

Electrostatic Applicators and Solutions

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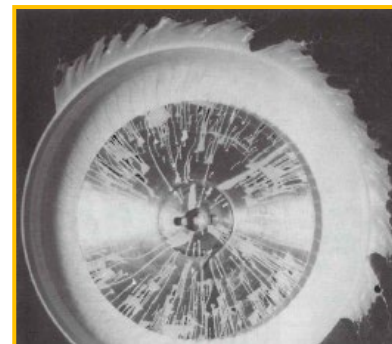
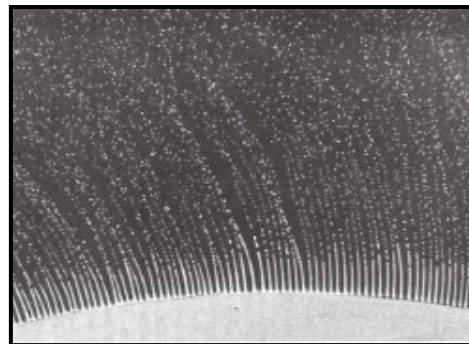
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Focus For Today's Conversation



Get more comfortable promoting rotary applicators!

- Atomization Types and Electrostatics
- Electrostatics = Expensive! Why do customers upgrade?
- Air Spray vs. Rotary Applicators – what matters to the customer
- Waterborne vs. Solventborne Materials with Electrostatics
- Why Customers don't Upgrade
- Tools for Success



Atomization Types



Hydraulic Atomization

Fluid forced through fixed orifice at high pressure
Fluid flow controlled by PSI and orifice size
Pattern size dictated by nozzle

Manual and automatic versions available



Air Assisted Airless

Fluid pressure 300 - 1500 psi
Air used to shape spray pattern

Airless

Fluid Pressure 1000 - 4000 psi



Air Atomization

Air used to impinge on fluid column
Atomization air forms droplets
Fan air shapes spray pattern

Manual and automatic versions available



Conventional Air Spray

Low Volume, High Pressure
Air cap pressure typ. 30 - 60psi

HVLP

High Volume Low Pressure
Air cap pressure less than 10 psi

TransTech / Compliant / LVMP

Low Volume, Medium Pressure
Air cap pressure typ. 20 - 40 psi



Centrifugal Atomization

Centrifugal force used to evenly distribute coating
Coating sheared off of edge of disk platter or bell cup

Automatic versions available

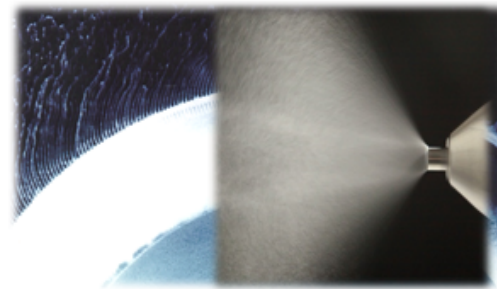


TurboDisk

Applicator mounted on vertical reciprocator
Used for high volume coating

Rotary Atomizer

Stationary, machine or robot mounted
Quick color change capability, highly adaptable



Electrostatics

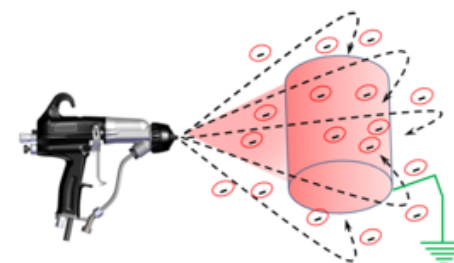
Electrostatic charge is used to drastically increase transfer efficiency. More of the coating sprayed goes on the part.

Negative electrostatic charge is applied to the coating material as it is being atomized. Product is at ground potential creating attraction.

Manual and automatic versions available

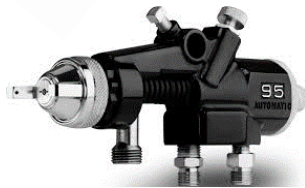
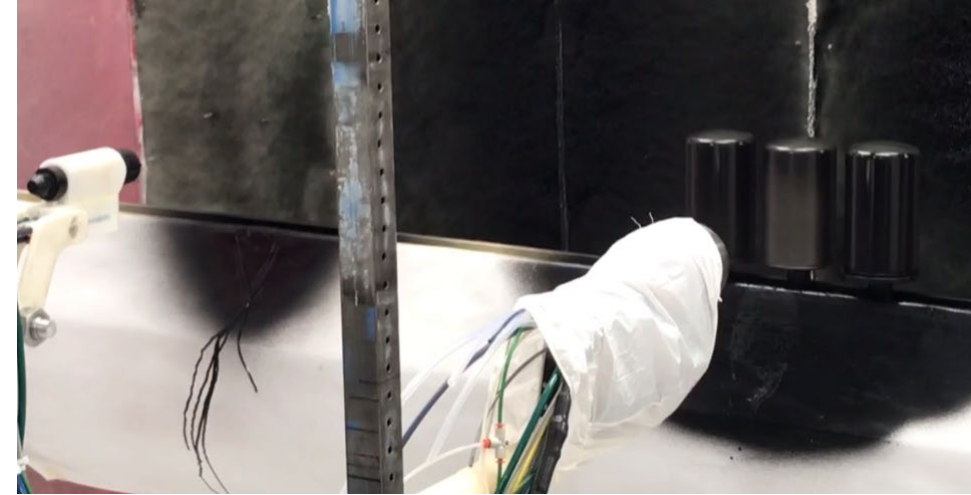
Can be applied to all atomization technology

Atomization Technology	% Transfer Efficiency							
	25	35	45	55	65	75	85	95
Conv.								
HVLP								
LVMP								
Airless								
AA Airless								
Conv. E-stat								
Rotary E-stat								
Turbodisk E-stat								



Why Do Customers Upgrade?

- Spraying Oil Filters
- Using two 95A guns
- Spraying 12 Gallons Per Day @ \$80 per Gallon
- Why would someone spend so much money?



\$3K - \$5K



\$7K-\$10k



\$10K-\$20K



\$25K-\$50K

Why Do Customers Upgrade?



\$3K - \$5K



\$7K-\$10k



\$10K-\$20K



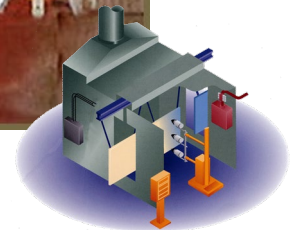
\$25K-\$50K

	95A Guns	Ransflex Auto	Evolver SE	Aerobell 168
Cost of Product	\$3,000	\$7,500	\$11,500	\$25,500
Yearly Maintenance Expenses	\$1,500	\$3,750	\$5,750	\$12,750
Yearly Material Usage	3750	3187.5	2625	2062.5
Yearly Material Spend	\$318,750	\$270,938	\$223,125	\$175,313
Year 1 Cost	\$323,250	\$282,188	\$240,375	\$213,563
Material Reduction	Baseline	15%	30%	45%
Year 1 Savings	Baseline	\$41,063	\$82,875	\$109,688

Why Else Do Customers Upgrade?

Toy manufacturer

- Switched to “bells” (rotary atomizers) mounted on short stroke reciprocator.
 - ✓ Faster color change time
 - ✓ More accommodating for “batch running”
 - ✓ Increased system efficiency



Toy Manufacturer Justification



System justification based on increased production

System Variables

Conveyor Speed (ft/min) =	8.00
Rack Spacing (ft) =	1.33
Parts Per Rack =	104
Seconds / Rack (sec) =	9.98
Racks Per Minute =	6.02
Racks Per Hour =	361
Parts Per Hour =	37,534
Hours Per Day =	20
Parts \ Day @ 100% Yield (no loss to color change) =	750,677

Color Change Variables

	TurboDisk System	AeroBell System
Color Changes Per Day =	100	100
Racks Skipped Per Color Change (Disk System) =	15	4
Color Change Time (sec) =	150	40
Number of Parts Per Day Lost to Color Change =	156,000	41,600
Actual Yield Per Day =	594,677	709,077
Increased Production Per Day =		114,400 19.2%

Why Else Do Customers Upgrade?



Customers System:

- Metal shelving and racking systems
- 2 long stroke reciprocators with 4 AA guns each (8 total applicators)
- Flow rate 500 ml/min each (4000 ml/min)

Primary concerns:

- Coverage
- Material usage

Finishing Brands Solution:

- Use applications lab facility to develop new process
- 3 Aerobell 168 mounted on short stroke reciprocator (2 stations)

Primary concerns addressed:

- Coverage – Aerobell 168 provide better coverage than current system
- Material usage – 375 ml/min (2250 ml/min total flow rate)
- Reduced material usage by 44% (2250/4000)



Summary of Why Customers Upgrade


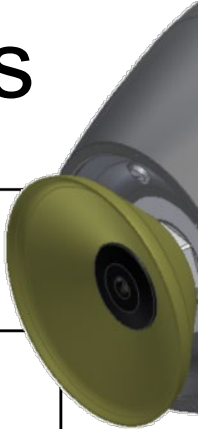


- Quality – 1st Time Yield (% of parts without requiring rework)
 - Is the part being reworked due to paint related issues?
 - Is the customer putting too much or not enough on the part?
 - How do the parts look vs. THEIR competitors?
- Production - % completion vs. % available
 - Only a factor if production is the bottleneck in the paint shop
 - Understand the tipping point between adding and eliminating shifts
 - Ask about how long many hours the conveyor is moving
 - Start up at beginning of day
 - Stop at end of shift
 - Unscheduled stops during production
- Savings – Focus on Paint Costs
 - You pay somebody to buy it
 - You pay somebody to apply it
 - You pay somebody to clean it up
 - You pay somebody to dispose of it

Rotary Vs. Air Atomization Technology



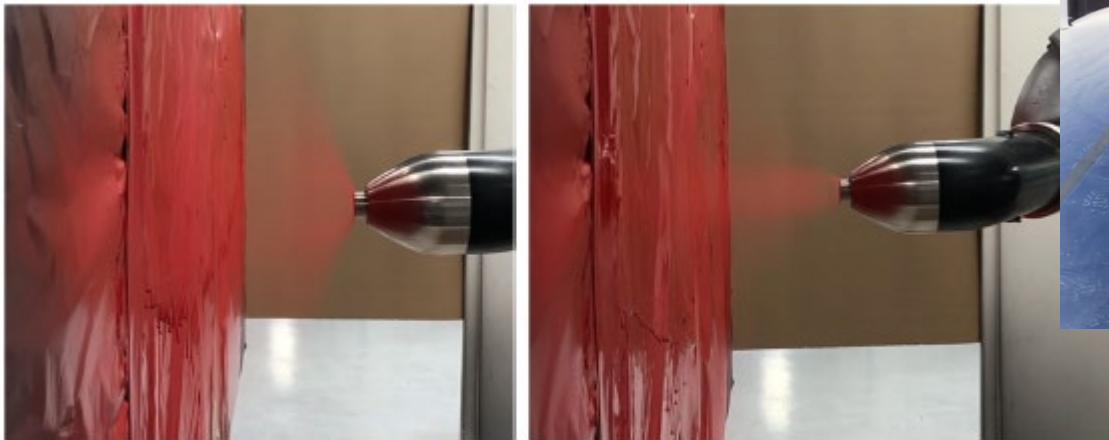
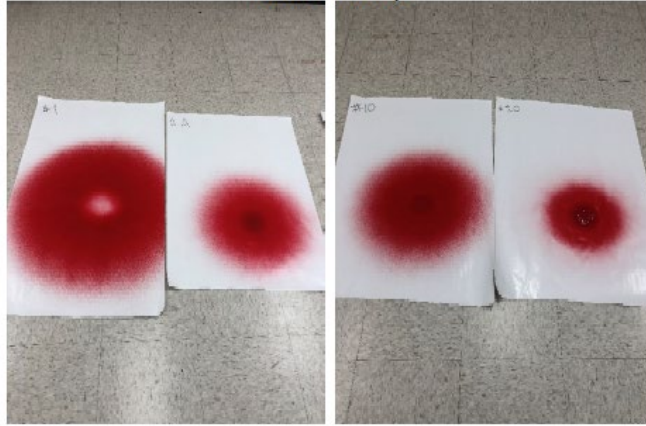
Q – Quality P – Production \$ - Savings

	Air Atomization	\$	Rotary Atomization	
	Transfer efficiency (35 – 65%) with electrostatics.	\$	Transfer efficiency (60 – 85%) with electrostatics, reduces material usage.	
	Transfer efficiency (15 – 40%) without electrostatics.	\$	Transfer efficiency (35 – 65%) without electrostatics, reduces material usage.	
	Elliptical spray pattern often presents problems with uniformity causing mottled appearance.	Q	Round spray pattern with excellent uniformity produces more uniform finish quality.	
	Wide range of atomized particle size distribution in spray pattern causing irregular surface / film.	Q	Very narrow atomized particle size distribution resulting in better finish and film build uniformity.	
	Elliptical spray pattern must be re-orientated normal to the surface being coated.	P	Round spray pattern is easily manipulated by robot resulting in programming efficiency of 10 - 15%.	
	Defects can be created if applicator is “triggered on” the surface (spitting).	Q	Atomizer is always rotating so applicator can be “triggered on” the surface.	

Round Spray Pattern Advantages

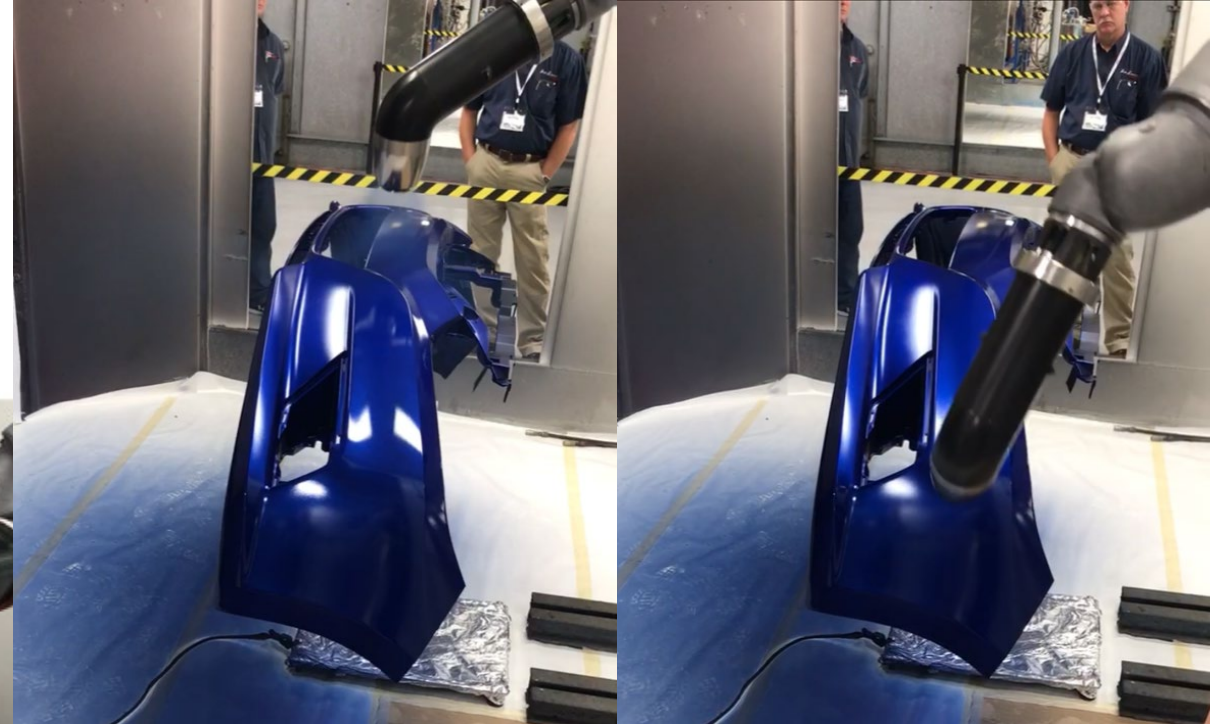


Pattern Uniformity



Typical Large Pattern Shape (300cc)

Typical Small Pattern Shape (300cc)



Electrostatics – Waterborne Coatings



- The main difference between the application of water and solvent borne coatings is the configuration of the fluid delivery system
- Because of the low resistivity of water based coatings, voltage applied at the applicator will travel through the fluid column to the fluid supply source and bleed off to ground effectively shorting out the high voltage circuit of an electrostatic applicator

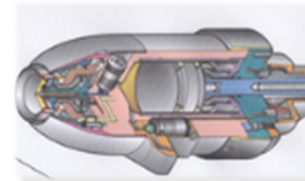
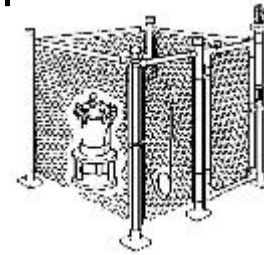


Electrostatics – Waterborne Coatings



The following methods can be used to apply water borne coatings electrostatically:

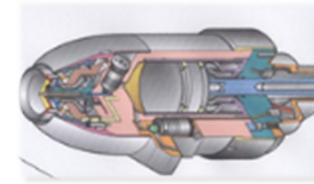
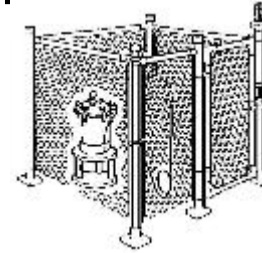
1. Isolated fluid supply
2. Direct Charge Applicator
3. In-direct charge applicator
4. Voltage Block System



Electrostatics – Waterborne Coatings

The following methods can be used to apply water borne coatings electrostatically:

1. Isolated fluid supply
2. Direct Charge Applicator



- *These two methods can all be grouped as batch dispensing methods.*
- *Once the batch is dispensed, it must be refilled.*

Electrostatics – Waterborne Coatings



The following methods can be used to apply water borne coatings electrostatically:

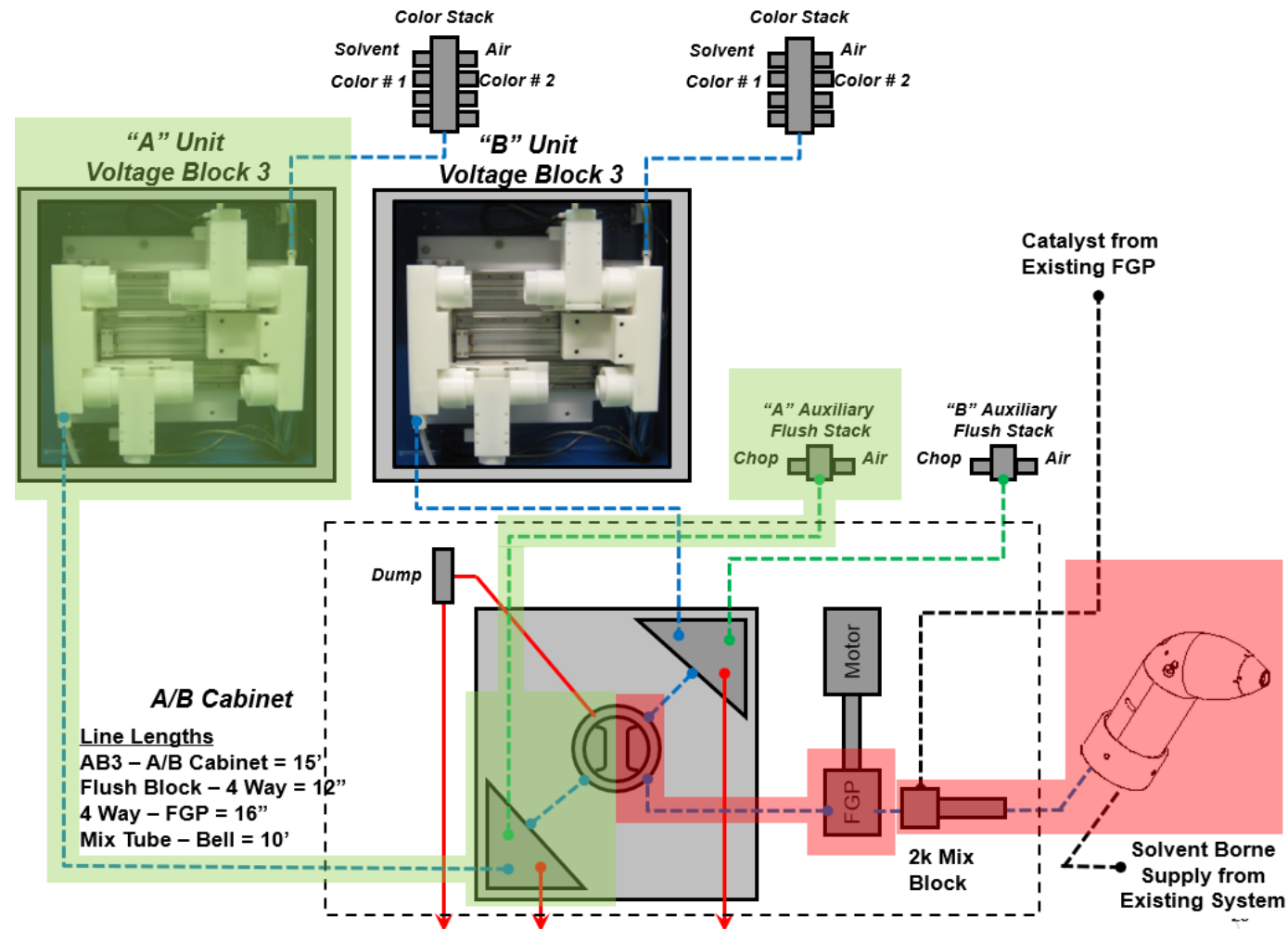
3. In-direct charge applicator

4. Voltage Block System

- *These two methods can be grouped as continuous dispensing methods.*
- *Fluid supply is from traditional paint circulation system and color stack assembly.*



Electrostatics – Waterborne Coatings



Why Customers Don't Upgrade









- Value has not been quantified
- Customer does not have the budget
- Competing with other priorities outside of Paint Shop
- Value has not been proven – must show it!
- Safety, safety, safety
 - People using the equipment
 - People approving the equipment
 - People overseeing safety

Tools For Success

- Understand your customer's process
- Quantify the opportunity to change
- Customer must be excited and ready to implement change
- Leverage experts for product conversations
- Lab testing sells jobs
- Works for all opportunities, not just rotary applicators



	Non-Manifold	Manifold	Robot Mount
Electrostatic Airspray			
Electrostatic Rotary			

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