SEMICONDUCTOR MARKET SOLUTIONS

BGA/CSP

MOLDING COMPOUND

PRODUCT	DESCRIPTION	PACKAGE SIZE	WARPAGE, m	MSL	GREEN	FILLER CONTENT %	SPIRAL FLOW, cm	CTE$_{\alpha 1}$, ppm/°C	Tg, °C
GR9810™ series	Hysol® GR9810™ series are technologically advanced epoxy molding compounds designed for use as an overmold on a wide variety of BGA and CSP. Its flexible hardener technology enables ultra low warpage. Hysol® GR9820-1™ is a "green" (non-antimony/bromine/phosphorous) molding compound and is capable of achieving JEDEC Level 3 at 260ºC reflow temperature.	PBGA 37.5 x 37.5 mm CSP Panel 50 x 60 mm	<4 < 6	L3/260°C	Y	85	120	11	200

SOLDER SPHERES

<table>
<tr><th rowspan="2">ALLOY</th><th rowspan="2">DIAMETER, mm</th><th rowspan="2">TOLERANCES ± mm</th><th rowspan="2">C_{pk}</th><th colspan="3">PACKAGE SIZE</th></tr>
<tr><th>SPHERES/BOTTLE</th><th>BOTTLE SIZE, CC</th><th>SPHERES/BOX</th></tr>
<tr><td rowspan="14">Sn-Ag-Cu Series
Sn96.5-Ag3.5
Sn-Ag1-Cu0.5
Sn-Ag2.6-Cu0.6
Sn-Ag3-Cu0.5*
Sn-Ag3.8-Cu0.7†
Sn-Ag4-Cu0.5†
Sn-Ag-Cu-Ni-Ge Series
Sn-Ag1-Cu0.5-Ni0.05-Ge††
Sn-Ag1.2-Cu0.5-Ni0.02-Ge††
Sn-Ag3-Cu0.5-Ni0.05-Ge††
CASTIN Series
CASTIN125®‡
CASTIN258®‡
CASTIN305®‡
Sn-Zn Series
Sn91-Zn9
Sn-Zn8-Ag0.5-Al0.01-Ga0.1</td><td>0.500</td><td rowspan="4">0.015</td><td rowspan="14">≥1.33</td><td rowspan="4">500,000</td><td>100</td><td rowspan="4">10,000,000</td></tr>
<tr><td>0.450</td><td rowspan="6">40</td></tr>
<tr><td>0.406</td></tr>
<tr><td>0.400</td></tr>
<tr><td>0.350</td><td rowspan="5">0.010</td><td rowspan="10">1,000,000</td><td rowspan="10">20,000,000</td></tr>
<tr><td>0.304</td></tr>
<tr><td>0.300</td></tr>
<tr><td>0.250</td><td rowspan="2">25</td></tr>
<tr><td>0.200</td></tr>
<tr><td>0.180</td><td rowspan="5">0.005</td><td rowspan="5">10</td></tr>
<tr><td>0.150</td></tr>
<tr><td>0.100</td></tr>
<tr><td>0.080</td></tr>
<tr><td>0.050</td></tr>
</table>

Patent No: †ISURF-U.S 5,527,628 *SENJU-JP3,027,441 ‡AIM-U.S5,352407 U.S5,405,577 JP2,752,258 ††FUJI-U.S6,179,935 JP3,296,289 Other alloys and sizes are available upon request.

SEMICONDUCTOR MARKET SOLUTIONS

BGA/CSP

TACKY FLUXES

PRODUCT	DESCRIPTION	APPLICATION	VISCOSITY, cPs	COLOR	TACK, g/mm²	ACID VALUE	SOLIDS CONTENT, %	IPC/J-STD-004 CLASSIFICATION
TFN600™	Standard viscosity; no clean tacky flux.	Printing (screen and stencil); pin transfer and dispensing.	300,000	Brown	130	76	49	ROL0
TFN610™	Low viscosity; no clean tacky flux .	Spraying, jetting and dipping.	25,000	Very Pale Yellow	133	116	66	ROL0
WS300™	Standard viscosity; water wash tacky flux.	Printing (screen and stencil); pin transfer and dispensing.	550,000	Brown	132	30	80	ORH1

UNDERFILLS

PRODUCT	DESCRIPTION	FLOW SPEED	VISCOSITY, cPs	Tg, °C	CTE_{a1}, ppm/°C	MODULUS, GPa	% FILLER	RECOMMENDED CURE
FP4545FC™	Low viscosity version of FP4548FC™.	Fast	9,000	115	30	7.1	55	60 min @ 165°C
FP4547™	Fast-flowing, low stress underfill for fine-pitch flip-chip applications.	Medium	18,000	135	80	11	69	60 min @ 165°C
FP4548FC™	Lead-free flip-chip packages (L3/260°C); low-k/Cu flip-chip packages with Hi-Pb bumps, flux compatible.	Medium	25,000	115	22	9.5	65	60 min @ 165°C
FP4549™	For fine-pitch flip-chip applications. Fast flowing, low stress underfill.	Very Fast	2,300	65	38	5.5	57	28 min @ 165°C
FP4581™	Lead-free flip-chip packages (L3/260°C); low-k/Cu flip-chip packages with Hi-Pb bumps, flux compatible.	Fast	17,000	86	33	7.6	55	120 min @ 165°C
UF8806J™	For large flip chip in package applications. Ultra low alpha emissions.	Fast	1,200	140	46	5.3	40	90 min @ 165°C
UF8806G™	Moisture resistant. For die sizes <25mm. Ultra low alpha emissions.	Fast	4,500	136	27	7.9	60	60 min @ 195°C
UF8826™	For eutectic high lead low k applications. Medium modulus, low CTE.	Fast	16,000	132	40	3.4	30	90 min @ 165°C
UF8826TI™	For lead-free packaging. Optimized modulus and self-filleting properties.	Fast	15,000	128	40	4.6	30	90 min @ 165°C
UF8828™	For eutectic, high lead or lead-free packaging. Higher modulus.	Fast	15,000	128	30	6.5	50	90 min @ 165°C
UF8829™	For small die in lead-free and low k applications. Higher modulus, lowest CTE.	Fast	10,000	122	28	7.5	60	90 min @ 165°C

WAFER BUMPING: SOLDER PASTE

PRODUCT	DESCRIPTION	ALLOY	% METAL LOADING	TACK, g/mm²	PRINT SPEED, mm/s	REFLOW ATMOSPHERE	IPC/J-STD-004 CLASSIFICATION
WS300™	A water wash flux system specially formulated with fine-powder lead-free alloys. High performance, water washable solder paste. Residues are easily removed with DI water, without the need for a saponifier. Good open time with excellent print definition and soldering.	96SC (SAC387) 97SC (SAC305)	89	0.8	25 - 100	N²	ORH1

LID ATTACH

PRODUCT	DESCRIPTION	VISCOSITY, CPS	TG, °C	THERMAL CONDUCTIVITY W/MK	MODULUS, GPA	RECOMMENDED CURE
3003™	Best balance of toughness, adhesion and modulus for most applications. Compatible with silicone TIM.	35,000	49	1.0	4.0	60 min @ 150°C + 30 min @ 175°C
3005™	For large packages and lead-free applications. Stress absorbing, fast cure, high temperature.	37,000	-15	0.5	0.3	30 min ramp @ 150°C + 30 min @ 150°C
MC723™	Bondline control achieved with 75 micron spacers. Compatible with silicone TIM.	57,000	42	0.8	3.3	30 min @ 150°C + 30 min @ 165°C