**Gotthard base tunnel – Sika drives steadily forward into new century**

**People building for people**

As the world's longest rail tunnel, the Gotthard base tunnel forms the centerpiece of the new transalpine rail route (NEAT). It embodies the Swiss values of innovation, precision and reliability. These values – upheld at all levels with pride, satisfaction and in a true spirit of partnership by Sika's project team throughout the 14-year construction period and, even before that, during the preliminary phase from 1996 – have helped to cement the success of this once-in-a-lifetime project. The Gotthard base tunnel is an impressive demonstration of how Sika builds with and for people.

The 57 km-long structure is both a novelty and a tour-de-force in tunnel engineering. It is the longest rail tunnel in the world and passes through one of the highest Alpine massifs. The rock overburden under the tallest summits runs to around 2,000 meters and, even at its highest point, the tunnel is still only some 550 meters above sea level. The new rail section will reduce the time that massive freight and modern high-speed trains need to travel from Zurich to Milan by around one hour.

**Prequalification process – 100-year service life required**

Client AlpTransit specified a service life of 100 years, during which time the concrete and waterproofing systems should require no significant maintenance. The upfront investment made by Sika in the years-long prequalification process and associated development of new materials totaled several millions of Swiss francs. And all this before a single kilogram of construction chemicals was supplied. Aside from having the courage to take entrepreneurial risks, the decision-makers were absolutely convinced that new product solutions could be found to meet the exceptionally stringent technical demands. After a highly selective procedure, the newly developed products underwent rigorous practical tests by official testing laboratories such as EMPA (Swiss Federal Laboratories for Materials Science and Technology) prior to the start of mass production.

**Gotthard – back to our roots**

The story of Sika's successful evolution into a global player began almost 100 years ago with a tunnel project at the very same location, the Gotthard. By providing a waterproofing solution for electrification of the rail tunnel in 1918, Sika not only ensured smooth operation of the north-south rail corridor, but also laid the foundations for Sika's worldwide success. The Gotthard base tunnel posed similar challenges to those of 1918, but also completely new ones: apart from the sheer scale of the project, one particular problem that stretched the tunnel engineers to their limits was to find ways of coping with the high underground temperatures of 30-40°C. The materials and equipment used on this unique project were also subject to tough requirements, one key issue being the specified 100-year concrete service life.

**Sika's across-the-board building expertise**

The new Gotthard tunnel project required Sika to draw on the full breadth of its construction expertise. Waterproofing systems, construction chemicals know-how and machinery solutions were only part of the package. High-grade shotcrete was used to support the tunnel excavation. This served as the base for the Sikaplan® and Sarnafil® waterproof membranes. The concrete lining was then placed using Sika admixtures so as to achieve the high degree of precision required for the tunnel surface geometry. The flawless concrete finish is a visible testament to the outstanding concreting workmanship.

**Sika products and services**

• Prequalification process from 1996 to 2002, with extensive testing

• Sika admixtures for over 2 million m3 concrete

• Waterproof membranes and jointing systems to seal an area exceeding 3 million m2

• 20,000 tonnes of concrete admixtures

• 40,000 tonnes of material shipments

• 12,662,500 minutes worked

• Shotcrete systems and robots on tunnel boring machines to boost driving efficiency

• Ancillary products from entire Sika range

**Sika AG Corporate Profile**

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika has subsidiaries in 93 countries around the world and manufactures in over 170 factories. Its approximately 17,000 employees generated annual sales of CHF 5.49 billion in 2015.