

TECHNICAL DATA SHEET

ZnO

High-surface-area active zinc oxide powder for industrial formulation development.

SUBSTANCE Zinc oxide	CAS-NO. 1314-13-2	EC-NO. 215-222-5	BET SURFACE > 60 m ² /g
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01 Description

ZnO is a high-surface-area active zinc oxide powder for industrial formulation development. The current product brief identifies a BET specific surface area above 60 m²/g. Its function depends on surface area, purity, crystal phase, agglomeration and the dispersion achieved in the application system.

02 Fields of application

Sulfur-cured rubber — vulcanization activator.

Protective coatings — fine barrier phase.

Coatings, inks, polymers for UV management — inorganic broad-band UV absorber.

Catalyst and specialty-chemical formulations — high-surface-area reactive oxide.

Application suitability and performance must be confirmed in the intended formulation.

03 Recommended starting levels

APPLICATION / SYSTEM	STARTING LEVEL AND BASIS	PARTICLE FUNCTION AND EXPECTED SYSTEM RESPONSE
Sulfur-cured NR, SBR and BR compounds	0,5–2,0 phr ZnO, based on 100 phr total rubber	FUNCTION Vulcanization activator within the sulfur/accelerator cure package. CHECK High-BET ZnO can permit reduced zinc loading. Re-optimize scorch safety, cure time, torque, crosslink density, ageing and abrasion.
Aqueous transparent UV-protective coatings	0,8–2,4 wt% active ZnO, based on solid binder	FUNCTION Broad-band inorganic UV absorber and functional pigment. CHECK Reduced UV transmission and protection of film and substrate with limited impact on gloss, colour and transparency when dispersion is sufficiently fine. Thin films generally require the upper part of the range.
Protective epoxy coatings	No transferable universal level; published optima differ between formulations	FUNCTION Fine barrier phase that can fill microdefects and increase diffusion-path tortuosity. CHECK Evaluate dispersion, viscosity, cure, adhesion, water uptake and EIS. Agglomeration or excess loading can create defects and reverse the effect.

The values are starting points for formulation screening, not ZnO performance specifications. The rubber range is for high-BET ZnO. The UV range is the active-ZnO equivalent of 2–6 wt% of a commercial 40 wt% ZnO dispersion, based on solid binder. For ZnO powder, correct the product addition for the released ZnO assay and determine the optimum dosage by application-related test series.

04 Technical data

PROPERTY	VALUE / METHOD
Chemical identity / identifiers	Zinc oxide · CAS 1314-13-2 · EC 215-222-5
Product form / appearance	Powder; colour to be released
Specific surface area	> 60 m ² /g · N ₂ -BET *
ZnO content / purity	To be released · test method to be stated
Crystal phase	To be released · XRD
Particle-size characteristics	To be released · primary-particle and agglomerate methods to be stated
Bulk density / moisture / surface treatment	To be released · test methods to be stated

* The BET value is taken from the current project brief and must be confirmed against the released specification or certificate of analysis before external issue. Entries marked “To be released” are placeholders, not product values. Typical values do not constitute specification limits unless agreed separately.

05 Processing instructions

Avoid dust formation. Add slowly under effective mixing. For liquid formulations, wet out and pre-disperse using a binder- and application-compatible dispersing additive where required; select shear or milling conditions according to the target fineness and stability. For UV applications, verify UV and visible transmission, haze, colour and gloss in the final film. In rubber, validate the mixing sequence and re-optimize the complete cure package. Use a concentration ladder around the stated starting level.

06 Packaging

Sample size: upon request. Commercial packaging: bags; net weight according to order confirmation.

07 Storage

Store in tightly closed original packaging in a dry, well-ventilated place. Protect from moisture and contamination; reseal opened bags. Storage temperature and shelf life: to be released.

08 Labelling

Classification and labelling are stated in the current safety data sheet. This TDS does not replace the SDS. Follow the handling and exposure-control measures specified in the SDS.

09 Special note

The stated starting levels do not constitute a product-performance specification. No antimicrobial, biocidal, cosmetic, food-contact or medical claim is made. The terms “nano” or “nanoparticle” are not used as product claims until the supplied grade has a documented particle-size assessment appropriate to the relevant legal or customer requirement.

10 – NOTES AND DISCLAIMER

The information in this document is provided in good faith and reflects the manufacturer's knowledge at the date of issue. It does not constitute a specification, guarantee or warranty. Product suitability for a particular formulation, process, substrate and intended use must be established by the user through appropriate testing. Nothing in this document relieves the user from complying with applicable legal, safety and regulatory requirements. nanoSaar Production GmbH may revise this document without prior notice.

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