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Feldbinder launches tank wagons made of titanium

The Zacens 57 as a lightweight alternative to enamelled steel tanks

The titanium tank wagon BTAN 57.4-1 for transporting molten monochloroacetic acid:

- **15 tonnes lighter than enamelled steel wagons**
- **permanently corrosion-resistant**
- **positive environmental balance**

With the BTAN 57, Feldbinder proves that it is worth trying to do something new. The first four-axle titanium tank wagon satisfies all along the line. 30 percent more transport volume due to the 40 percent lower weight of the wagon compared to the existing enamelled wagons - this improves the environmental balance and lowers logistics costs at the same time. The challenge of including a titanium rail wagon to the portfolio tallies with Feldbinder's aspiration for technology leadership. On behalf of the customer On Rail, Feldbinder designed a weight-optimised tank wagon of the Zacens class with a 57 m³ container for the transport of molten monochloroacetic acid (MCA).

Titanium welding requires a high level of expertise to ensure that the corrosion resistance and strength of titanium materials are not impaired. The medium-sized company for special vehicles has invested three years in the new type of wagon, working with the Swiss Safety Center, the TÜV Nord, and the EBA.

Gregor Wilhelmi, technical director, and project manager Thomas Wolff state: "In our view, the titanium tank wagon is the most demanding project we have ever accomplished. Collaboration with both partners, CABB and On Rail, as well as with the notified body and the regulatory authorities has been brilliant throughout the term of this project."

The transport, in particular of molten MCA, is challenging because the product temperature must always be above 60 degrees Celsius, and the product is a highly corrosive. Therefore, heated steel tank wagons with glass enamel coating have been mainly used heretofore. Glass enamel is chemically very resistant, but prone to mechanical damages. Clean transportation is an important safety- and quality issue, especially with chemical transports. "Titanium as a material clearly has an advantage here," noted Olaf Feldbinder, Sales Manager and Managing Director of Feldbinder Spezialfahrzeugwerke GmbH. To ensure temperature-controlled transport, the tanker is 150 mm thick and has an external steam heating system with a heating surface of approx. 8 m². The dome pan with sliding lid is also insulated and encloses all container fittings.

The undercarriage and the container bearing are a completely new development, which the Feldbinder Spezialfahrzeugwerke GmbH has protected under patent law. The objective of the new development was to transfer only the lowest possible proportion of the loads under railway operations to the titanium container.

In February 2019, the EBA granted the series production approval for the new development of the renowned specialist vehicle manufacturer. Previously, the wagon received the TSI approval by the TÜV Nord Luxembourg in December 2018 and in January 2019, the hazardous goods approval RID by the Swiss Safety Center. In March, the innovative BTAN 57.4-1 RID wagon type also passed the practical test at CABB Chemie with flying colours.

Comparison of tank wagon made of titanium with a heretofore used enamelled tank wagon:

Wagon	Tare weight	Volume	Payload
Tank wagon made of titanium	approx. 20,000 kg	approx. 57,000 l	approx. 70,000 kg
Enamelled tank wagon	approx. 35,000 kg	approx. 44,000 l	approx. 55,000 kg
<i>Advantage of titanium</i>	43%	30%	27%