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**EROSION AND MECHANICAL PROPERTIES OF HYDROTHERMALLY-RESISTANT NANOSTRUCTURED ZIRCONIA COMPONENTS**

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**Abstract**

Large scale 50×50 mm sintered nanostructured zirconia ceramics were fabricated via industrially viable dry pressing routes. The green bodies were sintered by a two-stage process and the optimised sintering conditions are reported. The suitability of nanostructured zirconia for demanding applications in petrochemical valve components was investigated by slurry impingement erosion experiments. Zirconia showed a 60-fold improvement compared to commonly used stellite-coated commercial stainless steel specimens under test conditions while no tetragonal to monoclinic phase transformation was observed after erosion. The enhanced performance was also valid when compared with reported erosion resistant properties of alumina and zirconia components by a factor of 36 and 3, respectively. This suggests nanostructured zirconia as a potential

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