

Bulletproof innovation

Creating a safe, corrosion-proof centrifuge case in Fiberglass Reinforced Plastic (FRP)



SUCCESS STORY:
NEW FRP-CASING FOR
A DECANTER CENTRIFUGE
AT LUBRIZOL ADVANCED
MATERIALS RESIN B.V.,
THE NETHERLANDS



▲ Fiberglass Reinforced Plastic (FRP) casing of a decanter centrifuge

The challenge: Develop a safe, cost-efficient alternative to titanium grade 2 case

Lubrizol, a highly advanced chemicals manufacturer, was experiencing severe corrosion in the case of one of its decanter centrifuges. In theory, the centrifuge's titanium grade 2 case and rotating assembly should have been able to withstand the hydrochloric acid that passed through the centrifuge. However, changing process conditions (elevated temperatures and concentrations) were causing substantial

corrosion problems and increasing maintenance costs. In addition to meeting its functional criteria, Lubrizol needed a solution that was:

- safe under all operating conditions despite high operating speeds, which generate a force that could release large particles at a lethal velocity if they were to penetrate the case.
- a cost-effective alternative.

- more resistant to the highly corrosive chemicals used in the separation process.

The customer turned to its local ANDRITZ SEPARATION partner for an answer to these challenges. Working with Plasticon Europe B.V., Netherlands and Lubrizol Advanced Materials Resin B.V., Netherlands, ANDRITZ SEPARATION has developed an innovative solution using FRP.

Our solution: An impenetrable new type of casing material

Robust and chemically resistant, FRP proved in initial calculations to be cost-effective compared to titanium. But was it strong enough?

Having reached the limits of analytical calculations, it was clear that a new type of safety test was needed. One that would simulate large solids and/or wear elements coming out of the centrifuge at extreme ve-

locities, but without putting anyone at risk. The answer was found in the most unlikely of places – a shooting range. An FRP construction, resembling the eventual shielding material, was used as a target and specially designed ammunition was fired at the target to replicate the trajectory of the potentially dangerous materials. After shooting, measuring, and investigating the results, it was proven that projectiles mo-

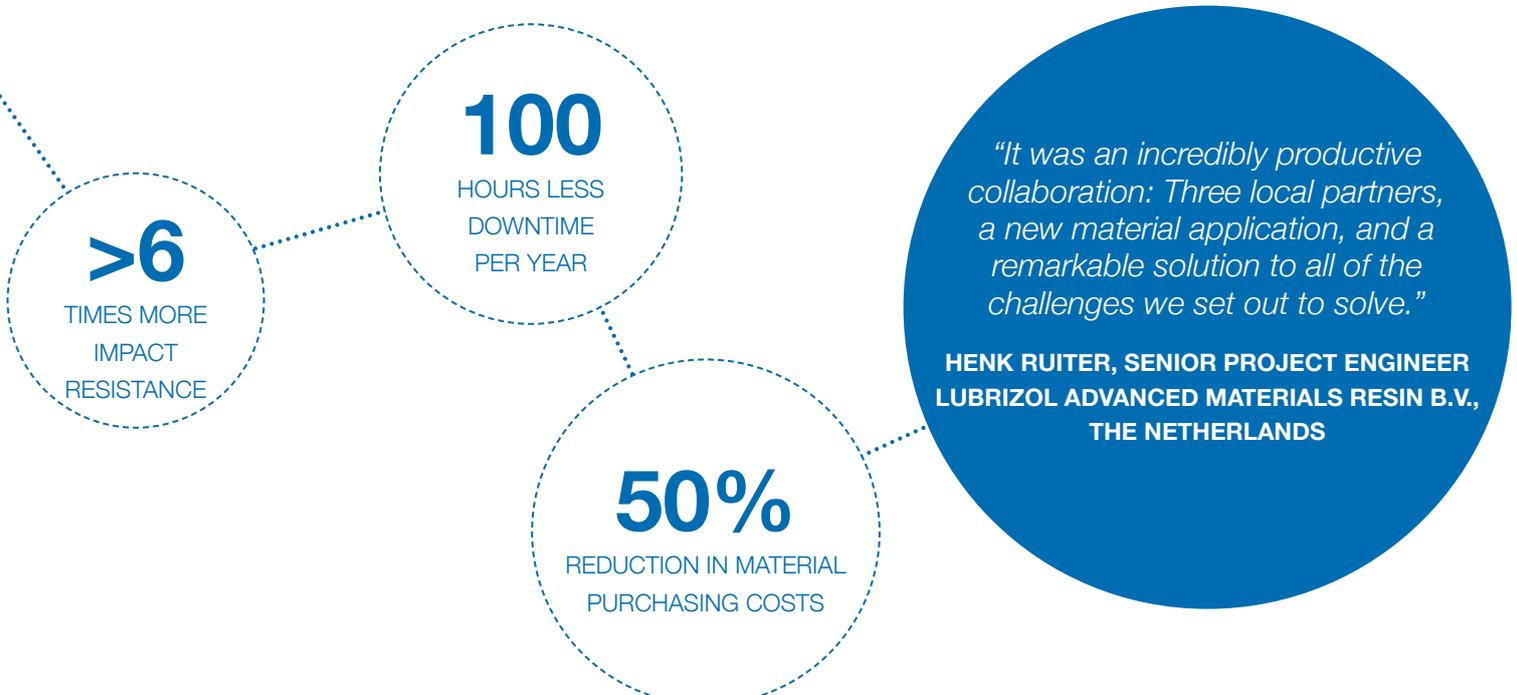
ving at six times the speed of any part coming from the centrifuge could not penetrate the 10 mm thick FRP construction. Even projectiles fired multiple times at the same impact area did not penetrate the target. This proves that, without a doubt, the safety of the surrounding personnel and this equipment could be guaranteed with an FRP centrifuge case.

Results: A safe, corrosion-resistant solution with 100 hours less downtime annually

The excellent teamwork between Lubrizol, Plasticon, and ANDRITZ SEPARATION resulted in an entirely new and innovative application for FRP. Used for a decanter centrifuge case, the material enabled safe

and reliable operations while allowing substantial savings for the customer in terms of purchasing and maintenance costs. Two years after installation, the case is still in excellent condition, reducing downtime by

one hundred hours annually. As an added bonus, the plastic case makes far less noise than the titanium metal case it replaced.



Key equipment



▲ Decanter centrifuge installed at Lubrizol

Benefits of the FRP centrifuge case

- Resistant to highly corrosive chemical substances, even at high temperatures and concentrations
- Robust and reliable construction amounting to 100 hrs/year in reduced downtime
- Reduced purchasing and maintenance costs compared to a new titanium case
- Significant noise reduction
- Proven through extensive safety testing

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