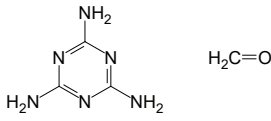


MF melamine-formaldehyde resin

PARAMETER	UNIT	VALUE	REFERENCES
GENERAL			
Common name	-	melamine-formaldehyde resin	
ACS name	-	1,3,5-triazine-2,4,6-triamine, polymer with formaldehyde	
Acronym	-	MF	
CAS number	-	9003-08-1	
RTECS number	-	OS1140000	
HISTORY			
Person to discover	-	Talbot, W F	Talbot, W F, US Patent 2,260,239, Monsanto, Oct. 21, 1941.
Date	-	1941	
Details	-	patent for manufacture of melamine aldehyde condensation products	
SYNTHESIS			
Monomer(s) structure	-		
Monomer(s) CAS number(s)	-	108-78-1; 50-00-0	
Monomer(s) molecular weight(s)	dalton, g/mol, amu	126.12; 30.03	
Monomer ratio	-	1:1.5-3	Hansmann, C; Deka, M; Wimmer, R; Gindl, W, Holz Roh Werkstoff, 64, 198-203, 2006.
COMMERCIAL POLYMERS			
Some manufacturers	-	BASF	
Trade names	-	Saduren	
PHYSICAL PROPERTIES			
Density at 20°C	g cm ⁻³	1-1.14	
Bulk density at 20°C	g cm ⁻³	0.7	
Color	-	white	
pH	-	8.5	
Melting temperature, DSC	°C	90-101	
Decomposition temperature	°C	185	Devallencourt, C; Saiter, J M; Fafet, A; Ubrich, E, Thermochim. Acta, 259, 143-51, 1995.
Maximum service temperature	°C	150	
Dielectric constant at 100 Hz/1 MHz	-	4.7-10.9/7.9	
Volume resistivity	ohm-m	1E10 to 1E12	
Surface resistivity	ohm	1E11	
Electric strength K20/P50, d=0.60.8 mm	kV mm ⁻¹	11-16	
Arc resistance	s	183	
Diffusion coefficient of water vapor	cm ² s ⁻¹ x10 ¹⁰	115-1970	Smith, P M; Fisher, M M, Polymer, 25, 84-90, 1984.

MF melamine-formaldehyde resin

PARAMETER	UNIT	VALUE	REFERENCES
MECHANICAL & RHEOLOGICAL PROPERTIES			
Tensile strength	MPa	45-52	
Flexural strength	MPa	80	
Shrinkage	%	1.5-1.8; 0.6-0.8 (mold)	
Viscosity	mPa s	500-800	
CHEMICAL RESISTANCE			
Alcohols	-	good	
Aliphatic hydrocarbons	-	very good	
Aromatic hydrocarbons	-	very good	
Esters	-	good	
Greases & oils	-	very good	
Ketones	-	good	
FLAMMABILITY			
Ignition temperature	°C	475-500	
Autoignition temperature	°C	623-645	
Limiting oxygen index	% O ₂	30-60	
Volatile products of combustion	-	CO ₂ , CO, hydrocarbons, NO _x , ammonia, formaldehyde	Devallencourt, C; Saiter, J M; Fafet, A; Ubrich, E, Thermochim. Acta, 259, 143-51, 1995.
UL 94 rating	-	V-0	
WEATHER STABILITY			
Spectral sensitivity	nm	300	Bauer, D R, Polym. Deg. Stab., 19, 97-112, 1987.
Emission wavelengths	nm	393	Bauer, D R, Polym. Deg. Stab., 19, 97-112, 1987.
BIODEGRADATION			
Typical biodegradants	-	<i>Pseudomonas, Acinetobacter, Agrobacterium, Pseudaminobacter and Rhodococcus</i>	El-Sayed, W S; El-Baz, A; Othman, A M, Int. Biodet. Biodeg., 57, 75-81, 2006.
TOXICITY			
NFPA: Health, Flammability, Reactivity rating	-	1-2/0-1/0	
Carcinogenic effect	-	not listed by ACGIH, NIOSH, NTP	
OSHA	mg m ⁻³	5 (respirable), 15 (total)	
Oral rat, LD ₅₀	mg kg ⁻¹	>10,000	
Skin rabbit, LD ₅₀	mg kg ⁻¹	>10,000	
PROCESSING			
Typical processing methods	-	coating, compounding, molding	
Processing pressure	MPa	3.5 (molding)	
Applications	-	cabinets, chipboard, construction materials (high pressure laminates), fiber glass sizing agent, furniture, insulation, kitchen utensils, paper laminates, water flocculation	
Outstanding properties	-	toughness, chemical resistance	

MF melamine-formaldehyde resin

PARAMETER	UNIT	VALUE	REFERENCES
BLENDS			
Suitable polymers	-	PET, POM	