particles.

2. Because there is appropriate air mix with the paint during atomization (that creates an air gap) there is enough electrostatic resistance so that the electrical charge cannot bleed back through the fluid system.

3. The fluid supply system can remain grounded because only the atomized particles are charged. Atmospheric conditions can create inconsistent electrostatic wrap, e.g., a humid day will create a more conductive environment than a dry day.

4. Regular maintenance is necessary to keep the charging probes free of excess paint build-up that causes decreased transfer efficiency and can sling paint onto parts causing rejects.

Voltage Blocking Methods . . .

1. This method combines the best of the direct charging method and the external charging method by directly charging the fluid and creating an air gap near the spray device.

2. The fluid supply equipment remains grounded and eliminates the need to isolate the entire system and the need for caging.

3. The Voltage Block can be placed either at or near the point of atomization.

4. The charged side of the system is limited to the spray device and connection hose while the remaining portion of the system remains grounded.

5. Because the charged part of the system is limited, the system is much safer and system maintenance is minimal. There is less chance for voltage leaks, less storage of electricity and less concern for build-up of paint overspray.
Voltage Blocking Methods (continued)...

6. The use of pneumatic controls for continuous paint supply requires no maintenance.

7. This voltage blocking method can be used for any size system and can be used with electrostatic and non-electrostatic guns using the same fluid supply equipment.

8. Small handgun systems give you the advantage of continuous fluid supply without interruption, thus eliminating the use of small batch pressure pots.

9. Waterborne systems generally require stainless steel fluid supply lines, pumps, filters, etc.

10. Very often, the Voltage Blocking method of isolation will allow you to use existing spray devices, providing they are non-corrosive guns, making the conversion from solvent and water very simple.

11. Voltage Block methods require minimal costs because expensive caging and total isolation is not required.

12. Long term costs of operation are also less with a voltage block due to fewer voltage leaks, higher transfer efficiency and less maintenance.
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