

VORTEX ANODIZING for Pistons

Perfect pistons in less than a minute!

Pioneer Metal Finishing Corporation was founded on anodizing pistons and we continue to be the leader in new piston anodizing methods and technologies. Pioneer's patented VA-100 high-speed, vortex anodizing machines greatly reduce process time and increase quality.

Hardcoat anodizing is used extensively in areas of high wear and corrosion and Pioneer has perfected hardcoat anodizing in the ring grooves and lands of automotive pistons through our High-Speed Vortex anodizing processes. Pioneer's technology minimizes ring groove welding in aluminum pistons with a narrow first land.

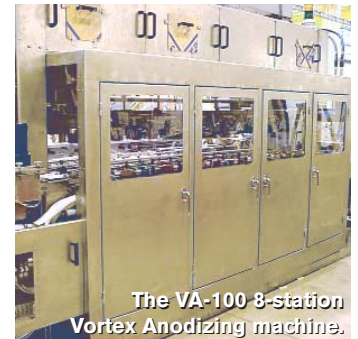


VA-100 Vortex Anodizing Offers:

- ✦ **Anodizing 50-times Faster than Batch**
- ✦ **Ideal for Just-in-time Production**
- ✦ **Very Compact Footprint**
- ✦ **Low Labor & Operating Costs**
- ✦ **Each Piston monitored for Quality Control**
- ✦ **Uniform Coating throughout Groove**
- ✦ **No Racking - Quick Change Fixtures**
- ✦ **Low Ra Capabilities**

✦ **Over 50 Million Pistons processed with VA-100 technology**

	2-Station VA-100	8-Station VA-100	Traditional Batch
Productivity	100-150 pistons/hr	300-400 pistons/hr	~100 pistons/hr
Process time for piston	30-50 <i>seconds</i>	30-50 <i>seconds</i>	~ 45 minutes
Staffing	1 person	1-2 person(s)	3-6 persons
Power requirements	480 - 3 phase 100A 110 V - 1 phase 15A (for PC)	480 - 3 phase 200A 110 V - 1 phase 2 x 15A (for conveyers)	Very high power requirements >500A
Footprint	~ 18' x 8' ~ 6m by 2.7m	~ 20' x 30' ~ 6.5m by 10m	~ 50' x 50' ~ 16m by 16m
Hookups	Electrical Water Compressed air Waste treatment optional	Electrical Water Compressed air Waste treatment	Electrical Water Compressed air Waste treatment Chillers; DI water Fume scrubbers
Waste Product	Water with lowered pH Spent electrolyte	Water is neutralized with built in treatment system. Will be able to dump to sewer. Spent electrolyte can be treated onboard	Multiple waste products from cleaners and processes. Large waste treatment system is needed
Time to change fixture	~ 5 minutes	15-20 minutes	Will need separate tooling for each piston. Time to set up tooling is 2-4 hours.



Excellence Award from Ford

In recognition of Pioneer Metal Finishing's valuable contribution in the flawless launch of anodized pistons on all FORD 4.6L 2V and 4V REP applications. By working together, and with only four months to Engine job #1, the team proactively timed, planned, and ppap'd anodized pistons required to resolve piston pound out failures witnessed in DV engines.