

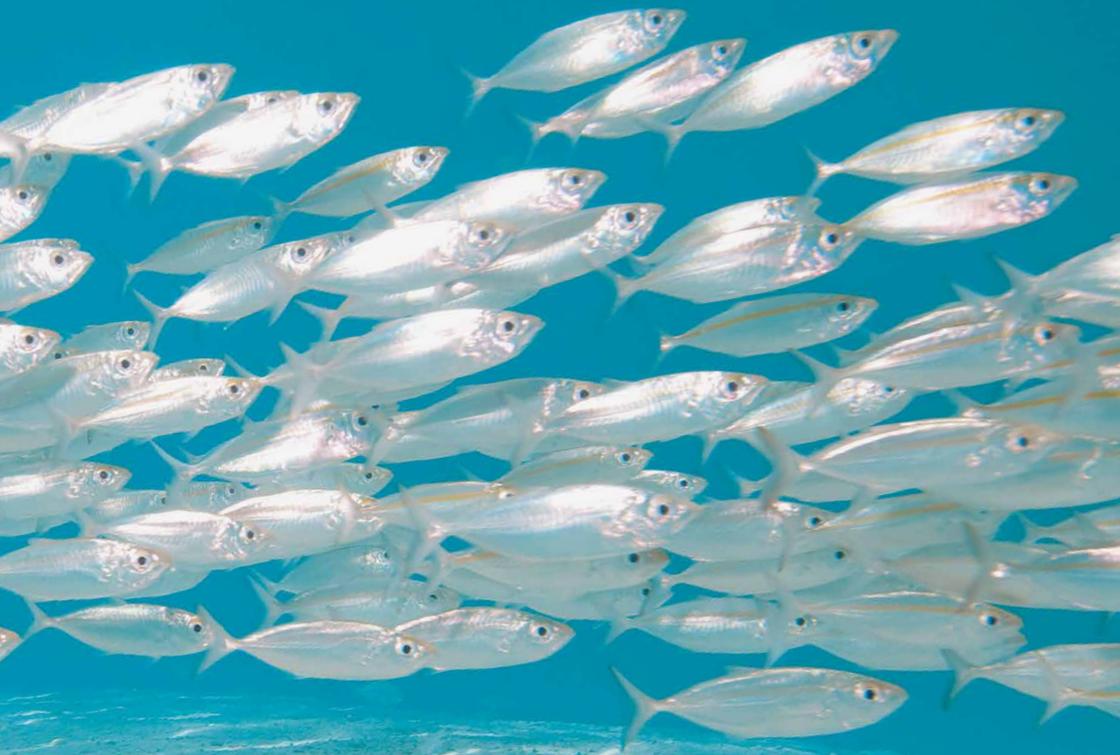
Tin Electrolytes

Brilliant prospects for your products.

bright tin processes

matt tin processes

electroless tin processes



Bright Tin SLOTOTIN 70

Bright Tin SLOTOTIN 70 is a sulphuric acid based electrolyte for the deposition of very bright tin layers. Even in very low current densities e.g. parts with a complex surface geometry light zinc layers are still deposited. The solderability of the tin coatings deposited from Bright Tin SLOTOTIN 70 is excellent and remains excellent even after heat ageing tests (e.g. 155 °C / 16 hours). The usual cloud formation of a sulphuric acid based tin electrolyte by tetravalent tin compounds is retarded in Bright Tin SLOTOTIN 70. A troublesome foaming does therefore not occur when operating this electrolyte. This is especially beneficial for barrel application since strongly foaming wetting agents would have a strong foaming effect during the barrel lift-out. The additives required for electrolyte make-up and operation meet the requirements of the RoHS Directive (Restriction of certain Hazardous Substances) EU Directive 2011/65/EU. The additives are free of alkylphenylethoxylate respectively nonylphenylethoxylate (NPEO).

Concentrations and operating conditions

		Rack	Barrel
Tin (II)	g/l	15 - 25	10 - 20
Sulphuric acid	g/l	160 - 200	60 - 200
Starter SLOTOTIN 71	ml/l	15 - 25	15 - 25
Operating temperature	°C	10 - 30	10 - 30
Cathodic current density	A/dm ²	1,0 - 2,5	≥ 0,4



Bright Tin GF 20 1

Bright Tin GF 20 1 is an organic acid-based fluoride- and **formaldehyde-free** process for the deposition of bright tin coatings. Solderability of the tin coatings is excellent, even after accelerated heat ageing at e.g. 155 °C for about 16 hours and the deposits aren't sensitive towards fingerprints. Bright Tin GF 20 1 can be used for the deposition of bright tin coatings in rack installations and at decreased metal content for bulk articles in barrel plants in the field of electronic- and electrotechnical component production including the printed circuit board (PCB) manufacturing. Bright Tin GF 20 1 is especially recommended for the application on small electronic components (ceramic chips) which tend to stick together. An especially developed additive prevents the parts as far as possible from sticking together. The additives are NPEO-free. Glass, ceramic or titanium aren't being attacked since

Concentrations and operating conditions

Rack / Barrel		Range
Tin (II)	g/l	8 - 25
Acid Concentrate FF	g/l	150 - 250
Starter GF 21 1	ml/l	10 - 40
Operating temperature	°C	15 - 25
Cathodic current density	A/dm ²	> 0,6 - 3,0

the electrolyte doesn't contain any fluoride. The use of titanium anode hooks is possible for the contacting of anodes if drag-in of fluoride ions or complex fluoride ions is prevented. If required the Bright Tin GF 20 1 can be operated as a tin-lead electrolyte by adding Lead Concentrate FP. This process is applied if sulphuric acid based electrolytes cannot be used, e.g. if a crossing of tin-lead electrolytes is unavoidable due to plant-specific reasons.

Tin SLOTOTIN MT 1110

The Tin SLOTOTIN 1110 is a strongly acidic, **fluoride-free** process for the deposition of matt to silky-matt, fine crystalline coatings. This process is applied in barrel plants for the coating of chips and small electronic components. Components plated with Tin SLOTOTIN 1110 show clearly less tendency to stick together like it's known from previously common processes. The deposits from Tin SLOTOTIN 1110 give excellent solderability and melting behaviour in reflow processes even after heat ageing (155 °C / 16 hours). The coatings contain a small amount of bismuth.

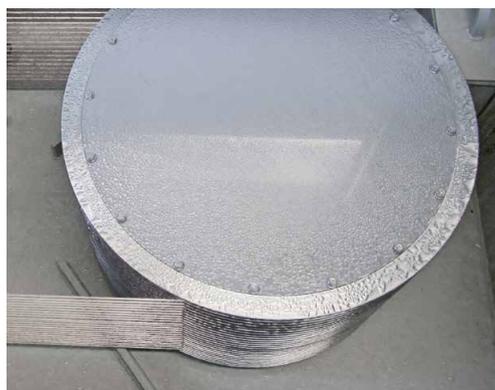
Concentrations and operating conditions		
		Range
Tin (II)	g/l	10 - 30
Acid Concentrate FF	g/l	200 - 300
Additive SLOTOTIN MT 1111	ml/l	30 - 60
Additive SLOTOTIN MT 1112	ml/l	0,25 - 2,0
Operating temperature	°C	20 - 40
Cathodic current density	A/dm ²	> 0,1 - 2,0



Tin SLOTOTIN MT 1080

Tin SLOTOTIN MT 1080 is a sulphuric acid-based electrolyte for the deposition of silky-matt tin coatings. For acidic matt tin electrolytes an unusually good covering power combined with an excellent solderability are the specific features of this process. The applications relate to tin plating of electronic or electrotechnical components. Additive SLOTOTIN MT 1081 is used in the same composition for barrel- and rack parts. The solderability of the deposits remains unlimited excellent even after a heat ageing test of 16 h / 155 °C. Cloud formation caused by the formation of Sn(IV) is retarded.

Concentrations and operating conditions		
		Range
Tin (II)	g/l	15 - 30
Sulphuric acid	g/l	150 - 200
Additive SLOTOTIN MT 1081	ml/l	10 - 30
Operating temperature	°C	15 - 30
Cathodic current density	A/dm ²	> 0,5 - 2,0



Tin MBF 20

Tin MBF 20 is a strongly acidic, fluoride-free process for the deposition of silky-matt fine crystalline coatings. It is used for tin plating of wires and tapes in reel-to-reel plating lines. The additives used are low foaming and so during operation no disturbing foam formation occurs. The deposits from Tin MBF 20 give excellent solderability and melting behaviour in reflow processes even after heat ageing (e.g. 155 °C / 16 hours).

Concentrations and operating conditions		
		Range
Tin (II)	g/l	30 - 120Acid
Acid Concentrate FF	g/l	70 - 135
Additive SLOTOTIN MBF 16 1	ml/l	10 - 30
Operating temperature	°C	35 - 60
Cathodic current density	A/dm ²	10 - 80

Matt Tin SLOTOTIN 40

The Matt Tin SLOTOTIN 40 is a strongly acidic, fluoride-free process for the deposition of silky-matt fine crystalline coatings. This process is mainly applied in reel-to-reel plants. With reduced tin concentration it can also be used for rack- and barrel applications. Tin is deposited in a grain size of 3 - 8 μm and tends to less formation of whiskers in comparison to bright tin layers (grain size < 1 μm). The deposited tin layers contain only low quantities of co-deposited organic compounds. Measured as carbon, the values are approx. 0.005 % by weight. The additives don't decompose during deposition. Therefore, the carbon co-deposition rate remains low even after longer operating period. Solderability of the tin coatings

Concentrations and operating conditions

		Range
Tin (II)	g/l	30 - 120
Acid Concentrate FF	g/l	70 - 200
Additive SLOTOTIN MBF 41 1	ml/l	30 - 70
Operating temperature	°C	35 - 60
Cathodic current density	A/dm ²	10 - 80

deposited from Matt Tin SLOTOTIN 40 is still excellent after heat ageing at (155 °C / 16 hours) and can be fused. The process has been developed as a lead-free alternative for all types of components. The coating is compatible with all lead-free tin-based solder-alloys.

Bright Tin GBF 30

Bright Tin GBF 30 is for the use in high speed reel-to-reel installations. The fluoride-free acidic electrolyte deposits bright tin coatings. Depending on plant conditions and operating temperature cathodic current densities up to 30 A/dm² can be achieved. Solderability is still excellent even after tempering (aging test). The additives used are low foaming. This results, even during intensive electrolyte agitation to no foam formation.

Concentrations and operating conditions

		Range
Tin (II)	g/l	30 - 120
Make-up Concentrate GBF 33	g/l	100 - 200
Additive SLOTOTIN MBF 16 1	ml/l	10 - 30
Operating temperature	°C	35 - 60
Cathodic current density	A/dm ²	10 - 80

Immersion Tin SN 30 1

Immersion Tin SN 30 1 is a process for the electrodeless deposition of tin on copper and copper alloys via charge exchange. Deposition is also possible on lead surfaces. Therefore, this process can also be used to brighten lead- or tin-lead coatings. Smooth bright tin layers approx. 1 - 2 μm thick are deposited on copper surfaces at a temperature of 70 °C, still enabling solderability after tempering (e.g. 4 hours at 155 °C). Immersion Tin SN 30 1 can be regenerated. The copper which accumulates over time can be separated from the electrolyte. Components required for deposition may be replenished according to analysis. As usual with conventional immersion tin electrolytes, disposal of the tin

Concentrations and operating conditions

		Range
Tin (II)	g/l	15 - 25
Make-up Concentrate SN 31	ml/l	100 - 120
Activation Salt SN 33	g/l	80 - 120
Additive CULMO AN 11 1	ml/l	5 - 15
Operating temperature	°C	20 - 80
Exposition time: depends on the required thickness of layer, max. up to approx. 2 μm are possible.		

plating solution is not required. The layers deposited from this electrolyte meet the requirements of the RoHS Directive (Restriction of certain Hazardous Substances) EU Directive 2011/65/EU. The additives are NPEO-free.

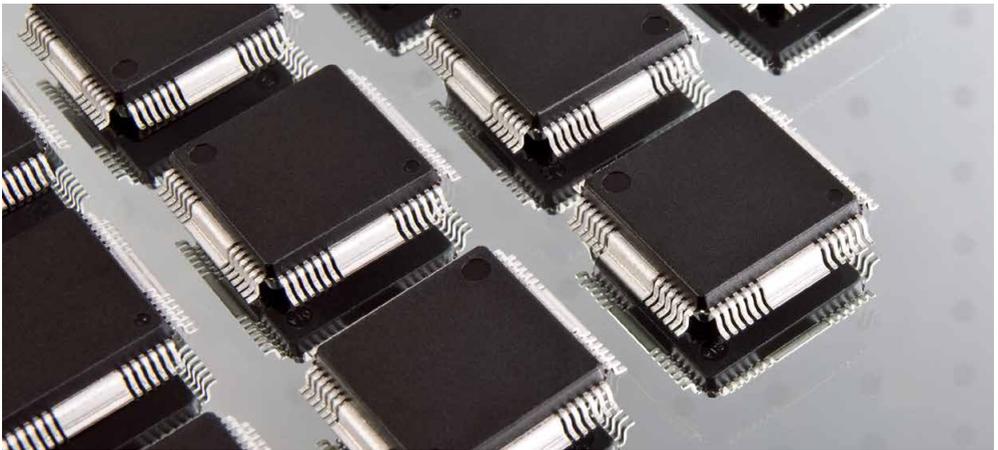
Matt Tin SAT 20 1

Matt Tin SAT 20 1 is a sulphate-free electrolyte for the deposition of fine crystalline coatings. The special features of this process are a good covering and less sensitivity towards bleeding of alkali soluble plating resists. A preferred field of application for the use as a metal resist is the PCB manufacturing. Anode solubility in systems based on the Acid Concentrate FF is much higher than in sulphuric acid based processes, so the electrolyte is to use when anode passivation occurs in a matt tin sulphate electrolyte. Matt Tin SAT 20 1 is easy to operate and to maintain. The operation of the electrolyte only

Concentrations and operating conditions

		Range
Tin (II)	g/l	10 - 30
Acid Concentrate FF	g/l	120 - 180
Tin Additive SAT 22/26	ml/l	8 - 12
Tin Additive SAT 23 1	ml/l	15 - 25
Operating temperature	°C	15 - 30
Cathodic current density	A/dm ²	0,5 - 2,0

requires maintenance of the Sn(II) and sulphuric acid concentration and replenishment of additives caused by drag-out losses. The electrolyte can be operated with methanol free additives. The additives are NPEO-free.



Matt Tin SAT 30 1

Matt Tin SAT 30 1 is a sulphuric acid based electrolyte for the deposition of fine crystalline deposits. This process offers an extraordinary covering power and excellent solderability. Fields of application for this process is the plating of electronic and electrotechnical parts. In the PCB industry, Matt Tin SAT 30 1 is used also for the deposition of metal resist layers. The additive system is used in both barrel- and rack applications. Without limitations, the deposits give excellent solderability even after heat ageing at 155 °C / 16 hours. The formation of tetravalent tin compounds is retarded which results in reduction of cloudiness in the electrolyte. Matt Tin SAT 30 1 is easy to operate and to maintain. The operation of the

Concentrations and operating conditions

		Range
Tin (II)	g/l	10 - 30
Sulphuric acid	g/l	140 - 200
Tin Additive SAT 31 1	ml/l	10 - 25
Tin Additive SAT 32/26	ml/l	10 - 25
Operating temperature	°C	15 - 30
Cathodic current density	A/dm ²	0,5 - 2,0

electrolyte only requires maintenance of the Sn(II) and sulphuric acid concentration and replenishment of additives caused by drag-out losses. The electrolyte can be operated with methanol-free additives. The additives are NPEO-free.

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