

SIMONA® Protective Sheets

## Perfect protection for gas pipelines



Processing SIMONA® Protective Sheets at the Ringsheim plant

**A regulation governing the safety of pipelines for gases and chemicals has been in existence in France since 2006. Pipelines that convey dangerous substances (e.g. combustible gases) through public spaces must be protected against damage caused by excavators and similar vehicles. To provide gas pipelines with mechanical protection, SIMONA has developed an innovative, easy-to-install system of PE protective sheets which is already in demand internationally.**

SIMONA® Sheets made of the materials PE-CoEx and PE-AR are ideal for use as protective sheets that meet exacting requirements and comply with stringent quality specifications.

SIMONA® PE Protective Sheets offer the following benefits:

- Long service life (approximately 100 years in the ground)
- High corrosion resistance
- High impact resistance even at low temperatures

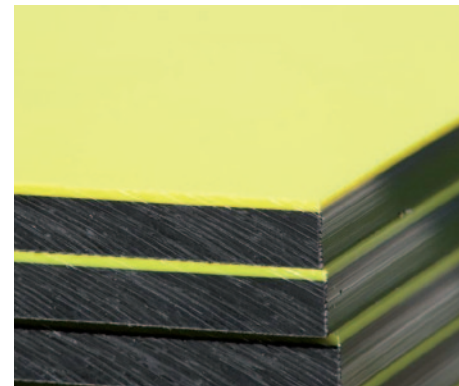
- Good chemical resistance
- Extreme robustness, e.g. they will withstand the impact exerted by a 32 tonne excavator bucket

### PE co-extruded

Co-extruded SIMONA® PE-CoEx is available in yellow/black and coloured/black/coloured for highly effective warning. Labelling or the application of a wide coloured stripe can be performed during the extrusion process.

### PE with anti-slip layer

SIMONA® PE-AR has an anti-slip layer and is ideal for efficient installation, depending on conditions and on the subsurface. A special coating reduces the risk of accidents when sheets are being laid on sloping or slippery



SIMONA® PE-CoEx protective sheets

### Your contact



**Louis Sperber**  
Industry Business Unit  
Technical Support

Louis Sperber has a degree in electrical engineering (University of Applied Sciences). He also completed a course of further study at the University of Mulhouse to qualify as a telecommunications engineer. After his studies he worked for ALCATEL as a developer for ten years and then in the sales department of an electronics company for three years.

Louis Sperber joined SIMONA in mid-1996. Initially, he was assigned to the TSC as an engineering consultant. In 2008, he was appointed as the manager in charge of technical customer support for the French-speaking region (France, Belgium and North Africa) within the Industry Business Unit. His responsibilities include the preparation of tank and pipe analyses, as well as cultivating business relations with French approval institutes such as LNE, CSTB and IPL.

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terrain. The soft layer applied during the co-extrusion process does not affect service life, impact resistance or the efficiency of warning.

### Assembly

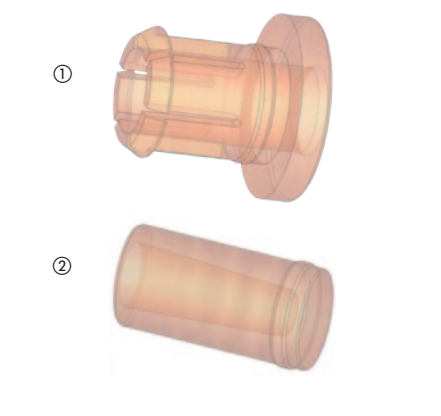
There are two possible methods of laying SIMONA® Protective Sheets: laying edge to edge, or laying with sheet overlap (Figure 1).

With the overlapping method, pressed-in PP rivets with a diameter of 30 mm are used for the purpose of mechanically connecting individual protective sheets to create an overall safety installation.

Special SIMONA® PP rivets and locking pins along the centre axis have an optimised geometry with maximum tensile strength at

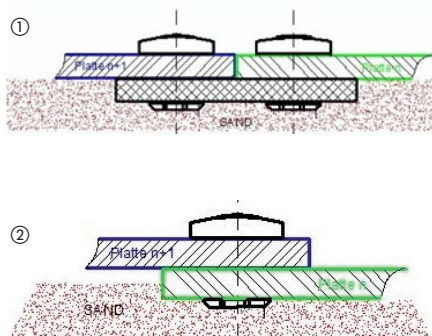
break (Figure 2). Owing to their high level of impact resistance and an elongation at break of over 50%, the protective sheets can be connected securely at all times. Increased resistance to surface water also prevents the sheets from coming apart.

Figure 2



- ① PP rivet
- ② Locking pin

Figure 1



- ① Laying with edge to edge
- ② Laying with overlap

### Cathodic corrosion protection

- Sheets can be pre-drilled with a diameter of 20 mm or 30 mm without jeopardising the level of resistance
- Regulation of water drainage
- Hence advantages for cathodic corrosion protection
- Resulting increase in sheet strength

### Protective sheets with retaining device

To protect workers against slipping when laying the protective sheets on sloping ground, it is advisable to use special protective sheets with studded panels 140 cm x 40 cm (Figure 3).



Figure 3: Protective sheets with studded panels

### Conclusion

Extreme robustness, long service life and outstanding reliability in conjunction with fast and easy assembly are the key quality features of SIMONA® PE-CoEx and SIMONA® PE-AR sheets. This makes them the perfect choice for mechanical protection of gas pipelines irrespective of weather conditions and the local situation (Figure 4).

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Figure 4: Protective sheets laid over a gas pipeline



SIMONA Technical Service Center

## Technical consultancy for tank design, composite construction and processing



**SIMONA's Technical Service Center offers a wide range of engineering services, with an emphasis on providing first-class customer consultation in all areas covered.**

### Chemical resistance

Every year, written replies are provided to over 500 customer enquiries about the chemical resistance of SIMONA® Products. Statements made are backed up by immersion tests that can be performed in the SIMONA laboratory in compliance with ISO 4433 and DIN 16888. Material and damage analyses can also be performed in the laboratory if required. With the SIMCHEM CD-ROM, customers can access a database listing over 3,000 substances and proprietary products.

### Tank design

Structural calculations for tanks and ventilation ducts (rectangular and circular geometries) are conducted with the aid of the

calculation software Tankdesigner. The program marketed by FAB Consult, which was written in technical collaboration with SIMONA AG, provides verifiable, reliable structural analyses. For tanks made of SIMONA® Twin-Wall Sheets there is a specially developed FEM-based software in use.

### Composite construction

The service profile includes processing and design information on fluoroplastics (e.g. PVDF, E-CTFE) as well as advice about the various types of fabric available.

### Product-specific advice

The TSC offers specific advice about all SIMONA® Products, e.g. polyolefin foams (welding, thermoforming), PVC foam (printing, die cutting), SIMOLUX (vacuum forming, printing, bending). There is close collaboration with paint manufacturers and thermoformers.

### Processing / Technology Centre

For thermoforming, hot forming, composite construction and the relevant welding methods, information is provided on processing techniques and on-site services are made available.

### Training

Nationally or internationally, at SIMONA or customer sites, the TSC offers training sessions focusing on SIMONA® Products, vari-

ous processing techniques (welding, hot forming, glueing, printing), the basics of polymers and numerous specific issues.

### Project consultancy

In the field of tanks, linings and pipes, customer projects are managed on an individual basis and special requests are catered

for accordingly. The TSC provides customers with technical consultancy services, plus accompanying laboratory tests if required.

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## Plastics Expertise

### Latest news from the DVS on tank calculations

Supplements 7 to 10 for calculating hoppers (ring-supported/web-supported) and sloping bottoms of circular tanks have been approved. With guideline backing it is now possible to calculate and document such designs in accordance with DVS 2205-2. For the construction work it is essential that a continuous outer casing is built. The hoppers/sloping bottom should be placed through the casing on the lower casing ring and be triple-welded. The supports (rings or stiffeners) can be welded on one side.

On account of the earthquake in Fukushima, the earthquake resistance of storage tanks has become a key issue. It has also been discussed by the DVS 4.3b panel of experts and a draft supplement has been published. The design will have to be implemented on the calculation basis of DVS 2205-2 Supplements 3, 7 and 9. DIN 4149 and DIN EN 1998-4 (Eurocode 8) are sup-

porting documents. Special records must be kept of the axial stability at the bottom edge of the tank (frame) next to the nozzles in the cylinder, axial stability of the supporting rings, the buckling resistance of the stiffeners and that of the tank fixtures. It is chiefly the supports, their number and their geometry that are affected by this guideline. They must prevent axial acceleration of the tank in the event of an earthquake and stop it from tipping over. Sizing in accordance with DVS 2205-2 is only applicable to the German earthquake region (max. 20% of the German area overall). Nor are tanks inside buildings covered by this guideline. The supplement has already been implemented in Tankdesigner and can be used after the next update.

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dehoplast® x-protect

# Plastic Sheets for Neutron Absorption



dehoplast® x-protect offers reliable neutron protection, e.g. in medical installations

**SIMONA dehoplast® x-protect is a specially developed polyethylene for shielding against neutrons. Owing to a high level of hydrogen in the plastic and homogeneously distributed boron compounds, neutron radiation in medical and nuclear applications can be very effectively slowed down and absorbed.**

dehoplast® x-protect is available as a pressed sheet dehoplast® x-protect 500 (high-molecular weight) and as dehoplast®

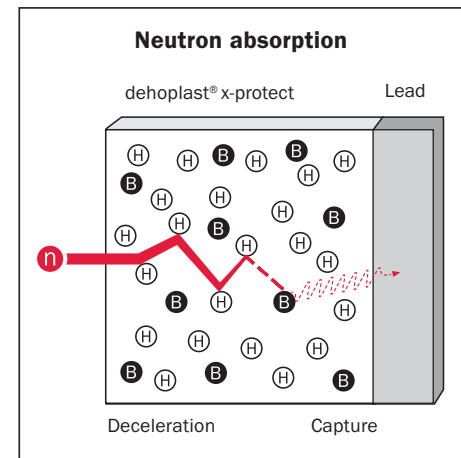
x-protect 1000 (ultra-high molecular weight). Among the typical applications are the lining of high-radiation rooms in clinics, radiotherapy systems, nuclear power plants, nuclear research centers, reprocessing plants, atomic waste transport and storage, nuclear powered ships and submarines, spacecraft and space stations.

## Excellent neutron absorption

The boron content and homogeneous distribution of boron compounds in dehoplast®

## Excellent properties of dehoplast® x-protect

- High absorption of thermal and free neutrons
- Low absorption of moisture
- Low specific weight compared to steel and lead
- High chemical resistance
- Good abrasion resistance
- High wear resistance
- High impact strength
- Wide service temperature range:
  - dehoplast® x-protect 500: -80 °C to + 80 °C
  - dehoplast® x-protect 1000: -100 °C to + 80 °C



of lead for example. The diagram shows how a neutron shield made of dehoplast® x-protect works.

## Good processing capability

dehoplast® x-protect sheets are lighter than other neutron protection materials and they are easy to machine.

Andrei Wenzel

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x-protect sheets ensure effective absorbercy. The standard proportion of boron in dehoplast® x-protect is five per cent. The boron content can be raised in order to increase the level of neutron absorption.

With dehoplast® x-protect the high-energy neutrons are initially slowed down by the hydrogen atoms in the polyethylene and then captured by the boron atoms. Any resulting secondary radiation can be attenuated in a further layer, which can be made

## Project Report

# Collection tank for acid solutions made with SIMONA® PP-DWU AlphaPlus®



Maximum safety standards were crucial for a tank made with SIMONA® PP-DWU AlphaPlus®

**G&H Kunststofftechnik GmbH & Co. KG was commissioned to construct a collection tank for the storage of acid solutions for an aluminium anodising plant. SIMONA® PP-DWU AlphaPlus® was the material of choice because its high level of chemical resistance makes it ideal for the construction of tanks and installations.**

## Initial situation

By nature, aluminium forms a thin oxide layer that prevents any further oxidation of the

metal. In an aluminium anodising plant this oxide layer is built up by technical means in an optimised process. The resulting oxide layer created artificially surpasses any natural layer by far in terms of thickness, hardness and wear resistance. However, creating an oxide layer on aluminium calls for an electrochemical process where acid liquids occur which have to be treated or disposed of. The quantity of such solutions depends on the size and throughput of the aluminium anodising plant.

## Task

G&H Kunststofftechnik GmbH & Co. KG in Sprockhövel received a contract to build a collection tank with a capacity of 92,000 litres for acid solutions for an aluminium anodising plant. Due to site conditions, the tank had to be rectangular.

## Solution

For this task the tank was constructed with SIMONA® PP-DWU AlphaPlus®, particularly as it offers a high level of chemical resistance.

Owing to its dimensions, the plastic tank, despite an external wall thickness of 25 mm, had to be reinforced with a steel cage in such a way that bowing would be limited to a

maximum amount suitable for the particular plastic. When planning the tank, including the steel frame, G&H Kunststofftechnik GmbH & Co. KG used a tank calculation program. On account of its large size, the steel reinforcement for the plastic tank (approx. 6.5 x 4.5 x 3.3 m) was delivered to the construction site as individual components. The entire tank was assembled on site and then integrated into the complete system installed at the final location.

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Ready for transport: part of the collection tank

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