

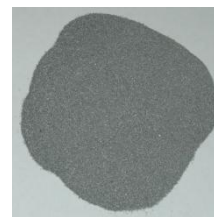
## HKP-ZFP

*nanostructured zinc flake pigments*

excellent corrosion resistance ☼ VOC-free ☼ water-stable\*

total processing cost 1.65 €/kg Zn\*\*

(activity-based costs without raw material, CM900, Germany 2016-10)



### Industry:

**coating industry**

ZFP can be manufactured faster | solvent-free ⇒ no volatile organic compound | cost-effective | environmentally friendly with | better long-term protection

**metalworking industry**

application in lacquers for steel and other metals and for standard demands (e.g. fasteners)

### Product/innovation 100% ready to market proved:

**technologically**

→ short processing times by High Kinetic Processing (HKP), good shelf life, high corrosion resistance

**economically**

→ cost-effective: shorter processing times, solvent-free production: less disposal

**ecologically**

→ solvent-free production ⇒ no VOC during processing, water-based coating systems possible

### Technical advantages:

**efficiency**

one-step process for flake formation and additive layer addition

**corrosion resistance**

salt spray test, deg. 1 (DIN EN ISO 9227), condensation climate test, deg. 0 (DIN EN ISO 6270-2)

**stability**

water storage, deg. 1 (DIN EN ISO 2812-2) ⇒ water-stable ZFP by solvent-free *in situ* HKP-coating

**surface**

smooth surface, easy applicable, air dry finish

**application**

Simoloyer® HKP, shorter and solvent-free manufacturing, water-based coatings possible\*

### Cost advantages:

**high corrosion resistance**

→ less material, less maintenance

**water-stability**

→ more applications possible, more markets, no solvents necessary to produce ZFP

**high stability**

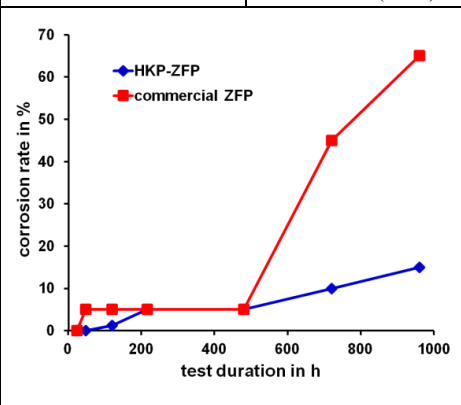
→ less waste, renewing less often

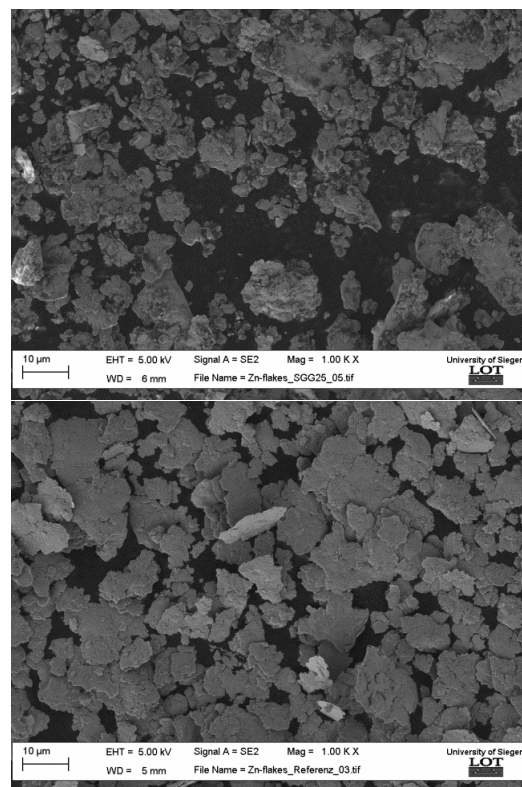
**VOC savings**

→ can represent cash earnings/savings as well

**Processing cost**

→ 1.65 €/kg at 450 t/a (CM900) to 3.25 €/kg at 70 t/a (CM100) \*\*

compared properties	HKP-ZFP	conventional ZFP
d <sub>50</sub> [μm]	< 25*	< 25
thickness [μm]	< 1.0*	< 1.0
manufacturing ZFP	few hours solvent-free	days - weeks solvents (VOC)
corrosion	 <p>corrosion rate in %</p> <p>test duration in h</p> <p>Legend: HKP-ZFP (blue diamonds), commercial ZFP (red squares)</p> <p>salt spray test</p> <p>within same master batch formulation</p>	
water storage	deg. 1	deg. 2
elasticity [mm] (before/after corrosion)	5/5	4/4
impact resistance [J] (before/after corrosion)	5/5	5/5
adhesion strength (before/after corrosion) (scale 0-5 pts., 0 is best)	0/1	0/1



Nanostructured HKP-ZFP (top) and conventional ZFP (bottom)

\* depending on additive and process control agent

\*\* depending on process parameters and costs for energy, labor, etc.