

Duratron T4503 PAI

Long Life Spray Nozzles for Automotive Electrostatic Body Paint Systems

TRENDS

To compete in the world market, automotive manufacturers and the companies that supply their manufacturing systems face the challenges of high productivity, high quality and cost competitiveness. When an equipment manufacturer engaged our partner Quadrant to help design a spray nozzle for an electrostatic coating system that could withstand the aggressive environment and increase in-service life, Duratron PAI was the recommended candidate for the precision machined components.

ANSWERS

The wear resistance and electrical properties of Duratron PAI, coupled with its extreme dimensional stability allowed a much simpler nozzle design. The machined part eliminated the costly downtime associated with shorter service life due to wear, and more frequent shut down for cleaning. Also, the cleaning process and agents posed no problem for Duratron PAI, allowing quick change-over between production runs.

CUSTOMER BENEFITS

The newly designed, machined Duratron T4503 PAI nozzle easily handles the aggressive paint systems and cleaners, while providing the mechanical strength needed to spin at speeds above 60,000 rpm. The light weight of Duratron PAI coupled with its strength and stability gave the system's builder a two-fold marketing advantage. The new nozzles needed less cleaning – which equated to a lower maintenance cost and allowed the end customer to increase production uptime, an equally valuable benefit.



Sealing in Liquid Epoxy, Cured

Application Requirements	Duratron PBI Performance Factors
The parts spin at very high rotation (60,000 rpm up to 85,000 rpm).	Duratron T4503 PAI maintains its dimensions and critical tolerances, due to its dimensional stability and creep resistance, even under extreme centrifugal loading conditions.
Paint particles move through the nozzle at a high rate of speed essentially 'sand blasting' the nozzle.	Duratron PAI has excellent wear resistance and its hardness helps deflect the particles resulting in increased service life.
Tighter hole patterns equal less solid material area that could result in reduced stiffness, component deflection and poor connections.	Extreme stiffness at high temperatures means minimal deflection and uniform pin connections during testing.
Nozzles are aggressively cleaned after each use to ensure no remaining paint will interfere with the next production run.	The chemical resistance of Duratron PAI withstands the aggressive cleaning agents with no degradation.

Other material candidate's:

- ❖ Ceramics: Extremely brittle; prone to frequent cracking during handling and installation.
- ❖ 30% Carbon Filled PEEK: lacks hardness and wear resistant compared to Duratron PAI.

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