Characteristics

filyxio MATHYM

Typical values	YbF_3 nano-dispersions
Chemical formula	YbF_3
Crystal structure	Orthorhombic
Average Particle Size (nm)	20 & 40
Density* (g/cm³)	8.2
Refractive index*	1.53
Dispersion solid content (wt.%) *Depending on dispersion medium*	Up to 70

*Theoretical

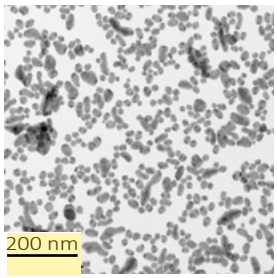
Nano-dispersion Characteristics	Example 1	Example 2
Nanoparticles	YbF_3	YbF_3
Monomer	UDMA	TEGDMA
Solid content (wt.%)	30	50
Viscosity (Pa.s)	50	6.9
Shear rate (s^{-1})	1	1
Radiopacity (mm Al)	2.5	5.4

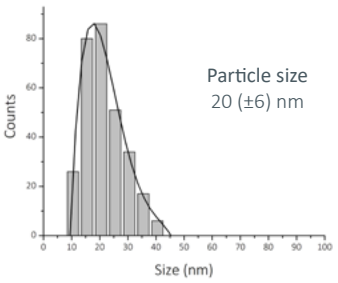
> **filyxio®** YbF_3 nanoparticles in suspension **main benefits:**

- High translucency of dental composites
- Higher depth of cure
- Low viscosity at high particle loading
- Improved flexural strength
- Higher filler load

*The **type of functionalization** provided strongly depends on dispersion medium & application requirements.*

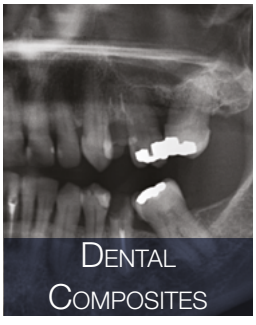
> Example of **particle morphology** & **size distribution** - YbF_3





Applications

> Our dispersions contain **the smallest YbF_3 nanoparticles** on the market and exhibit **the highest available solid contents**. We advise to use these products as **radiopacifying** fillers in dental composites. They are **compatible with all dental monomers**.



PRODUCT DESIGN

Our nano-dispersions are available **dispersed in a variety of solvents & resins:**

- Water
- Alcohol
- Acetone
- Methacrylate-based dental resin
- Custom solvent

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The information and data contained in this document are based on tests believed to be reliable and are indicative only. They are given to demonstrate the typical values attached to every single product in the range, but should under no circumstance be considered as a formal commitment. Depending on the measurement methods and/or instrumentation, the results may vary from information provided herein. Baikowski® and its related companies (subsidiary and affiliated companies) are neither responsible nor liable for results obtained from the use of the products. Because of numerous factors affecting results, Baikowski® makes no warranty of any kind, express or implied, including those of merchantability and fitness for a particular purpose. Each purchaser must conduct its own testing for safety and regulatory evaluations. **Baikowski SA reserves the right to change the information given herein without prior notice.**

Nano-dispersions

ZrO_2 / YSZ

Characteristics

zilight MATHYM

Nano-dispersions (Typical values)	ZrO_2	YSZ
Chemical formula	ZrO_2	ZrO_2 - 1 to 10 mol% Y_2O_3
Crystal structure	Monoclinic or tetragonal	Tetragonal[(1)]
Average Particle Size (nm)	6 - 90	5 - 20
Density* (g/cm^3)	5.7 (Monoclinic ZrO_2)	6.1 (3YSZ)
Refractive index	≥ 2.14	≥ 2.10
Dispersion solid content (wt.%) *Depending on dispersion medium*	Up to 70	Up to 70

**Theoretical*

[(1)] [(2)] Some grades contain a small fraction of:
[(1)] monoclinic particles
[(2)] anisotropic particles

> zilight® doped and undoped Zirconia nanoparticles in suspension **main benefits:**

- Smallest nanoparticles on the market
- High transparency nanocomposites
- Low viscosity at high particle loading

*The **type of functionalization** provided strongly depends on dispersion medium & application requirements.*

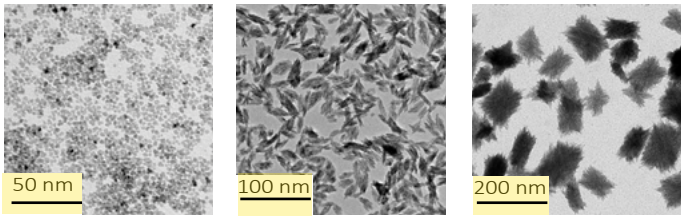
> Final ceramics made with YSZ nanoparticles in suspension **main characteristics:**

- Sintered at low temperature (950- 1200 °C)
- Fine-grained
- Highly translucent

> Example of thin films optical properties

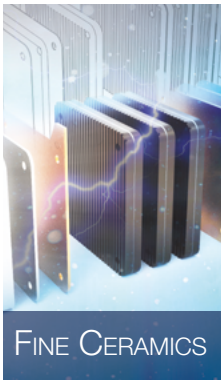
Composition	Solid loading (wt%)	Film thicness (µm)	Haze (%)
8YSZ in HDDA	50	3.2	0.2
8YSZ in HDDA	30	3.4	0.1
Pure HDDA	0	2.5	0.1

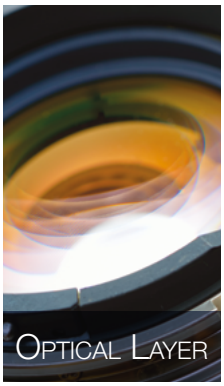
> Example of **particle morphology** & **size distribution** - YSZ



Applications

> Our dispersions are designed to **enhance optical, thermal and mechanical performances** of your material. Our nanozirconia shows a **very high refractive index**, which is your best ally in the design of optical materials. It can be used as a **sintering additive** for high-end ceramics or as a **filler** for refractive index enhancement of optical coatings (i.e. ophtalmic or display). It can also be used for mechanical reinforcement or as lubricants additives.





PRODUCT DESIGN

Our nano-dispersions are available dispersed in various solvents & resins:

- Water, alcohol, polyol, acetone, MEK
- Selected organic solvents
- Methacrylate-based dental resin
- Water based resins

Baikowski®