

SIMONA



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1. General information

SIMONA® COPLAST-AS is a composite material consisting of PVC weatherproofed outer skins and uPVC foam core. The material has a low density of approximately 0.70 g/cm³, at the same time retaining a high rigidity. It also offers sound and heat insulation.

Due to its flame retardancy, the material has a wide range of applications. An excellent surface finish, due to the solid PVC skins, makes it an ideal material for advertising, display and exhibition purposes, etc.

1.1 Advantages compared with solid PVC panels

- 1 m² SIMONA® COPLAST-AS, 8 mm thick, weighs appr. 5.6 kg.
1 m² SIMONA® PVC-CAW, 8 mm thick, weighs appr. 11.4 kg.
In other words, there is a clear reduction in weight for panels with the same thickness, therefore offering structural design advantages.
- Low thermal conductivity
- Oscillation/Vibration absorbent
- Very easy to use

1.2 Comparison with SIMONA® SIMOCEL-AS

Because of the weatherproofed outer skins of the material the following characteristics are apparent in comparison with SIMONA® SIMOCEL-AS

- better surface finish
- higher resistance to atmospheric corrosion
- smaller pressure response, because of the outer skin
- SIMONA® COPLAST-AS is available on request in 10 mm flame retardant to DIN 4102 B1.
SIMONA® SIMOCEL-AS has a flame retardancy to DIN 4102, B1 up to a thickness of 4 mm.

1.3 Examples of applications

Electro-technology

Switch cabinets, counter cabinets
Rear panels for TV and audio equipment
Switchboards

Building sector

Heat and sound insulation
Air conditioning and ventilation ducts
Internal architecture
Facades

Advertising sector

Signs
Displays
Exhibition stands
Photo lamination

Others

Traffic signs
Transport containers
Pattern making
Laboratory equipment
Tabletops

1.4 Antistatic effect

Plastics are good insulators. With regard to some applications, they can absorb and hold dust particles by electrostatic charge. For this reason SIMONA have introduced COPLAST-AS to reduce dust absorption as far as possible and to allow easier processing, printing, bonding, etc.

The antistatic effect can be achieved in two ways:

1. Surface applied antistatics only have an effect on the surface of the material, wearing down and becoming undetectable.
2. On COPLAST-AS the antistatic effect comes from within the sheet, distributing and redistributing itself to the surface. The antistatic effect used by SIMONA creates a hydrophilic coating on the surface. This coating absorbs the conductive charges and preserves the antistatic effect for the lifespan of the COPLAST-AS material.

After cleaning the material the antistatic effect always replenishes itself to the surface of the material by as much as is necessary to recreate the effect. For this reason the surface is not expected to smear in the course of time.

Conductivity depends on the surrounding atmospheric humidity. In dry air the figures are closer to 10^{12} Ohm. In a humid atmosphere figures of up to 10^9 Ohm are reached.

Measurements of the surface resistance showed an increase in conductivity on the colour layers. Therefore conductivity exists through the colour layers without the layers being disturbed or influenced in any other way.

2. Product range

Thickness in mm	SIMONA® COPLAST-AS white											
	2000 x 1000 mm		3000 x 1000 mm		2440 x 1220 mm		3050 x 1220 mm		3050 x 1500 mm		3050 x 1000 mm	
	kg/piece	* VE	kg/piece	* VE	kg/piece	* VE	kg/piece	* VE	kg/piece	* VE	kg/piece	* VE
8	11,2	7	16,8	5	16,7	5	20,8	4	25,6	4		
10	14,0	6	21,0	4	20,8	4	26,0	3	32,0	3		
12					25,0	3						
15			31,5	3								
19			39,9	2			49,5	2				
25			52,5	2								
30											64,0	2

* VE = shrink wrapped packing unit

3. Technical information

3.1 Material characteristics

	Test Standard DIN	Test method	Dimension	SIMONA® PVC-COPLAST-AS
Density*	DIN 53479		g/cm ³	0,70
Modulus of elasticity	DIN 53457		N/mm ²	1000
Impact strength	DIN 53453	small standard test bare	mJ/mm ²	25
Ball indentation hardness	DIN 53456	358/30	N/mm ²	16
Vicat distortion temperature	DIN 53460	B/50	°C	65
Average thermal coefficient of elongation	DIN 53752		K ⁻¹	0,83 · 10 ⁻⁴
Heat transition coefficient	**	at 10 mm	W/m ² K	3,4
Thermal conductivity	DIN 52612		W/m · K	0,068
Specific heat Cp at 20 °C	—	DSC-Analysis Mettler TA 3000	J/gK	0,79
Surface resistance	DIN 53482	Electrode A	Ohm	≤ 10 ^{12****}
Volume resistivity	DIN 53482	Annular electr.	Ohm · cm	10 ¹³
Water absorption	DIN 53495	Method C	weight-%	≤ 1,0
Short time welding factor	—		—	0,5 - 0,7
Combustion behaviour	DIN 4102	at 10 mm	—	B1****
	DIN 53438	part 3 surface flamed	—	F1
	DIN 53438	part 2 edge flamed	—	K1
Oxygen index	ASTM D 2863		%	> 35
Physiological admissibility	BGA		—	not given
Aireborne sound insulation			dB	25/8 mm thickness 32/15 mm thickness 36/25 mm thickness

- * The density and some of its properties may vary slightly from the specified values because of fluctuations caused by the process and geometric ratios (thickness of the outer skin pore size in the case of foam).
- ** The heat transition coefficient is a calculated size. The calculation bases on the following condition:
 $\alpha_1 = \alpha_2 = 11 \text{ W/m}^2\text{K}$
- *** Dependant on the atmospheric humidity
- **** Available on request

The datas specified here are guide values and may vary depending on the construction structure of the SIMONA® COPLAST-AS sheets, fluctuations due to the process as well as the production of the test piece and measuring methods. They are average values of measurements on sheets with a thickness of 10 mm. The indications cannot simply be transferred to finished parts. The manufacturer or user has to check the suitability for a specific application.

3.2 Behaviour in outdoor use

Both SIMONA® COPLAST-AS protective coatings have an excellent stabilisation for outdoor use. UVB-tests in our laboratory showed that an outdoor use of this material, after material-appropriate processing, over a longer period of time indeed is possible. The UVB-test presents weathering conditions which will not occur that extreme in nature.

Practical positive experience for more than 5 years have been achieved in Central European climat, north of the Alpes up to 1500 m sea level (Mülhausen, Alsace). But, please always bear in mind that all materials weather when being used outdoors and that discolourings cannot be avoided.

SIMONA® PVC semi-finished products are stabilized and contain neither cadmium nor lead.

Effect of rear ventilation and colour in external use

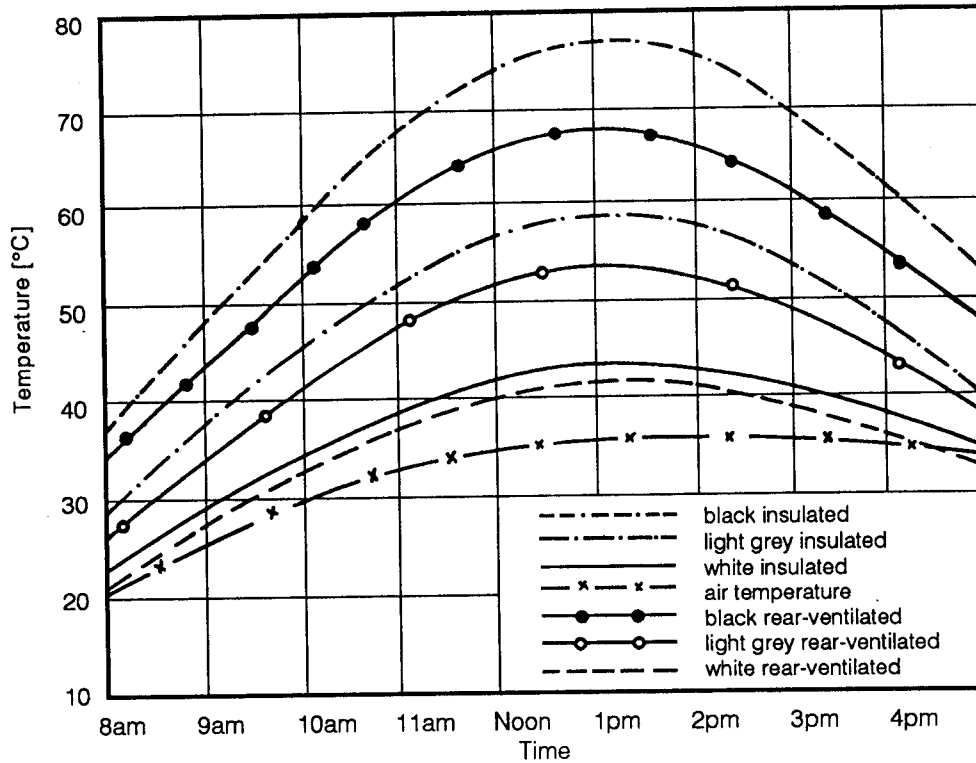
Experience has shown that external use of PVC is limited due to climatic conditions. For years PVC has been used very successfully in the Central European climatic zones north of the Alps. In Southern Climates where the suns radiation is fundamentally more intense and where there are higher temperatures PVC cannot be recommended without reservations.

Dark colours absorb heat fundamentally more than bright ones. Even in the Central European climate sheet temperatures can be twice as high as the actual outside temperatures. For this reason dark-coloured PVC sheets should not be used externally.

For this reason a renowned raw material manufacturer has measured temperatures under sun irradiation.

Test conditions: 3 to 4 mm thick sheets, partly rear ventilated, partly isolated.
The measurements were taken on a hot day in July (temperature at 8 o'clock in the morning: 22 °C, increasing to a maximum of up to 36 °C).

As expected the isolated sheets showed a higher heat absorption than the rear ventilated ones (see diagram). The figures measured at 1.00 ppm give information about the heat absorption of the individual colours.



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

Due to reduced heat absorption the bright-coloured semi-finished products have the following advantages:

- lower sheet temperature
- smaller thermal extension
- longer life

3.3 Heat transition coefficient (K)

The value K depends on sheet thickness, thermal conductivity (W/m²K) and heat transmission coefficient. The following values are based on field trials and calculations acc. to DIN 4108, part 4.

mm	K-Wert (W/m ² K)
8	3,48
10	3,15
12	2,88
15	2,56
19	2,23
25	1,86

3.4 Sound insulation

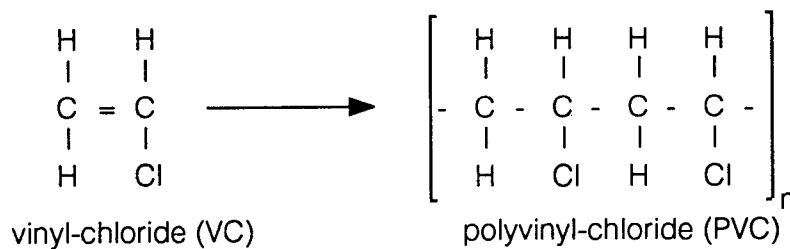
The sound insulation value R (acc. to DIN 52210 Part 1 - 3) describes the ability for airborne sound insulation of a plane sheet. R is the difference of sound level L1 within the broadcasting studio and L2 within the reception studio, both rooms separated by the test sheet. The following tabel gives the values R for SIMONA® COPLAST-AS sheets in dependance on thickness d.

The guide values for the sheet thicknesses 8 and 15 mm were measured by the National Material Research Laboratory NW. The others were determined arithmetically.

3.5 Health aspects

PVC is a relatively "old" material. During 1912 and 1913 the German chemists Klatte and Zacharias developed a method for its polymerization. In the late 20s commercial production started. Today the monomer vinyl chloride is produced as it was then from acetylene and hydrogen chloride as well as from ethylene and chlorine by more modern techniques based on petrochemical raw-materials.

The chain-shaped polyvinyl chloride (PVC) is produced from the colourless, gaseous vinylchloride (VC) by means of polymerisation (emulsion, suspension or mass polymerisation).



The above formulae show that as well as carbon and hydrogen PVC also contains chlorine (about 50 % by weight).

Burning PVC

PVC is a flame retardant material. This means that it extinguishes itself after the ignition source has been removed. In case of fire with a temperature of more than 400 °C the molecule chains split. As well as hydrogen chloride, carbon dioxide, carbon monoxide, soot, moisture and low-molecular polymers are produced, but no vinyl chloride (VC). If PVC combustion gases are inhaled, a doctor should be contacted (see also the SIMONA safety sheet).

Processing of PVC

Under normal material conditions no damage to health whatsoever is to be expected. No particular attention need be given to any odours which occur.

The welding temperatures are not sufficient to separate hydrogen chloride from the molecule. However, if, for example, bits of PVC remain on the heating element in the case of heated tool butt welding, the seam strength can be effected and damaging gases, e.g. containing hydrogen chloride may possibly be given off. Therefore we recommend regular cleaning of the heating element.

Measurements at the working height of the welder have been carried out in order to determine the content of hydrogen chloride during the wire welding procedure. These resulted in values too low to measure at a proof limit of 1 ppm. Some of our extruder staff have been standing at the extruder and producing semi-finished products for 20 years. Up till now no illnesses have occurred which could be due to PVC. Further no criticisms have arisen as a result of regular checks carried out by the employer's liability insurance association.

PVC "saw dust" can be thrown out into the surrounding air when cutting especially if blunt tools, with resultant high temperatures, are used. In this connection we distinguish between "less dangerous" coarse dust and fine dust. This dust can get into the lungs with the respiratory air, where in particular the fine dust can cause illnesses of the respiratory tracts. The MAK value for dusts amounts at present to 6 mg/m³ air.

The stabilisation of polymers is economically very important as it counteracts an accelerated aging caused by different influences. In this way rigid PVC can obtain a high resistance against heat and weathering. Effective systems of stabilisation for rigid PVC care based on metal combinations. Because of our responsible attitude towards health and the environment, SIMONA AG has renounced the use of the highly-effective, but toxic cadmium and lead combinations. We are proud of having achieved similar or equally good results for resistance to heat and UV attack with the considerably less risky tin stabilisers.

Content of monomer vinyl chloride (VC) in PVC

PVC polymerisates may contain slight residual quantities of monomeric VC, which has not been involved in the polymerisation process. However, SIMONA only uses raw materials containing no measurable level of VC. This has also been supported by extensive measurements on our premises by the trade board as well as by investigations of our raw-material suppliers which have been carried out at great expense. The measured values lie under 1 ppm, thus below the measurement limit.

MAK values

MAK means "maximum working place concentration". The values indicate the concentration in ppm of a gas, vapour or dust which based on an 8 hour working day is not considered to damage the health of the people employed in the work area.

The MAK values are issued by the Federal Ministry for employment and social welfare in Bonn. Even if, as explained before, the generally arising VC quantities in the work area are no longer measurable, it should — as in any other area in which people are together — be ventilated from time to time (also smokers in the office, motor vehicles mechanics /exhaust gases etc.).

Generally we recommend that sufficient ventilation should be provided in work areas where plastics are processed.

4. Processing

4.1 Cutting

SIMONA® COPLAST-AS can be cut very easily. The guides for sawing and drilling SIMONA® COPLAST-AS are more or less the same as for standard rigid PVC.

Saws (bandsaw, circular saw)

Clearance angle	10 — 15 ° carbide
Rake angle	0 — 5 ° carbide
Rake angle, bandsaw	0 — 8 °
Tooth pitch	2 — 8 mm
Cutting speed	circular saw up to 4,000 m/min band saw up to 2,000 m/min

When using circular saws we recommend the use of carbide tipped blades with alternating tothing in order to prevent partial splitting of the top layers. High peripheral speeds and low feed speeds give the best results.

Drilling

Clearance angle	8 — 10 °
Rake angle	3 — 5 °
Tip angle	80 — 110 °
Cutting speed	30 — 80 m/min
Feed	0.1 — 0.5 mm/U

4.2 Processing without cutting

Guillotining

We do not recommend guillotining SIMONA® COPLAST-AS as this causes permanent deformation on the edge of the material.

Nailing and bolting

SIMONA® COPLAST-AS is very tough. This allows the material to be nailed and bolted without predrilling.

4.3 Welding

Round and speed welding nozzle

For welding SIMONA® COPLAST-AS we recommend round SIMONA® PVC-CAW welding rod, diameter 3 — 4 mm

Air volume	approximately 40 l/min
Temperature	approximately 340 °C

When hot gas welding SIMONA® COPLAST-AS some yellowing might be seen around the area of the weld. However, this does not have a detrimental effect on the mechanical properties of the seam.

Butt welding

Temperature	180 °C
Heating up pressure	0.75 kp/cm ²
Welding pressure	2 kp/cm ²
Welding factor	0.5 — 0.7

Edge welding

Optimum depth of penetration	3/4 wall thickness
Temperature	180 °C

Note: short penetration times compared with solid PVC

4.4 Glueing

SIMONA® COPLAST-AS can be glued just as well as SIMONA® SIMOCEL-AS, PVC-CAW, PVC-MZ, PVC-D or PVC-GLAS. Because of the high polarity of the polymers, adhesives with PVC produce very strong bonds. However, the instructions given by the adhesive manufacturer regarding pre-treatment of the parts to be joined must be observed.

The following adhesives can be used:

Solvent adhesives

Usually tetrahydrofurane (THF) or methylene chloride based solvent adhesives are only suitable for bonding COPLAST-AS to other PVC materials.

Contact adhesives

Frequently based on polychloroprene, nitrile rubber or other synthetic rubbers. Contact adhesives are suitable for surface bonding, also to other materials such as wood, for example, exposed to moderate mechanical and thermal stresses.

2-pack reaction adhesives

Predominantly epoxy resin (EP), PMMA or PUR., 2-pack adhesives are generally tougher than EP or PMMA based adhesives and produce a very strong bond. This type of adhesive is excellently suited for bonding SIMONA® COPLAST-AS to foreign materials such as stone, metal, ceramic, wood, etc.

1-pack reaction adhesives

Usually based on cyano-acrylate. These reaction adhesives produce bonds which achieve their final strength in a very short time.

Adhesive films

We recommend unsupported adhesive films from dispersion adhesives to coat SIMONA® COPLAST-AS with photographic paper, posters, etc.

Adhesive tapes

Adhesive tapes produce joints which are not very strong and mainly serve as an aid for assembly or for surface joints.

4.5 Surface finish

Sealing the cut edges

The water absorption of SIMONA® COPLAST-AS is so low that there is no need to worry about swelling or peeling of the covering layers. Accumulation of moisture can only be expected in the exposed pores near the surface of the cut edge.

This can be prevented by one of the following measures:

- Application of liquid reaction resins (e. g. with pigments and thickeners)
- Painting with a suitable paint
- Application of water glass
- Ironing on edge veneers
- Sticking on strips of rigid PVC

Polishing

Generally SIMONA® COPLAST-AS can be polished but it must be remembered that the outer skin of this material is relatively thin. The cellular structure can be exposed if the surface is removed.

Printing

SIMONA® COPLAST-AS can be printed in the same way as rigid PVC with inks suitable for PVC. Screen printing is the method most frequently used. Our sheets are checked by renowned producers of screen printing inks with regard to their printability, adherence and scratch resistance. However, due to different requirements by our customers the results obtained do in no case exclude one's own preliminary experiments.

Lacquering

Lacquer adhesion on SIMONA® COPLAST-AS is excellent. PVC, acrylic or PUR based lacquers are advised. All the usual methods of application can be used.

Coating

SIMONA® COPLAST-AS can be coated with self-adhesive films, decorative films or other material films.

Flocking

Plush type surfaces, very attractive to the eye, can be achieved by flocking. Flocked parts are frequently used for packing high-quality consumables.

4.6 Constructive advice

When using SIMONA® COPLAST-AS externally, temperature changes can cause expansion in the length of the material.

The coefficient for thermal expansion amounts to $0.83 \cdot 10^{-4} \text{ K}^{-1}$, this means, that for every 1 m length and a change of temperature of 10 °C the material will experience a change of length of 0.83 mm.

Example:

Sheet	1 x 1 m
Temperature of assembly	+20 °C
Temperature in summer	+50 °C
Temperature in winter	-10 °C
Change of length of the sheet	± 2.49 mm

In our climatic zone white SIMONA® COPLAST-AS will generally not generate temperatures higher than 50 °C. The darker the colour the higher the heat absorption. Even a light grey colour can generate temperatures close to 60 °C; the temperature limit for SIMONA® COPLAST-AS applications.

Light coloured sheets have the following advantages: Because the heat absorption is lower, thermal expansion is therefore lower, the lifespan of the exposed sheet is higher because of the heat and UV stabilizers.

The best way to mount COPLAST-AS is to use a frame, either from slit pipe or U-profiles, from which the sheets cannot knock or slip out. Always apply fastenings with elongated holes, if possible with spacers to prevent heat accumulation.

When fixing PVC with screws you must drill holes approximately 10 % greater than the diameter of the screws. It is recommended that elastomer plain washers are used so that no inadmissible tensions are transferred to the PVC sheets. When the screws are tightened snap rings or plain metal washers should not be used.

Sheets can be joined by butt or hot air rod welding. Another possibility is to slit both edges and glue a strip of PVC (e. g. 2 mm thick) into one edge. If only one side is bonded, the other side can absorb the change in length. This is sometimes called "tongue and groove".

5. Advice

Our Sales Department and Technical Application Department are experienced in the use and processing of thermoplastic semi-finished products. We are looking forward to assisting you.

**Printability of
SIMONA® PVC-U sheets**

Adhesive strength and scratch resistance of possible one-component inks of **Marabu/Tamm** on printing material of **SIMONA/Kirn**
February 1996

Material	Vorreinigung	Maraplast		Maragloss		Maraspeed		Marasprint		Marastar		Marasoft		Libragloss	
		D		GO		SL		SP		SR		MS		LIG	
		H	K	H	K	H	K	H	K	H	K	H	K	H	K
SIMOPOR	PSV	+	+	+	+			+	+	+	+	+	+	+	+
SIMOCEL-AS	PSV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
SIMOCEL-COLOR	PSV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
COPLAST-AS	PSV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
PVC-GLAS	PSV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
PVC-D	PSV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
PVC-CAW		+	+	+	+	+	+	+	+	+	+	+	+	+	+
Surface finish		matt		gloss		good silk gloss		silk gloss		bright gloss		silk gloss		gloss	
Covering power		high		good		medium		medium		good		good		medium	
Drying		fast		fast		very fast		fast		very fast		very fast		fast	
Resistance				can be vacuum formed		can be vacuum formed		can be vacuum formed, good weather resistance, suitable for outdoor use		can be vacuum formed, good solvent resistance, good weather resistance, suitable for outdoor use		can be vacuum formed, good weather resistance, suitable for outdoor use		can be vacuum formed, suitable for outdoor use	

SIMOCEL-AS

Foamed rigid PVC sheet with a density of approx. 0,75 g/cm³. The antistatic formulation decreases static charge and virtually eliminates dust attraction. SIMOCEL-AS can easily be printed and is therefore used predominantly for the production of sign and display panels, etc. (SIMOCEL-AS is destined for inside use). SIMOCEL-AS satisfies the regulations conc. flame retardancy for use for exhibition work and similar applications. Apart from standard white colour SIMOCEL-AS can also be supplied in black, green, red, blue, yellow and grey.

COPLAST-AS

Two solid covering layers with high-quality surfaces sandwich the foamed core of COPLAST-AS. The covering layers (white) are stabilised for outdoor use and the light weight foamed core accounts for the low density of approx. 0,70 g/cm³. The antistatic formulation decreases static charge and virtually eliminates dust attraction. COPLAST-AS has proved eminently suitable for panels, cladding, laminating of photos and the manufacturing of doors and window panels.

PVC-GLAS

Sheets made of PVC-GLAS combine the advantages of rigid PVC with max. light transmission (up to 89 % depending on thickness). SIMONA® PVC-GLAS sheets satisfy the regulations conc. flame retardancy. SIMONA® PVC-GLAS is also available tinted, grained, translucent, in high impact resistant form and for food use. It is therefore suitable for many applications. To prevent soiling PVC-GLAS sheets are coated on both sides with a protective foil.

PVC-D

PVC-D has been specifically developed for use by the printing industry. This solid, rigid PVC sheet offers good impact strength and can be processed by all methods used traditionally for thermoplastic sheets. The smooth surface facilitates particularly accurate screen printing. PVC-D satisfies the regulations concerning flame retardancy. The DS type, with increased impact strength, is particularly suitable for the production of blanked parts.

Legend:

H = Adhesion of scotch tape
K = Scratch resistance

+ = good

- = insufficient

Ink grades for long-term outdoor use:

Marastar SR

As per blue scale DIN 16 525, the light fastness of the pigments used is situated in the area of 7 - 8 (superb to excellent). Therefore, only the 21 basic colour shades of Marastar SR can be used for an outdoor use over several years. A mixture with printing lacquer, transparent mass and other colour shades, especially to brighten these basic colours with white, greatly reduces the light and weathering fastness and thus should not be done (please ask for Marastar SR technical data sheet). With regard to an outdoor use over several years, an overpainting with the printing lacquer Marastar SRL/UV must be carried out. This lacquer protects the colour film and contains special UV-absorbers which absorb a large part of the UV light.

Our indications only count for applications with screen printing. For colour and lacquer we recommend a fabric between 68T and 77T.

These indications are given to our best knowledge and conscience, but no commitments can be derived thereof. Due to the different behaviour of printing materials, which indeed may show differences from charge to charge in respect to their printability even within a grade, our inks are only sold on the condition that the suitability for the application in question under consideration of the requirements - material, printing conditions - have been tested prior to printing.

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

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

10/2002

1. Indications to the manufacturerSIMONA AG
Teichweg 16
D-55606 KirnPhone (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 measuresIn 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/EWG

Page 2 of 2

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

10/2002

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 todays 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.