Heraeus

New Product: FLX89161
Smartflux Dipping Paste

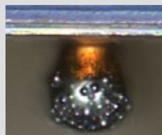
Smartflux FLX89161 is a water soluble halogen free fine pitch dipping paste designed for Flip Chip and BGA applications. Formulated using state-of-the-art Welco® powder, the product revolutionized chip and ball attach processes.

FLX89161 Benefits

- Improves solder joint formation for better yield
- Increases bump height
- Good wetting performance
- Halogen free
- Easy to clean using DI water

What is Smartflux Dipping Paste?

Smartflux fine powders provide anchors to hold the BGA balls in place during reflow process thus reduces mis-alignment of flip chip that results in yield loss caused by missing balls for BGA attach.



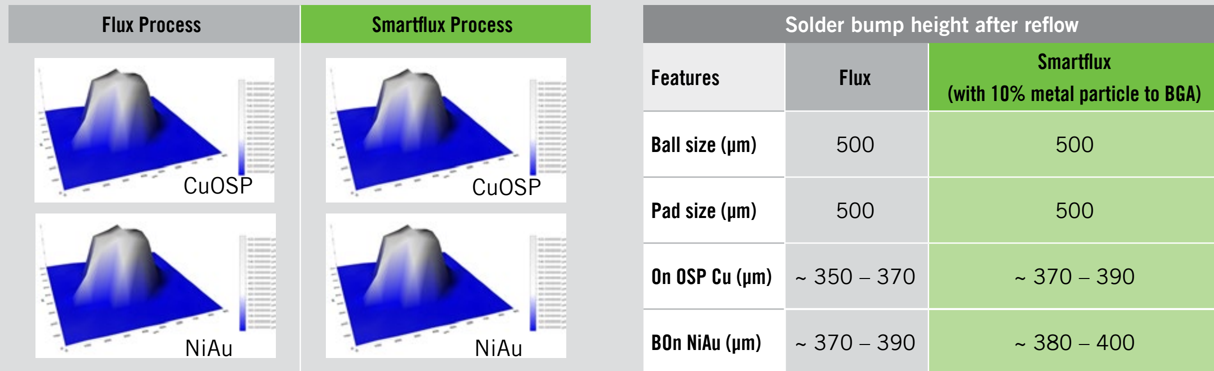
High quality fine powders added in low percentage enables fine pitch application of Smartflux for flip chip attach at < 100 µm pitch copper pillar. Solder joint of flip chip is also strengthened with no creeping of Tin-Silver cap onto copper pillar sidewall.

Traditional flip chip attach process only uses flux which results in non-wetting of copper pillars and solder bumps, due to substrate warpage and complexity of package. With the inclusion of fine powders, it is able to bridge and close the small gaps produced and prevent non-wet or open joints hence achieving higher yield.

Process Benefits of Smartflux

	Tacky Flux Process	Smartflux Process
Yield improvement (missing ball, shorts, etc)	+	++
Eliminates process steps (OSP cleaning, scrap, etc)	+	++
Using existing equipment	+	+
Cost effective	+	+

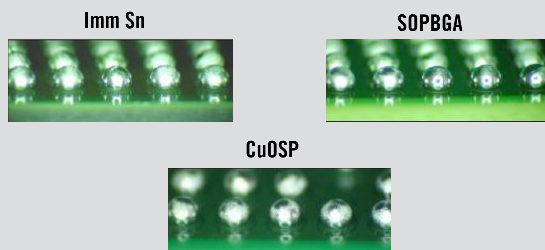
Effects of Smartflux on Bump Height



Solder bump height after reflow		
Features	**Flux**	**Smartflux (with 10% metal particle to BGA)**
Ball size (µm)	500	500
Pad size (µm)	500	500
On OSP Cu (µm)	~ 350 – 370	~ 370 – 390
BOn NiAu (µm)	~ 370 – 390	~ 380 – 400

100 % Yield

No missing balls, bridging balls, joined balls, partial wetting or flux residue issue was observed from the external evaluation data.



Pad Finish	SS	Peak Temp. (° C)	Dwell Time (secs)	Pin Dia. (mm)	Tray Depth (mm)	Yield
Imm Sn	19	235	60 – 75	0.5	0.4	100 %
	300	245				
	20	250				
SOPBGA	20	235	60 – 75	0.5	0.4	100 %
	280	245				
	18	250				
CuOSP	135	235	60 – 75	0.5	0.4	100 %
	135	245				
	135	250				

Value Proposition of Smartflux

Smartflux high activity level cleans pad or trace surface, eliminating the need for pre-cleaning process to remove contaminants prior to flip chip attach. This saves costs and reduces passive attach solder paste defects caused by cleaning flux interactions.

Another benefit of Smartflux is its compatibility with solder paste Welco® AP5112 in achieving low defects and improving solder joints. Typically, advanced packages make use of a single reflow process for passive component or flip chip attach application whereby there is a need for solder pastes used to have a compatible reflow profile.

By using Smartflux, there would be no compromise in the reflow profile.

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