



**LUXFER**  
MEL TECHNOLOGIES

## Nano Dispersions for Advanced Applications

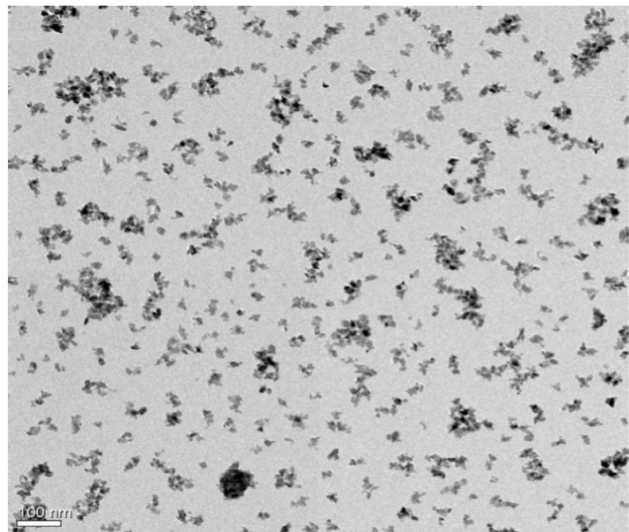
### Luxfer Nano Dispersions – General properties

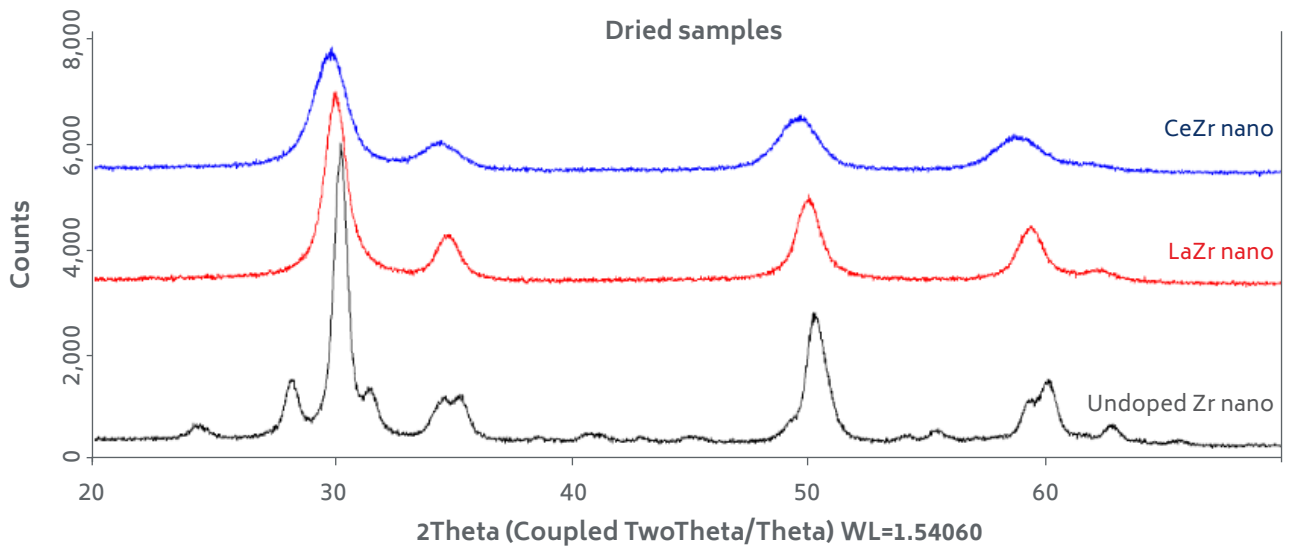
- Aqueous dispersion of mixed oxide
- 20-25 wt.% oxide (current standard\*)
- pH 3-8, composition dependant
- Contain no organic additives, or stabilizers
- Small particle size; Z-Average 100-300 nm
- Low viscosity; <100 cps, dependent on composition
- Long-term stability; >1 year
- Highly crystalline

### Range of compositions (dopants) available

Dried properties	SA (m <sup>2</sup> /g)	TPV (cm <sup>3</sup> /g)	Crystallite size (nm)
Zr nano	90	0.16	12
LaZr nano	130	0.18	7.7
CeZr nano	170	0.18	5.3

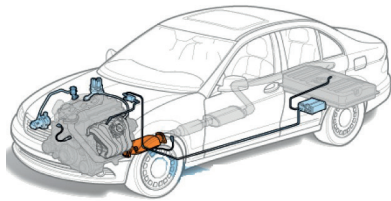
Some example nano compositions (undoped/doped)



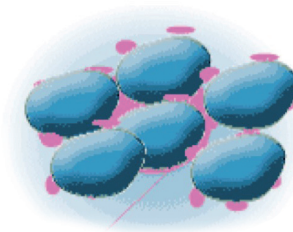


Phase depends on composition

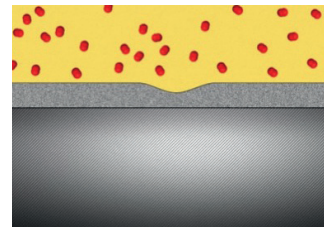
### Luxfer nano dispersions – potential applications



Emission control



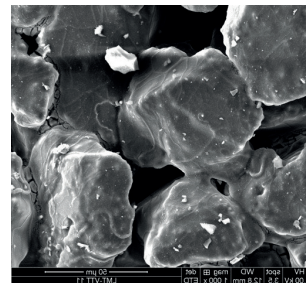
Binder



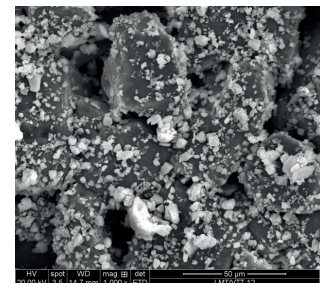
Coating/composite

### Application example – Filters (DPF/GPF)

- Coating applied to filter substrate, to provide:
  - Catalytic performance
  - Improved particle filtration efficiency
  - Maintain acceptable back pressure within the exhaust system
- Nano dispersion shows a more homogenous/denser coating
- TWC/OSC compositions are also available for GPF applications
  - CeZrOx mixed oxides containing additional dopants (e.g. La<sub>2</sub>O<sub>3</sub>, Nd<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>, Pr<sub>6</sub>O<sub>11</sub>)



CePrZrOx (nano) on SiC filter



CePrZrOx (milled oxide) on SiC filter

Discover more at

[www.luxfermeltechnologies.com](http://www.luxfermeltechnologies.com)

<sup>†</sup> The information contained within is meant as a guideline only

Copyright © Luxfer MEL Technologies 2023. The information provided within this document is aimed to assist manufacturers and other interested parties in the use of Luxfer MEL Technologies products. Luxfer MEL Technologies accepts no liability in whole or in part from use and interpretation of the data herein. All information is given in good faith but without warranty. Freedom from patent rights must not be assumed. Health and Safety information is available for all Luxfer MEL Technologies products. **DS-1076-0523**