



TECHNICAL CERAMICS

APPLICATION SOLUTIONS FOR PRODUCTION AND CONTROL OF
ADVANCED AND ENGINEERING HIGH-PERFORMANCE CERAMICS

Technical ceramics are engineered ceramic materials, either monolithic or multi-phase, designed to deliver specific mechanical, thermal, or functional properties. These materials are produced through powder-based processes where **chemistry, particle characteristics, thermal treatment, and microstructure** define final performance. Verder supports this journey with an integrated portfolio covering R&D **production, processing, and quality control**.



FROM POWDERS...

RAW MATERIALS & POWDERS

OXIDES AND NITRIDES AND CARBIDES
 Al_2O_3 , ZrO_2 , SiC , Si_3N_4 , AlN , B_4C

- | Size & shape: packing, sintering behaviour
- | Impurities: O/C/N/S control
- | Grain microscopy: OM/SEM



PARTICLE CHARACTERIZATION

SINTERABILITY & MICROSTRUCTURE

- | PSD: sintering behaviour, grain growth
- | Surface area & porosity: densification, shrinkage, properties

SLURRIES: DISPERSION & STABILITY

- | Dispersion PSD: agglomerates, coating/printing quality
- | Zeta potential: prevent aggregation
- | Stability/shelf-life: sedimentation control



THERMAL PROCESSING & TREATMENT

DEBINDING, SINTERING, HEAT TREATMENT

- | Controlled-atmosphere and high-temperature furnaces to perform safe debinding, sintering, and heat treatment of advanced ceramics
- | High-temperature thermal processing to achieve the desired density, phase assemblage, and microstructure required for high-performance applications



FINAL PRODUCT

PERFORMANCE | CONSISTENCY | COMPLIANCE

- | Powders/granules: size/shape/SSA; density/porosity/surface
- | Parts: sectioning/mounting/polishing; hardness + metallography
- | QC sampling + size reduction: reproducible downstream tests



MILLING, HOMOGENIZING, SIEVING

POWDER CONDITIONING FOR FORMING

- | Milling/mixing: repeatable size & composition (pressing/extrusion/injection)
- | Sieving: granule distribution, green density



CHEMICAL COMPOSITION

PURITY AND PHASE STABILITY

- | Elemental purity: avoid contamination/reactions
- | C/S/O/N/H: binder residues, trace control
- | SEM-EDX: element/phase mapping



STRUCTURE & MECHANICAL PROPERTIES

MICROSTRUCTURE -> PERFORMANCE

- | Sample prep: microstructure, defects
- | Grinding/polishing + hardness: wear, fracture, integrity



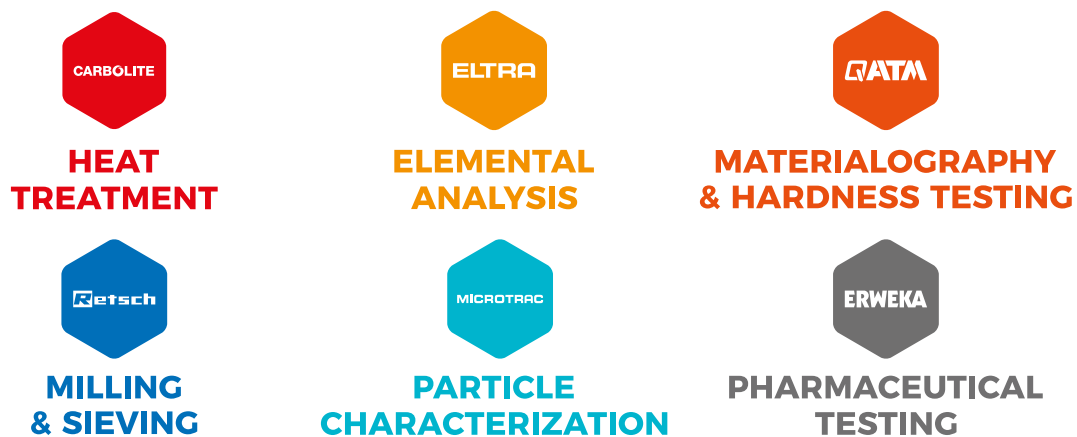
...TO PERFORMANCE

ENABLING PROGRESS



VERDER

GLOBAL REACH, LOCAL EXPERTISE



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