

ACABADOS FUNCIONALES

HIGH PHOSPHORUS ELECTROLESS NICKEL >10%P ALLOY

LNS = 134 g/L nickel concentrate, CM = Add own pH, CMP = pH self regulated NH₄OH

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright NiP alloy 10.5 - 12%P	ENOVA H10	General purpose system	6% AM/15% BH R: 6% AM/6%CM or 6% AM/6% CMP	RoHS compliant: <1000 ppm Pb
	ENOVA H10X	Matrix version of H10	4.5% LNS/ 10% 951BX (951 BXT for PTFE matrix chemistry) R: 4.5% LNS / 9.0%CH* *(CH = 367 g/L Hypo + 390 mL/L CX)	RoHS compliant: <1000 ppm Pb
	ENOVA 951 (H12 Europe)	Specialty version H10 - lower stabilizers for low loading / higher solution agitation	6% AM / 15%BH R: 6% AM / 6% CM	RoHS compliant: <1000 ppm Pb
	ENOVA 949	High deposition rate >12 microns/hr over all loading ranges. Improved Cu & brass initiation vs H10/H15. 6 g/L Ni & 38 g/L Hypo	6% AM / 15% B R: 6% AM / 6% CMP	RoHS compliant: <1000 ppm Pb
	ENOVA 949X	Matrix version of 949	4.5% LNS/ 10% BX R: 4.5% LNS / 9.0%CH* *(CH = 367 g/L Hypo + 390 mL/L CX)	RoHS compliant: <1000 ppm Pb
	ENOVA 950	Improved 949 system. Designed for better high thickness, low roughness, low stress deposits. 6 g/L Ni & 38 g/L Hypo	6% AM / 15% B R: 6% AM / 6% CMP	RoHS compliant: <1000 ppm Pb
Semi-bright / bright NiP alloy 10 – 12%P	ENOVA H14	Specialty version 949, brighter deposit, very high solution loading ready, higher stabilizer concentrations will not always meet RoHS compliance.	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	



Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright / bright NiP alloy 10 – 12%P	ENOVA H14X	Matrix version of H14. H14E allows use of Electrodialysis equipment with system	4.5% LNS / 10% BX R: 4.5% LNS / 9.0%CH** *(CH = 334 g/L Hypo + 390 mL/L CX)	
Bright NiP alloy 10.5 – 12%P	ENOVA 940 (H11 Europe)	Specialty bright version H10 system. Self pH regulated NH ₄ OH only	4.5%A / 15%BH R: 4.5%A / 9.0% CHP	
Semi-bright NiP alloy 11 - 13%P	ENOVA H15	Higher corrosion performance vs. H10/949 types. Replenishment option complete ammonia free version operation	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP or ammonia free 6% AM / 12% AFC	RoHS compliant: <1000 ppm Pb Full ammonia free available (AFC)
	ENOVA H15X	Matrix version of H15	4.5% LNS / 10% BX R: 4.5% LNS / 9.0%CH* *(CH = 334 g/L Hypo + 390 mL/L CX)	RoHS compliant: <1000 ppm Pb
	ENOVA GR 901	Production: Low Ni metal 3 g/L technology – based on H15 technology	3% AM / 9%B R: 3% AM / 3% CM or 3% AM / 3% CMP	Low metal operation. RoHS compliant: <1000 ppm Pb
	ENOVA 944	Specialty: Very high thickness. Up to 750 micron deposits. 4 g/L Ni and 40 g/L Hypo.	6% A / 15% B R: 9.0%A / 9%C	RoHS compliant: <1000 ppm Pb
	ENOVA 965	Specialty: Very high loading system (>2.5 dm ² /L)	6% AM / 15%BH R: 6% AM / 6% CM	
Semi-bright NiP alloy 10.5 – 12%P	ENOVA 993	Production: complete Lead free technology advanced stabilizer system	6% A / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	◦ Lead & Cadmium free Ammonia Free Option
Semi-bright NiP alloy 11.5 – 13%P	ENOVA 967	Specialty: Very high corrosion resistance applications only	6% AM / 15% BH R: 6% AM / 6% CM or 6% AM / 6% CMP	RoHS compliant: <1000 ppm Pb

◦ Meets ELV 2000/53/EC Annex II, June 2002, ROHS Directive 2002/95/EC and WEEE Directive 2002/96/EC



MEDIUM PHOSPHORUS ELECTROLESS NICKEL 4 - 9%P ALLOY

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-Bright Ni-P alloy 4 – 7%P	ENOVA EVEN MP	Improved ENOVA 163 technology platform for very hard, uniform, high deposit thickness (150 microns) with low compressive internal stress for shafts and rollers	6% AM / 15% B R: 6% AM / 6% CM	RoHS compliant <1000 ppm Pb
Bright NiP alloy 4 – 6%P	ENOVA 163	Very high deposit hardness at 770 - 820HV ₁₀₀ and heat treatable to 950 – 1000HV ₁₀₀ . Compressive stressed deposit, system >21 µm/h deposition rate	6% AM / 15% BH R: 6% AM / 6% CM or 6% AM / 6% CMP	
	ENOVA EF-163 (EF4 Europe)	User friendly lead and Cd free. Stabilized version of 163	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	◦ Lead and Cadmium free
	ENOVA EF-163	Variation 4 component replenishment of EF163, extended shelf life of concentrates.	6% MU / 15% B R: 6% AMT / 6% CMP	◦ Lead and Cadmium free
Low-bright NiP alloy 4 – 8%P	ENOVA EF-7	Specialty: Improved salt spray porosity resistance vs. EF8/EF9 type chemistry	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	
Semi-bright NiP alloy 4 - 8% P	ENOVA EF-7R	Specialty: brighter version of EF-7. 3 different replenishment options	6% AMR / 15% BR R: 6% AMR / 6% CMR add own pH 6% AMR / 6% CMPR self pH ammonia 6% AMR / 12% CMKR self pH carbonate	◦ Lead & Cadmium free Full ammonia free version available
Very Bright NiP alloy 4 – 8%P	ENOVA EF 516	Specialty: 4-component system version of EF9 for improved concentrate shelf life. Replenishment add own pH	6% 516MU / 15% B R: 6% A / 6% C	◦ Lead and Cadmium free

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
	ENOVA EF 520	Specialty: 4-component system improved tank stability when high solution loading or >50% production barrel plating. Add own pH	6% 520MU / 15% B R: 6% A / 6% C	◦ Lead and Cadmium free
Very Bright NiP alloy 4 – 8%P	ENOVA EF 520R	Self pH regulated version of EF520 – ammonium hydroxide	6% RMU / 15% RB R: 6% RA / 6% RC	◦ Lead and Cadmium free
Bright NiP alloy 5 – 7%P	ENOVA 570 (M13 Europe)	High speed version 540, >18 µm/h deposition, requires narrow control limits for best performance at abnormal operating conditions	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	
Semi-bright NiP alloy 5 – 8%P	ENOVA EF 581 (EF8 Europe)	Long solution life (> 8 MTO) without strike processing Al substrates. Bright version is EF9	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	◦ Lead & Cadmium free
	ENOVA EF 581X	Matrix version of EF 581	4.5% LNS / 15% BX R: 4.5% LNS / 6% CM* *(CM = 499 g/L Hypo + 580 mL/L CX)	◦ Lead & Cadmium free
	ENOVA EF 583	Improved 581 platform plating Cu alloys and stainless steel alloys. Bright version is EF592. If self pH regulated required, use EF583R.	6% AM / 15% B R: 6% AM / 6% CM	◦ Lead & Cadmium free
	ENOVA EF 583R	Further improved Cu alloys initiation vs EF583 Self pH regulated system version with either ammonia or carbonate pH regulation replenishment	6% AMR / 15% BR R: 6% AM / 6% CMPR – ammonia 6% AM / 12% CKR –carbonate self pH regulated	◦ Lead & Cadmium free Complete non-ammonia replenishment available

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Very bright NiP alloy 5 – 8%P	ENOVA EF-9	Bright Version of EF 581 (EF8) Platform Deposition >18 µm/h. Long solution life >12 MTOs. No stainless steel rack plating. Long solution life (> 8 MTO) without strike processing Al substrates	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP Specialty Make up/ Replenish: 6% AF/15%BK /12%CK for full non-ammonia. Electrodialysis equip. replenish using EF-9E	◦ Lead & Cadmium free Complete non-ammonia replenishment available
	ENOVA EF-9X	Matrix Version of EF-9	4.5% LNS / 15% BX R: 4.5% LNS / 6% CM* *(CM = 500 g/L Hypo + 580 mL/L CX) or 4.5% LNS / 9% CH* (CH = 334 g/L Hypo + 380 mL/L CX)	◦ Lead & Cadmium free
Semi-bright NiP alloy 5 – 9%P	ENOVA EF507	Specialty: 4-component system. Advanced stabilizer system for maximizing adhesion on zincated Al, passes 550F adhesion bake test. Self pH regulated only replenish	6% 507 MU / 15% B R: 6% AM / 6% CMP	◦ Lead and Cadmium free
Very bright NiP alloy 5 – 9%P	ENOVA EF-592 (EF92 Europe)	Improved EF9 platform plating Cu alloys and stainless steel alloys Deposition >18 µm/h. Improved plating on Cu alloys and stainless steel. For thick deposits, long life bath over Al. Special barrel plating performance replenishment chemistry (CMNB). Add your own pH only (For self pH regulate use EF592R)	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMNB	◦ Lead and Cadmium free

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Very bright NiP alloy 5 – 9%P	ENOVA EF-592R	Further improved Cu alloys initiation vs 592, Self pH regulated version of EF592	6% AMR / 15% BR R: 6% AMR / 6% CMPR	◦ Lead and Cadmium free
	ENOVA EF-594	Improved Cu alloy initiation vs EF592 Deposition >18 µm/h. Advanced stabilizer system- very good for thick deposits. Self pH regulated only (for add your own pH, use EF592)	6% AM / 15% B R: 6% AM / 6% CMP	◦ Lead and Cadmium free
Semi-bright NiP alloy 6 – 8%P	ENOVA 571 (M12 Europe)	Non-brightened version of 570 system	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	RoHS compliant: <1000 ppm Pb
	ENOVA 545 (M16 Europe)	Very stable, higher chelation than M14/M15, slower deposition, yet excellent for barrel plating	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	
Bright NiP alloy 6 – 8%P	ENOVA 546 (M17 Europe)	Bright version of 545	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP	
Full Bright NiP alloy 6 – 9%P	ENOVA GR 502	Low Ni metal 3 g/L technology – based on EF-9 type chemistry	3% AM / 15%B R: 3% AM / 3% CM or 3% AM / 3% CMP	Low metal operation. ◦ Lead & Cadmium free
Semi-bright NiP alloy 7 – 9%P	ENOVA 541 (M10 Europe)	Non-brightened version of 540 system	6% AM / 15% BH R: 6% AM / 6% CM or 6% AM / 6% CMP or 4.5% A / 9.0% CHP	RoHS compliant: <1000 ppm Pb
	ENOVA 541X	Matrix version of 541	4.5% LNS / 10% BX R: 4.5% LNS / 9.0%CH* *(CH = 334 g/L Hypo + 390 mL/L CX)	

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright NiP alloy 7 – 9%P	ENOVA M14	Higher chelation than 541/571, improved stability, >14 µm/h deposition	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP* (CMP component RoHS Compliant)	
Bright NiP alloy 7 – 9%P	ENOVA M15	Bright version of M14. Special replenishment system for deposition over Cu/brass substrates (M15T)	6% AM / 15% B R: 6% AM / 6% CM or 6% AM / 6% CMP or 6% AM / 6% CMT	
	ENOVA 551AF	For long life Al. High tolerance-potassium carbonate replenishment	6% AF-A / 10% AF-B. R: 6% AF-A / 10% AF-C	Full ammonia free operation system
Bright NiP alloy 7 – 9%P	ENOVA 540 (M11 Europe)	Very stable job shop system, >16 µm/h deposition.	6% AM / 15% BH R: 6% AM / 6% CM or 6% AM / 6% CMP or 4.5% A / 9.0% CHP	
Semi-bright NiP alloy 8 – 9.5%P	ENOVA 561	High Corrosion resistant, stable job shop chemistry for all applications	6% A / 15% B R: 6% A / 6% C	RoHS compliant: <1000 ppm Pb

^o Meets ELV 2000/53/EC Annex II, June 2002, ROHS Directive 2002/95/EC and WEEE Directive 2002/96/EC



LOW PHOSPHORUS ELECTROLESS NICKEL <4%P ALLOY

Characteristics	Process Name	Description / Key Features (Unless noted, systems operate at 6 g/L Ni & 30 g/L Hypo)	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright NiP alloy 1.5 – 4.0%P	ENOVA 241	High hardness deposit. Good corrosion resistance in Alkali's. Compressive stress deposits – high heat resistance. 5.4 g/L Ni, 22 g/L Hypo, pH 6.0 – 6.6. Wide operating temp range 66 – 88°C. Deposition rate 15-25 µm/h. Add own pH	4% A / 20% BH R: 4% AM / 8% CH	
Bright NiP alloy 1.5 – 4.0%P	ENOVA 242	Bright version of ENOVA 241. Add own pH	4% A / 20% BH R: 4% AM / 8% CH	
Bright NiP alloy 1.0 – 3.0%P	ENOVA 242X	Matrix version of 242 with lower P level in deposit	4% A / 10% BX / LPC2 at 15 g/L R: 4% AM / 8% CH** **(CH = 275 g/L Hypo + 437 mL/L CX)	
Semi-bright NiP alloy 1.0 – 3.0%P	ENOVA 243	High hardness deposit. Good corrosion resistance in Alkali's. Compressive stress deposits – high heat resistance. Self pH regulating.	6% MU / 15% B R: 6% AM / 6% CMP	◦ Lead and Cadmium free

COMPOSITE ELECTROLESS NICKEL SYSTEMS

Characteristics	Process Name	Description / Key Features	Operation parameters (Make-Up. R: replenish)	Ecology
Ni-P-PTFE Co-deposit 7 – 9%P 15 – 18% v/v PTFE	ENOVA 108	Low Friction coating, uniform distribution of PTFE particles throughout deposit thickness. Improved wear performance exposure to higher loads. Excellent stability. Deposition rate 5 – 10 µm/h	4.5% A / 15% BH / 4-6 g/L 108 dispersion R: 4.5% AM / 9% CH / 4.2 g/L 108 dispersion per MTO	
Ni-P-PTFE Co-deposit 10 – 11%P 20 – 25% v/v PTFE	ENOVA 110	Low Friction coating, provides higher PTFE deposit inclusion. Uniform distribution of PTFE particles throughout deposit thickness. Excellent stability. Deposition rate 5 -10 µm/h. Matrix version ENOVA 110 available	6.0% AM /15% BH / 4-6 g/L 110 dispersion R: 6.0% AM / 6.0% CM / 4.2 g/L 110 dispersion per MTO	RoHS compliant (<1000 ppm Pb)
Ni-P-Silicon carbide (SiC) very hard particle co-deposit 5 – 9%P 5 - 25% w/w SiC	ENOVA 102	For heavy wear loads. Selection of hard particle determines wear performance. Deposition rate 2 -3 times conventional processes with solution life 2 to 3 times conventional processes	6% A /15% B / Customer supplied dispersion needed to meet deposit requirement R: 6% A / 6% C	
Ni-P-Boron Nitride (BN) hard particle co-deposit 4 – 6%P 4 – 8% w/w BN	ENOVA KR	Very low CoF & improved performance vs. EN/PTFE coatings without reduction in hardness if heat treated. KR deposits reach > 850HV ₁₀₀ producing extremely slick abrasion and wear resistant coating. Up to 15 µm/hr deposition rate, operates like standard acid EN system. Hard Chromium Deposit Replacement	5% A /15% B / 10% Dispersion R: 5 % A / 10% C & 2 -3 % KR dispersion per MTO.	

SPECIALTY ELECTROLESS NICKEL SYSTEMS

Characteristics	Process Name	Description / Key Features	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright NiP alloy 4 – 9%P	ENOVA EF100	Alkaline Strike: Low temperature, 35 – 43°C operation. Ammoniated, specifically formulated to deposit a thin, uniform coating onto zincated Al substrates. Extends life of conventional EN. Operates 5.8 g/L Ni & 25 g/L Hypo	15% A / 5% C R: 10% B / 5% C	◦ Lead & Cadmium Free
	ENOVA 191	Alkaline Strike: Low temperature, 20 -35°C, (pH 9.5 – 11.0) for plastics and other non-conductors: ceramic / glass. Operates 3 g/L Ni & 15 g/L Hypo	3% A / 9% B R: 2.5% A / 5% C	Low metal and low temperature RoHS compliant (<1000 ppm Pb)
	ENOVA 192	Alkaline Strike: Low temperature: 21 – 43°C (pH 9.5 – 11). Ammoniated strike for Zn die cast or Al. Deposits 0.25 – 0.5 µm/10 min	18% A / 6% B R: 5% A / 10% C	RoHS compliant (<1000 ppm Pb)
	ENOVA 198	Alkaline Strike, Ammonia free, (pH 9 – 11) for Zn die cast and zincated Al. Eliminates need for copper cyanide strike. High tolerance for Zn and Al. Operates 3 g/L Ni & 15 g/L Hypo. Temp. 71 – 88°C	3% A / 10% B R: 2.5% A / 5.0% C	Ammonia free. RoHS compliant (<1000 ppm Pb)

Characteristics	Process Name	Description / Key Features	Operation parameters (Make-Up. R: replenish)	Ecology
Semi-bright NiP alloy 5.5 – 9%P	ENOVA IMAGEN Mg Process	Magnesium metallization process AZ91D alloy thixomolded or cast substrates. Only used with OPTIBOND Mg Pickle, Activator and Promotor prep system to provide proper metallization of Mg alloy surfaces. Operating temp 85 – 99°C.	6%A/ 15%B/ 20 g/L D R: 6% A / 6% C / 1–3 g/L D per MTO	RoHS compliant (<1000 ppm Pb)
Semi-bright NiP alloy 6 – 9%P	ENOVA 121	Acid (pH 3.5) chemistry hypo reduced (non-DMAB) for catalyzing brass and Cu substrates prior to applying other electroless Ni deposits. Good with stainless steel rack tips, excellent barrel activation. 77 – 93°C	12% A / 15% B R: 12% A / 6% C	
Semi-bright NiB alloy 1.5 – 4%B	ENOVA 103	DMAB reduced deposit for providing solderability and hardness/wear performance applications. Operates 4.5 g/L Ni & 1.5 g/L DMAB at pH 6.7 – 7.3. Deposits at 7 to 10 µm/h	20%A/ 2.5%B/ 7.5%C R: 7.5% A / 7.5% C	

TIN SYSTEMS

Characteristics	Process Name	Description / Key Features	Operation parameters (* = amount per 10,000 AH)	Ecology
Pure Tin, Matte	STARGLO MATTE	Electrolytic Sulfate Chemistry. Rack/barrel or high speed 0.1 – 27 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	WEEE, RoHS, and ELV threshold compliant.
	STARGLO MATTE	Electrolytic Fluoboric Chemistry: Rack/barrel or high speed 0.1 – 32 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	WEEE, RoHS, and ELV threshold compliant.
		Electrolytic MSA Chemistry Rack/barrel or high speed 0.1 – 54 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	WEEE, RoHS, and ELV threshold compliant.
	JUPITER 3000 NPF	Electrolytic Sulfate Chemistry. Rack/barrel	Replenisher: *3.0 – 5.0L	Nonyl-Phenol Free
Pure Tin, SATIN	STABAC 30	Immersion Tin, MSA Chemistry	See TDS documentation	
	STARGLO IT	Immersion Tin, Potassium Stannate Chemistry: single component system depositing onto Al and alloy substrates. Rack or barrel	Replenisher: 150 – 300 mL/L 60 – 70°C	WEEE, RoHS, and ELV threshold compliant.
	STARGLO IT-CU	Immersion Tin, MSA chemistry, Long life solderability. High build >1 µm for Cu substrates rack	Replenisher: 270 – 390 mL/L, 49 – 70°C	WEEE, RoHS, and ELV threshold compliant.
Pure Tin, SATIN/Matte	STABAC SATIN	Electrolytic Sulfate Chemistry. Rack or Barrel	Satin 1 (10 mL/L) @ 0.7 – 1.0 g/m ² Satin 2 (20 mL/L) @ 1.5 – 20. g/m ²	WEEE, RoHS, and ELV threshold compliant.
Pure Tin, Bright	STARGLO SN100	Electrolytic Sulfate Chemistry. Rack/Barrel or high speed: 0.5 – 27 A/dm ²	SN-1: 15-20 mL/L SN-2: 2.5 – 5.0 mL/L SN-3: 4.0 mL/L @ 2100 – 2650 AH/L	WEEE, RoHS, and ELV threshold compliant.
	STARGLO MSA HS	Electrolytic MSA Chemistry. High speed: >27 A/dm ²	MSA-1: -20 mL/L MSA- 2: -5.0 mL/L MSA- 3: -5.0 mL/L MSA- 5: 10 mL/L	WEEE, RoHS, and ELV threshold compliant.

Characteristics	Process Name	Description / Key Features	Operation parameters (* = amount per 10,000 AH)	Ecology
Pure Tin, Bright	STABAC CRYSTAL NPF	Electrolytic Sulfate Chemistry, Rack or barrel	*Base: 0.2 – 0.8L *Brightener 2.0 – 2.5L	Nonyl-Phenol Free
	STABAC 110 NPF	Electrolytic Sulfate Chemistry. Rack/barrel or high speed	*Base: 0.5 – 1.5L *Brightener: 1.0 – 1.5L	Nonyl-Phenol Free
	STABAC 150 NPF	Electrolytic Sulfate Chemistry. Rack/barrel	*Base: 0.25 – 1.0L *Brightener: 1.0 – 1.5L	Nonyl-Phenol Free
	STABAC 210 NPF	Electrolytic Sulfate Chemistry, Rack/barrel or high speed (former Jupiter 2000)	*210: 3.0 – 5.0L	Nonyl-Phenol Free
	STABAC 501	Electrolytic MSA Chemistry	See TDS for replenishment	
95/5 Tin Bismuth	STARGLO BIS-TIN	Electrolytic MSA Chemistry Rack/barrel or high speed 0.5 – 27 A/dm ²	Bis-Tin Additive: 40 – 50 mL/L 4000 – 5300 AH/L	WEEE, RoHS, and ELV threshold compliant.
90/10 Tin Lead, Matte	STARGLO MATTE	Electrolytic MSA Chemistry Rack/barrel or high speed 0.1 – 54 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	
		Electrolytic Fluoborate Chemistry. Rack/barrel or high speed 0.5 – 32 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	
90/10 Tin Lead, Bright	STARGLO MSA HS	High Speed electrolytic MSA Chemistry 10 – 43 A/dm ²	MSA 1: 20 mL/L MSA 2: 5 mL/L MSA 3: 5 mL/L @2650 AH/L	
	STARGLO MSA B/R	Electrolytic MSA Chemistry Rack/barrel 0.75 – 7.5 A/dm ²	MSA 1: 10-15 mL/L MSA 2: 5-10 mL/L MSA 3: 7.5-10 mL/L @2650 AH/L	
	STARGLO SN100	Electrolytic Fluoborate Chemistry. Rack/barrel or high speed 0.5 – 27 A/dm ²	SN-1: 12.5-17.5 mL/L SN-2: 12.5-17.5 mL/L @2100 - 2650 AH/L SN-3: 10-17.5 mL/L @2100 – 2650 AH/L	

Characteristics	Process Name	Description / Key Features	Operation parameters (* = amount per 10,000 AH)	Ecology
60/40 Tin Lead, Bright	STARGLO MSA B/R	Electrolytic MSA Chemistry Rack/barrel 0.75 – 3.2 A/dm ²	MSA 1: 5-15 mL/L MSA 2: 2.5-5 mL/L MSA 3: 2.5 -5 mL/L @2650 AH/L MSA 5: 10 mL/L @2650 AH/L	
	STARGLO MSA B/R	High Speed electrolytic MSA Chemistry 10 – 43 A/dm ²	MSA 1: 20 mL/L MSA 2: 5 mL/L MSA 3: 5 mL/L @2650 AH/L MSA 5: 10 mL/L @2650 AH/L	
		Electrolytic MSA Chemistry Rack/barrel 0.75 – 3.2 A/dm ²	MSA 1: 5-15 mL/L MSA 2: 2.5 -5 mL/L MSA 3: 2.5 -5 mL/L @2650 AH/L MSA 5: 10 mL/L @2650 AH/L	
60/40 Tin Lead, Matte	STARGLO MATTE	Electrolytic Fluoborate Chemistry. Rack/barrel or high speed 0.5 – 32 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	
		Electrolytic MSA Chemistry Rack/barrel or high speed 0.1 – 60 A/dm ²	Matte additive: 40 – 50 mL/L 4000 – 5300 AH/L	

STRIPPING SYSTEMS

Characteristics	Process Name	Description / Key Features	Operation parameters	Ecology
Alkaline – Immersion	DEMETAL SCN-NI	Strips EN deposits from steel, stainless steel, tin, silver, brass and Cu plated Al or Cu plated Zn die cast	A: 200 mL/L B: 200 mL/L pH > 9.0 40-80°C	Non-Cyanide
Acid - Immersion	DEMETAL STR	Strips Tin and Tin/Pb deposits off of Cu substrates	Ready to use concentrate 20-35°C	
Neutral – Electrolytic Anodic	DEMETAL TEL	Strips Cu, Br Ni, Satin Ni, & Cr deposits from 316 stainless steel rack contacts	A: 100 mL/L B: 20 mL/L pH: 6 – 7 Temp: 40-60°C 20 – 50 A/dm ²	Non-Cyanide
Alkaline - Immersion	DEMETAL Universal	Strips electrolytic Ni from stainless steel, brass and Cu surfaces	Universal Ni: 250 g/L Ammonia: 300 mL/L pH: 8.5 – 9.5 55-60°C	Non-Cyanide
Alkaline - Immersion	DEMETAL EN	Strips EN deposits and Ni deposits from steel, stainless steel, brass & Cu	A: 350 mL/L B: 100 g/L pH: >10 80-90°C	Non-Cyanide
Alkaline - Immersion	ENOVA NISTRIPR (ENOVA NISTRIP 501)	Strips EN deposits and Ni deposits from steel, stainless steel, Kovar, Ti (use A & B) or brass and Cu alloys (use A & C)	A: 330 mL/L B or C: 60 g/L pH: 12 – 13 80-90°C	Non-Cyanide
	COV-STRIP SM60 Option 1	Strips Ni, Brass, Cu, Zn, Cd and Ag deposits from ferrous substrates	SM 60: 60 g/L Sodium Cyanide: 150 g/L pH: > 11.5 25-60°C	
	COV-STRIP SM60 Option 2	Strips Tin & Tin/Pb from ferrous and Cu alloys.	SM 60: 30 g/L NaOH: 120 g/L 60-82°C	Non-Cyanide
Acid – Immersion	COV-STRIP SM60 Option 3	Strips Ni, Cd, Zn, Tin or Tin/Pb from Cu, Cu alloys (brass & bronze)	SM60: 60-120 g/L Sulfuric Acid: 200 mL/L 60-75°C	

Replenishment data in this bulletin is based on typical results and may vary depending upon different operating conditions.

