



Product Data Sheet, October 2004

# Vivak®

## Solid copolyester sheet

Your benefits:

- excellent thermoformability
- good impact strength
- suitable for food-contact applications
- good fire rating

Solid **Vivak®** sheets are made of thermoplastic copolyester. They offer high impact strength, a good fire rating, are suitable for food-contact applications and fully recyclable.

**Vivak® clear 099** is a grade of clear transparent sheet with extremely high light transmission and high gloss.

**Vivak® bronze 850** sheets are bronze-colored and transparent.

**Vivak® fluo** is a luminous transparent sheet with high gloss and extremely bright edges.

**Vivak® FR clear 099** has improved burning characteristics when tested acc. to DIN 4102.

**Applications:**

Ideal fields of application for Vivak® are: P.O.S. (displays, price tag holders, shelf partitions), direction signs, promotional symbols, food containers and trays, pharmaceutical applications, flat and formed machine coverings, partitions.

Vivak® can be rapidly thermoformed at low energy consumption, short production cycles, extreme degrees of stretching and accurate mold surface reproduction, without predrying. The sheets are easy to screen print and machine.

	Test Conditions	Typical Values	Unit	Test Method
<b>PHYSICAL</b>				
Density		1.27	g/cm <sup>3</sup>	ISO 1183-1
Moisture absorption	after storage in standard climate 23 °C/50% r. F. after storage in water at 23 °C until saturation	0.2 0.6	% %	ISO 62-4 ISO 62-1
Refractive index	20 °C	1.567	–	ISO 489
<b>MECHANICAL</b>				
Tensile stress at yield		> 45	MPa	ISO 527-2/1B/50
Elongation at yield		4	%	ISO 527-2/1B/50
Tensile strength		> 45	MPa	ISO 527-2/1B/50
Elongation at break		> 35	%	ISO 527-2/1B/50
Elastic modulus		2020	MPa	ISO 527-2/1B/1
Limiting flexural stress		ca. 80	MPa	ISO 178
impact strength	Charpy, unnotched	no break	kJ/m <sup>2</sup>	ISO 179/1fU
	Charpy, notched	ca. 7	kJ/m <sup>2</sup>	ISO 179/1eA
	Izod notched	ca. 6	kJ/m <sup>2</sup>	ISO 180/1A
<b>THERMAL</b>				
Vicat softening temperature	Method B50	80	°C	ISO 306
Thermal conductivity		0.2	W/m K	DIN 52612
Coeff. of linear thermal expansion		0.05	mm/m K	DIN 53752-A
Heat deflection temperature under load	Method A: 1.80 MPa	63	°C	ISO 75-2
	Method B: 0.45 MPa	70	°C	ISO 75-2
<b>ELECTRICAL</b>				
Dielectric strength		20	kV/mm	IEC 60243-1
Volume resistivity		10 <sup>15</sup>	Ohm-cm	IEC 60093
Surface resistivity		10 <sup>16</sup>	Ohm	IEC 60093
Dielectric constant	at 10 <sup>3</sup> Hz	2.6		IEC 60250
	at 10 <sup>6</sup> Hz	2.4		IEC 60250
Dissipation factor	at 10 <sup>3</sup> Hz	0.005		IEC 60250
	at 10 <sup>6</sup> Hz	0.02		IEC 60250

The mechanical properties were measured on sheets of 4 mm thickness.

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**Light Transmission:**

Test Method according to DIN 5036

The stated thicknesses are not all available as standard. Please ask us for more information. The stated values are typical values only.

Light transmission in %	0.5	0.75	1	1.5	2	2.5	3	4	5	6	8	10	12
Vivak® clear 099	90	90	90	90	89	89	88	88	87	86	85	84	80
Vivak® bronze 850					70		60	50	45	50	36		
Vivak® fluo green 680							80						
Vivak® fluo red 330							28						
Vivak® fluo orange 250							52						

**Available sizes:**

Vivak® is available in thicknesses of 0.5–10 mm and in the following sizes; other sizes and sheet thicknesses on request.

**Colors:**

Vivak® clear 099  
 Vivak® bronze 850  
 Vivak® FR clear 099  
 Vivak® fluo green 680  
 Vivak® fluo red 330  
 Vivak® fluo orange 250

**Sizes (Standard):**

2,050 x 1,250 mm  
 3,050 x 2,050 mm

**Thermoforming:**

Owing to their excellent flow and mold surface reproduction, Vivak® sheets can be thermoformed at low temperatures without predrying. Because of its low specific heat capacity, Vivak® requires little energy for thermoforming.

**Permanent Service Temperature:**

The permanent service temperature without load is approx. 60 °C.

**Fire Rating (\*)**

Oxygen index (LOI) 26 % ISO 4589

Country	Standard	Rating	Thickness	Color
Germany	DIN 4102	B 1 (indoors) no burning droplets	0.5-8 mm	FR clear 099
		B 1 (indoors) burning droplets	0.5-10 mm	clear 099
Italy	CSE RF 2/75/A CSE RF 3/77	Classe 1 (wall)	2-8 mm	all colors
France	NFP 92-501&505 NFP 16-101&102	M2	2-6 mm	clear 099
		F1	0.5-12 mm	clear 099
USA	UL94	V-2	≥ 3 mm	clear 099 (raw material)

**Glow wire flammability index, IEC 60695-2-12, in °C (\*)**

	0.5	0.75	1	1.5	2	2.5	3	4
Vivak clear 099	960	960	900	960	960	960	960	960
Vivak bronze 850					960		960	

(\*) fire certificates are limited in time, always check if the mentioned certificate is still valid

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A  Bayer MaterialScience Company**VIVAK®**