Development of a powered bogie for a diesel-electric locomotive

**Project specification**

The Rhaetian Railway (RhB) ordered four diesel-electric locomotives from Schalker Eisenhütte Maschinenfabrik GmbH for its infrastructure division. Moving heavy work trains, plowing snow and rescuing disabled trains are the main functions of these locomotives. The locomotives shall be operable on the entire RhB network, including both the main network and the Bernina line. The Bernina line, with its very tight 42 m minimum curve radius and an 18 km section with a heavy 70 ‰ grade, is particularly demanding for the bogie. It requires a high-performance brake system and heat-resistant wheels for the dissipation of braking energy. In addition, the bogie must be robust for the demanding service and for the winter conditions in the Alps.

**Customer benefit**

The operator RhB puts a locomotive into operation that meets very demanding requirements. Thanks to PROSE’s knowledge of the operating conditions of the railway and of the topography as well as geographical proximity to the operator PROSE were able to optimally meet RhB’s needs. The weight, the running dynamics and the structural strength of the bogie have been optimised for the high-power traction and for the heavy service weight that is typical of diesel-electric locomotives. PROSE was able to diminish the development risks thanks to their know-how, the short communication paths within PROSE and to the manufacturer, and to the fact that PROSE is familiar with the railway operator RhB.

**Our approach**

PROSE’s development team designed and developed the bogie in close collaboration with Schalker Eisenhütte Maschinenfabrik GmbH. As PROSE has all the expertise needed for the development, namely engineering, design, performance of layout calculations and structural analyses, thermal calculations and project management, the lines of communication within the project team were short. After the development phase, PROSE also finalised the detailed design and prepared the drawings. Schalker Eisenhütte Maschinenbaufabrik GmbH has the rights of remarketing of the bogie.

**Technical data for the bogie:**

- No. of bogies in revenue service: 8
- Track gauge: 1000 mm
- Max. speed: 100 km/h
- Axle load: 16 t
- Power output of the locomotive: 1800 kW
- Tractive effort: 230 kW

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**Customer: Schalker Eisenhütte, Germany**

**Operator: Rhaetian Railways (RhB), Switzerland**

**Project tasks:**

- Bogie conceptual design and development
- Structural analysis
- Thermal calculations for braking energy
- Simulation and analysis of running behaviour
- Detailed manufacturing design

**Project manager**

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