1. Standards

TZP-A WHITE
Y-TZP

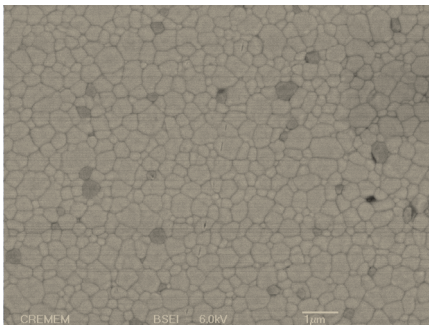
2. Description and use

Polycrystalline tetragonal Zirconia (ZrO_2) partially stabilized (5% weight) by yttrium oxide (Y_2O_3) and containing alumina (Al_2O_3) in order to give the material a perfect white colour. This material is perfectly suited for all kinds of cosmetic applications including contact with skin. It can be mirror polished with diamond and can be PVD coated due to high density and ultra-fine structure.
This material cannot be used for sterilization or high temperature applications especially in wet atmosphere (Temperature of use to be lower than 100°C in wet atmosphere and below 350°C in dry atmosphere).
This material can also be used for technical application needing high wear resistance but cannot be used for implants.

3. Composition

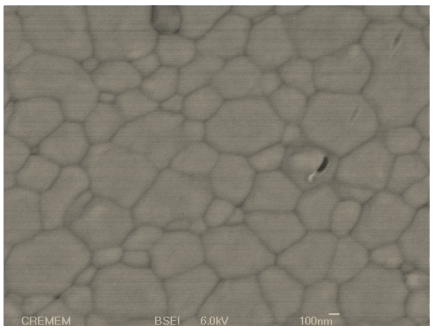
% ZrO_2	≥ 92,0
% Y_2O_3	4,9 – 5,2
% Al_2O_3	2,2 – 2,8

4. Microstructure



SEM micrograph after thermal etching.

Average grain size is lower than 1 micron and porosity rate is very low with a pore size inferior to a micron, dark areas are alumina.



SEM micrograph after thermal etching.

5. Physical and chemical properties

Coefficient of thermal expansion (CTE) = 10.10^{-6} K^{-1}
Thermal conductivity : 2 $W/m^{-1}.K^{-1}$

Theoretical density : 6,00
Minimum density : 5,94

6. mechanical properties

Young modulus: E = 200 GPa
3 points bend strength (as fired) : R_m = 400 – 600 MPa
3 points bend strength (polished) : R_m = 600 – 800 MPa

Fracture toughness : K_{IC} = 6 - 9 $MPa.m^{1/2}$
Hardness : 1350 Hv

7. Electrical properties

Electrical resistivity : 10^8 Ω . m
Dielectric constant : 22