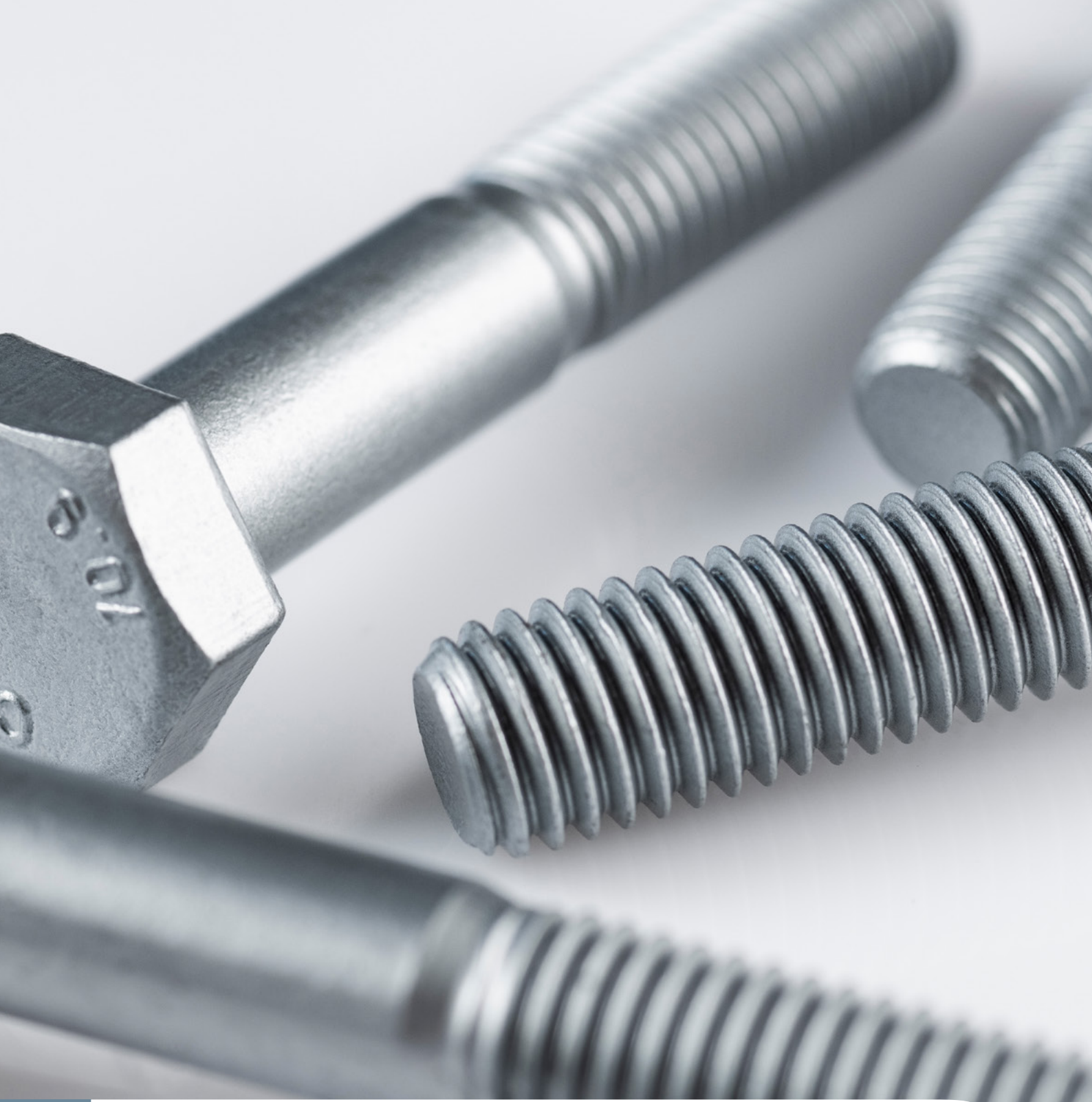


STAPA® STANDART®

Zinc pastes and Zinc flake powders for corrosion protection

A member of ALTANA

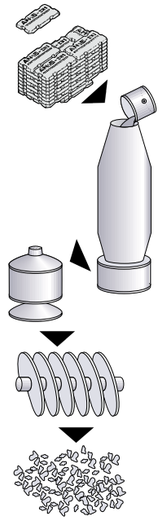
ECKART

Corrosion protection with STAPA® Zinc pastes, STANDART® Zinc flake powders and Zinc granules

Production process
The raw material for the flakes is atomized, irregular Zinc granules with a minimal purity of 99.995 acc. to DIN 1706 which is milled into lamellar particles in ball mills in the presence of a lubricant in white spirit. The pigment suspension produced after milling is screened, pressed on filter presses and homogenized in mixers to the standard combination of 90% solids and 10% solvent.

The same raw material is also used in a dry milling process in the presence of a lubricant to get flake-shaped Zinc powders.

Production flowchart Zinc granules



Raw material
SHG-Zinc 99.995%

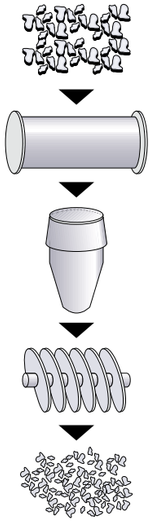
Atomization
Smelting of zinc ingots
Air – atomization

Screening
Separation of various particle sizes

Phlegmatization (Mixer)
Homogenization

Final product
Final test report / Packing

Production flowchart Zinc flake powder (Dry milling process)



Raw material
Zinc granules / Lubricant

Steel ball mill
Continuous production
Milling down of zinc granules using steel balls

Cyclone
Separation of various particle sizes

Phlegmatization (Mixer)
Homogenization
controlled oxidation

Final product
Final test report / Packing

Corrosion protection with STAPA® Zinc pastes and STANDART® Zinc flake powders

ECKART is a leading international manufacturer of metallic and pearlescent pigments for the paints and coatings industry, the graphic arts industry, the plastic, lightweight concrete and the cosmetic industry.

In the paint industry one of the most important corrosion protection applications are anti-corrosive coatings, wherein lamellar Zinc powders and pastes are used as functional pigments.

The anticorrosive properties of zinc have been well-known for decades; thousands of tons of Zinc dust are yearly used to protect goods and constructions everywhere in the world.

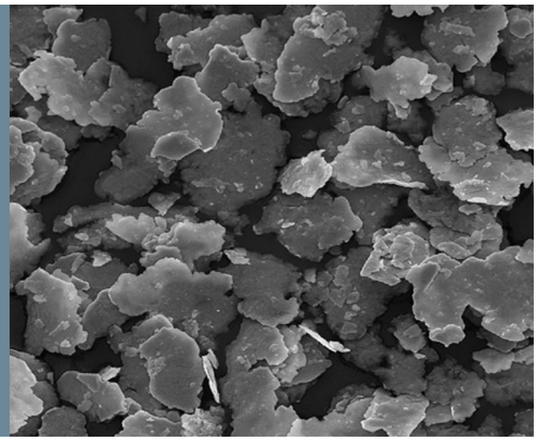
The development of Zinc flakes began back in the 70s, initiated by the desire for anti-corrosive pigments for thin films which offer good corrosion protection under mechanical loads. For a producer of diverse lamellar metalpigments like ECKART it was obvious to manufacture also lamellar (flake-shaped) Zinc pigments to fulfill these requests. Actually the main application field for Zinc flakes is still the coating of mass goods in a special dip coating process.

With the zinc pastes and zinc powder portfolio, ECKART offers solutionsto meet the requirements of high-quality products with outstanding corrosion protective properties.

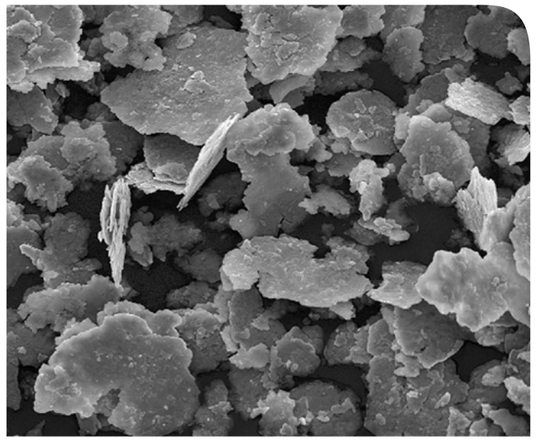
Zinc flake pigments Typ/Type	Alloy composition %	Non volatile content (pigment) acc. to DIN 55923 ± 2% %	Volatile content (solvents) acc. to DIN 55923 ± 2% %	Type of solvents *	Bulk density (typical value) appr. (kg/l)	Screen analysis/ wet sieving with organic solvents as rinsing liquid acc. to DIN 53196 <45 µm min. %	Typical characteristics of particle size distribution determined with Helos D50 approx. [µm]
STANDART® Zinc – Powders							
Zinc flake AT	Zn: 100**	100	-	-	1.0	97.0	22
Zinc flake GTT	Zn: 100**	100	-	-	0.8	98.0	13
Zinc Matt Black	Zn: 100**	100	-	-	1.4	97.0	7
STAPA® Zinc – Pastes							
Zinc 4	Zn: 100**	90	10	TE	-	97.0	16
Zinc 8	Zn: 100**	90	10	TE	-	99.0	13
STAPA® Zinc – Alloys							
4 ZnAl3	Zn: 97, Al: 3	91.5	8.5	TE	-	97.0	15
4 ZnAl7	Zn: 93, Al: 7	91.5	8.5	TE	-	97.0	15
4 ZnSn15	Zn: 85, Sn: 15	91.5	8.5	TE	-	97.0	15
15 ZnMg26	Zn: 74, Mg: 26	85.0	15.0	TE	-	99.0	15

* TE = Mineral spirit, other solvents available on request

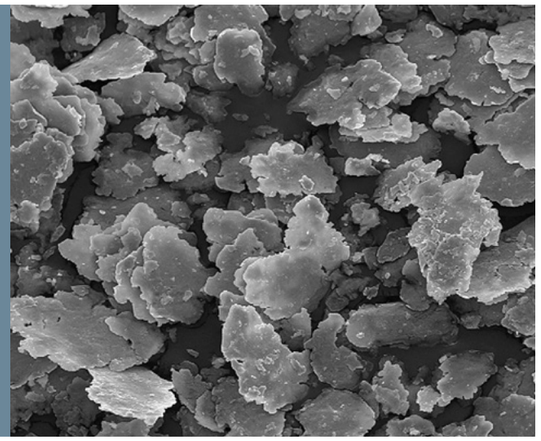
** Zinc is 99,995% pure



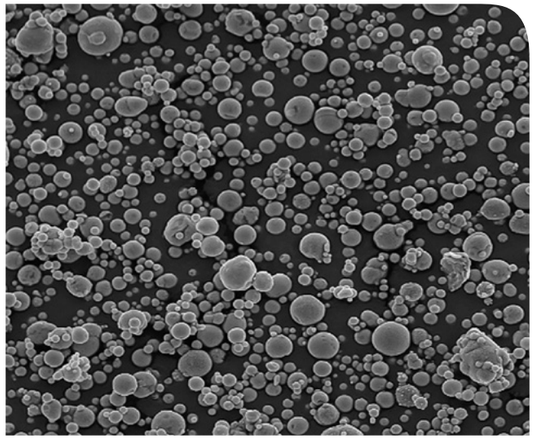
Zinc powder (450x)



Zinc paste (450x)



Zinc flake (450x)



Zinc dust (450x)

Mode of action of Zinc flakes

Apart from the cathodic corrosion protection provided by Zinc, Zinc flakes offer the additional advantage of excellent barrier protection. Cathodic corrosion protection is guaranteed by factors including conductive contact between Zinc and the steel surface and between the Zinc particles themselves. Whereas spot contact with relatively high resistance is achieved with Zinc dust particles, Zinc flakes have twodimensional contact which brings about a higher current density and hence a better anti-corrosive effect, though it can also lead to more rapid degradation of unprotected Zinc flakes. To counteract this, fillers in flake form and/or additional anti-corrosive pigments are often incorporated in the formulation.

Due to their platelet-like strukture, flakes have a markedly larger surface area than spherical Zinc dust. The correspondingly higher binder uptake allows formulations with a lower pigment volume concentration (PVC), which in turn leads to favourable application and paint properties.

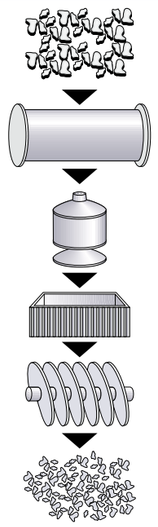
Paint properties, application and handling

Especially the large surface area/high binder uptake, which means less need of Zinc in the formulation lead to a lot of advantages:

- Greater flexibility
- Better substrate and intercoat adhesion
- Good overcoating properties
- Low porosity and permeability
- Smooth surface area
- Metallic appearance
- Lower settling tendency
- Sediment easier to stir up
- Less Zinc to store / to handle
- Higher productiveness
- Less Zinc need per m^2 –> ecological advantage

The use of Zinc flakes offers predominantly technical and ecological advantages without any economic drawbacks.

Production flowchart Zinc paste (Wet milling process)



Raw material
Zinc granules / Lubricant / White spirit

Steel ball mill
Batch production
Milling down of zinc granules using steel balls

Screening
Separation of various particle sizes

Filter press
Drying until desired solvent content

Phlegmatization (Mixer)
Homogenization

Final product
Final test report / Packing

Zinc dust and Zinc flakes

Technical data	Zinc dust	Zinc flake
Particle shape	spherical	lamellar
Density	appr. 2.2 kg/l	appr. 1.1 kg/l
Oil absorption value	appr. 6.5 g/100 g	appr. 22 g/100 g
Medium particle size	appr. 3 µm	appr. 15 µm
Specific surface area	small	large
Binder requirement	low	high
PVC	high	low

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With compliments

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