Fifteen years in the making, a 34.6-kilometer railway tunnel connecting Frutigen and Raron in Switzerland through an Alpine peak was officially opened for regular traffic in December 2007, enabling high-speed train travel through the Swiss Alps. In 2008, trains will travel at speeds up to 200 kilometers per hour through the tunnel, designed eventually to speed up to 250 kilometers per hour.

This dual-tube, single-track tunnel is operated with the help of 101 transverse tunnels connecting the tubes. These connections house the tunnel’s electro-mechanical infrastructure, as well as serving a safety function fitted with stainless steel fire safety doors. The electro-mechanical equipment is built into 136 stainless steel containers. This concept has cut down the electrical installation time by two years.

FHS Frech-Hoch AG of Switzerland supplies 136 containers, made from Outokumpu stainless steel, for a Swiss railway tunnel to house electromechanical equipment under demanding environmental conditions. The container maker secures the contract thanks to extraordinary technical assistance from Outokumpu, mediated by Swiss stainless steel distributor HANS KOHLER AG.
The containers have been designed to operate under extraordinary conditions inside the tunnel: a constant temperature of approximately 35 °C and atmospheric humidity of up to 80%. The rock conditions place further demands on the construction materials: chloride-containing water seeps through the rock with droplets falling onto the containers.

The tunnel designers wanted assurance from container makers of a long maintenance-free service life, requesting a 10-year guarantee for the stainless material with a lengthy list of conditions. One of the bidders for the contract was FHS Frech-Hoch AG, a Swiss specialist in containers for transport, who relied on their long-time supplier, stainless steel distributor HANS KOHLER AG of Switzerland. HANS KOHLER again relied on their long-term supplier Outokumpu: Outokumpu’s R&D arm was able to provide all the required extensive paperwork, as the only stainless producer within the bidding period. Outokumpu’s stainless configuration for the containers, defined by the Group R&D specialists, was Outokumpu’s proprietary super-austenitic grade 254 SMO® for the roof, and austenitic 1.4404 (ASTM 316L) and 1.4301 (304) for the outer and inner wall structures respectively. The chain of supply foolproof, the contract went to the three companies.

Again via HANS KOHLER, Outokumpu has also supplied stainless steel for the fire-safety doors of the transverse tunnels: both 1.4404 and super-austenitic 1.4539 (904L).

HANS KOHLER AG is a major stainless steels distributor, supplying the broadest range of products in Switzerland. Cooperation with Outokumpu group companies goes back decades. Switzerland, a country best known for its peaks, also peaks in stainless steel consumption: the country has the second highest per-capita consumption, behind Japan and ahead of the EU average by 22 percent.

Project
Stainless steel containers for electro-mechanical equipment and fire-safety doors in the Lötschberg base rail tunnel, running from Frutigen in the Kandertal/Bernese Overland to Raron in the Valais

Tunnel design and construction
BLS Alp Transit AG

Tunnel operator
BLS (Bern-Lötschberg-Simplon)

Container fabricator
FHS Frech-Hoch AG of Sissach, Switzerland

Container materials
Produced by Outokumpu, supplied by HANS KOHLER AG of Zurich, Switzerland
254 SMO® (1.4547), 10 tons, thickness 0.8 mm
1.4301 (304) and 1.4404 (316L), 200 tons each, thickness 1.5–6.0 mm

Fire-safety door materials
Largely produced by Outokumpu, supplied by HANS KOHLER AG
1.4539 (904L), 30 tons
1.4404 (316L), 50 tons