

## **CATALOG & Technical Bulletin**

# General Catalog of WORLD METAL CO.,LTD. Index

2	Business contents
5	WMF process ( customer's in-plant chemical blending )
7	Electroless Nickel plating chemicals ( Ni-P )
7	Electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics
8	Lead free electroless Nickel plating chemicals ( Ni-P )
9	Lead free electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics
9	Hazardous heavy metal free and heavy metal free electroless Nickel plating chemicals ( Ni-P )
10	Electroless Nickel plating chemicals for special applications ( Ni-P )
11	Electroless Nickel-Boron plating chemicals ( Ni-B ) for electronic parts, wiring patterns and common use
11	Lead free and heavy metal free electroless Nickel-Boron plating chemicals ( Ni-B )
12	Electroless plating chemicals for special applications ( Tungsten containing film plating and Cobalt alloy plating )
14	Brighteners for electrolytic Nickel plating
15	Special electrolytic Nickel plating chemicals
17	Electroless and electrolytic Copper plating chemicals
17	Electroless and electrolytic Gold plating chemicals
19	Electroless and electrolytic Silver plating chemicals
19	Other sorts of electroless and electrolytic plating chemicals
20	Electroless Gold plating equipment
22	Conditioners, cleaning chemicals and degreasing chemicals ( for electronic parts )
23	Degreasing chemicals, cleaning chemicals and supplementary agents ( for common use )
24	Etching chemicals ( on vacuum deposition films, pastes, ceramics and semi-conductor chips )
25	Etching chemicals ( for Copper series, steel series, SUS series and Titanium series materials )
26	Sensitizers, activators / Pd activating and catalysts
29	Stripping chemicals for plating films ( Ni, Au, Sn and solder )
29	Rust prevention chemicals, post-treatment chemicals and anti-tarnishing chemicals
30	Chemicals for electronic parts
31	Additives for special applications
31	Plating resist ink and masking chemicals
31	Chemicals for Aluminum
32	Pre-treatment process chemicals for LTCC
32	Chemicals for PCB and CAT-2000-1 process
35	Plating process, plating equipment, joint research for new technologies and processing for testing, recovering of Gold and precious metals

# **Development of IT relating field and surface treatment technology**

Surface treatment technology is essential item in electronics components relating field.

We, WORLD METAL CO., LTD., have hitherto been specialized in such industrial field.

While the products development cycles gets shorter and shorter, there is new demand for development capability with smoother response.



## **Our specialties**

**Technical R&D oriented company in surface treatment industrial field**

**Products quality management system based on ISO9001**

**Products development coordinated with customers needs**

**Always we relate to most advanced technology needs, we have established achievement in semi-conductors and electronic components field**

**Development for plating processes suited to materials and applications**

**Chemicals cost down by our own developed WMF process**

1. Cost down for general-purpose plating chemicals
  - WMF process;30~50% cost down
  - In-plant plating chemical blending by using concentrated form of the chemical solution and major chemical material
2. Plating process on glass ceramic substrates (LTCC)
  - Applicable to independent and extremely micro wiring patterns and lines and space (30 $\mu$ m and under)
  - Electroless Nickel / substitution Gold / thick Gold plating
  - Applicable to the RoHS directive
3. Selective partial plating on thin films
  - CAT-92 and CAT-99 process:plating on vacuum deposition films and sputtering films of Al, Cr-Cu and Cu
  - Ceramic IC packages (HTCC):plating on pastes of W, Mo-Mn, Ag, Ag-Cu, Cu-W, Mo, Mo-Cu, Cu, Ag-Pd, Al and Cr-Cu
4. Plating processes on PCB
  - Applicable to independent and extremely micro wiring patterns and applicable to such lines and spaces (30 $\mu$ m and under)
  - Electroless Nickel / substitution Gold / thick Gold plating
  - Electroless Nickel / Palladium / substitution Gold plating
  - CAT 2000-1 process and applicable to the RoHS directive
5. Plating process for semi-conductors
  - Plating on LSI and electrodes;bumps and damascene (special electrolytic and electroless plating)  
Cu, Ni, Ni-Fe, Au, Sn, Sn-Pb, In and Pb
  - BGA, flip chips, MCM, TAB, CSP and SMD
6. Plating on heat sinks:Cu-W, Cu-Mo, OFC, Al, AlSiC, ceramic series complex materials, etc.
7. Plating chemicals for providing heat resistance and mould releasing property;  
moulds for cathode-ray tubes and glass bottles / NIBOFRAM and NIBOFRAM E
  - Moulds for PET plastics (NIBOFRAM)
8. Plating on textiles and for EMI / LINDEN TX, LINDEN NZ and MCU-500
9. Plating chemicals for providing lubricant property and abrasion resistance / LINDEN 809 and COMPO-NF
  - Composite plating with PTFE, diamond, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, SiC, WC, CBN, NB, etc.
10. Plating on micro powders of mica, diamond, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub> and Cu ball
11. Plating on ABS resins and engineering plastics
12. Plating on sintered alloy, Neodymium, Samarium-Cobalt, and electrode formation on dielectric filters, PZT and ceramic capacitors
- Plating on glass discs
13. (non magnetic plating on glass substrate of hard disc and high adhesion power without etching glass surfaces)
  - Electroless Nickel alloy plating / LINDEN (Ni-P and Ni-P-W), NIBORON (Ni-B), NIBOFRAM (Ni-B-W), NIBOLIN (Ni-B-P) and NIBOTALIN (Ni-B-W-P)
14. Electroless Cobalt alloy plating / COMBATH (Co-P and Co-B) and CONIP (Co-Ni-P and Co-Ni-B)
15. Electroless Copper plating
16. ● Low temp. and low speed bath:MC-U and MCU-25
  - Middle speed bath (1~5  $\mu$ m/h):MCU-MS and MCU-500
  - High speed bath (5~8  $\mu$ m/h):MCU-HS and MCU-700
- Electroless Gold plating
17. ● Substitution Gold type:MN-AUA, MN-AUB, MN-AUC, MN-AUE, MN-AUI and MN-AUG
  - Self-catalyst type:GOLD 8, GOLD 8L, GOLD 9, GOLD 9L, GOLD 10 and GOLD 10L
  - Non-cyanide type:MN-AUN
- Brighteners for electrolytic plating, additives (for racks, barrels and hoops), brighteners for electrolytic Nickel plating (LIEBELIGHT)
18. and brighteners for Copper sulfate plating, Copper pyrophosphate plating and solder plating
  - Pre-treatment chemicals for semi-conductors and special materials
19. (conditioners, etching chemicals, Pd activators, blackening chemicals, improving chemicals for solderability, etc.)
  - Commission development and trial plating test (fare-pay services)
20. Recovering Gold and precious metals;recycling business
21. Total coordination for plating plants
22. (common use ~ clean room specifications and data management system by computer on-line system)
  - Arrangement for human-resources supplying service
23. (assigning to work in domestic and overseas destinations for professional surface treatment technical staff, technical guidance, granting technical license and entering into license agreement)



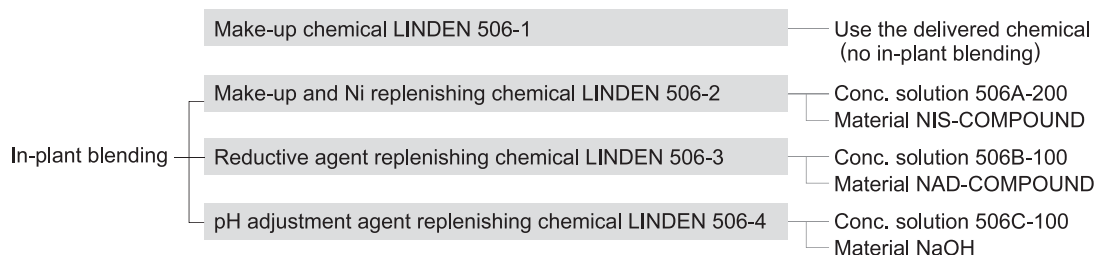


WMF process is the special process by which, the customers can conduct their in-plant chemical blending for our electroless plating chemicals for using in their factory with the back-up of our manufacturing know-how. When the chemical consumption reaches to a certain level, WMF process is so effective for the customers cost down, and more than several-ten of our customers have been enjoying the advantage of our WMF process.

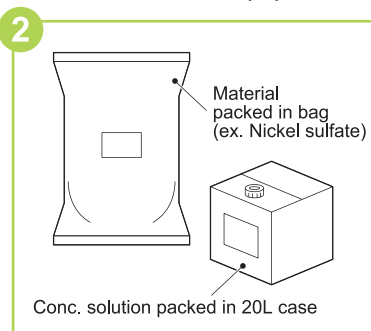
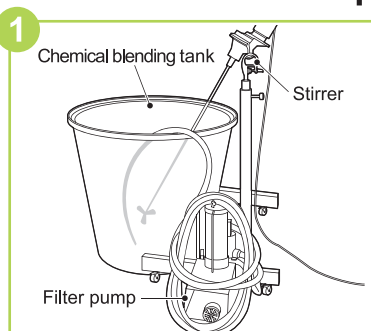
- Cost down of the plating chemicals (30~60% off)
  - It enable for the customers to upgrade their own technical capability and can develop their own special technology
  - Can supply the plating chemicals to other companies of their group member which can contribute a stable quality standard among them
  - Can contribute to the reduction of the environmental load specified by ISO-14001
  - Can establish appropriate counter-measure against complaint for their products
  - Can overcome the problem caused by material cost increase
  - Can arrange the export of the plating chemicals to their overseas factories
  - Can reduce cost for packing materials
- We assure our technical guidance shall be in perfect condition

\*Available catalogs, manual and MSDS for respective products

### In-plant chemical blending of electroless Nickel plating chemicals ( example )



## Details about WMF process ~ Initial equipment, chemicals and WMF process ~



### Initial equipment and chemicals

1. The required equipments for practicing WMF process are detailed as per left illustration marked as 1: "chemical blending tank", "stirrer" and "filter pump".  
\* These equipments are desirable to be prepared with 3 sets for rationalization of work.  
But "the stirrer" and "the filter pump" are capable to use as the common equipment severally.
2. The using chemicals will be delivered to customers in such manner of "the material packed in bag" and "the conc. solution packed in 20L case".  
Practice in-plant blending with these chemicals.

### The details of WMF process

#### 3. Water filling

Fill the chemical blending tank with water up to about 50% of the volume.  
\*We suggest to heat water with the electrical heater for helping the material to dissolve.

#### 4. Material charging

Charge the required quantity of the material after water level have reached to about 50% of the volume.  
Start to stir at this time.

#### 5. Conc. solution charging

Charge the required quantity of the conc. solution after having charged the material.  
Stir with stirrer continuously.

#### 6. Stirring (agitation)

Fill water up to the required water level after having charged the material and the conc. solution completely.  
Stir more than 3 hours in summer and more than 4 hours in winter with stirrer continuously until the charged material has dissolved completely.

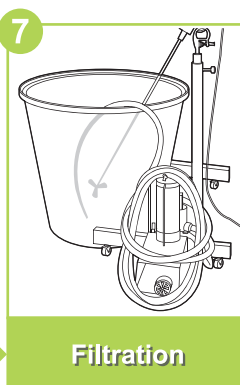
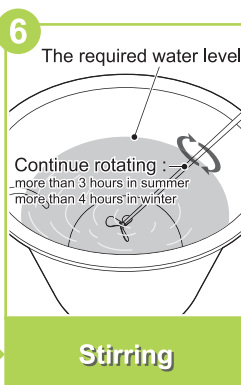
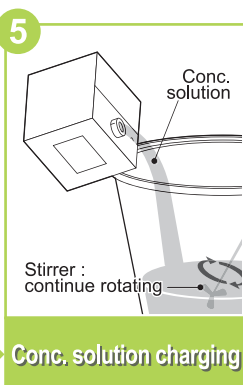
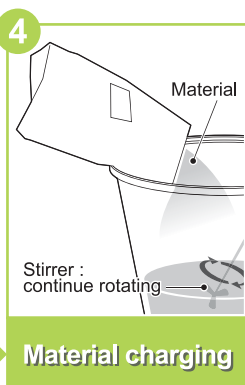
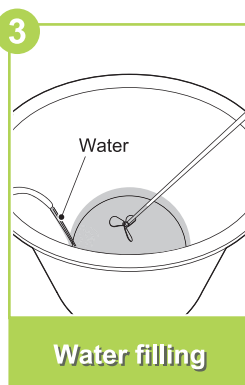
#### 7. Filtration

Stop stirring after the material has dissolved completely.  
Filtrate the chemical with the filter and transfer to the storage tank of the replenishing chemical.

The above described process is the approx. explanation about WMF process.

WMF process is not difficult process although in-plant chemical blending.

Everybody can produce the plating chemicals as same as our products by checking the volumes of the charged material and conc. solution.





Electroless Nickel plating chemicals ( Ni-P )

Electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics

Lead free electroless Nickel plating chemicals ( Ni-P )

Lead free electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics

Hazardous heavy metal free and heavy metal free electroless Nickel plating chemicals ( Ni-P )

Electroless Nickel plating chemicals for special applications ( Ni-P )

Electroless Nickel-Boron plating chemicals ( Ni-B ) for electronic parts, wiring pattern and common use

Lead free and heavy metal free electroless Nickel-Boron plating chemicals ( Ni-B )

Electroless plating chemicals for special applications ( Tungsteners containing film plating and Cobalt alloy plating )

Electroless Nickel plating chemicals ( Ni-P )				
Name	Specialties	Composition	Packing	Application
Materials for WMF process	<input type="checkbox"/> Cost down <input checked="" type="checkbox"/> Economical cost lower than market price	NIS—COMPOUND NAD—COMPOUND	20kg 25kg	<input type="radio"/> High purity and for blending electroless Nickel plating chemicals
LINDEN 506 506N 506T (high function plating)	<input type="checkbox"/> Superior solderability <input checked="" type="checkbox"/> Common use and continuous operation <input checked="" type="checkbox"/> Superior corrosion resistance <input checked="" type="checkbox"/> Superior plating film property <input checked="" type="checkbox"/> Superior brightness <input checked="" type="checkbox"/> Easy replenishing and no milky contamination <input checked="" type="checkbox"/> Sulfur free	506-1 <input type="checkbox"/> Make-up 506-2 <input type="checkbox"/> Replenishing 506-3 <input type="checkbox"/> 506-4 <input type="checkbox"/>	20L 200L 1000L	<input type="radio"/> Specially for outside and planting film property <input checked="" type="checkbox"/> Electronic parts <input checked="" type="checkbox"/> Mechanical parts <input checked="" type="checkbox"/> Automobile parts <input checked="" type="checkbox"/> Hardness after heat treatment:900Hv <input checked="" type="checkbox"/> Plating on big works <input checked="" type="checkbox"/> Lead frames <input checked="" type="checkbox"/> Shafts <input checked="" type="checkbox"/> Maintaining solderability
	<input type="checkbox"/> Chemicals for WMF process <input checked="" type="checkbox"/> Cost down:30%off	506A-200 506B-100 506C-100	20L 200L 1000L	
LINDEN 409 409E 880	<input type="checkbox"/> Common use and continuous operation <input checked="" type="checkbox"/> Superior plating film property <input checked="" type="checkbox"/> Easy replenishing and no milky contamination <input checked="" type="checkbox"/> Available two make-up solution type (409E)	409-0 <input type="checkbox"/> Make-up 409-1 <input type="checkbox"/> Replenishing 409-2 <input type="checkbox"/> 409-3 <input type="checkbox"/>	20L 200L 1000L	<input type="radio"/> Specially for plating film property <input checked="" type="checkbox"/> Electronic parts <input checked="" type="checkbox"/> Mechanical parts <input checked="" type="checkbox"/> Automobile parts <input checked="" type="checkbox"/> Hardness after heat treatment:900Hv <input checked="" type="checkbox"/> Shafts <input checked="" type="checkbox"/> Nuts
	<input type="checkbox"/> Chemicals for WMF process <input checked="" type="checkbox"/> Cost down:30%off	9A-100 9B-200 9C-100	20L 200L 1000L	
LINDEN 507T 507S	<input type="checkbox"/> Common use and continuous operation <input checked="" type="checkbox"/> Specially for brightness <input checked="" type="checkbox"/> Easy replenishing and no milky contamination <input checked="" type="checkbox"/> Available two make-up solution type (507S)	507-0T <input type="checkbox"/> Make-up 507-1 <input type="checkbox"/> Replenishing 507-2 <input type="checkbox"/> 507-3T <input type="checkbox"/>	20L 200L 1000L	<input type="radio"/> Specially for outside <input checked="" type="checkbox"/> Electronic parts <input checked="" type="checkbox"/> Mechanical parts <input checked="" type="checkbox"/> Automobile parts
LINDEN 406K 406KT	<input type="checkbox"/> Function plating, common use and continuous operation <input checked="" type="checkbox"/> Superior corrosion resistance <input checked="" type="checkbox"/> Superior plating film property <input checked="" type="checkbox"/> Superior malleability <input checked="" type="checkbox"/> Superior solderability <input checked="" type="checkbox"/> Easy replenishing and no milky contamination (406KT)	406K-1 <input type="checkbox"/> Make-up 406K-2 <input type="checkbox"/> Replenishing 406KT-3 <input type="checkbox"/> 406KT-4 <input type="checkbox"/>	20L 200L	<input type="radio"/> Specially for plating film property <input checked="" type="checkbox"/> Hermetic seal parts <input checked="" type="checkbox"/> Specially for outside <input checked="" type="checkbox"/> OA equipment <input checked="" type="checkbox"/> Electronic parts <input checked="" type="checkbox"/> Automobile parts <input checked="" type="checkbox"/> Hardness after heat treatment : 900Hv <input checked="" type="checkbox"/> Maintaining solderability <input checked="" type="checkbox"/> Specially for bending property <input checked="" type="checkbox"/> Non-magnetism <input checked="" type="checkbox"/> Aluminum alloys
	<input type="checkbox"/> Chemicals for WMF proces <input checked="" type="checkbox"/> Cost down:30%off	6KA-100 6KBT-300 6KCT-100	20L 200L	
LINDEN 5MK	<input type="checkbox"/> High corrosion resistance and function plating and continuous operation <input checked="" type="checkbox"/> Superior plating film property <input checked="" type="checkbox"/> Superior malleability and low inner stress <input checked="" type="checkbox"/> For thick plating (30~100μm) <input checked="" type="checkbox"/> For Aluminum	5MK <input type="checkbox"/> Make-up AK <input type="checkbox"/> Replenishing BK <input type="checkbox"/> CK <input type="checkbox"/>	20L 200L	<input type="radio"/> Plating on big works <input checked="" type="checkbox"/> Aluminum, Copper, brass and castings <input checked="" type="checkbox"/> Moulds <input checked="" type="checkbox"/> Components using in coast and sea <input checked="" type="checkbox"/> Nuclear power parts
LINDEN 512	<input type="checkbox"/> High corrosion resistance and function plating and continuous operation <input checked="" type="checkbox"/> For thick plating (30~100μm) <input checked="" type="checkbox"/> No rough deposit and no pit	512-1 <input type="checkbox"/> Make-up 512-2 <input type="checkbox"/> Replenishing 512-3 <input type="checkbox"/> Ammonia water	20L	<input type="radio"/> Plating on big works <input checked="" type="checkbox"/> Moulds <input checked="" type="checkbox"/> Nuclear power parts
LINDEN MNB	<input type="checkbox"/> Common use and for batch use <input checked="" type="checkbox"/> Excellent plating film property in all respects <input checked="" type="checkbox"/> No rough deposit and no pit <input checked="" type="checkbox"/> Available two make-up solution type	MNB <input type="checkbox"/> Make-up or MNB-1 <input type="checkbox"/> Make-up MNB-2 <input type="checkbox"/>	20L	<input type="radio"/> OA equipment <input checked="" type="checkbox"/> Automobile parts <input checked="" type="checkbox"/> Aluminum alloys <input checked="" type="checkbox"/> Electronic parts <input checked="" type="checkbox"/> Solderability

Electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics				
Name	Specialties	Composition	Packing	Application
LINDEN SA	<input type="checkbox"/> Specially for semi-conductor parts and electronic parts and for batch use <input checked="" type="checkbox"/> Neutral type bath and low contents of Phosphorus <input checked="" type="checkbox"/> Deposit dense plating film <input checked="" type="checkbox"/> No bridge in micro patterns <input checked="" type="checkbox"/> Low inner stress <input checked="" type="checkbox"/> Superior bonding property and solderability	LINDEN SA <input type="checkbox"/> Make-up or LINDEN SA-1 <input type="checkbox"/> Make-up LINDEN SA-2 <input type="checkbox"/>	20L	<input type="radio"/> Specially for plating film property <input checked="" type="checkbox"/> Al vacuum deposition patterns <input checked="" type="checkbox"/> Thin film patterns <input checked="" type="checkbox"/> Ceramics <input checked="" type="checkbox"/> Cr-Cu and Cr-Ni patterns

Name	Specialties	Composition	Packing	Application
LINDEN 100	<ul style="list-style-type: none"> <li>Plating bath at low temp. and neutral bath</li> <li>Low inner stress and superior plating film property</li> <li>For bonding and soldering</li> <li>Superior plating reactivity</li> </ul>	LINDEN 100-1 } Make-up LINDEN 100-2 } 30~80°C	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Ceramic condensers</li> <li>PZT</li> </ul>
LINDEN 200	<ul style="list-style-type: none"> <li>Plating bath at low temp. neutral bath and low contents of Phosphorus</li> <li>Plating speed:12~13μm/h (70°C)</li> <li>Superior plating film property</li> <li>Superior plating reactivity</li> <li>Can start plating before bath temp. reaches to 90°C</li> </ul>	LINDEN 200-1 } Make-up LINDEN 200-2 } 30~80°C	20L	<ul style="list-style-type: none"> <li>Plating on big works</li> <li>Ceramics</li> <li>Plastics</li> <li>Electronic parts</li> </ul>
LINDEN 202	<ul style="list-style-type: none"> <li>Neutral bath, low contents of Phosphorus and common use</li> <li>Low inner stress</li> <li>Superior plating reactivity</li> <li>High hardness without any heat treatment (700Hv)</li> </ul>	202-0 } Make-up 202-1 } 202-2 } Replenishing 202-3 }	20L	<ul style="list-style-type: none"> <li>Ceramic capacitors</li> <li>PZT</li> <li>Ag and Ag-Pd paste</li> <li>Electronic parts</li> </ul>
LINDEN 203H 203K	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> </ul>	203H-0 } Make-up 203H-1 } 203H-2 } Replenishing 203H-3 }	20L 200L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Thin film patterns</li> </ul>
LINDEN 204 (neutral bath)	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Inner stress is almost zero</li> </ul>	204-0 } Make-up 204-1 } 204-2 } Replenishing 204-3 }	20L 200L	<ul style="list-style-type: none"> <li>LTCC boards</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Thin film patterns</li> </ul>
LINDEN 303H 303HK	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Superior corrosion resistance</li> <li>Prove high performance with the combination of substitution Gold plating (MN-AUA)</li> </ul>	303H-1 } Make-up 303H-2 } 303H-3 } Replenishing 303H-4 }	20L 200L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Thin film patterns</li> </ul>
LINDEN 52	<ul style="list-style-type: none"> <li>Selective partial plating for PCB</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Prove high performance with the combination of substitution Gold plating (MN-AUE)</li> </ul>	52-1 } Make-up 52-2 } 52-5 } 52-3 } Replenishing 52-4 }	20L 200L 1000L	<ul style="list-style-type: none"> <li>PCB and FPC</li> <li>Substrate for substitution Gold plating</li> </ul>

### Lead free electroless Nickel plating chemicals ( Ni-P )

Name	Specialties	Composition	Packing	Application
LINDEN 5MK-LL 5MK-L 5MK-LN	<ul style="list-style-type: none"> <li>Common use and continuous operation</li> <li>Superior corrosion resistance</li> <li>Easy replenishing and no milky contamination</li> <li>Sulfur free</li> <li>Less smells of acetic acid (5MK-LN)</li> </ul>	5MK-L } Make-up AK-LL } BK-L } Replenishing CK-L }	20L 200L 1000L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Automobile parts</li> <li>Hardness after heat treatment:900Hv</li> <li>Plating on big works</li> <li>Shafts</li> </ul>
	<ul style="list-style-type: none"> <li>Chemicals for WMF process</li> <li>Cost down:30%off</li> </ul>	AKLL-100 BKL-100 CKL-300	20L 200L 1000L	
LINDEN 409L	<ul style="list-style-type: none"> <li>Common use and continuous operation</li> <li>Superior plating film property</li> <li>Superior corrosion resistance</li> <li>Easy replenishing and no milky contamination</li> <li>Superior brightness</li> </ul>	409-1L } Make-up 409-2L } 409-3L } Replenishing 409-4L }	20L 200L 1000L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Automobile parts</li> <li>Plating on big works</li> <li>Shafts</li> <li>Saw blades</li> </ul>
	<ul style="list-style-type: none"> <li>Chemicals for WMF process</li> <li>Cost down:30%off</li> </ul>	9AL-200 9BL-100 9CL-100	20L 200L 1000L	
LINDEN 513	<ul style="list-style-type: none"> <li>High corrosion resistance and function plating and continuous operation</li> <li>For thick plating (30~100μm)</li> <li>No rough deposit and no pit</li> </ul>	513-1 } Make-up 513-2M } 513-2S } 513-3 } Replenishing Ammonia water }	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Plating on big works</li> <li>Moulds</li> <li>Nuclear components</li> </ul>

Name	Specialties	Composition	Packing	Application
LINDEN 701	<ul style="list-style-type: none"> <li>Common use and continuous operation</li> <li>Specially for brightness</li> <li>Superior plating film property</li> </ul>	701-1 } 701-2 } Make-up 701-3 } 701-4 } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Specially for outside</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
LINDEN 711L	<ul style="list-style-type: none"> <li>Common use and continuous operation</li> <li>Specially for brightness and superior leveling property</li> <li>Superior plating film property</li> <li>Easy replenishing and no milky contamination</li> </ul>	711-1L } 711-2L } Make-up 711-3L } 711-4L } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Specially for outside</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
LINDEN MNB-L	<ul style="list-style-type: none"> <li>Common use and for batch use</li> <li>Superior plating film property</li> </ul>	MNB-L Make-up 200mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
LINDEN MNB-LC (Nickel chloride bath)	<ul style="list-style-type: none"> <li>Common use and for batch use</li> <li>Superior plating film property</li> <li>Less crystallization in winter</li> </ul>	MNB-LC Make-up 200mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>

#### Lead free electroless Nickel plating chemicals ( Ni-P ) for wiring patterns on electronic parts, PCB and ceramics

Name	Specialties	Composition	Packing	Application
LINDEN 203HL	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> </ul>	203H-0L } 203H-1L } Make-up 203H-2L } 203H-3L } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Thin film patterns</li> </ul>
LINDEN 204L (neutral bath)	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Inner stress is almost zero</li> </ul>	204-0L } 204-2L } Make-up 204-1L } 204-3L } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Thin film patterns</li> <li>LTCC substrates</li> </ul>
LINDEN 234L	<ul style="list-style-type: none"> <li>Selective partial plating for LTCC</li> <li>Less influence on basis materials</li> <li>Suited best for Ag and Ag-Pd paste</li> <li>Superior plating film property</li> <li>Low inner stress</li> </ul>	234-1L } 234-2L } Make-up 234-3L } 234-4L } Replenishing 234-5L }	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Ni plating on pastes of Ag, Ag-Pd and Cu</li> <li>LTCC substrates</li> </ul>
LINDEN 303HKL	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Superior corrosion resistance</li> <li>Prove high performance with the combination of substitution Gold plating (MN-AUA)</li> </ul>	303H-1KL } 303H-2KL } Make-up 303H-3KL } 303H-4KL } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Thin film patterns</li> </ul>
LINDEN 52L	<ul style="list-style-type: none"> <li>Selective partial plating for PCB</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Prove high performance with the combination of substitution Gold plating (MN-AUE)</li> </ul>	52-1L } 52-2L } Make-up 52-5L } 52-3L } Replenishing 52-4L }	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>PCB and FPC</li> <li>Substrate for substitution Gold plating</li> </ul>

#### Hazardous heavy metal free and heavy metal free electroless Nickel plating chemicals ( Ni-P )

Name	Specialties	Composition	Packing	Application
LINDEN 5MK-F	<ul style="list-style-type: none"> <li>Common use and continuous operation</li> <li>Superior corrosion resistance</li> <li>Easy replenishing and no milky contamination</li> <li>Sulfur free</li> </ul>	5MK-F } AK } Make-up AK-F } BK-F } Replenishing CK-F }	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>Automobile parts</li> <li>Hardness after heat treatment:900Hv</li> </ul>
LINDEN 204F (neutral bath)	<ul style="list-style-type: none"> <li>Selective partial plating for electronic circuits</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Inner stress is almost zero</li> </ul>	204-0F } 204-2F } Make-up 204-1F } 204-3F } Replenishing	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Thin film patterns</li> <li>LTCC substrates</li> </ul>



Name	Specialties	Composition	Packing	Application
LINDEN 52F	<ul style="list-style-type: none"> <li>Selective partial plating for PCB</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> <li>Prove high performance with the combination of substitution Gold plating (MN-AUG)</li> </ul>	52-1F } Make-up 52-2F } 52-3F } Replenishing 52-4F }	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>PCB and FPC</li> <li>Substrate for substitution Gold plating</li> </ul>

### Electroless Nickel plating chemicals for special applications ( Ni-P )

Name	Specialties	Composition	Packing	Application
LINDEN NZ	<ul style="list-style-type: none"> <li>Electroless Nickel plating chemical on textiles</li> <li>Can plate white and even film</li> <li>Superior bath stability</li> <li>Continuous operation</li> <li>Alkaline type and low temp. bath</li> </ul>	NZ-M } NZ-A } Make-up NX-B } Replenishing 30~50°C	20L	<ul style="list-style-type: none"> <li>EMI electromagnetic wave shields</li> <li>Electrode of electrical cell and urethane</li> <li>ABS resins</li> <li>Silicon wafers</li> </ul>
LINDEN TX	<ul style="list-style-type: none"> <li>Electroless Nickel plating on ABS resins, textiles and ferrite</li> <li>Can plate white and even film</li> <li>Easy to use</li> <li>Continuous operation</li> <li>Alkaline type and low temp. bath</li> </ul>	TX-M } TX-A } Make-up TX-B } Replenishing 30~40°C	20L	<ul style="list-style-type: none"> <li>ABS resins</li> <li>Electrode of electrical cell and urethane</li> <li>Acryl</li> <li>Ferrites and ceramics</li> <li>Plastics</li> </ul>
LINDEN 809 (ruggedness)	<ul style="list-style-type: none"> <li>Substrate plating for PTFE coating</li> <li>Can form uniform vase-shaped rough film</li> <li>Treat PTFE coating after LINDEN 809 plating and fix coating firmly with vacuum heat treatment</li> <li>Can maintain PTFE fixing</li> </ul>	809-A } Make-up 809-B } Replenishing 809-C } ◎Available PTFE coating agents	20L	<ul style="list-style-type: none"> <li>Specially for plating film property</li> <li>Forming film with abrasion resistance and lubricant property</li> <li>Moulds</li> <li>Valves</li> <li>Applying PTFE, MoS<sub>2</sub> and graphite</li> </ul>
COMPO-NF (PTFE)  COMPO-NFL (lead free)	<ul style="list-style-type: none"> <li>PTFE composite electroless Nickel plating</li> <li>Excellent lubricant property, abrasion resistance, water-repellent property and mould releasing property</li> <li>PTFE contents:10~26vol%</li> <li>Hardness:300Hv (as plated)</li> <li>Excellent bath stability and easy maintenance</li> <li>Can maintain bath with auto analysis replenishment equipment</li> <li>No contents of PFOS, PFOA and PFAS</li> </ul>	COMPO-NF-M } COMPO-NF-A } Make-up COMPO-NF-FB(FW) } COMPO-NF-B } Replenishing COMPO-NF-C }	20L 500g	<ul style="list-style-type: none"> <li>Specially for plating film property</li> <li>Forming film with abrasion resistance and lubricant property</li> <li>Moulds</li> <li>Valves</li> <li>Available composite plating with SiC, etc.</li> </ul>
LINDEN BLACK 469L (black color)	<ul style="list-style-type: none"> <li>Black colored electroless Nickel plating chemical</li> <li>Lead free plating</li> <li>Dip into black coloring chemical after electroless Nickel plating</li> </ul>	469-1L } 469-2L } Make-up 469-3L } Replenishing 469-4L } 469-5L } Black coloring	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Replacement for black Zinc plating</li> <li>Mechanical parts</li> <li>Automobile parts</li> <li>Optical components</li> </ul>
LINDEN SD-609	<ul style="list-style-type: none"> <li>Electroless Nickel plating for glass disks</li> <li>Dense plating film</li> <li>Can obtain adhesion power without etching glass</li> <li>Even covering power</li> <li>Non-magnetism</li> <li>Can plate 2μm on mirror-like surface (roughness about 10 Å)</li> </ul>	SD-609-M } SD-609-A } Make-up SD-609-B } Replenishing SD-609-C }	20L 200L	<ul style="list-style-type: none"> <li>Hard disks</li> <li>Glass</li> <li>Ceramics</li> <li>ITO</li> </ul>
LINDEN PH-200	<ul style="list-style-type: none"> <li>High contents of Phosphorus type electroless Nickel plating chemical</li> <li>Continuous operation:3~4 turns</li> <li>Superior plating film property and post-processing property</li> <li>P contents:12~13%</li> <li>High degree of amorphous property (non-crystallinity)</li> <li>High degree of anti-magnetic property at high temp.</li> <li>Low inner stress</li> <li>High corrosion resistance</li> </ul>	PH-200-M } PH-200-A } Make-up PH-200-B } Replenishing PH-200-C }	20L 100L	<ul style="list-style-type: none"> <li>Functional parts of high value added type</li> <li>Moulds</li> <li>Non magnetic plating on A<sub>0</sub> substrate for hard disks</li> <li>Marine components</li> <li>Sliding parts</li> <li>Electronic parts</li> </ul>
LINDEN T	<ul style="list-style-type: none"> <li>Strike electroless plating chemical</li> <li>Plate with LINDEN T after etching with T-22, and can be available for various sorts of plating on Titanium and stainless steels</li> <li>Superior adhesion power</li> </ul>	Treatment with T-22 ↓ Plating with LINDEN T (undiluted solution)	20L	<ul style="list-style-type: none"> <li>Various sorts of plating on Titanium</li> <li>Various sorts of plating on SUS</li> </ul>

Name	Specialties	Composition	Packing	Application
AP-555	<ul style="list-style-type: none"> <li>Pit prevention agent for electroless Nickel plating</li> <li>Can use both LINDEN (Ni-P) and NIBORON (Ni-B)</li> </ul>	10~20mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>For electroless Nickel plating bath</li> </ul>

### Electroless Nickel-Boron plating chemicals ( Ni-B ) for electronic parts, wiring patterns and common use

Name	Specialties	Composition	Packing	Application
NIBORON M	<ul style="list-style-type: none"> <li>Ni-B and continuous operation</li> <li>Superior heat resistance and discoloration resistance</li> <li>Low electric resistance</li> <li>Suited best for soldering and Ag-Cu soldering</li> <li>Superior plating film property after sintering</li> <li>Prove excellent performance with the combination of Pd activators (AT-90 series)</li> <li>No contents of Na</li> </ul>	NIBORON M Undiluted solution NIBORON A } Replenishing NIBORON B } 60℃	20L 200L	<ul style="list-style-type: none"> <li>CPU ceramic IC packages</li> <li>Semi-conductor parts</li> <li>Micro patterns smaller than 50μm</li> <li>Wire bonding</li> <li>Forming electrodes</li> <li>Heat sinks (Cu-W)</li> <li>Optical connector packages</li> <li>HTCC substrates (W paste)</li> <li>☆ Best seller</li> </ul>
NIBORON 5	<ul style="list-style-type: none"> <li>Ni-B and continuous operation</li> <li>Nickel contents:100%</li> <li>Same crystal structure with electrolytic Nickel plating film</li> <li>Best solderability and Ag-Cu solderability</li> <li>Excellent heat resistance and discoloration resistance</li> <li>Most active plating chemical and can plate on any materials</li> <li>Low plating temp. (35℃~)</li> <li>Strike electroless plating</li> <li>Void free</li> </ul>	NIBORON 5M } Make-up NIBORON 5B } Replenishing NIBORON 5A } 35~60℃	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Hermetic seal parts</li> <li>Plating on various sorts of pastes</li> <li>Plating on textiles</li> <li>Plating on micro powders</li> <li>Thermistor</li> <li>Lead terminals</li> <li>Heat sinks (Cu alloy)</li> </ul>
NIBORON 70	<ul style="list-style-type: none"> <li>Ni-B and continuous operation</li> <li>Superior heat resistance</li> <li>Superior solderability after heat treatment (650℃) in air</li> <li>Suited best for soldering and Ag-Cu soldering</li> <li>Low electric resistance</li> <li>Economical cost by replenishing type</li> </ul>	NIBORON 70S } NIBORON 70M } Make-up NIBORON 70R } Replenishing 60℃	20L 100L	<ul style="list-style-type: none"> <li>Ceramic packages</li> <li>Semi-conductor parts and electronic parts</li> <li>Micro patterns</li> <li>Wire bonding</li> <li>Forming electrodes</li> <li>Heat sinks (OFC and Al SiC)</li> <li>Automobile parts</li> </ul>
NIBORON 80	<ul style="list-style-type: none"> <li>Ni-B and continuous operation</li> <li>Superior heat resistance and discoloration resistance</li> <li>Low electric resistance</li> <li>Suited best for soldering and Ag-Cu soldering</li> <li>Economical cost by replenishing type</li> </ul>	NIBORON 80S } NIBORON 80M } Make-up NIBORON 80R } Replenishing 60℃	20L 100L	<ul style="list-style-type: none"> <li>Ceramic packages</li> <li>Semi-conductor parts and electronic parts</li> <li>Micro patterns</li> <li>Wire bonding</li> <li>Automobile parts</li> </ul>
NIBORON 946	<ul style="list-style-type: none"> <li>High contents of Boron</li> <li>For film with heat resistance and anti-oxidation</li> <li>Boron contents:4%~</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Heat resistance parts</li> </ul>

### Lead free and heavy metal free electroless Nickel-Boron plating chemicals ( Ni-B )

Name	Specialties	Composition	Packing	Application
NIBORON 70L	<ul style="list-style-type: none"> <li>Lead free type electroless Nickel plating chemical</li> <li>Superior solderability</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> </ul>	70-SL } 70-ML } Make-up 70-RL } Replenishing 70-BL } 60℃	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
NIBORON 75	<ul style="list-style-type: none"> <li>Heavy metal free type electroless Nickel plating chemical</li> <li>Excellent heat resistance</li> <li>Excellent solderability</li> <li>No bridge in micro patterns</li> <li>Superior plating film property</li> </ul>	75-S } 75-M } Make-up 75-R } Replenishing 60℃	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>



Name	Specialties	Composition	Packing	Application
NIBORON MF	<ul style="list-style-type: none"> <li>Heavy metal free type electroless Nickel plating chemical</li> <li>Superior solderability</li> <li>Superior plating film property</li> </ul>	Undiluted solution 50°C~60°C	20L 200L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>

#### Electroless plating chemicals for special applications ( Tungstener containing film plating and Cobalt alloy plating )

Name	Specialties	Composition	Packing	Application
NIBOFRAM	<ul style="list-style-type: none"> <li>Electroless Ni-B-W plating chemical</li> <li>Superior mould releasing property with glass</li> <li>Excellent heat resistance</li> <li>Low thermal expansion coef.</li> <li>Superior abrasion resistance</li> </ul>	Undiluted solution 50°C~70°C	20L	<ul style="list-style-type: none"> <li>Parts required abrasion resistance at high temp.</li> <li>Glass moulds</li> <li>Plastic moulds (PET)</li> <li>Continuous casting moulds</li> <li>Engine parts</li> <li>Thermistor</li> </ul>
LINDEN NPW	<ul style="list-style-type: none"> <li>Electroless Ni-P-W plating chemical</li> <li>Superior mould releasing property</li> <li>Excellent abrasion resistance and lubricant property</li> <li>Superior brightness</li> <li>Superior heat resistance</li> <li>High hardness compared with PTFE composite plating</li> </ul>	NPW-1 } Make-up NPW-2 } 90°C	20L	<ul style="list-style-type: none"> <li>Glass moulds</li> <li>Plastic moulds (PET)</li> <li>Rolls</li> <li>Sliding parts</li> <li>Optical parts (auto focus)</li> </ul>
NIBOLIN	<ul style="list-style-type: none"> <li>Electroless Ni-B-P plating chemical</li> <li>Superior plating film property due to its low contents of Phosphorus and Boron</li> <li>Superior heat resistance and mould releasing property</li> <li>Excellent abrasion resistance and lubricant property</li> <li>Superior solderability</li> </ul>	NIBOLIN BP-1 } NIBOLIN BP-2 } Make-up NIBOLIN BP-3 } NIBOLIN BP-4 Stabilizing agent Replenishing	20L	<ul style="list-style-type: none"> <li>Glass moulds</li> <li>Plastic moulds</li> <li>Rolls</li> <li>Sliding parts</li> <li>Gears</li> </ul>
NIBOTALIN	<ul style="list-style-type: none"> <li>Electroless Ni-B-W-P plating chemical</li> <li>Superior heat resistance and mould releasing property</li> <li>Excellent abrasion resistance and lubricant property</li> <li>Superior solderability</li> <li>Economical cost compared with traditional chemicals (NIBOFRAM)</li> </ul>	BTP-1 } Make-up BTP-2 } BTP-3 } Replenishing BTP-4 } BTP-5 Stabilizing agent	20L	<ul style="list-style-type: none"> <li>Glass moulds</li> <li>Plastic moulds</li> <li>Rolls</li> <li>Sliding parts</li> </ul>
COMBATH P	<ul style="list-style-type: none"> <li>Electroless Co-P plating chemical</li> <li>Excellent abrasion resistance</li> <li>Beautiful brightness with white gray color</li> <li>Prevent skip plating and burning for SUS materials</li> </ul>	Undiluted solution or Combas P-1 } Make-up Combas P-2 } Combas P-3 pH adjustment	20L	<ul style="list-style-type: none"> <li>Prevent skip plating and burning for SUS materials</li> <li>Printer parts</li> <li>Prove both magnetism and abrasion resistance</li> <li>Valves</li> </ul>
COMBATH M	<ul style="list-style-type: none"> <li>Electroless Co-B plating chemical</li> <li>Can obtain high pure Cobalt film</li> <li>Superior heat resistance and anti-skip plating property</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic film</li> <li>Valves</li> <li>Sliding parts</li> </ul>
COMBATH CPW	<ul style="list-style-type: none"> <li>Electroless Co-P-W plating chemical</li> <li>W : ~3%, P : ~5%</li> <li>Excellent heat resistance and lubricant property</li> </ul>	CPW-1 } Make-up CPW-2 }	20L	<ul style="list-style-type: none"> <li>Parts required abrasion resistance at high temp.</li> <li>Parts for steel manufacture</li> </ul>
COMBATH CBW	<ul style="list-style-type: none"> <li>Electroless Co-B-W plating chemical</li> <li>W:~3%, B:~0.5%</li> <li>Excellent heat resistance and abrasion resistance</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Parts required abrasion resistance at high temp.</li> <li>Parts for steel manufacture</li> </ul>
COMBATH 964	<ul style="list-style-type: none"> <li>Electroless Co-B plating chemical</li> <li>High contents of Boron</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic film</li> <li>Prevent Si dispersion</li> </ul>
CONIP 8020	<ul style="list-style-type: none"> <li>Electroless Co-Ni-P plating chemical</li> <li>Co:78%, Ni:18%, P:4%</li> <li>Barrier for preventing Au-Si dispersion</li> </ul>	8020-A } Make-up 8020-B }	20L	<ul style="list-style-type: none"> <li>Magnetic mediums</li> <li>Heat resistance plating</li> <li>IC packages</li> </ul>
NCP-9010	<ul style="list-style-type: none"> <li>Electroless Ni-Co-P plating chemical</li> <li>Ni:82%, Co:10%, P:8%</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic plating</li> <li>Form barrier layers</li> </ul>
NCP-8020	<ul style="list-style-type: none"> <li>Electroless Ni-Co-P plating chemical</li> <li>Ni:72%, Co:20%, P:8%</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic plating</li> <li>Form barrier layers</li> </ul>
NCB-9010	<ul style="list-style-type: none"> <li>Electroless Ni-Co-B plating chemical</li> <li>Ni:90%, Co:10%, B:0.5%</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic mediums</li> <li>Heat resistance plating</li> </ul>
NCB-8020	<ul style="list-style-type: none"> <li>Electroless Ni-Co-B plating chemical</li> <li>Ni:80%, Co:20%, B:0.5%</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Magnetic films</li> <li>Form barrier layers</li> </ul>



**Brighteners for electrolytic Nickel plating**

**Special electrolytic Nickel plating chemicals**

Brighteners for electrolytic Nickel plating				
Name	Specialties	Composition	Packing	Application
LIEBELIGHT L-0	<ul style="list-style-type: none"> <li>Primary brightener for bright Nickel plating</li> <li>Easy bath maintenance</li> <li>Ductile film</li> <li>Can plate thick film (thickness:several cm)</li> </ul>	L-0 5~20ml/ℓ	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Common use</li> <li>Steel manufacture use</li> </ul>
LIEBELIGHT L-1	<ul style="list-style-type: none"> <li>Primary brightener for bright Nickel plating</li> <li>Standard brightener</li> </ul>	L-1 15~25ml/ℓ	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Common use</li> </ul>
LIEBELIGHT L-1A	<ul style="list-style-type: none"> <li>Primary brightener for bright Nickel plating</li> <li>Improve leveling</li> </ul>	L-1A 15~25ml/ℓ	20L	<ul style="list-style-type: none"> <li>Common use</li> <li>Can use for any applications</li> <li>Display items</li> </ul>
LIEBELIGHT L-2AX	<ul style="list-style-type: none"> <li>Secondary brightener for bright Nickel plating</li> <li>Superior brightness</li> </ul>	L-2AX 0.1~3.0ml/ℓ	20L	<ul style="list-style-type: none"> <li>Automobile parts</li> <li>High class decorative items</li> <li>☆ Best seller</li> </ul>
LIEBELIGHT BLACK L-BK	<ul style="list-style-type: none"> <li>Additive for secondary brightener for bright Nickel plating</li> <li>Brightness with black tone</li> </ul>	L-1A 20ml/ℓ L-2AX 0.3ml/ℓ L-BK 0.2~1.0ml/ℓ	20L	<ul style="list-style-type: none"> <li>High class items</li> <li>Display items</li> </ul>
LIEBELIGHT L-2GH	<ul style="list-style-type: none"> <li>Secondary brightener for bright Nickel plating</li> <li>Brightness with slightly white color</li> <li>Improve color tone of Gold plating</li> </ul>	L-1A 20ml/ℓ L-2GH 0.3~1.8ml/ℓ	20L	<ul style="list-style-type: none"> <li>Can use for any applications</li> <li>Bookmarks and Gold buttons</li> <li>Substrate for Gold plating</li> <li>High class decorative items</li> </ul>
LIEBELIGHT RS LEVELER	<ul style="list-style-type: none"> <li>Additive for secondary brightener for bright Nickel plating</li> <li>Additive for improving leveling</li> </ul>	L-1 0.3~0.4ml/ℓ RS LEVELER 0.2~0.4ml/ℓ	20L	<ul style="list-style-type: none"> <li>Automobile parts</li> <li>Wheel nuts</li> <li>Decorative items</li> </ul>
LIEBELIGHT L-2B	<ul style="list-style-type: none"> <li>Secondary brightener for barrel Nickel plating</li> </ul>	L-1 20ml/ℓ L-2B 0.2~0.8ml/ℓ	20L	<ul style="list-style-type: none"> <li>Specially for barrel plating</li> <li>Electronic parts</li> <li>Neodymium</li> </ul>
LIEBELIGHT BR-500	<ul style="list-style-type: none"> <li>Brightener for barrel Nickel plating</li> <li>One solution type</li> <li>Superior covering power in low current density area</li> <li>Easy bath maintenance</li> </ul>	L-1A 20ml/ℓ (Make-up only) BR-500 0.2~1.0ml/ℓ	20L	<ul style="list-style-type: none"> <li>Specially for barrel plating</li> <li>Can use for any applications</li> <li>Coins</li> <li>☆ Best seller</li> </ul>
LIEBELIGHT L-200A	<ul style="list-style-type: none"> <li>Brightener for rack Nickel plating</li> <li>One solution type</li> <li>Can obtain mirror like brightness with high degree of leveling and mild tone in high current density area</li> <li>Superior covering power in Chromium plating</li> </ul>	L-1 20ml/ℓ (Make-up only) L-200A 0.6ml/ℓ	20L	<ul style="list-style-type: none"> <li>High class automobile parts</li> <li>Bumpers</li> <li>Mufflers of motorbike</li> <li>High class hotel items</li> </ul>
TBT-40	<ul style="list-style-type: none"> <li>Covering power improving agent for bright Nickel plating</li> <li>Extend bright area</li> </ul>	TBT-40 5ml/ℓ	20L	<ul style="list-style-type: none"> <li>Watt's bath</li> <li>Bright plating bath</li> </ul>
LIEBELIGHT SB-71 SB-72	<ul style="list-style-type: none"> <li>Brightener for semi-bright Nickel plating</li> <li>Ductile film with low inner stress</li> <li>Can plate in high current density area (40A/dm<sup>2</sup>)</li> <li>Even bright film over wide current density area</li> <li>Superior corrosion resistance</li> <li>For bending and deep drawing</li> <li>Superior leveling property</li> <li>Superior solderability</li> </ul>	SB-71 1~2ml/ℓ SB-72 1~2ml/ℓ	20L	<ul style="list-style-type: none"> <li>Plated steel sheets</li> <li>Automobile parts</li> <li>Plating on hoops</li> <li>Cell cases</li> <li>Office equipment</li> <li>Electronic parts</li> <li>☆ Best seller</li> </ul>
LIEBELIGHT SB-922	<ul style="list-style-type: none"> <li>Brightener for semi-bright Nickel plating</li> <li>One solution type</li> <li>Easy bath maintenance</li> </ul>	SB-72 2ml/ℓ (Make-up only) SB-922 0.2~1.0ml/ℓ	20L	<ul style="list-style-type: none"> <li>Automobile parts</li> <li>Electrical home appliance</li> <li>Decorative items</li> <li>High class hotel items</li> </ul>
NS-AP	<ul style="list-style-type: none"> <li>Pit prevention agent for Nickel plating</li> <li>Best product of pit prevention</li> </ul>	10~20ml/ℓ	20L	<ul style="list-style-type: none"> <li>Watt's bath</li> <li>Bright plating bath</li> <li>Semi-bright plating bath</li> </ul>

Special electrolytic Nickel plating chemicals				
Name	Specialties	Composition	Packing	Application
NIBOFRAM E	<ul style="list-style-type: none"> <li>Ni-W and electrolytic plating chemical</li> <li>W = 30%</li> <li>Excellent abrasion resistance</li> <li>Hardness:600~1200Hv</li> <li>Economical cost</li> <li>Can plate Cr on the plating film</li> <li>Less crack occurrence</li> <li>Can plate thick film (20~50μm)</li> </ul>	NIBOFRAM Make-up NIBOFRAM EN NIBOFRAM HEW } Replenishing NIBOFRAM EK	20L 200L	<ul style="list-style-type: none"> <li>Glass moulds</li> <li>Engine parts</li> <li>Plastic moulds</li> <li>Conductor rolls</li> <li>Continuous casting moulds</li> <li>Carbon rolls</li> <li>Steel manufacture</li> <li>Long life</li> </ul>
LINDEN EPN	<ul style="list-style-type: none"> <li>Ni-P and electrolytic plating chemical with super excellent corrosion resistance</li> <li>Superior oxidization resistance and corrosion resistance</li> <li>For substrate and superior combination property with other sorts of plating</li> <li>P = 15%</li> <li>Superior brightness</li> </ul>	EPN-M Make-up EPN-S } Replenishing EPN-P	20L	<ul style="list-style-type: none"> <li>Various sorts of moulds</li> <li>Sintered alloys</li> <li>Electronic parts</li> <li>Abrasion resistance parts</li> <li>Lead frames</li> </ul>
ZEROOLL	<ul style="list-style-type: none"> <li>Inner stress reducing agent</li> <li>Reduce inner stress of sulfamate bath and Watt's bath to zero</li> <li>Beautiful outside</li> </ul>	20~100ml/ℓ	20L	<ul style="list-style-type: none"> <li>For sulfamate bath</li> <li>For Watt's bath</li> <li>Bump plating</li> </ul>
NS-AP-S	<ul style="list-style-type: none"> <li>Pit prevention agent</li> <li>For Nickel sulfamate plating bath</li> </ul>	2~15ml/ℓ	20L	<ul style="list-style-type: none"> <li>Specially for sulfamate bath</li> </ul>
LIEBELIGHT SF-1 SF-2	<ul style="list-style-type: none"> <li>Brightener for Nickel sulfamate plating bath</li> <li>Can obtain mirror like brightness</li> <li>Wide bright range</li> </ul>	SF-1 10~50ml/ℓ SF-2 1~ 5ml/ℓ	20L	<ul style="list-style-type: none"> <li>Provide brightness</li> <li>Substrate for Gold plating</li> <li>Plating on electrical terminals</li> </ul>
NI-STK	<ul style="list-style-type: none"> <li>Special blending strike Nickel plating chemical</li> <li>Improve adhesion power</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Stainless steels</li> <li>KOVAR</li> <li>SKD-62</li> </ul>
NIFLOY 802T (permalloy)	<ul style="list-style-type: none"> <li>Ni-Fe and electrolytic alloy plating chemical</li> <li>Ni = 80%, Fe = 20%</li> <li>Superior magnetic property</li> <li>Easy bath maintenance</li> <li>Superior brightness</li> <li>Low thermal expansion coef.</li> </ul>	802-TM Make-up 802-TN 802-TF } Replenishing 802-TS 802-TA	20L 200L	<ul style="list-style-type: none"> <li>Magnetic plating</li> <li>Magnetic heads</li> <li>Torque sensors</li> <li>Watch parts</li> </ul>
NIBORON EB EB-10	<ul style="list-style-type: none"> <li>Ni-B and electrolytic plating chemical</li> <li>Can use easily by adding to Watt's bath, sulfamate bath, etc.</li> <li>High hardness:800Hv</li> <li>Improve heat resistance and abrasion resistance</li> <li>Can protect against radioactivity</li> </ul>	NIBORON EB-M 50~150ml/ℓ NIBORON EBL-1 0~50ml/ℓ	20L	<ul style="list-style-type: none"> <li>Metal pattern</li> <li>Moulds</li> <li>Atomic parts</li> </ul>
BMP-FW (for semi-conductors)	<ul style="list-style-type: none"> <li>Electrolytic Nickel plating chemical for forming bumps</li> <li>Low inner stress and high purity</li> <li>Superior covering power</li> <li>Superior adhesion power to barrier layers</li> <li>Ni on Ti-Cr-Cu, etc.</li> <li>Less skip plating</li> </ul>	Undiluted solution	5L 20L	<ul style="list-style-type: none"> <li>Substrate plating for solders and Au bumps</li> <li>Semi-conductor elements</li> </ul>
BMP-SN (for semi-conductors) NW-2	<ul style="list-style-type: none"> <li>Sulfamate bath type electrolytic Nickel plating chemical</li> <li>Low inner stress, high purity and non-brightness</li> <li>Superior covering power</li> <li>Superior adhesion power to barrier layers</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Substrate plating for solders and Au bumps</li> <li>Semi-conductor elements</li> </ul>



Electroless and electrolytic Copper plating chemicals

Electroless and electrolytic Gold plating chemicals

Electroless and electrolytic Silver plating chemicals

Other sorts of electroless and electrolytic plating chemicals

Electroless Gold plating equipment

Electroless and electrolytic Copper plating chemicals				
Name	Specialties	Composition	Packing	Application
MC-U	<ul style="list-style-type: none"> <li>Electroless Copper plating chemical for using at low temp.</li> <li>Fast plating speed</li> <li>Superior plating film density</li> <li>Can plate dense film</li> <li>Superior plating reactivity</li> </ul>	MCU-A Make-up, MCU-B Replenishing 18~30°C ~0.4 μm/h	20L	<ul style="list-style-type: none"> <li>Primary chemical Copper plating</li> <li>Through holes</li> <li>Ceramics</li> </ul>
MCU-25	<ul style="list-style-type: none"> <li>Electroless Copper plating chemical for using at low temp.</li> <li>Can plate dense film</li> <li>Superior bath stability</li> </ul>	MCU-25A Make-up MCU-25B Replenishing MCU-25C	20L 200L	<ul style="list-style-type: none"> <li>Plating on plastics</li> <li>ABS resins</li> <li>Ceramics</li> </ul>
MCU-500 MCU-MS	<ul style="list-style-type: none"> <li>Electroless Copper plating chemical for thick plating at middle speed</li> <li>Superior bath stability</li> <li>Superior plating film property</li> <li>Can use for long-term and continuous operation</li> </ul>	MCU-500-A Make-up MCU-500-B Replenishing MCU-500-C MCU-500-D MCU-500-H	20L 200L	<ul style="list-style-type: none"> <li>Plating on plastics</li> <li>ABS resins</li> <li>Ceramics</li> <li>Textiles</li> </ul>
MCU-HS MCU-700	<ul style="list-style-type: none"> <li>Electroless Copper plating chemical for thick plating at high speed</li> <li>Fast plating speed</li> <li>Superior plating film property and adhesion power</li> <li>Can use for long-term and continuous operation</li> <li>Superior color tone</li> <li>Superior bath stability</li> </ul>	MCU-AHS Make-up MCU-BHS MCU-CHS pH Adjustment 60~80°C 5~8 μm/h	20L 200L	<ul style="list-style-type: none"> <li>Omit primary Copper plating</li> <li>Semi additive process and full additive process</li> <li>Plating on ceramics</li> <li>SLC</li> <li>Build-up process</li> </ul>
ACB-900	<ul style="list-style-type: none"> <li>Brightener for Copper sulfate plating</li> <li>Superior macrothrowing power and covering power</li> </ul>	ACB-900M Make-up ACB-900S Replenishing	20L	<ul style="list-style-type: none"> <li>Plating on through holes</li> <li>PCB</li> </ul>
ACB-90 ACB-40	<ul style="list-style-type: none"> <li>Brightener for bright Copper sulfate plating</li> <li>Excellent brightness and leveling property</li> <li>Can obtain ductile film</li> <li>Less decomposition of brightener's ingredients</li> <li>Wide current density area</li> <li>For high temp. bath (40°C) (ACB-40)</li> </ul>	ACB-90M Make-up ACB-90A Replenishing ACB-90B	20L	<ul style="list-style-type: none"> <li>Bright plating</li> <li>Plating on plastics</li> </ul>
CP-60	<ul style="list-style-type: none"> <li>Additive for Copper pyrophosphate plating</li> <li>Most many achievements for through holes</li> </ul>	0.5~1.5mL/ℓ	20L	<ul style="list-style-type: none"> <li>Plating on thorough holes</li> <li>Plating on pastes</li> <li>Plating on sintered materials</li> <li>For prevention carburizing</li> </ul>
BMP-CUS (for semi-conductors)	<ul style="list-style-type: none"> <li>Electrolytic Copper plating chemical for forming bumps</li> <li>Low inner stress</li> <li>Superior covering power</li> <li>High purity</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>For forming Cu bumps</li> <li>Semi-conductor elements</li> </ul>
DAM-CUS	<ul style="list-style-type: none"> <li>Copper sulfate plating chemical for damascene</li> <li>Superior hole filling property</li> <li>Less voids</li> <li>Superior adhesion power to barrier layers</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Semi-conductors</li> </ul>
C-20 C-20STK	<ul style="list-style-type: none"> <li>Copper cyanide plating chemical for special use</li> <li>Can plate substrate surely on materials which become problem at weak adhesion power</li> <li>Suited best for substrate plating of Copper sulfate and Nickel plating</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Plating on Beryllium-Copper, Phosphorus bronze and Silver</li> <li>Plating on 42-alloy, KOVAR, castings and Zinc die-castings</li> <li>For prevention carburizing</li> </ul>

Electroless and electrolytic Gold plating chemicals				
Name	Specialties	Composition	Packing	Application
MN-AUA	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical</li> <li>Superior adhesion power</li> <li>Substrate for thick Gold plating</li> <li>Superior color tone (lemon yellow)</li> <li>Suited for sulfur free for Ni substrate</li> </ul>	MN-AUA 250~500mL/ℓ KAu(CN) <sub>2</sub> 2g/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
MN-AUB	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical</li> <li>High adhesion power to Nickel and Gold</li> <li>Superior color tone (lemon yellow)</li> <li>For Ni-B</li> </ul>	MN-AUB 200~500mL/ℓ KAu(CN) <sub>2</sub> 2g/ℓ	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> <li>Flip chips</li> <li>PCB</li> </ul>



Name	Specialties	Composition	Packing	Application
MN-AUC	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical for ceramics and PCB</li> <li>Stable ball share strength</li> </ul>	MN-AUC 250~500mℓ/ℓ KAu(CN) <sub>2</sub> 1.5g/ℓ	20L	<ul style="list-style-type: none"> <li>CAT-2000 process</li> <li>PCB and FPC</li> </ul>
MN-AUE	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical for PCB</li> <li>Stable ball share strength</li> <li>Use LINDNE 52 for Nickel substrate</li> </ul>	MN-AUE 50~250mℓ/ℓ 1%KCN 1~5mℓ/ℓ KAu(CN) <sub>2</sub> 1~4g/ℓ	20L	<ul style="list-style-type: none"> <li>CAT-2000-1 process</li> <li>PCB and FPC</li> </ul>
MN-AUG	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical for electronic parts</li> <li>Stable ball share strength</li> <li>Stable plating bath</li> <li>Suited for substrate for thick electroless Gold plating</li> </ul>	MN-AUG 100~500mℓ/ℓ 1%KCN 2~10mℓ/ℓ KAu(CN) <sub>2</sub> 1~4g/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>Mechanical parts</li> </ul>
MN-AUI MN-AUIP	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical</li> <li>Superior adhesion power</li> <li>Stable ball share strength</li> <li>Available powder type (MN-AUIP)</li> </ul>	MN-AUI Undiluted solution ~200mℓ/ℓ KAu(CN) <sub>2</sub> 1.5g/ℓ	20L 20kg	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>LTCC boards</li> <li>PCB and FPC</li> </ul>
MN-AUN (neutral type, non-cyanide type)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical (substitution/reduction type)</li> <li>Gold sulfite bath</li> <li>Thicknes:0.03~1.0μm</li> <li>Superior bath stability</li> </ul>	Undiluted solution Au containing solution 2g/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>For thick plating on semi-conductors</li> <li>PCB</li> </ul>
GOLD 8 GOLD 8L (self-catalyst type)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical for thick plating at high plating speed</li> <li>Stable plating bath</li> <li>Fast plating speed:1~3μm/h (75℃)</li> <li>Continuous operation (5~10 days)</li> <li>Excellent bonding property</li> <li>Au contents:99.99% (S.G. 19.3)</li> <li>Alkaline type</li> <li>Applicable to the RoHS directive (GOLD 8L)</li> </ul>	GOLD 8-M (GOLD 8L-M) 250~500mℓ/ℓ GOLD 8-A (GOLD 8L-A) 5g/ℓ KAu(CN) <sub>2</sub> 2~4g/ℓ	20L  1kg	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive (GOLD 8L)</li> <li>Bonding Gold</li> <li>IC packages</li> <li>Chip carriers</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>PCB</li> </ul>
GOLD 9 GOLD 9L (self-catalyst type)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical for thick plating at high plating speed</li> <li>Very stable plating bath</li> <li>Fast plating speed at low temp. compared with traditional type:1~3μm/h (65℃)</li> <li>Continuous operation (5~10 days)</li> <li>Excellent bonding property</li> <li>Applicable to fine patterns</li> <li>Excellent plating film property</li> <li>Alkaline type</li> <li>Applicable to the RoHS directive (GOLD 9L)</li> </ul>	GOLD 9-M (GOLD 9L-M) 250~500mℓ/ℓ GOLD 9-A (GOLD 9L-A) 5~7.5g/ℓ KAu(CN) <sub>2</sub> 2~4g/ℓ	20L  1kg	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive (GOLD 9L)</li> <li>Bonding Gold</li> <li>IC packages</li> <li>Chip carriers</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>PCB</li> </ul>
GOLD 10 GOLD 10L (self-catalyst type)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical for thick plating at high plating speed</li> <li>Stable plating bath</li> <li>Fast plating speed:1~3μm/h (75℃)</li> <li>Continuous operation (5~10 days)</li> <li>High heat resistance</li> <li>Excellent bonding property</li> <li>Applicable to fine patterns</li> <li>Alkaline type</li> <li>Applicable to the RoHS directive (GOLD 10L)</li> </ul>	GOLD 10-M (GOLD 10L-M) 250~500mℓ/ℓ GOLD 10-A (GOLD 10L-A) 5~7.5g/ℓ KAu(CN) <sub>2</sub> 2~4g/ℓ	20L  1kg	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive (GOLD 10L)</li> <li>Bonding Gold</li> <li>IC packages</li> <li>Chip carriers</li> <li>Electronic parts</li> <li>Mechanical parts</li> <li>PCB</li> </ul>
GOLD 8C-2 (direct plating on Copper)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical for thick plating on Copper materials</li> <li>Can plate thick Gold directly on Cu</li> <li>Can plate thick Gold on Ni</li> <li>Superior bath stability and no decomposition</li> <li>Beautiful color tone and superior bonding property</li> <li>Alkaline type</li> </ul>	After treatment by GOLD 8C-1 ↓ GOLD 8C-2 500mℓ/ℓ KAu(CN) <sub>2</sub> 5~8g/ℓ	20L  20L	<ul style="list-style-type: none"> <li>Plating on Cu</li> <li>Plating on small works</li> </ul>
GOLD ESTA	<ul style="list-style-type: none"> <li>Strike electrolytic Gold plating chemical</li> <li>Superior covering power</li> <li>Superior adhesion power</li> </ul>	Undiluted solution KAu(CN) <sub>2</sub> 1.5g/ℓ	20L	<ul style="list-style-type: none"> <li>For strike Gold plating</li> </ul>

Name	Specialties	Composition	Packing	Application
GOLD EPU	<ul style="list-style-type: none"> <li>High purity electrolytic Gold plating chemical</li> <li>Purity:99.99%</li> <li>Hardness:50 ~ 70Hv</li> <li>Superior bonding property</li> </ul>	Undiluted solution KAu(CN) <sub>2</sub> 5~17g/ℓ	20L	<ul style="list-style-type: none"> <li>For wire bonding</li> </ul>
GOLD EC-10 EC-10H	<ul style="list-style-type: none"> <li>Hard electrolytic Gold plating chemical for common use</li> <li>Excellent throwing power and dense film and corrosion resistance</li> <li>Economical cost and superior brightness</li> </ul>	Undiluted solution KAu(CN) <sub>2</sub> 5~17g/ℓ	20L	<ul style="list-style-type: none"> <li>Connectors and PCB</li> <li>Connecting terminals</li> <li>Semi-conductor industry</li> <li>Precision machinery industry</li> </ul>
AU-505	<ul style="list-style-type: none"> <li>Adhesion power improving agent for Gold plating</li> <li>Improve adhesion power between Ni/Au plating</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Hermetic seal parts</li> </ul>

### Electroless and electrolytic Silver plating chemicals

Name	Specialties	Composition	Packing	Application
SILVER 7	<ul style="list-style-type: none"> <li>Self-catalyst type electroless Silver plating chemical</li> <li>Can plate on Ni (NIBORON film)</li> <li>Flash Ag plating bath</li> <li>Even brightness</li> <li>Substitution Silver plating on Cu</li> </ul>	SILVER 7 200mℓ/ℓ Potassium Silver cyanide 2~6g/ℓ	20L	<ul style="list-style-type: none"> <li>Solderability</li> <li>Prevent color change</li> <li>Capacitors</li> <li>Ceramic substrates</li> <li>PCB</li> </ul>
AG-1 AG-2 (bright Silver plating)	<ul style="list-style-type: none"> <li>Additive for bright Silver plating (electrolytic cyanide plating bath)</li> <li>Can obtain hard and bright film</li> <li>180~210Hv</li> <li>Excellent abrasion resistance</li> </ul>	AG-1 Hardening agent AG-2 Brightener	5L 5L	<ul style="list-style-type: none"> <li>Decorative items</li> <li>Tableware</li> <li>Electronic parts</li> </ul>
AG-10 AG-100 AG-200	<ul style="list-style-type: none"> <li>Color change prevention agent for Silver</li> <li>Strong resistance to sulfurate gas atmosphere</li> <li>Superior solderability</li> </ul>	500mℓ/ℓ	18L	<ul style="list-style-type: none"> <li>Prevent color change for Silver materials</li> <li>Jewelry</li> <li>Electronic parts and wave guides</li> </ul>
AG-50	<ul style="list-style-type: none"> <li>Pre-treatment agent for Ag and Ag paste</li> <li>Pre-treatment agent for plating on Ag and Ag paste</li> <li>Brightening agent</li> <li>Ag paste → AG-50 → Ni plating → solder plating</li> <li>Remove color change</li> </ul>	50~300mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>Brightening agent for Silver materials</li> <li>Pre-treatment agent for plating</li> <li>Chip resistors</li> <li>Capacitors</li> <li>Improve bonding property</li> </ul>
ASM-200	<ul style="list-style-type: none"> <li>Adhesion power improving agent for plating on Ag, KOVAR and 42-alloy</li> <li>Use at various sorts of plating on Ag</li> <li>Deposition prevention agent on glass seals for Ni-P plating on hermetic seals</li> </ul>	500mℓ/ℓ ~ Undiluted solution 40℃	20L	<ul style="list-style-type: none"> <li>For decorative use</li> <li>Hermetic seal parts</li> <li>Electronic parts</li> </ul>

### Other sorts of electroless and electrolytic plating chemicals

Name	Specialties	Composition	Packing	Application
SN-402	<ul style="list-style-type: none"> <li>Substitution Tin plating chemical</li> <li>Fast plating speed</li> <li>Easy bath maintenance</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>TAB</li> <li>Electrode bars of electrical cell</li> </ul>
SN-7P	<ul style="list-style-type: none"> <li>Neutral type electrolytic Tin plating chemical</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Electronic parts</li> </ul>
SEW	<ul style="list-style-type: none"> <li>Pure electrolytic Tin plating chemical for special use</li> <li>Brightness with white color and semi-bright</li> <li>Suited best for thin film on ceramics with less Pb-Bi, Ag paste with less Pb and glass with less Pb-Bi</li> </ul>	SEW-M Make-up SEW-SN SEW-KS Replenishing SEW-AD	20L 200L	<ul style="list-style-type: none"> <li>Materials with weak resistance to chemicals</li> <li>Thin films, vacuum deposition films and pastes</li> <li>Electronic parts</li> </ul>
SN-AP	<ul style="list-style-type: none"> <li>Lead free electrolytic Tin plating chemical</li> <li>Pure Tin plating bath</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> </ul>



Name	Specialties	Composition	Packing	Application
LINDEN RS-11	<ul style="list-style-type: none"> <li>Electroless Sn-Ni alloy plating chemical (Sn:50%-Ni:50%)</li> <li>Superior corrosion resistance</li> <li>Superior solderability</li> <li>Alkaline type</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>PZT</li> <li>Ceramics</li> </ul>
PD-1 (Pd-P)	<ul style="list-style-type: none"> <li>Electroless Palladium plating chemical</li> <li>Superior heat resistance</li> <li>Superior sliding property</li> <li>Superior bath stability</li> </ul>	Undiluted solution or two solution type PD-1A } Replenishing PD-1B }	20L	<ul style="list-style-type: none"> <li>Connectors</li> <li>Substrate for Gold plating</li> <li>Heat resistance plating</li> </ul>
PD-100 (Pd ≒ 100%)	<ul style="list-style-type: none"> <li>Electroless Palladium plating chemical</li> <li>Superior heat resistance</li> <li>Superior sliding property</li> <li>Superior bath stability</li> </ul>	Undiluted solution or two solution type PD-100A } Replenishing PD-100B }	20L	<ul style="list-style-type: none"> <li>Connectors</li> <li>Substrate for Gold plating</li> <li>Heat resistance plating</li> </ul>
INS-200	<ul style="list-style-type: none"> <li>Electrolytic Indium plating chemical</li> <li>Suited for plating on micro area</li> <li>Superior covering power and throwing power</li> <li>Stable plating bath</li> <li>Lower melting point</li> </ul>	Undiluted solution	5L 20L	<ul style="list-style-type: none"> <li>For forming bumps</li> <li>Plating on precision parts</li> <li>MCM</li> </ul>

### Electroless Gold plating equipment

Name	Specialties	Composition	Application
Plating tank specially for GOLD 8	<ul style="list-style-type: none"> <li>PTFE tank with automatic replenishment equipment for GOLD 8A</li> <li>10L, 15L, 20L, 50L, 100L, etc.</li> </ul>	Thermostat, air agitation, cathode rocking and replenishment equipment	<ul style="list-style-type: none"> <li>Delivery: 1 ~ 2 months</li> <li>For GOLD 9, 9L, 10 and 10L</li> </ul>



Conditioners, cleaning chemicals and degreasing chemicals ( for electronic parts )

Degreasing chemicals, cleaning chemicals and supplementary agents ( for common use )

Etching chemicals ( on vacuum deposition films, pastes, ceramics and semi-conductor chips )

Etching chemicals ( for Copper series, steel series, SUS series and Titanium series materials )

Sensitizers, activators / Pd activating and catalysts

Conditioners, cleaning chemicals and degreasing chemicals ( for electronic parts )				
Name	Specialties	Composition	Packing	Application
PT-0	<ul style="list-style-type: none"> <li>Acid degreasing chemical for ceramics</li> <li>Provide hydrophilic property</li> <li>Make etching uniform</li> </ul>	100~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Ceramics</li> <li>PCB</li> </ul>
PT-100 PT-100K	<ul style="list-style-type: none"> <li>Acid degreasing chemical for PCB</li> <li>Strong cleaning ability</li> <li>Clean uniformly</li> </ul>	PT-100 50~200ml/ℓ PT-100K 75~125ml/ℓ	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Fine patterns</li> <li>CAT-2000 process</li> </ul>
PT-200	<ul style="list-style-type: none"> <li>For PCB</li> <li>Strong type acid degreasing chemical</li> </ul>	50~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>PCB and FPC</li> <li>CAT-2000-1 process</li> </ul>
PN-1	<ul style="list-style-type: none"> <li>Conditioner, neutral degreasing chemical</li> <li>Conditioner on ABS resins for plating</li> <li>Provide hydrophilic property</li> <li>Adjust orientation</li> <li>Make etching uniform</li> </ul>	PN-1 30~50ml/ℓ Na <sub>3</sub> PO <sub>4</sub> 10~40g/ℓ	20L	<ul style="list-style-type: none"> <li>Plating on ABS resins</li> <li>Ceramics</li> </ul>
800-SD	<ul style="list-style-type: none"> <li>Auxiliary additive for degreasing and etching (liquid type)</li> <li>Auxiliary additive for degreasing and etching W and Mo-Mn</li> <li>Use for ultrasonic cleaning</li> </ul>	100~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Ceramic IC packages</li> </ul>
800-S	<ul style="list-style-type: none"> <li>Degreasing chemical specially for ceramics (liquid type)</li> <li>Neutral soak degreasing chemical</li> <li>Degreasing chemical for electronic parts</li> </ul>	100~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>Degreasing chemical for various sorts of pastes on ceramics</li> </ul>
TFC-CDS	<ul style="list-style-type: none"> <li>Conditioner for thin films</li> <li>For vacuum deposition films and Cr/Cu sputtering films</li> <li>For thin films of Al and other sorts of metals</li> </ul>	100ml/ℓ	20L	<ul style="list-style-type: none"> <li>Thin film boards</li> <li>ITO substrates</li> <li>Thin film IC packages</li> </ul>
TFC-CM	<ul style="list-style-type: none"> <li>Conditioner for thick films</li> <li>For Ag pastes and Ag-Pd pastes</li> <li>For pastes of other sorts of metals</li> </ul>	20~100ml/ℓ	20L	<ul style="list-style-type: none"> <li>Thick film boards</li> <li>Glass ceramic substrates (LTCC)</li> <li>IC packages</li> </ul>
CD-103	<ul style="list-style-type: none"> <li>Cleaner conditioner</li> <li>For use cleaning and conditioning</li> <li>Remove oxidized film on Cu surface and stains at inside of through holes at same time</li> </ul>	50ml/ℓ	20L	<ul style="list-style-type: none"> <li>Through hole substrates</li> </ul>
L-505B	<ul style="list-style-type: none"> <li>Degreasing and rust removing chemical for PCB</li> <li>Acid degreasing</li> <li>Acid etching after resist printing</li> <li>Degrease and etch Cu</li> </ul>	200~500ml/ℓ 50~60℃	20L	<ul style="list-style-type: none"> <li>For selective partial plating on PCB</li> <li>CAT-2000 process</li> </ul>
PD-MIT PD-MIT2	<ul style="list-style-type: none"> <li>Bridge prevention agent</li> <li>Remove absorbed Pd selectively on glass and ceramics and prevent bridges</li> </ul>	100~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>CAT-2000 process</li> </ul>
NS-500	<ul style="list-style-type: none"> <li>Prevention agent for short circuits, leaks and bridges at Ni/Au plating on PCB</li> <li>Prevent short circuits between patterns</li> <li>Prevent deposition on resist</li> <li>Remove Cu etching residue</li> </ul>	200ml/ℓ	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Ni/Au plating</li> <li>CAT-2000 process</li> <li>SLC</li> <li>Build up</li> <li>PLP</li> </ul>
Z-200	<ul style="list-style-type: none"> <li>Acid degreasing chemical with etching ability</li> <li>Degrease and remove rust for Cu and Cu alloys</li> <li>Prevention agent for oxidization and color change of Cu at high temp.</li> <li>Remove oxide of KOVAR and 42-alloy</li> </ul>	100~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Lead frames</li> <li>PCB</li> <li>Cu pastes</li> <li>Cu materials</li> </ul>

Degreasing chemicals, cleaning chemicals and supplementary agents ( for common use )				
Name	Specialties	Composition	Packing	Application
EARTHMOCLEAN D (measures against earth environmental problem)	<ul style="list-style-type: none"> <li>Aqueous degreasing chemical replaced for organic solvents (Freon, methylene chloride, ethane, etc.)</li> <li>Measures against BOD and COD</li> </ul>	50~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Precision parts</li> <li>Specially for quality</li> <li>Zinc die-castings</li> </ul>
GLARINSE G	<ul style="list-style-type: none"> <li>Cleaning chemical with excellent draining</li> <li>Aqueous degreasing chemical replaced for organic solvents (Freon, methylene chloride, etc.)</li> <li>Suited best for cleaning glass series materials</li> </ul>	25~70ml/ℓ	20L	<ul style="list-style-type: none"> <li>LCD boards</li> <li>Glass disks</li> <li>Silicon wafers</li> </ul>
SA-100	<ul style="list-style-type: none"> <li>Soak degreasing chemical (powder type)</li> <li>All-purpose type</li> <li>Economical cost</li> </ul>	30~80g/ℓ 50℃	20kg	<ul style="list-style-type: none"> <li>Common use</li> <li>Steel materials</li> <li>Copper alloys</li> </ul>
SA-400	<ul style="list-style-type: none"> <li>Degreasing chemical for Copper series materials (powder type)</li> <li>No Phosphorus type with low bubbling</li> <li>Excellent effect for degreasing rolling oil and burned oil at punching</li> <li>Less tarnishing by alkaline dip to materials</li> </ul>	50~80g/ℓ 60℃	20kg	<ul style="list-style-type: none"> <li>Copper alloys, brass and Phosphorus bronze</li> <li>Lead frames</li> <li>OFC materials</li> </ul>
SA-800	<ul style="list-style-type: none"> <li>Soak degreasing chemical (powder type)</li> <li>Alkaline soak degreasing chemical</li> <li>Suited best for electroless Nickel plating</li> <li>Easy bath maintenance and superior working efficiency</li> <li>High performance and solve various sorts of problem caused by insufficient degreasing</li> </ul>	30~50g/ℓ	20kg	<ul style="list-style-type: none"> <li>Electrolytic plating for common use</li> <li>Electroless plating for common use</li> </ul>
ELC-400	<ul style="list-style-type: none"> <li>All-purpose type electrolytic degreasing chemical (powder type)</li> <li>Can degrease in short time and excellent water rinsing ability</li> <li>Less tarnishing by alkaline dip to materials</li> </ul>	60~90g/ℓ 50℃ 5A/dm <sup>2</sup>	20kg	<ul style="list-style-type: none"> <li>Ferrous series</li> <li>Copper alloys and brass</li> <li>Nickel series</li> </ul>
ELC-4000S	<ul style="list-style-type: none"> <li>Soak and electrolytic degreasing chemical</li> <li>Alkaline degreasing chemical</li> <li>Very high degreasing performance</li> <li>Suited best for degreasing Ag-Cu solders by adding CN</li> <li>Suited best for degreasing Copper and Copper alloys</li> </ul>	100~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>From common use to precision parts</li> <li>Steel materials</li> <li>Copper alloys</li> </ul>
ELC-4000SN	<ul style="list-style-type: none"> <li>Soak degreasing chemical for Copper (OFC)</li> <li>Alkaline degreasing chemical</li> <li>Very high degreasing performance</li> <li>Superior effect for degreasing with ultrasonic</li> </ul>	100~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>Special Copper alloys</li> <li>OFC materials</li> </ul>
ZD-10 ZD-20	<ul style="list-style-type: none"> <li>Electrolytic degreasing chemical for Zinc die-castings</li> <li>No etching to basis materials</li> <li>Can plate film with high adhesion power and no pinholes</li> </ul>	ZD-10 40g/ℓ ZD-20 20g/ℓ 40℃	20kg 20L	<ul style="list-style-type: none"> <li>Zinc die-castings</li> </ul>
ELC-5000S	<ul style="list-style-type: none"> <li>Carbon removing chemical</li> <li>Alkaline degreasing chemical</li> <li>Remove oils containing carbon</li> <li>Remove carbon burned strongly</li> </ul>	Undiluted solution RT~100℃	20L	<ul style="list-style-type: none"> <li>Glass moulds</li> <li>Rubber moulds</li> <li>Quartz oscillators</li> </ul>
CE-200	<ul style="list-style-type: none"> <li>Electrolytic degreasing chemical for removing smuts</li> <li>No contents of surfactant</li> <li>Suited best for degreasing Ag-Cu solders by adding CN</li> <li>High performance of removing smuts</li> </ul>	CE-200 100~300ml/ℓ NaCN 50~100g/ℓ	20L	<ul style="list-style-type: none"> <li>Electrolytic degreasing</li> <li>Remove smuts</li> <li>IC packages</li> </ul>
SAL-70L SAL-80L SAL-70L2 SAL-1000	<ul style="list-style-type: none"> <li>Degreasing chemical specially for Aluminum</li> <li>Replacement for organic solvents</li> <li>Can degrease with both soak and electrolytic use</li> </ul>	SAL-70L 200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Specially for Aluminum</li> <li>Replacement for organic solvents</li> </ul>
ED	<ul style="list-style-type: none"> <li>Auxiliary additive for electrolytic degreasing</li> <li>Remove smuts</li> </ul>	NaOH 50~70g/ℓ ED 50~70g/ℓ	20kg	<ul style="list-style-type: none"> <li>Remove smuts</li> <li>For electrolytic plating</li> </ul>
SGA	<ul style="list-style-type: none"> <li>Auxiliary additive for electrolytic degreasing</li> <li>Improve smut removing ability</li> <li>Improve rust removing ability by degreasing</li> </ul>	Electrolytic degreasing chemical 50~70g/ℓ SGA 10~30g/ℓ	25kg	<ul style="list-style-type: none"> <li>Remove smuts</li> <li>For electrolytic plating</li> </ul>

Etching chemicals ( on vacuum deposition films, pastes, ceramics and semi-conductor chips )				
Name	Specialties	Composition	Packing	Application
CR-11	<ul style="list-style-type: none"> <li>Remove Cr in Cr-Cu thin films</li> <li>Remove Cr only by etching and without etching Cu</li> <li>Provide hydrophilic property</li> <li>Remove Cr in forming bumps</li> </ul>	500ml/ℓ~ Undiluted solution 50~70℃	20L	<ul style="list-style-type: none"> <li>Thin film patterns</li> <li>Provide hydrophilic property to silicon wafers</li> <li>Flexible boards</li> <li>Bumps</li> </ul>
MC-WM	<ul style="list-style-type: none"> <li>Etching chemical for W and Mo-Mn alloy pastes, Cu-W, W, Mo and Mo-Cu</li> <li>Improve adhesion power and short circuits</li> <li>For pattern W, Mo and vacuum deposition films</li> <li>Remove Cr thin films</li> <li>Etch Cr-Mo steels and improve adhesion power</li> </ul>	100~500ml/ℓ RT~50℃	20L	<ul style="list-style-type: none"> <li>Ceramics</li> <li>IC packages</li> <li>PGA and MPU</li> <li>Heat sinks</li> <li>Thin films</li> <li>Bumps</li> </ul>
ETW (non-cyanide type)	<ul style="list-style-type: none"> <li>Etching chemical for W and Mo-Mn alloy paste, Cu-W, W, Mo and Mo-Cu</li> <li>Improve adhesion power and short circuits</li> <li>For pattern W, Mo and vacuum deposition films</li> <li>Remove Cr thin films</li> <li>Etch Cr-Mo steels</li> </ul>	ETW-1 50g/ℓ ETW-2 500ml/ℓ	16kg 20L	<ul style="list-style-type: none"> <li>Ceramics</li> <li>IC packages</li> <li>PGA and MPU</li> <li>Heat sinks</li> <li>Thin films</li> <li>Bumps</li> </ul>
MC-E	<ul style="list-style-type: none"> <li>Fluoride type auxiliary additive for etching</li> <li>Use together with HCl or H<sub>2</sub>SO<sub>4</sub></li> <li>Improve adhesion power by removing oxidized film</li> <li>Suited best specially for removing glass materials</li> <li>Superior effect for improving adhesion power and preventing short circuits on W and Mo-Mn paste</li> </ul>	MC-E 100ml/ℓ~ Undiluted solution HCl or H <sub>2</sub> SO <sub>4</sub> 200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Castings</li> <li>SUS</li> <li>42-alloy</li> <li>KOVAR</li> <li>Semi-conductor ceramics</li> <li>Hermetic seal parts</li> </ul>
MC-E5 (non-cyanide type)	<ul style="list-style-type: none"> <li>Etching W and Mo-Mn pastes</li> <li>Etching W and Mo-Mn pastes on AlN</li> <li>Etching Ag pastes</li> <li>Cu-W alloy pastes</li> </ul>	MC-E5 100~300ml/ℓ H <sub>2</sub> O <sub>2</sub> 200~800ml/ℓ	20L	<ul style="list-style-type: none"> <li>Ceramics</li> <li>IC packages</li> <li>PGA</li> <li>Ag and Ag-Pd paste</li> </ul>
MC-EC	<ul style="list-style-type: none"> <li>Etching chemical for ceramics (Barium titanate)</li> <li>Improve adhesion power by etching ceramics</li> </ul>	100ml/ℓ~ Undiluted solution 50~60℃	20L	<ul style="list-style-type: none"> <li>Barium titanate series</li> </ul>
MC-ET	<ul style="list-style-type: none"> <li>Remove SiO<sub>2</sub> films</li> <li>Pre-treatment for plating</li> <li>Replacement for hydrofluoric acid (for safety)</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Pre-treatment for plating on silicon wafers</li> </ul>
ET-13	<ul style="list-style-type: none"> <li>Etching chemical for silicon wafers and Si</li> <li>Pre-treatment for plating</li> <li>Improve adhesion power</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Transistors</li> <li>Solar cells</li> <li>Thyristors</li> </ul>
ET-70	<ul style="list-style-type: none"> <li>Etching chemical for Cu<sub>2</sub>O and CuO</li> <li>Remove cuprous oxide of Cu pins</li> <li>Etching clad Cu</li> <li>No etching to glass</li> </ul>	Undiluted solution 90~100℃	20L	<ul style="list-style-type: none"> <li>Pins of thermal sensor</li> <li>Pins of capacitor</li> <li>Pins of resistor</li> <li>Pins of lead</li> </ul>
ET-70K	<ul style="list-style-type: none"> <li>Additive for chemical polishing</li> <li>Add to hydrogen peroxide</li> <li>Economical cost compared with traditional chemicals</li> <li>Deburring chemical</li> </ul>	ET-70K 300ml/ℓ H <sub>2</sub> O <sub>2</sub> 270ml/ℓ	20L	<ul style="list-style-type: none"> <li>KOVAR</li> <li>42-alloy</li> <li>Hermetic parts</li> <li>Ferrous series</li> </ul>
ET-022F	<ul style="list-style-type: none"> <li>Special etching chemical for ceramics</li> <li>Improve adhesion power to chemical Copper and Nickel plating</li> </ul>	100~500ml/ℓ	20L	<ul style="list-style-type: none"> <li>Barium titanate series</li> </ul>
PT-1	<ul style="list-style-type: none"> <li>Primary etching chemical for PZT</li> <li>Improve adhesion power by using PT-2 together</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>PZT</li> </ul>
PT-2	<ul style="list-style-type: none"> <li>Secondary etching chemical for PZT</li> <li>Improve adhesion power</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>PZT</li> </ul>

Name	Specialties	Composition	Packing	Application
ET-AGB	<ul style="list-style-type: none"> <li>Etching chemical for Ag-Cu solders</li> <li>Alkaline cyanide type</li> <li>Etch KOVAR, Ag-Cu solders and Ni at the same time</li> <li>Improve adhesion power</li> </ul>	ET-AGB 10~50g/ℓ KCN 10~30g/ℓ	8kg	<ul style="list-style-type: none"> <li>Etching hetero-metals in PGA</li> <li>LPC (laser power caps)</li> <li>OSC caps</li> </ul>
HN-25	<ul style="list-style-type: none"> <li>Etching chemical for Ag and Ag-Pd paste</li> <li>Improve adhesion power and prevent leaks</li> <li>Remove metallic oxide</li> </ul>	50~500ml/ℓ	20L	<ul style="list-style-type: none"> <li>Ceramic boards</li> <li>Chip capacitors</li> <li>CR</li> <li>Lead frames</li> </ul>
HC-55	<ul style="list-style-type: none"> <li>Adhesion power improving agent</li> <li>Superior effect for ferrous series and SUS series</li> </ul>	100~700ml/ℓ	20L	<ul style="list-style-type: none"> <li>KOVAR</li> <li>42-alloy</li> <li>Lead frames</li> </ul>
HS-55	<ul style="list-style-type: none"> <li>Adhesion power improving agent</li> <li>Mild etching</li> <li>Superior effect for Cu-W alloys</li> </ul>	100~500ml/ℓ	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Cu series lead frames</li> </ul>

### Etching chemicals ( for Copper series, steel series, SUS series and Titanium series materials )

Name	Specialties	Composition	Packing	Application
ET-50 ET-50AMS ET-50TN ET-60	<ul style="list-style-type: none"> <li>Oxidizing type etching chemical for Copper</li> <li>Roughen substrate before plating</li> <li>Mild etching</li> <li>Improve adhesion power</li> </ul>	ET-50A 60ml/ℓ ET-50B 200g/ℓ  ET-50AMS 60ml/ℓ ET-50BN 200g/ℓ  ET-50A 60ml/ℓ ET-50BN 200g/ℓ	20L 20kg	<ul style="list-style-type: none"> <li>Copper alloys</li> <li>OFC materials</li> <li>Lead frames</li> <li>PCB and FPC</li> </ul>
ET-50FN	<ul style="list-style-type: none"> <li>Oxidizing type etching chemical for steel and Copper materials</li> <li>Remove Cu (diffused Cu)</li> </ul>	500ml/ℓ ~ Undiluted solution	20L	<ul style="list-style-type: none"> <li>DBC</li> <li>Sintered materials</li> <li>Cu materials</li> </ul>
ET-50F2	<ul style="list-style-type: none"> <li>Etching chemical for stainless steels</li> <li>Different system from HNO<sub>3</sub> system</li> <li>No emission of NO<sub>2</sub> gas</li> <li>Remove metallic oxide</li> </ul>	ET-50F2 250ml/ℓ ~ Undiluted solution HCl 0~100ml/ℓ	20L	<ul style="list-style-type: none"> <li>SUS materials</li> <li>Lead frames</li> <li>Remove mill scales</li> </ul>
MC-E	<ul style="list-style-type: none"> <li>Fluoride type auxiliary additive for etching</li> <li>Use together with HCl or H<sub>2</sub>SO<sub>4</sub></li> <li>Improve adhesion power by removing oxidized film</li> <li>Remove glass materials</li> <li>Remove Si, SiO<sub>2</sub> and other sorts of oxide</li> <li>Improve adhesion power at plating on stainless steels</li> </ul>	MC-E 100ml/ℓ ~ Undiluted solution HCl or H <sub>2</sub> SO <sub>4</sub> 200ml/ℓ	20L	<ul style="list-style-type: none"> <li>Castings</li> <li>SUS</li> <li>42-alloy</li> <li>KOVAR</li> <li>Semi-conductor ceramics</li> <li>Free cutting steels</li> </ul>
ASM-200	<ul style="list-style-type: none"> <li>Etching chemical and prevention agent for deposition on glass at Ni plating</li> <li>Etching chemical for Ag materials</li> </ul>	200~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>Hermetic seals</li> <li>Quartz oscillators</li> <li>Semi-conductor laser caps</li> </ul>
HM-100	<ul style="list-style-type: none"> <li>Acid etching chemical</li> <li>Remove mill scales</li> <li>Remove carbon and diffusion layers of Ag-Cu and KOVAR</li> </ul>	200ml/ℓ ~ Undiluted solution	20L	<ul style="list-style-type: none"> <li>Etching pins of KOVAR and 42-alloy</li> <li>Quartz oscillators</li> </ul>

Name	Specialties	Composition	Packing	Application
MC-EP	<ul style="list-style-type: none"> <li>Fluoride type auxiliary additive for etching and solid acid (powder type)</li> <li>Use together with HCl or H<sub>2</sub>SO<sub>4</sub></li> <li>Improve adhesion power by removing oxidized film</li> <li>Remove glass materials</li> <li>Remove Si, SiO<sub>2</sub> and other sorts of oxide</li> <li>Improve adhesion power at plating on SUS materials</li> </ul>	MC-EP 50~300g/l H <sub>2</sub> SO <sub>4</sub> or HCl 50~200ml/l	20kg	<ul style="list-style-type: none"> <li>Castings</li> <li>SUS</li> <li>42-alloy</li> <li>KOVAR</li> <li>Semi-conductor ceramics</li> <li>Free cutting steels</li> </ul>
T-22 T-44	<ul style="list-style-type: none"> <li>Etching chemical for Titanium (activating chemical)</li> <li>Use for plating on Titanium T-22 → LINDEN T (strike plating)</li> <li>Remove TiO<sub>2</sub> films</li> </ul>	T-22 Undiluted solution ↓ 80~90°C LINDEN T	20L	<ul style="list-style-type: none"> <li>Various sorts of plating on Ti</li> </ul>
Z-100 (acid emulsion)	<ul style="list-style-type: none"> <li>Reinforcing agent for acid cleaning</li> <li>Remove mill scales, oils and welding scales</li> <li>No excessive etching by inhibitor</li> </ul>	Z-100 50~100ml/l HCl 300~500ml/l	20L	<ul style="list-style-type: none"> <li>Remove mill scales of steel materials</li> <li>Clean spot welding points</li> <li>Quartz oscillators</li> </ul>

### Sensitizers, activators / Pd activating and catalysts

Name	Specialties	Composition	Packing	Application
MC-S	<ul style="list-style-type: none"> <li>Strong acid type sensitizer</li> <li>Long life</li> <li>For common use</li> </ul>	50~300ml/l	20L	<ul style="list-style-type: none"> <li>For copper plating</li> <li>Ceramics</li> <li>Textiles</li> </ul>
PT-3	<ul style="list-style-type: none"> <li>Special type sensitizer</li> <li>For PZT and Barium titanate</li> <li>Superior adhesion power</li> </ul>	100~300ml/l	20L	<ul style="list-style-type: none"> <li>PZT</li> <li>Barium titanate</li> </ul>
MC-A MC-A2	<ul style="list-style-type: none"> <li>Weak acid type activator (Pd)</li> <li>For plating on whole surface</li> </ul>	200ml/l	20L	<ul style="list-style-type: none"> <li>On ceramics</li> <li>Plating on textiles</li> <li>Plating on micro powders</li> </ul>
AT-PD	<ul style="list-style-type: none"> <li>Acid type activator (Pd)</li> <li>For plating on whole surface</li> </ul>	200ml/l	20L	<ul style="list-style-type: none"> <li>For plating on whole surface of Copper and Copper alloy</li> </ul>
AT-120	<ul style="list-style-type: none"> <li>Acid type activator for selective partial plating (Pd)</li> <li>Low Pd concentration bath</li> <li>For fine patterns</li> </ul>	AT-120 90~110ml/l Use together with H <sub>2</sub> SO <sub>4</sub>	20L	<ul style="list-style-type: none"> <li>Activate Cu on PCB</li> <li>No bridge and no skip plating</li> <li>CAT-2000 process</li> </ul>
AT-PD-22	<ul style="list-style-type: none"> <li>Weak acid type activator specially for Ag paste (Pd)</li> <li>For selective partial plating</li> <li>Ag pastes</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Ag and Ag-Pd pastes</li> </ul>
AT-100	<ul style="list-style-type: none"> <li>Weak acid type activator (Pd)</li> <li>For selective partial plating (for thin films)</li> <li>Activator of CAT-92 process</li> <li>Ni plating on Ni-Cr pastes</li> </ul>	200~500ml/l	20L	<ul style="list-style-type: none"> <li>Ni plating on Al vacuum deposition patterns</li> <li>ITO and LSI</li> <li>Cu and Cu pastes</li> </ul>
AT-110 AT-110L	<ul style="list-style-type: none"> <li>Acid type activator (Pd)</li> <li>For selective partial plating</li> <li>Applicable to the RoHS directive (AT-110L)</li> </ul>	AT-110 50~200ml/l AT-110L 30~200ml/l	20L	<ul style="list-style-type: none"> <li>Ni plating on Al vacuum deposition patterns</li> <li>ITO, LSI and PCB</li> <li>Cu and Cu pastes</li> </ul>
AT-80	<ul style="list-style-type: none"> <li>Alkaline type activator for selective partial plating (Pd)</li> <li>Activate Mo-Mn and W pastes</li> <li>Less bridges</li> <li>Pd plating</li> </ul>	500ml/l	20L	<ul style="list-style-type: none"> <li>IC packages</li> <li>Cu substrates</li> <li>Cu plating</li> </ul>
AT-90 AT-90L-2	<ul style="list-style-type: none"> <li>Neutral type activator for selective partial plating (Pd)</li> <li>Activate Mo-Mn, W and Ag pastes on AlN</li> <li>Activate Cu-W</li> <li>Activate Cu thin films</li> <li>Easy to use</li> <li>Applicable to the RoHS directive (AT-90L-2)</li> </ul>	AT-90 Undiluted solution ~200ml/l AT-90NS Replenishing (for AT-90)  AT-90L-2 Undiluted solution ~200ml/l	20L 200L	<ul style="list-style-type: none"> <li>AlN substrates</li> <li>Fine patterns</li> <li>W and Ag pastes</li> <li>PCB</li> <li>Mo-Mn pastes</li> <li>☆ Best seller</li> </ul>



Name	Specialties	Composition	Packing	Application
AT-905	<ul style="list-style-type: none"> <li>Weak acid type activator for selective partial plating (Pd)</li> <li>Pd activator specially for Mo-Mn and W pastes</li> <li>Can plate selectively and partially by easy Pd substitution</li> <li>Easy to use</li> <li>Economical cost and high Pd concentration</li> </ul>	Undiluted solution 40~70°C	20L	<ul style="list-style-type: none"> <li>Activate Mo-Mn and W pastes on Al<sub>2</sub>O<sub>3</sub> and Al</li> <li>IC packages</li> <li>PCB</li> </ul>
AT-907 AT-907L	<ul style="list-style-type: none"> <li>Neutral type activator (Pd)</li> <li>Improve no plating and skip plating caused by bipolar phenomenon</li> <li>For micro patterns (L&amp;S 30μm and under) and improving bridges</li> <li>Applicable to the RoHS directive (AT-907L)</li> </ul>	Undiluted solution 50~70°C	20L	<ul style="list-style-type: none"> <li>PCB and FPC</li> <li>CAT-2000-1 process</li> <li>Activating Mo-Mn and W pastes on ceramics</li> </ul>
PT-4	<ul style="list-style-type: none"> <li>Weak acid type activator (Pd)</li> <li>Plating on whole surface of ceramics</li> <li>Superior adhesion power</li> <li>For PZT and Barium titanate</li> </ul>	100~300ml/ℓ	20L	<ul style="list-style-type: none"> <li>Barium titanate</li> <li>PZT</li> <li>Al<sub>2</sub>O<sub>3</sub></li> <li>AlN</li> </ul>
PN-105	<ul style="list-style-type: none"> <li>Catalyst with no contents of HCl</li> <li>Less haloing phenomenon at Cu plating on PCB</li> <li>Small size of colloid particles</li> <li>For small size of through holes</li> </ul>	PN-105 25~35ml/ℓ PN-104 250~290g/ℓ	5L 20L 20kg	<ul style="list-style-type: none"> <li>Chemical Cu plating on multi-layer PCB</li> </ul>
PN-PS	<ul style="list-style-type: none"> <li>Acid type catalyst</li> <li>ABS resins</li> <li>Long life</li> <li>Economical cost</li> </ul>	PN-PS 150ml/ℓ HCl 150ml/ℓ 20~30°C	20L	<ul style="list-style-type: none"> <li>For plating on ABS resins</li> <li>Engineering plastics</li> <li>EMI</li> </ul>





Stripping chemicals for plating films ( Ni, Au, Sn and solder )

Rust prevention chemicals, post-treatment chemicals and anti-tarnishing chemicals

Chemicals for electronic parts

Additives for special applications

Plating resist ink and masking chemicals

Chemicals for Aluminum

Pre-treatment process chemicals for LTCC

Chemicals for PCB and CAT-2000-1 process

Stripping chemicals for plating films ( Ni, Au, Sn and solder )				
Name	Specialties	Composition	Packing	Application
LIPSTAR NC-1 NC-2	<ul style="list-style-type: none"> <li>Non-cyanide type Nickel stripping chemical</li> <li>No residue of smut of ferrous substrate</li> <li>No etching to basis materials</li> <li>Suited best for Nickel stripping on free cutting steels</li> </ul>	NC-1 160g/ℓ NC-2 270mℓ/ℓ NaOH 0~30g/ℓ or NC-1 80g/ℓ NC-2 180mℓ/ℓ	16kg 18L	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Electrolytic Nickel plating</li> <li>Moulds</li> <li>Neodymium magnets</li> <li>Mechanical parts</li> <li>Shafts</li> </ul>
LIPSTAR NC-11 NC-22	<ul style="list-style-type: none"> <li>Non-cyanide type Nickel stripping chemical</li> <li>Suited best for Nickel stripping after heat treatment</li> <li>Can strip electrolytic Nickel well</li> <li>No etching to basis materials</li> </ul>	NC-11 60g/ℓ NC-22 200mℓ/ℓ 70℃	12kg 20L	<ul style="list-style-type: none"> <li>Electrolytic Nickel plating</li> <li>Electroless Nickel plating</li> <li>Mechanical parts</li> </ul>
LIPSTAR NC-100 NC-200	<ul style="list-style-type: none"> <li>Non-cyanide type Nickel stripping chemical</li> <li>Can strip after heat treatment</li> <li>Large stripping capacity</li> <li>Can strip both electrolytic and electroless Nickel</li> </ul>	NC-100 160g/ℓ NC-200 280mℓ/ℓ or NC-100 80g/ℓ NC-200 180mℓ/ℓ	16kg 20L	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Electrolytic Nickel plating</li> <li>Mechanical parts</li> </ul>
LIPSTAR NC-10 NC-20 NC-30	<ul style="list-style-type: none"> <li>Non-cyanide type Nickel stripping chemical on Copper and brass substrate</li> <li>Less etching to basis materials</li> </ul>	NC-10 30g/ℓ NC-20 30g/ℓ NC-30 500mℓ/ℓ NaOH 50g/ℓ	3kg 3kg 20L	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Copper and brass parts</li> </ul>
LIPSTAR S	<ul style="list-style-type: none"> <li>Cyanide type Nickel stripping chemical</li> <li>Economical cost</li> <li>No etching to basis materials</li> <li>Fast stripping speed</li> <li>No residue of smut</li> <li>Beautiful stripped surface</li> </ul>	LIPSTAR S 60~100g/ℓ NaCN 100g/ℓ	24kg (8kg×3)	<ul style="list-style-type: none"> <li>Electrolytic Nickel plating</li> <li>Electroless Nickel plating</li> </ul>
LIPSTAR EV	<ul style="list-style-type: none"> <li>Electrolytic stripping chemical for Copper, Nickel and Chromium for jigs</li> <li>Can operate only by replenishing</li> <li>Can remove deposited metals by filtering</li> <li>No emission of hazardous gas</li> <li>Fast stripping speed</li> </ul>	LIPSTAR EV 33%	20L	<ul style="list-style-type: none"> <li>Plating jigs</li> <li>Jig branches in SUS material</li> <li>Jigs for electrolytic Ni plating</li> <li>Jigs for plating on plastics</li> </ul>
LIPSTAR GOLD LG-7DL	<ul style="list-style-type: none"> <li>Very fast stripping speed for Gold plating</li> <li>Economical cost</li> <li>Available powder type (LG-7DP)</li> </ul>	LG-7DL 200mℓ/ℓ KCN 50g/ℓ	20L	<ul style="list-style-type: none"> <li>Gold films, spattering films and vacuum deposition films on various sorts of materials</li> </ul>
LIPSTAR GOLD LG-8L	<ul style="list-style-type: none"> <li>Can strip Gold plating without etching substrate of Copper and Nickel</li> <li>Can re-plate Gold beautifully after stripping Gold plating</li> </ul>	LG-8L 200mℓ/ℓ KCN 50g/ℓ	20L	<ul style="list-style-type: none"> <li>Gold plating on Copper</li> <li>Ni/Au plating on Copper</li> <li>Lead frames</li> </ul>
LIPSTAR E-400	<ul style="list-style-type: none"> <li>Electrolytic stripping chemical for solder and Tin</li> <li>Can strip Tin alloy</li> <li>No contents of fluoride</li> </ul>	LIPSTAR E-400 250mℓ/ℓ 20μm/h (7A/dm <sup>2</sup> 9:1Tin-lead)	20L	<ul style="list-style-type: none"> <li>Strip jigs</li> </ul>
LIPSTAR NC-101	<ul style="list-style-type: none"> <li>Stripping chemical for solder and Lead</li> <li>No contents of nitric acid, hydrogen peroxide and fluoride</li> <li>Less etching to Copper materials</li> <li>No emission of gas and mist</li> <li>Fast stripping speed and can strip Lead</li> </ul>	NC-101-A 500mℓ/ℓ NC-101-B 500mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Lead frames</li> <li>Connectors</li> </ul>

Rust prevention chemicals, post-treatment chemicals and anti-tarnishing chemicals				
Name	Specialties	Composition	Packing	Application
NR-301	<ul style="list-style-type: none"> <li>Water-soluble type primary rust prevention chemical</li> <li>Primary rust prevention chemical which can replace with cyan</li> <li>Prevent rusts for vase-shaped holes at acid Zinc plating</li> <li>Primary rust prevention for materials after plating</li> </ul>	10~100mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>Brake parts</li> <li>Electronic parts</li> <li>Common ferrous materials</li> </ul>
NR-303	<ul style="list-style-type: none"> <li>Water-soluble type rust prevention chemical for water cutting</li> <li>Fill pinholes</li> <li>Extend 1~2 cycles in salt spray test</li> <li>Improve corrosion resistance further by using after chromate treatment at Zinc plating</li> </ul>	5~15mℓ/ℓ 20~50℃	16kg	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Electrolytic Nickel plating</li> <li>Zinc plating</li> </ul>

Name	Specialties	Composition	Packing	Application
NR-330	<ul style="list-style-type: none"> <li>Water-soluble type rust prevention chemical for water cutting (emulsion type)</li> <li>For electrolytic and electroless plating</li> <li>Fill pinholes</li> <li>Extend 1~2 cycles in salt spray test</li> </ul>	20~50mℓ/ℓ 20~50℃	18L	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Electrolytic Nickel plating</li> <li>Zinc plating</li> </ul>
NRG-50	<ul style="list-style-type: none"> <li>Water-soluble type rust prevention chemical for water cutting</li> <li>For treatment chemical which can replace with chromate treatment</li> <li>Form passive film on the surface of Nickel film</li> </ul>	NRG-50 50~200mℓ/ℓ Oxalic acid 50~200g/ℓ	16kg	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Electrolytic Nickel plating</li> <li>Plated castings</li> </ul>
HM-200NC	<ul style="list-style-type: none"> <li>Treatment agent which can replace with chromate treatment</li> <li>Form very thin passive film on Ni plating</li> </ul>	Undiluted solution 60℃	20L	<ul style="list-style-type: none"> <li>Electroless Nickel plating</li> <li>Shafts</li> </ul>
Z-200S	<ul style="list-style-type: none"> <li>Chemical for both soft etching and anti-tarnishing</li> <li>Treatment chemical for both rust prevention and rust removing for Copper and Copper alloys</li> <li>42-alloy, rust prevention and rust removing</li> </ul>	100~300mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>Copper and Copper alloys</li> <li>42-alloy</li> <li>Be-Cu</li> </ul>
CB-9	<ul style="list-style-type: none"> <li>Anti-tarnishing agent for Copper</li> <li>Primary rust prevention for Cu surface</li> <li>Not influence plating and solderability afterward</li> </ul>	50~100g/ℓ 60℃	18L	<ul style="list-style-type: none"> <li>Cu materials</li> <li>PCB</li> </ul>
CB-90	<ul style="list-style-type: none"> <li>Anti-tarnishing agent for Copper (for heat resistance)</li> <li>Superior effect at high temp. (about 150℃)</li> <li>Not influence electric resistance and adhesion power</li> </ul>	50~100g/ℓ	18L	<ul style="list-style-type: none"> <li>Cu materials</li> <li>PCB</li> </ul>
CB-99	<ul style="list-style-type: none"> <li>Anti-tarnishing agent for Copper</li> <li>New type anti-tarnishing chemical with no contents of BTA (benzotriazol)</li> </ul>	50mℓ/ℓ	18kg	<ul style="list-style-type: none"> <li>Cu materials</li> <li>PCB</li> </ul>

### Chemicals for electronic parts

Name	Specialties	Composition	Packing	Application
ET-140	<ul style="list-style-type: none"> <li>Improving and recovering agent for solderability</li> <li>Activate the surface of Cu and Ni plating</li> <li>Recover solderability</li> <li>Anti-tarnishing</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Electronic parts required soldering</li> <li>Nickel plating</li> </ul>
ET-140H	<ul style="list-style-type: none"> <li>Removing agent for oxide of solder and Tin</li> <li>Recover solderability of solder and Tin</li> <li>Remove oxide only</li> </ul>	500mℓ/ℓ ~ Undiluted solution	20L	<ul style="list-style-type: none"> <li>Solder plating and Tin plating</li> <li>Clean solder balls</li> </ul>
ET-150	<ul style="list-style-type: none"> <li>Improving and recovering agent for solderability</li> <li>Activate the surface of Ni plating</li> <li>Recover solderability</li> <li>Alkaline type</li> </ul>	200mℓ/ℓ	20kg	<ul style="list-style-type: none"> <li>Electronic parts required soldering</li> <li>Nickel plating</li> </ul>
PCB-1N	<ul style="list-style-type: none"> <li>Blackening agent for Cu surface</li> <li>Form even ruggedness</li> <li>Superior adhesion power to plastics and resist</li> <li>Improve adhesion power between Cu surface and resist</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>Copper inner layers of multi-layer PCB</li> <li>Copper surface of through holes</li> <li>Build-up boards</li> <li>OFC</li> </ul>
PCB-1R	<ul style="list-style-type: none"> <li>Bleaching agent for blackening treatment</li> <li>Reducing agent to Copper color</li> </ul>	Undiluted solution	20L	<ul style="list-style-type: none"> <li>OFC</li> </ul>
PC BROWN	<ul style="list-style-type: none"> <li>Roughening agent for Copper surface</li> <li>Form brown oxide films</li> <li>Can obtain high adhesion power for multi-layer (1.8kg/cm<sup>2</sup>)</li> <li>High adhesion power to plastics</li> </ul>	PC BROWN BR-1 PC BROWN BR-2 } Make-up 55~65℃	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Roughen the surface of inner layer of multi-layer printed circuit boards</li> </ul>

Additives for special applications				
Name	Specialties	Composition	Packing	Application
55-A	<ul style="list-style-type: none"> <li>Inhibitor (restraining agent for acid cleaning)</li> <li>Inhibit excessive etching to ferrous materials by adding to acid cleaning bath</li> <li>Improve outside</li> </ul>	55-A 20~50ml/ℓ HCl, H <sub>2</sub> SO <sub>4</sub>	20L	<ul style="list-style-type: none"> <li>○ Acid cleaning for steels and Copper</li> <li>● Remove mill scales</li> </ul>
CR-AMP	<ul style="list-style-type: none"> <li>Mist inhibiting agent for acid electrolysis (powder type)</li> <li>Mist inhibiting agent for Chromium plating</li> <li>Mist inhibiting agent for ALMITE</li> </ul>	0.3~1.0g/ℓ	1kg	<ul style="list-style-type: none"> <li>○ Chromium plating</li> <li>● ALMITE</li> <li>● Acid electrolysis</li> </ul>
ED-3	<ul style="list-style-type: none"> <li>Forming agent for trivalent Chromium in Chromium plating bath</li> <li>Can form easily by dummy plating</li> </ul>	As required	25kg	<ul style="list-style-type: none"> <li>○ Chromium plating</li> </ul>
NBF-150	<ul style="list-style-type: none"> <li>Pre-treatment agent for Nd-B-Fe</li> <li>Stabilize surface layers</li> </ul>	200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Plating on Nd-B-Fe</li> </ul>
NBF-220	<ul style="list-style-type: none"> <li>Pre-treatment agent for Nd-B-Fe</li> <li>Make surface layers uniform</li> </ul>	NBF-220 200ml/ℓ HN-25 200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Plating on Nd-B-Fe</li> </ul>
WSK-2500 (waste water treatment)	<ul style="list-style-type: none"> <li>Treatment agent for heavy metals</li> <li>Can remove various sorts of heavy metallic ions at the same time by strong reaction to chelated metallic complex salts which have been difficult to treat with traditional neutralization and sedimentation process</li> </ul>	WSK-2500 Add as required according to metallic ion concentration	20kg 220kg	<ul style="list-style-type: none"> <li>○ Waste water treatment</li> <li>● Make such heavy metallic ions as Cu, Ni, Zn, Pb, etc. in waste water insoluble</li> </ul>

Plating resist ink and masking chemicals				
Name	Specialties	Composition	Packing	Application
SEAL-PEAL #8008	<ul style="list-style-type: none"> <li>Masking chemical for plating (seal-peal):light red brown color</li> <li>For brushing and dipping</li> <li>Can prove acid and alkali resistance and heat resistance</li> <li>Economical cost</li> </ul>	RT~120℃	16kg	<ul style="list-style-type: none"> <li>○ Masking for electrolytic and electroless plating</li> <li>● Electronic parts</li> </ul>
PLATING-REGIST A	<ul style="list-style-type: none"> <li>Masking chemical for plating (high quality):green color</li> <li>For brushing and dipping</li> <li>Can prove acid and alkali resistance and heat resistance</li> </ul>	RT~120℃	3kg 5kg	<ul style="list-style-type: none"> <li>○ Masking for electroless plating</li> <li>● Electronic parts</li> </ul>
WMF537	<ul style="list-style-type: none"> <li>Masking chemical for plating (high quality) :green color</li> <li>For brushing and dipping</li> <li>Can prove acid and alkali resistance and heat resistance</li> </ul>	RT~120℃	28kg	<ul style="list-style-type: none"> <li>○ Masking for electroless plating</li> <li>● Electronic parts</li> </ul>

Chemicals for Aluminum				
Name	Specialties	Composition	Packing	Application
SAL-70L SAL-70L2	<ul style="list-style-type: none"> <li>Soak and electrolytic degreasing chemical specially for Aluminum</li> <li>Replacement for organic solvents</li> <li>Can use for soak and electrolytic degreasing</li> <li>Degreasing ability reinforced type (SAL-70L2)</li> </ul>	SAL-70L 200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Specially for Aluminum</li> <li>● Replacement for organic solvents</li> </ul>
SAL-80L	<ul style="list-style-type: none"> <li>Soak and electrolytic degreasing chemical specially for Aluminum</li> <li>Can use for soak and electrolytic degreasing</li> </ul>	200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Specially for Aluminum</li> <li>● Replacement for organic solvents</li> </ul>
AL-20	<ul style="list-style-type: none"> <li>Alkaline etching chemical</li> <li>Etching in alkaline side</li> </ul>	100~200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Improve adhesion power</li> </ul>
HL-20	<ul style="list-style-type: none"> <li>Acid etching chemical</li> <li>Use between primary and secondary Zincate treatment</li> <li>Improve adhesion power</li> </ul>	200ml/ℓ	20L	<ul style="list-style-type: none"> <li>○ Improve adhesion power</li> </ul>
AL-50	<ul style="list-style-type: none"> <li>Etching chemical for Aluminum</li> <li>Make etching uniform and improve adhesion power by adding to nitric acid</li> </ul>	100ml/ℓ+HNO <sub>3</sub> RT	20L	<ul style="list-style-type: none"> <li>○ Improve adhesion power</li> </ul>

Name	Specialties	Composition	Packing	Application
MC-EP	<ul style="list-style-type: none"> <li>Replacement for hydrofluoric acid and solid acid (powder type)</li> <li>HNO<sub>3</sub> + MC-EP</li> <li>Easy to use</li> </ul>	MC-EP 100g/ℓ	20kg	○ Improve adhesion power
SGA	<ul style="list-style-type: none"> <li>Auxiliary additive for removing smuts</li> <li>NaOH + SGA</li> </ul>	SGA 20~50g/ℓ	25kg	○ Improve adhesion power
ALBOND 100	<ul style="list-style-type: none"> <li>Cyanide type Zincate treatment chemical</li> <li>Excellent adhesion power</li> <li>Long life</li> <li>Easy to use</li> </ul>	Undiluted solution 20~50°C	20L	○ Aℓ and Aℓ alloys
ALBOND 250	<ul style="list-style-type: none"> <li>Non-cyanide type Zincate treatment chemical</li> <li>Excellent adhesion power</li> <li>Long life</li> </ul>	250mℓ/ℓ 20~25°C	25kg	○ Aℓ and Aℓ alloys ● Double substitution
ALBOND 500	<ul style="list-style-type: none"> <li>Non-cyanide type Zincate treatment chemical</li> <li>Non-cyanide type and excellent adhesion power</li> <li>Long life</li> <li>Alloy bath</li> </ul>	500mℓ/ℓ 20~25°C	25kg	○ Aℓ and Aℓ alloys ● Double substitution
ALBOND AM	<ul style="list-style-type: none"> <li>Acid type Zincate treatment chemical</li> <li>Excellent adhesion power</li> <li>Long life</li> </ul>	500mℓ/ℓ ~ Undiluted solution	20L	○ For Ni plating on Aℓ vacuum deposition films and Aℓ sputtering films

### Pre-treatment process chemicals for LTCC

Name	Specialties	Composition	Packing	Application
LT-2000C	<ul style="list-style-type: none"> <li>Alkaline degreasing chemical</li> <li>Less influence on basis materials</li> <li>Superior effect for Ag and Cu pastes</li> </ul>	200mℓ/ℓ	20L	○ LTCC substrates ● Ceramic substrates ● Ag, Ag-Pd and Cu pastes
AT-808	<ul style="list-style-type: none"> <li>Auxiliary additive for accelerating activation</li> <li>Induce even Pd activation</li> <li>Can prove excellent effect for activation of selective area of wiring patterns</li> </ul>	Undiluted solution	20L	○ LTCC substrates ● Ceramic substrates ● Ag, Ag-Pd and Cu pastes
AT-909	<ul style="list-style-type: none"> <li>Neutral type Pd activator</li> <li>Can plate without leaks, skip plating, etc. at plating on micro and independent patterns</li> </ul>	Undiluted solution ~500mℓ/ℓ	20L	○ LTCC substrates ● Ceramic substrates ● Ag, Ag-Pd and Cu pastes
AFP-500	<ul style="list-style-type: none"> <li>Removing agent for Pd residue</li> <li>No attacking to printed pattern resist</li> <li>Remove Pd penetrated into dicing lines</li> </ul>	500mℓ/ℓ	20L	○ LTCC substrates ● Ceramic substrates ● Ag, Ag-Pd and Cu pastes
PD-SET2	<ul style="list-style-type: none"> <li>Leak inhibiting agent</li> <li>Inhibit leaks, skip plating, etc. at plating on micro and independent patterns</li> </ul>	200mℓ/ℓ	20L	○ LTCC substrates ● Ceramic substrates ● Ag, Ag-Pd and Cu pastes

### Chemicals for PCB and CAT-2000-1 process

Name	Specialties	Composition	Packing	Application
PT-100 PT-200 PT-200K	<ul style="list-style-type: none"> <li>Acid degreasing chemical for PCB</li> <li>Strong cleaning ability</li> <li>Make cleaning uniform</li> <li>Cleaning ability reinforced type (PT-200)</li> </ul>	PT-100 50~200mℓ/ℓ	20L	○ Fine patterns ● PCB
ET-50 ET-50AMS	<ul style="list-style-type: none"> <li>Oxidizing type acid degreasing chemical for Copper</li> <li>Roughen substrate before plating</li> <li>Mild etching</li> <li>Improve adhesion power</li> </ul>	ET-50A 60mℓ/ℓ ET-50B 200g/ℓ	20L 20kg	○ Copper alloys and OFC materials ● PCB ● Cu series lead frames

Name	Specialties	Composition	Packing	Application
NS-500	<ul style="list-style-type: none"> <li>Prevention chemical for short circuits, leaks and bridges at Ni/Au plating on PCB</li> <li>Prevent short circuits by plating between patterns</li> <li>Prevent deposition on resist</li> <li>Remove Cu etching residue</li> </ul>	200mℓ/ℓ	20L	<ul style="list-style-type: none"> <li>PCB</li> <li>Ni/Au plating</li> <li>CAT-2000 process</li> <li>SLC</li> <li>Build-up</li> <li>PLP</li> </ul>
AT-120	<ul style="list-style-type: none"> <li>Acid type activator for selective partial plating (Pd)</li> <li>No bridge and no skip plating</li> </ul>	AT-120 90~110mℓ/ℓ Use together with H <sub>2</sub> SO <sub>4</sub>	20L	<ul style="list-style-type: none"> <li>Fine patterns</li> <li>PCB</li> <li>Applicable to the RoHS directive</li> </ul>
AT-905	<ul style="list-style-type: none"> <li>Weak acid type activator for selective partial plating (Pd)</li> <li>Pd activator specially for Mo-Mn and W pastes</li> <li>Can plate selectively and partially by easy Pd substitution</li> <li>Easy to use</li> <li>Economical cost and high Pd concentration</li> </ul>	Undiluted solution 40~70°C	20L	<ul style="list-style-type: none"> <li>Activate Mo-Mn and W pastes on Al<sub>2</sub>O<sub>3</sub> and Al</li> <li>IC packages</li> <li>PCB</li> </ul>
AT-907 AT-907L	<ul style="list-style-type: none"> <li>Neutral type activator (Pd)</li> <li>Improve no plating and skip plating by bipolar phenomenon</li> <li>For micro patterns (L&amp;S 30μm and under) and improving bridges</li> <li>For the RoHS directive (AT-907L)</li> </ul>	Undiluted solution 50~70°C	20L	<ul style="list-style-type: none"> <li>PCB and FPC</li> <li>CAT-2000-1 process</li> <li>Activate Mo-Mn and W paste on ceramics</li> </ul>
LINDEN 52 LINDEN 52L LINDEN 52F	<ul style="list-style-type: none"> <li>Electroless Nickel plating chemical for PCB and electronic circuits</li> <li>Superior selective partial plating ability on micro patterns</li> <li>Superior plating film property</li> <li>Superior plating reactivity</li> <li>Superior adhesion power to F-Au</li> <li>Applicable to the RoHS directive (52L and 52F)</li> </ul>	LINDEN 52-1 LINDEN 52-2 LINDEN 52-5 LINDEN 52-3 LINDEN 52-4 <div> Make-up Replenish </div>	20L 200L	<ul style="list-style-type: none"> <li>Specially for plating film property</li> <li>PCB and FPC</li> <li>CSP</li> <li>Micro patterns (50μm and under)</li> <li>Ni substrate for Gold plating</li> </ul>
	<input type="checkbox"/> WMF process chemical <ul style="list-style-type: none"> <li>Cost down</li> <li>30~60%off</li> </ul>	52A-100 52B-200 52C-100	20L 200L	
MN-AUE	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical for PCB</li> <li>Stable ball share strength</li> <li>Use LINDNE 52 for Nickel substrate</li> </ul>	MN-AUE 50~250mℓ/ℓ 1% KCN 1~5mℓ/ℓ KAu(CN) <sub>2</sub> 1~4g/ℓ	20L	<ul style="list-style-type: none"> <li>CAT-2000-1 process</li> <li>PCB and FPC</li> </ul>
MN-AUI MN-AUIP	<ul style="list-style-type: none"> <li>Substitution Gold plating chemical</li> <li>Superior adhesion power</li> <li>Stable ball share strength</li> <li>Available powder type (MN-AUIP)</li> </ul>	MN-AUI Undiluted solution ~200mℓ/ℓ KAu(CN) <sub>2</sub> 1.5g/ℓ	20L 20kg	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>LTCC substrates</li> <li>PCB and FPC</li> </ul>
MN-AUN (neutral type, non-cyanide type)	<ul style="list-style-type: none"> <li>Electroless Gold plating chemical (substitution/reduction type)</li> <li>Gold sulfite bath</li> <li>Plating thickness:0.03~1.0μm</li> <li>Superior bath stability</li> </ul>	Undiluted solution Au contents 2g/ℓ	20L	<ul style="list-style-type: none"> <li>Applicable to the RoHS directive</li> <li>Electronic parts</li> <li>For thick plating on semi-conductors</li> <li>PCB</li> </ul>





## Plating process

So far, we have devoted ourselves into development of a new plating process beside of such development of plating chemicals for long while. During such period, there have appeared so many new materials into our field and such new materials have provided us some special properties as their requirements. We are very happy if the following our newly developed plating process would be of some help to such customers who are going to emerge into a new technical field or who desire to develop such new customers.

1. Electroless Ni/Au plating process ( electrode formation ) on silicon wafers ( semi-conductors )
2. Nickel plating process on Neodymium-Boron-Iron ( Nd-B-Fe )
3. Ni/Cu/Ni plating process on Neodymium-Boron-Iron ( Nd-B-Fe )
4. Electroless plating process on Neodymium-Boron-Iron ( Nd-B-Fe )
5. High corrosion resistance electrolytic plating process on Neodymium-Boron-Iron ( Nd-B-Fe )
6. Electrode formation process by plating on high frequency dielectric filters
7. Electrode formation process by plating on PZT
8. Plating process on Cu-W ( by all electroless Nickel process )
9. Electroless Ni/Au plating process on hermetic seals ( air-tight terminals and quartz oscillators )
10. Ni/Au plating process on W pastes on Al<sub>2</sub>O<sub>3</sub> and AlN substrates ( ceramic IC packages )
11. Selective partial Ni/Au plating process on Ag, Ag-Pd and Cu pastes printed patterns ( LTCC substrates )
12. Electrolytic Ni/Sn plating process on Ag and Ag-Pd paste electrodes ( CR and chip capacitors )
13. Electroless plating process on Ag-Cu solders ( KOVAR/Ag-Cu solders )
14. Ni/F-Au/Au plating process on dissimilar metals ( PGA ) ( ceramic IC packages and W/B-Au )
15. Plating process for Ni/solder bumps on semi-conductor electrodes
16. Selective partial Ni/Au plating process on Al thin films on ceramics and glass ( CAT-92 )
17. Thin bump UBM process on semi-conductor chips ( CAT-920 )
18. Electroless Nickel plating process on lead frames of Cu alloys ( heat sinks )
19. Selective partial Ni/Au plating process on PCB and Cu wiring patterns ( CAT-2000 )
20. CAT-2500 and 2500-P ( PCB ) ( Ni/Pd/F-Au and Ni/Pd-P/F-Au )
21. CAT-2500 and 2500-P ( LTCC ) ( Ni/Pd/F-Au and Ni/Pd-P/F-Au )
22. Selective partial Ni/Au plating process on fine patterns of Cr-Cu thin films ( CAT-99 )
23. Selective partial Ni/Au plating process on SLC and build-up boards, applicable to BGA ( CAT-900 )
24. Double Nickel plating process ( dual Nickel plating with high corrosion resistance )
25. Electrolytic plating process on hoops ( strips and flat rolled steel sheets )
26. Plating process on stainless steels, super hard steels ( SKD ), etc.
27. Electroless plating process on fabrics, textiles and foamy plastics
28. Plating process on plastics
29. Electroless plating process on micro powders ( Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, mica, diamond, Cu powder and plastic powder )
30. Plating process on glass moulds
31. Substrate plating process on Ti and Ti alloys
32. Diamond composite plating process ( dicing saws for semi-conductors, drills and dressers for CMP )
33. PTFE composite plating process
34. Lubricant plating process ( different to composite plating )
35. Plating process on Al materials ( representative materials as ADC-12 )
36. WPC process ( plating process on through-holes )
37. TICOMAC process ( Cu wiring patterns on ceramics )
38. Electrode formation process by plating on ceramic capacitors
39. ACF process ( micro precision electroforming and micro photo electroforming )
40. High adhesion power plating process on Inconel ( for Inconel 18 )
41. High corrosion resistance electroless Nickel plating process on free-cutting steels ( all alkaline pre-treatment and non-Chromate type )
42. Electrolytic plating process on Zinc die-castings ( pinhole free, high corrosion resistance and high adhesion power )
43. Plating process on Peltier elements
44. Plating process on Be-Cu ( Beryllium-Copper )
45. WMF process ( customer's in-plant blending for electroless plating chemicals )



#### Plating equipment, waste water treatment plant, automated plating chemical controller and plating equipment for PCB

- We have installed so many numbers of plating lines to our customers which can not be copied by other competitors as we have included our own plating process into such plating lines

#### Joint research, assigned research and process development

- We have been assigned by our prospective customers under chargeable contract

#### Trial work for plating ( chargeable )

- We have been assigned by our customers for so many varieties of plating job but for small quantities under chargeable contract

#### Recovery and recycling for Gold and precious metals

- Au, Pt, Ag, Pd & Rh

\*For further details, please contact our sales representative

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