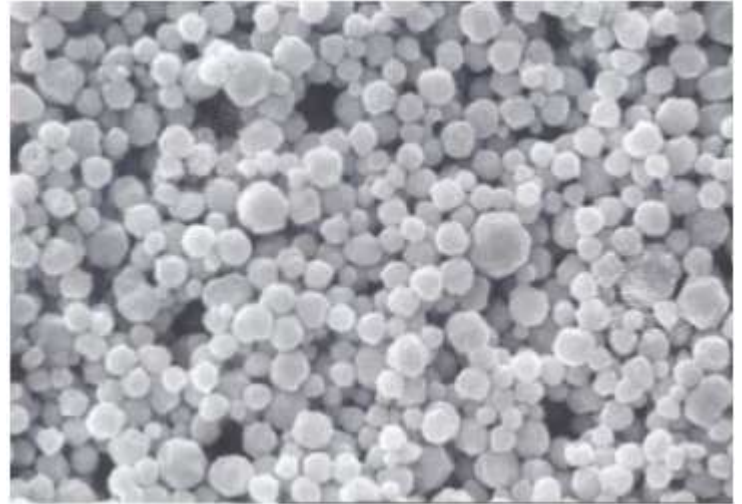




## 95%Ag / 5%Pd Powder AgPd 7102FG Series

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Cermet offers a comprehensive line of Ag/Pd powders specifically designed for use with ultra low fire (ULF) MLCC dielectrics. These new powders, 7000 FG (Functional Gradient) series powders, offer the same highly dispersed monosized spherical powders typical of our standard 7000 series Ag/Pd powders with the added advantage of improved dispersion. The FG materials are produced with a Pd rich exterior to improve the firing and dispersion characteristics of high Ag content powders. This technique can be applied to all Ag/Pd ratios. These powders are also available with a variety of organic and inorganic coatings to modify oxidation, shrinkage, and wetting characteristics



10kx SEM of 95%Ag / 5%Pd Powder 7102FG Series

We welcome the opportunity to develop new products for your unique requirements.

### TYPICAL POWDER CHARACTERISTICS

| Characteristics                  | Parameter | Procedure         |
|----------------------------------|-----------|-------------------|
| Surface Area (m <sup>2</sup> /g) | 0.7 – 1.6 | BET Method        |
| Tap Density (g/cm <sup>3</sup> ) | 3.0 – 5.5 | Tap-Pak Volumeter |
| PSD D90 (µm)                     | 0.6 – 2.5 | Horiba CAPA       |
| PSD D50 (µm)                     | 0.3 – 1.5 | Horiba CAPA       |
| PSD D10 (µm)                     | 0.1 –1.0  | Horiba CAPA       |

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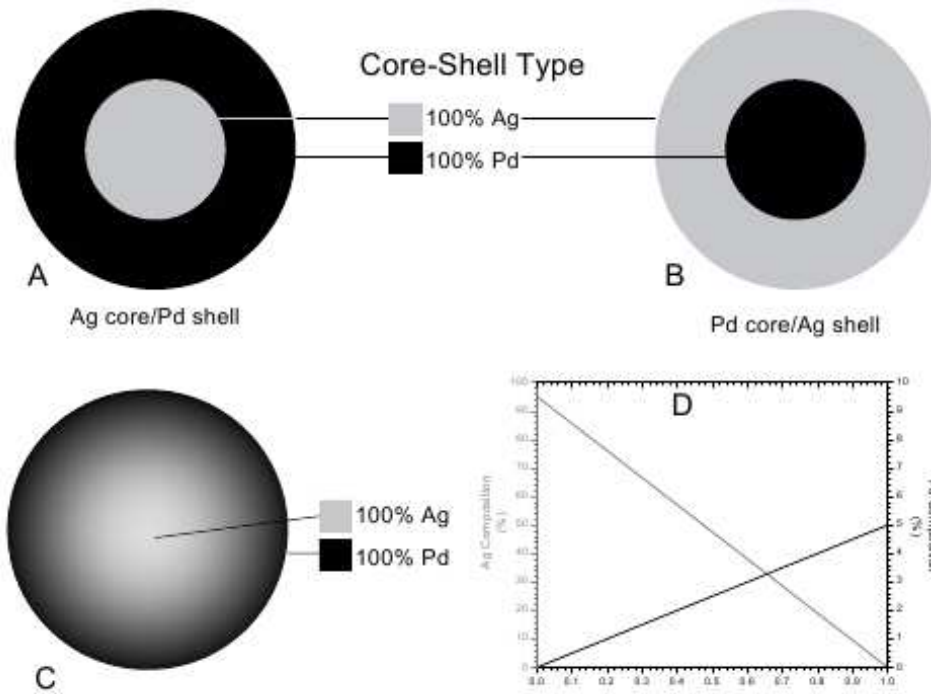
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# 95%Ag / 5%Pd Powder AgPd 7102FG Series

## Functionally Graded AgPd Powder Technology

Cermet utilizes unique chemical precipitation technology to manufacture conductive electronic powders. These powders can be a single metal, any AgPd alloy composition, or be functionally graded (FG). FG powders can be core-shell (Figure 1 a & b) or continually varied (Figure 1 c & d). The FG powders can be made in any AgPd composition and with any desired profile. AgPd powders in low fire applications can be made in the FG version to provide a Pd rich (or pure) exterior providing Pd-like powder characteristics. The Pd rich exterior delays the sintering onset temperature of the electrode layer in buried electrode applications, and reduces "free" Ag which can migrate into the dielectric, and volatilization/evaporation during firing. Having a Pd rich exterior on a low fire application powder also imparts desirable mechanical properties when milling the conductive powders into electronic pastes since Pd is easier to mill/disperse than Ag. Cermet utilizes its FG and D (dispersion) technologies to produce a highly deagglomerated powder product capable of very thin and smooth laydown ideal for constructing high layer count



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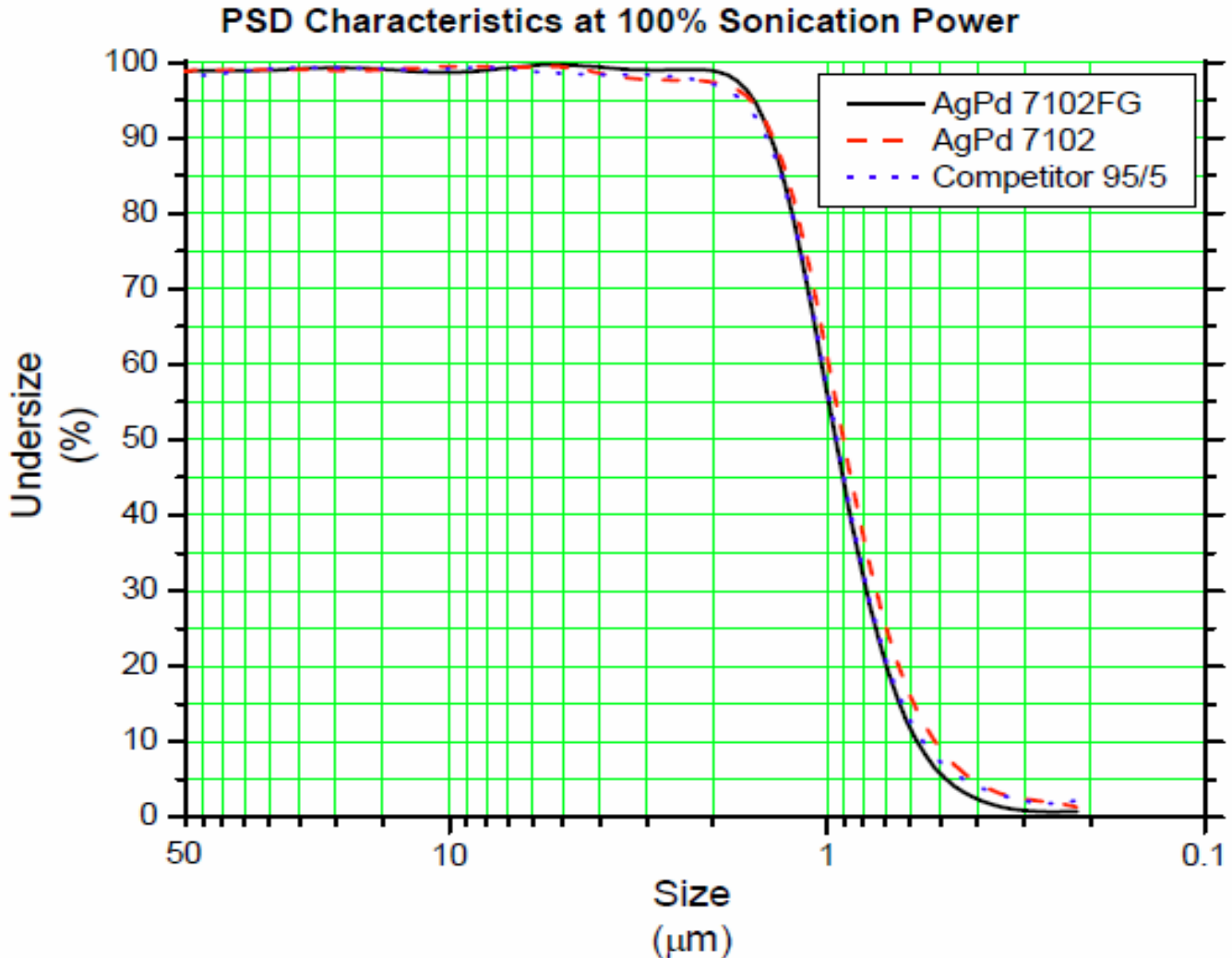
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# CERMET

## 95%Ag / 5%Pd Powder AgPd 7102FG Series



This figure shows the comparison of PSD characteristics of two versions of 95%Ag5%Pd and the leading competitor version of this powder as measured by a Micromeritics Sedigraph 5100 in A12 dispersion media with the sonication power set at full power. The Cermet FG version demonstrates the best PSD performance.

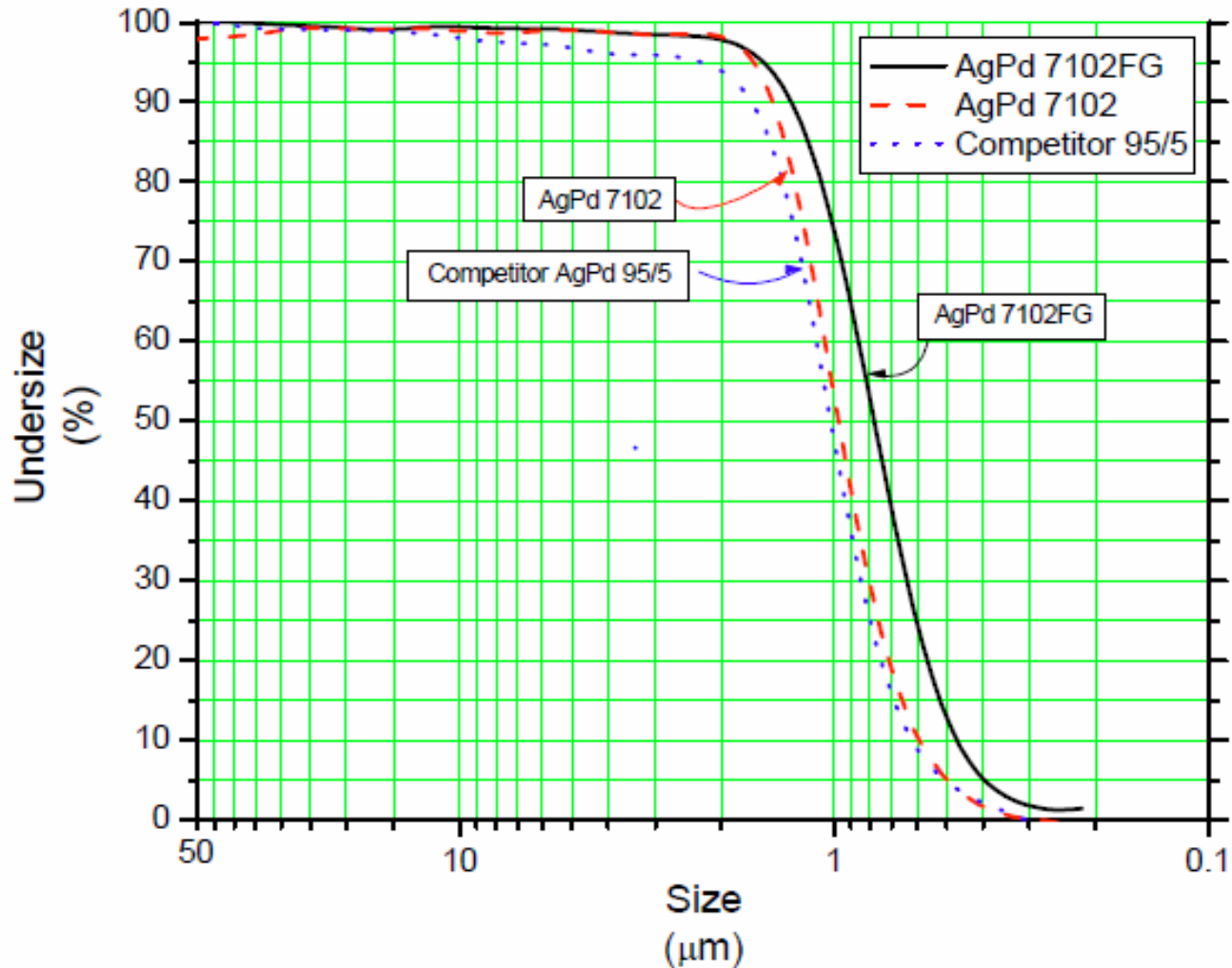
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## 95%Ag / 5%Pd Powder AgPd 7102FG Series

### PSD Characteristics at 75% Sonication Power



This figure shows the comparison of PSD characteristics of two versions of 95%Ag5%Pd and the leading competitor version of this powder as measured by a Micromeritics Sedigraph 5100 in A12 dispersion media with the sonication power set at 75% of full power. The Cermet FG version demonstrates the best PSD performance.

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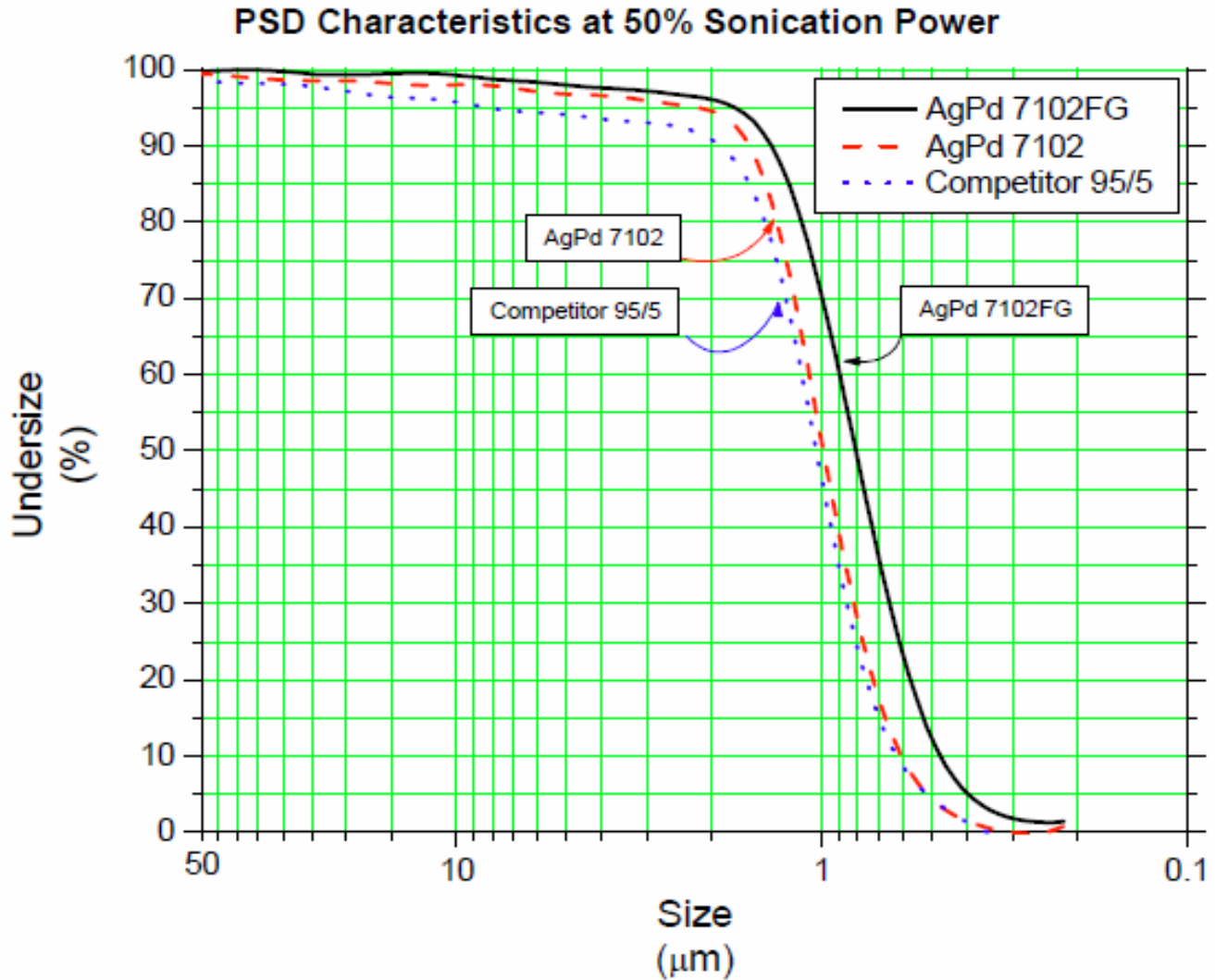
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CERMET

## 95%Ag / 5%Pd Powder AgPd 7102FG Series



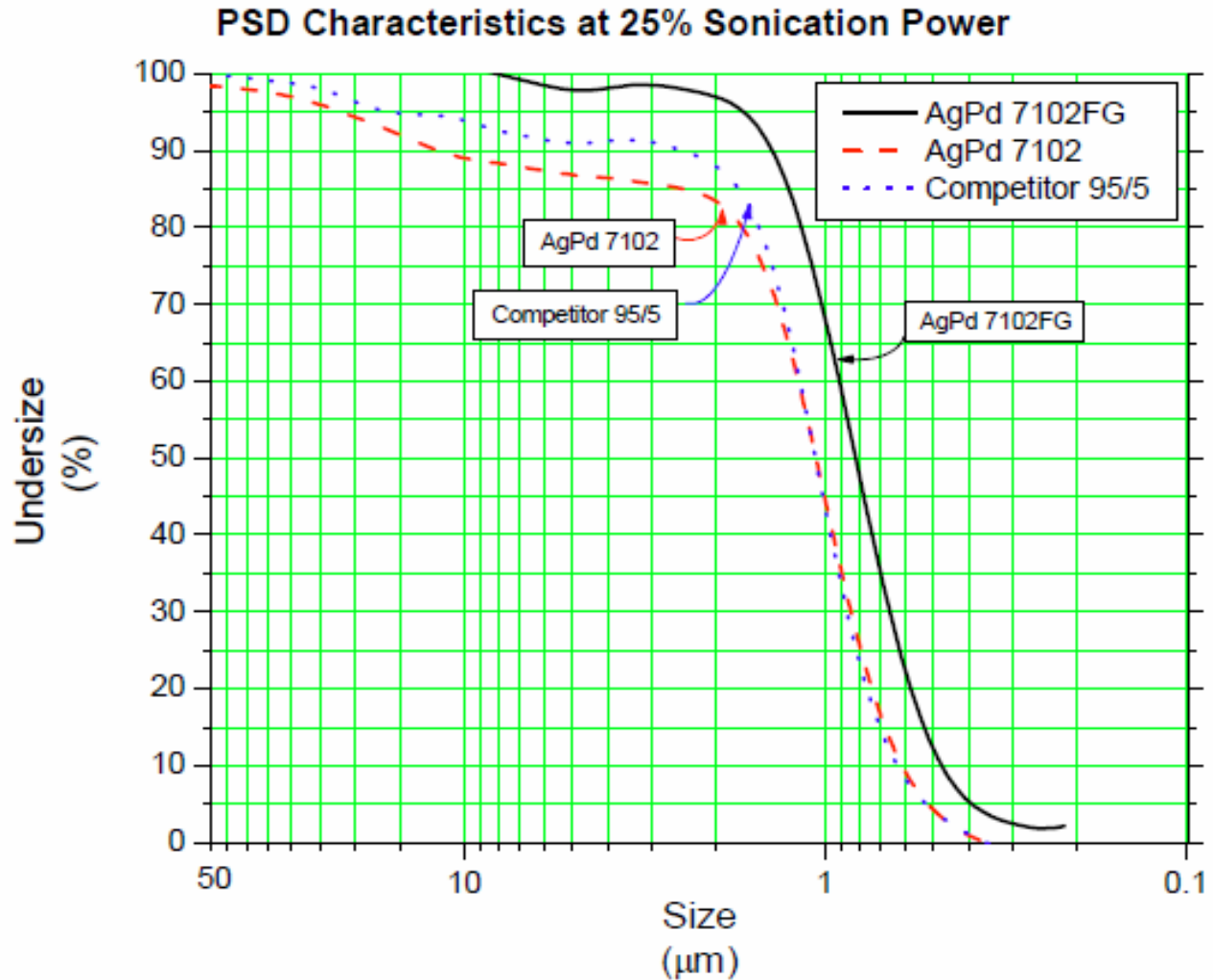
This figure shows the comparison of PSD characteristics of two versions of 95%Ag5%Pd and the leading competitor version of this powder as measured by a Micromeritics Sedigraph 5100 in A12 dispersion media with the sonication power set at 50% of full power. The Cermet FG version demonstrates the best PSD performance.

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## 95%Ag / 5%Pd Powder AgPd 7102FG Series



This figure shows the comparison of PSD characteristics of two versions of 95%Ag5%Pd and the leading competitor version of this powder as measured by a Micromeritics Sedigraph 5100 in A12 dispersion media with the sonication power set at 25% of full power. The Cermet FG version demonstrates the best PSD performance.

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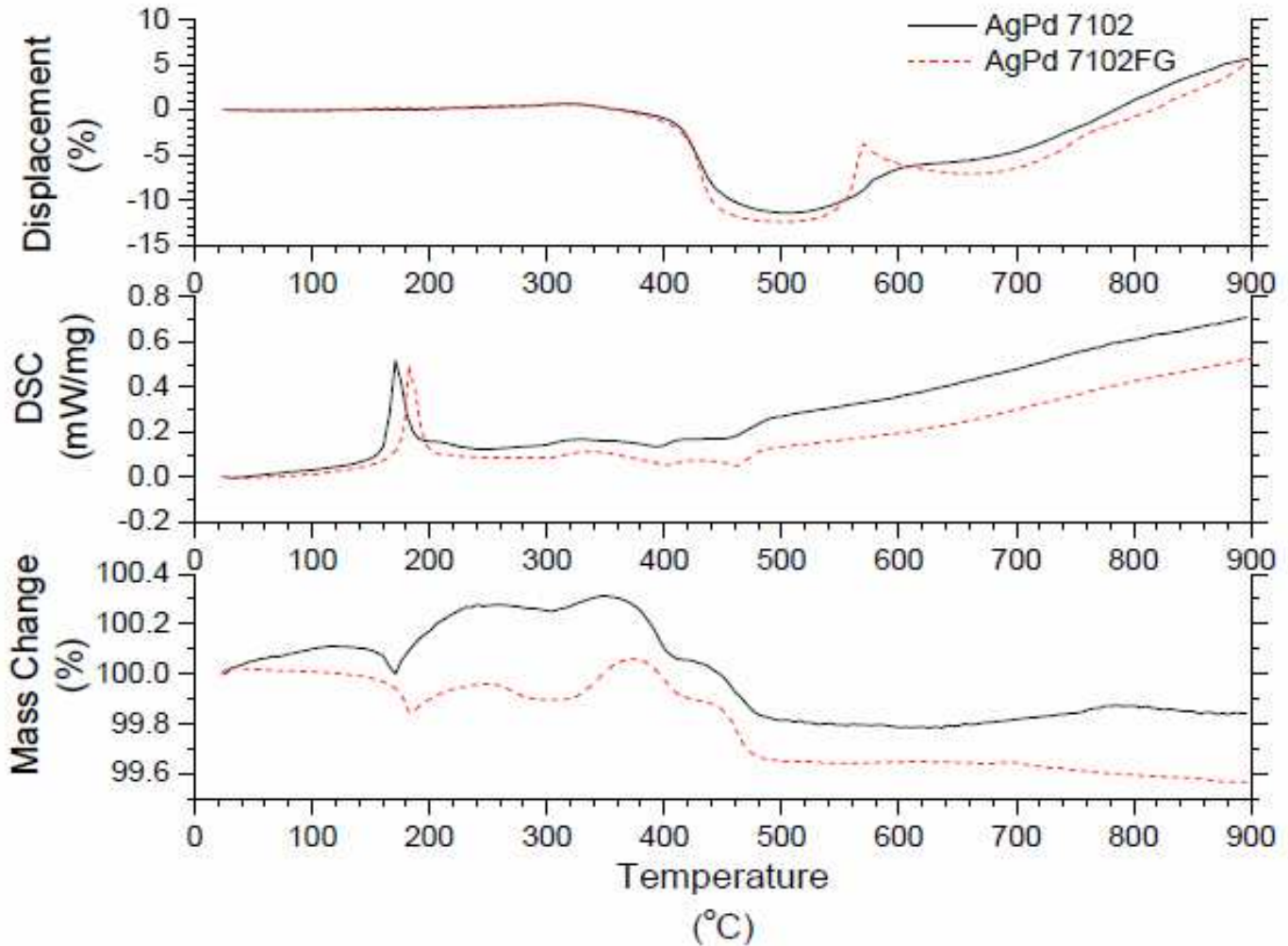
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CERMET

## 95%Ag / 5%Pd Powder AgPd 7102FG Series

### Thermal Characteristics of AgPd 7102 Series Powders



Netzsch STA 449, DIL 402C  
Scan Rate: 10°C min<sup>-1</sup> in air

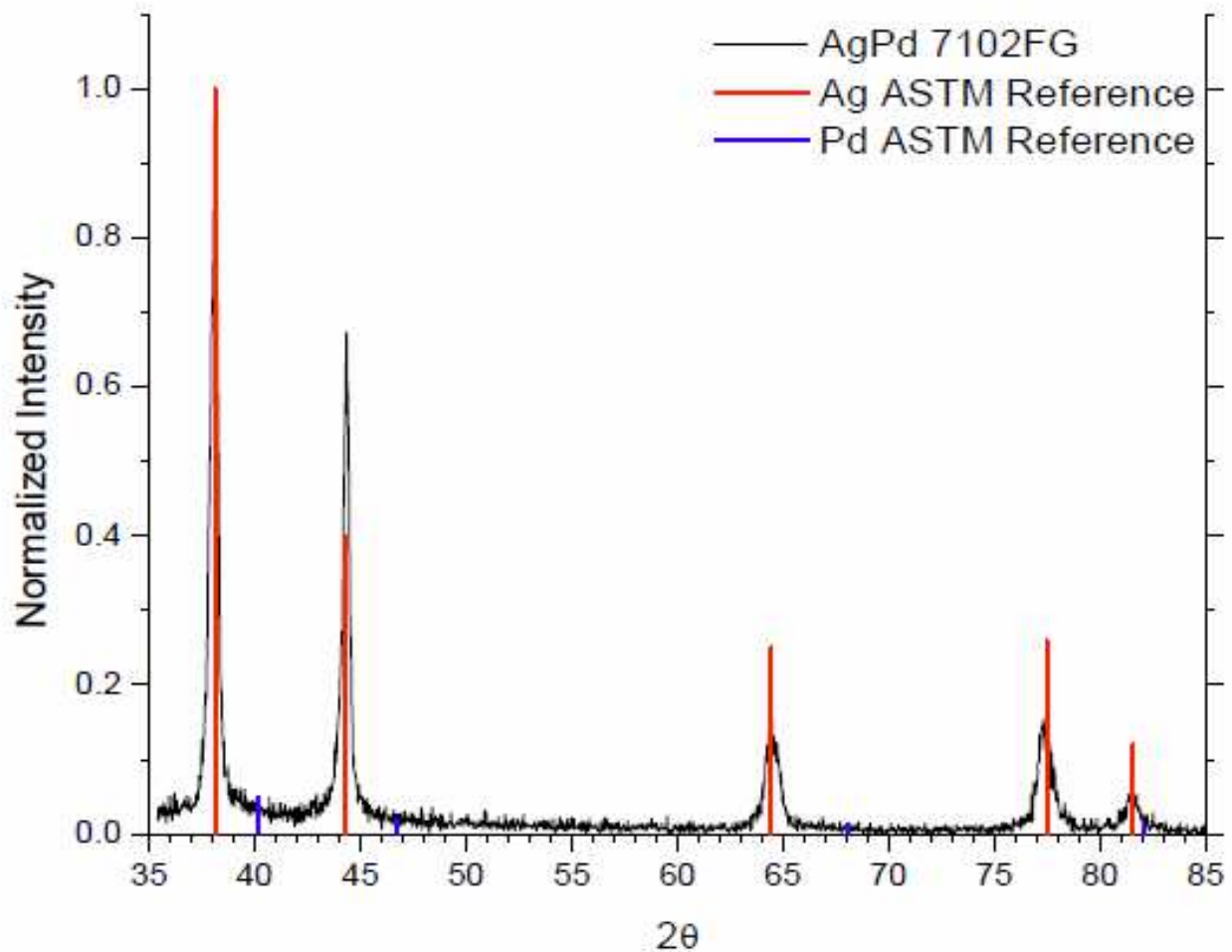
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## 95%Ag / 5%Pd Powder AgPd 7102FG Series

AgPd 7102FG Typical X-Ray Diffraction Spectrum



Siemens D500 Diffraktometer.  
1200 WATTS, Step Size 0.03, Dwell 1.0 s

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