

## Shrinkage Tests on PMC

**Question** *Does firing time alter shrinkage?*

**Process** Make five identical rings from PMC3.  
Fire them @ 1650°F (900°C) at different times,  
then make careful measurements.

Sample 1	15 min.
Sample 2	30 min.
Sample 3	45 min.
Sample 4	60 min.
Sample 5	120 min.



**Results** The rings were exactly the same.

**Conclusions** Firing PMC3 for 15 minutes at 1650°F creates a dense material. All the binder is gone and the silver particles are well joined. Prolonged heating does not add to density.

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**Question** *Does firing temperature affect shrinkage?*

**Process** Make five identical rings of PMC3.  
Fire them at different rates and carefully  
measure the results.

**Results** The rings were smaller as the temperature  
increased.

**Conclusions** As predicted, lower temperatures do not  
fully fuse the metal, leaving a material with  
microscopic spaces. At higher temperatures  
the metal becomes denser, as seen in smaller  
rings. This “densification” could be described as more shrinkage.



	<i>temp °F</i>	<i>hold time</i>	<i>final diameter</i>	<i>% shrinkage</i>
Sample 1	1110°	45 min.	19.0 mm	11.7
Sample 2	1200°	20 min.	18.7 mm	13.0
Sample 3	1290°	10 min.	18.5 mm	14.0
Sample 4	1450°	30 min.	18.0 mm	16.3
Sample 5	1650°	30 min.	18.0 mm	16.3

**Special  
Note**

Shrinkage numbers are confusing, and relate not only to the type of PMC and firing temperatures, but also to the size and shape of the piece. All stated shrinkage rates refer to fully sintered PMC, and should be thought of as plus or minus 3%.

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