

Wherever Your Imagination Takes You

**KÖMACEL®**



# LET YOUR CREATIVITY SOAR



NO.1 WORLDWIDE  
IN RIGID PVC  
FOAM SHEETS



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**KÖMMERLING**

# Working with Kömacel®

## Machining

Kömacel® sheets can be easily and quickly worked with standard tools to process wood and metal (plastic bits and blades are required). To prevent breaking and splitting, the tools must be sharp. Generally, you should use a high cutting speed and slow, continuous forward feed. Normally, it is not necessary to cool the cutting tools, but in special cases, compressed air is sufficient. Deep notches and sharp edges can cause premature breaking of the material if too much weight is placed on the affected area.

## Welding

Kömacel can be welded by normal procedures, such as hot gas, heated tool, bending and welding, friction, etc., using common equipment. Before welding, the part of the sheet to be welded must be properly cleaned with a cleaning agent or by machining. After welding, finishing may be necessary. Kömacel should be worked very carefully to ensure that the foam structure does not collapse.

## Bonding

Kömacel will accept most adhesives for rigid PVC. The sheet surface must be clean, dry and free of oil or grease. When choosing an adhesive, consider the strength required, the temperature the sheet will be exposed to, cure time and environmental safety.

When bonding Kömacel to itself, the same solvent-type adhesives used for rigid PVC will provide excellent results. We recommend Lord and IPC Weldon products for most applications in which bonding to Kömacel or another substrate is required. As always, we suggest a test piece prior to full production.

## Printing and Coating

Because of its smooth surface, Kömacel is easy to print, paint and coat. Although, in principle, any PVC-compatible paint can be used, these systems have proved most suitable:

- One- and two-component acrylic paint systems
- Two-component polyurethane paint systems (DD paints)
- Screen-printing paints for PVC (bonding agent basis acrylic resin/PVC copolymerisate)
- Carbit Paint Carbithane 11 Series Low Acrylic Polyurethane and Series 12

## Fixing and Storage

With a coefficient of linear thermal expansion  $\alpha = 0.08 \text{ mm/m}^\circ\text{C}$ , Kömacel sheets vary more in length than wood or metal. When you install screen-printed advertising boards or fix curtain walling and cladding, possible sheet expansion has to be taken into account. The appropriate fixing method depends on the application.

Always store Kömacel sheets on a dry and even surface in heated rooms at  $15 - 20^\circ\text{C}$  ( $59 - 68^\circ\text{F}$ ). Sheets inside the packing must not be exposed to weathering and solar radiation.



## Tolerances

### Thickness (s)

$\pm(0.1 + 0.05 \times s)$

### Width

$0 + 0.25 \text{ mm}$  (0.01 in.)

### Length

$0 + 10 \text{ mm}$  (.39 in.)

### Right angle precision

max  $1.5 \text{ mm/m}$  (0.05 in./vd.)

### Angle of cuttings

$0.5^\circ$

### Evenness

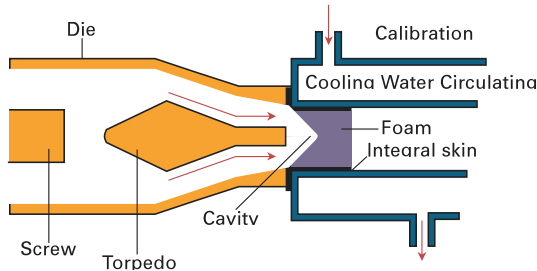
max  $1.5 \text{ mm/m}$  (0.06 in.)

## Colors

White 654/652

Permissible color difference according to DIN standard 6174, color white,  $\geq 1.2$  CIELAB units.





## The Versatile, High Impact-resistant, Integral-skin, Rigid Foam PVC Sheet for Graphic and Industrial Applications

Suitable for a virtually unlimited range of applications, PVC is one of the oldest and most developed synthetic materials. For more than 100 years, Kömmerling has been dedicated to developing the highest-quality rigid PVC sheets.

Kömacel®, an integral skin-foam sheet made of rigid PVC according to the Celuka process, has been part of Kömmerling's range of thermoplastic sheets for more than 25 years. It fits requirements for a multitude of applications, from a substrate for backers of channel letters to wood replacement. However Kömacel is used, experience has proven its quality.

### Characteristics and Benefits

Kömacel is the substrate of choice when the following characteristics are required:

- Fine-cell foam structure – light and easy to fabricate
- Smooth outer skin – ideal for screen printing, paints and vinyls
- Gloss finish – high-tech look
- Homogeneous coloring – little change in color from run to run
- Widest range of thicknesses – 4 – 30 mm
- Great for indoor and outdoor uses
- Thermal and sound insulation – absorbs vibrations and oscillations
- Good insulation value
- High flexural strength
- High impact strength – suitable for high-traffic areas
- Lightweight and easy to handle
- Easy to fabricate with most common tools
- Weatherproof and light-fast – solid surface ideal for exterior applications where other products have failed
- Chemical and corrosion resistance
- Moisture resistance – low water absorption
- Low flammability (UL-94VO) – perfect for trade shows and exhibit halls
- Bonds easily to similar and various other substrates

Kömacel sheets are not harmful to human health or the environment in manufacturing, applications or disposal. Kömacel is free of lead, cadmium and barium. All Kömmerling products comply with national and international regulations relating to the environment.

It is not recommended to laser cut Kömacel



## European Technical Values

For applications requiring more detailed technical data, please contact our specialists.

Properties	Examination Method	Unit	Values 4. 5. 6 mm Values	Values 8. 10. 13 mm	Values 19. 24. 30 mm <sup>1</sup>			
<b>Mechanical</b>								
Apparent density <sup>2</sup> DIN 53 479	q/cm <sup>3</sup>	0.85	0.55 – 0.60	0.55 – 0.60				
Tensile strength	DIN 53 455	N/mm <sup>2</sup>	20	15	–			
Elongation at tear DIN 53 455	%	30	20	–				
Flexural strength	DIN 53 452	N/mm <sup>2</sup>	30	30	20			
Compressive strength (range of elasticity)	DIN 53 421	N/mm <sup>2</sup>	10	4	3.5			
Compressive stress for compressive strain of 30%	DIN 53 421	N/mm <sup>2</sup>	20	9	5.5			
Modulus of elasticity	DIN 53 457 (similar to)	N/mm	1100	850	1100			
Impact strength: 20°C	DIN 53 453	kJ/m <sup>2</sup>	20	17	–			
Impact strength: 0°C	DIN 53 453	kJ/m <sup>2</sup>	–	15	–			
Impact strength: -20°C	DIN 53 453	kJ/m <sup>2</sup>	–	13	–			
Ball pressure hardness	DIN 53 456	N/mm <sup>2</sup>	–	20	–			
Shore hardness D	DIN 53 505		55	75	77			
<b>Thermal</b>								
Vicat softening temp.	DIN 53 460	°C	75	74				
Temp. of deflection under load acc. To ISO/R 75 (HDT)	DIN 53 461	°C	56	63				
Coefficient of linear thermal expansion (-30° - 50°C)	DIN 53 752	mm/m °C	0.08	0.08				
Thermal conductivity (0° - 60°C)	DIN 53 616	W/mK	0.10	0.05 – 0.07				
u-value (rate of heat transfer) <sup>2</sup>	DIN 52 616	W/m <sup>2</sup> K		10mm ~3.0	13mm ~2.6	19mm ~2.13	24mm ~1.9	30mm ~1.58
<b>Electrical</b>								
Surface resistance	DIN VDE 0303 T3 Ω		>1 x 10 <sup>14</sup>	3.7 x 10 <sup>14</sup>	7.0 x 10 <sup>14</sup>			
Volume resistivity	DIN VDE 0303 T3 Ω x cm		4 x 10 <sup>15</sup>	4.4 x 10 <sup>15</sup>	6.0 x 10 <sup>15</sup>			
Dielectric strength	DIN VDE 0303 T2 kV/cm		100	48	48			
Dielectric constant E	EIN 53 484 T2		2.4	1.9	1.8			
Dielectric dissipation factor	DIN 53 483 T2		0.013	0.013	0.0084			
Tracking resistance	DIN IEC 112		CTI 600	CTI 600	CTI 600			
<b>Other</b>								
Valued sound insulation measure RW	DIN 52 2120/84	dB	–	10mm ~3.0	13mm ~2.6	19mm ~2.13	24mm ~1.9	30mm ~1.58
Water absorption after 7 days	DIN 53 495	%	>0.2					
Fire behavior	DIN 4102 (D)		B 1 (Color 654, thickn. 4, 5, 6, 10 mm)					
	NFP 92-501 (F)		M 1 (Color 654, thickn. 4, 5, 6, 10 mm)					
	BS 476, Part 7, 1971 (UK)		Class 1 (Color 654, thickn. 4 mm)					
	UL 94 (USA)		VO	VO				
	VKF (Switzerland)		5.3	5.3			5.3	
	Italia (I)		Class 1	Class1 (Color 654, thkn.10mm)				

<sup>1</sup>The missing values of Kömacel® – 19/24/30 mm – cannot be determined in conformity with the standards by applying measurement techniques.

<sup>2</sup>These are standard values that apply to an average density. Small variations depending on the sheet thickness are not excluded.



## U.S. Technical Values

Property	Value	ASTM Method
Density (lbs/cubic ft)	37	D792
Water absorption (%)	<1	D570
Flexural strength (psi)	3,952	D790
Flexural modulus (psi)	192,700	D790
Tensile strength (psi)	1,739	D638
Tensile modulus (psi)	113,400	D638
Compression strength (psi)	2,018	D695
Compression modulus (psi)	90,200	D695
Notched izod impact strength (ft-lb/inch)	0.27	D256
Puncture impact energy (ft-lbs)	7.34	D3763
Coefficient of linear expansion (in./in. °F)	3.2 x 10 <sup>-5</sup>	D696
Burn rate	None when flame removed	
Flame spread index	25	E84
Heat deflection temp. at 264psi (°F)	143	D648
Oil canning at 140 °F	None	D3979

## ASTM E84-03 Test Results

Property	Flame Spread Index	Smoke Developed Index
Kömacel®	15	350

## ASTM C518 Test Results

Thermal Resistance, R = 1.976 and per inch equals 2.18 for 1" Kömacel

Thermal Resistance, R = 1.106 and per inch equals 2.37 for 1/2" Kömacel

## Kömacel Sheet Sizes

Stock Size inches	Pallet Quantity	Thickness	
		mm	inches
48 x 96	125	4	5/32
48 x 118	125	4	5/32
48 x 96	100	5	3/16
48 x 118	100	5	3/16
48 x 96	75	6	1/4
48 x 118	75	6	1/4
48 x 96	60	10	3/8
48 x 118	50	10	3/8
48 x 96	40	13	1/2
48 x 118	40	13	1/2
48 x 96	30	19	3/4
48 x 118	30	19	3/4
48 x 96	20	24	1
48 x 118	20	24	1
48 x 96	15	30	1 3/16
48 x 118	15	30	1 3/16



The information contained here is supplied in good faith and represents values obtained through empirical observation and as indicated by our own experience. The figures given are to be understood as reference figures and may vary according to processing methods and environmental conditions.

This information shall not be construed to be legally binding. In particular, it shall not exempt the purchaser from taking responsibility for testing the product supplied so as to determine its suitability for the intended application.

Consequently, this information shall not constitute an independent contractual relationship nor a warranty of the properties indicated. In the event, however, that liability should be at issue, it shall be precluded insofar as premeditation or gross negligence cannot be substantiated.

# KÖMACEL®

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