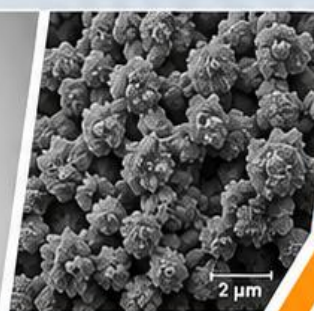
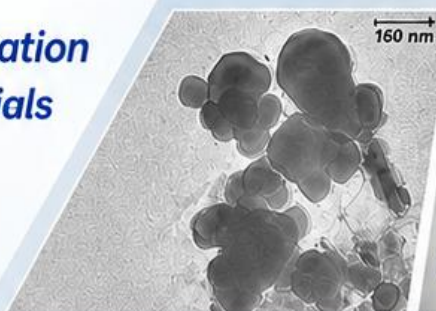


Mullite-MoSi₂ Nanocomposite Powder

Advanced Mullite-MoSi₂ Nanocomposite Powder
for Extreme Temperature Applications

*Engineering the Next Generation
of High-Temperature Materials*



Product Overview

Our Mullite-MoSi₂ Nanocomposite Powder combines the exceptional electrical conductivity of molybdenum disilicide (MoSi₂) with the outstanding thermal stability and mechanical strength of mullite. This innovative nanocomposite material delivers superior performance in the world's most demanding high-temperature environments.

Designed for advanced heating elements, refractory components, and high-temperature structural applications, our powder overcomes the traditional limitations of pure MoSi₂ while maintaining excellent oxidation resistance and thermal performance.

***Built for reliability.
Engineered for extreme temperatures.***

Key Features



High-temperature stability

Maintains performance in extreme environments



Excellent electrical conductivity

From MoSi₂ for efficient heating



Superior mechanical strength

Reinforced by mullite



Enhanced oxidation resistance

Longer service life



Nanoscale composite design

Optimised microstructure for improved performance

1 / TECHNICAL DATA

Technical Specifications

Specified product data and editable fields for future release of measured values.

PROPERTY	VALUE / SPECIFICATION
Product	Mullite–MoSi ₂ Micro/Nanocomposite Powder
Composition	60% Mullite / 40% MoSi ₂
Purity	99%
Particle size	D50: 500 nm (customizable)
MoSi ₂ melting point	2030 °C
Mullite melting point	1830 °C
Apparent density	4.74 g/cm ³
Tap density	
Specific surface area (BET)	
Product code	

02 / MATERIAL BASIS

Material Properties

Key constituent characteristics underpinning the composite design.

MoSi₂

- Metallic-like electrical conductivity
- High-temperature capability
- Strong oxidation resistance under suitable conditions
- Melting point: 2030 °C

Mullite

- High-temperature ceramic stability
- Thermal and mechanical robustness
- Stable refractory phase
- Melting point: 1830 °C

03 / PERFORMANCE RATIONALE

Why Mullite–MoSi₂?

A composite approach intended to balance the electrical, thermal, and mechanical demands of extreme-temperature service.

PROPERTY / CONSIDERATION	CONVENTIONAL MoSi ₂	MULLITE–MoSi ₂ COMPOSITE
Electrical functionality	Metallic-like electrical conductivity; established for high-temperature heating applications.	Retains MoSi ₂ as the conductive phase within a ceramic-reinforced composite.
Oxidation/service behaviour	Forms a protective SiO ₂ layer in oxidizing environments; performance depends on temperature and service conditions.	Adds a thermally stable mullite phase to the MoSi ₂ -based system, with the aim of supporting overall service robustness.
Mechanical behaviour	Low ductility at lower temperatures; creep can limit performance during prolonged very-high-temperature exposure.	Mullite is incorporated as a refractory ceramic phase to support structural stability of the composite.
Thermal capability	High-temperature capability; melting point approximately 2030 °C.	Combines MoSi ₂ functionality with mullite refractory stability; mullite melting point approximately 1830 °C.

Note: Comparison points describe the material design rationale; final application performance should be validated for the intended operating conditions.

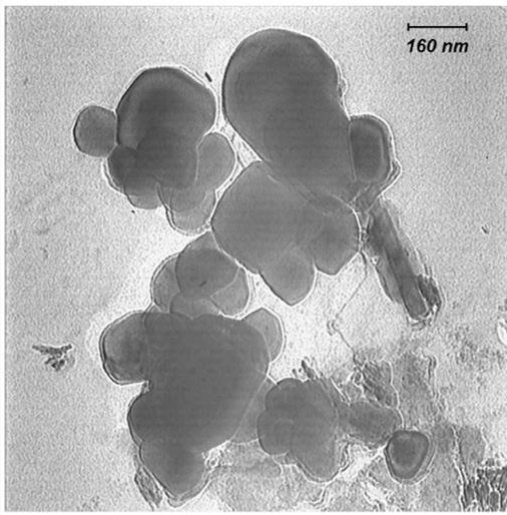
Benefits summary

Composite architecture can be tailored for high-temperature heating elements, refractory components and other applications where electrical conductivity must coexist with thermal stability and ceramic reinforcement.

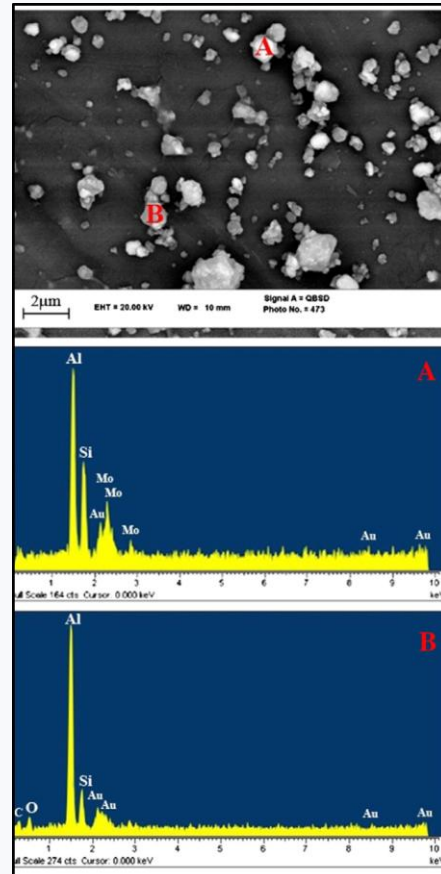
04 / CHARACTERIZATION

Microstructure & Characterization

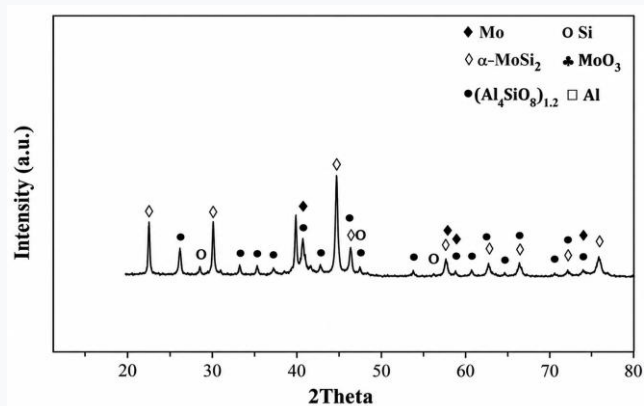
TEM MORPHOLOGY



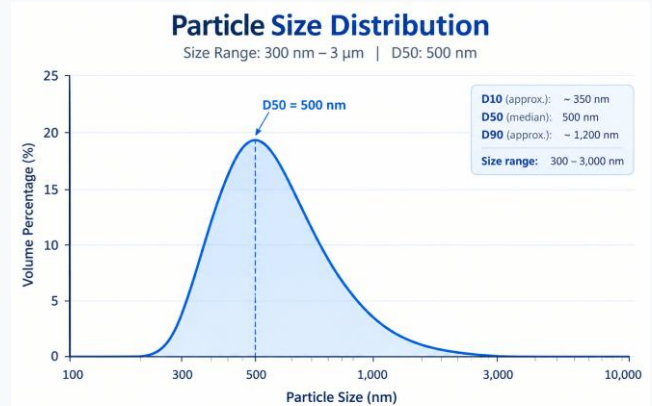
SEM / EDX



XRD PATTERN



PARTICLE SIZE DISTRIBUTION



05 / APPLICATIONS

Designed for Extreme-Temperature Systems

Potential application areas for engineered Mullite–MoSi₂ powder formulations.

01	Industrial heating elements High-temperature electrical heating components and element bodies where conductivity and thermal robustness are important.
02	Advanced ceramics Feedstock or additive phase for engineered ceramic systems requiring temperature stability and functional properties.
03	Refractory components High-temperature components where refractory stability and structural integrity are required.
04	High-temperature structural components Potential use in protective or load-bearing ceramic-rich systems subject to thermal exposure.
05	Aerospace & energy Candidate material platform for advanced thermal-management and high-temperature energy applications.

Formulation & process support

Persis AMS can support material selection and formulation discussions for specific process routes, including powder processing and application-oriented development.



06 / ORDERING

Ordering Information

ORDERING FIELD	DETAIL
Product name	Mullite–MoSi ₂ Micro/Nanocomposite Powder
Composition	60% Mullite / 40% MoSi ₂
Particle size	D50: 500 nm (customizable)
Purity	99%
Packaging	
Minimum order quantity	0.5Kg
Lead time	
Product code	
Quote/enquiry	Via email/website

TECHNICAL DISCLAIMER

The values in this datasheet are specified or indicative unless otherwise stated. Final properties may vary with formulation, processing route, particle-size distribution, and test method. Users should validate the material for their intended application and operating conditions. Product specifications may be updated as characterization and qualification data become available.

PERSIS AMS

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Advanced Materials for Extreme Environments

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