



Halogen Free Non/Low-Flow Prepreg

(IPC-4101/130)

尚茂電子材料股份有限公司

ShineMore Technology Materials Co., Ltd.

Website: <http://www.shinemo.com.tw>

ANSI: FR-4.1 UL FILE: E199230

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Green Material

■ High Tg, Halogen Free Non/Low-Flow Prepreg

SM-560N-H is specifically designed for rigid-flex PCB structure, multilayer FPC, as well as for Coreless Build-Up type for IC substrate manufacturing. Featured with characteristics of low-flow, halogen free, good thickness uniformity and flatness, SM-560N-H prepreg consisting of optimal resin flow provides excellent bonding force with a variety of polyimide materials. Fully cured SM-560N-H provides strong bonding force with Polyimide(PI) coverlay in rigid-flex PCB products. In addition, SM-560N-H performs well for multiple-layered rigid-flex bonding, sequential lamination, and fully complied with lead-free requirement. Aiming to be compatible with punch process, we intentionally formulate SM-560N-H with minimized dust generation during FPC processes.

■ Performance And Processing Advantages

- Stable resin flow
- Low resin powder dust generation
- High Tg
- Halogen-free compatible
- Lead-Free compatible
- Reduced Z-axis thermal expansion
- Excellent bonding strength with Polyimide(PI) materials
- Superior dimensional stability, thickness uniformity and flatness
- Good drilling process ability
- Excellent through-hole and soldering reliability
- Compatible with AOI process

■ Industry Approvals

- | | |
|---------------------------------|----------|
| ● UL Designation-ANSI Grade | FR-4.1 |
| ● UL File Number | E199230 |
| ● Flammability Rating | UL94 V-0 |
| ● Maximum Operating Temperature | 130°C |

■ Standard Availability

- Thickness: from 1.2 mil (30 μ m) 1027 type \times 1 ply to 4.3 mil (110 μ m) 3313 GF \times 1 ply
- Availability: both in roll or panel form
- SM-560N-H made of very fine glass fabrics of 1017 type might be available upon customer needs and commercial-available glass fabric resources
- Prepregs with other glass fabric type, resin content or resin flow-in scale may be available upon customer request

Property of Cured SM-560N-H Prepreg

Based on 0.5t H/H oz

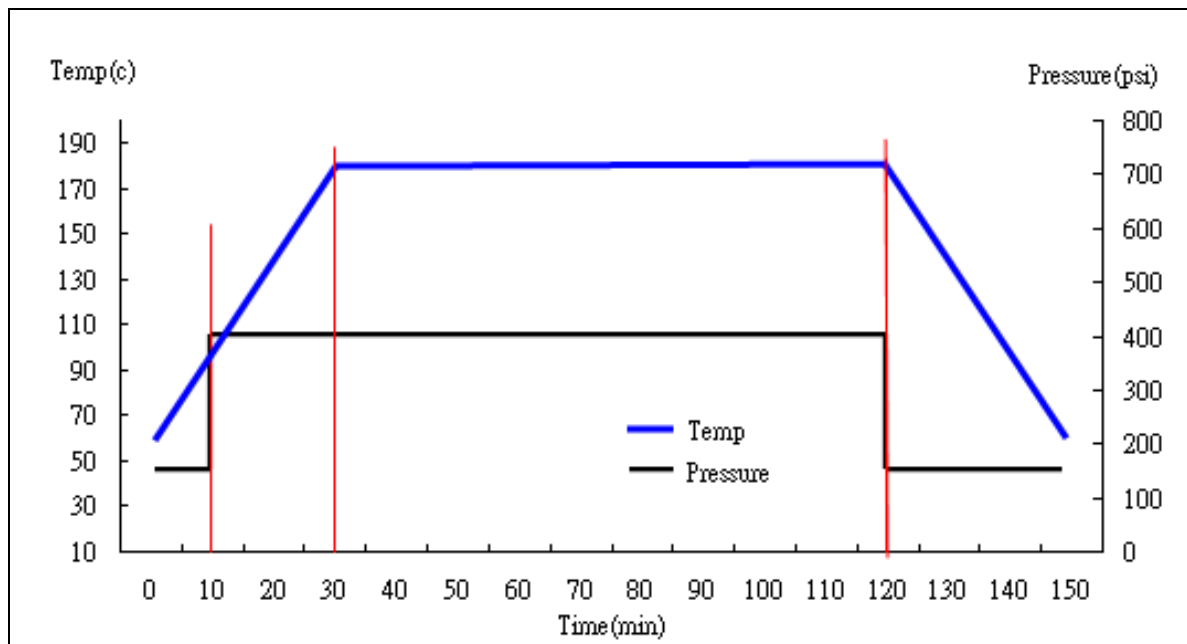
	Test Items	Units	Test Condition	Typical Value	Test Method (IPC-TM-650)
Electrical	Dielectric Constant (1GHz)	--	C-96/23/50	4.4	2.5.5.13
	Dissipation Factor (1GHz)	--	C-96/23/50	0.013	2.5.5.13
	Volume Resistivity	M Ω -cm	C-96/35/90	$> 10^{10}$	2.5.17.1
	Surface Resistivity	M Ω	C-96/35/90	$> 10^8$	2.5.17.1
Physical	Moisture absorption	%	E-24/50+d-24/23	< 0.2	2.6.2.1
	Peel strength (PI Side)	lb/in	As Received	> 6	2.4.8
	Peel strength (0.5oz)	lb/in	As Received	> 7	2.4.8
Thermal	Glass Transition Temp.	$^{\circ}$ C	DSC	> 170	2.4.25
	Z-Axis CTE	%	TMA Expansion(50-260 $^{\circ}$ C)	< 2.5	2.4.24
	Time to Delaminate	min.	TMA (Unclad, 288 $^{\circ}$ C)	> 60	2.4.24.1
	Decomposition Temp.	$^{\circ}$ C	TGA(5% wt loss)	370	2.4.24.6
	Thermal stress	sec	288 $^{\circ}$ C Solder dipping	> 120	2.4.13.1
	Flammability	---	A&E-24/125	V-0	UL94

Standard Prepreg Specification

G/F	R/C(%)	Flow In (mil)	V/C(%)	THK (μ m)
1027	59 \pm 3	20~40	≤ 1.5	30 \pm 10
1037	64 \pm 3	20~40	≤ 1.5	40 \pm 10
106	70 \pm 3	20~40	≤ 1.5	50 \pm 10
1067	68 \pm 3	20~40	≤ 1.5	60 \pm 10
1078	64 \pm 3	20~40	≤ 1.5	80 \pm 10
3313	55 \pm 3	20~40	≤ 1.5	110 \pm 10

Prepreg Press Condition

- Hot Start Cycle for SM- 560N-H



For Multi-layered Rigid-Flex PCB,

A typical press cycle is listed as follows,

1. Material heating ROR (Rate of Rise) 2~6°C/min,
2. Material cured temperature > 170°C (better >180°C), Curing Time > 60 min
3. Vacuum condition should be continued until over 140°C (material temperature)
4. Pressure Profile: Start with kiss pressure of 100-150 psi for 5-15 minutes, and then apply full pressure of greater than 400 psi (lamination pressure)

- **Ordering Information**

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NOTE

1. Typical Property values are for information purposes only.
2. Any sale of these products will be governed by the terms and conditions of the agreement under which they are sold.
3. Press cycle shown above is a convenient example. The optimum press cycle still depends on product structure and actual situation in production line.