Our product

3D Cer-Paste ZRP

Sinters to around 90+% density at 1500 C in air atmosphere and can go to full density <=1600 C. Its thermal shock resistance is excellent, surviving eight cycles of being heated rapidly to 800 C and, after equilibrating there, being quenched into water and quickly reheated back to 800 C etc. Due to this remarkable behavior, it was believed that ZRP composition must have very low thermal expansion. Since parts can be glued with our Vitragard FS that was designed for fused silica parts, the possibility of ZRP having expansion comparable to fused silica was considered.

In order to make bars that could be machined into test pieces for measuring the thermal expansion, a RefClay ZRP (see our RefClay https://zypcoatings.com/products/?swoof=1&woof_text=refclay products) composition was made such that dense cast-and-fired pieces resulted [fired at 1400 C, 0.5 hr].

The dense ZRP bars were sent to Orton for thermal expansion testing, with the reports here:

E228 Graph_ZYP Coatings_124665 ZI

E228 Table_ZYP Coatings_124665 ZI

For the ZRP composition, the CTE (20-1000 C) is 0.55 x 10^{-6}/C which compares with 0.54 x 10^{-6}/C from 20-1000 C for fused silica. And fused silica is limited in upper use temperature to about 1100 C due to its devitrification, whereas ZRP is usable to 1500 C.