

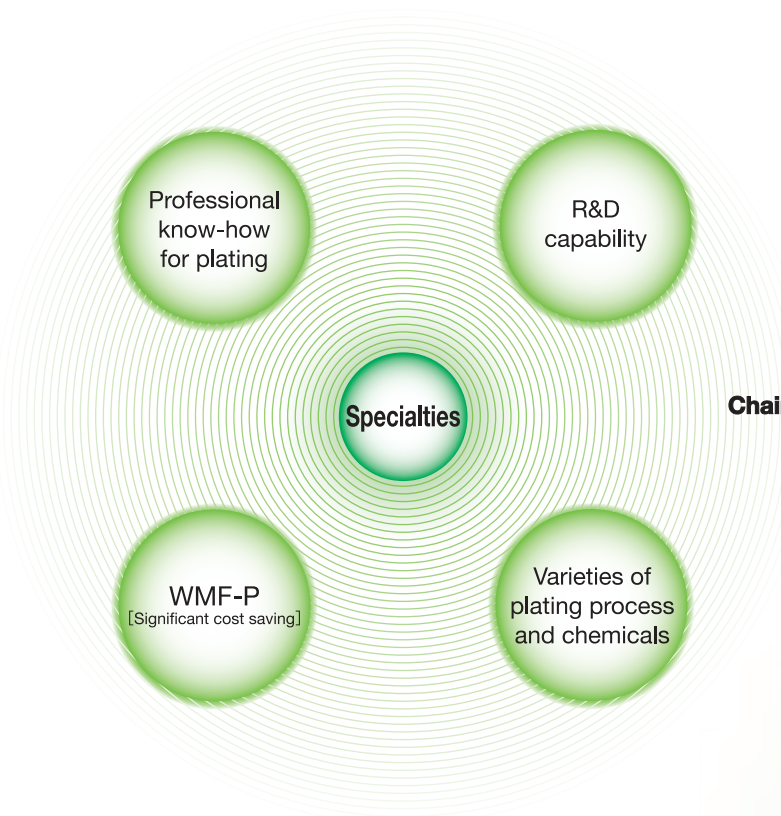
PROFILE OF WORLD METAL

High Technology & Cost Down

We continue to offer new surface treatment technology in sequence

We, WORLD METAL CO.,LTD., aim at the R & D oriented company. We are the high technology venture in surface treatment industry. We have hitherto devoted by our selves and have contributed to such epoch making big technical innovation of semi-conductors and electronics industries as IC, LSI, etc. by developing and offering a new plating process and plating chemicals for them. Plating is situated in such interdisciplinary sphere in the industries and is back-upped with a long term experience and several branches of academies. We, sincerely welcome your choice as your technical partner as we are well equipped with a long term experience and R & D capability.

Professional engineers group of the surface treatment industries



Company Profile

Name WORLD METAL CO., LTD.

Incorporated February 7th, 1980 (Business started :1978)

Capital paid up 10 Million Yen

Chairman and Director HAYASHIDA Hidenori
(STA Authorized technical professional)

President & CEO HAYASHIDA Hiroyuki

Directors HAYASHIDA Chikako
HAYASHIDA Kuniaki

Address No.1-29 Imagome 2-Chome,
Higashi-Osaka City, Osaka, Japan

Employee 50

Business ① R&D, manufacturing and sales of surface treatment chemicals

② R&D for new plating process for new materials

③ Designing, manufacturing and sales of plating plant, equipment and waste water treatment plant

④ To be assigned manufacturing of plating chemicals from customers under OEM contract

⑤ Joint R & D for new technology

⑥ To supply materials and know-how to the customers for allowing customer's in-plant manufacturing of the plating chemicals under WMF-process technology

Offices KANTO Sales office
TOKAI Sales office
Recycle Division (TOKYO)



"WORLD METAL CO.,LTD."





History

Industrial Patents

Major Suppliers

Bankers

**Our Customers
and Their
Industrial Sectors**

History

1978 Business started

1980 Incorporated WORLD METAL CO., LTD.

1987 Opened KANTO Sales office to cover north east Japan

1993 Opened TOKAI Sales office to cover middle Japan

1999 Centralized head quarter, R & D division and manufacturing factory in Higashi-Osaka City

2000 Opened KYUSHU Sales office to cover south Japan

2001 Started manufacturing chemicals in Korea

2003 Started manufacturing chemicals in Taiwan and Philippines

Obtained ISO-9001 certificate

2004 Started manufacturing chemicals in China

2005 Completed arrangement for RoHS requirements

2007 Opened business office in Thailand

Introduced KES (environmental management system)

2008 Nominated as the financial aid approved enterprise from government bureau : METI
(Ministry of economy, trade and industry)

Industrial Patents

67 Patents including such patents applied for both in Japan and overseas countries

Major Suppliers

Sumitomo Corporation

Hayakawa & Co., Ltd.

Nippon Chemical Industrial Co., Ltd.

Rhodia (Japan) Co., Ltd.

BASF

Yoneyama Yakuhin Kogyo Co., Ltd.

Bankers

Mitsubishi Tokyo UFJ Bank, Ltd. / The Nanto Bank, Ltd.

Our Customers and Their Industrial Sectors

- ① IC, LSI Semi-conductors and Electronic Parts
- ② PCB (Printed Circuit Boards)
- ③ EMI (Electromagnetic Wave Shields)
- ④ Moulds and Rolls
- ⑤ Stationery and OA equipment
- ⑥ Automobiles
- ⑦ Steelworks, Rolls, Hoops and Furnaces
- ⑧ Decorative and display items
- ⑨ LCD, PDP and CRT
- ⑩ Ceramics



Major Products
[Plating Chemicals]

- Electroless Nickel plating chemicals (Ni-P)
- WMF process (customer's in-plant chemical blending)
- 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 patterns and common use
- Lead free and heavy metal free electroless Nickel-Boron plating chemicals (Ni-B)
- Electroless plating chemicals for special applications (Tungsten containing film plating and Cobalt alloy plating)
- Brightener for electrolytic Nickel plating
- Special electrolytic Nickel plating chemicals
- Electroless and electrolytic Copper plating chemicals
- Electroless and electrolytic Gold plating chemicals
- Electroless and electrolytic Silver plating chemicals
- Other sorts of electroless plating and electrolytic plating chemicals
- Electroless Gold plating equipment
- Conditioners, cleaning chemicals, degreasing chemicals and supplementary agents
- 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
- 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
- Plating process, plating equipment, joint research for new technologies and processing for testing, recovering of Gold and precious metals



Major Plating Processes Established

- 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_2O_3 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 (Al₂O₃, SiO₂, 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 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)

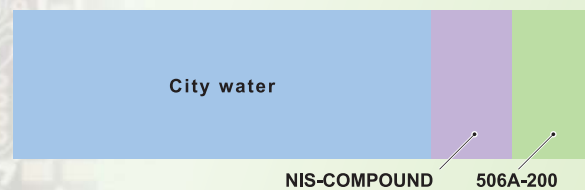
WMF process [Customer's in-plant chemical blending]

WMF process is to supply the customers with our manufacturing know-how allowing the customers to manufacture our products in customer's factory site for their own use. WMF process is recommended to such customers whose chemical consumption is over a certain level and can expect so big cost saving specially for such chemicals as electroless Nickel plating chemicals and we have established more than 50~60 customers who have been enjoying so significant cost cutting merits.

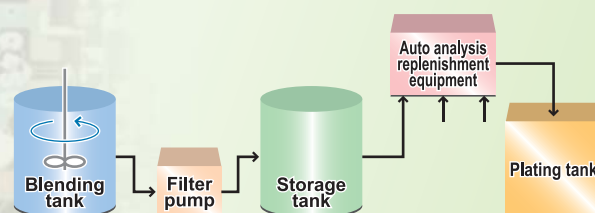
Specialties

- ➔ Can contribute customer's cost down for plating chemicals by 30~60%
- ➔ 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 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 plating chemicals to their overseas factories
- ➔ Can reduce cost for packing materials
- ➔ We assure our technical guidance shall be in perfect condition

■ ex. LINDEN 506-2, Ni replenishment



■ WMF process equipment (3 replenishments → 3 systems)



Major Selling Items
Major Customers

Major Selling Items

Electrolytic Nickel Anode (Plate, Coin-Shaped and Pellet)
 Copper Anode (Electrolytic, Phosphorous and OFC)
 Nickel Sulfate, Nickel Chloride, Boric Acid, Copper Sulfate
 Organic Acid (Malic Acid, Citric Acid, Succinic Acid and Lactic Acid)
 Sodium Gluconate, EDTA, Rochelle Salt (Potassium Sodium Tartrate)
 Sodium Hydroxide, Sodium Hypophosphite, Potassium Pyrophosphate

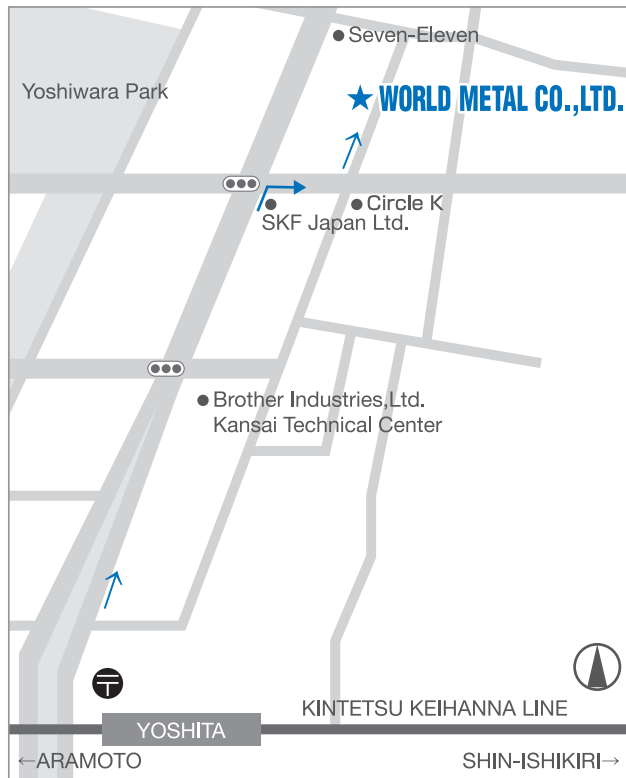
Major Customers

AIST (Advanced Industrial Science and Technology)	Nikon Corporation
Akebono Brake Industry Co., Ltd.	Nippon Electric Glass Co., Ltd.
Asahi Glass Co., Ltd.	Nippon Inter Electronics Corporation
Asahi Kasei Corporation	Nippon Steel Corporation
Asahi Techno Glass Corporation	Nisshinbo Industries, Inc.
Canon Inc.	NITTO DENKO Corporation
CITIZEN	Olympus Corporation
Denki Kagaku Kogyo Kabushiki Kaisha	Osaka University
DENSO Corporation	Panasonic
Fuji Electric Group	ROHM Co.,Ltd.
Fujikurakasei Co., Ltd.	SANYO Electric Co., Ltd.
FUJITSU	Seiko Epson Corporation
Hitachi, Ltd.	Seiko Instruments Inc.
Hitachi Metals, Ltd.	Shinko Electric Industries Co., Ltd.
Kawasaki Microelectronics Inc.	SONY Corporation
Kobe University	Sumiden Fine Conductors
Koito Mfg. Co., Ltd.	Sumitomo Electric Industries, Ltd.
KYOCERA	Sumitomo Metal Industries, Ltd.
Mitsui & Co., Ltd.	TDK
Mitsubishi Chemical Corporation	TOKUYAMA Corp.
Mitsubishi Electric Corporation	TORAY Industries, Inc.
N.E. Chemcat Corporation	TOSHIBA Corporation
Nagase & Co., Ltd.	TOSOH Corp.
NEC Corporation	TOTO Ltd.
NGK Insulators, Ltd.	Toyo Kohan Co., Ltd.
NGK Spark Plug Co.,Ltd.	Other many Plating Industries.
Nihon Yamamura Glass Co., Ltd.	

OSAKA ACCESS

KINTETSU KEIHANNA LINE [YOSHITA]

10 minutes from the third exit.



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TOKAI

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TOKYO [Recycle Division]

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