Surface Treatment Chemical Products

JCU CORPORATION

CONTENTS

I. SURFACE CONDITIONER

1. ALKALINE SOAK CLEANER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAPREP SK-113	For steel. Has strong detergency and a long solution life. Chelate-free.	SK-113	20kg	50-90g	60-80
EBAPREP SK-144	For all kinds of nonferrous metal except magnesium.	SK-144	20kg	50-70g	60-80
EBAPREP SK-18	For steel, copper, and copper alloy. Has strong detergency. Can remove slight buffing remnants.	SK-18	20kg	40-70g	50-80

2. ALKALINE ELECTRO CLEANER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAPREP E-221	Best suited for zinc die cast. Excellent effect also on copper, brass, and steel.	E-221	20kg	25-75g	60-70
EBAPREP E-223	For steel. Low foaming type with strong detergency. Intended for both cathodic and anodic electrocleaning. Chelate-free type.	E-223	20kg	50-100g	50-80
EBAPREP E-283	For non-ferrous metal. Intended for both cathodic and anodic electrocleaning. Phosphor-free.	E-283	20kg	45-80g	50-65
EBAPREP E-20	For steel, copper and copper alloy. Intended for both soak and electrocleaning. Strong emulsification effect. Intended for both cathodic and anodic electrocleaning. Non-chelate. Please consult for further details.	E-20 Sodium hydroxide	20kg	For steel electrocleaning 20-50g 10-60g	30-60

3. ACID ACTIVATOR

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAVATE V-30	Solution type activator for die cast zinc parts. Improves the adhesion (and reduces blisters).	V-30	17L	10-50mL	15-40
EBAVATE V-34 C	Solution type activator for steel, copper and copper alloy. Best suited for activation for re-plating of nickel and leaded brass. Also applicable to other kinds of metal.Hydrochloric or sulfuric acid is to be added separately.	V-34 C Hydrochloric acid (35%)	20L	50-200mL 50-500mL	15-70
EBAVATE V-345	For all kinds of metal. Dry acid.	V-345	20kg	30-300g	15-60
EBAVATE V-37	For copper and copper alloy. Dry acid. Easy wastewater treatment.	V-37	20kg	30-120g	15-50

4. ACID CLEANER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAPREP AC-51	Enhances the effect of acid cleaning of steel, copper, and copper alloy. Added to hydrochloric or sulfuric acid cleaning bath for simultaneous degreasing and derusting. Has a great inhibition effect of etching smut.	AC-51 Hydrochloric acid(35%) or Sulfuric acid (98%)	20L	5-30mL 100-500mL	RT-40
EBAPREP AC-55 P	Intended for the same application as AC-55 and has the same features. Removes especially heavy rust and scale. Dry acid. Contains fluoride.	AC-55 P Sulfuric acid (98%)	20kg	50-100g 50-100mL	RT-50

5. SPECIAL ADDITIVE FOR ACID AND ALKALINE CLEANER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAFIN F-90	Mist suppressor for acid and alkaline cleaner. Added to acid and alkaline cleaner baths to prevent mist.	F-90	10L	0.1-5mL	
EBAFIN EF-901	Scale and smut remover for alkaline cleaning. Removes rust and scale when added to an alkaline electrocleaning bath. Suppresses smut.	EF-901	20kg	10-100g	

6. CHEMICAL POLISHING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAPOLISH CHP-200 X	Sulfuric acid type bright pickling process for copper and copper alloy. Easy wastewater treatment. Generates no harmful gas.	CHP-200 X Sulfuric acid (98%) Hydrogen peroxide(35%)	20L	100-200mL 100-200mL 15-150mL	25-60

7. WATER-SOLUBLE RUST PREVENTION AGENT

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAFIN G-800	Water-soluble rust prevention agent. Prevents discoloration of all kinds of metal including steel, copper, copper alloy, aluminum, and others. Weak alkaline type.	G-800	20L	5-40mL	20-50

8. PART STRIPPER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBASTRIP ST-41	Stripper for nickel and nickel alloy plating on steel. Especially effective in stripping ferro-nickel alloy plating. Contains neither cyanide nor ammonia.	ST-41 A ST-41 B ST-41 C Acetic acid	10kg 20kg 20L	60g 60g 250mL pH adjustment	25-85
EBASTRIP ST-411	Stripper for nickel plating on steel. Contains neither cyanide or chromium.	ST-411 A ST-411 B	10kg 20kg	100g 200g	30-80
EBASTRIP ST-456	Stripper for nickel plating on copper and brass. Does not contain cyanide, chromium and ammonium.	ST-456 Sulfuric acid (98%)	15kg	80-140g 50-70mL	65-75

9. RACK STRIPPER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBASTRIP ST-42W	Electrolytic stripper for stainless steel racks. Single solution type. The solution has good stability. Plating film of almost all kinds of metal like copper, nickel, and chromium may be stripped.	ST-42 W ST-42AW	20L 20L	300-400mL* Correction	30-60
EBASTRIP ST-420	Electrolytic stripper for stainless steel racks. Low concentration type. The chance of stray current corrosion of basis material is very slim. Plating film of almost all kinds of metal like copper, nickel, and chromium may be stripped. Wastewater treatment is relatively easy.	ST-420 ST-421 Acetic acid	20L 20L	100mL* 20mL* pH adjustment	30-60

*For both make-up and replenishment.

Ⅱ. PLATING ON PLASTICS

1. PRETREATMENT

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENILEX WE	Prevents unevenness in chromic acid etching caused by air pockets.	ENILEX WE Sulfuric acid (98%)	20L	5-20mL* 0-50mL	40-60
ENILEX RD	Reduces hexavalent chromium to trivalent chromium and decreases the adverse effects of hexavalent chromium on the subsequent process.	ENILEX RD Pure conc. hydrochloric acid(37%)	20L	5-20mL* 30-80mL	30-50
ENILEX CT-580	Provides palladium catalyser over plastic substrate in the process of electroless plating on plastics. High-tin concentration type.	ENILEX CT-580 Hydrochloric acid(35%)	10L	10-50mL 150-350mL	30-40
ENILEX CT-304	Provides palladium catalyser over plastic substrate in the process of electroless plating on plastics. Has excellent palladium adsorption effect.	ENILEX CT-304 Tin chloride Hydrochloric acid(35%)	10L	2-5mL/L* 5-10g/L 150-350mL	30-40

*For both make-up and replenishment.

2. ELECTROLESS NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENILEX NI-100	Provides smooth and uniform film. Bath maintenance by automatic equipment is recommended.	ENILEX NI-100AM ENILEX NI-100BM ENILEX NI-100A ENILEX NI-100B	20L 20L 20L 20L	160mL(For make-up) 160mL(For make-up) Replenishment Replenishment	25-45
ENILEX NI-5	Concentrated solution. Lead-free type. Smooth and uniform film with good adhesion can be obtained.	ENILEX NI-5 M ENILEX NI-5 A ENILEX NI-5 B ENILEX NI-5 C	20L 20L 20L 20L	45mL(For make-up) For replenishment 30mL* 45mL(For make-up)	35-45

*For both make-up and replenishment.

3. DIRECT PLATING ON PLASTICS/D-POP PROCESS

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
D-POP EA	Improves the adsorption effect of catalyst and deposition of metals.	D-POP EA Chromic anhydride Sulfuric acid (98%)	20L	3-5mL* 380-410g 380-410g	65-70
D-POP CD	Enhances the effect of adsorption of catalyst on resin, such as polycarbonate alloy, etc. on which the effect is weak in normal process.	D-POP CD	20L	10-30mL*	10-20
D-POP ACT	Provides palladium catalyst on the resin surface. Has excellent adsorption effect.	D-POP ACT Hydrochloric acid(35%)	10L	15-35mL* 150-300mL	30-45
D-POP ME	Forms a uniform conductive film on the resin surface. Good stability.	D-POP ME-A D-POP ME-B	20L 20L	90-110mL* 270-330mL*	35-45

*For both make-up and replenishment.

Ⅲ. COPPER PLATING

1. DECORATIVE ACID COPPER PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
CU-BRITE EP-30	For substrate of metal and plastic in general. Has excellent brightness and leveling in a wide range. Allows high temperature and high current density operation.	CU-BRITE EP-30A CU-BRITE EP-30B CU-BRITE EP-30C	20L 20L 20L	0.8-1.4mL* 0.2-0.5mL* 3-5mL	20-35

*For both make-up and replenishment.

2. SPECIAL TREATMENT PRIOR TO ACID COPPER PLATING ON PLASTICS

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ACTIVATOR PDC	Intended for activation of electroless nickel plating film. To be added to chemical nickel activator solution prior to acid copper plating to prevent immersion deposition of copper in acid copper plating solution.	PDC Sulfuric acid (98%)	20L	5-15mL* 10-50mL*	20-40

*For both make-up and replenishment.

Ⅳ. NICKEL PLATING

1. SEMI-BRIGHT NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
BLS	For multi-layer nickel undercoating on plastic substrate. Formalin-free. Single solution type.	BLS-MU BLS-1 #82 or #82-K	20L 20L 20L	8-20mL 0.8-1.5mL* 1-2mL	50-60
CF-24T	For multi-layer nickel undercoating on plastic substrate. Formalin-free. Excellent mechanical properties. Brightener decomposition remains in a small amount even if insoluble anode is used.	CF-NⅡA CF-24T #82 or #82-K	20L 20L 20L	0-1mL 1-2mL* 1-2mL	50-60
909S	For multi-layer nickel undercoating on plastic substrate. Has excellent leveling and ductility. Single solution type.	CF-MU CF-9 #82 or #82-K	20L 20L 20L	2-4mL 0.8-1.2mL* 1-3mL	50-65

*For both make-up and replenishment.

2. BRIGHT NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
HI-BRITE #88	Applicable to almost all kinds of substrate. Produces plating film of incomparable ductility. The bath is incomparably stable and tolerant of impurities.	#810 #81 #83 #82 or #82-K	20L 20L 20L 20L	3-7mL Replenishment 10-15mL* 1-2mL	50-60
#88-J	Intended for zinc die-cast parts. Quite tolerant of zinc contamination.	#810 #81 #83-J #82 or #82-K	20L 20L 20L 20L	3-7mL Replenishment 10-20mL* 1-2mL	50-60
#77	Suited for the "New Microporous Chrome Plating System," high corrosion resistant Ni-Cr plating.	#711A #733 AJ-4 #82 or #82-K	20L 20L 20L 20L	0.5-1.2mL* 10-15mL* 1-3mL 1-2mL	50-60
HI-BRITE Z	Applicable to almost all kinds of substrate. Provides a rather blackish appearance. Single solution type. Easy solution control. For both rack and barrel plating.	Z-CONC #83 AJ-4 #82 or #82-K	20L 20L 20L 20L	1-1.5mL* 10-20mL 3-5mL 1-2mL	50-60
HI-BRITE #909B	For steel substrate. Excellent leveling and brightness with deep black tint. Applicable also to barrel plating.	#810 #901B #903B #82 or #82-K	20L 20L 20L 20L	4-6mL 0.5-1mL 12-18mL* 1-3mL	50-60

*For both make-up and replenishment.

3. ULTRA BRIGHT NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
PIKATEL PK-SUPER	For general metal substrate. Gives chrome plating great covering power. Single brightener system.	PK-MU PK-CL PK-SUPER #82 or #82-K	20L 20L 20L 20L	10-20mL 0-2mL 0.3-0.8mL* 1-2mL	50-60
PIKATEL PK-EXCEL	Applicable to metal substrates in general. Has excellent levelling effect and provides a blakish mirror brightness. Double-brightner system.	#83 PK-EXCEL 10 PK-EXCEL 20 PK-CL #82-A	20L 20L 20L 20L 20L	10-20mL Replenishment 0.2-0.5mL* 0-2mL 1-2mL	50-65

*For both make-up and replenishment.

4. NICKEL PLATING FOR BARREL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
NL-BL	For general metal substrate. Gives the deposit mild brightness, extremely small inner stress, good flexibility and ductility, and good adhesion. Single brightener system.	NL-BL #82	20L 20L	2-5mL* 1-3mL	50-60
HI-BRITE BL	For general metal substrate. Gives excellent covering power to low current density areas and excellent brightness in a short time. Single brightener system.	BL-MU BL-01 #82	20L 20L 20L	10-20mL 0.1-0.5mL* 1-3mL	50-60
PIKATEL PK-02BL	Applicable to metal substates in general. Has excellent covering power in low-current areas. Single brightener system.	PK-MU PK-02 BL #82	20L 20L 20L	10-20mL 0.2-0.4mL* 1-3mL	50-60

*For both make-up and replenishment.

5. SPECIAL NICKEL PLATING

5-1. HIGH CORROSION RESIST NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
TRI-STRIKE	Significantly improves corrosion resistance by providing a nickel strike deposit between semi-bright and bright nickel layers.	TRI-STRIKE #82	20L 20L	2-10mL* 1-3mL	45-50
MP-NI 308	Microporous chrome plating. A special nickel strike plating process to obtain high corrosion resistance on bright nickel film. Uniform pore number can be obtained.	MP-311 MP-333 MP POWDER 308 MP-308 B MP-366	20L 20L 10kg 20L 20L	2-5mL* 5-15mL* 2-4g* 2-4mL* 0.5-1mL*	50-60
MP-NI 309	Microporous chrome plating. Intended for the same application as MP-NI 308. Enough pore number can be obtained even under low powder concentraion.	MP-301 MP-303 or MP-333 MP POWDER 309 A MP POWDER 309 B MP-309 E	20L 20L 5kg 0.3kg 20L	2-6mL* 5-15mL* 0.5-1g* 0.02-0.2g* As appropriate	50-60

*For both make-up and replenishment.

5-2. SATIN FINISH, HIGH CORROSION RESIST NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
SATIN-NI TYPE Ⅰ	Satin nickel plating with suppressed brightness. Uniform and delicate appearance. High corrosion resistance. Composite bath.	STY-101 STY-104 STY-105	20L 20L 15kg	2mL* 7mL* 150g*	60-68
SATIN-NI TYPE Ⅱ	Satin nickel plating with an appearance slightly brighter than TYPE I. Composite bath.	STY-101 STY-104 STY-106	20L 20L 10kg	2.5mL* 5mL* 150g*	60-68
WARM SATIN	Nickel plating with warm satin appearance. Relatively long life emulsion bath.	EM-1 EM-2 EM-3 WARM SATIN	20L 20L 20L 20L	6mL* 15mL* 0.5mL* 0.3mL*	50-55
COOL SATIN	Nickel plating with satin appearance, ranging from bright satin as white series to a little bit misty bright aluminium color. Emulsion bath.	EM-1 EM-2 EM-3 COOL SATIN	20L 20L 20L 20L	6mL* 15mL* 0.5mL* 0.3mL*	50-55

*For both make-up and replenishment.

5-3. LOW LEVELLING BRITE NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
COMBRITE NL TYPEⅡ	Bright nickel plating with extremely suppressed levelling to emphasize the finish of undercoat.	NL-2 MU NL-2 #83 #82	20L 20L 20L 20L	2.5-5mL Replenishment 15-25mL* 1-3mL	45-55

*For both make-up and replenishment.

5-4. BLACK NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
BLACK-NICKEL GT	Provides unique and stable appearance.Uniform black brown film can be obtained in a wide range of current density.	GT-1 GT-2 #82-A	20L 20L 20L	90-110mL* 90-110mL* 1-3mL	45-50

*For both make-up and replenishment.

6. ADJUSTER

Process	Application & Features	Pack-ing	Usage
AJ-4	Adjusts the carriers and levellers of all the bright nickel plating processes.	20L	To be used as necessary based on analysis.
Electric potential adjuster E	Improves corrosion resistance of plated film by shifting the electric potential, which is measured by step test, to nobler.	20L	Addition: 0.01-0.05mL

7. REMOVER OF METAL IMPURITIES

Process	Application & Features	Pack-ing	Usage
CU-SHUT 3	Removes metal impurities in nickel plating bath. Especially good at removing copper component by co-deposition into the film.	20L	To be added by 0.01-0.05mL/L
Remover of organic impurities Purifier PNⅡ	Eliminates the adverse effect of organic impurities in bright nickel plating bath.	20kg	1-3g/L

8. WETTING AGENT

Process	Application & Features	Pack-ing	Usage
#82	Intended for all the types of nickel plating bath. Reduces the surface tension to prevent pits from forming. Low-foaming type.	20L	1-2mL/L
#82-K	Intended for all the types of nickel plating bath. Assures good wettability during transfer.	20L	0.5-2mL/L

V. CHROMIUM PLATING

1. DECORATIVE CHROMIUM PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBACHROM E-300	Supplies catalyst to decorative chromium plating bath. Has excellent covering power and strong activation effect that prevent smudge. Solution type.	ECR-300L Chromic acid Sulfuric acid (98%)	20L	5-15mL* 180-330g 0.6-1.5g	38-52
EBACHROM B-400	Uniform black chromium plating film may be obtained in a short time. Excellent corrosion resistance and abrasion-proof.	ECR-B400 ECR-B400 K Chromic acid, flake	20kg 5kg	25-35g* Replenishment 400-450g	15-25
JCR-1000	Fluoride-free bath. Assures high current efficiency and deposits a film of great hardness and excellent brightness. No etching in low-current areas.	JCR-1000 Chromic acid Sulfuric acid (98%)	20L	40mL 240-300g 2-5g	50-60

*For both make-up and replenishment.

2. MIST SUPPRESSOR FOR CHROMIUM PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
MISTSHUT NP	Mist suppressor for decorative chromium plating (Compliant with PFOS). Quite stable surfactant for chromium plating. Prevents scattering of mist and allows easy separation of solution.	MISTSHUT NP	20L	0.02-0.5mL*	

*For both make-up and replenishment.

3. ELECTRO-CHROMATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBACHRO-500	Cahodic dichromate system for stainless steel, nickel and chromium plated surfaces. Improves corrosion resistance without deteriorating the appearance of plated parts.	ECR-500	20L	100mL	RT-70

Ⅵ. ZINC PLATING

1. CYANIDE ZINC PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAZINC S-80	For rack plating of all the variations in concentration. Excellent brightness with extremely good covering power.	SUPER 80	20L	2-5mL*	15-40

*For both make-up and replenishment.

2. ZINCATE ZINC PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
DIMENSION	For both barrel and rack plating. High production efficiency thanks to high current density and high temperature operation it allows. Excellent brightness, covering power, and uniform throwing power.	DIMENSION A CONC DIMENSION B DIMENSION C DIMENSION D DIMENSION MS	20L 20L 20L 18L 20L	3-8mL* 0.25-3mL* 1-3mL* 10-20mL* 0.01-0.1mL*	20-45

*For both make-up and replenishment.

3. ACID ZINC PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAZINC EMZ-1200 Ⅱ	Intended for both ammonia chloride and potassium chloride baths. May be used for both barrel and rack operation. Good physical properties.	MZ-1200 MⅡ MZ-1200 RⅡ	20kg 17kg	20-60mL* 0.5-2mL*	15-35
EBAZINC EMZ-8000	Ammonia chloride bath for barrel plating. May also be used for racks. Wide ranges of operation allow easy solution control.	MZ-8000 M MZ-8000 R	20kg 20kg	20-80mL* 0.5-2mL	15-35

*For both make-up and replenishment.

4. TRIVALENT CHROMIUM CONVERSION COATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
TRIVALENT 300	Cr^{3+} chromate for corrosion resistance. Uniform, strong bluish to yellow tint is obtained. Has excellent adhesion and corrosion resistance.	TRIVALENT 300A TRIVALENT 300B	20kg 20kg	80-150mL Replenishment	18-35
Yellow conversion coating TRIVALENT 400	Intended for barrel plating. Uniform and strong yellow appearance can be obtained. Has excellent heat and corrosion resistance.	TRIVALENT 400A TRIVALENT 400B TRIVALENT 400C	20kg 20kg 20kg	100-200mL 60-120mL* Replenishment	20-40
Black conversion coating TRIVALENT 1100	Cr^{3+} chromate for corrosion resistance. Intended for barrel operation. Uniform black film is obtained. Provides corrosion resistance equal to or better than the former black conversion coating.	TRIVALENT 1100AM TRIVALENT 1100BM TRIVALENT 1100A TRIVALENT 1100B	20kg 20kg 20kg 20kg	60-100mL 10-30mL Replenishment Replenishment	15-35
Finishing TRIVALENT BKF2	Finishing agent intended exclusively for TRIVALENT 1100. Improves brightness and corrosion resistance and prevents unevenness in drying.	TRIVALENT BKF2 TRIVALENT BKF-AD2 TRIVALENT BKF-AD3	20kg 20kg 20kg	50-300mL* 3-8mL* 3-8mL*	20-50

*For both make-up and replenishment.

5. SPECIAL ADDITIVE FOR ZINC PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Auxiliary additive TRIVALENT FC	Suppresses formation of ferrous impurities.	TRIVALENT FC	20kg	As appropriate	

6 ANTI-RUST FOR ZINC PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Water soluble anti-rust process JN COAT 1710	Water soluble silica coating agent specially intended for zinc and zinc alloy plating. High anti-rust performance can be obtained after treatment on chromate conversion coating. 1710: Has excellent anti-rust performance on zinc alloy. AC : Thin film coating agent. Black color available.	JN COAT 1710	18kg	200~700g/kg*	20-35
Water soluble anti-rust process JN COAT AC		JN COAT AC JN COAT AC-BP	18kg 15kg	Original solution* ~70g/kg*	25-35

*For both make-up and replenishment.

Ⅶ. ALLOY PLATING

1. ZINC-NICKEL ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBALOY ZIN-LOY	Has three times or more of heat resistance and corrosion resistance properties compared with general zinc plating. The chance of hydrogen embrittlement is quite slim. Suited for automotive parts that require high heat resistance and corrosion resistance.	(Rack) ZN-50 BL MU ZN-10 ZN-20	 20L 20L 20L	40-60mL Replenishment 1-3mL*	33-37
		(Barrel) ZN-50 BL MU ZN-50 BL ZN-60 BL	 20L 20L 20L	40-60mL Replenishment 1-3mL*	33-37
TRIVALENT ZN300	Cr^{3+} chromate for Zn-Ni alloy plating.	TRIVALENT ZN300A TRIVALENT ZN300B	20kg 20kg	15-30mL 15-30mL	20-30

*For both make-up and replenishment.

2. TIN-COBALT ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBALOY SNC	Tin-cobalt alloy plating with an appearance similar to that of chromium plating.Intended for both rack and barrel plating.	SNC #1 SNC #2 SNC-TIN (For Sn metal supply) SNC-COBALT (For Co metal supply)	20L 10L 10L 10L	75-125mL* 5-20mL* Replenishment Replenishment	45-55
EBALOY SNC-BLACK	Tin-cobalt alloy plating with black appearance. Intended for both rack and barrel plating.	SMC #1 SNC #3 SNC-TIN (For Sn metal supply) SNC-COBALT (For Co metal supply)	20L 10L 10L 10L	75-125mL* 5-20mL* Replenishment Replenishment	45-55

*For both make-up and replenishment.

3. TIN-NICKEL ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBALOY SNI #2 BLACK	Tin-nickel alloy plating with black appearance. Gives a reddish tint to the blackness of the tin-cobalt plating process SNC BLACK. For both rack and barrel plating.	EBALOY-Nickel #2 SNC #3	20L 10L	160-240mL 10-20mL*	45-55
EBALOY SNI	Tin-nickel alloy plating with a rather reddish, unique tint. Pirophosphoric acid bath. Intended for both rack and barrel plating.	SNI-TIN SNI-NICKEL	20L 20L	350-550mL* 140-220mL*	45-55

*For both make-up and replenishment.

Ⅷ. ELECTROLESS PLATING

1. ELECTROLESS NICKEL PLATING/NI-P

1-1. BATCH TYPE

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENIPAC PHRⅡ	Lead-free bath. Allows high deposition rate and gives the film good brightness.	ENIPACK PHRⅡ	20L	200mL	80-95

1-2. CONTINUOUS TYPE

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ECOLTY CORE	Lead-free bath.Change of appearance is rare and excellent physical performance can ben obtained even after a period of operation.	ECOLTY CORE AM ECOLTY CORE BM ECOLTY CORE A ECOLTY CORE B ECOLTY CORE C	20L 20L 20L 20L 20L	50mL 200mL Replenishment Replenishment Replenishment	80-95
ECOLTY CORE GT	Lead-free bath. Contains a high level of phosphorus. Phosphorus content in the plated film can be stably maintained at 12%.	ECOLTY CORE GT AM ECOLTY CORE GT BM ECOLTY CORE A ECOLTY CORE B ECOLTY CORE C	20L 20L 20L 20L 20L	50mL 200mL Replenishment Replenishment Replenishment	80-95

2. FUNCTIONAL ELECTROLESS NICKEL PLATING/NI-B

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENIPAC BN-Ⅱ	Nickel-boron type. Has especially good solderability and great hardness (without heat treatment). (The film contains boron by 0.6%.)	ENIPACK BN-S ENIPACK BN-M ENIPACK BN-R	20L 20L 20L	150mL 50mL* 50mL*	63-65

*For both make-up and replenishment.

3. FUNCTIONAL ELECTROLESS NICKEL/PTFE COMPOSITE COATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ECOLTY TEF	Electroless composite coating process that uniformly co-deposits fine grains of polytetrafluoroethylene (PTFE) of 1.0 μm or less into electroless nickel-phosphor film. The film has excellent abrasion resistance and low coefficient of friction. Additionally, it also has excellent water and oil repellence and good non-viscous (die separation) property.	ECOLTY TEF AM ECOLTY TEF BM ECOLTY TEF A ECOLTY TEF B ECOLTY TEF DISPERSION ECOLTY SW	20L 20L 20L 20L 3kg 1L	50mL 200mL Replenishment Replenishment 5-10g* 5mL	87-92

*For both make-up and replenishment.

4. SPECIAL TREATMENT PRIOR TO ELECTROLESS NICKEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENIPAC CTS	To be used as the activation solution for electroless nickel plating of copper, copper alloy, and nonmetals. Smooth film with good adhesion may be obtained.	ENIPACK CTS	20L	80-110mL*	20-60

*For both make-up and replenishment.

5. PART STRIPPER FOR ELECTROLESS NICKEL

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ENIPAC HS	Stripper for removing electroless nickel film from copper and brass substrates. Has great stripping rate without damaging the surface.	(Copper & brass substrate) ENIPACK HS-20 ENIPACK HS-30 Sodium hydroxide	 10kg 20L 	 100g* 500mL* 30g	85-95

*For both make-up and replenishment.

Ⅸ. CHEMICALS FOR ELECTRONIC PARTS

1. PRETREATMENT

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBACLEAN IC-200 RM	Alkaline electrocleaner. Non-silicate, non-chelate, low foaming type.Intended for various electronic parts and IC lead frames. Suitable for cathodic/anodic and PR cleaning.	IC-200 RM	20kg	40-100g	45-55
EBACLEAN IC-220	Alkaline electrocleaner. Low-silicate and non-chelate type. Intended for various electronic parts and IC lead frames. Suitable for cathodic/anodic and PR operation.	IC-220	20kg	40-60g	45-55
EBACLEAN IC-231	Alkaline electrolytic burr softening agent. Softens resin burrs attached to various electronic parts and IC lead frames. Intended for cathode.	IC-231 A (IC-231 B, for replenishment when necessary)	17L 10L	100-300mL 0-10mL	50-60

2. CHEMICAL ETCHING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Soak etching agent EBAETCH IC-313 N	High speed etching agent for IC lead frames of 42-alloy. Halogen-, hydrogen peroxide- and phosphoric acid-free. Intended for high speed rack-less and coil-to-coil plating lines.	IC-313 NA IC-313 NB	18L 20L	200-400mL 30-100mL	30-55
Soak etching agent EBAETCH CHP-200 XMⅡ	Etching agent for copper and copper alloy. Intended for IC lead frames and coil to coil plating line. Three-solution, easy-to-control type. Halogen and surfactant free.	CHP-200 XMⅡ Sulfuric acid (98%) Hydrogen peroxide(35%)	20L	100-200mL 50-200mL 50-200mL	25-40
Soak etching agent EBAETCH CA-30	Etching agent for copper and copper alloy. Intended for IC lead frames and coil to coil plating line. May be used for Corson alloy. May be used for copper and copper alloys in general.	EBAETCH CA-30 Hydrogen peroxide(35%)	20L	200-400mL 10-80mL	20-40
Electrolytic etching agent EBAETCH CA-40 P	Electrolytic etching agent for copper and copper alloy. Intended for IC lead frames and coil-to-coil plating line. May be used for Corson alloy. Chelate- and halogen-free. Part of dissolved copper is removed by deposition on cathode plate. Has a long bath life.	EBAETCH CA-40 P	20kg	120-180g	30-50

3. TIN PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Semi-bright tin plating EBASOLDER HS-220 S	Alkane sulfonic acid bath. Good appearance and solderability. Excellent covering power in low current area. Allows high-temperature and high-current operation. Intended for both barrel and rack operation.	EBASOLDER SN EBASOLDER A EBASOLDER HS-220 S	20kg 20kg 20L	Barrels(Racks) 100(600)g 120(60)g 40(40)mL	20-40 (40-50)
Semi-bright tin plating EBASOLDER RS-26	Sulfuric acid bath. Good appearance and solderability. Excellent throwing power. Intended for rack plating.	Tin(Ⅱ) sulfate Sulfuric acid (98%) EBASOLDER RS-26	20L	40g 140g 40mL	20-35
Semi-bright tin plating EBASOLDER UT-55Ⅱ	Alkane sulfonic acid bath. Little change in stress in electrodeposits over time after plating assures good whisker suppression effect.Has excellent solderability and uniform semi-bright appearance may be obtained.	EBASOLDER SN EBASOLDER A EBASOLDER UT-55Ⅱ A EBASOLDER UT-55Ⅱ B	20kg 20kg 20L 20L	Barrels(Racks) 100(600)g 120(75)g 40(40)mL 20(20)mL	20-40 (30-50)
Semi-bright tin plating EBASOLDER UT-55HDⅡ	Alkane sulfonic acid bath. Little change in stress in electrodeposits over time after plating assures good whisker suppression effect.Has excellent solderability and uniform semi-bright appearance may be obtained.Allows high speed plating under high current density.	EBASOLDER SN EBASOLDER A EBASOLDER UT-55HDⅡ A EBASOLDER UT-55HDⅡ B	20kg 20kg 20L 20L	600g 75g 40mL 20mL	30-50
Bright tin plating EBASOLDER NATURAL #201	Alkane sulfonic acid bath. Formalin-free bath of good stability. Excellent solderability. Excellent brightness and covering power in low current area. Intended for barrel plating.	EBASOLDER SN EBASOLDER A EBASOLDER NATURAL #201 EBASOLDER NATURAL #202 EBASOLDER NATURAL #203	20kg 20kg 20L 20L 20L	100g 170g 30mL 4mL 5mL	10-20

4. TIN & LEAD ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Semi-bright Solder Plating EBASOLDER #10 R	Alkane sulfonic acid bath.Sn : Pb=95 : 5～60 : 40 Excellent throwing power at low current density areas. Applicable to high current density (5～15A/dm²). Intended for both barrel and rack.	EBASOLDER SN EBASOLDER PB EBASOLDER A EBASOLDER #10 R	20kg 20kg 20kg 10L	(Sn:Pb=90:10) (barrel) 90g 5g 85g 30mL	20-30
		EBASOLDER SN EBASOLDER PB EBASOLDER A EBASOLDER #10 R	20kg 20kg 20kg 10L	(rack) 180g 10g 110g 30mL	20-30
High-speed semibright solder plating EBASOLDER HS-805	Alkane sulfonic acid bath. Sn : Pb=95 : 5～60 : 40 Applicable to high current density (5～20A/dm²). Low effervescence. Especially suitable for plating lead frame and hoop. Uniform appearance. Excellent physical properties such as solder wettability. Intended for rack.	EBASOLDER SN EBASOLDER PB EBASOLDER A EBASOLDER HS-805	20kg 20kg 20kg 20L	(Sn:Pb=90:10) 380g 20g 90g 40mL	20-30

5. TIN & SILVER ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Semi-bright tin-silver alloy plating EBASOLDER SEⅡ	Alkane sulfonic acid bath. Sn:Ag=99:1-95:5 Allows operation in a wide range of current density. Good uniformity in composition and good solderability.	EBASOLDER SN EBASOLDER AG EBASOLDER A EBASOLDER SE-ⅡA EBASOLDER SE-ⅡB	20kg 20L 20kg 10L 20L	(In case of Sn:Ag=97.5:2.5) 300g 12mL 160g 60mL 100mL	20-35
Semi-bright tin-silver alloy plating EBASOLDER SE-BLⅡ	Alkane sulfonic acid bath. Chelate-free Sn-Ag alloy bath. Good uniformity in composition and good solderability. Intended for barrel operation.	EBASOLDER SN EBASOLDER AG EBASOLDER A EBASOLDER SE-BLⅡA EBASOLDER SE-BLⅡL EBASOLDER SEⅢC	20kg 20L 20kg 20L 20L 0.8kg	200g 1mL 140g 100mL 40mL 0.4g	20-30

6. SPECIAL ADDITIVE FOR TIN PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Anti-coupling agent EBASOLDER SPⅡCONC	Intended for using EBASOLDER #10R process for tin plating. Quite effective in preventing coupling Micro Chip Resister (MCRs) in barrel operation.	EBASOLDER SN EBASOLDER A EBASOLDER #10R EBASOLDER SPⅡCONC	20kg 20kg 100L 20L	100g 100g 40mL 0.3mL	15-30

7. WHISKER SUPPRESSED TIN PLATING FOR IC LEAD FRAMES OF COPPER ALLOY (WHISKER BUSTER PROCESS)

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Alkaline electro cleaner WB-200	Intended exclusively for the Whisker Buster Process. The cleaner may be used in cathodic, periodic reverse current, and anodic operation.	WB-200	20kg	40-100g	45-55
Etching agent WB-300	Dipping etching agent especially intended for the Whisker Buster Process on copper and copper alloy. Provides smooth and activiated surface by removing modified layer and oxidized layer. Able to prevent whisker formation thanks to the effect of a special additive used.	WB-300A(AF) WB-310B Hydrogen peroxide(35%) *(AF) is applicable to corson alloy.	20L 20L	200-400mL 20-50mL 20-40mL	30-40
Sn plating WB-500HD	Semi-bright pure tin plating intended exclusively for the Whisker Buster Process. It provides a fine, uniform, semi-bright appearance in a wide range of current density areas. The crystal gains of the film are appropriate in size to allow little change in internal stress of the film over time, and consequently provide excellent whisker suppression effect. The bath also has excellent throwing power. Allows high-speed plating at high current density.	EBASOLDER SN EBASOLDER A WB-500 A(HDA) WB-500 B(HDB)	20kg 20kg 20L 20L	600g 75g 40mL 20mL	30-50
Anti tarnish WB-900	Intended exclusively for the Whisker Buster Process. Excellent effect in prevent tarnishing.	WB-900	20L	20-100mL	40-60

8. STRIPPING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Rack stripper EBASTRIP SA-10T	Soak rack stripper for tin-silver (Sn-Ag) alloy. Nitric acid is to be added separately and the amount of residual smut after stripping is small. NOx generation is comparatively small in amount.	SA-10T Nitric acid (67.5%)	20L	40-60mL 450-550mL	25-35
Rack stripper EBASTRIP IC-462	Electrolytic rack stripper for tin-bismuth (Sn-Bi) alloy. Thanks to its being of electrolytic type, the amount of sludge generated is small and the bath has a long life. No NOx gas is generated like the case of soaking in nitric acid.	EBASTRIP IC-462A EBASTRIP IC-462B	20L 20L	150-300mL 25-100mL	30-50
Rack stripper EBASTRIP IC-463	Electrolytic rack stripper for tin. Being free from halogen and nitric acid, the chance of corrosion of SUS is small.	IC-463 A IC-463 B EBASOLDER SN Sulfuric acid (98%)	20L 20L	50-90mL 10-30mL 10mL (Make-up only) 100-140mL	30-50
Part stripper EBASTRIP SA-421	Part stripper for parts plated with Sn-Ag. Also applicable to Sn and Sn-Pb. Especially suited for 42-alloy. Fluoride-free.	SA-421	20L	Original solution	25-35

9. Sn^{4+} PRECIPITATOR FOR TIN & TIN ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBASOLDER TIN-CLEANER	Sedimentation treatment agent for tetravalent tin formed in tin and tin alloy baths. Available in two types: Types I and Ⅲ.	TIN CLEANER TYPE I (Collective treatment of the whole volume) TIN CLEANER TYPE Ⅲ (Treatment in a small quantity)	10L 20L	2-20mL 2-6mL	Normal Normal

10. ANTI TARNISHING FOR TIN & TIN ALLOY PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBAFIN S-50	Excellent anti-tarnish effect after tin and tin-alloy plating without deterioration of solderability.	EBAFIN S-50	20L	20-100mL	40-60

11. ELECTROLESS COPPER PLATING FOR EMI SHIELDING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBASHIELD EC-Ⅱ	Electroless copper plating bath for EMI shield. Capable of plating on substrate of various types of resin and fabric with good adhesion. Has excellent bath stability.	EC-M EC-A EC-B EC-C EC-TF2	20L 20L 20L 20L 20L	100mL 40mL 18mL 7.5mL 5mL	40-60

X. CHEMICALS FOR PRINTED WIRING BOARDS

1. DE-SMEAR

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Swellant JDS-15	Swellant for de-smear process. Intended for mass-produced boards in general. For general-purpose and is economical.	JDS-15 Sodium hydroxide	20L	80-300mL 15-30g	65-75
Swellant JDS-35	General purpose agent of neutralization reduction after de-smear and etching. Has a long bath life and allows continuous, stable operation.	JDS-35 Sulfuric acid (98%)	20L	70-150mL 70-120g	35-45

2. PRETREATMENT FOR ELECTROLESS COPPER PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Cleaner/Conditioner JPB-10	Cleaner/conditioner best suited for CATALYZER JPB-30 Cleans the substrate surface and also accelerates the adsorption of palladium catalyzer.	JPB-10	20L	50-70mL	50-60
Catalyzer JPB-30	Catalyzer containing a low level of palladium. Excellent colloidal state of palladium, although low in concentration, facilitates sufficient effect.	JPB-30 Hydrochloric acid(36%) Sodium chloride	20L	17-25m L 30-60mL 160-240g	37-43
Accelerator JPB-40	Weak alkaline-type accelerator. Alters the palladium-tin film formed by JPB-30 to a state with strong catalytic effect.	JPB-40A JPB-40B	20kg 20L	7-13g 15-25mL	45-50

3. ELECTROLESS COPPER PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Thin electroless copper plating PB-503F	Thin electroless copper plating bath for general use. Has wide ranges of operating conditions and the bath is highly stable. Allows deposition of 0.4 μm film in 15 min.	PB-503 AF PB-503 BF PB-503 RF	20L 20L 20L	100mL 100mL Replenishment	23-27
Electroless copper plating JPB-50	Cyanide-free electroless copper plating. Suited for continuous mass production. The greatest bath stability allows easy control in the field.	JPB-50A JPB-50M JPB-50BS	20L 20L 20L	70mL 100mL Replenishment	28-32

4. CLEANING PRIOR TO ELECTRO COPPER PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
Alkaline cleaner PB-230	Alkaline electrocleaner for PWBs. Removes drying spots and traces of gloved fingerprints left in hanging PWBs on racks after electroless copper plating. Chelate-free.	PB-230	20kg	30-60g	40-55
Acid cleaner PB-242 D	Best suited as the cleaner prior to secondary copper plating.	PB-242 D	20L	50-200mL	40-50
Acid cleaner PB-242 D PU	Low-foaming type based on PB-242D.Suited for vertical, continuous plating machine.	PB-242 D PU	20L	50-200mL	40-50
Acid cleaner PB-268	Sulfuric acid-based acid cleaner that removes oxide film and resist remnants. Excellent osmotic force makes it best suited for PWBs with small through and via holes. Non-chelate type.	PB-268 Sulfuric acid (98%)	20L	50-150mL 100-200g	25-45

5. ELETRO ACID COPPER PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
CU-BRITE 21	The most orthodox process having all the basic performance required by acid copper plating for through holes filling. Excellent throwing power and facile bath management. Intended for phosphorus-containing copper anode.	CU-BRITE 21 MU CU-BRITE 21 CU-BRITE 21SF STB	20L 20L 20L 20L	5mL Replenishment Replenishment Correction	20-30
CU-BRITE 31	Improved leveling performance besides the same features as those of CU-BRITE 21. Suited for insoluble anode.	CU-BRITE 31 MU STB CU-BRITE 31 SF	20L 20L 20L	10mL 0.5mL・ Replenishment Replenishment	20-30
CU-BRITE VT28	Especially excellent throwing power for BVHs besides through holes. Suitable for both soluble and insoluble anodes.	CU-BRITE 28 MU STB CU-BRITE 28 SF	20L 20L 20L	2.5-5mL 0.5mL Replenishment	20-30
CPOS	Suitable for high speed copper pillar plating. Excellent pillar top flatness and uniform film thickness for whole workpiece. Intended for insoluble anode. Optimized process is recommended based on conditions such as pillar shapes. CPOS : Copper pillar plating on flat pad. FPOS : One step plating process for via filling and copper pillar on pad with vias.	CPOS-MU CPOS-A CPOS-B	20L 20、200L 20L	15-25mL Replenishment Replenishment	25-35
FPOS		FPOS-A FPOS-B	20L 20L	5-15mL 0.5-1.5mL	20-26

6. ELECTRO ACID COPPER PLATING FOR VIA FILLING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
CU-BRITE VFⅡ	Acid copper plating for build-up PWBs of via-filling type that is applicable to both patterned PWBs and those also with through holes.Intended for pattern and panel plating.	CU-BRITE VFⅡ-A CU-BRITE VFⅡ-B CU-BRITE VFⅡ-LD	20L 20L 20L	20-30mL 0.3-1mL Auxiliary additive	20-28
CU-BRITE VFⅣ	Acid copper plating for build-up PWBs of via-filling type that is applicable to both fine patterned PWBs and those also with through holes. Variation in film thickness due to that of line density is reduced.	CU-BRITE VFⅣ-A CU-BRITE VFⅣ-B CU-BRITE VFⅣ-C	20L 20L 20L	15-25mL 0.5-1.5mL Auxiliary additive	20-26
CU-BRITE VF5	Acid copper plating for filling via holes in PKGs. While variation in film thickness due to that of line density is reduced, it is capable of filling the holes with a thin layer on the top surface.	CU-BRITE VF5-A CU-BRITE VF5-B	20L 20L	5-15mL 0.25-0.75mL	20-26
CU-BRITE VFMW	Acid copper plating for PWBs with both via and through holes. Mainly intended for HDI panels and patterned PWBs.	CU-BRITE VFMW-A CU-BRITE VFMW-B CU-BRITE VFMW-C	20L 20L 20L	7.5-12.5mL 0.25-0.75mL Auxiliary additive	20-26
CU-BRITE VH	Acid copper plating for build-up PWBs capable of via-filling. Mainly intended for HDI panels.	CU-BRITE VH-A CU-BRITE VH-B CU-BRITE VH-C	20L 20L 20L	4-7.5mL 0.25-0.5mL 2-4mL	20-26
CU-BRITE VL	Acid copper plating for build-up PWBs capable of via-filling. Intended for panel plating. Suited for the any layer stuck construction thanks to its filling capability with a thin layer on the top surface.	CU-BRITE VL-A CU-BRITE VL-B CU-BRITE VL-C	20L 20L 20L	7.5-30mL 0.5-1.5mL 5-20mL	20-28
CU-BRITE VL2	Better thin film filling performance compared with CU-BRITE VL. Especialling excellent filling performance for big BVH. Suitable for anylayer. Intended for insoluble anode.	CU-BRITE VL2-A CU-BRITE VL2-B CU-BRITE VL2-C	20L 20L 20L	2.5-7.5mL 0.5-1.0mL 7-20mL	20-28
CU-BRITE 881Z	Via filling process applicable to high current density (2～5A/dm^2) . Improved productivity due to shortened plating time. Suitable for anylayer. Suitable for insoluble anode.	CU-BRITE 881Z-A CU-BRITE 881Z-B CU-BRITE 881Z-C	20L 20L 20L	7.5-25mL 0.5-2mL 5-15mL	25-45*

*Necessary adjustment is needed due to plating conditions.

7. ELECTRO ACID COPPER PLATING FOR THROUGH HOLE FILLING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
CU-BRITE TFⅡ	Acid copper plating for filling micro-through holes in the core layer of build-up PWBs. Suitable for phosphorus-containing copper anode.	CU-BRITE TFⅡ-A CU-BRITE TFⅡ-B	20L 20L	13-17mL 2-7mL	20-26
CU-BRITE TF3	Excellent film thickness uniformity since it is applicable under high sulfuric acid compare with TFⅡ. Excellent void free performance. Suitable for both soluble and insoluble anodes.	CU-BRITE TF3-A CU-BRITE TF3-B CU-BRITE TF3-C	20L 20L 20L	8-15mL 1.25-2.5mL 4-8mL	20-26
CU-BRITE TF4	Excellent through hole filling with thin surface film. Suitalbe for both soluble and insoluble anodes.	CU-BRITE TF4-A CU-BRITE TF4-B CU-BRITE TF4-C	20L 20L 20L	5-20mL 0.5-1.5mL 10-30mL	20-26

8. REEL-TO-REEL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
CU-BRITE RF	Bright acid copper plating for flexible PWBs intended for pattern plating in reel-to-reel system. Assures excellent flatness of patterned lines. Allows high current density operation. Suitable for insoluble anode.	CU-BRITE RF MU CU-BRITE RF-A CU-BRITE RF-B	20L 20L 20L	10mL Supply and replenishment 0.5-1mL	20-35

9. ANTI TARNISHING FOR COPPER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
PB-901WS	Prevents tarnishing after acid copper plating with no adverse effect on the subsequent steps. Quick water drainage on substrate surface.	PB-901 WS	20L	0.5-2mL	20-30

10. RACK STRIPPING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
ST-479	Copper stripper from stainless steel racks. Has a great stripping rate. Has specially excellent bath and hydrogen peroxide stability.	ST-479 Sulfuric acid (98%) Hydrogen peroxide(35%)	20L	15-25mL 70-120mL 80-200mL	30-40
Rack stripper ST-480	Copper stripper from stainless steel racks. Removes palladium smut from the racks.	ST-480 A ST-480 B Sulfuric acid (98%) Hydrogen peroxide(35%)	20L 20L	15-20mL 40-60mL 70-120mL 90-150mL	30-45

11. RESIST STRIPPER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
RS-081	Stripper intended for soluble or semi-soluble dry film resist as well as screen-printed alkaline soluble resist. Does neither adversely affet tin or tin-lead alloy nor oxidize the copper surface. Stripper for semi-additive process.	RS-081	20L	9-12%	45-55
RS-083	Concentrated water solution for stripping dry film resisit used for fine pattern formation by semi-additive process or stripping extremely thick dry film resist for bump formation.	RS-083A RS-083B	20L 20kg	8.3-17% 3.7-7.4%	45-70
RS-085	Stripper intended for soluble or semi-soluble dry film resist as well as screen-printed alkaline soluble resist.	RS-085	20L	7.5-12%	50-60

12. TIN ETCHING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
TE-061	Hydrogen peroxide-based tin and solder stripper with a minimal level of erosion of the copper surface. Chemical consumption is suppressed to a minimal level for the bath is controlled with a highly saturated state.	TE-061	20L	100%	21-32

13. CYANIDE-FREE Pd REMOVER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
FINELISE PJ-10	Removes metal residue (Palladium and Copper) after patterning.Almost no etching copper pattern.Contains no toxic substance or heavy metal.	FINELISE PJ-10A FINELISE PJ-10B	20L 20L	450-550mL 25-75mL	47.5-52.5
FINELISE BB-20	Bridge prevention agent over copper pattern. Prevents adsorption of palladium to metal residue on resin.No adverse effect on deposition of electroless nickel/gold plating.	FINELISE BB-20	20L	50-150mL	RT
FINELISE FL	One step process intended for stripping Pd residue left on resin surface after quick etching and bridge prevention around connectors during electroless plating by semi-additive method. No harzadous substance such as cyanide and chrome.	FINELISE FL-A FINELISE FL-B	20L 20L	450-550mL 20-100mL	45-55

14. SEED LAYER (Ni-Cr) REMOVER

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
SEEDLON	Dissolves sputtered seed metal (Ni-Cr) on polyimide while suppressing copper dissolution. Promptly removes the Ni-Cr alloy (Cr: Approx 5 to 20%) remaining between fine copper lines. Scarcely changes the surface configuration of the copper lines.	SDN-A (SD-A) SD-B (In the use of SD-A)	20L 20L	600-700mL 2-4mL (1-3mL)	42.5-47.5

15. PRETREATMENT FOR PRECIOUS METAL PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
PB-242 D	Etching agent suitable for cleaning before electroless and electrolytic precious plating. Excellent degreasing performance.	PB-242 D	20L	50-200mL	40-50
PB-228	Soft etching agent facile to manage without containing ammonium ions.	PB-228 Sulfuric acid (98%)	20kg	50-150g 30-70mL	20-40
PB-300	Activator suitable to be applied on copper patterns for selectively immersing Pd.	PB-300	20L	200mL	20-30
PB-305		PB-305 PB-305 RP	20L 20L	400mL Replenishment	20-30

16. ELECTROLESS NICKEL/GOLD PLATING, ELECTROLESS NICKEL/PALLADIUM/GOLD PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
SKYLITE PB-606	Electroless nickel plating bath for the undercoat of electroless palladium and gold plating. Applicable to both ENEPIG and ENIG processes. Causes little corrosion, thus assures good solder joint strength. Has a stable deposition rate and maintains phosphorus content at a stable level.	PB-606 M PB-606 A PB-606 B PB-606 C PB-606 D	20L 20L 20L 20L 20L	150mL 45mL* Replenishment Replenishment 3mL*	79-81
SKYLITE PB-802	Electroless palladium plating process for ENEPIG. Palladium-phosphorus film can be obtained.	PB-802 MU PB-802 RD PB-802 RP	20L 20L 10L	200mL 25mL* Replenishment	45-5
SKYLITE PB-805	Electroless palladium plating process for ENEPIG. Pure palladium film can be obtained.	PB-805 MU PB-805 RD PB-805 RP	10L 10L 1L	100mL 100mL Replenishment Replenishment	50-65
SKYGOLD I-80	ENIG plating process. Uniform gold film can be obtained on nickel.	SKYGOLD I-80	20L	300mL Replenishment	80-90
SKYGOLD I-91	ENEPIG plating process. Uniform gold film can be obtained on palladium.	SKYGOLD I-91	20L	200mL Replenishment	80-90

*For both make-up and replenishment.

17. ELECTRO NICKEL/GOLD PLATING, ELECTRO NICKEL/PALLADIUM/GOLD PLATING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
PB-730	Nickel plating bath for terminals.Intended for Watts and sulfamic acid baths. Plating film with excellent physical properties may be obtained. PB-710 : Brightener bath. Use as appropriateaccording to the relevant conditions.	PB-730 PB-710	20L 20L	10-20mL As appropriate	50-60
SKYPALLA	Pure palladium electroplating bath. Fine deposits may be obtained. Best suited for Ni/Pd/Au plating.	SKYPALLA MA SKYPALLA MB SKYPALLA RP SKYPALLA AJ PD REPLENISHER	1L 1Pack 1L 1kg 1L	50mL *1 Replenisher Specific gravity adjuster Pd replenisher	40-60
SKYGOLD GS-1	Gold strike plating bath for pretreatment of gold plating. Good adhesion to the undercoat may be obtained.	SKYGOLD GS-1 MP SKYGOLD GS-1 RP SKYGOLD GS-1 AJ	1Pack 1L 1kg	*2 Replenisher Specific gravity adjuster	25-40
SKYGOLD S-10	Pure gold electroplating bath. Has excellent throwing power. Applicable to both Ni/Au and Ni/Pd/Au processes.	SKYGOLD S-10 MP SKYGOLD S-10 RP SKYGOLD S-10 AJ	1Pack 1L 1kg	*3 Replenisher Specific gravity adjuster	45-75
SKYGOLD H-30	Electrolytic hard gold plating process. Gold-cobalt film can be obtained. Excellent uniform electrodeposition. Applicable to both Ni/Au and Ni/Pd/Au.	SKYGOLD H-30 MP SKYGOLD H-30 RP SKYGOLD H-30 AJ SKYGOLD H-30 AC	10L make-up, 50L make-up 1L 1kg 1kg	*4 Replenisher specific gravity adjustment pH adjustment	45-60

*1-4: The package for either 10L or 50L bath is intended to be used wholly at a time for 10L or 50L bath make-up respectively.

18. SOFT ETCHING SERIES

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
SB	Hydrogen peroxide/sulfuric acid-based soft etching agent capable of smoothly finishing the treated surface. Stable etching rate, regardless of the change in copper concentration, makes the solution control easy.	SB-331RU	20kg	Replenishment	20-35
SI	Hydrogen peroxide/sulfuric acid-based soft etching agent for fine roughening with tolerance toward chlorine. Stable etching rate, regardless of the change in copper concentration, makes the solution control easy. Suited for the pretreatment of resist for it roughens the copper surface finely.	SI-360W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	1.5-2.5% 2-8% 2-8%	20-35

19. HYPERETCH HE

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
HE	Hydrogen peroxide/sulfuric acid-based etching agent capable of uniformly treating copper foils. Has a great etching rate. Suited for thinning copper foils to be used conveniently in micro patterning (Subtractive Process/Semi Additive Process).	HE-500W3C-EX Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	1.5% 8% 5%	25-45
HE3	Hydrogen peroxide/sulfuric acid etching agent to improve copper foil uniformity. Suppresses pits formation after etching and ensures thin copper film.	HE3-530W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20L	1% 8% 0.28%	25-35

20. FINE ETCHING

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
SAC	Hydrogen peroxide/sulfuric acid-based etching agent for circuit formation in the Semi Additive Process. Reduction in the width and thickness of circuits is extremely suppressed for it preferentially dissolves and removes the electrolessly plated copper.	SAC-700W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	4-6% 2-8% 2-6%	25-35
		SAC-702M SAC-701R35 SAC-701RU	20L 20kg 20L	80-95% 2-10% Replenishment	25-35
FE-830Ⅱ	Hydrogen peroxide/sulfuric acid-based etching agent for circuit formation in the Modified Semi Additive Process for electroplated copper foil base. Preferentially dissolves and removes the seed layer (copper substrate) of electroplated copper base.	FE-830W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	0.3-0.5% 3-7% 3-7%	25-35
FA-900	Hydrogen peroxide/sulfuric acid etching agent for pattern formation on electrolytic copper foil by MSAP. Excellent chlorine resistance. Able to dissolve seed layer (base copper) on electrolytic copper base with high priority.	FA-900W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	1.3-1.7% 3-5% 8-10%	25-35

21. COPPER SURFACE ROUGHING ETCHING PROCESS

21-1. NBS SERIES

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
NBSⅡ	Hydrogen peroxide/sulfuric acid-based etching agent for roughening the copper surface in the steps prior to circuit formation and SR application. Improves adhesion between copper and the resist and thus reduces defect rate.	NBSⅡ-200W3C-EX Hydrogen peroxide (35%) Sulfuric acid (98%)	20kg	4.5% 4-5% 3-7%	25-40
		NBSⅡ-202M NBSⅡ-201R35 NBSⅡ-201RU	20L 20kg 20L	90% 4-5% Replenishment	25-40
NBSⅢ	Hydrogen peroxide/sulfuric acid-based etching agent for roughening the copper surface in the steps prior to circuit formation and SR application. Improves adhesion between copper and the resist and thus reduces defect rate. Effluent treatment is simplified for it contains no phosphorus.	NBSⅢ-210W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	2% 1.5-3.5% 1.5-3.5%	25-40

21-2. NBD SERIES (PRETREATMENT)

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
NBP	Hydrogen peroxide/sulfuric acid-based micro etching agent that also performs degreasing. To be used for pretreatment for it activates the copper suface to suppress surface irregularity and achieve uniform roughening.	NBP-012M NBP-011RU NBP-014MU	20L 20L 20L	20-30% Replenishment Replenishment	25-40

21-3. NBD SERIES

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
NBDⅡ	Hydrogen peroxide/sulfuric acid-based alternative process to brown dioxide. Improves adhesion to resin by roughening the copper surface as a step prior to lamination. Unlike brown dioxide, no haloing is expected even in the absence of reduction treatment. Great adhesion is obtained for materials of high Tg, high ε, and halogen-free. Extremely improved handling compared with brown dioxide.	NBDⅡ-102M NBDⅡ-101R35 NBDⅡ-101RU NBDⅡ-105MU	20L 20kg 20L 20L	90-94% 6-10% Replenishment Replenishment	25-40

21-4. NBDL SERIES (PRETREATMENT)

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
PDL	Surface treatment agent for direct CO_2 laser processing. Hydrogen peroxide/sulfuric acid-based micro etching agent for removing oxides and degreasing. To be used for pretreatment for it activates the copper suface to suppress surface irregularity and achieve uniform roughening.	PDL-W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20L	1% 1-3% 0.5%	25-35

21-5. NBDL SERIES

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (vol)	Temp. (℃)
NBDL	Surface treatment agent for direct CO_2 laser processing. Hydrogen peroxide/sulfuric acid-based etching agent. Improves the energy absorptivity of CO_2 laser to allow formation of via holes directly on the copper surface. Reduced steps compared with brown oxide and improved production efficiency thanks to horizontal transfer.	NBDL-W3C-A NBDL-W3C-B Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg 20kg	1.5% 2.5-3% 6-8% 4-6%	25-35
SPDL-ND	Hydrogen peroxide/sulfuric acid-based etching agent to remove splash copper and copper burr (over hang) during copper direct via formation. Etching performed before removing resin such as desmear can suppress erosion on via bottom, which can remove splash copper and copper burr.	SPDL-ND-W3C Hydrogen peroxide(35%) Sulfuric acid (98%)	20kg	2% 4-6% 7-9%	25-35

XI. CHEMICALS FOR SEMICONDUCTOR WAFERS

1. ACID COPPER PLATING FOR BUMPS

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
XP-CS	Matte type copper plating, which contains no sulfur, for micro patterning and bumps. Single additive system allows simple bath control. Insoluble anode may be used.	XP-CS XP-CS-R	20L 1L	Original solution Replenishment	18-30
CU-BRITE BU	Bright process intended for columnar bumps. Recommended current density is 1~5A/dm².	CU-BRITE BU CU-BRITE BU-A CU-BRITE BU-B	20L 10L 10L	Original solution Supply & correction Supply & correction	15-30
CU-BRITE BU2HA	Bright rewiring and bump plating process with special flat deposit surface. Recommended current density is 5~10A/dm².	CU-BRITE BU2HA CU-BRITE BU2HA-A CU-BRITE BU2HA-B	20L 10L 10L	Original solution Supply & correction Supply & correction	25-35
CU-BRITE BUHD	Matte bump plating process without containing sulfur. Facile bath management due to one content additive. Possible operation with current density high than 15A/dm².	CU-BRITE BUHD CU-BRITE BUHD-R	20L 5L	Original solution Replenishment	30-50
CU-BRITE HI-BU	Bright bump plating process with special flat deposit surface.Possible operation with current density high than 15A/dm².	CU-BRITE HI-BU CU-BRITE HI-BU-A CU-BRITE HI-BU-B	20L 5L 5L	Original solution Supply & correction Supply & correction	25-35

2. SILVER ALLOY PLATING FOR BUMUPS

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
JSOLDER BUHD	Sn-Ag bump plating applicable to high current density (>18A/dm²) . Stable deposited Ag content ratio is avaible. Uniform deposit and excellent reflow performance.	JSOLDER BUHD JSOLDER A JSOLDER SN JSOLDER AG JSOLDER BUHD-A JSOLDER BUHD-B	20L 10kg 20kg 1L 10L 10L	Original Supply & correction Supply & correction Supply & correction Replenishment Replenishment	23-27

3. NICKEL PLATING FOR BUMPS

Process	Application & Features	Products	Pack-ing	Usage	
				Conc. (/L)	Temp. (℃)
EBANICKEL BNI	Sulphamic acid bath. Excellent physical properties with a low internal stress. Excellent throwing power and solution stability. Suited for the formation of barrier layer in bump plating process.	EBANICKEL BNI-MU	20L	Original solution	40-60

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2016.03.5H〔S〕