

1. Standards

TZP - F315
(Tetragonal Zirconia Polycrystal)
Black Y-TZP

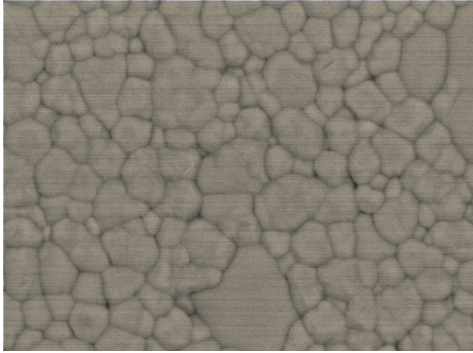
3. Composition

% ZrO ₂	≥ 88,9
% Y ₂ O ₃	4,7 - 5,0
% Other (pigments)	5,5 - 6,5

2. Properties and use

Polycrystalline tetragonal Zirconia (ZrO₂) partially stabilized (5% weight) with yttrium oxide (Y₂O₃) and containing pigments (iron, nickel, chromium and cobalt oxides) that endows the material with a deep black color and some magnetic properties. This material is perfectly suited for all cosmetic applications including contact with skin. It can be mirror polished with diamond and can be PVD coated due to the 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).

4. Mechanical properties without heat treatment



SEM Microstructure after thermal etching.

Average grain size is lower than 1 micron and porosity rate is very low with pore size inferior to a micron.

5. Physical and chemical properties

Coefficient of thermal expansion (CTE) = $10 \cdot 10^{-6} \text{ K}^{-1}$
Thermal conductivity : $2 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$

Theoretical density : 5,97
Minimum density : 5,92

6. Mechanical properties

Young modulus: E = 200 GPa
3 points bend strength (as fired) : $R_m = 400 - 600 \text{ MPa}$
3 points bend strength (polished) : $R_m = 600 - 800 \text{ MPa}$

Toughness : $K_{IC} = 5 \text{ à } 6 \text{ MPa} \cdot \text{m}^{1/2}$
Hardness : 1350 Hv