

Gas Permeability Tests of Polymers

Summary

Gas permeability of various plastic materials for food packages and electronic Products etc. under the specified temperature and humidity condition.

Table 1 Apparatus

Apparatus	OX-TRAN MOCON	PERMATRAN-W MOCON	GAS PERMEABILITY TOYO-SEIKI	OX-TRAN MOCON
Gas	O ₂	H ₂ O	Variou gas (N ₂ ,H ₂ ,C ₂ H ₄ etc)	O ₂
Method	Equal-pressure	Equal-pressure	Differential-pressure	Equal-pressure
Satandard	JIS K7126-2 ASTM D3985 ISO 2782-2	JIS K7129 ASTM F1249 ISO 15106-2	JIS K7126-1 ASTM D1434 ISO 2782-1	JIS K7126-2 ASTM D3985 ISO 2782-2
Permeability Range	0.02-2000 (cm ³ /(m ² ·24h·atm))	0.01-600 (g/(m ² ·24h))	1-10,000 (cm ³ /(m ² ·24h·atm))	0.001-0.05 (cm ³ /(pkg·24h))
Temperature	10-40°C	10-40°C	10-80°C	23-55°C
Humidity(RH)	0, 35-90%	35-90%, 100%	0%	50-90%
Sample	Film, Sheet (<1mm)	Film, Sheet (<1mm)	Film, Sheet (<2mm)	Bottle(pkg.) (300-1500ml)

Example

Fig.1 Temperature dependence of O₂ permeability of polymers

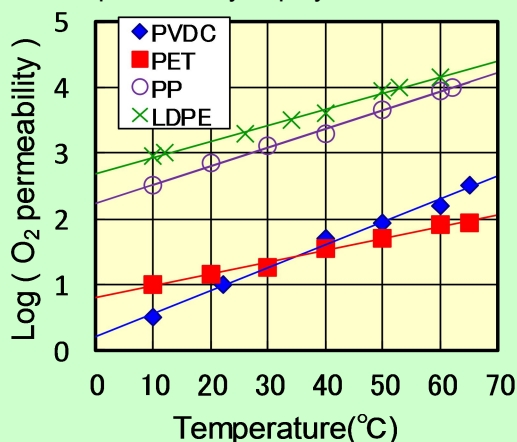


Table 2 O₂ permeability coefficients of polymers (reduced by biaxial orientation)

Sample		O ₂	CO ₂	H ₂ O
		cm ³ ·mm/(m ² ·24h·atm)	cm ³ ·mm/(m ² ·24h·atm)	g·mm/(m ² ·24h)
PET	Non oriented	5.0	15.6	1.38
	Biaxially oriented	1.7	5.2	0.65
HDPE	Non oriented	85.0	290	0.55
	Biaxially oriented	37.8	125	0.25
PP	Non oriented	78.9	284	0.76
	Biaxially oriented	32.0	110	0.20
PA (NY6)	Non oriented	1.2	4.8	6.00
	Biaxially oriented	0.4	1.6	2.00

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