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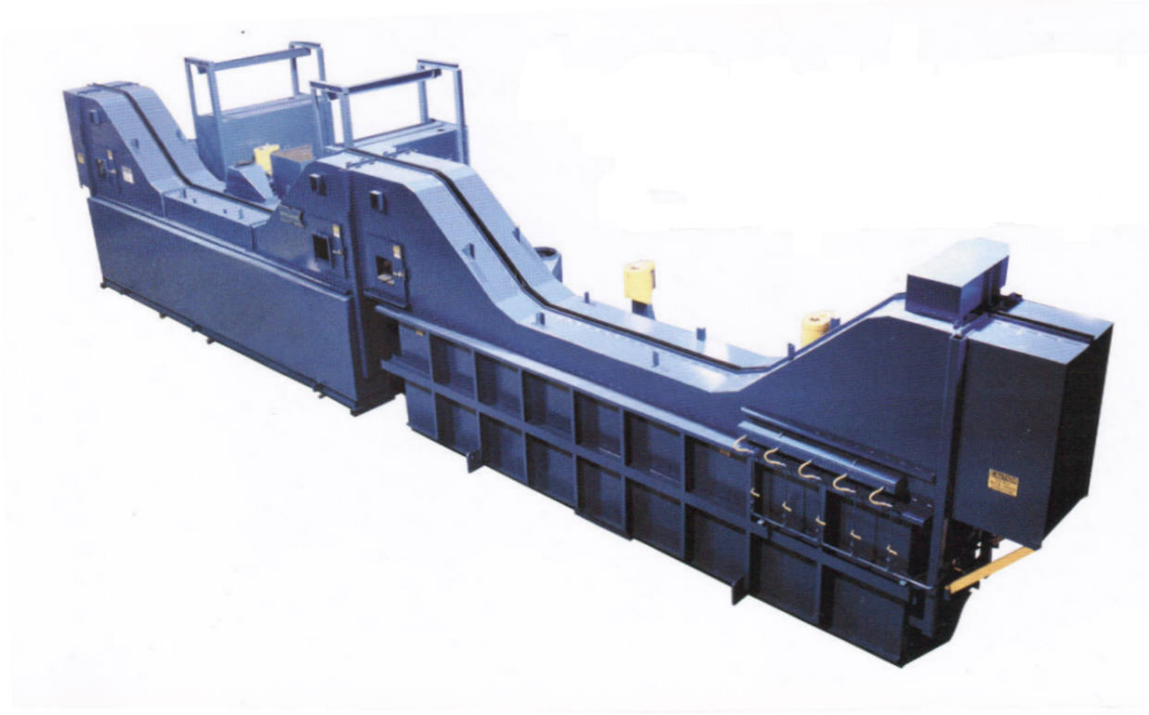
EXTREME CLEANING TECHNOLOGIES®

Continuous Operation, Kontinuous™ Benefits



Powder Coating Transfer Efficiency Tests

On September 5, 2007, independent tests were performed to measure the effects of variable part grounding on transfer efficiency, film build control and finish quality. The testing was carried out at the demonstration labs of a premier spray gun manufacturer.

A series of parts were hung on a conveyor and moved through the powder booth in front of one stationary powder gun. Three different types of parts were run with three different levels of resistance to earth ground. Parts and powder were weighed before and after each application.

It should be noted that the potential transfer efficiency (TE) of the application equipment is much higher than the test results. The test TE is lower because of low part density. The lack of good part density reduces average TE by 30 to 35%. One set of panels was run to establish the potential TE with good density and the potential TE exceeded 65%.

Parts

10” Square Panel
Wire Shelf, Approximately 8” x 10”
10” long, ½” Diameter Tubing, Four (4) Pieces Per Rack

Spray Setup

One (1) Corona Charging Spray Gun in Fixed Position
Output: Approximately 4.5 grams/second
Voltage: 100kV Potential
Gun-to-target Distance: 12”
Line Speed: 8 FPM

Test Data & Results

Resistance <1.0 Meg ohm							
Part	**Grams Sprayed**	**Grams on Part**	**Transfer Efficiency**	**Film Thickness**		**Standard Deviation**	**First Pass Quality**
				Min	**Max**		
Flat Panel	28.1	7.8	28%	1.7 mils	2.3 mils	0.32	Excellent
Wire Shelf	27.0	8.9	33%	1.9 mils	2.0 mils	0.20	Excellent
Tubes	30.4	8.8	29%	1.8 mils	2.4 mils	0.35	Excellent
Average			30%				

Resistance >1.0 Meg ohm (1 mils powder build)							
Part	**Grams Sprayed**	**Grams on Part**	**Transfer Efficiency**	**Film Thickness**		**Standard Deviation**	**First Pass Quality**
				Min	**Max**		
Flat Panel	35.1	9.2	26%	1.7 mils	3.9 mils	0.97	Very Good
Wire Shelf	28.0	7.9	28%	1.8 mils	3.8 mils	0.95	Good
Tubes	38.0	10.2	27%	2.1 mils	4.0 mils	0.99	Poor
Average			27%				

Resistance Infinite (no ground)							
Part	**Grams Sprayed**	**Grams/ Part**	**Transfer Efficiency**	**Film Thickness**		**Standard Deviation**	**First Pass Quality**
				Min	**Max**		
Flat Panel	36.3	9.7	26%	1.8 mils	4.7 mils	1.1	Poor
Wire Shelf	35.6	7.9	27%	1.7 mils	4.5 mils	1.2	Fair
Tubes	37.9	8.1	21%	1.7 mils	4.9 mils	1.5	Poor
Average			25%				

Conclusions

- Transfer efficiency declines by an average of 5% when no ground is present.
- Film build uniformity is much worse when the ground is poor.
- Faraday cage penetration is much worse when the ground is poor.
- Rejects from light coat and orange peel are two to three times more likely with poor ground.
- Poor ground results in higher overall film build and more over-spray, increasing the cost of material by approximately 7%.
- The average revenue losses associated with poor ground are estimated to be around 12% of gross revenue when rejects and material consumption are factored together.