



SIMONA



The image shows a construction site with a street grid overlaid on a background of modern buildings. In the foreground, several large orange pipes with a green stripe and a black inner lining are laid out on a wet surface. A black pipe is also visible in the background. The pipes are connected to a drainage grate in the foreground.

SIMONA® PE 100 AP-Line wastewater piping system

The piping system with an
abrasion-resistant inner layer

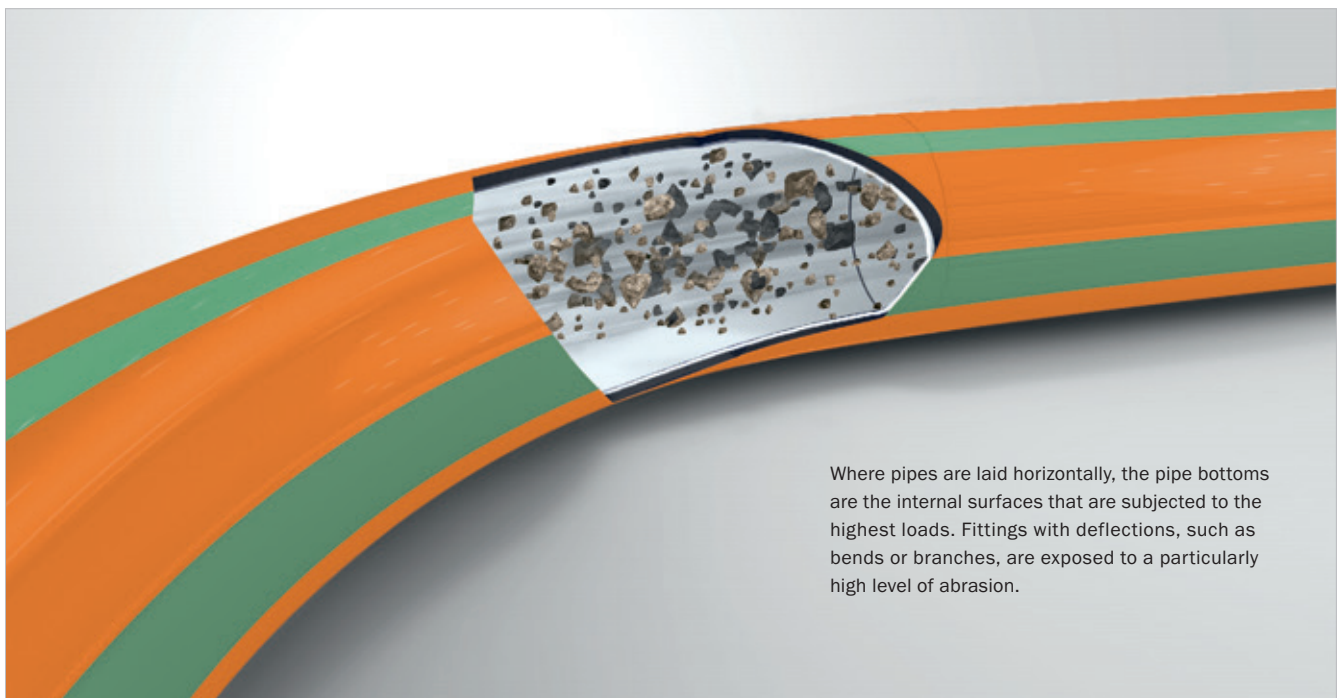
GLOBAL THERMOPLASTIC SOLUTIONS

SIMONA® PE 100 AP-Line wastewater piping system

When it comes to wastewater applications, in particular, piping systems are invariably exposed to a continuous, high level of mechanical stress due to sand, fine-grain gravel and a mixture of substances bound in the sewage sludge. For years now, SIMONA has been developing plastic piping system solutions with an increased level of abrasion resistance in order to prolong service life in those cases in which there is exposure to substantial mechanical stress.

SIMONA® PE 100 AP-Line pipes and fittings were also developed specially for applications in the field of wastewater transport where erosion is caused by the constant discharge of solids. In these pipelines the inner surface is highly wear-resistant (AP = Abrasion Protection).

In the past, standard SIMONA® PE 100 pipes have already proved the perfect choice on account of their excellent wear resistance compared to that of conventional materials such as GRP and steel. By comparison, the new SIMONA® PE 100 AP-Line pipes are characterised by yet another significant improvement in abrasion resistance, and hence an increase in service life when in operation.

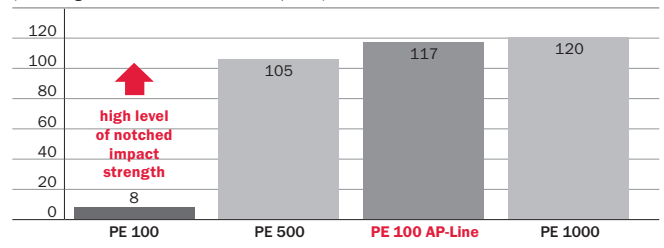


Excellent notched impact strength

In addition to high abrasion resistance, the inner layer also has a very high level of notched impact strength, combined with the benefit of being able to absorb a large amount of impact energy. This provides a distinct advantage for the hydraulic and pneumatic transport of solids with a high proportion of sharp-edged particles, such as sand and gravel.

Notched impact strength with double V-notch

(according to DIN EN ISO 11542-2 in mJ/mm²)

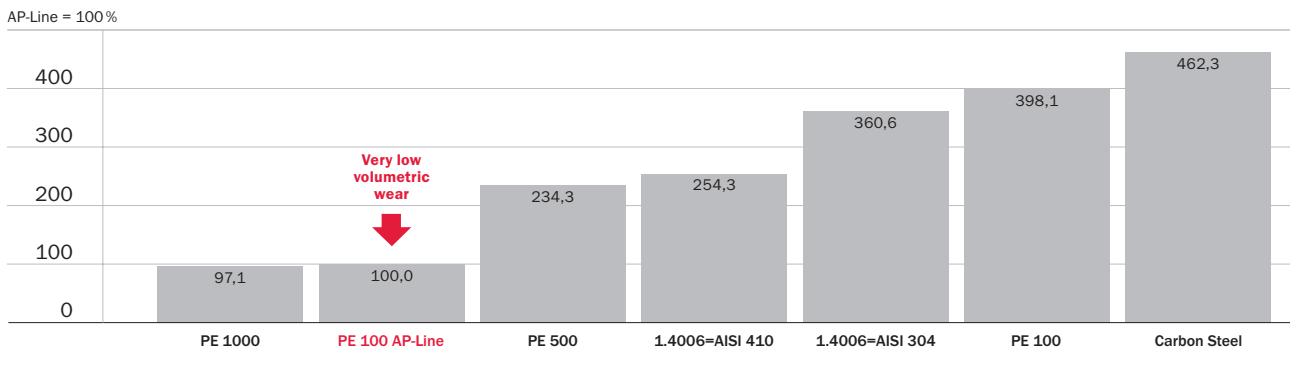


Excellent abrasion resistance

Compared to other common pipe materials, SIMONA® AP-Line exhibits much less volumetric wear in sand-slurry tests due to the high degree of wear protection provided by its integrated inner layer. In fact, wear is 2.5 to 4.6 times less than with various grades of steel. Consequently, the service life expectancy of SIMONA® AP-Line pipes is longer than that of conventional solutions.

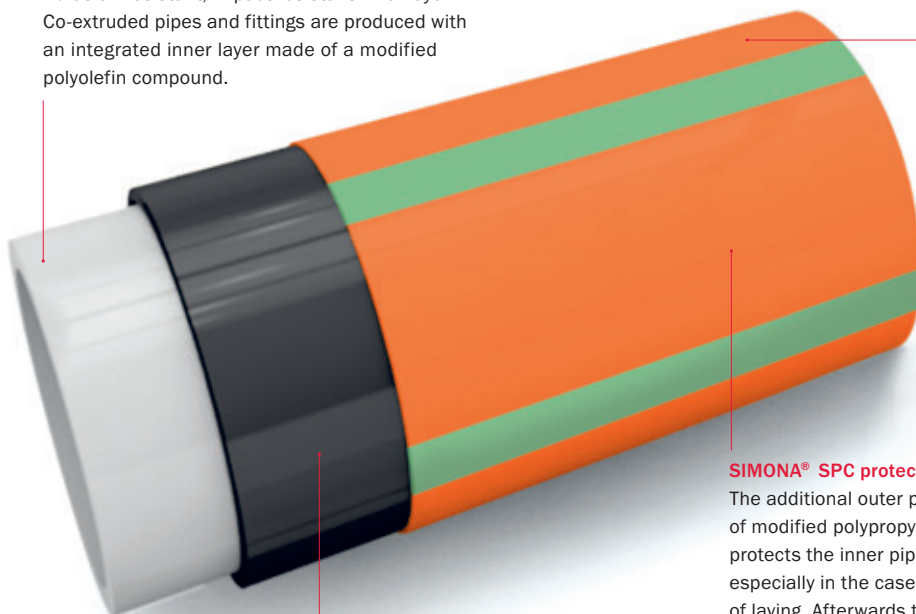
The AP-Line piping system also displays tangible benefits when compared with products made of PE 1000 and PE 500. Although the amount of wear is approx. 3% lower in the case of PE 1000, for example, SIMONA® PE 100 AP-Line piping systems enable efficient processing in accordance with DVS and installation by means of all standard closed and open methods of pipelaying, thus ensuring much lower total costs over the service life.

Comparison of volumetric abrasion



Pressure-resistant PE 100 RC inner pipe

Abrasion-resistant, impact-resistant inner layer. Co-extruded pipes and fittings are produced with an integrated inner layer made of a modified polyolefin compound.



SIMONA® PE 100 RC

Multilayer pipe made of PE 100 RC (PAS 1075 Type 2) with functional indication layer for all-embracing quality monitoring.

SIMONA® SPC protective-jacket pipes

The additional outer protective jacket made of modified polypropylene (PAS 1075 Type 3) protects the inner pipe against damage, especially in the case of trenchless methods of laying. Afterwards the inner pipe still has 100% new-pipe quality.

Pressure-resistant and welding in accordance with DVS

Pipes and fittings made of PE 100 RC and polyolefin compound that can be welded in accordance with DVS using standard methods.

SIMONA® PE 100 AP-Line pipes and fittings – key benefits

- + Pipes and fittings with abrasion-resistant, impact-resistant inner layer
- + Permanently strong, watertight joints made by standard DVS welding methods
- + Homogeneous connection of inner layer and inner pipe by means of coextrusion
- + Easy and efficient laying and assembly due to the light material weight of the 6 m and 12 m pipes; non-standard lengths are available on request
- + High corrosion resistance and chemical resistance
- + Much longer service life
- + Reduced assembly and maintenance costs
- + Application-oriented non-standard components available on request (e.g. customised radius to suit hydraulic conditions)



As a system provider SIMONA offers not only PE 100 AP-Line pipes but also an extensive range of PE 100 AP-Line fittings.

Additional benefits of SIMONA® PE 100 SPC AP-Line at a glance

- + Excellent bond strength and shear strength between inner pipe and protective jacket (tested on a batch-by-batch basis)
- + High abrasion resistance of the PP Protect protective jacket
- + No crack propagation from the protective jacket into the inner pipe
- + High inner pipe resistance to slow crack propagation (PE 100 RC)
- + Extremely effective protection against major physical damage such as notches, abrasion and wear (PE 100 SPC)
- + Pipelaying can be performed using all the common open and closed methods

Extensive product range

SIMONA's in-house workshop oversees the production of fittings engineered from SIMONA® PE 100 AP-Line pressure pipes. Pipes and fittings are generally available in outside diameters from 160 mm to 630 mm in classes SDR 17 and SDR 11. Other components and pipes in different SDR series are available on request, e.g. pipes with antistatic treatment, non-standard components and sheets to complement the system.

SIMONA® PE 100 AP-Line, SDR 11/SDR 17¹

	Outside diameter d (mm)
Pipes	
Pressure pipes ²	160 – 630
Fittings	
AP-Line loose flange (F-piece)	160 – 630
Tee, reduced	160 – 630
Bends, welded, 30° to 90°	160 – 630
Bends, seamless, 11° to 90°	160 – 400

¹ Nominal pressure load in relation to effective PE 100 wall thickness.

² Pipes with added inner layer for full pressure-specific load-bearing capacity available on request.



i Further information about SIMONA® PE 100 AP-Line can be found here,

References

SIMONA® piping systems for the rehabilitation of a wastewater pump pipeline

A cast-iron pipeline had been eroded by constant discharge of solids. Therefore, after about 38 years of operation pipe fractures had appeared at multiple points. Extensive pipe rehabilitation had thus become an urgent necessity. As part of this project it was particularly important for the new wastewater pressure pipes to have a highly wear-resistant inner layer.

Based on PAS 1075 Types 2 and 3, SIMONA® PE 100 RC AP-Line CoEx wastewater pressure pipes were made without and with a protective jacket, respectively. They were particularly suitable for meeting the requirements of this project.

Owing to a high level of notch and crack resistance, it was possible to lay the new pressure pipeline by means of the trench-cutting and the HDD method, which not only saved time but also proved highly cost-effective.

The system provider supplemented the project with appropriate fittings such as bends with $r = 5d$ as well as non-standard components such as loose flanges. The new AP-Line product range for wastewater pressure pipelines offers significant added value for the conveyance of solids and serves to ensure a very long system service life.



Installation of the pipeline by trench cutting



Pipe insertion into the pre-cut trench



SIMONA® PE 100 RC SPC-AP-Line wastewater pressure pipes

SIMONA® PE 100 SPC-AP-Line for trenchless renewal of a wastewater pipeline

An old wastewater pipeline made of asbestos cement had to be renewed over a total length of 840 m on account of considerable damage. In Germany, the rehabilitation of an old pipe made of asbestos cement requires compliance with the provisions of TRGS 519 (German Technical Rules for Dangerous Substances). Therefore, a suitable pipelaying method had to be selected where the procedure would conform to German 'BGI' occupational health and safety standards and minimise exposure. Static pipe bursting satisfies those requirements and was thus selected as the laying method. Furthermore, it was important to the client that the new pipeline should have an abrasion-resistant internal surface due to the levels of sediment in the wastewater, which were very high at times.

SIMONA® PE 100 SPC AP-Line was identified as the best possible system solution: the added protective jacket made of modified polypropylene is characterised in particular by a high level of abrasion resistance and is ideal for trenchless pipelaying by means of the pipe bursting method. The inner pipe also has convincing features, such as high resistance to point loads and linear loads, plus slow crack propagation, so it provides permanently reliable protection against pipeline failure and ensures a maximum service life. Consequently, even after trenchless laying, SIMONA® PE 100 SPC AP-Line pipes still possess 100% new-pipe quality. In addition, the AP-Line inner layer (AP = Abrasion Protection) protects the pipeline against abrasion and enables a much longer service life.



Machine pit with Grundoburst 400 G static bursting rig during the insertion procedure. Compulsory protective clothing for the operators in compliance with TRGS.

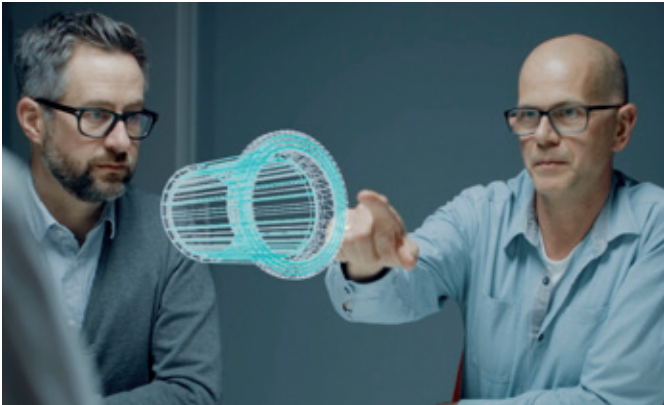


Old asbestos cement pipeline DN 150 with damaged inner layer



New pipe SIMONA® PE 100 SPC AP-Line OD 200 x 11.9 SDR 17

Advisory service



Worldwide we offer you a first-class advisory service. Our employees at the Technical Service Centre and Customer Service will be pleased to provide you with comprehensive advice, from project planning, product selection and material selection to applications advice on pre-engineering in the field. In addition to product and material selection, strength analyses, information about pipelaying methods, non-standard sizes and customised product developments, we also support you with the calculation of verifiable structural analyses for buried pipes. Our experts will also be glad to provide you with appropriate support in processing the products directly on site.

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