

Accelerating Innovation in Rail Transportation

How a Leading Railway Manufacturer revolutionized composite testing with Premier ESR

World's leading Railway Equipment Manufacturer



ALPHATECHNOLOGIES

Rheology Scientists & Engineers

Background

A leading railway equipment manufacturer and pioneer in high-speed rail and maglev transportation sought to revolutionize train carbody structures using advanced composites for significant weight savings. The company established a 'new R&D laboratory to characterize thermoset resins used in prepreg and VARTM processes for maglev train shell components.

Key Details

- > Industry: Railway Transportation
- > Application: Composite Shell Components
- > Process: Prepreg autoclave & VARTM
- > Materials: Epoxy, Phenolic, Polyester Resins
- > Goal: High-Performance composite testing lab

The Challenge

- Inaccurate, inconsistent cure data from conventional DSC instruments
- Time Consuming validation requiring 15-day autoclave trials
- Difficulty correlating temperature data across different instruments
- Lack of existing standards for resin testing in rail industry

The Alpha Technologies solution

Premier Encapsulated Sample Rheometer (ESR) providing real-world simulation of curing cycles with simultaneous cure kinetics and Tg measurements

Key Value Propositions

- Real-world curing simulation vs. laboratory estimates
- Single, instrument for both cure kinetics and Tg data
- Enables industry standardization leadership
- Dramatically cuts material waste and costs
- Accelerates product development

BREAKTHROUGH RESULTS

5-in 1
TEST
SOLUTION

15 → 1
DAYS PER
TRIAL

80%
SCRAP
REDUCTION

< 9 mo
PAYBACK
PERIOD

142%
FIRST YEAR ROI