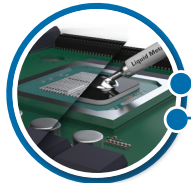


Soldering Materials for Heterogeneous Integration & Assembly

Thermal Management (TIMs)

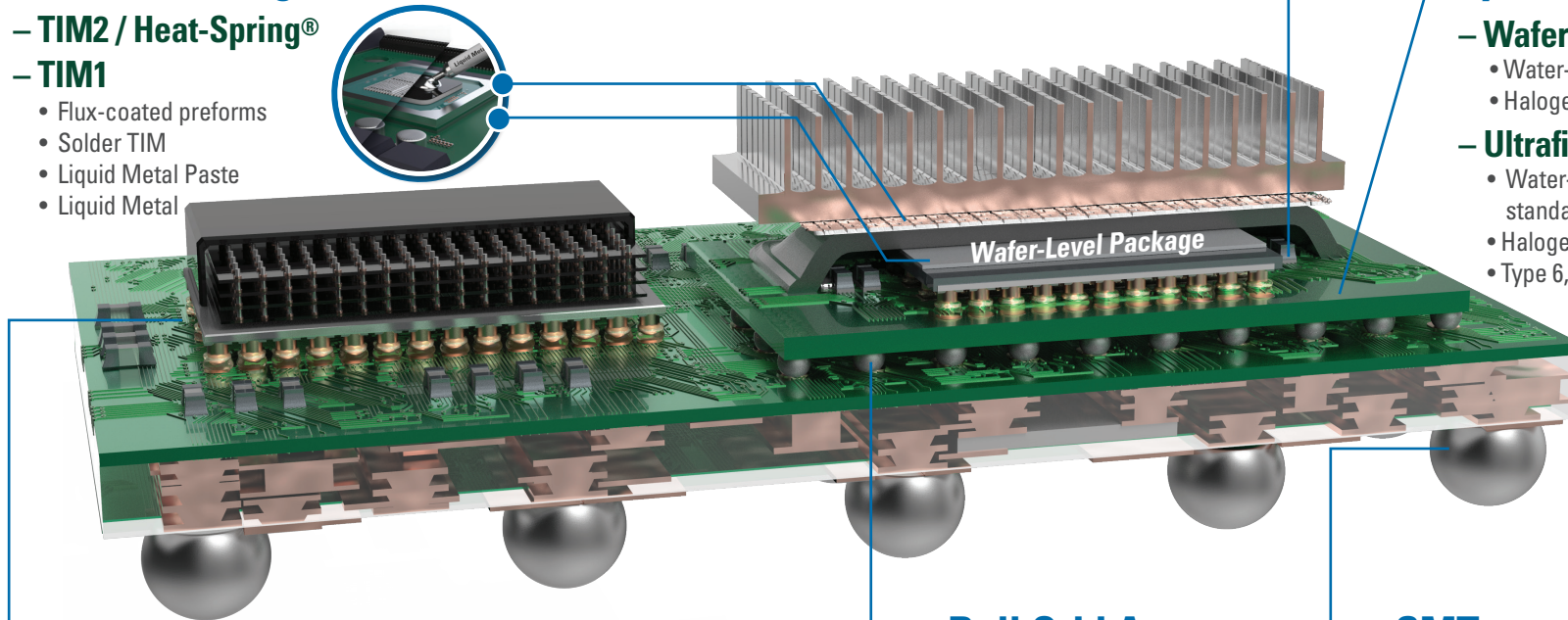
- TIM2 / Heat-Spring®
- TIM1
 - Flux-coated preforms
 - Solder TIM
 - Liquid Metal Paste
 - Liquid Metal



Ultra-Small Passives

System-in-Package

- Wafer-Level Ball-Attach Flux
 - Water-soluble
 - Halogen-free
- Ultrafine-Pitch Solder Paste
 - Water-soluble, ultra-low residue, and standard no-clean
 - Halogen-free
 - Type 6, Type 7, and Type 8



3D Logic / Memory and Flip-Chip

- Wafer Bumping (Bump Fusion) Flux
 - Water-soluble
 - Spin-on and jetting
 - Halogen-free
- Flip-Chip Flux
 - Water-soluble, ultra-low residue, and standard no-clean
 - Dipping, spraying, and jetting
 - Halogen-free and halogenated

Ball Grid Array

- Ball-Attach Flux
 - Water-soluble and no-clean
 - Pin transfer and printing
 - Halogenated and halogen-free

SMT

- Solder Paste
- Solder Wire
- Solder Flux
- Preforms
- Bar Solder

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Recommended Semiconductor Fluxes and Solder Pastes



Material Group	Material Type	Material Name	Flux Type	Halogen-Free	Application	Comments
FLUX	Wafer Bumping Flux	SC-5R	Solvent-clean	Yes	Spin coating	High Pb, Sn/Pb Eutectic and SnAg solder bumps
		WS-3543	Water-wash	Yes	Spin coating	High viscosity for taller copper-pillars and larger bumps (>40 microns)
		WS-3401	Water-wash	Yes	Spin coating	Low viscosity for smaller pillars and bumps
	Wafer-Level or Panel-Level Packaging Flux	WS-676	Water-wash	Yes	Printing	0.5mm and smaller pitch wafer-level or panel level package
	Flip-Chip Flux	WS-575-SP	Water-wash	Yes	Jetting/Spraying	Sn/Pb Eutectic and SnAg onto SOP for logic flip-chip
		FC-NC-HT-A1	No-clean	Yes	Jetting/Spraying	Mass reflow flux compatible with CUF
		WS-446	Water-wash	No	Dipping	Best flux for poor solderability
		WS-641	Water-wash	Yes	Dipping	For chip-on-wafer, high-density Cu-pillar application
		NC-26-A	Ultra-low residue no-clean	Yes	Dipping	Best compatibility with CUF/MUF
		NC-26S	Ultra-low residue no-clean	Yes	Dipping	Avoids capillary flow up to die surface for fine-pitch devices
		NC-699	Near-zero residue	Yes	Dipping	Controlled solderability, compatible with wide variety of CUF/MUF
	Ball-Attach Flux	WS-446-AL	Water-wash	No	Pin Transfer	Best flux for poor solderability
		WS-823	Water-wash	Yes	Pin Transfer	Best all-around halogen-free ball-attach flux, easily cleaned
		WS-829	Water-wash	Yes	Printing and pin transfer	For sphere size <0.25mm and fine-pitch high-density ball-attach, best cleanability
		NC-585	No-clean	Compliant	Pin Transfer	Good wetting onto bare nickel for 0.5mm pitch or lower BGA/PGA
	Flip-Chip and Ball-Attach Flux	NC-809	Ultra-low residue no-clean	Yes	Dipping	Enhanced wetting, compatible with wide variety of CUF/MUF
					Printing and pin transfer	Suitable for no-clean process, good wetting onto gold surface
		WS-446HF	Water-wash	Yes	Dipping	Best all-around halogen-free flip-chip flux, easily cleaned
					Pin Transfer	Suitable for one-step Cu OSP process for sphere size 0.25mm and above
		WS-910	Water-wash	Yes	Dipping, printing, and pin transfer	Easily cleanable residue, leading to best-in-class CUF/MUF compatibility post-clean
SOLDER PASTE	Jetting and Microdispensing Paste	PicoShot® WS-5M	Water-wash	Yes	Jetting	For dot jetting of 350–550µm diameter
		PicoShot® NC-5M	Solvent- or aqueous-based chemistry or no-clean	Yes	Jetting	For dot jetting of 360–510µm diameter
		PicoShot® NC-6M			Jetting	For dot jetting of 230–280µm diameter
		Indium12.8HF			Jetting and Microdispensing	For dot jetting down to 80µm diameter and above, and fine-line dispensing for metal lid-attach
		Indium6.6HF-HD	Water-wash	Yes	Jetting and Microdispensing	Water-washable jetting and fine-line dispensing paste
	SiPaste® Solder Paste	SiPaste® 3.2HF-HD	Water-wash	Yes	Type 6, Type 7, and Type 8 solder paste suitable for ultrafine-pitch printing	Best all-around pure water-soluble paste
		SiPaste® C312HF	Solvent- or aqueous-based chemistry or no-clean			Best-in-class transfer efficiency and stencil life; best all-around fine-feature paste
		SiPaste® C316HF	Solvent- or aqueous-based chemistry			Post-reflow flux residue easily cleanable with diluted chemistries, good fine feature printing
		SiPaste® SMQ77	No-clean			No-clean, ultra-low residue process that is compatible with post-reflow underfill
OTHER	Adhesive Solution	NC-702A	Minimal to no residue	Yes	Dipping/Dispensing/Jetting	Holding die, chip and preform in place, for formic acid reflow