

**SECTION II: CERAMICS**

**PURCHASE SPECIFICATION**

**1.0 SCOPE**

The suppliers listed in this specification have been approved to supply ceramics used in vacuum electron device bodies as well as metallized ceramics. Graphite is also included in this section. Where applicable, these suppliers receive periodic process surveillance through supplier audits and process audits coordinated between MPP Purchasing and Process Engineering. The use of suppliers not subject to this level of surveillance is strongly discouraged.

**Note:** Development materials may be ordered from suppliers other than those listed here with the written approval of Engineering and Materials.

The requirement to utilize these suppliers extends to ceramics procured by MPP’s subassembly suppliers. Any deviation from this requirement shall necessitate a Supplier Deviation Request and a First Article Test and should only be considered when extreme urgency offsets the increased technical risk.

**2.0 MATERIAL TYPES**

The ceramics and their suppliers are organized in the following tables according to material type: Alumina Pressed, Beryllia Pressed, Alumina Extruded, Beryllia Extruded, and Miscellaneous. The governing MPP Purchase Specification (P-Spec) is applied.

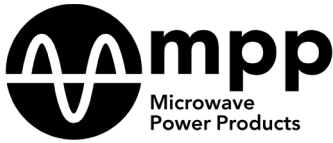
<b>P14-1</b>				
<b>Aluminum Oxide Ceramic: Die Pressed or Iso-Pressed</b>				
<b>Material</b>	<b>Supplier</b>	<b>Grinding Supplier</b>		<b>P14-8 Metallizing Supplier</b>
AD-94	CoorsTek	CoorsTek	Precision Ferrites & Ceramics	CoorsTek INTA Elcon
AL-300 AL-500 AL-995	MAM-Wesgo MAM-Duramic MAM-Erlangen	MAM-Wesgo MAM-Duramic MAM-Erlangen	Insaco Accuratus Ceramics	MAM-Wesgo MAM-Erlangen* INTA Elcon

\* MAM-Erlangen metallizing does not meet P14-8 requirements. Metallizing specifications must be on the drawings. Die pressed or iso-pressed AD-995, supplier CoorsTek, may be specified for unmetallized applications only as “AD-995 per P0-1”.

<b>P14-1</b>				
<b>Beryllium Oxide Ceramic: Die Pressed or Iso-Pressed</b>				
<b>Material</b>	<b>Supplier</b>	<b>Grinding Supplier</b>		<b>P14-8 Metallizing Supplier</b>
Beramic 995	CBL Ceramics	CBL Ceramics	- - -	CBL Ceramics
Thermalox 995	Materion Ceramics	Materion Ceramics	Accuratus Ceramics Stratamet	CBL Ceramics
Berlox	America Beryllia	America Beryllia		INTA Stratamet

**Revision Information**

Update company name and logo.



**APPROVED SOURCES FOR RAW MATERIALS AND PROCESSES**

Spec. No.: **P0-1, Sec. II**

ECO: MPP625925 Rev. F

**SECTION II: CERAMICS**

Date: October 17, 2024

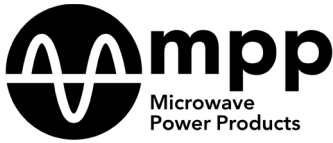
**PURCHASE SPECIFICATION**

<b>P14-7</b>			
<b>Aluminum Oxide Ceramic: Extruded</b>			
<b>Material</b>	<b>Supplier</b>	<b>Grinding Supplier</b>	
AD-85 AD-94 AD-995 AD-998	CoorsTek	CoorsTek	Precision Ferrites & Ceramics Insaco Accuratus Ceramics
AL-300 AL-500 AL-995	MAM-Wesgo	MAM-Wesgo	
Alsimag 614 Alsimag 771 Alsimag 777	McDanel Advanced Ceramic Technologies	McDanel Advanced Ceramic Technologies	

<b>P14-7</b>		
<b>Beryllium Oxide Ceramic: Extruded</b>		
<b>Material</b>	<b>Supplier</b>	<b>Grinding Supplier</b>
Thermalox 995	Materion Ceramics	Materion Ceramics; Accuratus Ceramics; Stratamet

<b>Graphite by P-Spec</b>			
<b>Material</b>	<b>Supplier</b>	<b>Machining or Laser Cutting Supplier</b>	<b>Purification Supplier</b>
Pyrolytic Graphite Cups <b>P14-19</b>	Minteq Pyrogenics Group	None Qualified	N/A
Machined and Purified Graphite <b>P14-21</b>	POCO Graphite	POCO Graphite	POCO Graphite

<b>Miscellaneous Ceramic Types Referenced by MPP P-Spec</b>			
<b>Material</b>	<b>Supplier</b>	<b>Grinding Supplier</b>	<b>P14-8 Metallizing Supplier</b>
AD-999 Vistal Alumina <b>P14-15</b>	CoorsTek	CoorsTek Precision Ferrites & Ceramics Insaco	N/A
Lossy Aluminum Nitride (AlN) <b>P14-17</b>	Ceradyne		N/A
BeO/SiC <b>P14-6</b>	CBL Ceramics		N/A



**SECTION II: CERAMICS**

<b>Miscellaneous Ceramic Types Referenced by MPP P-Spec (continued)</b>			
Boron Nitride, Hot-Pressed (HPBN) <b>P14-9</b>	Momentive Performance Materials		N/A
Boron Nitride, Anisotropic Pyrolytic (APBN) <b>P14-2001</b>	Momentive Performance Materials		N/A
Low Thermal Expansion Ceramics <b>P14-3</b>	HP Technical Ceramics - Zerotherm	Precision Ferrites & Ceramics Insaco	N/A
Sapphire <b>P14-14</b>	Crystal Systems	Insaco	None Qualified
Aluminum Nitride (AlN) <b>P14-18</b>	Sienna Technologies	Sienna Technologies Accuratus Ceramics	N/A

**3.0 REFERENCES**

- P14-1 Ceramic Bodies
- P14-3 Low Thermal Expansion Ceramics
- P14-6 Beryllia/Silicon Carbide RF Lossy Material
- P14-7 Extruded Ceramics
- P14-8 Metallized and Nickel-Plated Ceramics and Sapphire
- P14-9 HP Boron Nitride
- P14-14 Gyrotron Sapphire Output Window
- P14-15 Heater Ceramics
- P14-17 Aluminum Nitride Composite RF Lossy Material
- P14-18 Aluminum Nitride Ceramics (AlN)
- P14-19 Pyrolytic Graphite Cups
- P14-21 Machined and Purified Graphite Parts
- P14-2001 APBN (Anisotropic Pyrolytic Boron Nitride)