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**Glossary of terms used
in electroplating and related
processes**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS H 0400 : 1982** is replaced with **JIS H 0400 : 1998**.

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Glossary of terms used in electroplating and related processes

Introduction This Standard is the Japanese Industrial Standard prepared based on **ISO 2079**, *Surface treatment and metallic coatings—General classification of terms* published in 1981 as the second edition and **ISO 2080**, *Electroplating and related processes—Vocabulary* published in 1981 as the second edition, in such a manner that the terms and definitions specified in these International Standards are contained without modifying the technical contents and those not specified in these International Standards are added as a part of this Japanese Industrial Standard.

1 Scope This Japanese Industrial Standard specifies principal terms and definitions used in electroplating and related processes.

Remarks : The International Standards corresponding to this Standard are given below.

ISO 2079 : 1981 *Surface treatment and metallic coatings—General classification of terms*

ISO 2080 : 1981 *Electroplating and related processes—Vocabulary*

2 Classification of terms The terms used in electroplating and related processes are shown classified into eight areas given below.

- a) General
- b) Processing agents and equipment
- c) Grinding and preconditioning
- d) Plating process
- e) Post treatment
- f) Related surface processing
- g) Treatment of waste water
- h) Test and inspection

3 Terms and definitions Terms and definitions shall be as stated below.

English equivalents are shown for information.

Remarks : When two or more terms are stated side by side, the stated order means the precedence.

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a) General

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1001	表面処理	HYOUMEN-SYORI	To modify the surface of a material. Informative reference : To modify the character of surface or to add new function by changing the conditions of the surface.	surface treatment, surface finishing
1002	化学めっき法	KAGAKU- MEKKIHOU	A method to deposit a metal coating on a metal or non-metallic surface chemically. Informative reference : There are displacement method, chemical reduction method and thermal decomposition method. The displacement method is classified into immersion plating and contact plating, and the chemical reduction method into autocatalytic plating and non-autocatalytic plating.	chemical plating, electroless plating
1003	化成処理	KASEI-SYORI	Chemical or electrochemical process of producing a stable compound or a metal surface. Informative reference : There are phosphating, chromating, blackening, etc.	conversion treatment
1004	拡散処理	KAKUSAN-SYORI	a) Process of producing a surface layer by diffusion of another metal or non-metal into the surface of the substrate. b) In electroplating, heat treatment applied to a work piece to achieve alloying or inter-metallic compound formation between coating and base metal or between two or more coatings.	diffusion treatment
1005	熔融めっき法	YOUYU-MEKKIHOU	Process of obtaining a metal coating on the surface by dipping the work piece into a bath of molten metal.	hot dip metal coating, hot dipping

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1006	金属被覆	KINZOKU-HIMAKU	General term denoting all metal coatings obtained by any method.	metal coating, metallic coating
1007	電気分解, 電解	DENKI-BUNKAI, DENKAI	An operation to cause chemical change in such a manner that a pair of electrodes are immersed into an ion conductor like an electrolyte and a current is passed through the electrolyte.	electrolysis
1008	電解析出, 電析	DENKAI- SEKISYUTU, DENSEKI	The process of depositing a substance upon an electrode by electrolysis. Informative reference : In this process, generation of hydrogen gas, deposition of metals, deposition of polymer membrane, etc. are included.	electrolytic deposition, electrodeposition
1009	電着	DENTYAKU	Formation of a substance by adhesion on an electrode due to electrolysis.	electrodeposition
1010	電析結晶	DENSEKI-KESSYÔ	Formation of crystal metal or metal oxide on an electrode, in electrolytic deposition.	electrocrystallization
1011	電気めっき法	DENKI-MEKKIHO	A process to deposit a metal on the surface of a metal or non-metal electrochemically.	electroplated coating, electroplating
1012	貴金属	KI-KINZOKU	A metal with a high positive electrode potential as compared with that of the normal hydrogen electrode. Informative reference : A metal which is not easily ionized, therefore not easily dissolved is called nobler. For example copper is nobler than zinc, and gold is nobler than copper or zinc.	noble metal
1013	卑金属	HI-KINZOKU	A metal with a lower positive electrode potential as compared with that of the normal hydrogen electrode.	base metal

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1014	酸化	SANKA	A reaction in which a substance combines with oxygen.	oxidation
1015	還元	KANGEN	A reaction in which a substance combines with hydrogen or a part or whole of oxygen in an oxide or a chemical compound including oxygen is removed.	reduction
1016	アニオン, 陰イオン	ANION, IN-ION	A negatively charged ion.	anion
1017	カチオン, 陽イオン	KATION, YOU-ION	A positively charged ion.	cation
1018	電解質	DENKAISITU	A substance which is dissolved in a solvent like water and ionized, and the solution has electric conductivity and causes an electrolytic phenomenon when a current is passed through it.	electrolyte
1019	電気流動	DENKI-EIDOU	Such a phenomenon that charged particles in a solution transfer due to potential gradient.	electrophoresis, cataphoresis
1020	イオン移動, イオン流動	ION-IDOU, ION-EIDOU	Such a phenomenon that ions transfer when a current is passed through an electrolyte.	ion transference, ion transport, ion migration
1021	輪率	YURITU	The proportion of the total current carried by a specific ion when a current is passed through an electrolyte.	transference number, transport number
1022	錯塩	SAKUEN	A compound salt of consisting of two or more single salts which is dissociated into complex ions but does not produce ions of its constituents when it is dissolved into water.	complex salt
1023	錯イオン	SAKUION	An ion which is produced when an electrolytic complex salt is dissociated.	complex ion

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1024	複塩	HUKUEN	A compound salt consisting of two or more single salts which is dissociated into the ions of its constituent salts when it is dissolved into water.	double salt
1025	電導度塩	DENDOU DO-EN	A salt added to an electrolyte to increase its electric conductivity.	conducting salt, electric conducting salt
1026	キレート化合物	KIRÉTO- KAGOU BUTU	A compound in which the metal atom forms part of a ring structure and is not readily dissociated into ions.	chelate compound
1027	電極	DENKYOKU	A term denoting anode or cathode.	electrode
1028	陽極	YOU-KYOKU	a) An electrode at which a metal dissolves electrochemically. When the metal is not dissolved, the electrode at which anions (negative ions) are discharged. b) The object which performs these functions.	anode
1029	陰極	IN-KYOKU	An electrode at which precipitation of metal or hydrogen occurs electrochemically.	cathode
1030	酸化還元電位, 平衡電位	SANKA-KANGEN- DEN'I HEIKÔ-DEN'I	The potential which appears when the electrode reaction of a single oxidation-reduction system is balanced.	oxidation-reduction potential, redox potential
1031	バイポーラ電極	BAIPÔRA- DENKYOKU	A conductor immersed in the electrolyte between the anode and the cathode but not connected to the power supply which acts like electrodes.	bipolar electrode
1032	分極	BUNKYOKU	Deviation of potential from the natural potential caused at an electrode during electrolysis.	polarization
1033	アノード分極	ANÔDO-BUNKYOKU	The polarization at an anode	anode polarization
1034	カソード分極	KASÔDO- BUNKYOKU	The polarization at a cathode.	cathode polarization

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1035	減極	GENKYOKU	A decrease in the polarization of an electrode.	depolarization
1036	アノード反応, 陽極反応	ANÔDO-HANNOU, YOUKYOKU-HANNOU	A reaction such as the discharge of anions, dissolution of metals and oxidation which occurs at an anode in an electrolysis.	anode reaction
1037	カソード反応, 陰極反応	KASÔDO-HANNOU, INKYOKU-HANNOU	A reaction such as the discharge of cations and reduction which occurs at a cathode in an electrolysis.	cathode reaction
1038	陽極酸化	YOUKYOKU-SANKA	An oxidation reaction which appears on the surface of an electrode due to an anodic treatment.	anodic oxidation
1039	拡散層	KAKUSANSOU	In electrolytic processing, the thin layer of the solution which is in contact with an electrode and differs in its concentration from that of the bulk of the solution due to transfer of substance caused by diffusion.	diffusion layer
1040	アノード皮膜	ANÔDO-HIMAKU	a) Solid film formed on the anode during electrolysis. b) In electrolytic processing, the thin layer of the solution which is in contact with the anode and differs in its concentration from that of the bulk of the solution.	anode film
1041	カソード皮膜	KASÔDO-HIMAKU	In electrolytic processing, the thin layer of the solution which is in contact with the cathode and differs in its concentration from that of the bulk of the solution.	cathode film
1042	電流濃度	DENRYÛ-NOUDO	Current intensity per unit volume of the electrolyte.	current concentration
1043	電流密度	DENRYÛ-MITUDO	Current intensity per unit surface area of the electrode.	current density
1044	臨界電流密度	RINKAI-DENRYÛ-MITUDO	The upper limit and lower limit of the current density by which normal film is formed (in electroplating).	critical current density
1045	限界電流密度	GENKAI-DENRYÛ-MITUDO	The maximum value of current density above which the current density does not increase even when the voltage is increased because the supply of ions by diffusion becomes the limit.	limiting current density

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1046	電流効率	DENRYŪ-KOURITU	The ratio of the current used for the aimed electrode reaction to the current passed. Informative reference : The ratio of actual precipitation (or dissolution) to the theoretical precipitation (or dissolution) is expressed as a percentage.	current efficiency
1047	アノード効率, 陽極効率	ANŌDO-KOURITU, YOUKYOKU-KOURITU	Current efficiency of a specified anodic process.	anode efficiency
1048	カソード効率, 陰極効率	KASŌDO-KOURITU, INKYOKU-KOURITU	Current efficiency of a specified cathodic process.	cathode efficiency
1049	過電圧	KADEN'ATU	The difference between the electrode potential under actual electrolysis and the equilibrium electrode potential. Informative reference : There are hydrogen overvoltage, oxygen overvoltage, activation overvoltage, concentration overvoltage, etc.	overvoltage
1050	水素過電圧	SUIISO-KADEN'ATU	Overvoltage in hydrogen producing reaction.	hydrogen overvoltage
1051	酸素過電圧	SANSO-KADEN'ATU	Overvoltage in oxygen producing reaction.	oxygen overvoltage
1052	電流分布	DENRYŪ-BUNPU	Profile of current passing through each position of an electrode.	current distribution
1053	ハルセル	HARUSERU	An electrolytic cell of special shape to observe the effects on electrode surface over a wide range of current densities.	Hull cell
1054	電解液, 電解質溶液	DENKAIEKI, DENKAISITU-YOUEKI	A solution prepared by dissolving an electrolyte with a solvent such as water.	electrolytic solution

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1055	陽極液	YOUKYOKUEKI	In a divided cell, the portion of electrolyte on the anode side of the diaphragm.	anolyte
1056	陰極液	INKYOKUEKI	In a divided cell, the portion of electrolyte on the cathode side of the diaphragm.	catholyte
1057	めっき浴	MEKKIYOKU	A plating vessel in which an electroplating solution is filled.	plating bath
1058	素地	SOZI	A material upon which coatings are deposited or formed.	basis material, basis metal
1059	下地	SITAZI	A material upon which a coating is directly deposited. Informative reference : For a single coating the substrate is identical with the basis material. For multilayer plating the intermediate coating is called the substrate.	substrate
1060	核生成	KAKUSEISEI	In electroplating on non-conductive substrate, the preplating step in which a catalytic material adsorbed onto the surface of the substrate to act as sites for the initial stages of deposition.	nucleation
1061	析出電位	SEKISYUTU-DEN'I	In electrocrystallization or electrodeposition, the potential at which the deposition of solid product begins.	deposition potential
1062	電気めっき範囲	DENKIMEKKI-HAN'I	The current density range over which a satisfactory electro-deposition can be obtained.	deposition range, electroplating range, plating range
1063	一次電流分布	ITIZI-DENRYŪ- BUNPU	The distribution of the current over the surface of an electrode which would be expected from geometrical considerations alone.	primary current distribution
1064	被覆力	HIHUKURYOKU	The ability of an electroplating solution under a given set of conditions, to deposit metal initially over the entire surface of the cathode.	covering power

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1065	レベリング, 平滑能	REBERINGU, HEIKATUNOU	The ability of an electroplating solution to make the micro roughness, scratch by grinding, etc. on the basis material smooth. It is also called smoothing action.	levelling, (USA, leveling)
1066	均一電着性, マクロスローイングバ ワー	KIN'ITU- DENTYAKUSEI, MAKURO- SURÔINGU-PAWÂ	The ability of an electroplating solution to make the thickness of coating uniform.	throwing power, macrothrowing power
1067	微視的均一電着性, ミクロスローイングバ ワー	BISITEKI-KIN'ITU- DENTYAKUSEI, MIKURO- SURÔINGU-PAWÂ	The ability of an electroplating solution under a specific set of conditions to deposit metal sufficiently on pores or scratches.	microthrowing power
1068	めっき分布, 金属分布比	MEKKI-BUNPU, KINZOKU-BUNPUHI	The ratio of the thickness of deposited metal upon two specified areas of a cathode.	metal distribution ratio
1069	不動態	HUDOUTAI	Special surface conditions of metal surface under which the dissolution or reaction is suspended chemically or electro-chemically.	passivity, passive state
1070	不動態化	HUDOUTAIKA	Imparting passivity to a metal surface.	passivating, passivation, passivate
1071	活性化	KASSEIKA	a) Elimination of a passive surface condition to increase chemical reactivity of the surface. b) In a process to deposit the metal on a non-conductive basis material, the treatment by which the catalytic metal is adsorbed on the surface.	activation
1072	光沢電気めっき	KOUTAKU- DENKIMEKKI	A process that produces an electrodeposit having a high degree of specular reflectivity in the as-plated condition.	bright electroplating

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1073	光沢電気めっき範囲	KOUTAKU-DENKIMEKKI-HAN'I	The range of current densities with which bright electroplating can be obtained under a given set of operating conditions.	bright electroplating range
1074	光沢浸せき法	KOUTAKU-SINSEKIHO	Brief immersion in a solution of various constituents to produce a bright surface on a metal.	bright dipping
1075	化学光沢処理	KAGAKU-KOUTAKUSYORI	Immersion of aluminum and its alloys into a solution to produce a bright surface. Informative reference : This is the term used in the UK.	chemical brightening
1076	水素ぜい性	SUIISO-ZEISEI	Such a phenomenon that ductility or toughness of the material to be coated decreases due to absorption of hydrogen in the process of pretreatment and coating treatment.	hydrogen embrittlement
1077	電着応力	DENTYAKU-ÔRYOKU	The tensile or compressive internal stress which is caused in the film due to electrodeposition.	stress of electrodeposits
1078	表面張力	HYOUMEN-TYÔRYOKU	In the interface where two phases are in contact with each other, the force which acts to decrease the contact area of the two phases.	surface tension
1079	アニーリング	ANÎRINGU	A heat treatment which is carried out at a certain temperature for the purpose of removing the strain due to formation or improving the adhesion.	annealing
1080	pH	pH	The logarithm of the reciprocal of a hydrogen ion concentration. Informative reference : This is used to show the alkali consumption or acid consumption of a solution or the like.	hydrogen ion concentration
1081	アノード腐食	ANÔDO-HUSYOKU	Dissolution of anode metal by the electrochemical action in the electrolytic cell or in the atmosphere.	anode corrosion

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1082	カソード防食	KASÔDO- BOUSYOKU	Method of reducing corrosion rate by making the work piece cathodic either by applying an external voltage or by making an electrical connection with a sacrificial anode.	cathodic protection
1083	犠牲防食	GISEI-BOUSYOKU	The form of cathodic protection whereby a metal is protected by corrosion of less noble metal with which it is in electrical contact.	sacrificial protection
1084	バレル法	BARERUHO	Mechanical, chemical or electrolytic treatment of articles in bulk in a rotating container.	barrel processing
1085	電鍍法	DENTYŪ-HOU	A method for producing, repairing or reproducing of metallic products by electroplating.	electroforming
1086	置換反応	TIKAN-HANNOU	A reaction by which atoms or a group of atoms included in a compound is replaced by other atoms or group of atoms.	substitution reaction
1087	イオン交換	ION-KOUKAN	Such a phenomenon that the ion of a certain substance is replaced by the ion of the solution, in an aqueous solution of a salt.	ion exchange
1088	ウイスカ	UISUKA	Microscopical monocrystalline metallic filamentary growth. Informative reference : It is produced naturally in storage or service, or sometimes in plating process. It is likely produced in tin plating or the like.	whiskers
1089	めっきの種類	MEKKI NO SYURUI	Classification of plating according to kind of metals and alloys used for the plating.	kind of plating
1090	めっきの構成	MEKKI NO KOUSEI	The sequence of kinds of successive platings which constitute a multilayer plating.	composition of plating
1091	めっきのタイプ	MEKKI NO TAIPU	In platings of the same kind, platings which are different in the character, form or method of plating.	type of plating

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1092	めっき有効面	MEKKI-YŪKOU MEN	Important surface for the service of the surface treatment.	significant surface
1093	使用環境	SIYOU-KANKYOU	Relating with decorative or corrosion preventive plating, the ambient atmosphere which directly or indirectly affects the product in the environment where the plated product serves.	service condition

b) Processing agents and equipment

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2001	添加剤	TENKA-ZAI	A material added to a plating bath or other solutions for the purpose of improving the characteristics of the plated film.	addition agent, additives
2002	光沢剤	KOUTAKU-ZAI	An addition agent that gives brightness to the plated film.	brightener, brightening agent
2003	錯化剤	SAKKA-ZAI	An addition agent that will combine with metallic ions to form complex ions.	complexing agent
2004	酸化剤	SANKA-ZAI	An addition agent to oxidize other substances.	oxidizing agent, oxidizer
2005	還元剤	KANGEN-ZAI	An addition agent to reduce other substances.	reducing agent, reducer
2006	緩衝剤	KANSYOU-ZAI	An addition agent that opposes changes in pH.	buffer
2007	界面活性剤	KAIMEN-KASSEI-ZAI	A substance used for improving wetting effects or for causing emulsion dispersion by reducing the surface tension of a liquid.	surface active agent, interfacial action agent, surfactant
2008	湿潤剤	SITUZYUN-ZAI	A substance that reduces the surface tension of a liquid, thereby causing it to spread more readily on a solid surface.	wetting agent

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2009	清浄剤, 洗浄剤	SEIZYOU-ZAI, SENZYOU-ZAI	A substance which assists in cleaning dirt such as oil and fat adhering on the surface of material.	detergent, cleaning agent, cleaner
2010	抑制剤, インヒビタ	YOKUSEI-ZAI, INHIBITA	A substance used for preventing rapid or local progress of chemical or electrochemical reaction. Informative reference : In plating this is used in pickling solution.	inhibitor
2011	乳化剤, エマルジョン剤	NYŪKA-ZAI, EMARUZYON-ZAI	A substance used to produce a stable emulsion.	emulsifying agent, emulsifier
2012	キレート剤	KIRÊTO-ZAI	A substance which forms a complex compound (chelate compound) of ring structure by combining with a metal ion.	chelating agent
2013	不溶性アノード	HUYOUSEI-ANÔDO	An anode which does not contribute metal ions to the electrolyte during electrolysis.	inert anode, insoluble anode
2014	補助極	HOZYOKYOKU	An auxiliary anode or cathode used for improving throwing power or covering power.	auxiliary electrode
2015	補助陽極	HOZO-YOUKYOKU	An auxiliary anode which is arranged in a part where current density is minimum and improves the current density distribution of the cathode.	auxiliary anode
2016	補助陰極, かぶり止め	HOZO-INKYOKU, KABURI-DOME	An auxiliary cathode which is arranged for improving the current density of the cathode. Informative reference : A cathode separate from the work piece is arranged at a position where the current is likely concentrated, for the purpose of uniforming the plated thickness or preventing burning of plated film.	auxiliary cathode, robber, thief, supplementary cathode

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2017	棒棒	KYOKU-BOU	A metallic bar which is the conductive part fixed to an electrolytic cell and leads the current to the anode or cathode from the busbar.	bar (anode or cathode), rod
2018	バスバ	BUSUBA	A rigid conductor for carrying the current from the power supply to the anode and cathode bars.	busbar
2019	アノードバッグ	ANÔDO-BAGGU	A bag which covers the anode so that the anode slime does not affect the material to be plated.	anode bag
2020	隔膜	KAKUMAKU	A porous or permeable film which divides anode and cathode compartments.	diaphragm
2021	シールド	SÎRUDO	a) A non-conducting barrier positioned to improve the current distribution on an anode or cathode. b) To alter the current distribution on an anode or cathode by the interpolation of a non-conductor.	shield
2022	分離セル	BUNRI-SERU	A cell containing a diaphragm or other means for physically separating the anolyte from the catholyte.	divided cell
2023	引っかけ, ジグ, ラック	HIKKAKE, ZIGU, RAKKU	A frame for supporting and carrying current to articles to be plated.	jig, rack, plating rack
2024	整流器	SEIRYŪKI	A device that converts alternating current to direct current.	rectifier
2025	脈動率, リップル	MYAKUDOURITU, RIPURU	Regular modulations in the d.c. output created by the characteristics of the source of supply.	ripple
2026	めっき防止材	MEKKI-BOUSIZAI	A material for stopping off of the electroplating in such a way that the material is applied to a part of the electrode or rack as the resist.	stop-off material, stopping off, masking material
2027	ダミー電極, ダミー	DAMÍ-DENKYOKU, DAMÍ	A cathode used for removal or decomposition of impurities in a plating bath.	dummy, dummy cathode