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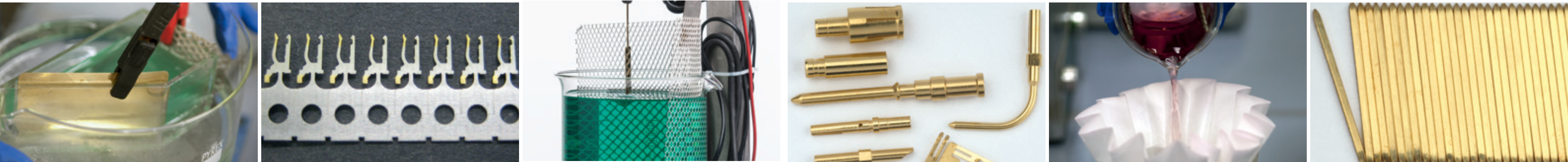
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METALOR®

METALOR®



Process Name	PPDS No.	PM Content g/L	Temperature °C	Current Density A/dm²	Hardness (Vickers)	pH	Decorative	Electronics	Other	Application	Features
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GOLD PROCESSES - CYANIDE BASED

MetGold 2010 VBS Series	10088/10095	1.5 - 4.0	30 - 40	0.05 - 0.2	140 - 180	4.1 - 4.5		●		Connectors	Acidic, cobalt/nickel hardened, improved thickness distribution
MetGold 2010 B Series	10087/10094	2 - 3	30 - 40	0.1 - 1.0	140 - 180	4.1 - 4.5		●		Connectors	Acidic, cobalt/nickel hardened, improved thickness distribution
MetGold 2010 VR Series	10085/10092	3.5 - 6.0	30 - 40	0.5 - 2.0	140 - 180	4.2 - 4.9		●		Connectors, PCBs, components	Acidic, cobalt/nickel hardened, improved thickness distribution
MetGold 2010 HS Series	10086/11171	6 - 10	30 - 60	1 - 60	140 - 180	4.2 - 4.9		●		Connectors, PCBs	Acidic, cobalt/nickel hardened, improved thickness distribution, high speed, reel-to-reel
MetGold 2010C (HS) RPC	10943	6 - 18	30 - 60	1 - 60	140 - 180	4.2 - 4.9		●		Connectors	Acidic, cobalt hardened, pore reduction, high speed, reel-to-reel
MetGold 3010C (HS)	11023	4 - 25	50 - 60	1 - 60	130 - 180	4.0 - 4.5		●		Connectors	Acidic, cobalt hardened, minimized immersion, high speed
MetGold 3010N (HS)	11090	8 - 25	50 - 60	1 - 60	130 - 180	4.0 - 4.5		●		Connectors	Acidic, nickel hardened, minimized immersion, high speed
MetGold FB7000	12002	3 - 10	45 - 60	10 - 50	130 - 180	4.0 - 4.4		●		Connectors	Cobalt hardened, high speed for selective plating, reel-to-reel
MetGold FB7000NI	12012	3 - 10	45 - 60	10 - 50	130 - 180	4.0 - 4.4		●		Connectors	Nickel hardened, high speed for selective plating, high speed, reel-to-reel
MetGold HEB Series	10060	3 - 6	27 - 45	0.1 - 1.6	120 - 180	4.0 - 4.5		●		Electronic, electrical components	Acidic, cobalt/nickel hardened, exceptionally high cathode efficiency, low gold concentration, fully analyzable
MetGold HES Series	10061/10065	6 - 16	35 - 60	0.5 - 100	120 - 180	4.2 - 4.8		●		Electronic, electrical components	Acidic, cobalt/nickel hardened, exceptionally high cathode efficiency, low gold concentration, fully analyzable, reel-to-reel
MetGold HS Series	10062/10068	2 - 16	35 - 60	5.0 - 50.0	120 - 180	4.0 - 5.0		●		PCBs, connectors, electrical components	Acidic, cobalt/nickel hardened, exceptionally high cathode efficiency, low gold concentration, fully analyzable, reel-to-reel
MetGold K130AF	12017	1	50	2	-	5.5		●		PCBs, FPCs	Strike plating, anti-fungus properties



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GOLD PROCESSES - CYANIDE BASED

MetGold K160D	12018	1	55	2	-	5.5		●		PCBs, FPCs	Strike plating on copper substrate
MetGold K185ST	10123	5 - 20	55	0.8 - 60.0	130 - 160	4.4		●		Switches, connectors etc.	Cobalt hardened, high speed, reel-to-reel
MetGold K186	10128	2 - 10	40 - 60	0.8 - 10.0	130 - 160	4.4 - 4.8		●		PCBs, FPCs	Cobalt hardened
MetGold K44	10126	8 - 10	65	1.0	80 - 120	6.3		●		PCBs, FPCs	Acid system for matt, pure gold deposits
MetGold K440	10127	8 - 10	75	16	80 - 120	6.7		●		Integrated circuits, leadframes etc.	Acid system for matt, pure gold deposits, high speed, jet, reel-to-reel
MetGold K700	10124	6 - 10	60 - 75	0.2 - 0.8	80 - 120	5.5 - 6.9		●		PCBs, FPCs	Acid system (uniform electrodeposition) for matt, uniform deposits
MetGold K720D	12019	5	65	0.5	80 - 120	6.3		●		PCBs, FPCs	Acid system for matt, pure gold plating on copper substrate
MetGold K76	12020	3	35	0.3	130 - 160	3.8 - 4.0		●		Switches, connectors	Cobalt hardened
MetGold Pure 99	10071	2 - 12	55 - 80	0.05 - 1.2	≤80	5.0 - 6.5		●		Semiconductors, PWBs	Exceptionally pure lustrous to semi-bright gold deposit
MetGold Pure 99-4R	10074	2 - 8	40 - 60	0.05 - 0.4	≤80	6.0 - 7.0		●		Semiconductors, PWBs	Exceptionally pure lustrous to semi-bright gold deposit, resistant to metallic impurities
MetGold Pure 99-54	12003	2 -24	50 - 60	0.05 - 0.4	≤80	5.5 - 7.0		●		Semiconductors, PWBs	Exceptionally pure lustrous to semi-bright gold deposit, ideal for fully aqueous dry film photo resist applications
MetGold Pure ATF	12004	5 - 15	55 - 70	0.5 - 20.0	90	5.5 - 7.0		●		Microelectronics	Arsenic free and thallium free, high speed
MetClad 2000 Series	10007	1 - 6	25 - 40	0.8 - 1.0	160 - 220	3.5 - 4.2	●			Leather fittings, luxury costume jewellery	23 - 24 karat gold deposits, wide colour range, mix 'n' match
MetClad CdF 18KR	10703	3 - 5	50 - 70	0.5 - 1.8	250 - 350	9.5 - 10.6	●			Quality costume jewellery, watch cases	Copper brightened, corrosion resistant



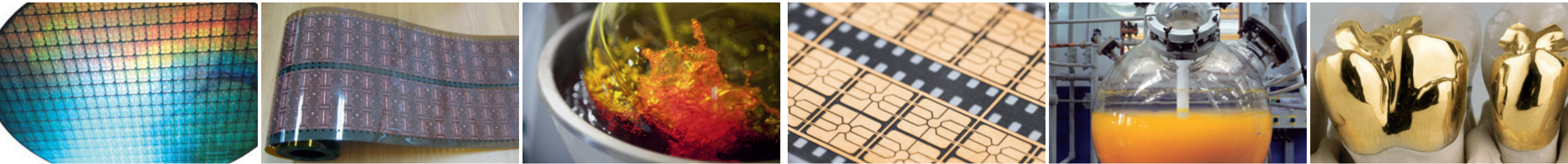
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GOLD PROCESSES - CYANIDE BASED

MetClad CdF 18KY	12005	4.5 - 5.5	65 - 70	0.6 - 0.8	400	9.8 - 10.2	●			Watch case	Cadmium free
MetClad NiF 2N	12006	3.5 - 4.5	35 - 40	0.5 - 1.0	220 - 280	3.4 - 4.0	●			General decorative	Nickel free
MetForm 18P	11108	5 - 7	65 - 72	0.5 - 1.5	200 - 400	9.8 - 10.8	●			Electroforming, conventional electroplating	Alkaline system for gold, copper, cadmium alloy
MetGild 2000 Series	11106	0.5 - 1.0	50 - 60	4 - 6 V	-	10.0 - 11.0	●			Gilding and flash	Nickel free, zinc, copper, silver brightened, Swiss colour standard, mix 'n' match
MetGold MPColor Series	10056	0.5 - 1.0	55 - 65	6 - 12 V	-	9.0 - 11.0	●			Gilding and flash	Nickel, copper, silver brightened, Swiss colour standard, 1N14 - 5N
MetGold MP109	10078	3 - 16	25 - 45	0.1 - 1.2	150 - 180	4.5 - 5.0	●	●		Contacts, decorative, PCBs	Cobalt brightened

GOLD PROCESSES - ELECTROLESS

Atomex	12016	0.5 - 7.5	70 - 100	n.a.	-	5.0 - 8.0	●	●		Decorative, electronic parts	Cyanide-based immersion process for nickel and copper underplating, solderability protection
Imex 510D	12021	3	80	n.a	-	6.0		●		Electronic parts	Cyanide-based immersion process for copper underplating, solderability protection
Ormex Series	10138/11109	1.0 - 6.8	90 - 95	n.a	-	5.0 - 5.2			●	SMD, microelectronic circuits	Cyanide-based immersion process for thin gold coatings on nickel underplating, solderability protection
Supermex 250	10144	1 - 3	55 - 75	n.a.	-	6.5 - 7.5		●		Semiconductor wafers, connectors, electronic components	Cyanide-free immersion process for nickel and palladium underplating
Supermex 880	12022	1.75 - 2.25	55 - 65	n.a	-	7.3		●		Semiconductor wafers, connectors, electronic components	Cyanide-free thick electroless plating process for gold underplating



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GOLD PROCESSES - CYANIDE FREE

MetGold ECF11	12008	13 - 17	57 - 63	0.2 - 1.2	40 - 130 40 - 70*	7.4 - 7.8		●		Gold bumps on silicon wafers	Sodium-sulphite based, low hardness after annealing
MetGold ECF33B	10340	10 - 15	52 - 56	0.2 - 1.0	40 - 110 40 - 70*	7.6 - 8.0		●		Gold bumps and line printing on silicon wafers	Sodium-sulphite based, low hardness after annealing
MetGold ECF66A	10159	10	45	0.5	100 - 140	7.2		●		Fineline printing on silicon wafers	Sodium-sulphite based, bright gold deposit
MetGold ECF7000	12014	13 - 17	55 - 59	0.4 - 1.0	40 - 130 60 - 80*	7.8 - 8.2		●		Gold bumps on silicon wafers	Sodium-sulphite based, low/mid hardness after annealing
MetGold ECF78N	12023	10	50	0.3	80 - 120	9.5		●		Fineline printing on silicon wafers	Sodium-sulphite based, bright gold deposit
MetGold ECF88K	10162	8 - 12	55 - 65	0.1 - 1.0	40 - 110 40 - 70*	7.6 - 8.0		●		Gold bumps and line printing on silicon wafers	Sodium-sulphite based
MetGold ECF9000	12024	15	57	0.4 - 1.0	80 - 110 80 - 110*	8.0		●		Gold bumps on silicon wafers	Sodium-sulphite based, high hardness after annealing
MetGold NCF500	10158	1	25	0.8	-	8.4		●		Gold bumps and line printing on silicon wafers	Sodium-sulphite based, strike gold plating on nickel substrates
MetGold NCF500D	12025	1	30	0.5 - 1.0	-	8.0		●		Gold bumps and line printing on silicon wafers	Sodium-sulphite based, strike gold plating on copper substrates
MetGold ECF64D	10149	12 - 18	50	0.3	120 - 180	9.1			●	Dental, industrial	Ammonium-sulphite based

* after annealing





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SILVER PROCESSES

MetSil 150	10197	20 - 50	15 - 25	0.1 - 3.0	100 - 120	>12	●	●		General decorative, cutlery, connectors, electronic components, microwave boxes	Cyanide based, for mirror bright, haze-free deposits
MetSil AG10	10203	60	20 - 25	20	100 - 120	13		●		Connectors, switches	Cyanide based, alkaline, bright hard deposits
MetSil AG20/AG30	12026/12027	80	40	7.0	80 - 120	13		●		Electronic components	Cyanide based, alkaline, bright deposits
MetSil CNF Series	11051/11137	20 - 34	17 - 40	0.1 - 1.2	100 - 120	9.8 - 10.2	●	●	●	General applications, photovoltaic cells	Cyanide free
MetSil Deco	10198	36	19-35	<2.5	120	-	●	●		Decorative, electronics	Cyanide based, non-metallic brightened
MetSil HCD	10212	50 - 80	60 - 70	45 - 220	100 - 120	8.0 - 10.0		●		Semiconductors, spot plating on leadframes	Cyanide based, slightly alkaline, high speed
MetSil K900/S900	10218/10346	40 - 80	40 - 80	20 - 110	-	8.0 - 9.0		●		Integrated circuits, leadframes etc.	Low cyanide, alkaline, matt deposits, high speed, reel-to-reel, selective
MetSil K930/S930	10219/12045	40 - 80	40 - 80	40 - 150	-	8.0 - 9.5		●		Integrated circuits, leadframes etc.	Low cyanide, alkaline, semi-bright deposits, high speed, reel-to-reel, selective
MetSil LED Bright AG20	12029	45 - 80	25 - 40	1.0 - 12.0	80 - 120	13		●		Electronic components for LED	Cyanide based, alkaline, bright deposits
MetSil LED Silver 4000	12030	40 - 80	40 - 65	30 - 150	-	8.5		●		LED substrates	Low cyanide, weakly alkaline, bright deposits
MetSil LED Silver 4100	12031	40 - 80	25 - 30	2 - 4	-	8.5 - 9.5		●		LED substrates	Low cyanide, weakly alkaline, bright deposits at low current density
MetSil N-Brite	10205	37.0	23	0.7 - 1.0	145 - 165	12.4	●	●		Decorative, electronics	Cyanide based, alkaline, bright, hard deposits
MetSil S940	10208	40 - 100	40 - 80	100 - 200	80 - 100	8.0 - 9.5		●		Integrated circuits, leadframes etc.	Low cyanide, alkaline, semi-bright deposits, high speed, reel-to-reel, selective
MetSil SP4000	10221	40 - 90	50 - 70	50 - 200	80 - 100	8.0 - 9.5		●		Integrated circuits, leadframes	Low cyanide, alkaline, semi-bright deposits, high speed, reel-to-reel, selective

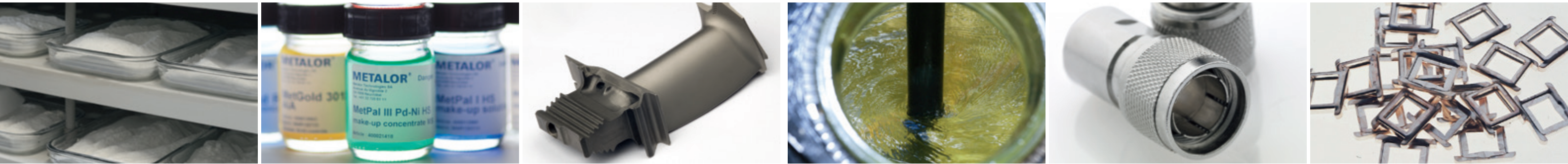


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PALLADIUM PROCESSES

MetPal 2000B	10163	1.5 - 2.5	20 - 35	0.3 - 1.0	400	7.8 - 8.5	●	●		General decorative, costume jewellery, electronic	Nickel free, neutral to mildly alkaline process for pure palladium plating of flash deposits
MetPal III Pure Pd Deco	10769	1 - 5	55 - 75	0.8 - 5.0	390 - 560	3.5 - 4.5	●			General decorative, jewellery	Patented, ammonia free, chloride free, pure palladium
MetPal III Pure Pd Strike	11115	1 - 4	55 - 75	1 - 15	390 - 560	3.5 - 4.5		●		Connectors, semiconductors	Patented, ammonia free, chloride free, pure palladium, high speed
MetPal Brite GB1	11113	2 - 12	30 - 65	0.25 - 1.50	400 - 550	7.0 - 8.0	●			General decorative	Nickel free, neutral to mildly alkaline, pure palladium, white, bright deposits
MetPal C	10176	8 - 12	32 - 40	0.5 - 2.7	290 - 480	6.8 - 7.5		●		Connectors and semiconductors	Chloride based, pure palladium
MetPal EPD	10193	2 - 6	40 - 60	-	400 - 550	1.5 - 2.5		●		PCBs, direct metallization of copper and solder pads	Sulphate based, electroless, pure palladium
MetPal LF800S	12034	4 - 6	35 - 50	1.5	-	8.0 - 9.0		●		Leadframes	Pure palladium, thin plating, good solderability, suitable for pre-plated frames, reel-to-reel
MetPal S	10178	10 - 20	35 - 46	0.2 - 2.2	200 - 240	6.0 - 9.5		●		Connectors, semiconductors, PCBs	Sulphate based, ductile, pure palladium
PallaMex 800	10862	1.5 - 2.5	50 - 75	-	-	5.5 - 6.5		●		PCBs, semiconductor wafers, positive photo resist	Electroless, alkalinescent, pure palladium, semi-bright deposits





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PALLADIUM ALLOY PROCESSES

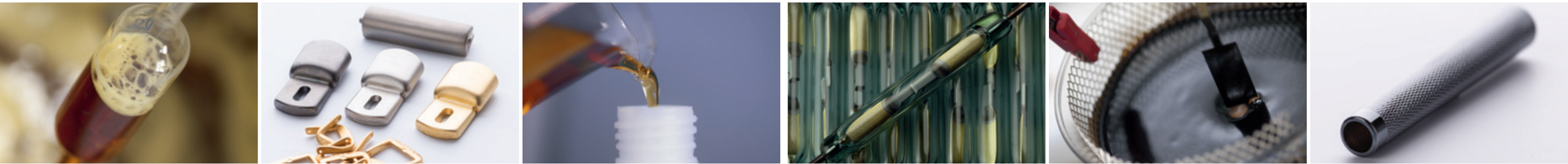
MetPal 820	10190	20	30	1	550	8.8	●	●		Decorative, industrial, electronics	Alkalescent, low ammonia, palladium-nickel alloy
MetPal 820HS	10192	20	35	50	550	8.0		●		Electronics, connectors	Alkalescent, low ammonia, palladium-nickel alloy, high speed, reel-to-reel
MetPal I HS	10184	18 - 22	30 - 35	3 - 50	390 - 560	7.8 - 8.5		●		Connectors, semiconductors	Chloride based, palladium nickel, high speed, jet, selective
MetPal I Pd-In D	12007	4 - 6	45 - 47	0.5 - 0.9	280	8.0 - 8.5	●	●		General decorative, electronics	Nickel free, palladium indium, jet, selective
MetPal II HS	11114	12 - 25	30 - 55	3 - 50	390 - 560	7.5 - 8.5		●		Connectors, semiconductors	Low ammonia, palladium nickel, high speed, jet, selective
MetPal III Pd-Ni HS	10183	10 - 23	60 - 75	25 - 60	390 - 560	3.5 - 4.5		●		Connectors, semiconductors	Patented, ammonia free, chloride free, palladium nickel, low to high speed, jet, selective
MetPal III Pd-Ni V&B	11126	3 - 5	55 - 75	1.5 - 2.5	390 - 560	3.5 - 4.5	●	●		Decorative, electronics	Patented, ammonia free, chloride free, palladium nickel

PLATINUM PROCESSES

Met-Pt 200S	11116	2 - 10	25 - 70	0.5 - 10.0	400	0.5 - 1.5	●	●		Variety of substrates under a variety of conditions	Bright, hard deposits
Met-Pt 209	10258	4 - 6	80 - 90	2 - 8	400 - 500	8.0 - 9.0		●	●	Aerospace turbine blades, titanium anodes	Matt, adherent, low-stress deposits

BASE METAL PROCESSES

MetWhite 100	11112	-	45 - 65	1 - 4	400 - 500	12 - 13	●	●		Decorative, electronic components	Cyanide based, white bronze, substitute for nickel as barrier layer or final contact finish
MetWhite 100 PbF	10705	-	55 - 70	0.5 - 3.0	-	13.4 - 14.0	●	●		Decorative, electronic components	Cyanide based, lead free, white bronze, substitute for nickel as barrier layer or final contact finish, RoHS compliance



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RHODIUM PROCESSES

MetBrush Rh	10645	20	20 - 30	-	750 - 900	<1.0	●			Jewellery	Brilliant white to grey deposits, brush
Met-Rh 225 Series	10248	4 - 6	50 - 60	0.25 - 2.0	700 - 900	0.5 - 1.5		●		Reed switches, semiconductor wafers, general electronics/industrial	Sulphate based, hard, ductile and low stress, matt to semi-matt deposits, up to 12 microns
Met-Rh 4040 D	12044	1 - 4	30 - 50	0.2 - 3.0	910 - 1080	0.5 - 1.5	●			Jewellery, watch cases, watch bands, spectacle frames	Sulphate based, extremely white, bright reflective deposits
Met-Rh 4040 E	10250	4 - 6	20 - 60	0.3 - 2.0	780 - 1080	0.5 - 1.5		●		PCBs, vacuum tube grids, semiconductors, reed switches	Sulphate based, compressively stressed, crack free, ductile, thick rhodium deposits
Met-Rh F100	11119	1.5 - 4.0	35 - 50	5 - 15	700 - 900	<1.0	●			Decorative	Sulphate based, flash deposits
Met-Rh FW	12035	2	40 - 70	5 - 15	700 - 900	<1.0	●			Decorative	Sulphate based, white bright deposits
Met-Rh S515W	12015	1.6 - 2.2	25 - 40	0.5 - 3.0	800 - 900	<1.0	●			Jewellery, watch cases, watch bands, spectacle frames	Ultra-white and bright flash deposits
Met-Rh W	10244	2 - 4	40	2	750 - 900	<1.0	●			Decorative	Phosphate based, flash and high grade deposits

RUTHENIUM PROCESSES

Met-Ru 2000	11125	3 - 20	50 - 70	0.5 - 2.0	600 - 900	1.0 - 1.9	●			General decorative	Hard, bright mirror type deposits, mix 'n' match, from grey to deep grey
Met-Ru 3000 Black	11019	5	60 - 70	2 - 5	-	0.1 - 0.5	●			General decorative	Bright, extra black deposits



Process Name	PPDS No.	PM Content g/L	Temperature °C	Current Density A/dm²	Hardness (Vickers)	pH	Decorative	Electronics	Other	Application	Features
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TREATMENTS

ChemiStrip NB Au stripper	12036	-	30 - 40	-	-	-	●	●	●	Selective gold plating	Gold stripping
ChemiStrip XO Cu stripper	10344	-	40	-	-	-	●	●	●	Strike plating	Copper stripping for iron-nickel substrates
Met-Cu Protect 100	12050	-	45 - 60	-	-	4.0 - 5.0	●	●	●	Chromium-free passivation of copper-plated products	Excellent copper after treatment agent for anti-tarnish
MetTreat 100 Au stripper	10322	-	18 - 50	-	-	12.0	●	●	●	Immersion stripping from copper, copper alloys, nickel and nickel alloys	Gold stripping, alkaline system with minimum attack on the base metal
MetTreat 300 Rh stripper	11044	-	70 - 80	1.0 - 1.5/piece	-	-	●			Electrolytic stripping from white gold alloys	Rhodium stripping, acidic system with minimum attack on the base metal
MetTreat 1000 Au sealant	12051	-	50 - 55	-	-	8.0 - 9.0	●	●		Additional assistance in corrosion protection by some sealing of pores in the gold deposit	Additional gold corrosion protection
MetTreat SuperDip A	10348	0.1 - 2.5	25 - 40	-	-	-		●		Silver-plated leadframes	Silver anti-immersion on copper, high speed, reel-to-reel
MetTreat PowerDip EW	10345	0.05 - 1.0	25 - 40	-	-	9.0 - 10.5		●		Silver-plated leadframes	Silver anti-immersion on copper, reel-to-reel
MetTreat SAG500	10342	-	20 - 60	0.2 - 25.0	-	9.2 - 10.5		●		Electrolytic stripping from silver-plated leadframes	Silver stripping
MetSil Protect 200/300	11123/12052	-	40 - 60	-	-	4.0 - 10.0	●	●	●	Chromium-free passivation of silver-plated products	Excellent silver after treatment agent for anti-tarnish
MetTreat LED Guard 88	12037	-	25	-	-	-		●		Silver after treatment for LED processes	Silver after treatment agent for wire bonding
MetTreat LED Guard H3	12038	-	40	-	-	-		●		Silver after treatment for LED processes	Silver after treatment agent for anti-tarnish
MetTreat LED Guard S1	12039	-	25	-	-	-		●		Silver after treatment for LED processes	Silver after treatment agent for anti-tarnish
MetTreat PET880	12040	-	25	-	-	-		●		Copper after treatment for LED processes	Copper after treatment agent for anti-tarnish