



Bombardier dual-powered locomotives benefit from 60% weight saving in onboard batteries

Bombardier ALP-45DP locomotives meet critical axle weight limits for North American operators with Saft MRX nickel-based battery system.

Dual-power benefits

The switch from traditional lead-acid batteries to Saft's compact and lightweight nickel-based batteries has enabled Bombardier to achieve a 60% weight reduction in the onboard battery system of its ALP-45DP dual-powered locomotives.

The locomotives, aimed at operators in North America, feature Bombardier's MITRAC dual-power propulsion technology. The diesel-electric locomotives can serve partially electrified routes to provide passengers with a 'one-seat' ride that improves convenience and reduces journey

times. The Saft MRX battery systems will provide the power needed to:

- ensure continuity of vital electronic control circuits and other vehicle loads while traversing neutral sections of the overhead catenary,
- provide cranking power to start one of the two 1,567 kW diesel engines,
- provide backup support for all vehicle control and critical safety loads in the event of a failure.

Thanks to their flexible drive technology, the ALP-45DP locomotives can be used on the entire networks of the first purchasers, New Jersey Transit (NJT) and Canada's Agence Métropolitaine de Transport (AMT) in Montreal.



Case study



SAFT

All-up weight critical

Previously, Bombardier locomotives in North America used standard lead-acid battery blocks, but this was not feasible for the dual-powered locomotive. The battery system for the ALP-45DP locomotive comprises a total of 56 Saft MRX cells, with a nominal voltage of 72 V and a capacity of 160 Ah.

All-up weight is a critical factor for the ALP-45DP since it has just four axles and the need to carry both the electrical traction units and diesel engines took the design close to the maximum axle limit. The standard lead-acid batteries weigh 1,100 kg, while the Saft MRX batteries are only 425 kg but provide equivalent performance. This 60% saving has proved vital in helping us bring the total vehicle weight down to our target. A further key advantage of the Saft MRX batteries is their compact design, so the volume claim on the space available in the battery compartment is only around 60% of that required by the lead-acid batteries.

Ringo Klein, System Engineer responsible for Locomotive Auxiliary Power Supplies at Bombardier Transportation's Locomotive & Equipment Electrical Engineering division.



Saft MRX specialized nickel-based rail batteries - key benefits

- 30% lighter and smaller than conventional Ni-Cd batteries, offering significant increases in passenger-carrying capacity, while enabling OEMs and operators to specify the optimum battery system for the installation
- robust Sintered/Plastic Bonded Electrode (S/PBE) construction
- very low lifecycle cost since Saft's superior nickel-based technology is field-proven to last more than 15 years with no risk of sudden-death failure
- integrated water filling system; two-year topping up interval
- strong, flame-retardant plastic container, highly resistant to shock and vibration
- wide operating temperature range of - 20°C to + 50°C; resistant to extreme temperatures from - 50°C to + 70°C.



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