

# LINE CARD

## ENGINEERED SOLUTIONS IN SURFACE FINISHING

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FINISH	METHOD	ROHS, ELV & REACH COMPLIANT?	APPEARANCE	SPECIFICATIONS	NOTES
Gold, Hard (Type I or II)	MPM VW	YES	Matte to Bright	MIL-G-45204, ASTM B488, AMS 2422, AMS 2425, ISO 27874	Type I (99.7%) or Type II (99.0%) per ASTM B488 and MIL-G-45204. Hard gold offers improved wear resistance for contact and interconnect applications.
Gold, Soft (Type III)	MPM VW	YES	Matte to Semi-bright	MIL-G-45204, ASTM B488, AMS 2422, AMS 2425, ISO 27874	Type III (99.9%) per ASTM B488 and MIL-G-45204. The highest purity gold for wire bonding, highly corrosive or biocompatibility applications.
Gold, Duplex (Type I or II and Type III)	MPM VW	YES	Matte to Semi-Bright	MIL-G-45204, ASTM B488, AMS 2422, AMS 2425, ISO 27874	An engineered, dual-layer of hard and soft gold used to reduce porosity and improve corrosion performance. Duplex gold can often reduce the overall amount of gold needed to meet porosity & corrosion test requirements.
Silver, Matte (Type I)	MPM VW	YES	Matte	QQ-S-365, ASTM B700, AMS 2410, AMS 2411, AMS 2412	99.9% pure, matte silver available with or without anti-tarnish (chromate) application. Type I silver provides the highest conductivity and purity required for high temperature applications. Type I silver is commonly used as a high temperature lubricant for bearings, bushings or anti-seize on fasteners.
Silver, Semibright (Type 2)	MPM VW	YES	Semi-Bright	QQ-S-365, ASTM B700	Semibright silver available with or without anti-tarnish (chromate) application. Outstanding solderability, corrosion resistance, electrical & thermal conductivity, high temperature resistance and lubricity/anti-galling.
Silver, Bright (Type 3)	MPM VW	YES	Bright	QQ-S-365, ASTM B700	Bright silver (as-plated) available with or without anti-tarnish (chromate) application. Provides the best hardness and wear resistance of silver types. Full bright white appearance with excellent solderability, corrosion resistance, electrical & thermal conductivity, lubricity/anti-galling.
Nickel, Bright (Watts, Sulfate)	MPM VW	YES	Bright	ASTM B689, QQ-N-290, ISO 1458, AMS 2403, AMS 2423	Fully bright electrolytic nickel with moderate ductility. Bright nickel offers good corrosion resistance, conductivity, hardness and high temperature resistance. Bright nickel is commonly used as an underplate (diffusion barrier) where a high luster finish is desired.
Ducta-Bright 7a® Nickel	MPM VW	YES	Bright	ASTM B689, QQ-N-290, ISO 1458, AMS 2403, AMS 2423	A proprietary bright nickel system developed by APT for application on shell casings in the ammunition industry. The most ductile bright nickel system available today for any application involving crimping or flexing.
Nickel, Sulfamate	MPM VW	YES	Matte to Semi-bright	MIL-P-27418, ASTM B689, QQ-N-290, ISO 1458, AMS 2424, AMS 2403, AMS 2423	A high purity, ductile nickel deposit free of organic brighteners. Excellent for brazing, soldering, welding or epoxy bonding. More corrosion resistant than watts formulation. Sulfamate nickel is an outstanding underplate (diffusion barrier) where flexing or bonding is required.
Black Nickel (Tin/Nickel)	MPM VW	YES	Varies	MIL-P-18317	A fully conductive electrolytic black nickel that plates jet black when plated full bright, charcoal gray when plated semi-bright. Surface finish of raw part greatly influences final color, luster and appearance.
Electroless Nickel (High Phosphorous)	MPM VW	YES	Matte to Semi-bright	MIL-C-26074E, ASTM B733, ISO 4527, AMS 2404	Excellent corrosion resistance, non-magnetic, Rc 50-53 (as-plated), Rc 67-69 (with heat treat), heavy build capabilities to 0.005 inches. High Phosphorous electroless nickel is the most corrosion resistant of all electrolytic or electroless nickels.
Electroless Nickel (Medium Phosphorous)	MPM VW	YES	Semi-bright to Bright	MIL-C-26074E, ASTM B733, ISO 4527, AMS 2404	Good corrosion performance, magnetic, Rc 53-55 (as-plated), Rc 68-70 (with heat treat), heavy build capabilities to 0.002 inches.
Tacti-Black® Electroless Nickel	MPM VW	YES	Bright Black to Matte Grey	MIL-C-26074E, ASTM B733, ISO 4527, AMS 2404	A proprietary black electroless nickel that offers the same engineering properties of electroless nickel with a fully conductive, black appearance. Medium phosphorus variety is Semi-bright to bright black; high phosphorus variety is Semi-bright to matte charcoal grey. Surface finish of raw part greatly influences final color.
Copper	MPM VW	YES	Matte to Bright	ASTM B734, AMS 2418, MIL-C-14550	Acid and alkaline cyanide bath formulations. Heavy build capabilities to thicknesses 0.020" or more. Various as-plated deposit hardness available for specific projectile/bullet applications.
Tin, Bright	MPM VW	YES	Bright	ASTM B545, MIL-T-10727, AMS 2408 & ISO 2093	Good corrosion resistance and excellent deposit ductility commonly used for contact or interconnect conductor applications.
Tin, Matte	MPM VW	YES	Matte	ASTM B545, MIL-T-10727, AMS 2408 & ISO 2093	A pure tin deposit free of organic brighteners. The best tin for soldering or bonding applications, often referred to as solderable tin.
Tin/Lead	MPM VW	NO	Matte	ASTM B579, MIL-P-81728, ASTM B200	95/5, 10/90, 90/10 & 60/40 formulations inventoried; custom tin/lead ratios available upon request. Heavy build and plate-to-gauge capabilities for babbitt applications within the bearing industry.
Tin/Copper/Lead	MPM VW	NO	Matte	Company Specific	8/2/90 formulation is an excellent babbitt material for plate-to-gauge bearing applications.
Lead	MPM VW	NO	Matte	MIL-L-13808, AMS 2414, ASTM B200	A pure lead deposit for severely corrosive environments including exposure to strong mineral acids. Battery, energy storage usage as well as heavy build and plate-to-gauge for bearing/bushing applications.
Powder Coating		YES	Varies	MIL-PRF-24712 & Company Specific	APT specializes in demanding selective powder coating (masking) and high cosmetic powder paint applications. Chromating of aluminum/zinc is available to enhance corrosion performance.
Passivation, Commercial		YES*	N/A	QQ-P-35, ASTM A967, ASTM A380, AMS 2700	All methods of citric and nitric acid passivation provided at all temperature ranges include nitric formulations with sodium dichromate. Custom passivation formulations to unique company specifications available.
Passivation, AAA		YES*	N/A	QQ-P-35, ASTM A967, ASTM A380, AMS 2700	A specialized passivation method developed by Carpenter Technology specifically for the passivation of free machining stainless steels including 303, 416, 420F, 430F and 440F. Produces the most corrosion resistant surface of free machining stainless steel and prevents flash acid attack (rusting) of the passivated surface.
Passivation Precision (Medical)		YES*	N/A	QQ-P-35, ASTM A967, ASTM A380, AMS 2700, ASTM F86	Delicate medical-grade passivation of medium sized to micro stainless steel, titanium and cobalt-chrome (MP35N) components utilizing ultrasonic generation throughout the process. Up to five stages of ultrasonic cleaning, passivating and rinsing can be provided including an ultrasonic IPA (isopropanol) final rinse.
Vapor Degreasing		N/A	N/A	N/A	N-Propyl Bromide solvent for consistent, non-aqueous cleaning of components. Excellent at removing stamping and cutting oils from parts prior to heat treat to avoid discoloration and/or excessive scale formation.
Ultrasonic Cleaning		YES	N/A	Company Specific	Various frequency ultrasonic generators available with or without sweep. Cleaning in a range of cleaners or solvents including IPA (isopropanol). Sealed nitrogen-filled packaging available.

**QUALITY SYSTEMS:** ISO 13485 & 9001 Certified, ITAR Registered, Type 10 Federal Firearms License, Numerous Corporate Approvals.

**SUBSTRATES PLATED ON:** Mild steel, stainless steels, hardened steels, tool steels, Inconel, pure nickel, cobalt-chrome (MP35N), Kovar, pure copper, coppers alloys including tellurium & beryllium, brass, nickel-silver, Monel, Hastalloy, aluminum alloys, lead, metalized plastics.

**VALUE ADDED SERVICES:** Selective plating and powder coating, heavy build plating, plate-to-gauge, PPAP, IQ, OQ & PQ Validations, inventory management, Kanban, custom packaging, sealed nitrogen packaging (preserves finish), subassembly, pre and post-plate baking, post-plate corrosion inhibitors and rust preventatives (APT-H4™).

**ICON KEY:**

Rack = Barrel = Vibratory = Basket = Minimum Part Movement Barrel = Tray =

\*Depending on Spec



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