

# Transparent PI Film

## Neopulim<sup>®</sup> L



**Mitsubishi Gas Chemical Co., Inc.**

# Basic Properties of Neopulim® L



MITSUBISHI GAS CHEMICAL COMPANY, INC.

	unit	L-3430	L-1000	LH-1000	remarks
Glass Transition Temp.	°C	303	260	260	DSC
CTE*1	ppm/°C	58	54	40	TMA 100~150°C
Specific Heat	J/kg/K	1750	1530	—	DSC 200°C
Density	kg/m <sup>3</sup>	1230	1260	—	
Heat Conductivity	W/m/K	0.198	—	—	Laser flash 200°C
Water Absorption	%	2.1	1.6	—	24hours dipped
CHE*2	ppm/%RH	63	52	40	25°C 20-80%RH
WTR*3	g/m <sup>2</sup> /day	93	85	—	JIS K7129 200um

\*1 Coefficient of linear thermal expansion    \*2 Coefficient of linear humidity expansion

\*3 Water transfer rate

L-3430 :30,50,100,200um available, L-1000 : 30,50,100,200um available,  
LH-1000 : 50um available

The data mentioned above is not guarantee value but representative one.

		L-3430	L-1000	
Dielectric Constant		2.9	3.2	1MHz
Dissipation Constant		0.006	0.005	1MHz
Surface Resistivity	$\Omega / \square$	4.4E+16	4.8E+16	500V
Volume Resistivity	$\Omega \cdot \text{cm}$	7.3E+16	1.5E+17	500V

❑ Dielectric constant and dissipation constant are smaller than the aromatic polyimides.

❑ Good insulator

The data mentioned above is not guarantee value but representative one.

## Comparison with another material

		Dielectric Constant	Dissipation Constant	
L-3430	1kHz	3.0	0.0028	
	1MHz	2.9	0.0063	
L-1000	1kHz	3.3	0.0012	
	1MHz	3.2	0.0052	
Kapton H	1kHz	3.5	0.001	25°C, JIS C2318
Upilex 25S	1kHz	3.5	0.0013	25°C, ASTM D150
Upilex 75S	1kHz	3.3	0.0038	25°C, ASTM D150
Zeonor	1MHz	2.3	0.005	ASTM D150
Arton	1MHz	3	0.01	ASTM D150
PC	1MHz	3	0.01	ASTM D150
PMMA	1MHz	3	0.04	ASTM D150
PEN		2.9	0.003	

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# Mechanical property of Neopulim® L

		L-3430	L-1000	PC	Kapton	
Tensile Strength	MPa	112	103	90	350	JIS K7127
Tensile Modulus	GPa	2.2	2.1	1.8	5.7	JIS K7127
Tensile Elongation	%	12	13	170	57	JIS K7127
Flexural Modulus	GPa	2.4	–	2.3	–	
Surface Roughness Ra	nm	<1.0	<1.0	–	–	AFM
Rz	nm	<5.0	<5.0	–	–	AFM
Surface Hardness		H	HB	–	–	pencil method

The data mentioned above is not guarantee value but representative one.

# Optical Properties of Neopulim® L

Optical Property	unit	L-3430	L-1000	Remarks
Transmittance	%	90 (100 μ m)	89 (100 μ m)	JIS K7105
Refractive Index		1.602	1.610	589.3nm
Abbe Number		30	27	
Retardation	nm	10	10	
Photoelastic coefficient	$10^{-12} \text{m}^2/\text{N}$	55	58	

- ❑ Transmittance is 90% . (@100 μ m)
- ❑ Refractive index is 1.6 .
- ❑ Low retardation

The data mentioned above is not guarantee value but representative one.

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