

# SIMONA



Further Products  
from SIMONA

# SIMONA® PE multilayer sheets – Effective protection against emissions

**PE multilayer sheets are made of polyethylene and feature a unique barrier layer. The ability of the EVOH layer to block gases and vapours containing hydrocarbons, combined with the excellent vacuum-forming properties of polyethylene, makes SIMONA® PE multilayer sheets a truly pioneering solution for the manufacture of fuel tanks. Moreover, thanks to this cutting-edge technology, manufacturers will be able to meet even the most demanding fuel-tank emission standards well into the future.**

PE multilayer sheets consist of two outer layers made of high-molecular-weight polyethylene, followed by two regrind layers. A layer made of ethylene vinyl alcohol (EVOH) with adhesion promotion layers on both sides acts as a barrier.

Multilayer sheets can be manufactured in a width of up to 2,400 mm by means of the coextrusion method. Using a thermoforming process, the sheets are subsequently made into tanks. One of the key benefits of the materials used within this area is the so-called barrier effect, with the help of which lower emission levels prescribed for future fuel tanks can be met with ease.

## **Benefits of processing multilayer sheets for tanks**

SIMONA® PE multilayer sheets offer a range of benefits, not only with regard to product characteristics but also in terms of commercial viability within the areas of manufacturing and logistics. Thermoformed tanks are larger in volume and lower in weight compared with conventional blow-moulded tanks. They are also suited to more flexible production and machining concepts due to the fact that the thermoforming process deployed within this area is not as machine-dependent as blow-moulding. Depending on the quantities to be manufactured, processors may opt for standalone, in-line integrated or rotational solutions. Thanks to on-site production of the tanks at the actual assembly plant, there is no longer the need for shipment of bulky components prior to assembly – sheets cut to size and transported on pallets are sufficient.



### Key characteristics

- Gas- and aroma-proof barrier effect
- Corrosion-resistant
- Extremely tough and high level of rigidity
- Impact-resistant
- Physiologically safe
- Temperature range from -50 °C to +80 °C
- Outstanding vacuum-forming properties
- Machine-weldable without impairing barrier properties
- Excellent value



### Product range

#### SIMONA® PE Multilayer Sheets

Material	PE-HD, EVOH-barrier layer
Colour	  Outer layers black or natural (coloured layers available upon request)
Thickness	3–10 mm
Width	max. 2400 mm
Layer structure	5–7 layers, variable layer thickness
EVOH layer thickness	2–10 per cent of total thickness

Specific technical assessments may be required for other combinations of materials.

# SIMONA® twin-wall sheets – the second generation: High rigidity, low weight

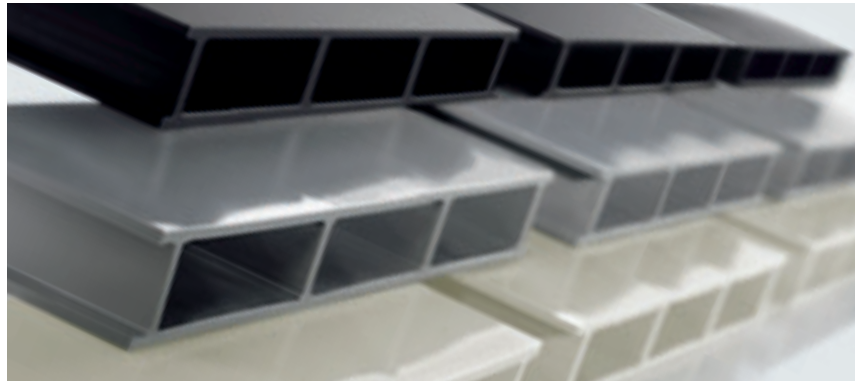
Twin-wall sheets are manufactured from PE 80, PP-H 100 or PPs sheets using state-of-the-art machine technology.

## Benefits of second-generation product

- Variable web spacing
- Number of web structures can be selected
- Various sheet thicknesses available
- Combination of various material thicknesses possible
- Excellent processing characteristics
- Wide range of applications
- Technical support for tank design, including FEM calculations

## Design-specific advantages

- Rectangular tanks possible without steel reinforcement
- Light-weight solution due to cavity structure
- Excellent sound insulation (DIN ISO 140-3 certifications available upon request)
- High rigidity and strength
- High resistance to fracture
- Broad scope of application



## Material-specific advantages

- High thermal insulation
- Good electrical insulator
- Good sliding properties
- High wear resistance
- High chemical resistance
- Low water absorption
- Resistant to microorganisms
- Excellent processing capability

## Areas of application

### Construction industry

- Slip and anti-wear sheets in conjunction with thermal insulation
- Walk-on swimming-pool covers
- Light-weight formwork
- Light-weight shaft base or concrete-lined for anti-buoyancy
- Shafts
- Protective ducts for pipelines and utility systems
- Stone impact protection in road construction
- Sound barriers with and without packing
- Safety floor sheets

### Apparatus, equipment, machinery

- Rectangular tanks/vessels
- Covers for electroplating baths, structurally strong and thermally insulating
- Boat construction
- Storm-water retention basins
- Cooling-water tanks
- Floating pontoons for pipelines and supply lines at sea
- Refrigerating containers/ice boxes
- Sound booths
- Spray booths
- Weather booths
- Biofilters
- Safety tanks
- Water supply tanks



**SIMONA® PE-HKP**

PE 80 is a high-heat resistant, UV-stabilised polyethylene.



**SIMONA® PP-HKP**

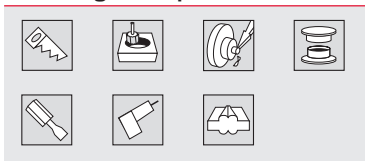
PP-H is a homopolymeric polypropylene with permanent-heat resistance.



**SIMONA® PPs-HKP**

PPs is a low-flammability, homopolymeric polypropylene with permanent-heat resistance.

**Processing techniques**



**First-generation twin-wall sheets**

Height mm	Web height mm	3000 x 1000 kg/unit	Web spacing mm	Material thickness mm
PE-HKP, black				
54	41	42.0	140	6
PP-HKP, grey				
54	41	42.0	140	6
PPs-HKP, grey				
54	41	42.0	140	6

**Second-generation twin-wall sheets**

Height mm	Web height mm	3000 x 1000 kg/unit	Web spacing mm	Material thickness mm
PE-HKP, black				
54 – 100	variable	variable	56 – 140	5 – 8
PP-HKP, grey				
54 – 100	variable	variable	56 – 140	5 – 8
PPs-HKP, grey				
54 – 100	variable	variable	56 – 140	5 – 8

**Material specifications of first-generation product (standard sheets)**

	PE-HKP	PP-HKP	PPs-HKP
Density, kg/m <sup>2</sup>	13.6	13.2	13.6
Modulus of elasticity in web direction	540	740	810
Modulus of elasticity perpendicular to web direction	120	140	152
Modulus of elasticity perpendicular to web direction	no break	no break	no break
Impact strength at –40 °C	0.59	0.56	0.56
k-value, W/[m <sup>2</sup> · K]	–50 to +80	0 to +100	0 to +100
Temperature range, °C			
Fire behaviour DIN 4102 (basic sheet)	normal flammability	normal flammability	low flammability B1
Sound insulation, dBA	28 (filled with rock wool: 31)		

**Material specifications of second-generation product (standard sheets)**

	PE-HKP	PP-HKP	PPs-HKP
Specifications vary depending on product type			

**Corners made of twin-wall sheets**

Corners in 45° and 90° angles are made of PE-80, PP-H or PPs and are available upon request.

# SIMONA® Hollow rods

## PE 100 hollow rods, black

Ø mm	s mm	d <sub>i</sub> mm	Weight		Order no.
			kg/m	kg/piece	
110	32.5	45.0	7.89	9.47	035001155
125	30.0	65.0	8.92	10.70	035001326
140	37.5	65.0	12.04	14.45	035100001
160	35.0	90.0	13.70	16.44	035001158
160	45.0	70.0	16.20	19.44	035001156
180	30.0	120.0	14.12	16.94	035001337
180	40.0	100.0	17.53	21.04	035100002
210	55.0	100.0	26.69	32.03	035001101
230	65.0	100.0	33.58	40.30	035001104
230	70.0	90.0	35.14	42.17	035100013
260	70.0	120.0	41.65	49.98	035001369
290	70.0	150.0	48.22	57.86	035100003
325	77.5	170.0	60.06	72.07	035001113
365	77.5	210.0	69.77	83.72	035100004
410	75.0	260.0	78.67	94.40	035100005
460	77.5	305.0	92.82	111.38	035100006
470	82.5	305.0	100.31	120.37	035100014
510	75.0	360.0	102.16	122.59	035100007

Standard length: 1200 mm

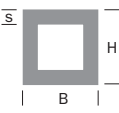

Available upon request:

- Hollow rods in custom lengths

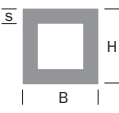
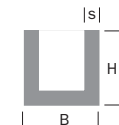
s = Wall thickness    d<sub>i</sub> = Inside diameter

# SIMONA® Profiles

## PE profiles, black

	<b>B</b> mm	<b>H</b> mm	<b>s</b> mm	<b>Weight</b> kg/m	<b>Order no.</b>
<b>Square pipes</b> Length: 5 m 	35	35	3.0	0.36	045000001
	35	35	4.0	0.47	045000168
	50	50	4.0	0.70	045000002
	50	50	6.0	1.00	045000169
<b>U-profiles</b> Length: 5 m 	48	46	3.5	0.44	045000008
	49	67	4.0	0.67	045000003
	49	72	4.0	0.70	045000170
	49	112	4.0	1.00	045000004
	49	132	4.0	1.16	045000005
	69	92	4.0	0.93	045000006
	69	134	4.0	1.25	045000007
	90	92	4.0	1.00	045000171
	92	155	5.0	1.86	045000009

## PP profiles grey (~ RAL 7032)

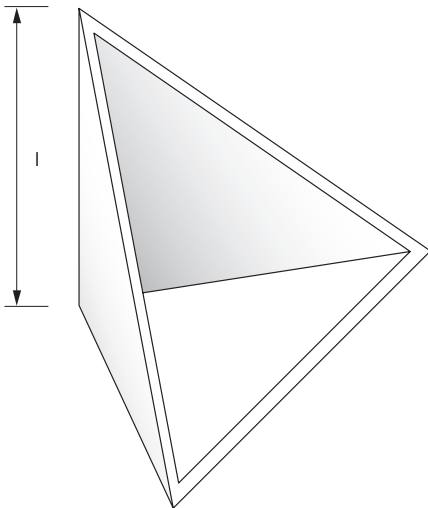
	<b>B</b> mm	<b>H</b> mm	<b>s</b> mm	<b>Weight</b> kg/m	<b>Order no.</b>
<b>Square pipes</b> Length: 5 m 	35	35	3.0	0.35	045000010
	35	35	4.0	0.45	045000011
	50	50	4.0	0.66	045000012
	50	50	6.0	0.95	045000013
<b>U-profiles</b> Length: 5 m 	48	46	3.5	0.42	045000023
	49	67	4.0	0.63	045000014
	49	72	4.0	0.67	045000155
	49	112	4.0	0.96	045000015
	49	132	4.0	1.01	045000016
	69	92	4.0	0.88	045000017
	69	134	4.0	1.18	045000019
	90	92	4.0	0.97	045000156
	92	155	5.0	1.76	045000024

Available upon request:

- Square pipes in PPs
- Profiles in custom lengths

s = Wall thickness

# SIMONA® tank corners



## SIMONA® PE-HD tank corners, black

Wall thickness mm	Edge length l mm	Weight kg/piece	PU piece
5	150	0.15	4
8	150	0.23	4
10	150	0.28	4

PU = Packing unit

## SIMONA® PP-H tank corners, grey

Wall thickness mm	Edge length l mm	Weight kg/piece	PU piece
5	150	0.15	4
8	150	0.22	4
10	150	0.27	4

PU = Packing unit

SIMONA tank corners are a versatile solution for structural applications as well as repair purposes.

### Fields of application

- Direct fitting to the walls of rectangular tanks to eliminate welding seams
- Reinforcement for rectangular tanks by welding on the corners internally or externally
- Reinforcement for linings by welding corners to the tank from the inside
- Repair corners for sealing corner areas of tanks
- Corner element for seals
- Impact protection in equipment engineering to avoid damage
- Supporting element for covers

# SIMONA® scrapers – Professional welding in accordance with DVS



SIMONA scrapers are an indispensable tool within the area of high-quality hot-gas welding. They are available in units of 5 scrapers per pack.



Correct welding is demonstrated at the SIMONA Technology Centre.

## Examples of weld structure in accordance with DVS, angle of 60° (single V)

Sheet thickness mm	Welding rod Quantity x diameter in mm
2	1 x 4
3	3 x 3
4	1 x 3
4	2 x 4
5	6 x 3

## Temperatures during hot-gas welding, measured in the welding nozzle

PE	300 – 340 °C
PP	280 – 320 °C
PVC	350 – 400 °C
PVDF	360 – 400 °C

## Welding of plastics

Plastic welding refers to the permanent joining of thermoplastics by applying heat and pressure, with or without the use of additional materials.

All welding processes are performed when the materials in the boundary areas of the surface being joined are in a ductile state. Here, the linear molecules of the parts being joined and pressed together link up and entwine to form a homogeneous material bond.

Only plastics of the same category, e.g. PP and PP, and within these groups only those with identical or similar (adjacent) molecular weight and the same density, can be welded to one another; colour does not have to be taken into account. Rigid polyethylene and plasticized polyethylene cannot be welded to one another.

One exception to this rule is the bonding of rigid PVC to acrylic glass, where the strength of the welded seam is satisfactory.

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