Engineering Property - Physical Constants of Die-Thane

Value for specific gravity, thermal conductivity, linear coefficient of thermal expansion and linear shrinkage are shown in Table I.

Results for specific gravity are based on water which is 1.0 and give a quantity numerically equal to the density in grams per cubic centimeter. The specific gravity of vulcanizates of Die-Thane urethane rubber varies depending on the polymer density and amount of MBCA used; for example, the specific gravity of Die-Thane varies from 1.12 to 1.14 as the MBCA curing agent level changes from 15 parts to 21 parts.

Thermal Conductivity

Thermal conductivity is defined as the amount of heat per unit time passing across unit area and through unit thickness of material for unit temperature differences in the direction in the direction of the thickness. The units for thermal conductivity (K Factor) are BTU per hour per square foot for temperature gradient of one degree Fahrenheit per inch thickness.

Linear Coefficient of Thermal Expansion

The coefficient of thermal expansion is the ratio of the change in length per degree to the length at 32° F. The coefficient of thermal expansion varies with temperature. The expansion of all rubbers are of the same magnitude, approximately 10 times that of structural steel. If the part dimensions are critical, as in O-rings and seals, thermal expansion of rubber should be calculated.

Linear Shrinkage

Linear shrinkage is the approximate percent change in the dimensions of a part which occurs when the part cools to room temperature. The figures for linear shrinkage shown in Table I are for conventional mixing and curing conditions. Shrinkage is normal for most rubbers and should be accounted for in mold design.

TABLE I

		Thermal Conduct		Linear Coefficient of THERMAL EXPANSION, In/in/°F			
Die-Thane	Specific Gravity	BTU/(hrs) (Sq ft) (°F/In)	-32° F to +32°F	32° F to 75°F	75°F to 212°F	212°F to 302°F	Linear Shrinkage %
DT25	1.10	0.917	1.43X10-4	1.01X10-4	0.95X10-4	0.90X10-4	1.0
DT15	1.13	0.862	1.27X10-4	0.89X10-4	0.89X10-4	0.69X10-4	1.7
DT5	1.19	0.754	0.79X10-4	0.81X10-4	0.75X10-4	1.08X10-4	1.7