

# Research on Risk Prevention to occupational exposure to MNMs in the construction sector

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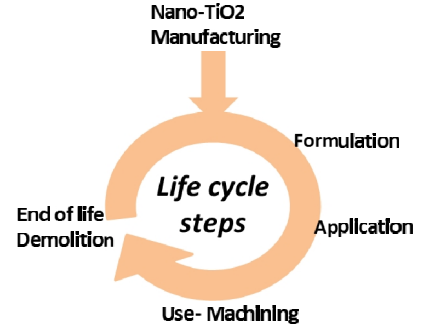
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Application of depollutant mortar (nanoTiO<sub>2</sub>)

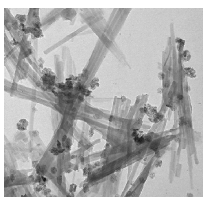


- ❑ A set of traditional constructive materials containing MNMs have been produced and a series of prevention **strategies** have been **designed** in order to prevent their related OHS risks
- ❑ These materials presented reduced risks but achieved the same performance than their traditional homologous



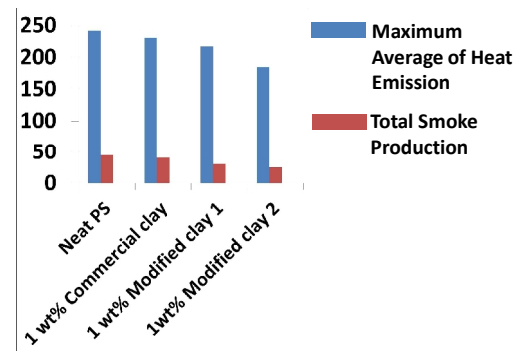
- ❑ Safety by design
- ❑ Concentrated and stable suspensions
- ❑ Reduce dust release during the manipulation
- ❑ Chemical modifications in order to reduce smoke in case of fire

MNMs	Application	Strategy
TiO <sub>2</sub>	Self-cleaning and depolluting mortar	Use concentrated and stable dispersions Use n-TiO <sub>2</sub> supported on sepiolite microfibers (safety by design)
SiO <sub>2</sub>	Self-compacting concrete	Use concentrated and stable dispersions
Nanoclay	Fire resistant polymeric panels	Low energy in mixing process to reduce the particle release Reduce the smoke release from the panels in case of fire
Cell NFs	Insulating polyurethane foam	Achieve good dispersions-NOAA bounded to the matrix (to reduce the likelihood to release free NOAAs from solid matrix)
CNFs	Composite materials for electromagnetic interference shielding	



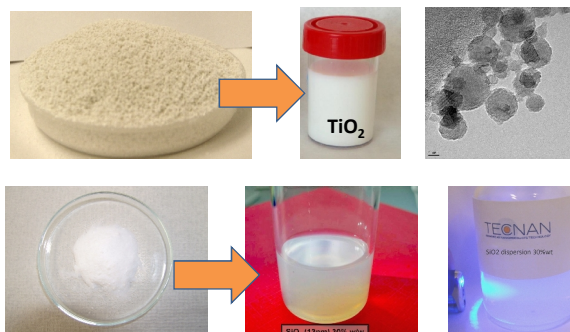
Supporting nanoparticles in microfibers: Safety by design

The modification of the nanoclay led to a smaller release of heat and smoke



Measurement data suggests that the occupational exposure to nano-TiO<sub>2</sub> is **SMALLER** when using sepiolite

	Occupational Exposure 8h-TWA to TiO <sub>2</sub> (mg/m <sup>3</sup> )	
	n-TiO <sub>2</sub> /Sepiolite	n-TiO <sub>2</sub>
Mortar manufacturing	0.008	0.073
Mortar application	0.016	0.043



Highly stable and active nanodispersions: safe handling