SIMONA

Product Information

01/94

PVC-CAW / PVC-HSV / PVC-MZ

Contents

1/94 d
1/94 e
This product information replaces all former editions.

1. General information

1.1 Characteristic properties of SIMONA® PVC semi-finished products

- High rigidity
- Flame retardant
- Good chemical resistance
- Low thermal coefficient of expansion
- Excellent electrical insulation properties
- Universal application
- Easy to process
  - can be cut
  - can be welded
  - suitable for hot shaping
  - suitable for vacuum deep-drawing
  - can be glued
  - suitable for GFK sandwich construction

SIMONA® PVC-CAW

SIMONA® PVC-CAW is a standard impact-resistant rigid PVC according to DIN 16927. Because of its strength, which is on the limit of the high impact resistance classification (the next higher classification), the material offers high processing reliability. Its principal characteristics are also represented in the nomenclature:

C — chemical resistance in accordance with DIN 16929
A — for apparatus construction
W — weather stabilised

SIMONA® PVC-HSV

Because of its strength SIMONA® PVC-HSV belongs clearly to the high impact-resistant field. Particularly to be emphasised is its good deformability under heat including extreme deep drawing components. HSV is intended for indoor applications, for outdoor applications special measures are required to protect against UV.

SIMONA® PVC-MZ

SIMONA® PVC-MZ also belongs to the high impact-resistant classification. Its highly effective weather resistance guarantees many years of use.

1.2 Distinguishing characteristics

	SIMONA® PVC-CAW	SIMONA® PVC-MZ	SIMONA® PVC-HSV
Impact strength Notched impact strength	normally impact resistant 4kJ/m²	highly impact resistant 10 kJ/m²	highly impact resistant 12 kJ/m²
lower service temperature limit	± 0 °C	-20 °C	-20 °C
Stabilisation for outdoor use	high, adequate for many applications	very good	normally stabilised
Colour fastness in outdoor application (colours white and light grey)	slight colour variations can be expected over a period of time	very high level of colour fastness	shade differences are possible over the years
Deep-drawing characteristics	sufficient capacity for stretching	good capacity for stretching	very high capacity for stretching
Flame retardancy acc. to DIN 4102 B1	yes (for wall thicknesses of up to 4 mm - PA-III 2.732)	no but self-extinguishing	no but self-extinguishing
Chemical resistance	DIN 8061 supplement 1	DIN 8061 supplement 1	under extreme stresses, e.g. concentrated sulphuric acid, slightly less resistant

1.3 Applications

We recommend use in situations, where high rigidity with low flammability as well as excellent chemical resistance is required, up to a temperature of 60 °C.

Building trade

- panels for exposed concrete
- basement light shafts
- sound insulation walls
- window panels
- roof coverings
- shutters, ventilation slats
- ceiling panels (theatres, halls)
- doors
- façades
- air filters for cooling towers

Installations, equipment, machinery

- extraction systems
- caustic baths
- machine covers
- pipework systems
- fans
- filling installations for packed goods
- conveyors
- distributors in filling installations

Electrical sector

- switch and meter boxes
- switch panels
- cable ducting

Publicity sector, displays

- shop-window designs
- signs
- rear walls for illuminated signs
- lighting
- stage decoration
- television studios
- templates

2. Product range

	SIMONA® PVC-CAW	SIMONA® PVC-MZ	SIMONA® PVC-HSV
	sheet thickness in mm		
Extruded sheets acc. to DIN 16927			
2000 x 1000 mm	1 - 50	1 - 30	3 - 6
3000 x 1500 mm	2 - 30	2 - 10	4 - 10
Standard colours	white, ivory, light grey, swiss grey similar to RAL 7037, dark grey, RAL 7011, red	white, light grey	on request: dark grey RAL 7011
Pressed/continuously pressed sheets			
2000 x 1000 mm	10 - 60	10 - 40	—
1000 x 1000 mm	70 - 100		—
Standard colours	dark grey RAL 7011, black	light grey	
	Diameter in mm		
Welding wire acc. to DVS 2211			
Round wire	2, 3, 4, 5	3, 4	3, 4
Shaped wire			
- Triangle 90°	4, 5, 6, 7	4	on request
- Three barreled	5		
Solid rods acc. to DIN 16980			
ivory	6 - 250	on request	—
darkgrey RAL 7011	6 - 250	20 - 80	—
red, black	6 - 110	light grey	—
swiss grey similar to RAL 7037	8 - 200		—
Pipes acc. to DIN 8061/62			
dark grey RAL 7011	10 - 200	—	—

Sheets with grained surface, profiles, hollow rods, rectangular tubes available on request

Further PVC material from the SIMONA®-range

For screen printing*

SIMONA® PVC-D: normal impact strength
SIMONA® PVC-DS: high impact strength

For door manufacturing

SIMONA® PVC-T: very effective UV-stabilisation

For the manufacturing of difficult deep-drawing parts

SIMONA® PVC-TF (thermoforming)

For the food industry

SIMONA® PVC-LZ: physiologically safe according to the recommendations of the BGA

For drinking-water supply

SIMONA® PVC-WT: complies to KTW recommendations

For electro industry

SIMONA® PVC-E: complies with ball indentation test in accordance with VDE 0606

Electrically conductive*

SIMONA® PVC-EL: surface resistance < 10^6 Ohm, normal impact strength

Antistatic*

SIMONA® PVC-CAW-AS: surface resistance 10^{12} — 10^{13} Ohm depending on the relative atmosphere humidity

Hard foamed PVC-sheets*

SIMONA® SIMOCEL-AS: density app. 0,75 g/cm^3, flame retardant according to DIN 4102 B1, antistatic
SIMONA® COPLAST-AS: density app. 0,70 g/cm^3, solid weather-stabilised antistatic surface layers and foamed core, if requested also available with test certificate according to DIN 4102 B1 at 10 mm thickness.

Transparent*

SIMONA® PVC-GLAS: various glass-clear and translucent types

* Further details are included in our special brochures and product information manuals.

3. Technical information

3.1 Material characteristics

	Test method	Dimension	SIMONA® PVC-CAW	SIMONA® PVC-MZ	SIMONA® PVC-HSV
Density	DIN 53479	g/cm^3	1,42	1,42	1,40
Bending E-Modulus	DIN 53457	N/mm^2	3000	2800	2700
Yield stress	DIN 53455	N/mm^2	58	52	54
Elongation at tear	DIN 53455	%	15	20	18
Impact strength	DIN 53453	kJ/m^2	without break	without break	without break
Notched impact strength	DIN 53453	kJ/m^2	4	10	12
Indentation hardness H 358/30	DIN 53456	N/mm^2	130	110	130
Shore hardness D	DIN 53505	——	82	77	79
Vicat softening temp. B/50	DIN 53460	K (°C)	351(78)	348(75)	350(77)
Average thermal coefficient of expansion	DIN 53752	K^{-1}	$0{,}8 \cdot 10^{-4}$	$1{,}0 \cdot 10^{-4}$	$0{,}8 \cdot 10^{-4}$
Thermal conductivity*	DIN 52612	W/mK	0,159	0,159	0,159
Dielectric strength** method K 20/P 50	DIN 53481	kV/mm	39	34	37
Spec. volume resistance ring electrode	DIN 53482	Ohm · cm	$> 10^{15}$	$> 10^{15}$	$> 10^{15}$
Surface resistance electrode A	DIN 53482	Ohm	10^{13}	10^{14}	10^{13}
Tracking resistance method KC	DIN 53480	V	> 600	> 600	550
Dielectric constant	DIN 53483	——			
at 300 - 1000 Hz			3,2	3,3	3,6
at $3 \cdot 10^5$ Hz			3,0	3,1	3,1
Dielectric loss factor	DIN 53483	——			
at 300 Hz			0,03	0,03	0,04
at 1000 Hz			0,02	0,02	0,03
at $3 \cdot 10^5$Hz			0,02	0,03	0,04

* measured on test pieces 10 mm thick
** measured on test pieces 1 mm thick

The figures indicated are guide values and may vary according to the processing method and the method used to make the test specimen.
Unless specified otherwise these are average values obtained from measurements on extruded sheets 4 mm thick. These values cannot be automatically used for finished parts. The manufacturer/user should check the suitability of our materials for a specific application.

Moulding compound designation (DIN 7748, of 9/85)

PVC-CAW: FM DIN 7748 - PVC - U, ED, 078-04-33
PVC-MZ: FM DIN 7748 - PVC - U, EDLP, 076-08-28
PVC-HSV: FM DIN 7748 - PVC - U, EDP, 076-15-28

3.2 Combustion behaviour

SIMONA® semi-finished products show self-extinguishing characteristics. These are based on the minimum oxygen concentration necessary for burning. This so-called oxygen-index lies well above the oxygen content of air and is as follows:

PVC-CAW	43,7 %
PVC-HSV	39,6 %
PVC-MZ	34,8 %

The ignition temperature of all SIMONA® PVC materials is above 390 °C.

In accordance with DIN 4102 part 1

SIMONA® PVC-CAW (test mark PA-III 2.732 up to 4 mm wall thickness)

can be classified as a flame retardant construction material of class B1.

No application has been made for a prolongation of the test certificate for SIMONA® PVC-HSV (2 mm).

No application has been made for a test certificate for SIMONA® PVC-MZ.

3.3 Behaviour in outdoor use

SIMONA® PVC-CAW is stabilised to a high degree for outdoor use.

SIMONA® PVC-HSV is intended for indoor use.

SIMONA® PVC-MZ has a very efficient stabilisation. For external use very good colour fastness and many years of use are guaranteed.

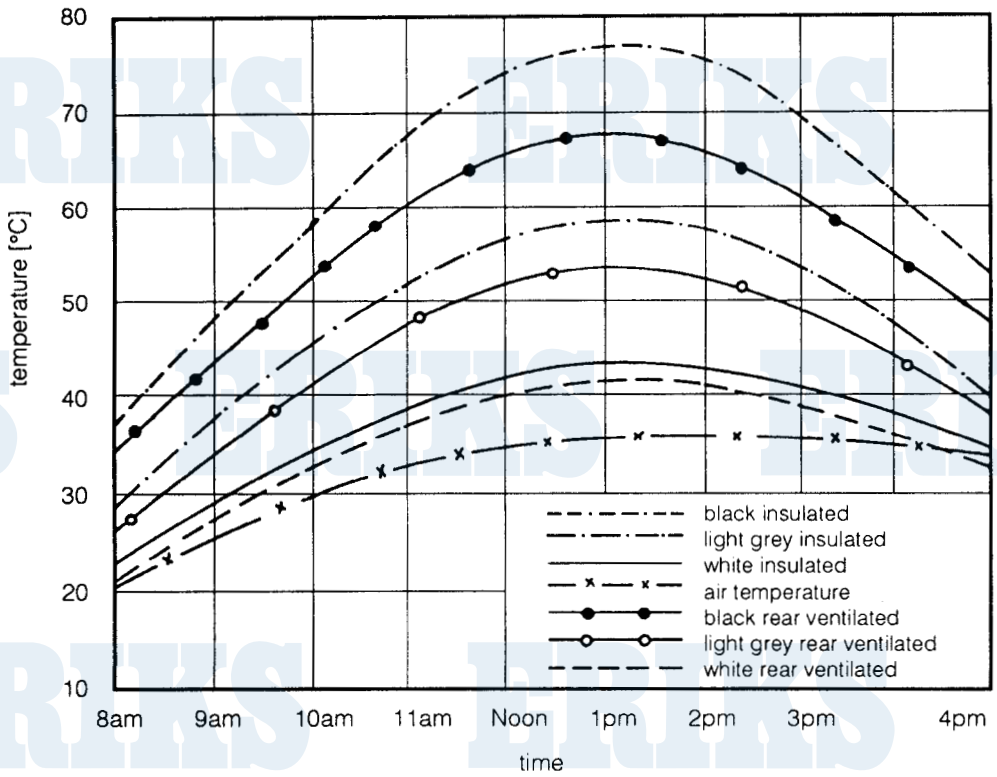
SIMONA® PVC semi-finished products are stabilised in an environmentally friendly way, as they contain neither cadmium nor lead.

Effect of rear ventilation and colour in external use

Experience has shown that the external use of PVC is limited by climatic conditions. For many years PVC has been used very successfully in the Central European climate zones, north of the Alps. The use of PVC is not recommended without some reservation in southern countries with essentially more intensive sun irradiation and higher temperatures, however in addition the chosen colour has a considerable influence on the life time.

Dark colours absorb heat to a much greater extent than light ones. Even in the Central European climate zone sheet temperatures twice as high as the actual outside temperatures can be reached. For this reason dark-coloured PVC sheets should not be used out of doors. A renowned raw-material manufacturer has made a contribution by carrying out measurements of the temperature progression caused by sun irradiation.

Test conditions: 3 — 4 mm thick PVC sheets, some rear ventilated, some insulated. The measurements were taken on a hot day in July. As expected the insulated sheets showed a higher heat absorption than the rear ventilated ones (see diagram). The figures measured at 1pm give information on 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 light-coloured semi-finished products have the following advantages:

- lower sheet temperature
- lower thermal expansion
- longer life

Assembly instructions

SIMONA® PVC semi-finished products expand in heat and contract as the temperature falls (coefficient of thermal expansion — see chapter 3.1: values of material). Therefore, when fastening PVC sheets, e. g. by screwing, the drilling holes have to be about 10 % larger than the diameter of the screw used. To prevent unacceptable stresses being transferred to the PVC sheets when the screws are tightened the use of elastomer washers is very much recommended. Under no circumstances should so-called snap rings or metal washers be used.

3.4 Physiological safety

SIMONA® PVC-CAW, PVC-HSV and PVC-MZ do not meet the requirements of the foodstuffs and consumables legislation.
For applications where this property is required we recommend the use of SIMONA® PVC-LZ. For drinking water application we recommend SIMONA® PVC-WT.

3.5 Chemical resistance

SIMONA® PVC is classified as resistant against many diluted and concentrated acids, alkalis and salts. The same applies for alcohols, aliphatic compounds and many oils. Aromatic compounds and halogenated hydrocarbons, esters and ketones will etch it. PVC is not resistant to very strong oxidizing agents; in this case there is the risk of stress crack formation at welds and at cold or hot shaped positions.
You will find detailed information in our „Chemical resistance" catalogue.

3.6 Water absorption

Rigid PVC can absorb moisture to a small extent. It may appear in the form of blisters when the material is vacuum-deep-drawn. In this case, it should be dried in a circulating air oven at about 55 °C. The time required depends on the moisture and the sheet thickness.

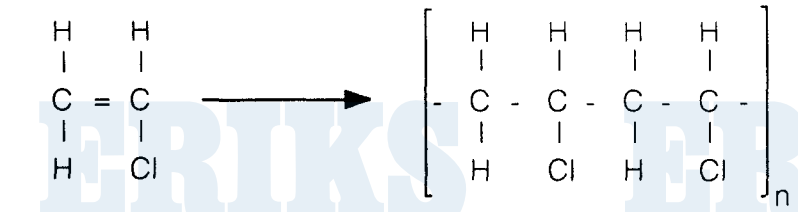
3.7 Service temperature range

SIMONA® PVC is generally fit for use up to 60 °C, above 60 °C it softens relatively quickly. For applications around or below 0 °C, please refer to table 1.2.

3.8 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 vinyl-chloride (VC) by means of polymerisation (emulsion, suspension or mass polymerisation).



vinyl-chloride (VC) polyvinyl-chloride (PVC)

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/m^3 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 are 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

SIMONA PVC semi-finished products can be processed without problems. Nearly all processing and forming methods which are usual for thermoplastics can be carried out.

4.1 Cutting

SIMONA® PVC can be cut very well. The use of blunt tools can, through the resultant temperature increase, lead to inaccurately cut edges. For the guide values for drilling and sawing please see our technical application brochure „Cutting of SIMONA plastics".

4.2 Non-cutting

Punching
Thinner sheets can be readily stamped using ordinary stamping devices. In order to avoid stresses, the lip angle of the stamping die should lie between 40 and 55 °C. SIMONA® PVC-CAW/-HSW/MZ can be punched up to a sheet thickness of 3 mm. During cold weather, especially before punching or separating with gate shears, the sheets should be stored at room temperature for sufficient time to achieve a degree of flexibility.

Gate shears/polar cutter
SIMONA® PVC sheets can be cut without problems with gate shears. In practice on the polar cutter, however, it has been shown that it is very difficult to cut several sheets of SIMONA® PVC-CAW at one time without splintering. For this reason 2 sheets only should be used at one time. However, with SIMONA® PVC-MZ/HSV perfect results are achieved.

4.3 Welding

SIMONA® PVC semi-finished products can be welded without any problem using welding methods:

Hot gas welding						
	Air	Air temp.	Speed cm/min			
			Circular nozzle		High speed welding nozzle	
	l/min	°C	Ø 3 mm	Ø 4 mm	Ø 3 mm	Ø 4 mm
PVC-CAW	45 - 50	370 - 380	15 - 20	ca. 15	35 - 40	30 - 35
PVC-HSV PVC-MZ		350 - 360				

Heated element butt welding							
	Temp.	Matching up* pressure	Heating		Changing over Time	Joining	
			pressure	Time		pressure	Time
	°C	N/mm²	N/mm²	sec	sec	N/mm²	min
PVC-CAW	220-230	0,1	0,01	45-300	< 3	0,2-0,4	5-20
PVC-HSV PVC-MZ	215-220						

* The matching-up time depends on the pre-treatment of the surface to be welded. It has to be determined by the processor for each individual application. The matching-up time is the time which (depending on the material thickness) is necessary to achieve a material bulge height of >0 mm at the heating element.

4.4 Thermoforming (deep drawing)

Like any other PVC, the SIMONA® PVC material can be perfectly deep-drawn, thermoformed or bent. For detailed information on these techniques please see our technical application information manual „Vaccum forming, thermoforming, bending".

4.5 Bonding

Because of their polar behaviour SIMONA® PVC semi-finished products can be bonded relatively simply, achieving a high degree of adhesive strength. In this connection attention should be given to any advice by the adhesive manufacturer — with regard to the MAK-values. Experience has shown that smaller bonding surfaces, for example gluing of edges, do not reach the MAK-values when they are sufficiently ventilated.

Solvent adhesives
These adhesives are exclusively used for bonding PVC materials together and produce transparent joints. The following adhesives mostly based on Tetrahydrofuran (TFA) or methylene chloride can be used:

- Tangit and Dytex (Henkel, 4000 Düsseldorf)
- Cosmofen Plus (Weiß, 6342 Haiger 1)

2-component reaction adhesives
These consist mainly of epoxy resins (epoxide = EP), acrylate (PMMA) or polyurethane (PUR). PUR 2-component adhesives are generally tougher than EP or PMMA adhesives, and they produce very strong joints. This type of adhesive is ideally suited for joining PVC with „foreign" materials like stone, metal, ceramic, wood, etc. The joints are clearly visible as 2-component adhesives usually have their own colour.

1-component reaction adhesive
These adhesives consist mostly of cyano-acrylate (for example instant glue). These reaction adhesives produce bonded joints which reach their final strength in a short time. The joints are transparent.

Pressure sensitive adhesive tapes
These usually produce joints which are not very strong and are mainly used as an assembly aid. Adhesive tapes are not transparent as a rule. Detailed information is contained in our „Bonding" technical application information manual.

4.6 Surface finishing

A surface clean and free from grease is required for good results for any surface finish.

Screen printing (serigraphy)
Screen printing inks must be specially prepared for the material to be printed. Solvents and thinners should help to etch the surface of the PVC to fix the ink and at the same time control the speed of evaporation possibly in connection with the addition of a retarding agent. Screen print inks for rigid PVC are generally physically drying, i. e. solvents evaporate leaving an ink film behind.
Nowadays, manufacturers pay more and more attention to selecting solvents which do not endanger the health of employees. The instructions of the screen print ink manufacturer must be adhered to. The choice among the multitude of products on the market from manufacturers with famous names depends on a whole list of requirements:

- sheen grade (dull, silky, shining, high shining)
- processing (deep-drawing, welding, etc.)
- indoor and outdoor application
- particular characteristics (chemical resistance)
- food-grade, perspiration and saliva resistant

Moreover, the characteristics of the company's equipment come into play like tunnel or air drying, printing methods, screen composition and other criteria.

The surface of the PVC should be cleaned and degreased just before being printed. Our sheets have been tested by famous manufacturers of screen print inks for their printability including bond strength and scratch resistance. The positive results obtained regarding the differing requirements for modern screen printing do not at all exclude you carrying out your own tests.

The enclosed „Printability of SIMONA rigid PVC sheets" information sheets show some screen print inks which have been tested with regard to their suitability for our material.

Varnishing
The composition of colours for spray coat and brush coat only differ from the screen print colours to a large extent in the degree of dilution. The lacquer and varnish manufacturers supply appropriate spray thinners. After appropriate cleaning of the surface bonding strength and scratch resistance equal to that for screen printing are obstained without difficulty.

5. Advice

Our sales staff and application engineers have had many years experience in the use of and processing of thermoplastic semi-finished products. We will be pleased to give you any further advice.

SIMONA

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

10/2002

Trade name: **SIMONA® PVC-CAW / PVC-CAW-UV**
PVC-E / PVC-LZ

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
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 independing 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

9. Physical and chemical characteristics

Phenotype:		Change of state:	
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:	1.41 – 1.44 g/cm³

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.

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

Trade name: **SIMONA® PVC-D / PVC-DS / PVC-DS-TW / SIMONA® PVC-HSV / PVC-MZ / PVC-T / PVC-TF**

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
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 independing 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

9. Physical and chemical characteristics

Phenotype:		Change of state:	
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:	1.40 – 1.43 g/cm³

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.