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Technical Newsletter from SIMONA AG 2/2010

SIMONA® PP-H AlphaPlus® Geotherm

New developments for “deep geothermics”

Against the backdrop of public debate about reliable, independent energy supply, renewable energy sources are becoming increasingly important. Geothermics is classified among these energy sources because it also takes into consideration environmentally relevant aspects such as CO_2 emissions.

Utilising geothermal energy in the Earth’s crust at depths of at least 400 m, so-called “deep geothermics” represents a specific form of geothermal power generation. This energy can be used both for heating purposes and to generate electricity.
Specially for geothermics projects, SIMONA modified a top-quality standard SIMONA® PP-H AlphaPlus® pipe with regard to material and connections in such a way that it can withstand the thermal and mechanical loads generally associated with operations in this area. At the bottom of a deep geothermics borehole temperatures can be expected to exceed 85 °C (rock) and 70 °C (water). For these thermal stresses SIMONA® PP-H AlphaPlus® pipes are also provided with special thermal stabilisation, as a result of which they can be used in that temperature range on a permanent basis. Further development of SIMONA® SIMOFUSE® connection technology for PP systems (integral electrofusion welding), which originated in unpressurised waste-water applications, also became necessary in order to meet the thermal, hydraulic and mechanical requirements. Appropriately equipped systems can meet up to 80 per cent of the heat and refrigeration demand of a relatively large building such as the new “SuperC” study and service centre run by RWTH Aachen. By comparison, this is equivalent to the amount of heat required to supply 200 single-family homes. Furthermore, the system can avoid the equivalent of 300 tonnes of carbon dioxide emissions a year.

SIMONA® PP-H Alpha Plus® Geotherm for the RWTH Aachen deep geothermics project.

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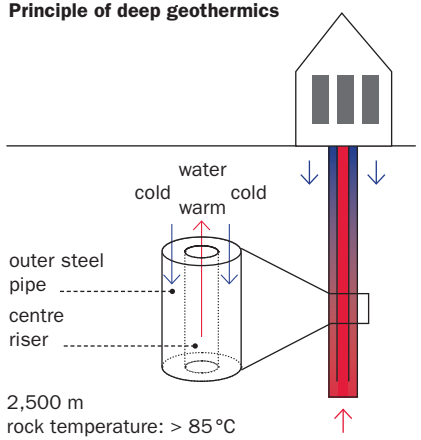
Principle of deep geothermics



Your contact

Jürgen Thielert
Head of Sales Industrial Pipes, Piping Systems Business Unit

Jürgen Thielert, a qualified engineer specialising in textiles production, has been working as head of sales for the piping systems business unit at SIMONA AG since November 2009.
His duties have included overseeing global projects in the field of corrugated pipes (i.e. non-pressurised applications such as wastewater, drainage and cable protection), mainly in the markets of central Europe, Asia and Australia. In total, Mr. Thielert has amassed around 10 years’ professional experience in this international environment.
In the field of industrial pipes, he is responsible for developing key accounts and the establishment of specific new markets and distribution structures as well as global project business. Customer focus, maintaining a thorough knowledge of markets and finding client-specific solutions are his priorities.

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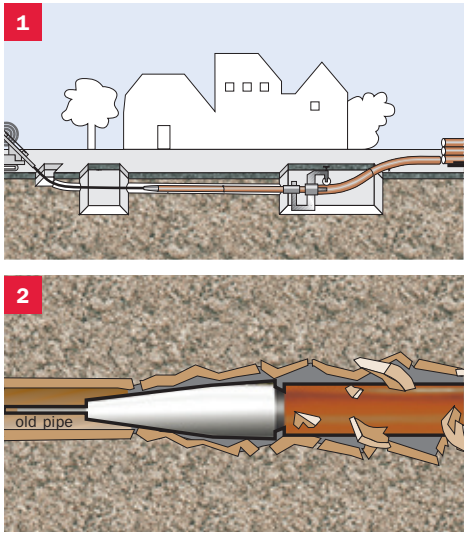
SIMONA® PE 100 SPC RC-Line

Fully crack-resistant

PE piping systems have demonstrated their competitiveness and performance for over 50 years. In response to the ever wider range of applications and pipelaying methods, PE materials have had to be adapted and enhanced with regard to quality.

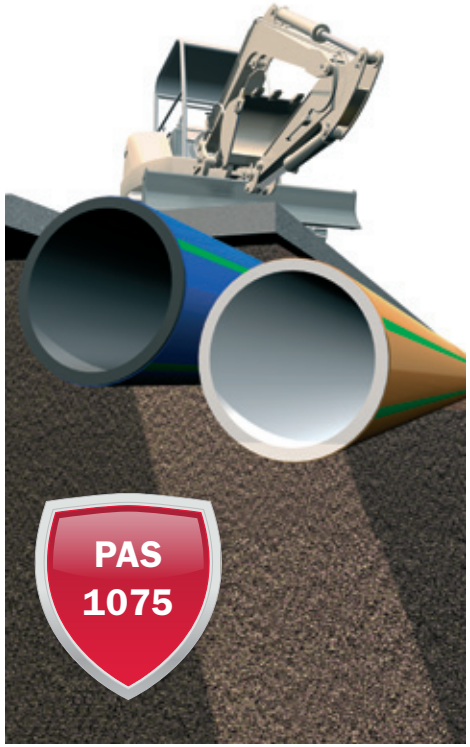
The enhanced PE 100 RC was added to the series of standardised PE materials (PE 63, PE 80 and PE 100). RC materials are suitable in particular wherever the material is subject to very high mechanical stresses. The latter occur particularly during sand bed-free and trenchless laying, as in horizontal wash-boring and pipe bursting, for example. The highest level of operational reliability nowadays is provided by RC piping systems with so-called additive protective layers or protective-jacket pipes. SIMONA® PE 100 SPC RC pipes consist of an inner pipe which – in accordance with PAS 1075 – has the highest resistance to crack propagation and point loads. In addition, this inner pipe is protected by a specially modified, scratch-resistant and abrasion-resistant PP protective jacket. The PP protective jacket prevents the pipe surface from sustaining unacceptable scores and notches due to sharp-edged stones and material fragments – especially when using modern pipelaying methods – and also provides maximum protection against fragments acting on the outside of the inner pipe when in service (penetration).



Trenchless pipelaying
1: Swagelining
2: Berstlining

Benefits of SIMONA® SPC RC-Line pipes:

- High resistance to slow and rapid crack propagation
- High resistance to external point loads acting when in service
- High level of protection for the pipe when exposed to stone or material fragments (penetration)
- Permanently secure integral and non-positive connections
- Permanently resistant to subsidence as well as static and dynamic loads
- Cost-effective processing, installation and laying due to assembly accessories
- Inspection-friendly, low-cost servicing and cleaning options.



SIMONA® SPC RC conforming to PAS 1075.

With regard to pressure-specific load-bearing capacity, the loads exerted by external forces, such as soil loads and live loads, and the combined effect thereof, PE 100 RC pipes with additive protective layers provide the highest technical and economical operational reliability in heavy-duty supply lines and waste-water systems.

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Plastics Expertise

RC materials conforming to PAS 1075:

PE 100 RC materials (RC = **R**esistance to **C**rack) were developed as a result of optimisation procedures in the manufacture of multimodal PE 100 for new fields of application. The improvement of standard PE 100 to create PE 100 RC materials is performed by means of copolymerisation with suitable alpha-olefins or additional polymerisation steps. PE 100 RC materials feature high stress crack resistance and are described and classified in PAS 1075 in conjunction with alternative pipelaying methods (sand bed-free and trenchless pipelaying methods). PAS 1075 is a supplement to existing standards and guidelines. The minimum level of stress crack resistance of RC materials is defined as a creep rupture strength of 8760 h in the FNCT (**F**ull **N**otch **C**reep **T**est). In the FNCT a notched, square material sample is tested at 80 °C up to fracture or a load limit defined by time, with a test stress of 4.0 N/mm^2 in a wetting agent of 2 per cent Arkopal N-100.

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Project Report

SIMONA® PE 100 pipes for seawater desalination in the UK

I: Feed lines made with large-size SIMONA® PE 100 pipes; t. r. Brackish water storage tank with PE 100 feed pipe, OD 1000/1200 mm; d. r. Raised PE 100 collecting main below the filtration modules

Climatic changes, population growth and an expected increase in consumption as a result of the 2012 Summer Olympic Games in Greater London are making it more and more important to develop drinking water resources in the UK. To this end a seawater desalination plant has been built in Beckton. The material and product of choice: corrosion-resistant SIMONA® PE 100 pipes. They were used to implement numerous customised engineering solutions over the entire period of construction.

Initial situation

Water is often in short supply in London and Oxford when conditions are particularly dry. Seawater desalination plants – planned and constructed with plastic pipes for transporting brackish water and filtered drinking water – are innovative solutions for meeting a constant rise in water consumption on a sustainable basis.

Task

On the north bank of the River Thames the supply network had to be expanded in order to develop new drinking water resources. The raw material used for components installed at the seawater desalination facility had to provide the following benefits:

- Excellent corrosion resistance
- Extended service life of up to 100 years
- Ultra-smooth inside surface to avoid incrustations
- Permanently tight welds
- High resistance to salt water
- Appropriate national drinking water approval

Solution

Corrosion-resistant SIMONA® PE 100 pipes are the ideal transport system both for salt water and for filtered drinking water. The Thames is subject to tidal influence in the section of the river to be used by the facility. Water is only removed from the river at low tide because then the proportion of salt in the water is lowest. The method used to produce drinking water is reverse osmosis. Raw water is filtered to obtain drinking water with the aid of a defined pressure and specially developed osmosis membranes. Applying this method and using 100 per cent renewable forms of energy, the regional utility, Thames Water, produces around 140 million litres of drinking water a day in an environmentally friendly way at an acceptable cost.

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PE 100 welded pipe section, OD 900 mm SDR 17 incl. reinforced tee PN 10.

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