1.0 SCOPE

The metal suppliers listed in this specification have been approved to supply raw materials to the MPP stockrooms and to outside machine shops. Approval is based on quality, service, and end-product performance.

2.0 RESPONSIBILITIES

2.1 MPP Purchasing shall be responsible for advising subcontractors of the contracted raw material suppliers.

2.2 Suppliers shall be responsible for:

2.2.1 Verifying material certifications and ensuring that the certified material properties conform to the requirements of the stated MPP specification for industry standard.

Note: If said material is subsequently found not to conform to the supplied certifications, suppliers shall be responsible for pursuing compensation and corrective action from their raw-material source.

2.2.2 Maintaining record of forward and reverse traceability for raw material to certifications for a minimum of 5 years.

- Forward traceability means that it is possible for all parts produced for MPP to be traced back to the original mill certifications from the MPP purchase order.
- Reverse traceability means that for a given heat of raw material, it is possible for all parts produced for MPP to be traced to a part number, purchase order, and shipment date.

3.0 CERTIFICATIONS

3.1 When specified by a MPP purchase order, drawing, or material-specific P-Spec, the Certificate of Analysis (C of A) or Certificate of Conformance (C of C) shall be included with the shipment of the parts.

3.1.1 The C of A, which shall substantiate conformance to the requirements of material properties, as specified, shall be provided with the shipment of all materials categorized as *strategic* and *critical.* Conflicts shall be handled on an exception basis using the Supplier Deviation Request (SDR) process.

3.1.2 The C of A shall include:

- Heat lot number
- Chemical analysis
- Manufacturing specification(s) as defined in Section 2.0
- The temper/mechanical properties grain size, etc. of the material as required
- Identification of the mill source to facilitate the verification of approved sourcing

3.2 For all materials defined herein as “Specialty Metals” (reference DFAR 252.225-7000), the C of A or C of C shall state compliance with the requirements thereof.

3.3 While it is preferred that a single heat per shipment be used, a maximum of two heats may be shipped. However, the heat lots must be separated and identified.

3.4 The Source/Distributor shall retain the C of A provided by the raw-material source to ensure traceability.

4.0 CATERGORIES

Commonly used metals and alloys have been divided into four groups, each with their own category of requirements that reflect confidence in material quality and purchase economics. These groups are identified as follows:

Group 1—Strategic Materials
Group 2—Critical Materials
Group 3—Commercial Materials
Group 4—Braze Alloys (see P10-0)

4.1 Form Codes

Form codes (see **Table 1**) define the shape of material to be used in the fabrication/machining of the manufactured components. When a form indicator is associated with the P-Spec listed in the material block of the drawing or the MPP raw-material purchase description, the part must be fabricated from the specified material shape. The form codes still apply even when the P-Spec has been superseded by an industry standard.

Note: Exceptions require Engineering approval and a waiver even when ordering commercial materials.

TABLE 1. Material Form Codes

FORM CODE	DEFINITION
A	Flat Products (Other Than Forgings): Plate, Sheet, Wafer, Ribbon, Strip, Flat Wire **Note: As specified herein, Code P shall indicate "Plate," and Code S shall indicate "Sheet."**
B	Bar: Round, Hex, Polygon, etc.
C	Wire: Round, Bare, Solid
D	Tubing
E	Special Characteristics: Extrusions, etc.
F	Forgings
J	Powder
P	Plate
S	Sheet
WG	Waveguide
Z	Castings

4.2 Strategic Materials

Strategic materials require special melts, special fabrication, and/or minimum purchases. The materials listed in **Table 2** are purchased and stocked by MPP, and provided to suppliers and/or used by MPP for internal processing; exceptions to this rule require documented agreement between the supplier and MPP. If MPP does not supply adequate material or if additional material is required for any reason, the responsible MPP purchasing representative shall be contacted.

TABLE 2. Strategic Material Sources

Description	Form Designation (Ref. Table 1)	Applicable Specification	Finished Product Source/Distributor	Raw Material Source
Copper OFE	Waveguide (WG)	P3-1WG	A.T. Wall[1] Penn Engineering[1]	Proterial (Formerly known as Hitachi Metals Neomaterial); Luvata
Copper-Clad Monel	Strip (A)	P15-2	Source; Clad Metal Specialties;	
Kovar (Fe-Ni-Co)[2]	Tubing (D)	ASTM F15	A.T. Wall	Note[3]
Monel 404[2]	Tubing (D)	P2-5 ASTM F96	A.T. Wall[1]	LeBronze Industrial
Nickel 220E	Strip (A); Rod (B)	P2-14	Source[1]	Carpenter
Nickel–4% Tungsten (a.k.a. Nickel 129)	Strip (A)	P2-4	Source[1]	Carpenter
Stainless Steel,[2] Type 304LMC	Rod (B)	P1-8	Source[1]	Carpenter

[1] MPP testing of incoming material is required before use. See Table 5 for guidelines on sample sizes required for MPP testing.

[2] Defined as “Specialty Metal” (ref. DFAR 252.225-7000) and subject to the requirements thereof.

[3] Source not specified by MPP; see suggested distributor for raw material in the Commercial Raw Materials section.

4.3 Critical Materials

Critical materials are source directed and are typified by limited sources of supply, long lead times, and/or minimum lot sizes. MPP performs periodic process-control audits on suppliers of critical materials. Source direction is necessary for compliance with ongoing stocking programs and/or procurement of materials unique to MPP applications that are not available commercially or that have more stringent requirements than current commercial specifications. A stocking program is supported by supplier commitments to carry inventory in accordance with MPP forecast requirements.

These materials may be furnished only by the source(s) listed in **Table 3**. In the event that prescribed materials are unavailable in the desired sizes, contact MPP procurement for guidance.

TABLE 3. Critical Material Sources

Description	Form Designation (Ref. Table 1)	Applicable Specification	Finished Product Source/Distributor	Raw Material Source
Braze Alloys (all but ZGS Platinum)	Wafer, Ribbon, Flat Wire (A); Round Wire (C); Powder (J)	P10-0*	Source	Lucas Milhaupt; MAM-WESGO Metals; Materion Advanced Materials (Platinum only P10-8)
Braze Alloy, ZGS Platinum	Wafer, Ribbon, Flat Wire (A); Round Wire (C)	P10-32	Johnson Matthey	Johnson Matthey
Copper, OFE (UNS C10100)	Rod and Bar (B)	P3-1	Copper & Brass Sales; Sequoia Brass & Copper	Proterial[1] (Formerly known as Hitachi Metals Neomaterial) Luvata[2] Mitsubishi[3]
	Plate, Sheet, Strip (A)	P3-1	Copper & Brass Sales; Sequoia Brass & Copper	Proterial[1] (Formerly known as Hitachi Metals Neomaterial) Aurubis[2] Mitsubishi[3] Revere Copper Products[3] Mansfelder Kupfer & Messing GnbH[3]
	Tubing (D)	P3-1	Copper & Brass Sales; Sequoia Brass & Copper	Luvata[4] Mitsubishi[3] Sumikei (imported by Okaya) [2]
	Forgings (F)	P3-1	Source; Weldalloy[3]; Rinck Associates[3]; Zollern; Scot Forge[3]	Proterial (Formerly known as Hitachi Metals Neomaterial) ; Mitsubishi; Luvata; Zollern; Aurubis
	Special Forgings (F)	P3-22	Scot Forge[3]	Proterial (Formerly known as Hitachi Metals Neomaterial) ; Mitsubishi; Luvata; Aurubis
Monel 404[5]	Plate and Strip (A), Sheet (S)	P2-5 (ASTM F96)	J. L. Anthony	LeBronze Industrial
Copper/Nickel 70/30	Rod and Bar (B)	P3-10	Copper & Brass Sales (TMX)	Wieland Austria
	Plate and Strip (A); Sheet (S)		J.L. Anthony**; Vista Metals; Copper & Brass Sales (TMX)	LeBronze Industrial
Copper/Nickel (70/30)-VG[6]	Rod (B)	P3-10	Copper & Brass Sales (TMX)	Wieland Austria[3,6]
Core Iron, Vac-Melt	Plate, Sheet, and Strip (A); Rod and Bar (B)	P1-6	Source	Carpenter
High Purity Iron	Plate, Sheet, and Strip (A); Rod and Bar (B)	P1-6 (ASTM 848 and 1126)	Source	Allied Metals
Nickel, Copper Clad	Strip (A)	Purchase (Text) Drawing	Source	Technical Material, Inc.; LeBronze Industrial Clad Metal Specialties

Description	Form Designation (Ref. Table 1)	Applicable Specification	Finished Product Source/Distributor	Raw Material Source
Molybdenum	Tape (E)	P4-4	H. Cross	Distributor-controlled
Molybdenum, HT	Bar, Rod (B); Wire (C)	P4-21	Ed Fagan; Source; Leading Edge Metals and Alloys	Elmet Technologies (HCT Molybdenum)
Molybdenum, Gold-Plated	Wire (C)	P4-11	Source	Global Tungsten & Powder
Molybdenum, Platinum-Coated	Wire (C)	P4-19	Johnson Matthey	Elmet Technologies
Molybdenum-Rhenium (50/50)	Sheet (S)	P4-9	H. Cross; Rhenium Alloys	H. Cross; Rhenium Alloys
	Rod (B)		Rembar; Rhenium Alloys	Rhenium Alloys
	Wire (C)			
3% Rhenium-Tungsten[7]	Wire (C)	ASTM F73, Type 2A	Union City Filament, Ceradyne 3M, H. Cross, Spectramat, Source	Toshiba; Wolfram; Toho
Tungsten	Rod (B), Wire (C); Tape and Stranded Wire (E)	P4-1	H. Cross, Source	A.L.M.T. Corp *(formerly known as Allied Materials or Tokyo Tungsten);* Elmet Technologies
Tungsten, Platinum-Coated	Wire (C)	P15-5	Johnson Matthey	Elmet Technologies
Tungsten, Thoriated	Wire (C)	P4-12	Source	Toshiba; Wolfram (Tungsten Technologies)

* See MPP Specification P10-0.

** J. L. Anthony is a distributor of LeBronze Industrial for sheet, strip, and plate stock and is a re-roller.

1 No raw-material testing required.

2 MPP testing of incoming material required before use of all forms (except plate 1" or less in thickness). See Table 5 for guidelines on sample sizes required for MPP testing.

3 MPP testing of incoming material required before use. See Table 5 for guidelines on sample sizes required for MPP testing.

4 MPP testing of incoming material required before use. Testing required for OFE copper tube with outer diameter (OD) sizes of 3.5" and larger. See Table 5 for guidelines on sample sizes required for MPP testing.

5 Defined as "Specialty Metal" (ref. DFAR 252.225-7000) and subject to requirements thereof.

6 "VG" indicates "Vacuum Grade", which is defined as meeting the chemistry requirements for 70Cu/30Ni Vacuum Grade material per P3-10.

7 Source changes require individual first-article approvals for each affected cathode heater.

4.4 Commercial Materials

Commercial materials are a group of metals that are supplied by distributors and purchased against standards established by the American Society for Testing and Materials or other recognized standards/specifications such as Aerospace Material Specifications, Military, or Federal standards. Materials that are defined as “Specialty Metals” must be procured from domestic sources or qualifying countries in accordance with DFAR 252.225-7000 inclusive of all additional articles incorporated therein by reference or otherwise.

Table 4 lists the forms, specifications, and suggested distributors for commercial raw materials commonly used by MPP. Commercial materials may be purchased from distributors other than those listed. Note that these materials are purchased to the applicable commercial/government specifications. The specifications listed in the “Former MPP Specification” column are for reference only since they have been superseded by the specifications listed in the “Applicable Specification” column.

TABLE 4. Commercial Material Reference Chart

Description	Form (See Sec. 5.1)	Applicable Specification	Suggested Distributor	Former MPP Specification
Aluminum, Alloy 1100	Sheet, Plate, and Foil	ASTM B209	Copper & Brass Sales (TMX); Sequoia Brass & Copper; Castle Metals; Reynolds Aluminum; Leading Edge Metals and Alloys	P6-4
	Bar, Rod and Wire	ASTM B211		
	Extruded Bars, Rods, Wire, Shapes and Tubes	ASTM B221		
	Tube, Seamless Drawn	ASTM B210		
Aluminum, Alloys 5083, 5086, 5052, 6061, and 6063	Sheet, Plate and Foil	ASTM B209		P6-2
	Bard, Rod and Wire	ASTM B211		
	Extruded Bars, Rods, Wire, Shapes and Tubes	ASTM B221		
	Tube, Seamless Drawn	ASTM B210		
Aluminum, Alloy 6101	Extruded Bar, Rod, Tube, Pipe and Structural Shapes	ASTM B317		P6-4
Aluminum, Cast Aluminum Tool and Jig Plate	Plate	P6-5	Coast Aluminum[1]	---
Beryllium-Copper; UNS C17200 UNS C17300	Rod and Bar	ASTM B196	E. Jordan Brooks; Ed Fagan; Copper & Brass Sales (TMX); Sequoia Brass & Copper; Leading Edge Metals and Alloys	P3-14
	Plate, Sheet, Strip and Rolled Bar	ASTM B194		
Brass, Free Cutting; UNS 36000	Rod, Bar, and Shapes	ASTM B16	Castle Metals; Copper & Brass Sales (TMX); Sequoia Brass & Copper	P3-4
Brass, Cartridge; UNS C26000	Plate, Sheet, Strip, Bar, and Disks	ASTM B19	Copper & Brass Sales (TMX); Sequoia Brass & Copper	P3-7
Chromium Copper 182 (UNS C18200)	Plate, Sheet, Strip and Rolled Bar	UNS C18200 RWMA Class 2	Copper and Brass Sales Weldaloy	P3-19
Chromium Zirconium Copper (CR ZR CU) (UNS C18150)	Bar, Plate	UNS C18150 RWMA Class 2	CADI Co.	- - -
Copper, Grade 102; (UNS C10200)	All	ASTM B42, ASTM B68, ASTM B170, ASTM B152	Copper & Brass Sales (TMX); Sequoia Brass & Copper	P3-15
Copper, Dispersion Strengthened (GLIDCOP Al-15)	Strip, Wire, Bar, Rod, and Shapes	P3-21	North American Hoganas; J.L. Anthony	- - -
Copper, Dispersion Strengthened (GLIDCOP Al-60)	Strip, Wire, Bar, Rod, and Shapes	P3-21	North American Hoganas	- - -
Copper-Tungsten (Elconite)	Bar and Rod	P4-14	Saturn Industries; Leading Edge Metals and Alloys	- - -
Cupronickel (90/10); UNS C70690	Plate, Sheet, Strip, and Rolled Bar	ASTM F96, Alloy 3[2]	Alaskan Copper & Brass; TMX; Sequoia Brass & Copper; Leading Edge Metals and Alloys	P3-10

1 Per MPP specification P6-5, the acceptable raw material sources are Alpase (K-100S) and Vista Metals (ATP-5)

2 UNS C70600 in accordance with ASTM B151 or MIL-C-15726 may be substituted as an alternative when ASTM F96 Alloy 3 is unavailable.

TABLE 4. Commercial Material Reference Chart (Continued)

Description	Form (See Sec. 5.1)	Applicable Specification	Suggested Distributor	Former MPP Specification
Hastelloy B-2	Strip and Bar	ASTM B335/B333	H. Cross; Leading Edge Metals and Alloys	P2-12
Invar Alloy 36 (Low-Expansion Fe/Ni Alloy)	Wire, Rod, Bar, Strip, Sheet, and Tube	ASTM F1684, UNS No. K93603	Ed Fagan; Copper & Brass Sales (TMX); NEA; Leading Edge Metals and Alloys	P5-4
Phosphorous Bronze 510 (UNS C51000)	Plate, Sheet, Strip and Rolled Bar	ASTM B103, ASTM B139	Copper & Brass Sales Sequoia Brass & Copper	P3-17
Invar Alloy 42 (Low-Expansion Fe/Ni Alloy)	Sheet and Strip	ASTM F30	NEA; Ed Fagan; Ametek; Leading Edge Metals and Alloys	P5-5
Invar Alloy 46 (Low-Expansion Fe/Ni Alloy)				P5-3
Invar Alloy 48 (Low-Expansion Fe/Ni Alloy)				P5-6
Invar Alloy 52 (Low-Expansion Fe/Ni Alloy)				P5-7
Iron, Electrical	Bar, Wire, and Strip	ASTM A848 ASTM A1126	CMI Specialty Products; Uddeholm; Carpenter; Allied Metals	P1-2, P1-7
Iron-Nickel-Chromium Sealing Alloy[3]	Strip, Rod, Wire, and Tube	ASTM F31	Carpenter	P5-2
Kovar (Fe-Ni-Co)[3]	Sheet, Strip, Bar, and Wire	ASTM F15 P5-1 (deep draw)	NEA; Ed Fagan; Carpenter; Copper & Brass Sales (TMX); Ametek; Specialty Metals; Leading Edge Metals and Alloys	- - -
Lead	Plate, Sheet, and Strip	ASTM B749	J&L Digital Precision; Vulcan GMS; Mayco Manufacturing	- - -
Molybdenum	Sheet, Strip, and Foil	ASTM B386, Alloy 360, 361 P4-4	Ed Fagan; Plansee; Elmet Technologies; NEA; GTP (C only); H. C. Stark; Leading Edge Metals and Alloys	- - -
Molybdenum	Bar, Rod, and Wire	ASTM B387, Alloy 361 P4-4		- - -
Molybdenum TZM	Bar, Rod, and Wire	ASTM B387, Alloy 363, 364		P4-15
Molybdenum TZM	Plate, Sheet, Strip and Foil	ASTM B386, Alloy 363, 364		
Nickel 200	Plate, Sheet, and Strip	ASTM B162	Castle Metals; H. Cross; Ed Fagan; NEA; Leading Edge Metals and Alloys; Ametek Specialty Metals	P2-15
	Wire	DIN 17753; ISO 9724		

[3] Defined as “Specialty Metal” (ref. DFAR 252.225-7000) and subject to the requirements thereof.

TABLE 4. Commercial Material Reference Chart (Continued)

Description	Form (See Sec. 5.1)	Applicable Specification	Suggested Distributor	Former MPP Specification
Nickel 201	Plate, Sheet, Strip	ASTM B162; P2-17	Ed Fagan; NEA; Ametek Specialty Metals; Leading Edge Metals and Alloys	- - -
Nickel 205	Wire and Ribbon (Strip)	AMS 5555; P2-17	H. Cross Co.; Ed Fagan; NEA; Ametek Specialty Metals; Leading Edge Metals and Alloys; California Fine Wire	P2-2
Nickel, Electron Tubes (205/233)	Sheet and Strip	P2-17	H. Cross Co.; NEA; Leading Edge Metals and Alloys	P2-2
Nickel 270	Strip, Wire	P2-17	H. Cross Co.; NEA; Leading Edge Metals and Alloys	P2-6
Superalloy, Nickel-based UNS N07041 (René 41)	Wire	AMS 5800	Elgiloy	- - -
Steel, Carbon	Plate, Bar and Shapes	ASTM A36; Grade 1008–1025, ASTM A108 or A576; Grade M1008–M1025, ASTM A575	Castle Metals; Lapham; Hickey Steel; Uddeholm	P1-1
	Bar	Grade M1008–M1025, ASTM A575; Grade M1008–M1025; ASTM A108		
	Sheet and Strip	ASTM A1008		
	Seamless Tube	ASTM A519		
Steel, Stainless[3]— Types 304, 304L, 316/316L, 321, and 347 *(304LMC is a Strategic Material)*	Plate, Sheet, and Strip	ASTM A240	Ryerson Steel; Castle Metals; Brown Metals; Carpenter	P1-3
	Bars and Shapes	ASTM A276		
	Seamless Tube	ASTM A511 ASTM A269		
Steel, Stainless,[3] Free-Machining, Types 303/303Se	Bar	ASTM A582	Castle Metals; Ryerson Steel; Brown Metals; Carpenter	P1-3
Steel, Stainless[3]— Type 410	Plate, Sheet, and Strip	ASTM A276	Ryerson Steel; Castle Metals	P1-5
	Bar and Rod	ASTM A176		
Tantalum	Plate, Sheet, and Strip	ASTM B708, Grades R05200 and R05400	H. C. Stark; Rembar; ATI Specialty Alloys and Components (formerly Wah Chang); Leading Edge Metals and Alloys	P4-3
Titanium[3]	Plate, Sheet, and Strip	ASTM B265, Grade 1	Tico Titanium; Titanium Metals Corp.; Arnold Engineering; Ed Fagan	P4-8
Zirconium[3]	Bar, Rod, and Wire	ASTM B351, Grade R60001	H. Cross; Leading Edge Metals and Alloys	P4-2
	Plate, Sheet, and Strip	ASTM B352, Grade R60001		

[3] Defined as “Specialty Metal” (ref. DFAR 252.225-7000) and subject to the requirements thereof.

5.0 MPP TESTING OF INCOMING MATERIAL GUIDELINES

Many materials listed in P0-1 as Critical or Strategic Materials require testing of incoming material before use. The following table provides Suppliers with guidelines for test sample size requirements to conduct testing and evaluation at MPP.

TABLE 5. MPP Material Testing Sample Size Reference Chart

MATERIAL	PURCH. SPEC.	FORM	SAMPLING PROCEDURE
Copper (OFE)	P3-1	Plate, Sheet, Strip, Rod*,**, Bar*, Tubing & Waveguide	Cut 1/2" to 1" thick sample from one end (both ends if longer that 6 ft.) For Rods** greater than 6" in diameter, cut at maximum ½" thick samples. Rod* and Bar* form: machine the cut surface to a finish of 63 or better For samples of material 1/8" or less, no machining Waveguide uses a 1" length sample
Cupronickel	P3-10	Sheet, Strip & Plate	Cut 1" square sample from end
		Rod, Bar, Wire & Tubing	<1/8" diameter: cut sample 2" in length >1/8" diameter: cut sample 5/8" in length
Molybdenum	P4-4	Wire	Cut a sample 4" in length from each spool
		Strip & Sheet	<0.060": cut 2" square
		Strip <2" Wide	Cut a sample 4" long
		Rod	0.100" diameter to 0.375": cut 1/2" sample from each end
HTC Molybdenum	P4-21	Wire	Cut a 12" sample from each spool
Gold Plated Molybdenum	P4-11	Wire	Cut 6" length samples from each spool
Platinum Coated Molybdenum	P4-19	Wire	Cut ½" to 1" length samples from each spool

TABLE 5. MPP Material Testing Sample Size Reference Chart (Continued)

MATERIAL	PURCH. SPEC.	FORM	SAMPLING PROCEDURE
Cathode Nickel 129	P2-4	Bar, Sheet & Strip	<0.060” thick: cut 3” square sample; cut 1” square sample if >0.060” thick <3/8” in diameter: cut sample 2” in length >3/8” in diameter: cut sample 5/8” in length
Cathode Nickel 220E	P2-14	Bar, Sheet & Strip	<0.060” thick: cut 3” square sample; cut 1” square sample if >0.060” thick <3/8” in diameter: cut sample 2” in length >3/8” in diameter: cut sample 5/8” in length
Nickel 205 Nickel 270	P2-17	Wire	Cut 4” length samples
Monel 404	P2-5	Tubing	1” length
Thoriated Tungsten	P4-12	Rod, Bar & Wire	Cut 1/2 “ to 1” length samples
Platinum Coated Tungsten	P15-5	Wire	Cut 1/2” to 1” length samples from each spool
Stainless Steel, Type 304 LMC	P1-8	Rod & Bar	1/2” length sample
Vacuum Melted Core Iron	P1-6	Plate, Rod & Bar	1/2” length sample

6.0 APPLICABLE DOCUMENTS

Source	Doc. No.	Title
MPP:	P0-1	Approved Sources for Raw Materials and Processes
	P10-0	Braze Alloys for Internal Vacuum Use (All Forms)
	Various	Purchase Specifications (P-Specs)
Other:		
Aerospace Material Specifications (AMS)	Various	
American Society for Testing and Materials (ASTM)	Various	
Defense Federal Acquisition Regulation (DFAR)	252.225-7000	
Electronic Industries Alliance (EIA)	Various	
Military Specifications (MIL Specs)	Various	
Other industry standards, such as Federal standards (e.g., AA, QQ, PP)	Various	

APPENDIX – Trade Names for Various Material

MPP P-Spec or Equivalent	Material	Trade Name
P1-1	Low-Carbon Steel	CDS (Cold-Drawn Steel) CFS (Cold-Finished Steel) CRS (Cold-Rolled Steel) Cold-Drawn Tubing Cold-Finished Bars Cold-Rolled Strip SAE 1010–1030 AISI C1010–1030 ASTM A36
ASTM A848	Core Iron (Extra-Low-Carbon Steel)	Consumable Electrode Core Iron *(former Carpenter name)* Electrical Iron *(current Carpenter name)* Consumet Mirromold Hobbing Steel Electromagnetic Iron (CMI-C)
P1-3	Stainless Steel (300 Series) 304 L 304 L/VAR 304 ESR 304 LMC	Austenitic SST Low Carbon Vacuum Arc Remelt (Cleaner Grade) Electro Slag Remelt (Cleaner Grade) Low Manganese and Carbon
P1-4	Stainless Steel 430	Ferritic SST
P1-5	Stainless Steel 440, 410, 420	Martensitic SST
P1-6	Vacuum-Melt Core Iron (Low-Carbon Iron)	Vacuum-Melted Core Iron Vacumet Vacumet-Consumet Core Iron Double Vacmelt Core Iron VIMVAR Low-Carbon Iron Magnetic High Purity Iron
P2-17	Nickel 205 or 233	formerly “A” Nickel (Electronic Grade)
P2-4	Nickel 129	Nickel/4% Tungsten; *Cathode-Approved by MPP Test*
P2-17	Nickel 200	formerly “A” Nickel
P3-1	OFE-Copper (Oxygen-Free Electronic)	originally OFHC Copper Copper Alloy 101 CDA 101 UNS C10100 OF-HIT (Proterial [Formerly known as Hitachi])
P5-1	Iron, Nickel, Cobalt Sealing Alloy	Kovar (Carpenter) Rodar Sealvar Fernico Therlco FeNiCo
	Soft Glass Sealing Alloy	Sealmet H-C4 Carpenter 426

APPENDIX – Trade Names for Various Material (Continued)

MPP P-Spec	Material	Trade Name
	Low-Expansion Nickel-Iron Alloy, Type 36	Invar Nilvar
P5-8	High-Permeability Nickel-Iron Alloy 4/79	Moly Permalloy Hymu 80 Hypernom
P5-9	High-Saturation Alloy 49/49/2—Fe/Co/V	Vanadium Permendur Hiperco 50