



CASE STUDY

**CONSISTENCY IN EVERY COAT: HOW A WHEEL MANUFACTURERS
REDUCED FILM DEVIATION AND COSTS WITH TRYSTAR'S RECTIFIERS**

BACKGROUND

The automotive industry relies heavily on high-quality coatings to ensure that metal parts, like wheels, are both aesthetically pleasing and resistant to corrosion. The best way of achieving this is electrocoating (e-coating), a process that uses electrical currents to apply a consistent layer of paint to metal surfaces. While e-coating ensures durability and protection, it comes with a significant challenge: maintaining uniform paint thickness across different part sizes and shapes.

Inconsistent paint thickness can lead to costly product rejections, rework, and increased material waste, all of which hurt production efficiency.

THE CHALLENGE

Due to unavoidable loading patterns with different wheel sizes, and differing e-coating approaches, the variability in paint thickness presented a significant operational issue. Their production line processed wheels of various sizes, and manually adjusting the voltage during the e-coating process became increasingly difficult and imprecise.

The inconsistent paint thickness led to several challenges, including:

- High material waste, as overcoated wheels used excess paint.
- Increased rejection rates, as many parts didn't meet strict quality standards.
- Operational inefficiencies, with labor-intensive rework processes to correct the undercoated or overcoated wheels.
- Unoptimized energy use, due to inefficient manual voltage adjustments.

CLIENT OVERVIEW

- A leading manufacturer & supplier of wheels and wheel-end components to the global commercial vehicle markets.
- 480,000 square foot facility

\$150,000

Annual cost savings in
paint use reduction



These fluctuations in paint thickness not only affected product quality but also limited the manufacturer's overall production output.

SOLUTION & BENEFITS

The manufacturer needed an automated, precise system to consistently control the e-coating process across varying wheel sizes, reducing deviation in film thickness and improving production efficiency.

The manufacturer implemented Trystar's Rectifiers, equipped with the Automatic Average Current Density (AACD) control system. This technology allowed for automatic voltage adjustments tailored to the varying sizes of wheels being processed, ensuring that the current density remained consistent throughout the e-coating process. Within weeks, the benefits were noticeable.



Rapid ROI

The AACD system provided an almost 14X ROI in a period of 3 months compared to a typical payback period of 3 years which is the industry standard.



Materials & Cost Savings

By maintaining the correct current density, paint usage was optimized, reducing over-application. The manufacturer recorded a 10% reduction in paint consumption while still meeting quality standards.



Operational Efficiency

The rectifiers optimized energy consumption, resulting in lower electricity usage and therefore cost savings on power. Furthermore, the automated system was adaptable to different part sizes and production volumes, laying the groundwork for scalability in the future.