

FRIALEN large couplers – safe at sea and ashore

New natural gas pipeline through the Lake Thun



■ The Lake Thun region in Switzerland is embedded in a gorgeous mountain scenery

The installation of the new natural gas pipeline between Thun and Interlaken was a technically challenging project, specifically because approximately half of the pipeline was routed through Lake Thun. This made highest demands on the quality and safety of the materials. For the land pipeline, gas pipes made of the high-performance plastics PE were thus used. Because of the depth of the lake of up to 200 metres, cemented steel pipes were chosen for the sea pipeline.

The region in the proximity of Interlaken and the Lake Thun is increasingly becoming a popular holiday destination for tourists. This also results in an increasing energy demand. Up to now, an isolated facility in Interlaken supplied energy to the residents. It is the last one in Switzerland not connected to a natural gas pipeline. From the supplied liquid gas, the isolated facility produces a propane-air mixture and feeds it to the gas network. In view of the increasing gas consumption, such a facility is, however, no longer economical. The Interlaken tourist region presently consumes 30 giga watt hours (GWh), 80 GWh are expected for

the future. In addition, the company of Rigips AG, Leissigen, purchases 15 GWh of gas.

Conversion to natural gas

In view of the growing demand, the local energy providers decided to switch from propane gas to natural gas: It is safer, eco-friendlier, and easier to procure. In addition, it is hoped to strengthen the location Berner Oberland Ost with around 45,500 inhabitants and its economic attractiveness. The installation of a new main pipeline provides access to the Swiss natural gas network to further regions surrounding the Lake Thun.

Project:

Installation of a natural gas pipeline from Thun to Interlaken

Construction site:

Region Thunersee, Schweiz

Customer:

Erdgas Thunersee AG /Industrielle Betriebe, Interlaken

Project management:

B + S AG, Bern

Underground engineering:

Weiss + Appetito AG, Bern;
Grossmann AG, Interlaken

Piping engineering:

Weiss + Appetito AG
Rohrleitungstechnik, Bern;
Josef Muff AG, Sarmenstorf

Hydraulic engineering:

Willy Stäubli Ing. AG, Zurich

Dealer:

Bläsi AG, Bern

Technical support:

Glynwed AG, Switzerland
FRIATEC AG, Germany

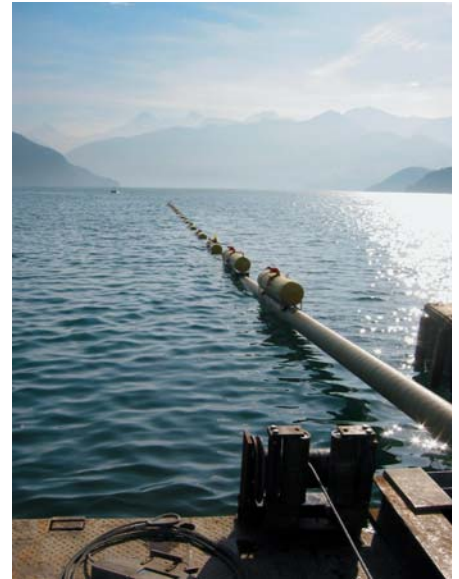


■ Connection of a shut-off valve at the transition land / sea

Installation under water ...

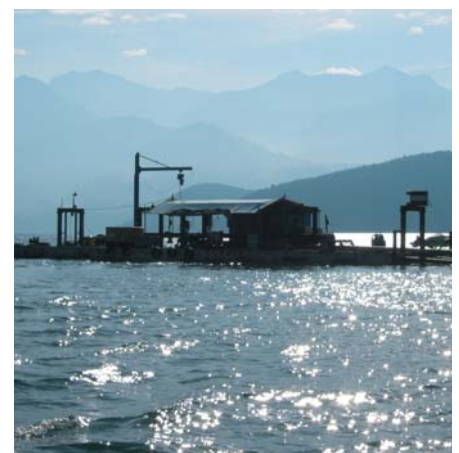
The project presented a specific challenge for technology and the responsible persons: Half of the pipeline with a total length of 33 kilometres is routed under water – directly through the Lake Thun from Einigen to Unterseen/Interlaken. The technicians of Josef Muff AG, Sarmensdorf, which performed the installation work, prepared the natural gas pipeline ashore: At first, they welded 16 metres long steel pipes to form sections of 336 metres each. In the course of the quality assurance, they x-rayed the welds and subjected them to a leak test before mounting floats to the pipings.

The technicians lowered the individual sections using a track unit. The floating pipe sections were then transported to the welding pontoon and welded there to the previous pipe. Here, the welds were x-rayed again and re-insulated. A mobile laboratory served the immediate evaluation of the X-ray photographs. With the help of a specifically produced guide pipe made of PE 100 of the dimension d 500 SDR17, the technicians installed the steel pipeline at the bottom of the lake. Thanks to the electrofusion method, the individual pipes of the 540 metres long guide pipe could be quickly and straightforward joined



■ The sea pipeline was lowered to the bottom, down to a depth of more than 200 metres

with FRIAFIT couplers AM d 500, PE 100 SDR 17. Two additional FRIAMAT fusion units, which FRIATEC provided to the technicians, facilitated this work and guaranteed a quick progress of the construction project. At the lakeshore, the pipes were buried in the ground up to a lake depth of 10 metres.



■ The sea pipeline was fused on the floating pontoon.



■ Excavators transported the pre-fused pipe sections to the place of installation

... and ashore

The installation of the land pipeline also required special preparations: Approximately 170 property owners had to grant the right for passing through the pipeline. In contrast to the sea pipeline, the approximately 16 kilometres long land pipeline in the dimensions d 280 to d 400 consists of the high-performance material PE 100 SDR 11. The operating pressure of the pipeline is 5 bar. The material is non-corroding and is best suited for flush drillings through the ground. 12 flush drillings were required to be able to pass under railway lines and roads along the pipeline route. During these drillings, a wear-resistant multi-layer pipe made of

PE 100 SDR 11, which is specifically suited for this type of routing, was installed.

For horizontal directional flush drilling, e.g. special protective jacket pipes were joined by heated tool butt welding. In places where this joining technique reached its limits – e.g. when joining longer pipe sections, in case of change of direction or when integrating fittings – the technicians used FRIALEN Safety Fittings UB in the dimensions d 280 to d 400. Along the pipeline route, the technicians installed a total of more than 400 FRIALEN large couplers which are best suited for complex installation work.



■ The PE elbows were fused using a FRIAMAT fusion unit



■ A shut-off valve integrated with FRIALEN Safety Fittings

Routing

... ashore

- Starting point: high-pressure pipeline (70 bar) between Bern and Thun
- Project start: connection from new pressure-reducing and measurement station (DRM) Auwald, Thun/Heimberg.
- Length: 13.4 kilometres (Auwald to Einigen)

... under water

- Installation of a valve station in Einigen (Unteres Kandergrien)
- Length: approx. 16.8 kilometres (Einigen to Neuhaus as well as connection of the company of Rigips AG in Leissingen) plus approx. 2.2 kilometres (Neuhaus to Spital)

The natural gas pipeline ends at the transfer station Spital Unterseen / Interlaken.

Focus on safety and quality

“We focused on the safety and quality of the products from the beginning”, says Urban Ittig, managing director of Weiss + Appetito AG Rohrleitungstechnik. Because of the good experience the company gained with FRIATEC products, Urban Ittig never considered competitive products. The managing director also appreciates the consultation by and the



■ Preparation of the insertion of a pipe section into the horizontal flush drilling



FRIALEN large couplers UB made of HDPE offer numerous advantages: They have a barcode for the fusion process as well as a pre-heating barcode from d 280. The pre-heating counteracts shape deviations at the pipes to be fused and compensates for ring gaps of up to 3 mm between the coupler and the pipe. In addition, the exterior reinforcement prevents an expansion of the coupler during the fusion process. This stabilises the required melt pressure in the fusion zone. These properties provide for maximum connection quality and high stability.



■ A powerful team (from top left to bottom right): Michael Helf (FRIATEC AG), Urban Ittig (Weiss+Appetito AG), Armin Grüter (Glynwed AG), Rudolf Probst (Bläsi AG), Jürg Nachbur (Industrielle Betriebe Interlaken), Markus Jäggi (B+S AG), Peter Baumgartner (Glynwed AG)

competence of Glynwed and FRIATEC: "These services offered by Glynwed and FRIATEC are very important for us. We appreciate the competent cooperation and partnership".

FRIALEN proven in Swiss natural gas network

It was above all the FRIALEN electrofusion fittings which were of an advantage

during the installation work for Markus Jäggi of B+S AG, the planning company of the project. For the pipeline from Thun to Interlaken, a relatively large diameter was required and the subsoil was partially very demanding. For this challenge a proven product was needed which guarantees absolute safety. "The FRIALEN fusion couplers meet this criterion without any doubt. They are proven pipe connections in the Swiss natural gas network", emphasised Markus Jäggi. Mr. Jäggi could also rely on the service of Glynwed and FRIATEC: "For technical queries, we had an excellent support which provided us with the required answers within a very short time".

The new pipeline was officially inaugurated on 15 August 2008. The construction work took more than one year, from the spring of 2007 to July 2008. The total project costs amounted to approximately 17 million Swiss francs.



■ Tier and 90° elbow – piping when space is at a premium



■ The PE fittings were fused using a FRIAMAT fusion unit

Company information

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