Agenda

- Market trend vehicles
- Paste for AR < 0.6
- Market trends metal compostion
- Almit
- Conclusion

Market trends – In Vehicles

Miniaturization with reliable joints need…..

Automotive trend:

- High level Driving / Safety / Environment Function
  ⇒ Electronics / Control upgrading
- Shift P H E V / E V

In-Vehicle trend:

- ECU distribution, ECU combination, Mechatronical integration
- Reduction in Unit size & weight, Low cost, LTCC PCB

  Low Temperature Cofired Ceramics – LT means sintering temperature is below 1000° C
- PCB down sizing, High Density SMT, No. of IC's increasing
- Chip miniaturization, BGA, Device with pins, Odd & High tall devices

Market trends - Vehicles

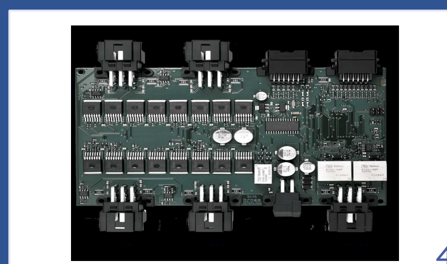
ECU examples and others:

1. Security ECU
2. Cooling fan module
3. Automatic Transmission (AT) Control Valve
4. Seat control unit
5. Engine ECU
6. E-Power steering (Mechatronical integration)
7. Electrical oil pump
8. Door control unit
9. Battery monitoring ECU

1

2

3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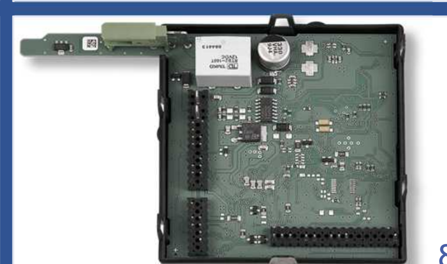
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Pictures copied from website - Denso + Brose

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Market trends - Mechatronical Integration

Mechatronical integration:

① ECU Miniaturization
is required to put beside actuator

② High heat resistance is also
required due to ECU heat itself.

Integrate PCB (ECU) with
<Actuators> like Motor (DC, Solenoid etc.)
This is ''Mechatronical Integration'' !

Advantage of ''Mechatronical integration''

① Diversified ECU integrated in Module makes high accuracy control possible.

② Direct connection of ECU and devices makes reduction of wire harness.
Weight of vehicle will be lighter.

③ Less electrical connections reduces failure of vehicle.

④ Reduction of Vehicle assembly's process operation.

⑤ Moduling gives versatility, makes cost down.

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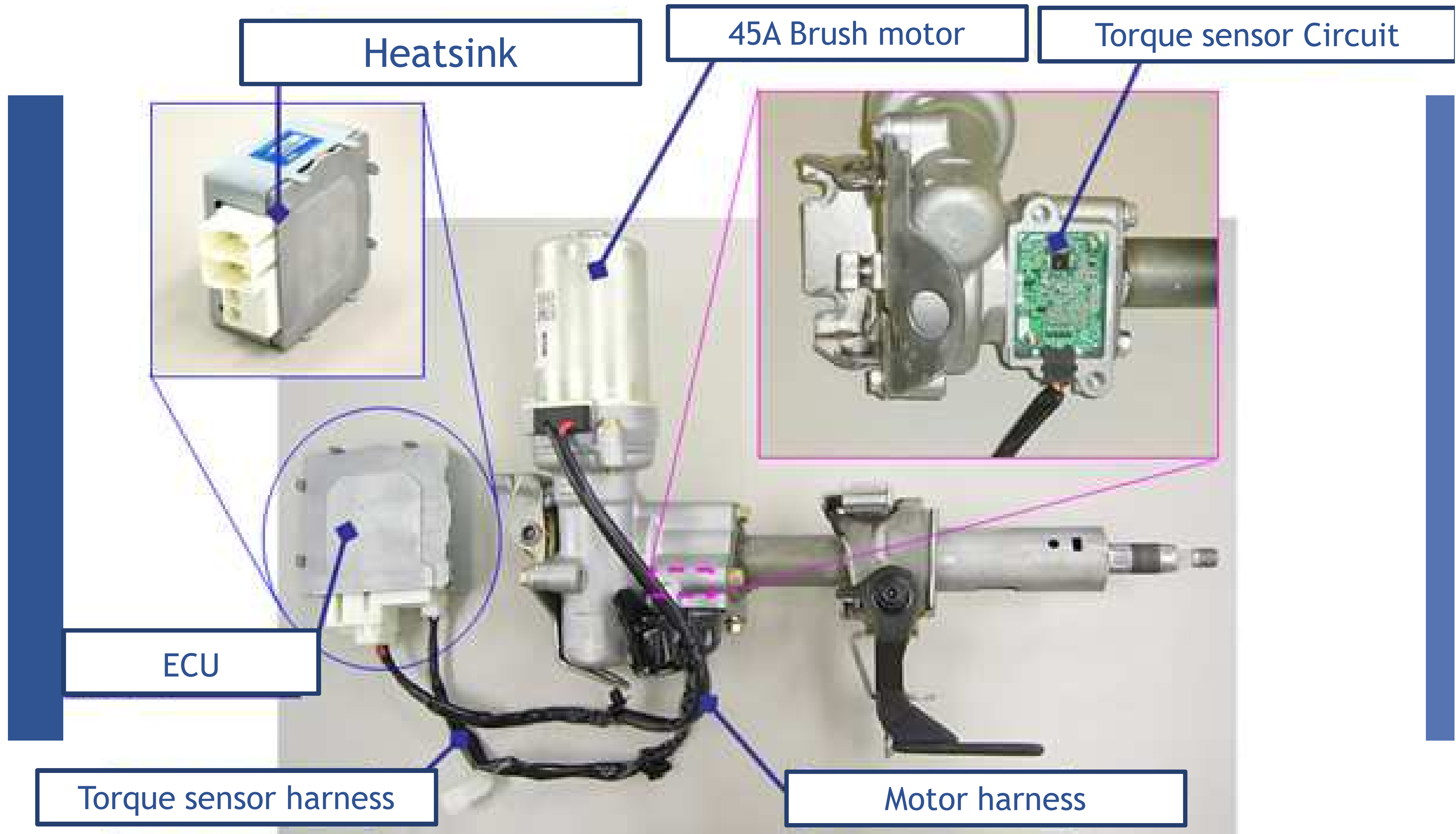
Mechatronical Integration- Electrical power steering



NSK reprinted from the website

In Vehicle - Analysis the present state

【Car manufacture Specific indication】

① Ready to use 「0201」
・with Stencil：150μm

②Ready to use 「BGA0.5p」
・with stencil：150μm

③Preparation ''no repair''
・Defect products must be scraped

④From wave to SMT process
Assemble devices process change
・Process change for defect PPM reduction.

①Function

1. **Distribution** → No. of PCB/vehicle increasing.
   Assemble area, Method, space has flexibility.
2. **Utilization** → Reduction No. of device. Intensive device functionality.
3. **Mechatronical Integration** → miniaturization
   ・High accuracy control, lighter.

②Performance

1. Small・Light,thinner.
   → No.device reduction、High density, smaller PCB.
   Device down size（0201, BGA 0.5mmp）＊Stencil thickness 150 μm to maintain joint strength
2. Low cost
   ・cost reduction of Material, Equipment (machines)
   → Turn to IC →reduce mounting devices.

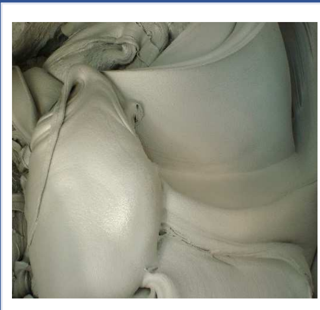
③Quality

1. Forbiddance of repair
   ・Defect products must be scraped.
   Assemble devices process change （Defect PPM cut）

   From Wave process to SMT process.

Solder paste – Required technical specification

Required specification of solder paste.



Mixed paste.

1. High difficulties Print（High Aspect ratio Print）
   - ・Stencil thickness：150µm Devices：0201, BGA0.5mm P
     Print variation Target：5σ, within 20%.

2. Print for no assembly failure, no defect.
   - ・No repair. Defect one must be waste.
   - ・Stable print property.（Stable「Viscosity, Ti Index」）

3. 「Strong cohesive property」while paste wet.
   - ・Change assembly process way.
     From Wave to Reflow process.
     ⇒Solder paste volume will be increased.
     Device for Wave soldering needs large solder volume.
     ⇒**Strong cohesive** helps good solder wetting up

without solder balls, or remained powders.

Strong cohesive properties define on one hand the dugtility (Viscosity) and on the other hand the flow properties (Rheologie) and are important for the processing properties.

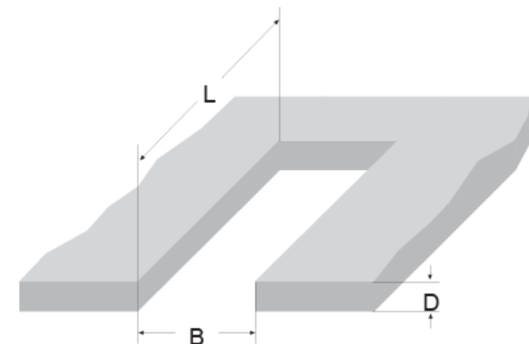
Area Ratio - Example for better understanding

Aspect ratio:
The ratio of the width of the aperture to the thickness of the stencil foil.

Area ratio:
The ratio of the area of aperture opening to the area of aperture walls.

$$\text{Aspect ratio} = \frac{\text{Aperture width}}{\text{Stencil thickness}} = \frac{B}{D}$$

$$\text{Area ratio} = \frac{\text{Aperture opening area}}{\text{Aperture walls area}} = \frac{LxB}{2x(L+B)xD}$$



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Definition – Aspect ratio/Area ratio

Aspect ratio:
The ratio of the width of the aperture to the thickness of the stencil foil.

Area ratio:
The ratio of the area of aperture opening to the area of aperture walls.

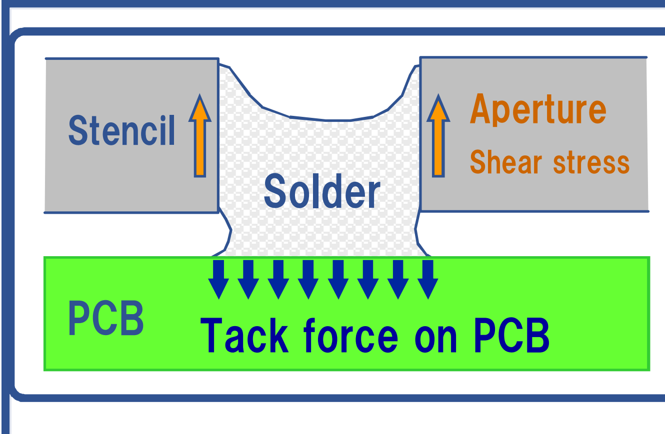
Aperture size:
A typical guideline is a minimum of four particles of paste powder across the width of the aperture.

Area ratio is a critical metric resp. unit for successful stencil printing. It is widely accepted that in order to get good stencil printing the AR must be greater than 0.66.
Experience has shown that if AR<0.66, the "solder paste transfer efficiency" is getting worse.

Keep in mind!
Aspect ratio > 1.5
Area ratio > 0.66
(Design Guide according to IPC-7525B - 3.2.1.2)

Automotive - Area ratio requirement

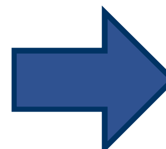
Area ratio out of “limit”.



Parts		Stencil (μm)	Area ratio	Stencil aperture size (mm)
Chip	0201 inch 0603 mm	150	0,431	0.24X0.28
		100	0,646	
	01005 inch 0402 mm	100	0,437	0.17X0.18
		80	0,546	
	008004 inch 0201 mm	60	0,446	0.10X0.115
		50	0,535	
BGA	0.5mmp	150	0,467	ϕ0.28
		100	0,700	
	0.4mmp	120	0,458	ϕ0.22
		100	0,550	
	0.3mmp	100	0,450	ϕ0.18
		80	0,563	

Market trends

Case I : Automotive, Industry
Device size : 0201
・「0201」discussion start to use
better performance, cost down
・Keep current stencil thickness

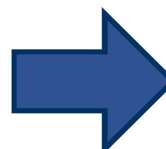


【Aspect ratio】

①S. thickness	100µm	150µm	180µm
②Aspect ratio	0.646	0.431	0.37

③Aperture size : 0.24mmX0.28mm
④Pitch to next joint : 100µm

Case II : Mobile phone
Device size : 01005
・0.35mmp connector, no open contact
・BGA0.4p, maintain solder volume
Joint strength up against drop

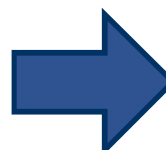


【Aspect ratio】

①S. thickness	80µm	100µm	120µm
②Aspect ratio	0.546	0.437	0.364

③Aperture size : 0.17mmX0.18mm
④Pitch to next joint : 100µm

Case III : Device
Device size : 008004 (0090045)
・Keep stencil thickness 60µm
Super narrow pitch,.
Keep joint strength
・Powder「Type6」, high cost



【Aspect ratio】

①S. thickness	50µm	60µm	100µm
②Aspect ratio	0.535	0.446	0.345

③Aperture size : 0.10mmX0.115mm
④pitch to next joint : 80µm

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Solder Paste - LFM 48 W MR-A

Solder Paste
for very small
Aspect Ratio.
Alloy. SAC 305
Powder Size 4
Ti. 0.7
120 Pa･s
(Malcom Viscosity
10rpm,25℃)

1P ＝ 0,1(kg/ms)
＝ 0,1 Pa･s

0201 High aspect print Printing Comparison MR-A

Stencil thickness ：150μm Aperture size：0.30X0.28

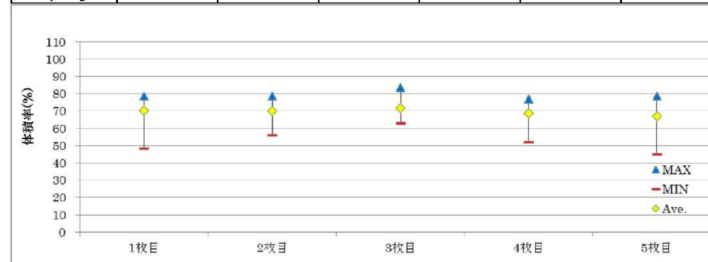
Type4

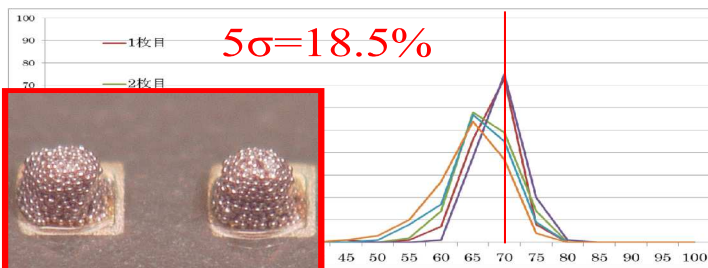
【cleaning / 1 board】

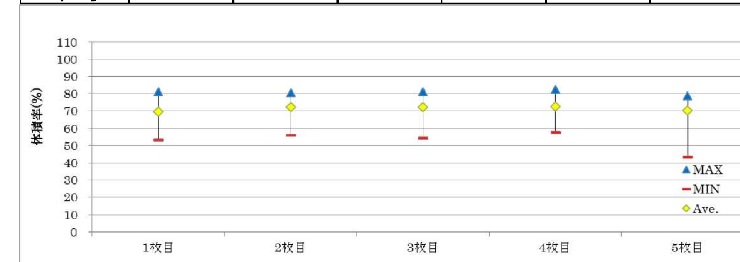
	1	2	3	4	5	平均
1 σ	11.7	12.8	9.4	14.5	16.3	12.9
σ	3.9	4.3	3.1	4.8	5.4	4.3
2 4値	2.57	2.35	3.19	2.06	1.84	2.40
2 43値	2.54	2.33	3.01	1.97	1.65	2.30
R	30.0	22.5	20.6	24.8	33.4	26.3
0 大	78.4	78.6	83.4	76.8	78.4	79.1
0 .	48.5	56.1	62.9	51.9	45.0	52.9
平均	70.3	69.8	71.7	68.6	66.9	69.5

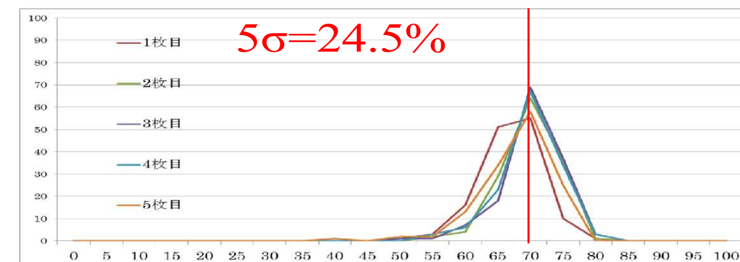
【Cleaning / 5 boards】

	1	2	3	4	5	平均
1 σ	13.3	12.6	13.6	13.3	15.9	13.8
σ	4.4	4.2	4.5	4.4	5.3	4.6
2 4値	2.25	2.37	2.21	2.26	1.88	2.19
2 43値	2.21	2.20	2.03	2.07	1.86	2.08
R	27.9	24.4	27.0	24.7	35.6	27.9
0 大	81.3	80.6	81.3	82.5	78.9	80.9
0 .	53.4	56.2	54.3	57.9	43.3	53.0
平均	69.5	72.2	72.4	72.5	70.3	71.4









Solder Paste – LFM 48 W MR-A

Solder Paste
for very small
Aspect Ratio.
Alloy. SAC 305
Powder Size 4
Ti. 0.7
Viskosity: 120 Pa・s
(Malcom Viscosity
10rpm,25℃)

1P = 0,1(kg/ms)
= 0,1 Pa・s

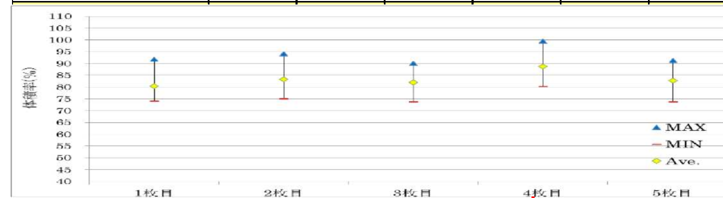
BGA0.5p High aspect print Printing Comparison MR-A

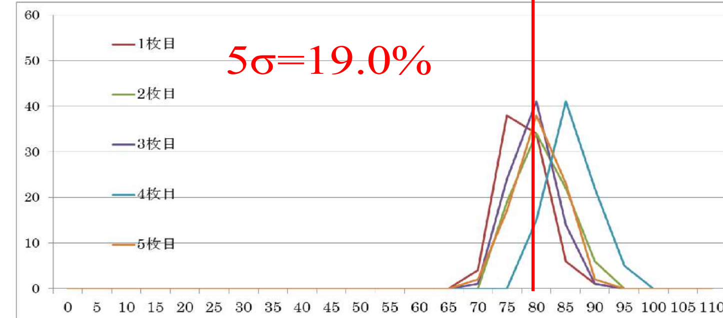
Stencil thickness：150μm Aperture size：φ0.28mm

Type4

【Cleaning / every board】

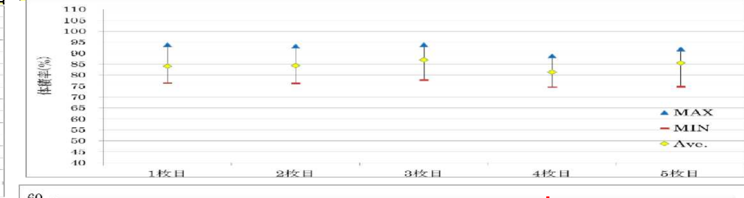
	1	2	3	4	5	2 均
7 σ	10.8	12.7	9.8	12.5	11.0	11.4
σ	3.60	4.24	3.27	4.15	3.66	3.78
Cp.	2.79	2.37	3.08	2.42	2.75	2.68
Cpk.	2.75	2.11	2.88	1.72	2.50	2.39
R	17.6	19.0	16.4	19.2	17.4	17.9
3 0 54 6	91.7	94.1	90.1	99.5	91.2	93.3
3 1 54 6	74.1	75.1	73.7	80.3	73.8	75.4
2 均54 6	80.5	83.3	82.0	88.7	82.8	83.4

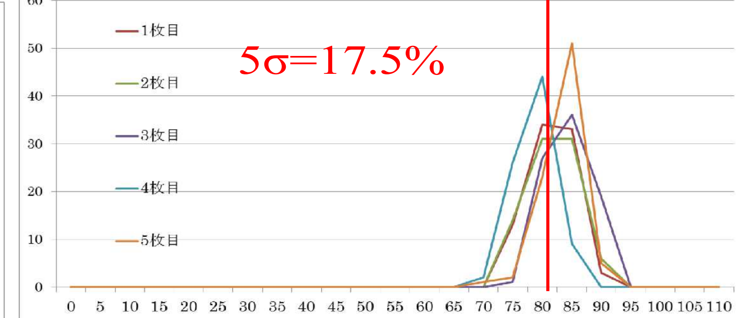




【Cleaning / 5 boards】

	1	2	3	4	5	2 均
7 σ	11.4	11.8	10.8	9.5	9.5	10.6
σ	3.80	3.92	3.61	3.15	3.17	3.53
Cp.	2.65	2.56	2.79	3.19	3.18	2.87
Cpk.	2.29	2.19	2.14	3.05	2.60	2.45
R	17.5	17.0	16.1	14.1	17.2	16.4
3 0 54 6	93.8	93.2	93.9	88.7	91.9	92.3
3 1 54 6	76.3	76.2	77.8	74.6	74.7	75.9
2 均54 6	84.1	84.4	86.9	81.4	85.5	84.4





Agenda

- Market trend vehicles
- Paste for AR < 0.6
- Market trends metal compostion
- Almit
- Conclusion

Market trends

Technical requirements of the soldering material is increasing.

Miniaturization → Down size / fine pitches / new devices

Reliable joints– tough specification

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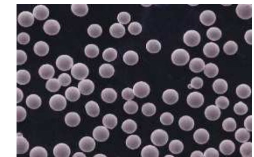
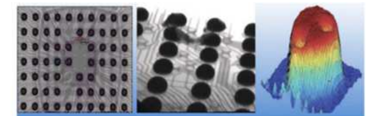
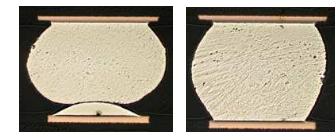
Market trends

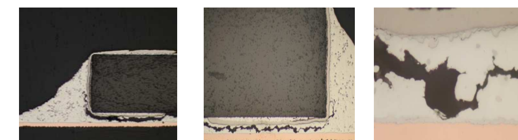
Miniaturization with reliable joints need.....

- Stencil apertures become smaller... → smaller powder size/ Dispense
- Printed deposit volume & quality... → Good print / longer stencil life
- minimize to repair work... → Good wetting / High yield
- To keep joints strength... → Stronger Metal
- Flux residues other function









Market trends - Alloys

SAC 305
Sn-3,0Ag-0,5Cu (0.035Fe-Ga)

SAC 105
Sn-1,0Ag-0,5Cu

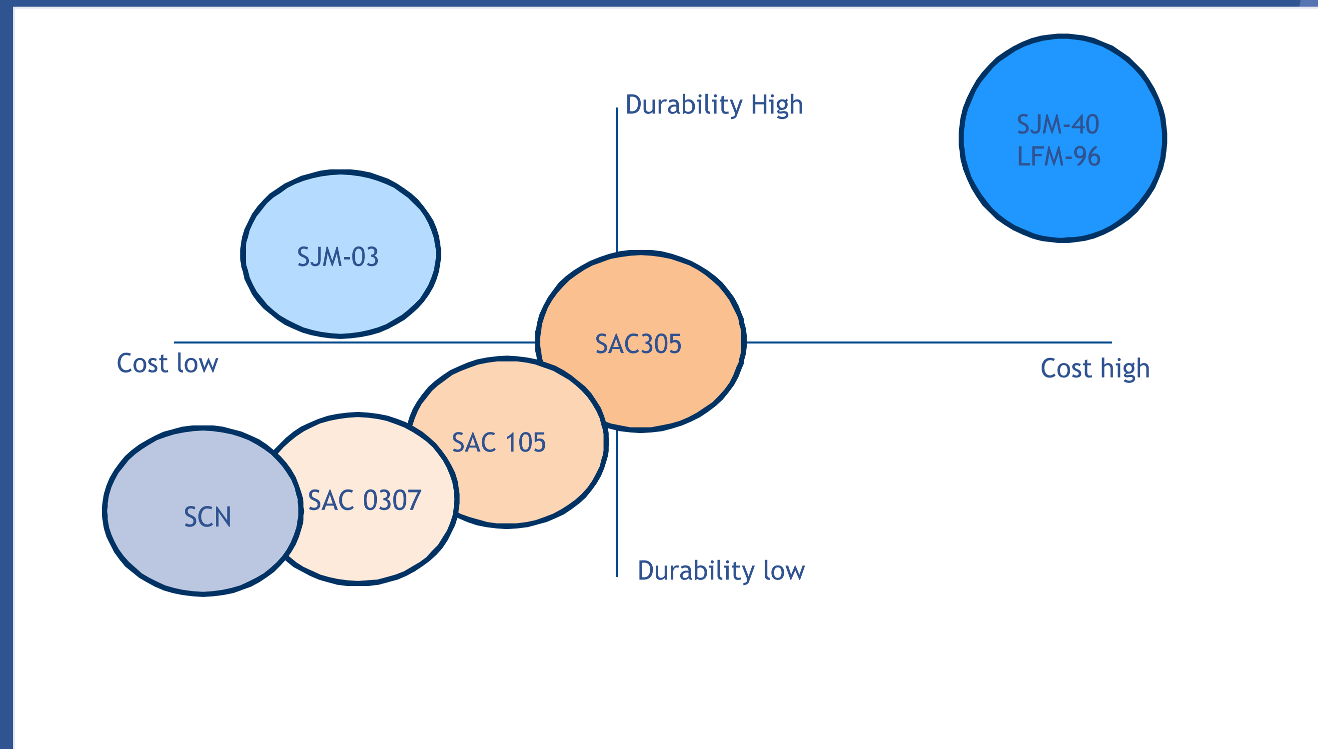
SAC 0307
Sn-0,3AG-0,7Cu (0.035Fe-Ga)

SCN
Sn-0.6Cu-0.05Ni-(0.035Fe-Ga)

SJM-03
Sn-0,3Ag-0,7Cu,2,0Bi

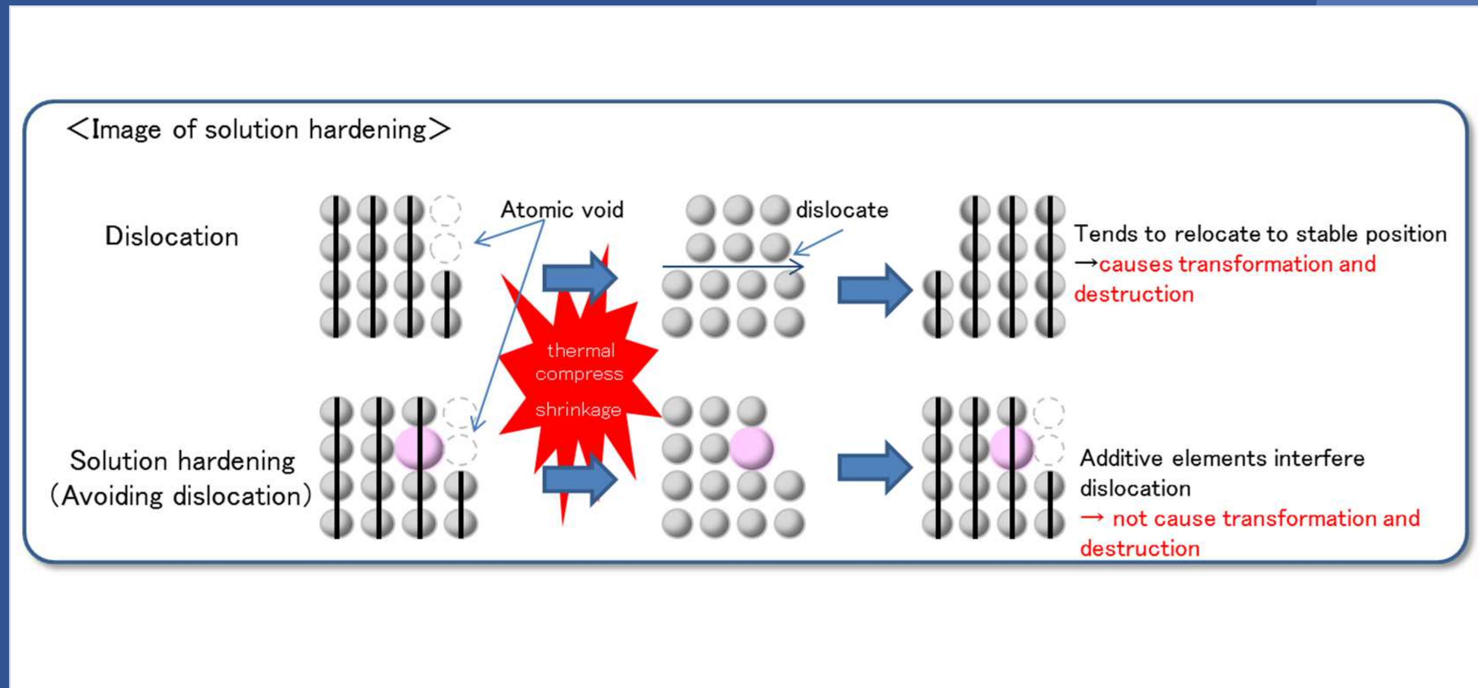
SJM-40
Sn-4,0Ag-2,0Bi-3,0Sb

LFM 96
Sn-3.5Ag-0.5Bi-6.0In



Legierungen: SJM – Strong Joint Metal

Lattice defect
Materials are grouped according to certain types of atoms, the arrangement of which is called a lattice . Starting from a perfect lattice structure, the strength of a material is calculated from attractive and repulsive forces acting between its atoms.
However, the actual strength of a material is considerably lower than the calculated value because the atomic lattice contains voids and dislocations.
Material failure is therefore often due to these defects.

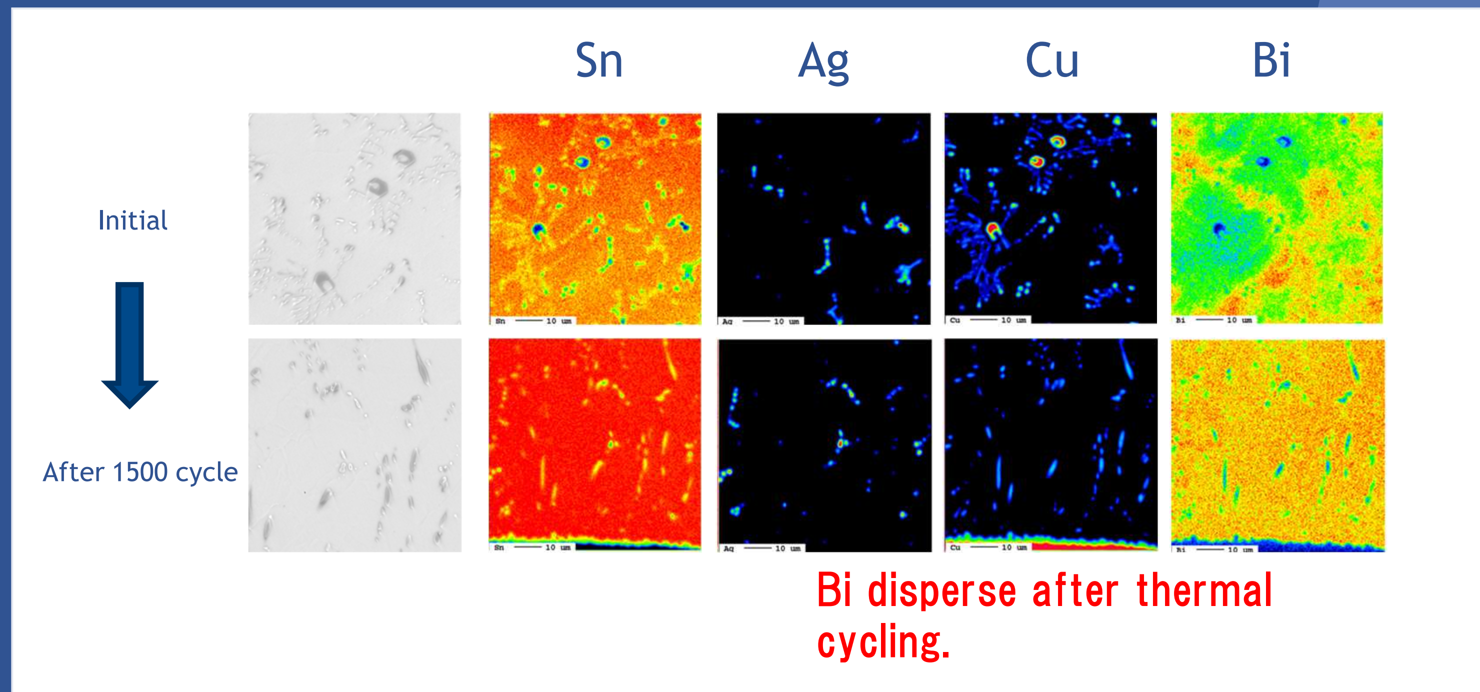


Solidification influences the dislocation.

Alloy: SJM alloy
EPMA Analysis/ electron probe micro analysis

Analaysis

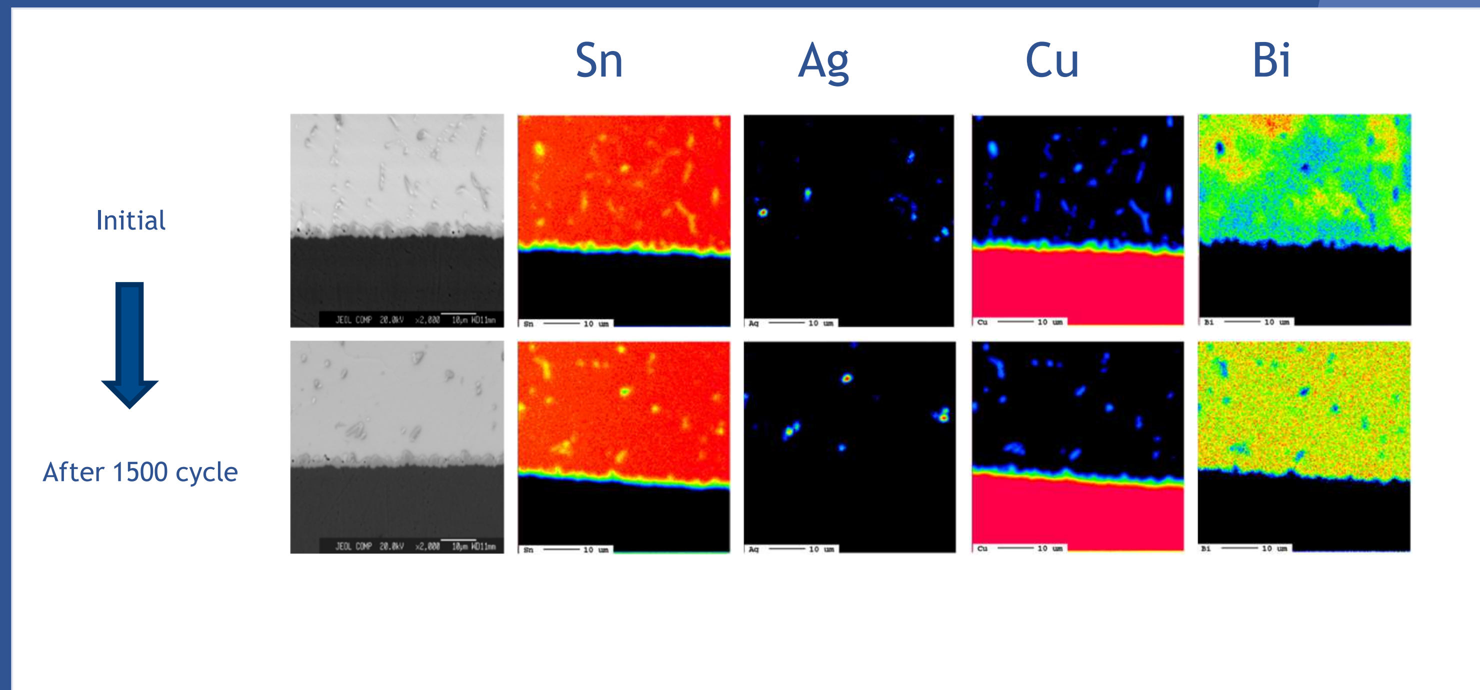
Solder filet:



Alloy: SJM alloy
EPMA Analysis/ electron probe micro analysis

Analaysis

Interface:



Alloys: SJM - Strong Joint Metal

The alternative for SAC.

Alloys with high reliability.

Product-name	Alloy	Solidus (℃)	Liquidus (℃)
SJM-03	Sn-0.3Ag-0.7Cu-2.0Bi-0.01Fe-α	210	225
SJM-10	Sn-1.0Ag-0.7Cu-2.0Bi-0.01Fe-α	212	224
SJM-30	Sn-3.0Ag-2.0Bi-1.0Sb-β	216	224
SJM-35	Sn-3.5Ag-2.0Bi-β	216	220
SJM-40	Sn-4,0Ag-2.0Bi-3.0Sb-β	221	227

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Alloy: Analysis of Indium alloys

Scope:
Compare solder joint strenght - reference SAC305 alloy.

Testconditions:
pcb FR 4 t=0.8mm
Cu-OSP Finish
Profil: 160-190℃; 90sec.
Peak: 230℃

Climate test condition:
-40℃ +150℃
Soak time 10min.
Switch over time 2min.
1000cyc.

Produkt-name	Legierung	Solidus (℃)	Liquidus (℃)
LFM-71	Sn-3.5Ag-0.5Bi-4.0In	205	212
LFM-96	Sn-3.5Ag-0.5Bi-6.0In	200	210
LFM-70	Sn-3.5Ag-0.5Bi-8.0In	194	206
LFM-48	Sn-3.0Ag-0.5Cu	217	220

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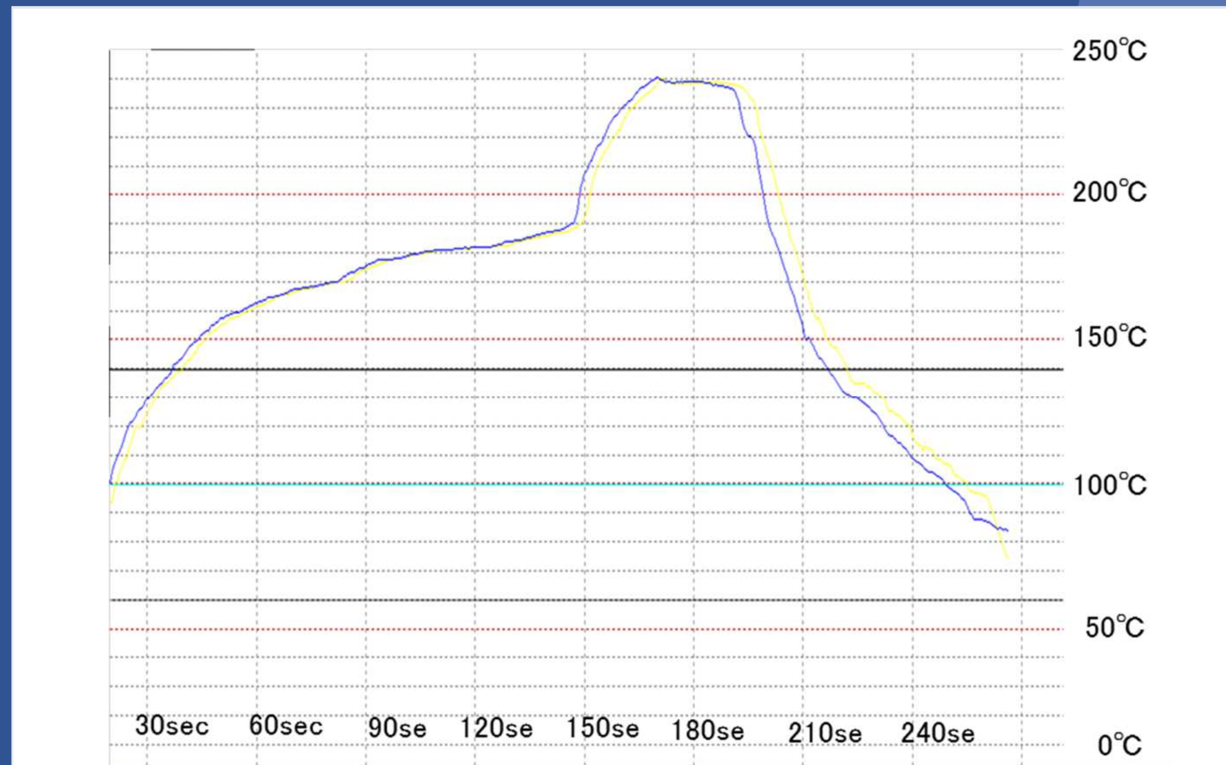
Alloys: SJM - Strong Joint Metal

Research:
Push/Pull test
mit 1mm/min.

testing conditions
Temperatur -40～+125℃
Soak time 30 min.
Cycles:
500, 800, 1000, 1500,2000,cyc

Shear test:
Parameter: 1mm/min
Repetitions n=30

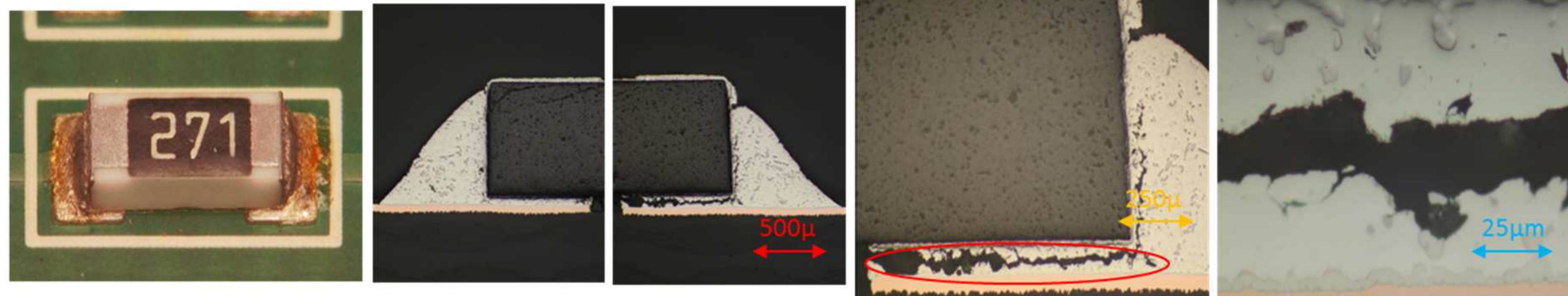


(Sn-3.0Ag-0.5Cu)

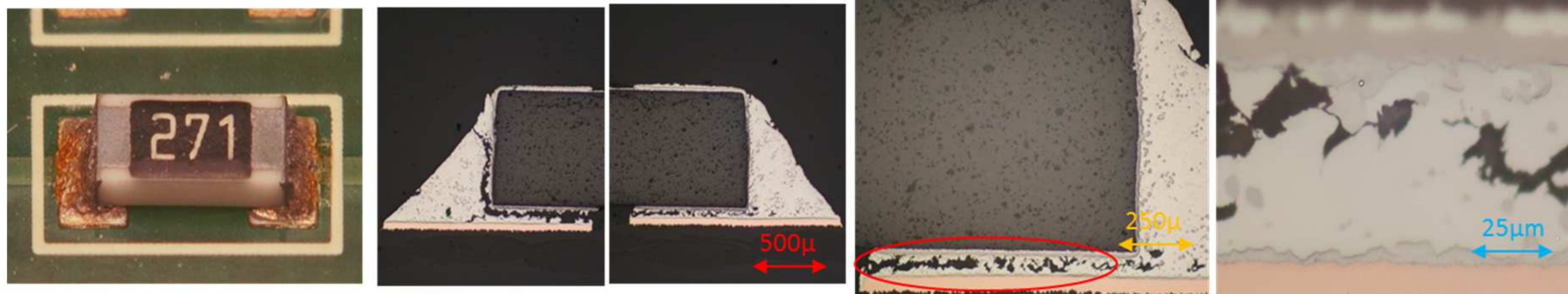
Alloys: SJM – Strong Joint Metal

(Sn-3.0Ag-0.5Cu)

1500



2000



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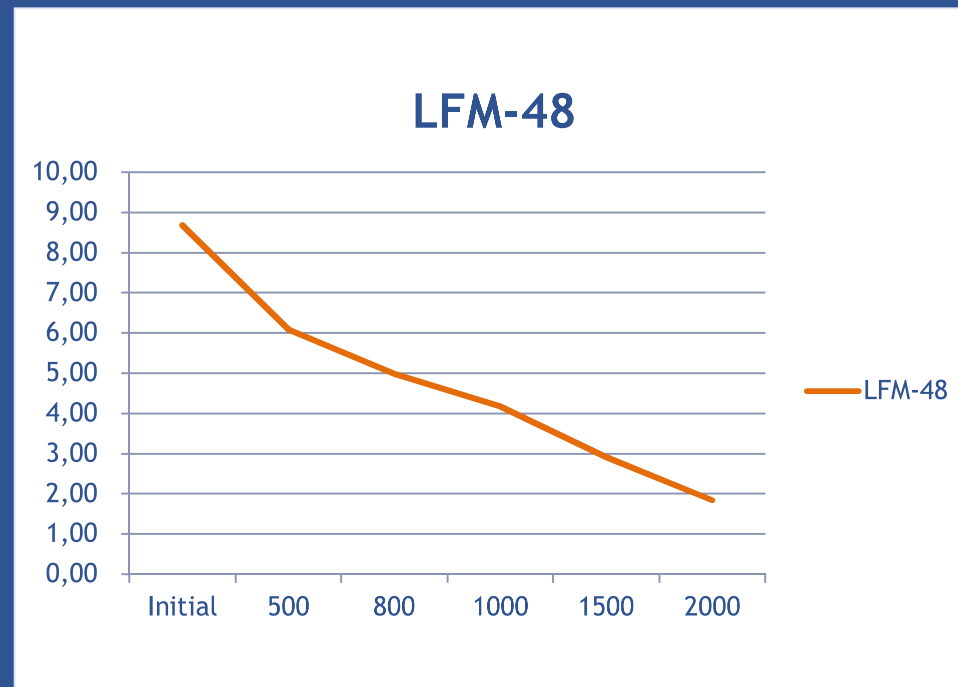
Alloys: SJM - Strong Joint Metal

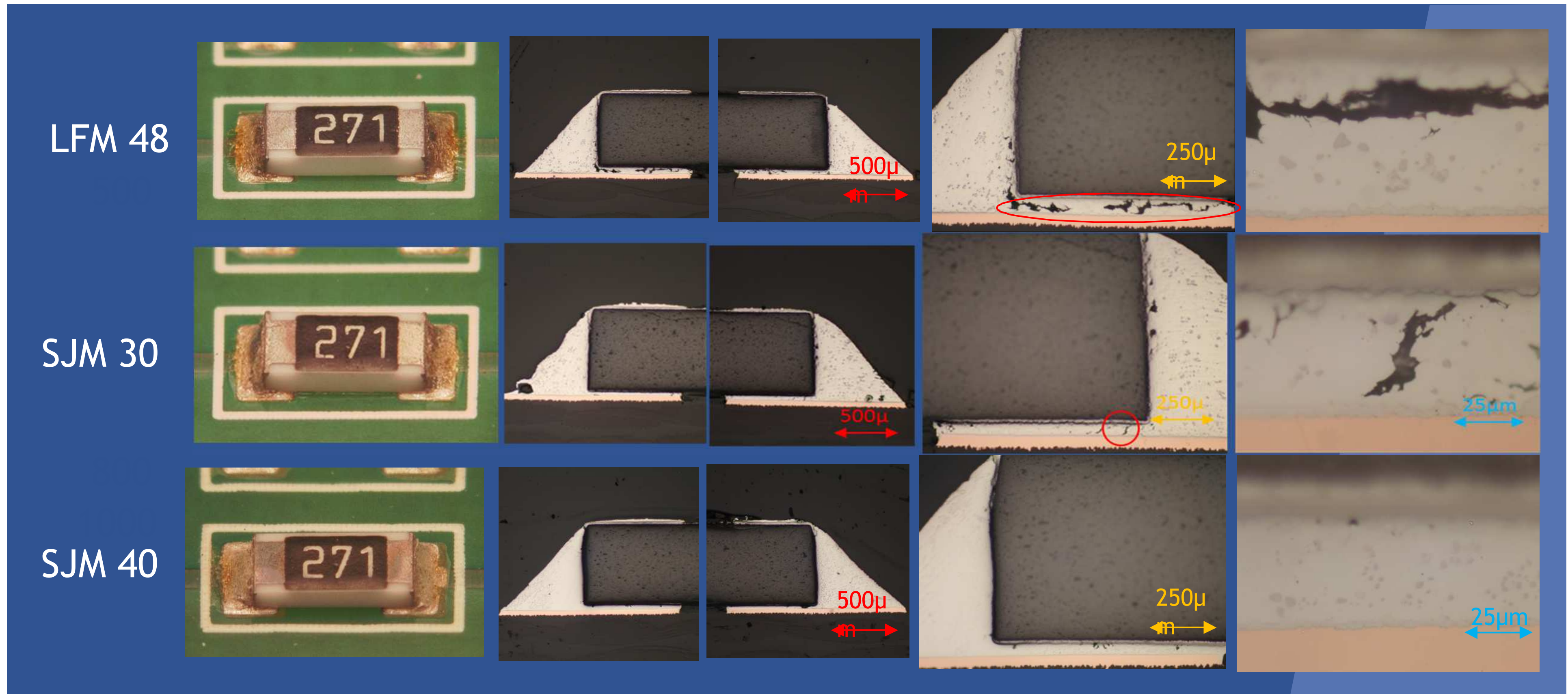
Rsult:

(Sn-3.0Ag-0.5Cu)

After 1000 cycles you need approx. 4 kgf ≈ 40 N only, to push the component of the pcb. (push/pull test).



Alloys: After 1000 cycles in the heat chamber



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Alloys: SJM – Strong Joint Metal

SJM 03
Sn-0.3Ag-0.7Cu-2.0Bi

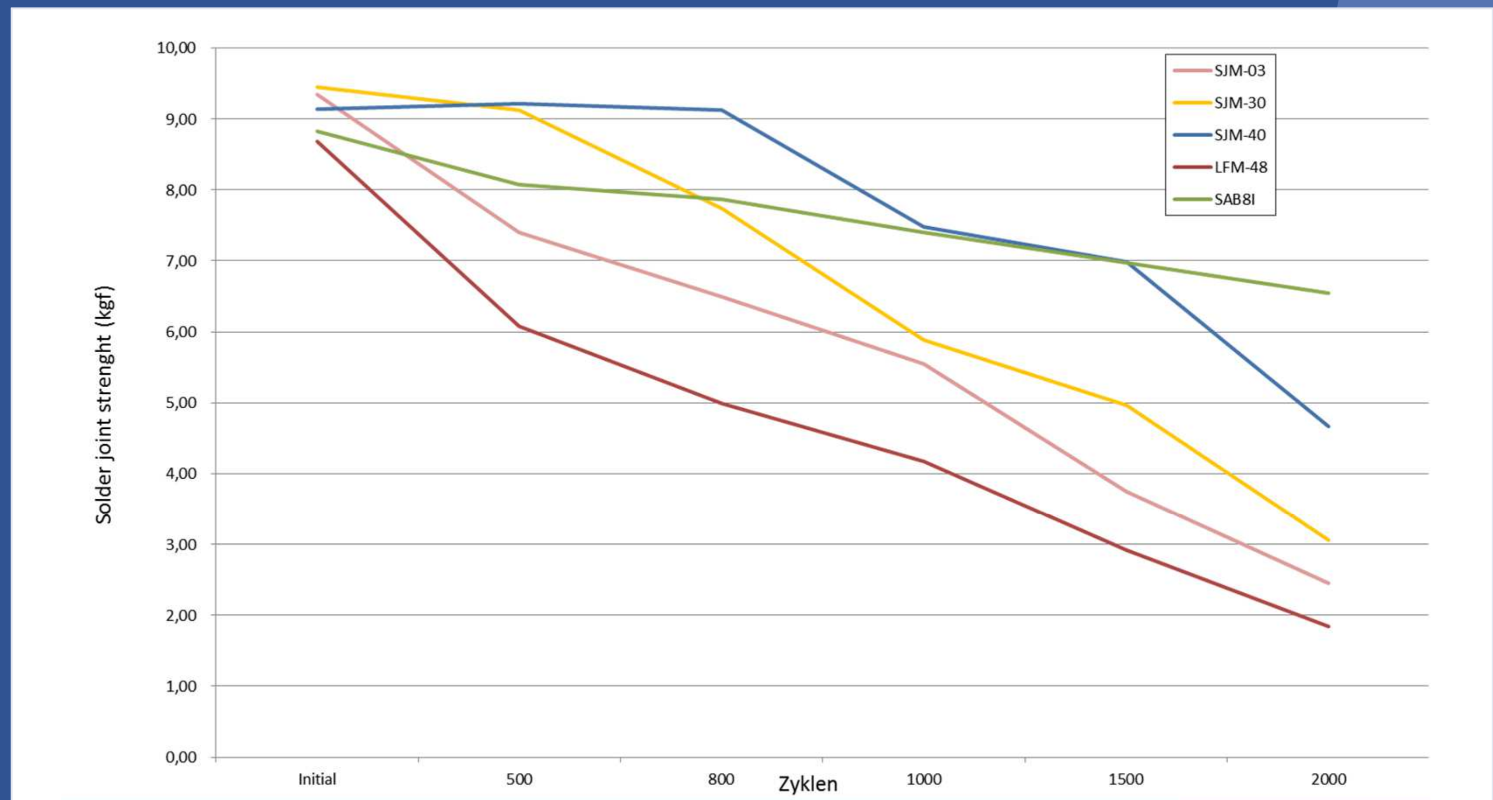
SJM 30
Sn-3.0Ag-2.0Bi-1.0Sb-B

SJM 40
Sn-4,0Ag-2.0Bi-3.0Sb-B

LFM 48
Sn-3.0Ag-0.5Cu

LFM 70
Sn-3.5Ag-0.5Bi-8.0In

After 1000 cycles the SJM40 and LFM 70 alloy is on the same level as the SAC 305 on initial stage.

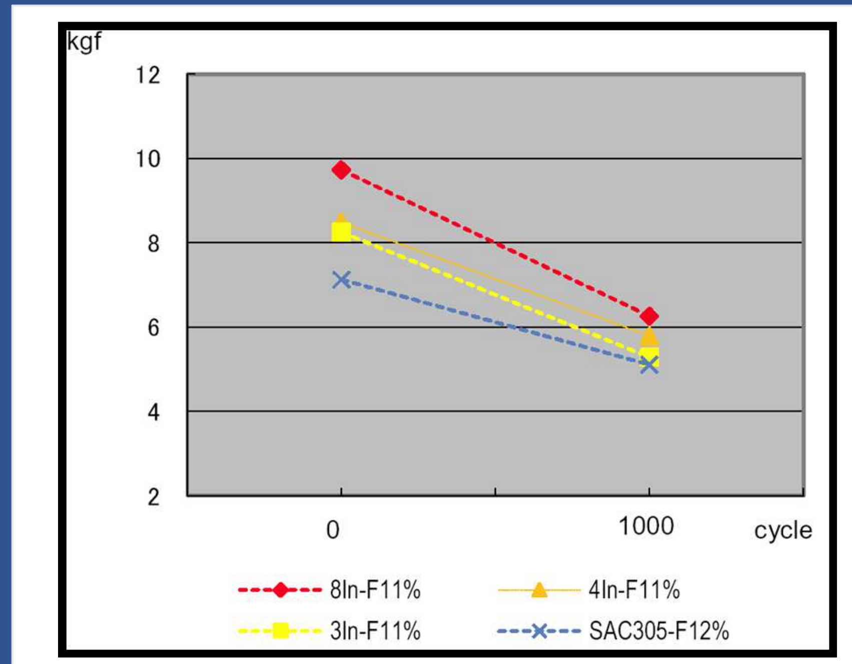


Alloy: Results after heat cycle test - strength test

Result of the analysis:

Climate chamber.
Testconditions:
-40℃ +125℃
Soak time 10min.
Switchover time 2min.
1000cyc.

Push Pull Test:
Manufacture: Aikoh
Tetscondition: 1mm/min.
Measure the solder joint strength.



SAC305 > SAB4I > SAB8I

Alloy: Analysis of Indium alloys

Scope:
Compare solder joint strenght - reference SAC305 alloy.

Testconditions:
pcb FR 4 t=0.8mm
Cu-OSP Finish
Profil: 160-190℃; 90sec.
Peak: 230℃

Climate test condition:
-40℃ +150℃
Soak time 10min.
Switch over time 2min.
1000cyc.

	Alloy	Capacitor						Resistor	
		0402	0603	0805	1206	1812	2225	0603	0805
LFM-71	Sn-3.5Ag-0.5Bi-4.0In	O	O	O	X	X	X	O	x
LFM-96	Sn-3.5Ag-0.5Bi-6.0In	O	O	O	O	O	O	O	O
LFM-70	Sn-3.5Ag-0.5Bi-8.0In	O	O	O	X	X	X	O	x
LFM-48	Sn-3.0Ag-0.5Cu	O	X	X	X	X	X	X	x

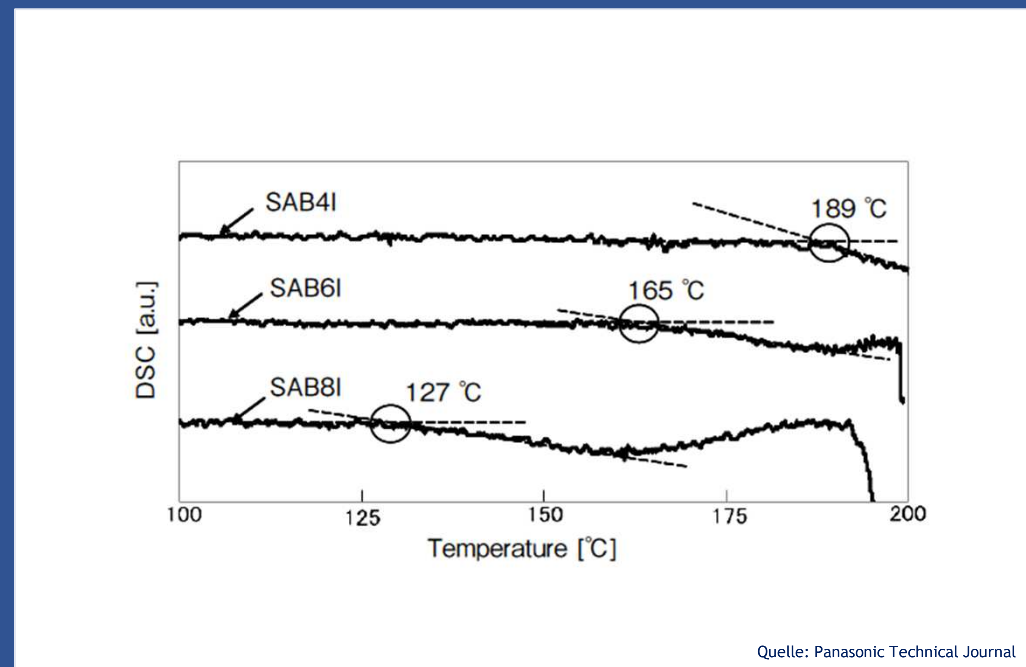
Alloy: Analysis of Indium alloys – Phase transition

Phase transition of Indium alloys

SAB4I = Sn-3.5Ag-0.5Bi-4.0In

SAB6I = Sn-3.5Ag-0.5Bi-6.0In

SAB8I = Sn-3.5Ag-0.5Bi-8.0In



DSC = Differential scanning calorimetry

Alloys: Physical Properties

Category	Unit	SJM-03	SJM-30	SJM-35	SJM-40	SAC0307	SAC305	Measurement method
Specific gravity Spezifisches Gewicht		7.4	7.4	7.4	7.4	7.3	7.4	Gravity meter
Sheer strength Scherfestigkeit	（MPa）	57	65	64	77	30	44	JIS Sheer test (JIS Z 3198-2)
Yield stress Materialfließgrenze	（MPa）	38	47	43	50	23	38	JIS Sheer test (JIS Z 3198-2)
Elongation Längenänderung	（%）	23.1	26.5	23.7	18.8	44.3	48.4	JIS Sheer test (JIS Z 3198-2)
Young ratio Elastititätsmodul	（GPa）	50	50	51	52	53	50	Ultra sonic method
Poisson's ratio Querdehnungszahl		0.36	0.35	0.35	0.35	0.34	0.36	Ultra sonic method
Specific heat Spezifische Wärmekapazität	(J/g・K	0.22	0.21	0.21	0.22	0.23	0.23	Laser Flash method
Heat conductivity Wärmekunduktivität	(W/m・K)	58.6	55.0	59.5	51.0	67.4	63.2	Laser Flash method
Vickers Hardness Härteprüfung nach Vikvers	HV	25	27	25	32	12	16	Hardness meter

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Alloy: Summing up

Produkt-name	Alloy	Solidus (°C)	Liquidus (°C)	Reliability	Wire	Paste
LFM-71	Sn-3.5Ag-0.5Bi-4.0In	205	212	xx		x
LFM-96	Sn-3.5Ag-0.5Bi-6.0In	200	210	xxxx	X	x
LFM-70	Sn-3.5Ag-0.5Bi-8.0In	194	206	xx		x
LFM-48	Sn-3.0Ag-0.5Cu	217	220	xx	x	x
LFM-23	Sn-0.6Cu-0.05Ni	228	229	x	x	x
SJM-03	Sn-0.3Ag-0.7Cu-2.0Bi-0.01Fe-α	210	225	xxx	x	x
SJM-10	Sn-1.0Ag-0.7Cu-2.0Bi-0.01Fe-α	212	224	xxx	x	x
SJM-30	Sn-3.0Ag-2.0Bi-1.0Sb-ß	216	224	xxx		x
SJM-35	Sn-3.5Ag-2.0Bi-ß	216	220	xxx		x
SJM-40	Sn-4,0Ag-2.0Bi-3.0Sb-ß	221	227	xxxx	x	x

Non silver lead free alloys: LFM 23S new anti tip wastage alloy

The concept of LFM 23.

Sn-Cu-Ni features + anti iron wastage feature.
(longer tip life + 0,035Fe)
Gallium reduce the oxidation of the metal.

Product-name	Alloy	Solidus (℃)	Liquidus (℃)
LFM-23S	Sn-0.6Cu-0.05Ni-0.035Fe-Ga	228	229
LFM-22	Sn-0.7Cu	227	227
Sn-Cu-Ni	Sn-0.6Cu-0.05Ni-0.01Ge	228	229

Gallium metal is not reactive with air and water because it forms a passive, protective oxide layer.

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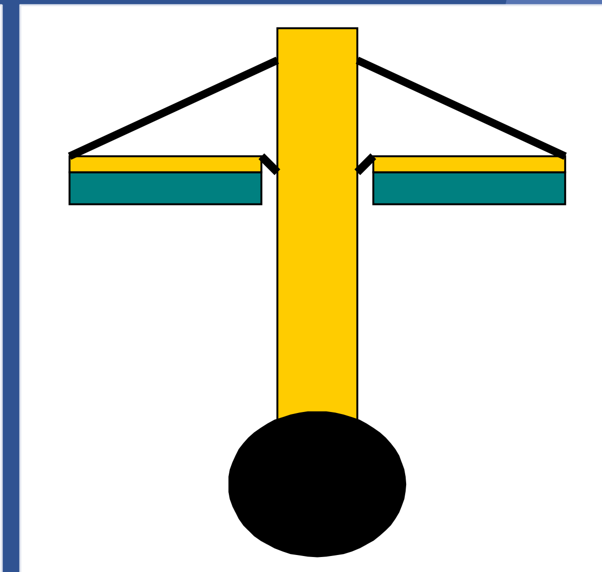
Non silver lead free alloys: Creep test

Test conditions:

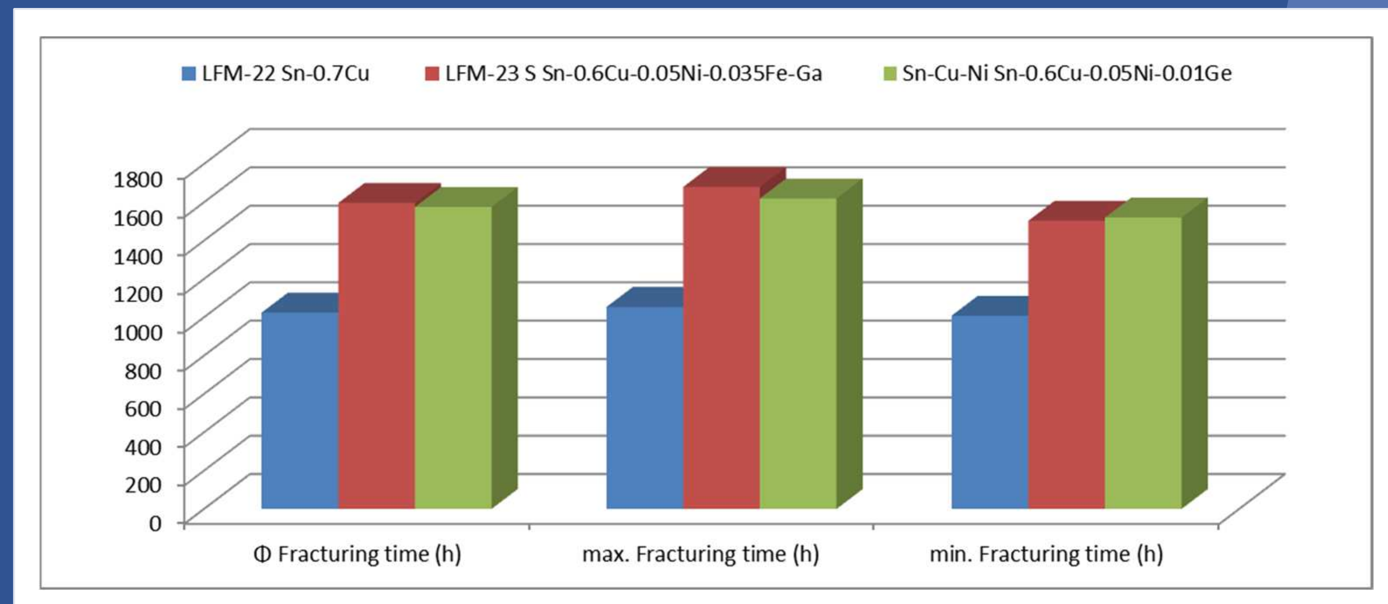
1. Pattern size / diameter 3.0mm
2. Hole size / diameter 1.0mm
3. Cupper wire size / Φ 0.8 mm x 100 mm
4. Solder quantity / 30mg
5. Weight / 1kg
6. 130 degree C atmosphere
7. Test substrate – FR-1 (20x30x1.6mm)



Non silver lead free alloys: Creep test

Result:

Creep features are increasing by adding Ni to LFM 22 (SnCu).



LFM-23 S= Sn-Cu-Ni alloy > LFM-22

Alloys	Φ Fracturing time (h)	max. Fracturing time (h)	min. Fracturing time (h)
LFM-22 Sn-0.7Cu	1024	1054	1008
LFM-23 S Sn-0.6Cu-0.05Ni-0.035Fe-Ga	1596	1680	1503
Sn-Cu-Ni Sn-0.6Cu-0.05Ni-0.01Ge	1575	1620	1520

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Non silver lead free alloys: Thermal fatigue test

Test conditions:

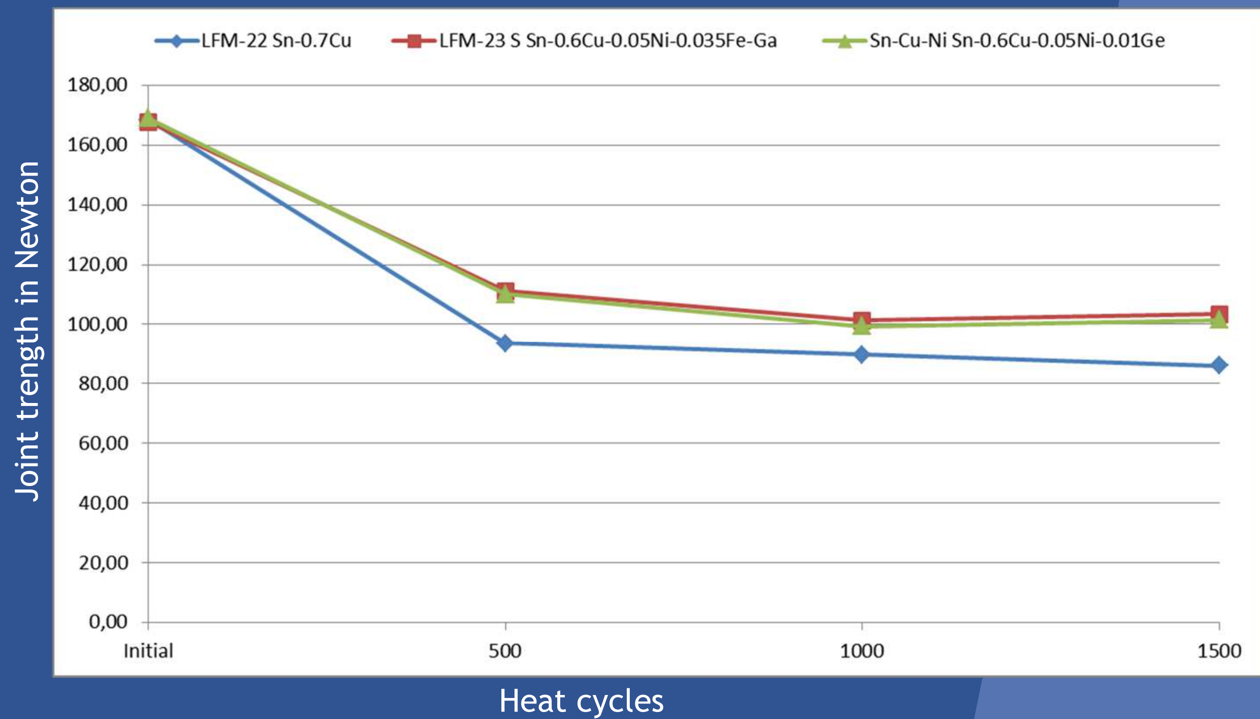
1. Test machine ： ESPEC　TSE-11-A
2. Test temperature ： -40℃～+125℃
3. Hold time ： 30min each temperature
4. No. of cycle ：initial、500cyc、1000cyc、1500cyc
5. Test substrate ：FR-1(20×30×1.6mm)
6. Pattern ： land φ3.0mm hole diameter φ1.0mm
7. Cu wire：φ0.8mm×100mm

Non silver lead free alloys: Thermal fatigue test

Result:

Thermal fatigue feature after 1500cycle is increasing by adding Ni to LFM-22

LFM-23S=Sn-Cu-Ni alloy＞LFM-22

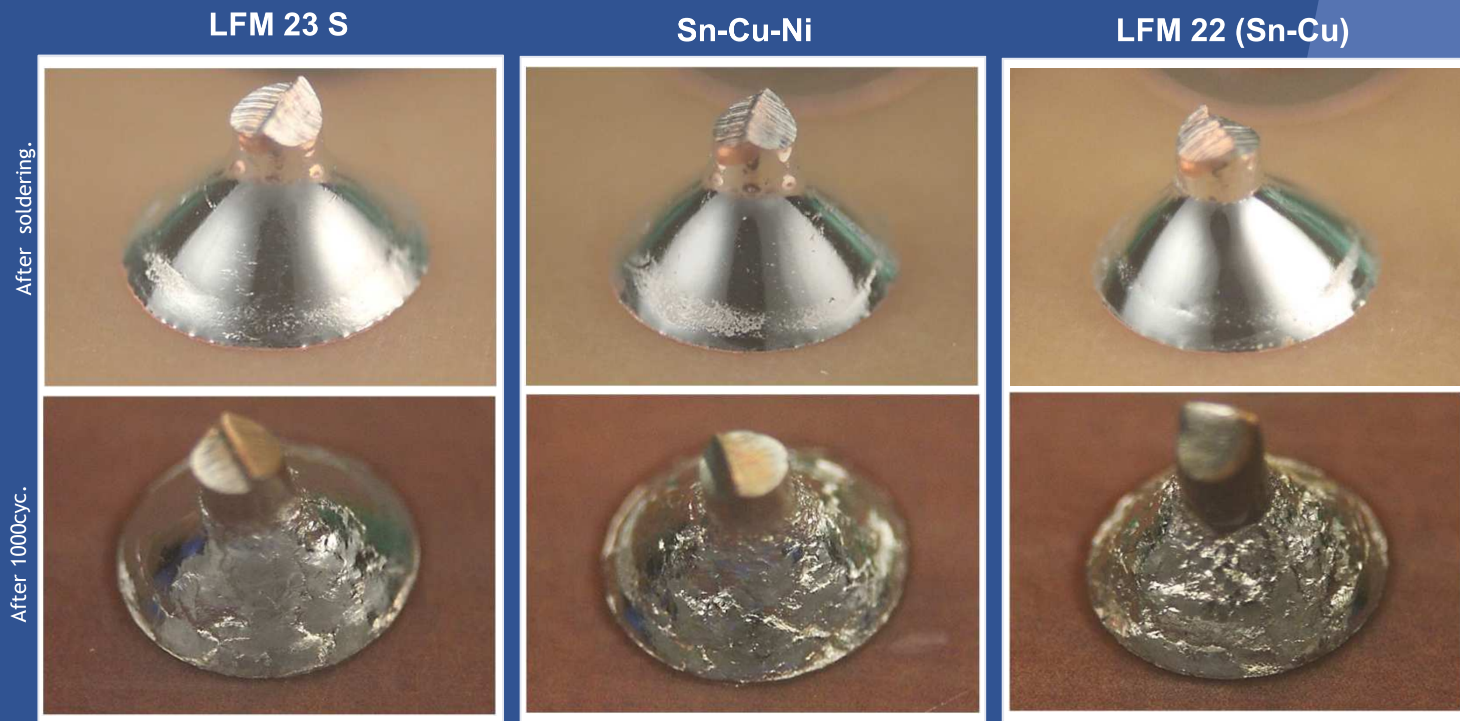


Alloy/Heat cycles	LFM-22 Sn-0.7Cu	LFM-23 S Sn-0.6Cu-0.05Ni-0.035Fe-Ga	Sn-Cu-Ni Sn-0.6Cu-0.05Ni-0.01Ge
Initial	168,38	167,69	168,87
500	93,56	111,11	110,03
1000	89,73	101,20	99,44
1500	86,00	103,36	101,50

Non silver lead free alloys: Appearance

Shininess of the surface was great as Sn-Cu-Ni alloy and Sn-Cu eutectic.

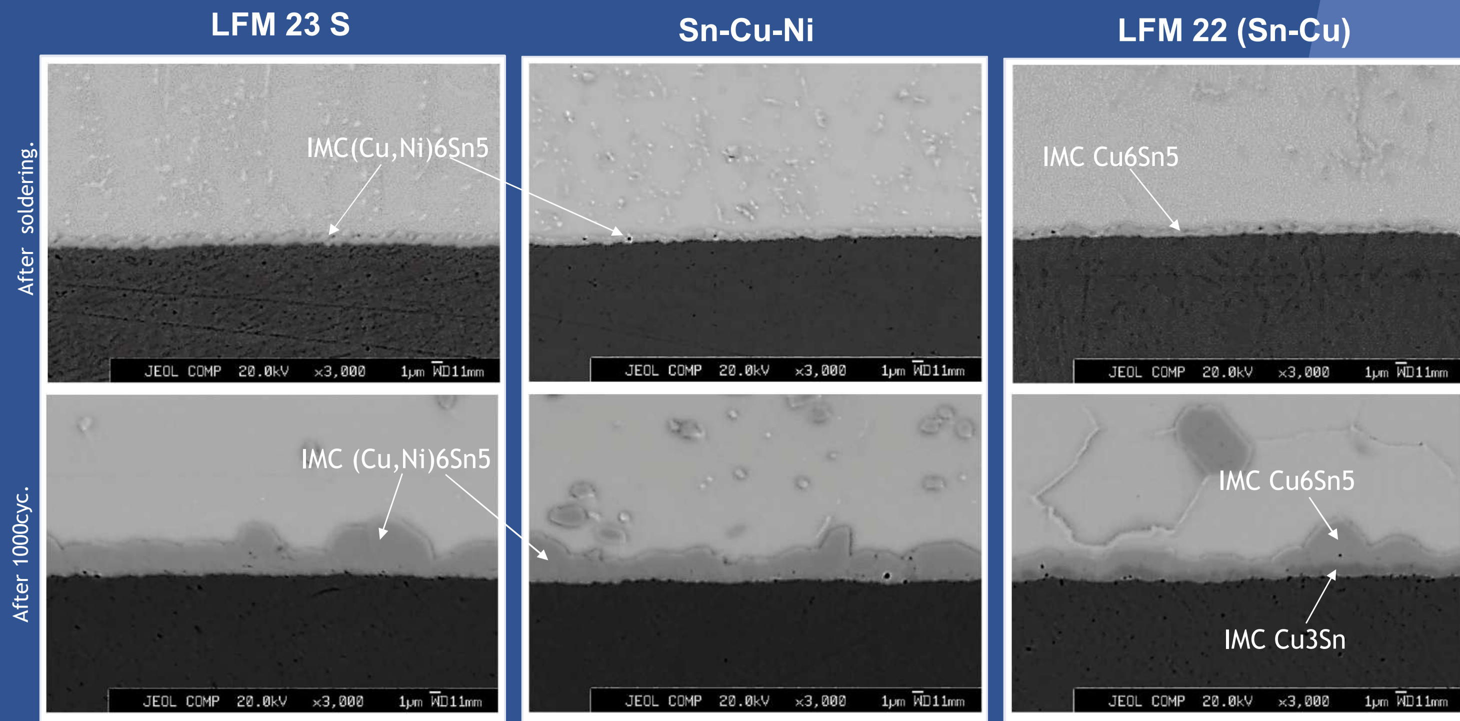
Wrinkles on the surface caused by heat cycle for LFM-23S and Sn-Cu-Ni alloy are less than Sn-Cu eutectic.



Non silver lead free alloys: IMC (intermetallic compound)

There is no difference of thickness of the IMC between the alloys.

Ni restrain growth of Cu3Sn layer after 1000 heat cycles.



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Non silver lead free alloys: Physical Properties

Category	Unit	LFM 23S Sn-0.6Cu-0.05Ni-0.035Fe-Ga	Sn-Cu-Ni	LFM 22 Sn-0.7Cu	Measurement method
Specific gravity Spezifisches Gewicht		7.3	7.3	7.3	Gravity meter
Sheer strength Scherfestigkeit	(MPa)	32	31	29	JIS Sheer test (JIS Z 3198-2)
Yield stress Materialfließgrenze	(MPa)	23	22	21	JIS Sheer test (JIS Z 3198-2)
Elongation Längenänderung	(%)	36	37	46	JIS Sheer test (JIS Z 3198-2)
Young ratio Elastititätsmodul	(GPa)	62	63	55	Ultra sonic method
Poisson's ratio Querdehnungszahl		0.32	0.31	0.35	Ultra sonic method
Specific heat Spezifische Wärmekapazität	(J/g・K	0.22	0.21	0.23	Laser Flash method
Heat conductivity Wärmekunduktivität	(W/m・K)	65,5	62.7	65.3	Laser Flash method
Vickers Hardness Härteprüfung nach Vickers	HV	11	11	12	Hardness meter

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Non silver lead free alloys: Soldering performance

Comparison:

SR-LA SUPER LFM-23S

and Sn-Cu-Ni

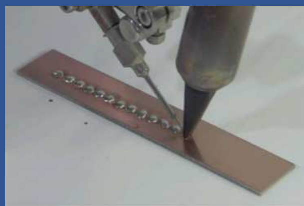
Soldering on Cu solid substrate by soldering robot.

Tip temperature：320,350,380℃

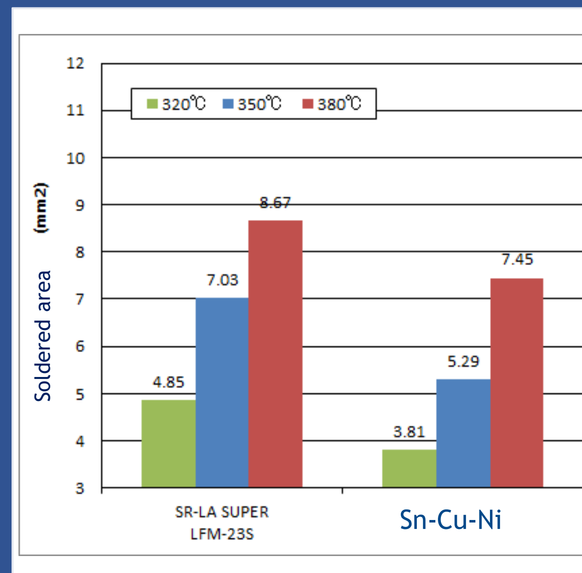
Feeding amount：5mm

Feeding speed：10mm/s

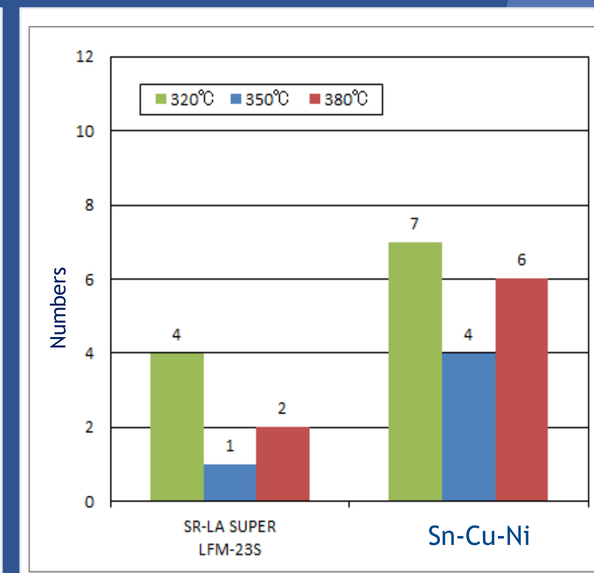
Holding time：0.5s



Soldered Area



Flux- and solder ball splattering



Our products has superior wettability and less splattering.

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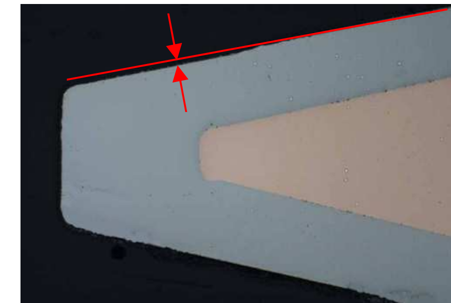
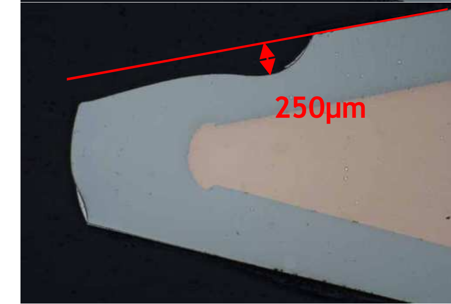
Non silver lead free alloys: Life time test soldering tips

Tip life time comparison between our product of SR-LA SUPER LFM-23S and Sn-Cu-Ni.
Cross section after 20000 solder shots by soldering machine.
Tip temperature：380℃
Feeding amount：5mm
Feeding speed　：10mm/s
Holding time：0.5s

	Initial	after 20000 solder shots	
LFM 23 S			Tip erosion depth 50μm
Sn-Cu-Ni			Tip erosion depth 250μm

Our product has superior endurance for tip life
（5 times greater than competitor product）

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Non silver lead free alloys: LFM 23S portfolio

Available flux types for LFM 23:

LFM 23 S NHR TH

LFM 23 S Gummix 21 Zeta

LFM 23 S SR – LA Super

Fluxtype	LFM-23S
M1	SR-LA Super
L1	Gummix 21 Zeta
L0	NHR-TH

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Non silver lead free alloys: Conclusion

1. Adding Ni in our LFM 22 alloy (Sn-Cu) shows improvement effects on creep feature and thermal fatigue feature.
2. Fe in LFM-23S is spread out throughout solder alloy and no segregation is confirmed.
3. SR-LA SUPER LFM-23S has superior soldering performance and 5 times greater endurance for tip erosion than Sn-Cu-Ni reference products.
   (when soldered with 380℃ tip)

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Almit - Important Almit sites

Almit Japan:

Production Wire and Paste.
ca. 150 t. per month.

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Almit China:

Production wire and paste.
ca. 75 t. per month.

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Almit Thailand:

Production Wire and Paste.
ca. 110 t. per month.

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Almit Germany:

Central stock Europe.

Production Flux.

Paste production planned.

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Almit - Important Almit sites

Almit Research and Development:

approx. 36 employees

Core competence:
Development of Flux.
Scoped for:
Reflow-Soldering - paste.
Inductiv soldering - paste and wire.
Laser soldering - paste and wire.
Iron soldering - wire.
Robot soldering - wire and paste.

Almit - Important Almit sites

Almit Research and Development:

Assortment of units for the evaluation of our products:

Viscometer
Tackiness Tester
Printer
Mounter
Robot soldering machine (iron+laser)
3D Checker
Reflow Simulator
Reflow oven

Almit - Important Almit sites

Almit Entwicklung und Forschung:

Assortment of units for the evaluation of our products:

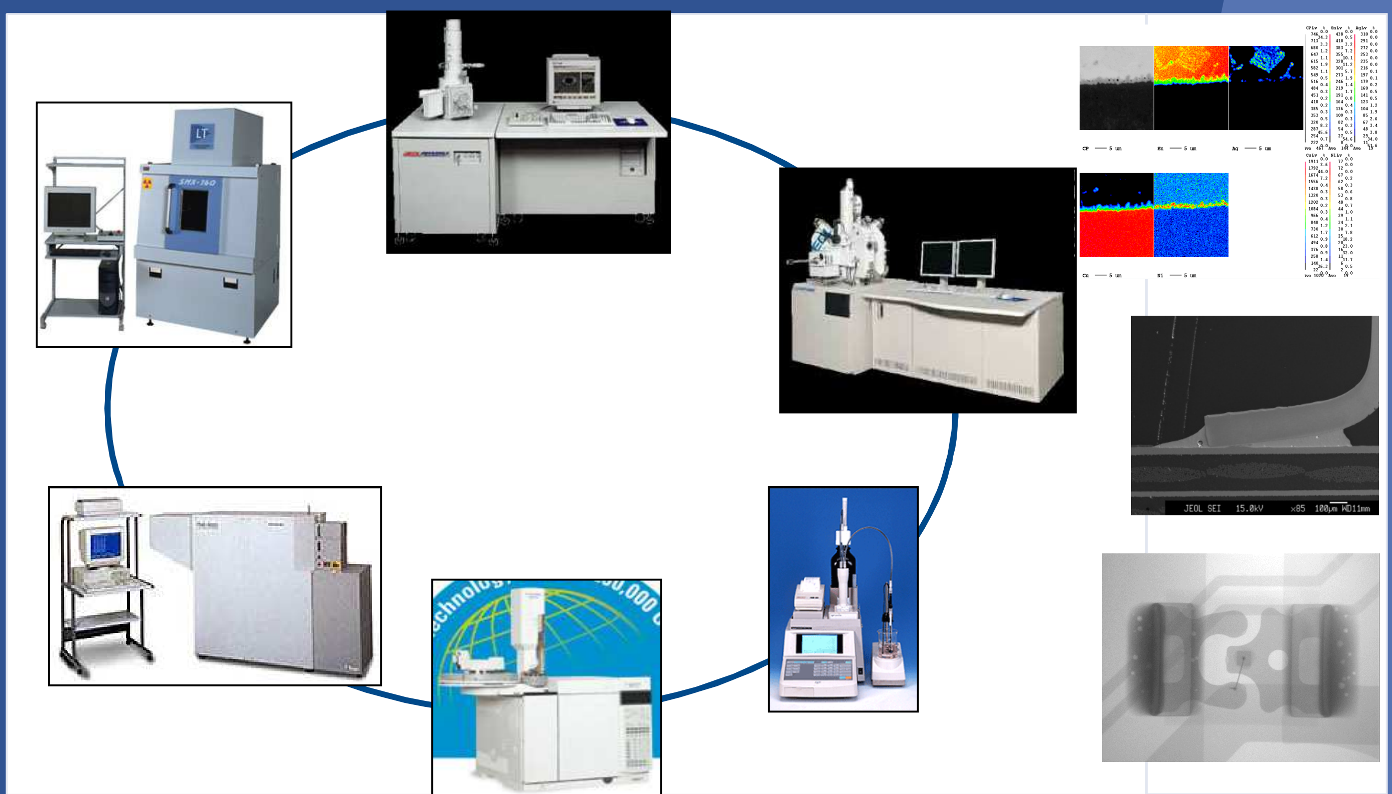
Rheo meter
Image observation
Cross section grinder
Heat cycle
Heat shock
Constant temp. humidity

Almit - Important Almit sites

Almit Research and Development:

Assortment of units for the evaluation of our products:

X-ray analysis
SEM/EDS
EPMA
Potentiometric Titration
Mass Spectrometer
Optical emission spectrometry



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Almit:
Since 1956 hold by
Familie Sawamura.
Almit GmbH Deutschland
since 2005, 51% Familie Mendel.

Global footprints:
5 Production sites
16 Branches
27 agency abroad
Customers
at 60 countries worldwide.
GLOBAL TURNOVER:
75 MIO. DOLLAR
215 EMPLOYEES

END

Thank you

Almit GmbH