



# Pipe Cover

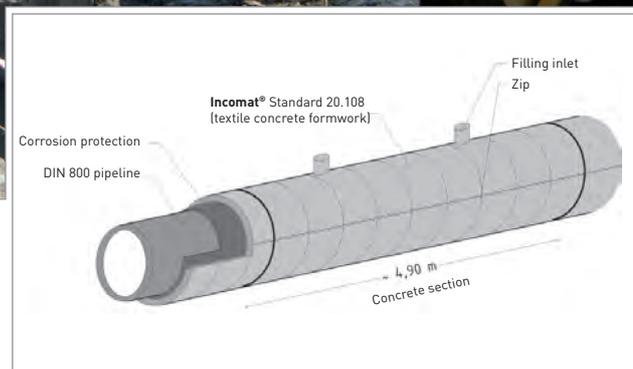
## Inverted Syphon

### EVN Netz GmbH – “West 4” western trunk gas pipeline, Austria – encasement of inverted syphons –

Incomat® provides long-term negative buoyancy



Lifting into place of inverted syphon no. 12 at Hechtengraben stream



Schematic assembly of encased pipeline

## Background

For the development of EVN Netz GmbH's “West 4” western trunk gas pipeline between Auersthal / Gänserndorf and Langenschönbichl / Tulln, a consortium comprising Leyrer + Graf Bau GmbH and Nacap Rohrleitungsbau GmbH was contracted to build an approx. 60 km long pipeline section. The route includes a series of inverted syphons by means of which the (DN 800) pipeline crosses under the many intervening waterbodies and watercourses. To protect the pipeline against mechanical damage and buoyancy or uplift, the inverted syphons were encased in concrete.

## Solution

The solution adopted to install the concrete encasement made use of HUESKER Synthetic GmbH's Incomat® textile formwork – in preference to the originally specified ballasting method by means of shuttered in-situ concrete. Incomat® concrete mattresses comprise two high-strength woven layers connected by synthetic spacer ties. The mattress thickness is determined by the length of these

spacers. The Incomat® elements were filled with self-compacting concrete (SCC) of class C 25/30 (minimum 28-day cylinder strength  $\geq 30$  N/mm<sup>2</sup>) to DIN 1045-2 (EN 206-1) so as to create a monolithic body of concrete within the textile formwork.

## Project stages

The first project phase, in May 2011, involved the trial construction and installation of a 15 m long inverted syphon. After the success of this “test” had convinced the contracting consortium that Incomat® offered the best solution, it was duly adopted for all subsequent waterbody crossings. The average thickness of the concrete encasement on this project ran to around 0.11 m. Each mattress element constituted a separate concrete section





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Zipper connection



Incomat® encasement prior to filling



Concreting of the mattress element

with an approximate length of 4.90 m after pouring. A sequence of up to 13 adjacent elements was needed for the inverted syphon structures, depending on their size.

### Work sequence

The preparations for concreting and the actual pouring operations were performed outside the waterbody. The inverted syphon sections of the pipeline were treated with a suitable polymer-based anti-corrosive coating. All necessary precautions were taken to prevent the Incomat® concrete mattresses from damaging this protective finish. The integrity of the coating was additionally checked after the assembly had been lifted into its definitive position. It is particularly important for cathodic protection of the pipe that this type of encasement has no negative impact on electrical conductivity. The individual Incomat® elements were custom-manufactured for the specific project at the HUESKER Synthetic GmbH plant, and fitted with filling inlets and a zip. The textile formwork elements were placed around the pipeline and zipped together lengthwise on site. The mattresses were then successively filled with concrete. At the end of the 28-day curing period, each inverted syphon assembly was moved to its place of installation and lifted into the waterbody by several construction machines.

### Result

HUESKER Synthetic GmbH's Incomat® textile formwork helped to deliver a solidly built, easily installable, high-performance solution that fulfilled the necessary ballasting function for the inverted syphons.

Project/location: EVN western trunk gas pipeline from Auersthal / Gänserndorf to Langenschönbichl / Tulln in Austria

Client: EVN Netz GmbH Maria Enzersdorf

Contractor: Consortium comprising Leyrer + Graf Bau GmbH and Nacap Rohrleitungsbau GmbH

Built: April – June 2011

Product: **Incomat® Standard 20.108**

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