

CHEMISTRY THAT MATTERS™



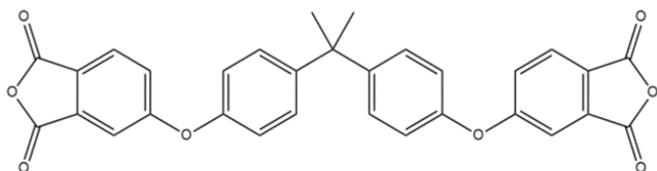
BUILDING POLYIMIDE VARNISHES AND FILMS USING HIGH PURITY BPADA

SD1100P POWDER TECHNICAL BULLETIN

SABIC's Specialties Business

GENERAL BUSINESS USE

SD1100P PRODUCT DATA

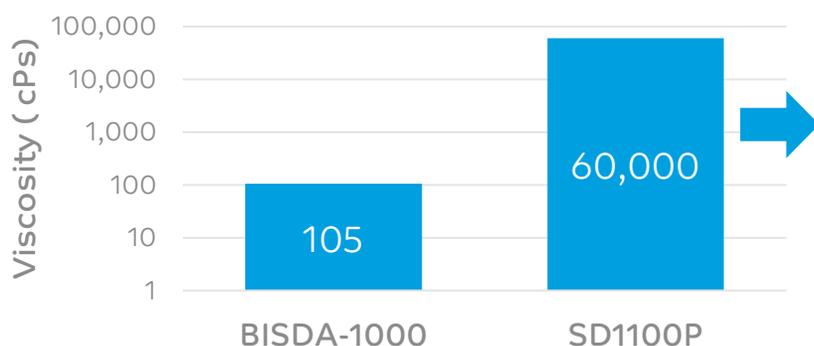


SD1100P powder

Synonyms: Bisphenol A, Diphthalic Anhydride (BPADA)
 2,2-bis [4-(3,4-dicarboxyphenoxy) phenyl] propane dianhydride
 CAS: 38103-06-9
 MW: 520.49 g/mol

SD1100P powder is a high purity 4,4'-BPADA powder. When used in polyimide applications, SD1100P powder may offer performance improvements such as solubility of polyimides in organic solvents, lower water absorption, lower dielectric constant and lower dissipation factor.

Comparison of polyamic acids with 4,4'-oxydianiline (ODA) in N-Methyl-2-Pyrrolidone (NMP)



Flexible 20 µm film produced with SD1100P-ODA

Typical Properties	BISDA 1000 (standard purity)	SD1100P (high purity)
4,4' BPADA (%)	>97.5	>99
Imide anhydride (%)	<3.0	<1.5
Acid content (%)	<3.0	<0.5
Physical form	Yellow flakes	White powder
Melting temp. (°C)	180-185	188-191

COMPARISON OF POLYIMIDE FILMS USING SD1100P POWDER AND DIFFERENT DIANHYDRIDES



Flexible 38 μm film produced with SD1100P-ODA

When polymerized with 4,4'-oxydianiline (ODA), the resulting polyimide film has unique properties in comparison to similarly prepared films of oxydiphthalic anhydride (ODPA) and pyromellitic dianhydride (PMDA).

Typical Properties	SD1100P-ODA	ODPA-ODA	PMDA-ODA
Glass transition (DSC, 20 °C / min)	220-224 °C	260 – 265 °C	390 – 410 °C
T _d 5% (TGA, under N ₂ , 10 °C / min)	520 °C	550 °C	580 °C
Dielectric constant, 10 Ghz	3.1	3.3	3.4
Loss tangent, 10 Ghz	0.005	0.009	0.019
Water uptake, % by weight	0.7 – 1 %	1.9 %	2.6 %
T-Peel adhesion strength to copper foil	1.45 N/mm	1.34 N/mm	1.29 N/mm

SD1100P powder increases the solubility of the final polyimide, enabling the formulation of soluble polyimide varnishes for a variety of potential applications.

Solvent*	SD1100P-ODA	ODPA-ODA	PMDA-ODA
NMP	Soluble	Insoluble	Insoluble
DMAc	Soluble	Insoluble	Insoluble
Chloroform	Soluble	Insoluble	Insoluble
THF	Soluble	Insoluble	Insoluble

*Solutions of 10 mL solvent and several milligrams of PI film were sealed and gently heated in a 35 °C water bath for several hours and observed for dissolution.



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