

SIMONA



02/2004

Product Information
SIMOPOR / SIMOPOR-LIGHT

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1 General

SIMONA® SIMOPOR/SIMOPOR-LIGHT sheets feature low densities of approx. 0.70 g/cm³ and 0.5 g/cm³ respectively, coupled with considerable rigidity. High sound and heat insulation, comparable with that of integral skin foams, can be taken for granted with these two materials; the thermal conductivity of SIMONA® COPLAST-AS is 2.56 W/m²K/15 mm and airborne sound insulation is 32 dB/15 mm sheet thickness. The fire rating – for both materials there are B1 test certificates confirming low flammability in accordance with DIN 4102 for the entire range of thicknesses – opens up a wide range of applications for this material.

SIMOPOR/SIMOPOR-LIGHT white is suitable for outdoor use to a limited extent.

Cell structures at the cutting edges can be sealed tightly and neatly with appropriate synthetic resins or so-called edge strips. However, owing to the low water absorption of SIMOPOR and SIMOPOR-LIGHT this is only normally required for reasons of visual appearance.

1.1 Advantages over solid PVC sheets

- Considerable weight reduction
- Better handling
- 1 m² of a sheet in 3 mm:
SIMOPOR 2.1 kg, PVC-CAW 4.3 kg
- 1 m² of a sheet in 10 mm:
SIMOPOR-LIGHT 5.0 kg, PVC-CAW 14.2 kg
- Low thermal conductivity, thus favourable k-value
- Oscillation and vibration-absorbent
- Excellent processing qualities
- Lower cost per unit area

1.2 Examples of applications

- Advertising sector
 - Signs
 - Displays
 - Exhibition stands
 - Photograph backing
- Construction sector
 - Heat and sound insulation
 - Interior design
 - Shopfitting
 - Shop counter design
 - Interior finish
 - Partitions
 - Window and door manufacture
 - Façade construction
 - Panelling
- Miscellaneous
 - Transport containers
 - Modelmaking

2 Range of products

2.1 SIMONA® SIMOPOR

extruded, foamed, white

thickness: 1–5 mm

dimensions: 2000 x 1000 mm

2440 x 1220 mm

3050 x 1220 mm

3050 x 1530 mm

3050 x 2030 mm

2.2 SIMONA® SIMOPOR-LIGHT

extruded, foamed, white

thickness: 3–19 mm

dimensions: 2000 x 1000 mm

2440 x 1220 mm

3050 x 1220 mm

3050 x 1530 mm

3050 x 2030 mm

3 Technical information

3.1 Material specifications

	Test standard	Dimension	SIMOPOR	SIMOPOR-LIGHT
Mechanical properties				
Density	ISO 1183	g/cm ³	0.72	0.55
Tensile test	DIN EN ISO 527			
Yield stress		MPa	20	13
Yield strain		%	2.5	3
Tensile strain at break		%	20	20
Modulus of elasticity in tension		MPa	1300	750
Impact bending test	DIN EN ISO 179			
Impact strength		kJ/m ²	11	15
Surface hardness				
Shore hardness	ISO 868	–	53	48
Thermal properties				
Vicat softening point	DIN EN ISO 306	°C	A/50: 82	A/50: 82
Coefficient of linear thermal expansion	DIN 53752	K ⁻¹	0.8 · 10 ⁻⁴	0.8 · 10 ⁻⁴
Thermal conductivity	DIN 52612	W/mK	0.087 ¹⁾	0.0709/19 mm Dicke
Fire behaviour	DIN 4102	–	B1 ²⁾	B1 ³⁾
Electrical properties				
Volume resistivity	DIN IEC 60167	Ohm · cm	10 ¹²	–
Surface resistivity	DIN IEC 60093	Ohm	> 10 ¹⁵	> 10 ¹⁵
Water absorption	DIN 53495	%/24 h	< 0.2	0.5
Physiological admissibility	acc. to recomm. of BgVV	–	no	no

¹ measured at test specimen of 6 mm thickness

² test certificate for 1–5 mm

³ test certificate for 5–19 mm

The data listed are standard values and they can vary according to the method of processing of samples. These data are average values of measurements at extruded sheets (for SIMOPOR of 4 mm, for SIMOPOR-LIGHT of 10 mm thickness). The data cannot be simply transferred to finished parts. The suitability of our materials for a certain type of application shall be checked by the manufacturer or user.

3.2 Performance in outdoor use

SIMONA® SIMOPOR/SIMOPOR-LIGHT sheets have limited stabilisation for outdoor use. Owing to the interaction of a number of physical processes (intensity of radiation, temperature) and chemical processes (sulphur dioxide, nitrogen oxides and ozone in the ambient air), the extent of which cannot be determined in advance, no accurate information can be provided regarding service life in practical use. Based on extensive tests using accelerated weathering apparatus service life under normal conditions can be expected to be approx. 1 to 2 years without any significant changes in colour, assuming Central European climatic conditions.

SIMONA® PVC semi-finished products are provided with stabilisers which contain neither cadmium nor lead.

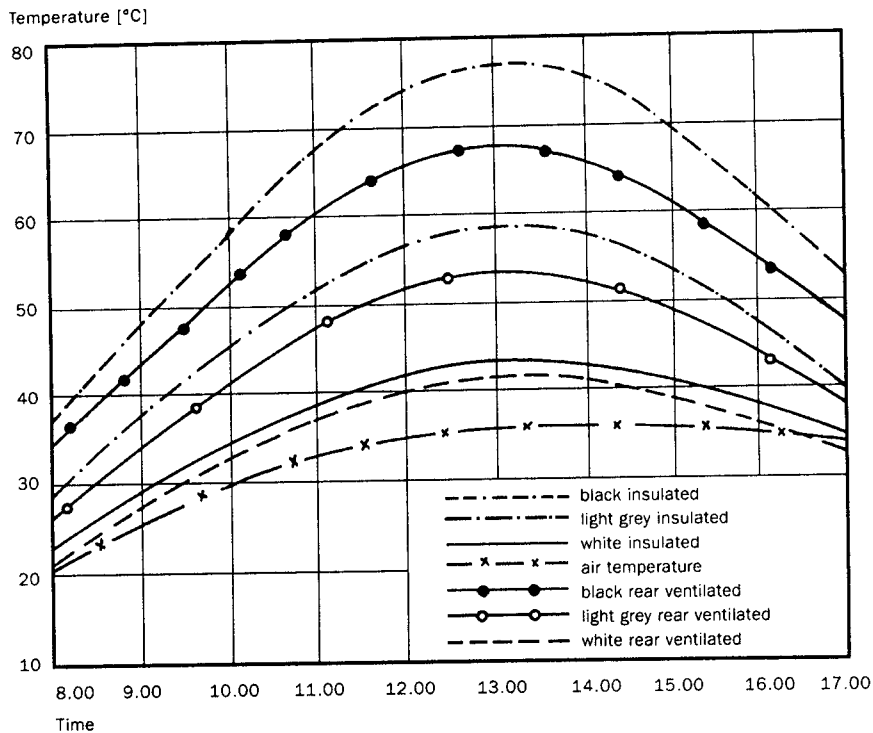
Influence of back ventilation and colour shade on performance in outdoor use

Experience has demonstrated that the use of PVC in the open air is limited owing to climatic conditions. For years now PVC has been used very successfully in Central European climatic zones north of the Alps. In Mediterranean countries with much more intense solar radiation and higher temperatures the use of PVC cannot be recommended without reservation.

Dark colours absorb heat much more than light colours. Even in Central European climatic zones sheet temperatures can therefore reach levels which are twice as high as actual outdoor temperatures. For this reason dark-coloured PVC sheets should not be used outdoors.

A well-known raw material supplier has made a valuable contribution to product analysis with measurements of the change in temperature during exposure to solar radiation.

Test conditions: PVC sheets 3–4 mm thick, partially back-ventilated, partially insulated. The measurements were taken on a hot day in July. As expected, insulated sheets had a higher level of heat absorption than the back-ventilated ones (see diagram). Information on heat absorption of the respective colour shades is provided by the values measured at 1 p.m.



Temperature readings of the uPVC sheets depending on colour and rear ventilation sheet thickness 3–4 mm, sun irradiation, max. air temp. 36 °C

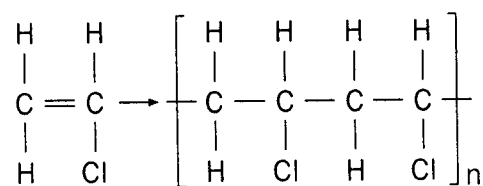
Consequently, light-coloured semi-finished products have the following advantages due to lower heat absorption:

- Lower sheet temperature
- Less thermal expansion
- Longer service life

3.3 Health aspects

PVC has a relatively long tradition. As far back as 1912–1913, German chemists Klatte and Zacharias developed a process to polymerise PVC. Full-scale production was launched at the end of the 1920s. Nowadays, monomeric vinyl chloride is manufactured from acetylene and hydrogen chloride according to the traditional method and from ethylene and chlorine according to the more recently developed process based on petrochemical raw materials. The long-chain

polyvinyl chloride (PVC) is made from the colourless, gaseous vinyl chloride (VC) by polymerisation (emulsion, suspension or mass polymerisation).



Vinyl chloride (VC) Polyvinyl chloride (PVC)

From the formulas indicated it becomes evident that PVC contains not only carbon and hydrogen but also chlorine (approx. 50 % by weight).

How PVC burns

PVC is a low-flammability material. This means that the flame extinguishes itself if the source of ignition is removed. In the event of a fire at temperatures above 400 °C the molecular chains are split. In addition to hydrogen chloride, this process will generate carbon dioxide, carbon monoxide, carbon, moisture and low-molecular polymerisation products, but not vinyl chloride (VC). If fumes from PVC are inhaled, a doctor must be consulted (see also SIMONA® safety data sheet).

Processing PVC

Under material-compatible conditions no health hazards whatsoever are to be expected. There is no need to take special measures with regard to odours.

The temperatures occurring during welding are not sufficient to split off the hydrochloric acid from the molecule. However, if, for example, clinging deposits of PVC are left on the heated tool after heated tool butt welding, the strength of the welded seam will be affected and toxic gases, e.g. containing hydrochloric acid, may be emitted. For this reason it is advisable to clean the heated tool regularly.

In order to establish the hydrochloric acid emission during hot-gas welding, measurements have been taken at the welder's level of work. They are non-measurable values and the detection limit is 1 ppm. Some of our extruder staff have been operating extrudes for 20 years, manufacturing PVC semi-finished products. So far there have been no illnesses attributable to PVC. Regular monitoring by the accident insurance association has not resulted in any objections either.

When machining by chip-forming processes PVC dusts can be emitted into the ambient air, especially when using blunt tools and consequently high temperatures. A distinction is made between "relatively safe" coarse dust and fine dust. This dust can enter the lungs together with inhaled air; it is particularly the fine dust which can cause respiratory disorders. For this reason it is recommended that the dusts be extracted during processing. The MWC (maximum workplace concentration) is currently 5 mg/m³ air.

The stabilisation of polymers has a high level of economic importance because it counteracts accelerated aging caused by various influences. In the case of rigid PVC it is thus possible to achieve a high level of resistance to heat and weathering. Effective stabilisation systems for rigid PVC are based on metal compounds. Committed to health and environmental protection, SIMONA AG refrains from using highly effective but toxic compounds containing cadmium and lead. We are proud of achieving similarly or equally good results in terms of resistance to thermal stress and exposure to ultraviolet light using the much safer tin stabilisers.

Monomeric vinyl chloride (VC) content in the PVC

PVC polymers can contain slight residues of monomeric VC which was not involved in the polymerisation process. However, SIMONA only uses selected raw materials with minimal VC levels (≤ 3 mg/kg). In the manufacture of semi-finished products the level of vinyl chloride is reduced to approx. 0.5 mg/kg.

At service temperature all SIMONA PVC-U semi-finished products either liberate no volatile compounds that can be detected by conventional means, e.g. vinyl chloride, or they do not liberate any relevant compounds. An "outgassing" of VC in the region of 1 ppm is only to be expected from temperatures of approx. 200 °C upwards and an exposure time of > 1.5 h, or if machining is not conducted properly (the value specified by the German "TRGS" Technical Rules for Dangerous Substances is $420 \leq 5 \text{ mg/kg}$).

MWC values

MWC (in German MAK) means "maximum workplace concentration". The values state the concentration in ppm of a gaseous, vaporous or powdery work material which is assumed, for an exposure time of eight hours a day, not to damage the health of staff in the working area.

The MWC values are issued by the Federal Ministry of Labour and Social Affairs in Bonn, Germany. As a matter of policy we recommend providing adequate ventilation in working areas where plastics are being processed.

3.4 Behaviour in fire

SIMONA® SIMOPOR and SIMOPOR-LIGHT are flame retardant. We are in possession of test certificates covering the entire range of thicknesses:

SIMOPOR	1–5 mm
SIMOPOR-LIGHT	5–19 mm.

Please bear in mind that the certificates issued by the testing institutions only assess the combustibility of the semi-finished product as B1. In many cases any further processing or installation of semi-finished products makes it necessary to obtain a further assessment.

Depending on the material and application, certain conditions are specified in the certificates of approval, e.g.:

- sheet thickness tested
- minimum distance of more than 40 mm from other flat construction materials
- no painted or coated sheets

These and any further restrictions which are dependent on the product are indicated on the respective test certificate.

4 Processing

4.1 Machining

SIMONA® SIMOPOR and SIMOPOR-LIGHT are very easy to machine by chip-forming processes. The approximate figures for sawing and drilling are virtually the same as for standard rigid PVC:

- Sawing (band saw, circular saw)

Lead angle 10–15° HM (Carbide tipped)
 30–40° SS (high-speed steel)

Tool orthogonal angle,

circular saw 0–5° HM
 5–8° SS

Tooth pitch 2–8 mm

Set 0.5 mm

Cutting speed

circular saw up to 4000 m/min

band saw up to 2000 m/min

- Drilling

Lead angle α 8–10°

Twist angle β 30°

Tooth orthogonal

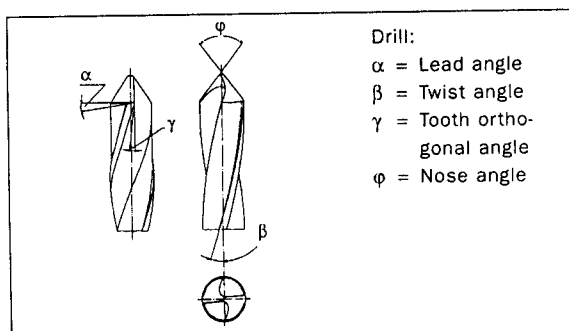
angle γ 3–5°

Nose angle φ 80–110°

Cutting speed 30–80 m/min

Forward feed 0.1–0.5 mm/r

In the case of thin-walled workpieces care must be taken to ensure that high cutting speeds are selected.



4.2 Shaping

Cutting with guillotine shears

SIMONA® SIMOPOR can be cut with automatic and manually operated guillotine shears. The sheets (up to 3 mm thick) should have a material temperature of approx. 20–30 °C. At thicknesses above 3 mm and in the case of SIMONA® SIMOPOR-LIGHT (from 6 mm upwards) we recommend using so-called profiling knives (e.g. Korn-Sallmetall GmbH, 42781 Haan-Gruiten). Cutting with guillotine shears is not to be recommended because at those thicknesses the sheet is squashed owing to the foam texture.

Punching

The most suitable tools are ones that take the form of male and female dies. Hole punches can also be used but the tool must be sharp.

The quality of the cut edge is dependent both on the sharpening of the punching tools and on sheet thickness. In the case of thin sheets (up to 3 mm) the cut is generally neater than with sheets up to approx. 6 mm. As when cutting with guillotine shears, material temperature should be approx. 20–30 °C.

Experience has also demonstrated that steel-rule dies produce better results than forged dies.

Nails and screws

SIMONA® SIMOPOR is very tough. This makes it possible to insert nails and screws into the material without having to pre-drill. Plastic screws and fasteners are particularly suitable (e.g. Simaf, 79813 Titisee-Neustadt).

4.3 Welding

Circular and high-speed welding nozzle

Rectangular rod made from SIMONA® SIMOPOR/
SIMOPOR-LIGHT (cut from sheets)

Air flow	approx. 40–45 l/min
Temperature	340 °C

When hot-gas welding SIMOPOR/SIMOPOR-LIGHT there may be a partial yellow discoloration at the edge of the seam. However, this effect does not have any negative influence on the mechanical properties of the seam.

- Heated tool butt welding

Temperature	200–220 °C
Adaptation	0.07 N/mm ²
Welding pressure	0.2 N/mm ²
Welding factor	ca. 0.5

- Fold welding

Optimum penetration depth	0.7 · s
Temperature	200–220 °C

Important: short penetration times compared to solid PVC sheets

Bending by non-contact warming

With this bending process it is recommended that both sides be heated. The width of the heated zone should be approx. 2–3 x wall thickness, and the distance between the lamps and the sheet should be matched to the required angle and radius of bending. Good results can be obtained when bending sheets up to a thickness of 10 mm.

4.4 Glueing

SIMONA® SIMOPOR/SIMOPOR-LIGHT can be glued just as effectively as SIMONA materials PVC-CAW, PVC-MZ, PVC-HSV, PVC-D and PVC-GLAS.

Glued bonds to PVC produce high-strength connections due to the high polarity of the polymer. However, attention must always be paid to the adhesive manufacturer's instructions regarding pretreatment of the surfaces of the items being joined. Surfaces being glued should always be free of dust, oil and grease. For cleaning purposes one can use standard methylated spirits, for example, but not aggressive solvents (e.g. MEK).

The following adhesives can be used:

Solvent-based adhesives

Usually based on tetrahydrofuran (THF) or methylene chloride. Solvent-based adhesives are only suitable for bonds between SIMONA® SIMOPOR/SIMOPOR-LIGHT and other PVC materials. They are available both in non-pigmented form and in white-dyed form with visually enhanced adhesive join.

Sources: e.g. Tangit from Henkel, 40589 Düsseldorf/Germany; Cosmofen from Weiss, 35708 Haiger/Germany

Contact adhesives

Frequently based on polychloroprene, nitrile rubber or other synthetic rubbers. Contact adhesives are ideal for flat surfaces, even with other materials such as wood, assuming mechanical and thermal stress is moderate (e.g. adhesives from Wevo Chemie, 73751 Ostfildern/Germany, or from Klebchemie, 76356 Weingarten/Germany).

2-pack reaction adhesives

Chiefly based on epoxy resin (EP), PMMA or PUR. PUR-based 2-pack adhesives are generally tougher than EP or PMMA-based ones and produce high-strength bonds. This type of adhesive is ideal for joining SIMONA® SIMOPOR/SIMOPOR-LIGHT to different materials such as stone, metal, ceramics, wood, etc.

1-pack reaction adhesives

Usually based on cyanoacrylate (e.g. instant adhesive). These reaction adhesives produce adhesive bonds which reach their ultimate strength within a very short space of time.

Adhesive films

We recommend baseless adhesive films made of dispersion adhesives for laminating SIMONA® SIMOPOR/SIMOPOR-LIGHT with photographic paper, posters or the like (e.g. Neschen, 31675 Bückeburg/Germany).

Adhesive tapes

Adhesive tapes produce low-strength bonds and are chiefly used as assembly aids or for flat bonds without any mechanical or thermal stress (e.g. 3M, 41453 Neuss/Germany; Orafol-Klebeteknik GmbH, 16515 Oranienburg/Germany).

4.5 Thermoforming

Sheets made from SIMONA® SIMOPOR/SIMOPOR-LIGHT can be made into fittings on all current thermoforming machines.

From a sheet thickness of 3 mm upwards it is recommended that both sides be warmed. This shortens heating time and ensures gentle, uniform warming throughout the cross-section of the sheet. In the heating process the sheet should be supported with compressed air. The thermoforming machine must be screened off from draughts on all sides.

Approximate figures for heating SIMONA® SIMOPOR/SIMOPOR-LIGHT

▪ Thermoforming machine	
Top and bottom heaters	
Heater power	approx. 20 kW/m ²
Set heater power approx.	75 %
Sheet/heater distance	approx. 200 mm
Heating time for a wall thickness of 3 mm	approx. 38 sec.
Heating time for a wall thickness of > 6 mm – approx. 10 mm	approx. 65 sec.
Material forming temp.	approx. 160 – max. 170 °C

For larger wall thicknesses it is recommended that the sheets be preheated in an oven to approx. 60 °C (higher cycle times, avoidance of colour changes).

Compared to SIMONA® PVC-CAW the heating time for SIMONA® SIMOPOR/SIMOPOR-LIGHT is approx. 40 % shorter.

Tool design

The tools can be made of the same materials as those used for other thermoformable plastics. The vacuum channels should have a diameter of ≤ 1 mm.

In the case of foams with a closed skin there is a risk of the surface cracking during the thermoforming process. In order to prevent this it is absolutely essential that the following be observed:

- Area stretch ratios of approx. 1:1.5 to a maximum of 1:2 are possible
- Edge radii at least 3 to 5 times wall thickness
- Tool temp. approx. 50 °C

It is possible to form SIMONA® SIMOPOR/SIMOPOR-LIGHT by thermoforming either into a male or female mould. With a male mould one will normally achieve a more uniform wall thickness distribution because here it is possible to pre-stretch the warmed sheet. With this process one must ensure that the mould has a draft of approx. 5° in order to be able to remove the item from the mould properly.

4.6 Surface treatment

Printing

SIMONA® SIMOPOR/SIMOPOR-LIGHT can be printed with PVC-compatible printing inks in the same way as solid rigid PVC (e.g. printing inks from Marabu, 71732 Tamm/Germany; Printcolor Screen AG, CH-8965 Mutschellen/Switzerland; Sericol GmbH, 46240 Bottrop/Germany). Screen printing is the process used most frequently. The surface must be cleaned and degreased just before printing.

Our sheets have been tested for their printability, including ink adhesion and scratch resistance, by major screen-printing ink manufacturers. However, owing to the varying demands made on modern screen printing, the positive results obtained do not mean that the customer should not conduct preliminary trials of his own. SIMONA® SIMOPOR/SIMOPOR-LIGHT can also be printed with "new" printing processes (e.g. digital printing or thermotransfer printing).

Varnishing

The adhesion of varnishes to SIMONA® SIMOPOR/SIMOPOR-LIGHT is excellent. PVC, acrylic or PUR-based varnishes should be used. All current application techniques can be used.

Coating

SIMONA® SIMOPOR/SIMOPOR-LIGHT can be coated with self-adhesive foils, decorative foils or other foils made of different materials.

Flocking

By flocking it is possible to achieve plushy, highly attractive surfaces. Flocked thermoformed products are frequently used for packaging up-market consumer goods.

With this process dispersion adhesives are preferred.

4.7 Constructive Advice

When using SIMONA® SIMOPOR/SIMOPOR-LIGHT in outdoor applications, i.e. where temperatures are constantly changing, attention must be paid to the thermal change in length. The mean thermal coefficient of linear expansion is $0.8 \cdot 10^{-4} \text{ K}^{-1}$, which means that over a length of 1 m and with a change in temperature of 10 °C the length of the material will change by 0.8 mm.

Example:

Sheet	1 x 1 m
Installation temp.	+ 20 °C
Summer temp.	+ 50 °C
Winter temp.	- 10 °C
Change in length	± 2.4 mm

In the case of white SIMONA® SIMOPOR/SIMOPOR-LIGHT and designs with back ventilation, temperatures are not likely to exceed 50 °C in our climatic zone. Even a light grey colour provides warmth which is close to 60 °C, the temperature limit for using SIMONA® SIMOPOR/SIMOPOR-LIGHT.

The most favourable means of holding SIMOPOR/SIMOPOR-LIGHT sheets is a frame made of slotted tubing or U-profiles in which the sheets can neither touch nor slip out. Please always provide fasteners with slots, preferably with spacers in order to prevent heat accumulation.

When fastening PVC sheets with screws the holes should be drilled approx. 10% larger than the screw diameter being used. In order to ensure that no undue stresses are transferred to the PVC sheets when the screws are tightened, it is urgently recommended that elastomer washers be used. Under no circumstances should snap rings or metal washers be used!

The connection of sheets can be performed both by hot-plate welding and hot-gas welding. Another possibility is, for example, to make a slot in the two sheets being joined, like the tongue-and-groove method, and glue them together with a matching strip of PVC (e.g. 2 mm thick). If only one side is glued, the other side can absorb the change in length.

5 Advisory service

Our staff in the Sales Department and Applications Technology Department have many years of experience in the use and processing of thermoplastic semi-finished products. We will be only too pleased to advise you.

Printability of SIMONA® PVC sheets

from left to right x|x|x|x|x :

Adhesive strength | Scratch resistance | Covering power | Resistance (UV resistance; vacuum forming) | Drying

+ = good o = satisfactory - = insufficient

Manufacturer	Marabuwerke GmbH & Co. KG, Asperger Straße 4, D-71732 Tamm									
	Libragloss LIG	Libramatt LIM	Libraprint LIP	Libraspeed LIS	Maragloss GO	Marasprint SP	Marastar SR	Marastar SR +10% H1 UVS	Ultrastar UVS	Ultraplus UVP
SIMOPOR	o + o + +	+ + + + +	+ + o + +	+ + o + +	o + + + +	o + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +
SIMOPOR-LIGHT	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +
SIMOCEL-AS	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	o + + + +	+ + + + +	+ + o - +	+ + + - +
SIMOCEL-COLOR	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +
COPLAST-AS	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ - o - +	+ + + - +
SIMOPLAN	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +
PVC-GLAS	+ - o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +
PVC-CAW	+ + o + +	+ + + + +	+ + o + +	+ + o + +	+ + + + +	+ + o + +	+ + + + +	+ + + + +	+ + o - +	+ + + - +

Manufacturer	Printcolor Screen AG, Welschloh 299, CH-8965 Mutschellen						
	Serie 320	Serie 386 (Serie 600-HDA)	Serie 388	Serie 565	Serie 569	Serie 588	Serie 650 (Serie 600-HDA)
SIMOPOR	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
SIMOPOR-LIGHT	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
SIMOCEL-AS	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
SIMOCEL-COLOR	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
COPLAST-AS	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
SIMOPLAN	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
PVC-GLAS	+ - + - +	+ - + - +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +
PVC-CAW	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + - +	+ + + - +	+ + + o +

Manufacturer	Sericol GmbH, Weusterstraße 9, D-46240 Bottrop				
	Polyplast PY	Plastijet XG	Mattplast MG	Multispeed IQ	Omnipus UL
SIMOPOR	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
SIMOPOR-LIGHT	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
SIMOCEL-AS	+ - + + o	+ - + - +	+ + + - +	+ + + - +	+ + + - +
SIMOCEL-COLOR	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
COPLAST-AS	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
SIMOPLAN	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
PVC-GLAS	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +
PVC-CAW	+ + + + o	+ + + - +	+ + + - +	+ + + - +	+ + + - +

CEE-Safety Data Sheet according to 91/155/EWG

Page 1 of 2

Trade name: **SIMONA® SIMOCEL-AS / COPLAST-AS /
SIMONA® SIMOPOR / SIMOPOR-LIGHT**

10/2002

1. Indications to the manufacturer

SIMONA AG
Teichweg 16
D-55606 Kirn

Phone (0 67 52) 14-0
Fax (0 67 52) 14-211

2. Composition / Indications to components

Chemical characteristics: polymer of vinylchloride, foamed
CAS-number: not necessary

3. Possible dangers

unknown

4. First-aid measures

General comment: medical aid is not necessary

5. Fire-fighting measures

In case of fire please use gas mask and breathing equipment independent of circulating air.
Fire residues must be disposed of according to the local instructions.

Suitable fire-fighting appliance: water fog, foam, fire fighting powder, carbon dioxide

6. Measures in case of unintended release

not applicable

7. Handling and storage

Handling: no special regulations must be observed

Storage: unlimited good storage property

8. Limitation of exposition

Personal protective equipment: not necessary

CEE-Safety Data Sheet according to 91/155/EWGTrade name: **SIMONA® SIMOCEL-AS / COPLAST-AS**
SIMONA® SIMOPOR / SIMOPOR-LIGHT**9. Physical and chemical characteristics**

<u>Phenotype:</u>	<u>Change of state:</u>	
form: semi-finished product	crystallite melting point:	80 °C
colour: different	fire point:	FIT 390 (values indicated
smell: not distinguishable	inflammation temperature:	SIT 455 in literature)
	density:	0.55 – 0.72 g/cm ³

10. Stability and reactivity

Thermal decomposition: above appr. 200 °C

Dangerous decomposition products:

Besides hydrochloric acid also carbon dioxide and water will develop during the burning process. In case of incomplete burning also carbon monoxide and traces of phosgene may arise.

11. Toxic indications

During several years of usage no effects being harmful for the health were observed.

12. Ecological indications

No biodegradation, no solubility in water, no effects being harmful to the environment must be expected.

13. Waste-disposal indications

Can be recycled or can be disposed of together with household rubbish (acc. to local regulations).

Waste key for the unused product: EAK-Code 120 105

Waste name: waste of polyvinylchloride

14. Transport indications

No dangerous product in respect to / according to transport regulations

15. Instructions

Marking according to GefStoffV/EG: no obligation for marking

Water danger class: class 0 (self classification)

16. Further indications

The indications are based on our today's knowledge. They are meant to describe our products in respect to safety requirements. They do not represent any guarantee of the described product in the sense of the legal guarantee regulations.