

PMFS polymethyltrifluoropropylsiloxane

PARAMETER	UNIT	VALUE	REFERENCES
GENERAL			
Common name	-	polymethyltrifluoropropylsiloxane	
CAS name	-	polysiloxanes, Me 3,3,3-trifluoropropyl	
Acronym	-	PMFS	
CAS number	-	63148-56-1	
Formula		$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---O---} \\ \\ \text{CH}_2\text{CH}_2\text{CF}_3 \end{array} \right]_n$	
HISTORY			
Date of discovery	-	1950	
SYNTHESIS			
Monomer(s) structure	-	$\begin{array}{c} \text{CH}_3 \\ \\ \text{Cl---Si---Cl} \\ \\ \text{CH}_2\text{CH}_2\text{CF}_3 \end{array}$	
Mass average molecular weight, M_w	dalton, g/mol, amu	900-340,000	
Producer	-	Dow Corning	
PHYSICAL PROPERTIES			
Density at 20°C	g cm ⁻³	1.24-1.30	
Color	-	clear	
Refractive index, 20°C	-	1.381-1.383	
Odor		slight	
Melting temperature, DSC	°C	-47	
Decomposition temperature	°C	300	
Glass transition temperature	°C	-66 to -75	
Maximum service temperature	°C	-40 to 285	
Hildebrand solubility parameter	MPa ^{0.5}	18.0	
Surface tension	mN m ⁻¹	25.7-28.7	
Dielectric constant at 100 Hz/1 MHz	-	6.95-7.35	
Volume resistivity	ohm-m	1E11	
MECHANICAL & RHEOLOGICAL PROPERTIES			
Tensile strength	MPa	9	
Elongation	%	240	
CHEMICAL RESISTANCE			
Alcohols	-	good	
Aliphatic hydrocarbons	-	good	
Aromatic hydrocarbons	-	poor	
Esters	-	poor	
Halogenated hydrocarbons	-	poor	

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Ketones	-	poor	
⊖ solvent, ⊖-temp.=25.7°C	-	cyclohexyl acetate, methyl hexanoate	
FLAMMABILITY			
Ignition temperature	°C	325 (open cup); 101.1 (closed cup)	
Volatile products of combustion	-	CO, CO ₂ , formaldehyde, fluorine compounds	
TOXICITY			
NFPA: Health, Flammability, Reactivity rating	-	2/1/0	
Oral rat, LD₅₀	mg kg ⁻¹	500-5,000	
Skin rabbit, LD₅₀	mg kg ⁻¹	1,000-2,000	
PROCESSING			
Applications	-	automotive, dentures, electrical contacts, greases, flotation medium for inertial guidance systems, lubricants in aerospace, precision timing devices, sonar lenses	