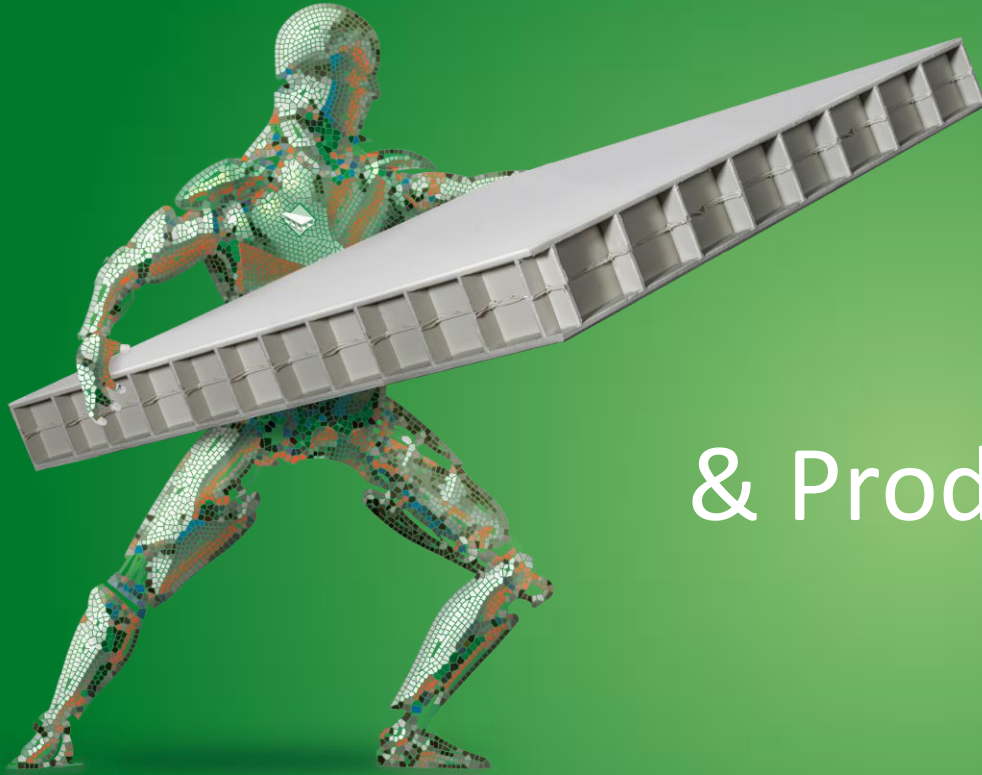




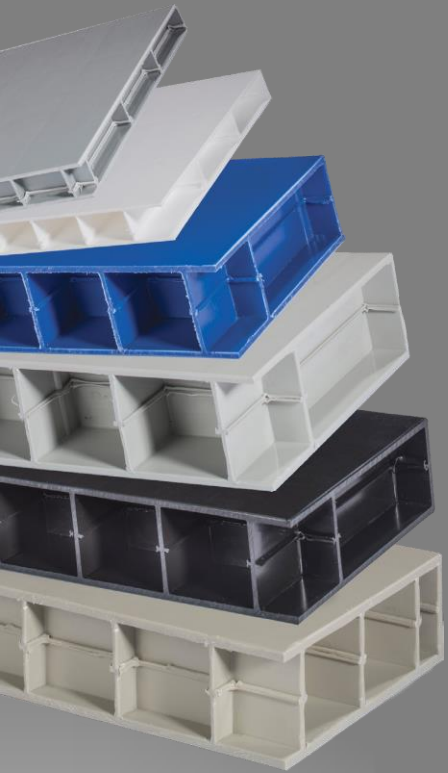
Corporate & Product presentation



Contents

- Round table
- Product Range
- Processing
- Applications
- Technical characteristics
- The company





Product Range



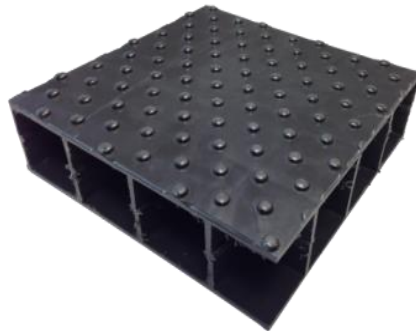
Product Range – existing (50mm)



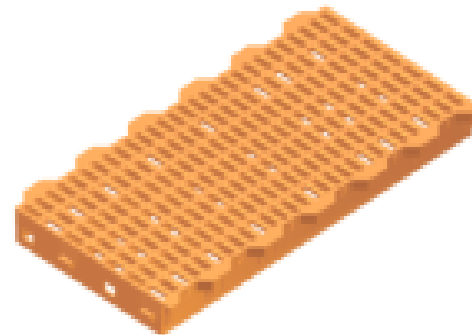
Light panel



Multipowered



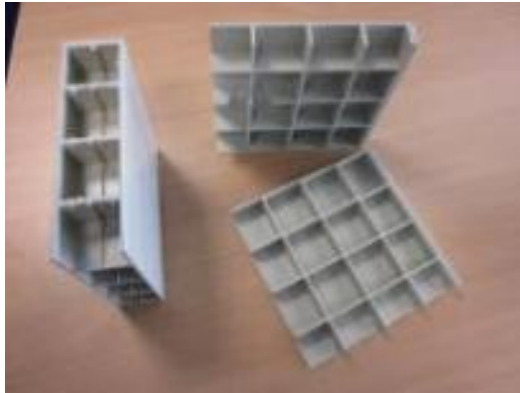
Antiskid Panel



Slat



Cell structure 50/50 vs 50/100



Product range – NEW!

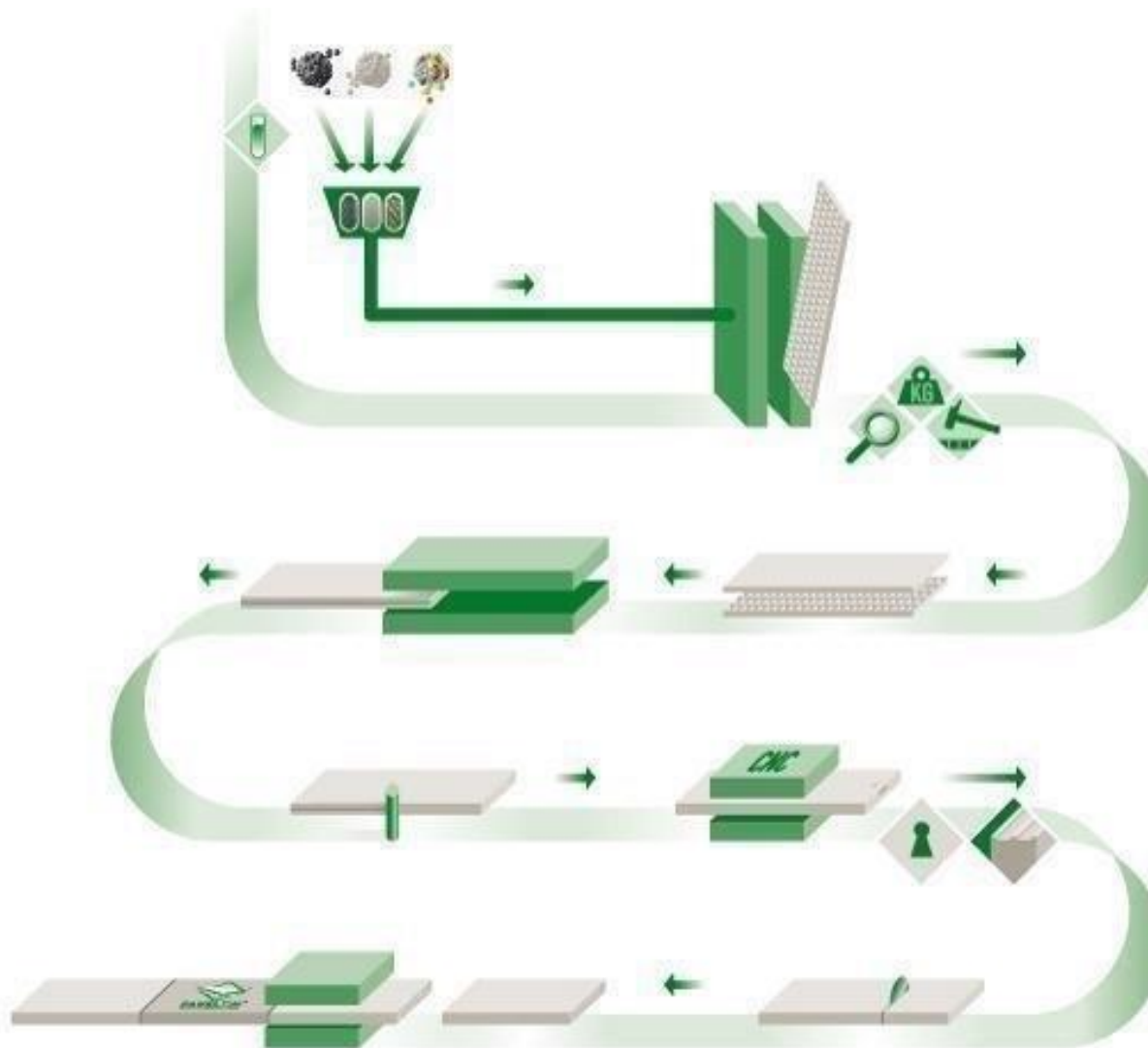
35mm panel



20mm panel

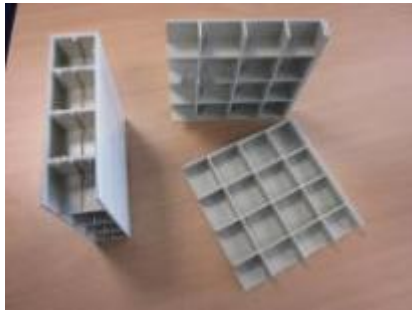


Production process



Panel characteristics: Light & Strong (50mm)

Twin-wall structure: cross-ribbed



	PP - Copolymer	HDPE
50/50	13kg/m ²	14kg/m ²
50/100	10kg/m ²	11kg/m ²

Light & strong



Raw material

- New always UV stabilized
- Near-to-prime without MFI certificate
- Recycled 100% PP recycling



Colours (prime)

- Standard colours:

- PP

- Beige UV (RAL7032)
 - White UV (RAL9010)
 - Grey FR (RAL7037)

- PE

- Black
 - Light grey UV (RAL7038)
 - White UV (RAL9010)



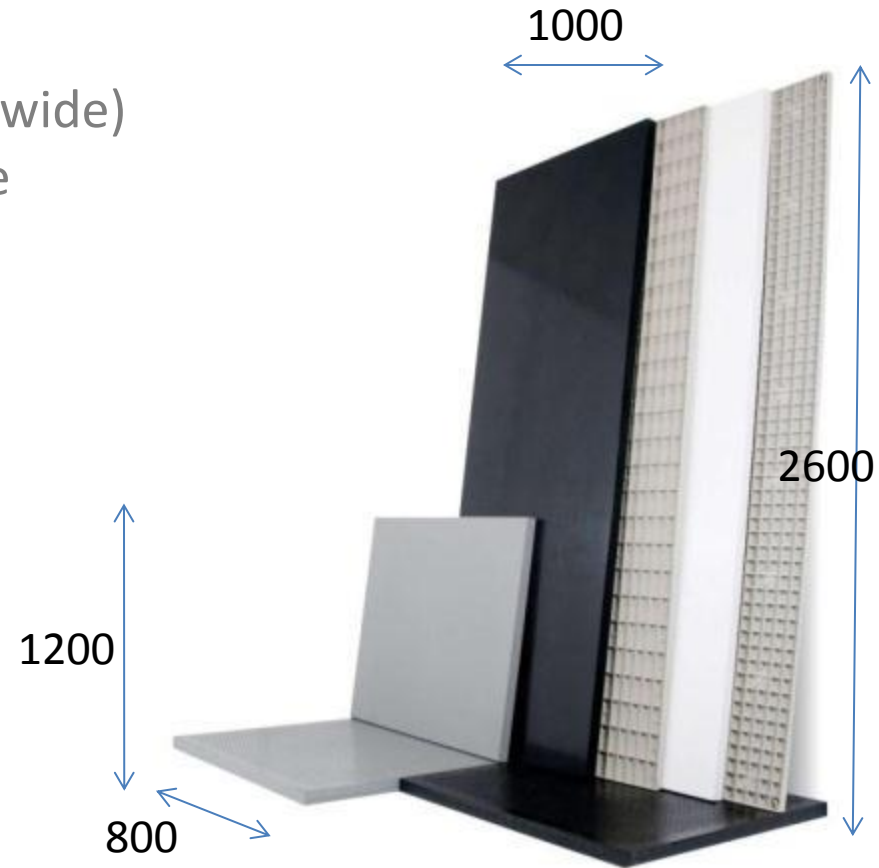
- Non-standard colours:

- On demand with minimum quantity
(e.g. light blue UV)



Options

- UV stabilized (mid-European, worldwide)
- PPFR (PPS) RAL7037 ~ B1 Certificate
- PP-EL (electrically conductive)
- Anti-skid



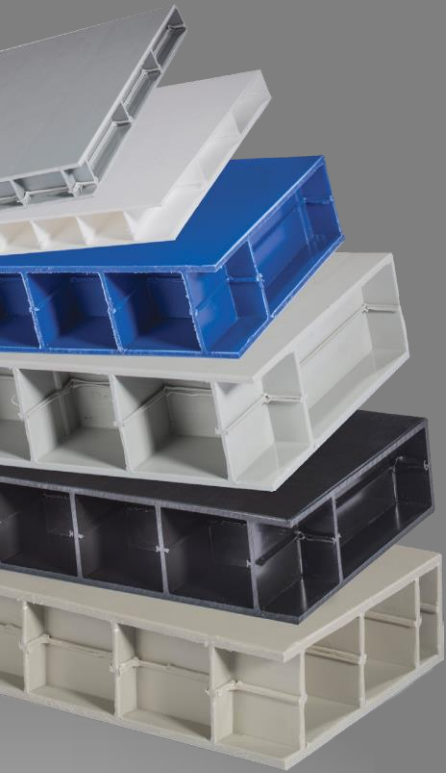
Slats: characteristics

- Material: PP prime 
- Standard dimensions:
 - 600x500x50mm
 - 800x500x50mm (closed)
 - Other dimensions on demand (on stock)
- Standard colour: orange UV
- Maximum load: 250kg/m²



Traceability





Processing Paneltim panels



Why Paneltim?

Butt welding



Weight



Complementary



Stability



Time to process



UV



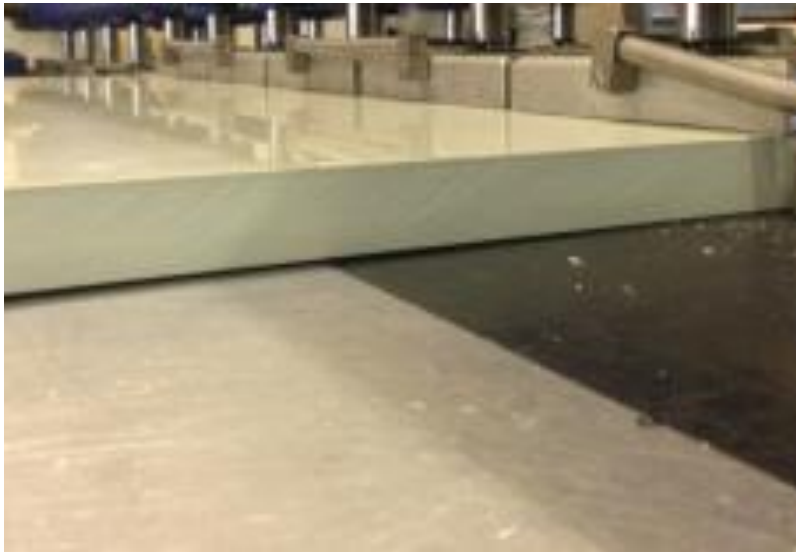
Stable constructions



Butt welding



Butt welding with massive panel: 1h for 30mm thickness



dataset: DVS-data data: P P

length: mm

thickness: mm

heating unit:

	min:sec	spec. pressure N/mm²	force N
melting:	2:00	0.10	3000
heating:	7:10	0.01	300
welding:	45:00	0.10	3000

selection of type and data

☒ QVS-Data ☐ free defined

P P

PE - HD

PVC - extrudiert

PVC - gepresst

P V D F

▲

▼

select

selected dataset:
1 P P

OK



Butt welding with Paneltim panel: 1 minute for 50mm thickness



Easy processing in the workshop



Inside reinforcements



Hinges

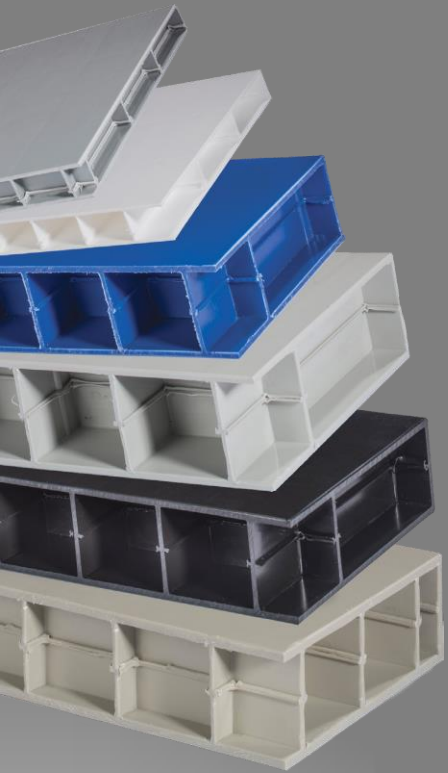


Rubber sealings



Combinations with massive components

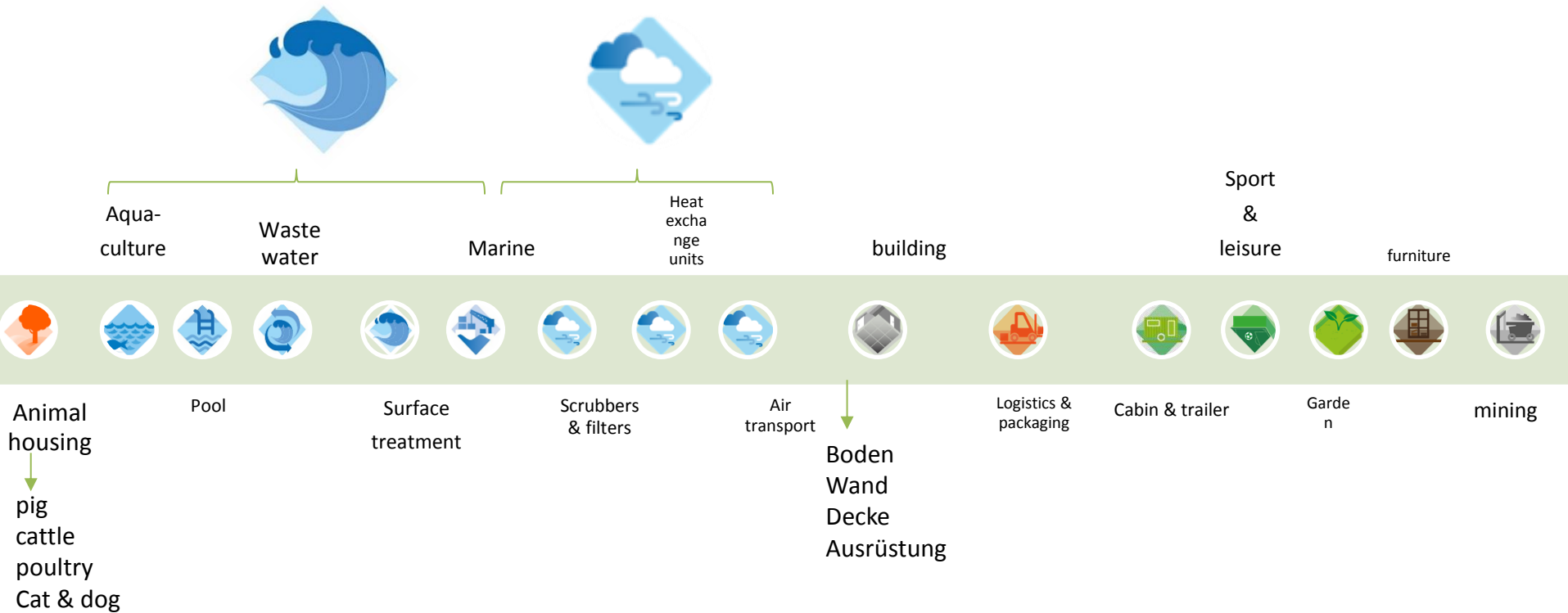




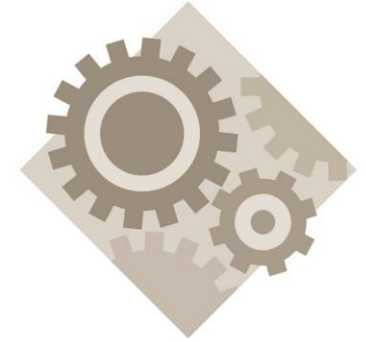
Applications



Application sectors



Sectors in construction



Infrastructure

Cabins
Technical rooms
Walls, floors



Air

Air scrubbers
Air ducts
Air filters



Liquids

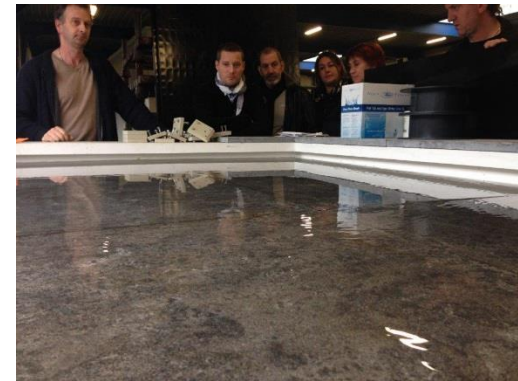
Swimming pools
Tanks
Filters



Applications per sector



Applications per sector



Tanks



Tanks - lids



Safety bund



Swimming pool



Swimming pond



Spa



Filters



Fish tanks



Floating



Air scrubbers



Heat recovery



Air filters



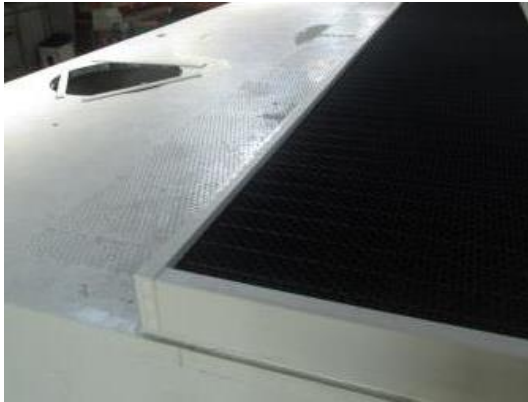
Air ducts



Technical rooms



Constructions with anti-slip surfaces



Walling



Cabins



Flightcases



Pallets



Sports infrastructure



Furniture



Technical characteristics

Raw material characteristics

Panel characteristics

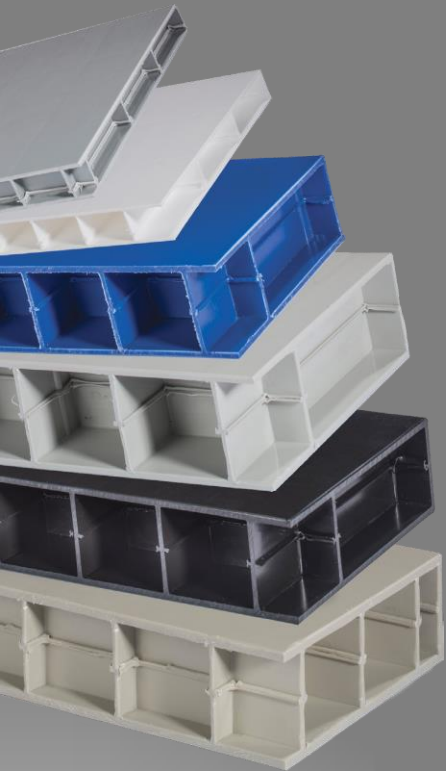
Applications

Tests

Welding

Calculations

Test certificates



Raw material characteristics

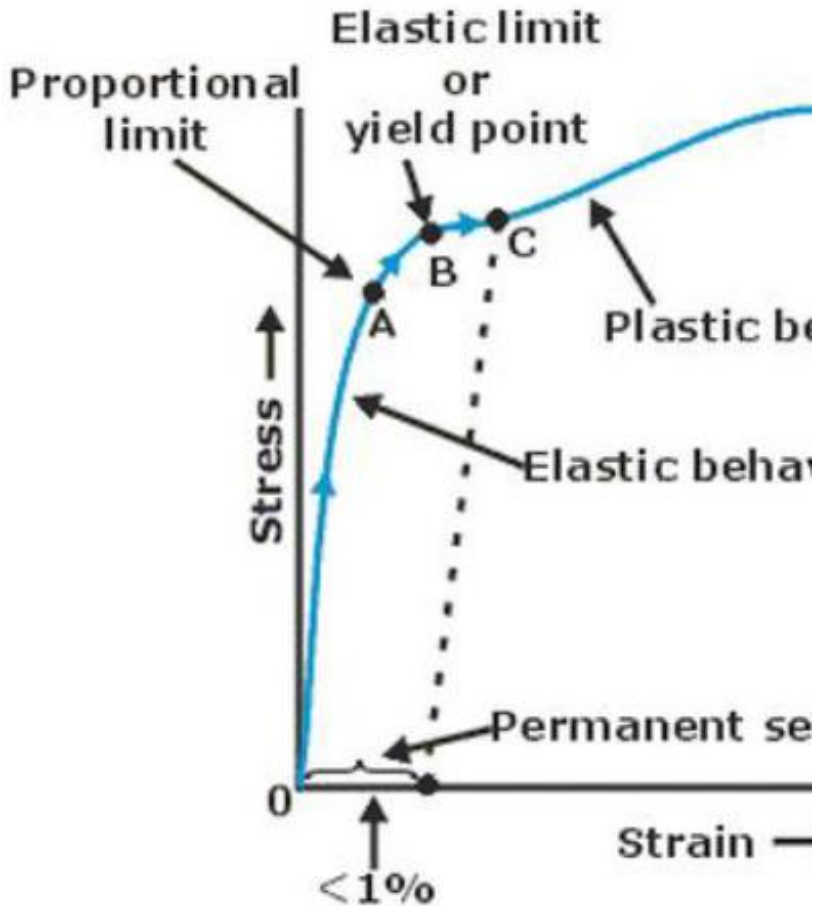


Characteristics of PP Copo

PPCO PRIME	Test method	Typical Values	Unit	Remark
General properties				
Density	ISO 1183-1	0,905	g/cm ³	
Melt Flow Rate (230°C / 2,16 kg)	ISO 1133	6	g/10min	
Mechanical properties				
Tensile strength (Stress at Yield)	ISO 527	24	MPa	
Strain at yield	ISO 527	6	%	
Tensile modulus of elasticity	ISO 527	1350	MPa	
Notched impact resistance (IZOD)	ISO 180/4A	10	kJ/m ²	at 23°C
Shore hardness	ISO 868	68	Scale D	
Thermal properties				
Melting temperature	ISO 11357-3	163	°C	
Thermal capacity	DIN 52612	1800	J / kg K	
Coefficient of linear thermal expansion	DIN 53752	100 - 180	10exp-6/ K	
Heat deflection temperature (0,45 Mpa)	ISO 75/B	89	°C	
Electrical properties				
Surface resistivity	DIN VDE 0303	>10exp14	Ohm	
Flammability				
Fire resistivity	ISO 11925-2	E		



Molecular characteristics of PP Copo & HDPE



PP Copo



- Tensile E-mod 1350 Mpa
- Elastic limit 21 MPa - 6 %
- Impact resistance 10 kJ / m²

HDPE



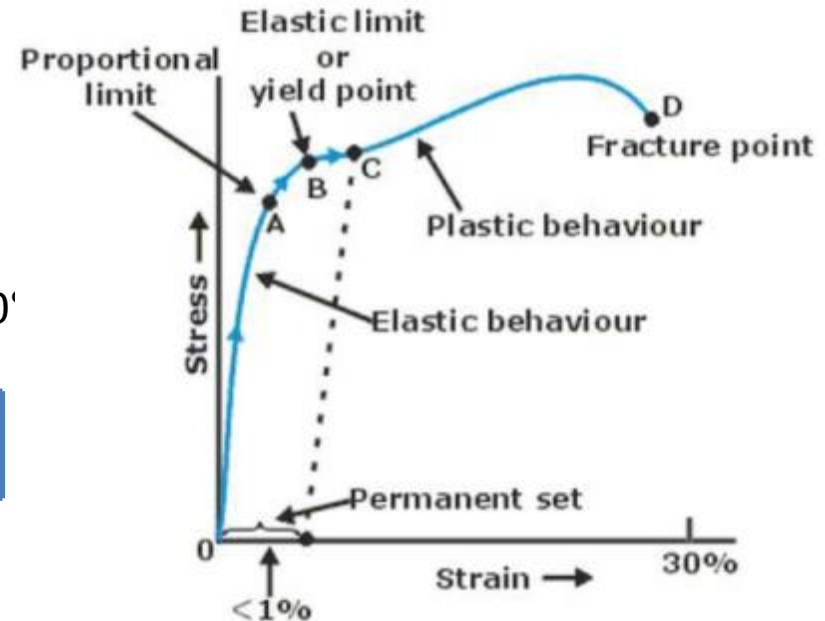
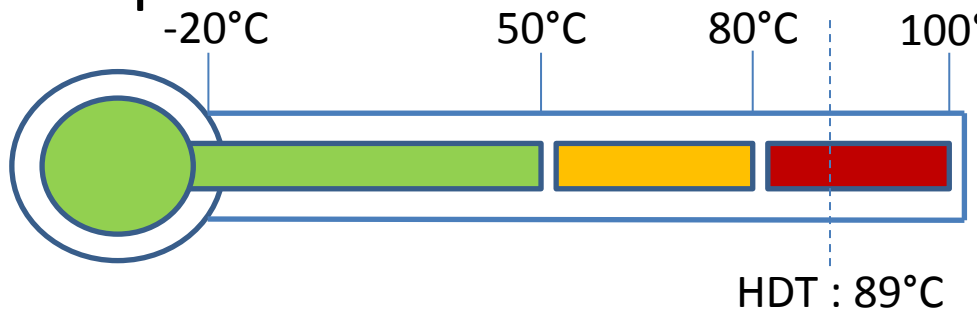
- Tensile E-mod 1000 Mpa
- Elastic limit 25 Mpa - 11 %
- Impact resistance 8 kJ / m²

Different characteristics & different applications

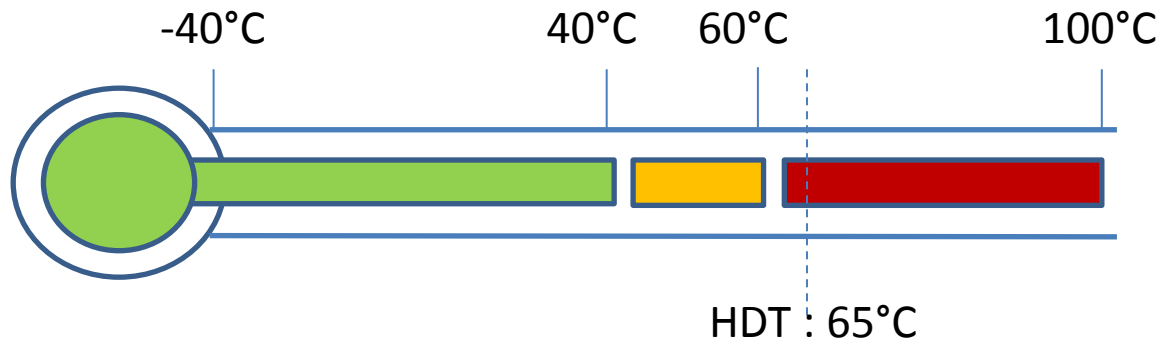


Processing temperature

PP Copo



HDPE



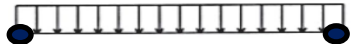
- Standaard (Wasser)
- Lucht
- Stoom (kortstondig)

Remark: temperature change 1°C/min

Panel characteristics



PP multipowered panel

Mechanical properties	Typical value	Unit	Test method	Remark
Typical value for homogeneous load :				
Panel for 1% deformation span 1000 mm	5750	N/m ²		
Panel for 1% deformation span 1200 mm	3450	N/m ²		
Average impact resistance	>= 1,5	m	ASTM D 1709	at 23 °C
Processing			Test method	
Product is easy to weld : hot air, extrusion and mirror butt welding.			In house experience, SKZ	
See the technical welding guidelines for correct processing.				
Thermal properties	Typical value	Unit	Test method	
Temperature range for constant stress or pressure	-20 °C I + 50 °C	°C		
Temperature range without stress or pressure	-20 °C I + 80 °C	°C		
Thermal shocks are not allowed, gradual heating of max. 1 °C / minute allowed.				
The construction should be designed for absorbing the load in cold and hot circumstances.				
Thermal conductivity	1,7	W/(m ² x K)	DIN 52612-1	
Coefficient of linear thermal expansion	1,3	mm / m / 10°C		
Electrical properties	Typical value	Unit	Test method	
Typical surface resistivity	> 10exp14	Ohm / m	IEC 60093	
Recycling	100% recyclable			



Mechanical panel characteristics

For 1m Span & 1 % deflection at 23°C:

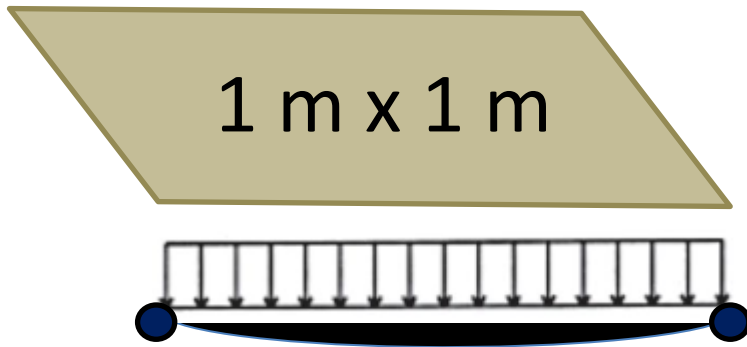
575 kg (*PP 50/50*)

480 kg (*PE 50/50*)

460 kg (*PP 50/100*)

410 kg (*PE 50/100*)

1 m x 1 m



Remark: free panel, only for short-term load!



Temperature expansion of the panels

1,3 mm / m / 10 °C (*PP*)
1,5 mm / m / 10°C (*PE*)
E.g.: 8 m x 1,5 ~ 12 mm

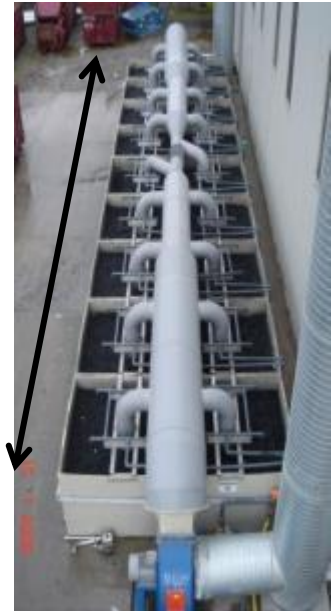


1 m x 1 m



Time ~max. 1°C / min.

Remark: black-coloured panels expand the most!



Insulating capacity

Good insulation:

1,9 W / (m² x K) (*PE 50/100*)

1,8 W / (m² x K) (*PE 50/50*)

1,8 W / (m² x K) (*PP 50/100*)

1,8 W / (m² x K) (*PP 50/50*)



Heat transfer between inside and outside:

~ 30 Minutes



Which application with which panel?

LEGEND

Extremely suitable / very frequently used:



Highly suitable / frequently used:



Suitable / occasionally used:



Less suitable / infrequently used:



Not appropriate:



	PPCopo Prime 50 mm MultiPowered panel 50/50 (UMP)	PPCopo Prime 50 mm Lightweight panel 50/100 (LXL)	PPCopo Prime 50 mm Antiskid panel 50/50 (ANTI)	PPFR Prime 50 mm Compressed panel 50/50 (PRES)	HDPE Prime 50 mm Lightweight panel 50/100 (LXL)	HDPE Prime 50 mm MultiPowered panel 50/50 (UMP)	HDPE Prime 50 mm Lightweight panel 50/50 (UMP)	HDPE Prime 50 mm Antiskid panel 50/100 (LXL)	HDPE Prime 50 mm Compressed panel 50/50 (PRES)	HDPE Recy 50 mm Compressed panel 50/50 (PRES)
Aquaculture & swimming pools (Fluid)	Highly suitable	Extremely suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Extremely suitable	Extremely suitable	Extremely suitable	Highly suitable
Chemical engineering and tank building (Fluid)	Extremely suitable	Highly suitable	Highly suitable	Extremely suitable	Highly suitable	Extremely suitable	Highly suitable	Extremely suitable	Extremely suitable	Highly suitable
Surface treatment metals (Fluid)	Extremely suitable	Highly suitable	Highly suitable	Highly suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Highly suitable	Highly suitable
Buffer tanks (Fluid)	Extremely suitable	Highly suitable	Highly suitable	Extremely suitable	Highly suitable	Extremely suitable	Extremely suitable	Highly suitable	Highly suitable	Highly suitable
Environment and waste water tanks & disposal technology (Fluid)	Extremely suitable	Highly suitable	Highly suitable	Highly suitable	Highly suitable	Extremely suitable	Extremely suitable	Extremely suitable	Extremely suitable	Highly suitable
Drinking and pure water technology (Fluid)	Extremely suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Highly suitable	Highly suitable
Pump manufacturing (Fluid)	Extremely suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Extremely suitable	Highly suitable	Highly suitable	Highly suitable	Highly suitable

Accelerated ageing test

				HDPE		PPCopo		
Use of chemicals*		Concentration		20°C	40°C	20°C	50°C	
Acids	Hydrogen Chloride	HCl	50%					
			100%					
	Phosphoric acid	H3PO4	30%					
			50%					
			100%					
	Sulphuric acid	H2SO4	50%					
			98%					
			Smoking	Not applicable				
Hydrogen Fluoride	HF	35%						
Alkali	Sodium hydroxide	NaOH	50%					
			100%					
	Calcium hydroxide	Ca(OH)2	Saturated					
	Oxidizing agents and acids	Nitric Acid	HNO3	30%				
50%								
100%								
Sulphuric acid / Nitric Acid		H2SO4/HNO3	50%/50%	Not applicable				
Iron(III) chloride		FeCl3	Saturated					
Sodium hypochlorite (bleach)		NaClO	3%					

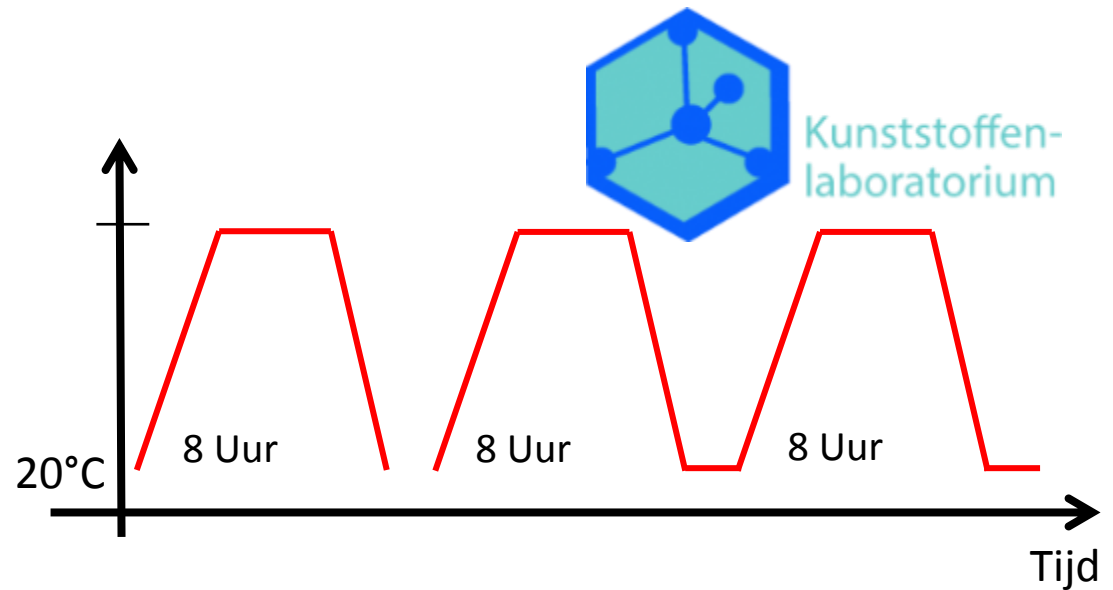
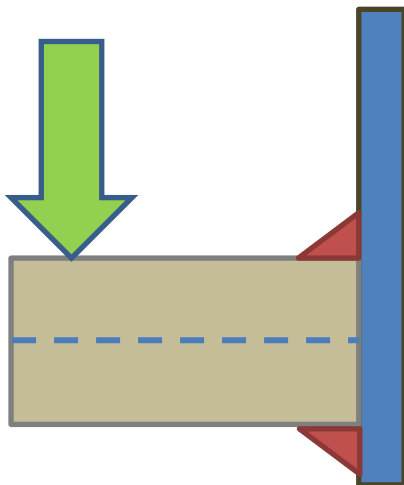
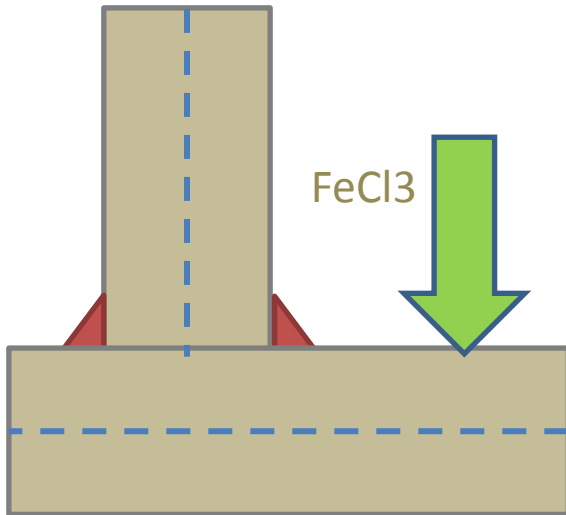
LEGEND

Resistant:	OK: the panel strenght remains unchanged.
Limited resistance	Limited: no long lifespan
Not resistant	NOK: Paneltim® Panel is not appropriate for permanent contact and constant load.



Accelerated ageing test: detailed test setup

Detail Opstelling



- Constant mechanical **load**
- Variable **Temperature**
- Until fracture

With several **chemical** substances



Technical welding instructions

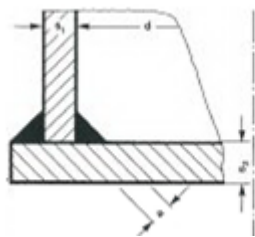
50mm Multipowered panel 50/50

Material: PP Copo Prime				
Butt welding	Typical value	Unit	Typical tolerance	Pressure force
Melting	30	sec	+/- 4	0,12 N/mm ²
Heating	0	sec	+/- 2	0,05 N/mm ²
Welding	30	sec	+/- 4	0,12 N/mm ²
Thickness panel	18	mm	+/- 3%	In function of length
Temperature	197-200	°C	+/- 10	
Extrusion welding	Typical value	Unit		Based upon
Material base temperature	220-230	°C		SKZ report
Hot-air temperature	260-275	°C		SKZ report
Air Volume	300	l/min.		SKZ report
Welding shoe joint width (under 45° position)	14	mm		SKZ report
Welding shoe pressing length	40	mm		SKZ report
Welding shoe A-value	6-8	mm		
Hot-air welding	Typical value	Unit		
Hot-air temperature	260-270	°C		
Rod shape	Triangle	5-3-3	mm	

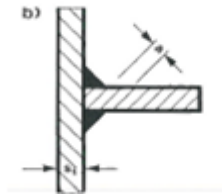


Technical welding guidelines

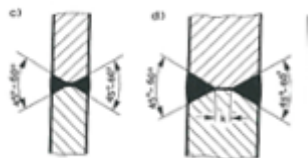
DVS 2205-5:



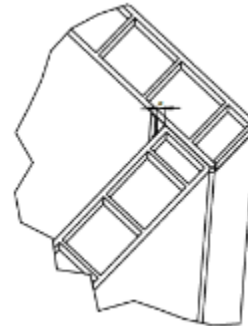
$S3 > S1: a = 0.7 \times S1$
 $S1 > S3: a = 0.7 \times S3$



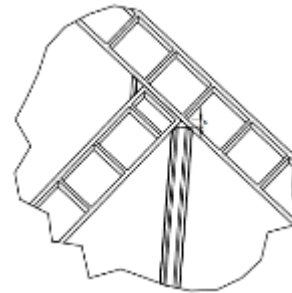
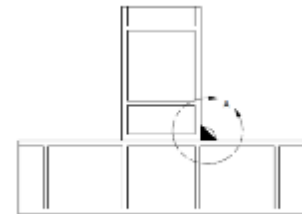
$a = 0.7 \times S1$
 $f = 0.2 \times S1$



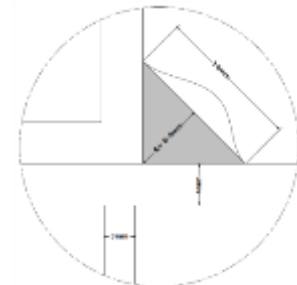
Paneltim®:



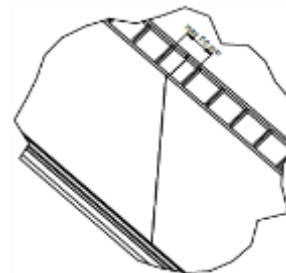
$a = \max 6 - 8 \text{ mm}$



$a = \max 6 - 8 \text{ mm}$



max. rib height 25 mm



Calculations

- Freestanding rectangular tanks
- Indicative
- Example:

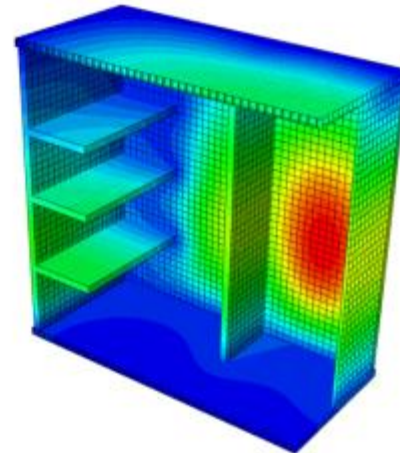
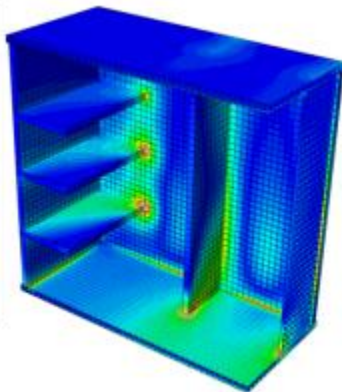
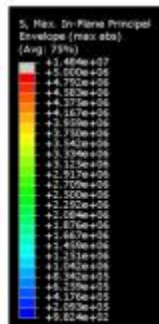
Material:	PE-HD
Dimensions (LxWxH):	7200 x 1600 x 1200 mm
Type of construction:	with all around strengthenings (manual positioning)
Medium:	Water
Temperature:	30 °C
Lifetime:	10 years

- Based on DVS 2205-5 (construction)



Calculations

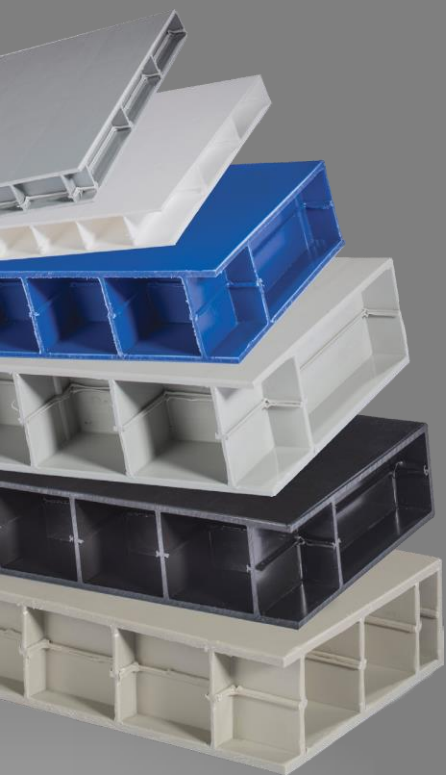
- Calculation agency based on TÜV
- With FEA model/CAE software
 - E.g. Inventor, Abaqus, SolidWorks, Creo...
- For complex calculations
 - Influence of sun, wind, snow,...
 - Complex structures



Test certificates

- SKZ Report P1049 PE / PP
- Testrapport brandgedrag DLG
- EC conformiteitsverklaring
- Testrapport Isolatiewaarde
- Testrapport Levensmiddelengeschiktheid PE / PP





The company





History

1999



2010

1st K-Messe Düsseldorf

2016

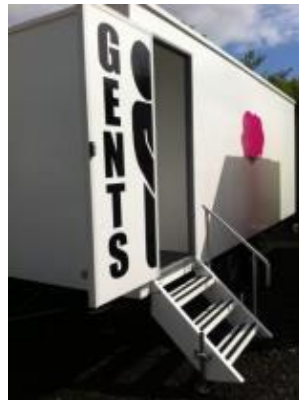
20mm
35mm
antislip

1997 – PP/PE
50/50



2005

PP/PE 50/100



2013

2nd K-Messe :
New 50/50 panel



Pioneer in sandwich panel technology

Only producer worldwide of 2600*1000*50mm injection mould panel



