

Nuenz silicon nitride fibre technologies

Nuenz develops and supplies silicon nitride fibre additives, engineered surfaces and dispersion solutions for advanced polymer, adhesive, composite and thermal-material applications.

Familiar silane chemistry, configurable fibre surfaces and formulation support reduce the effort required to evaluate advanced ceramic reinforcement.

PROVEN PERFORMANCE



IT WORKS

Demonstrated improvements in selected adhesive and thermoset properties

EASY TO INTEGRATE



IT FITS YOUR PROCESS

Straightforward dispersion into existing processes without the need for complicated mixing equipment

FLEXIBLE PLATFORM



MULTIPLE GRADES

Different options for performance demands, processing and cost requirements.



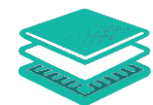
ADHESIVES



THERMAL MANAGEMENT



INDUSTRIAL COATINGS



COMPOSITES



MINING CHEMICALS



AEROSPACE



SPACE SYSTEMS



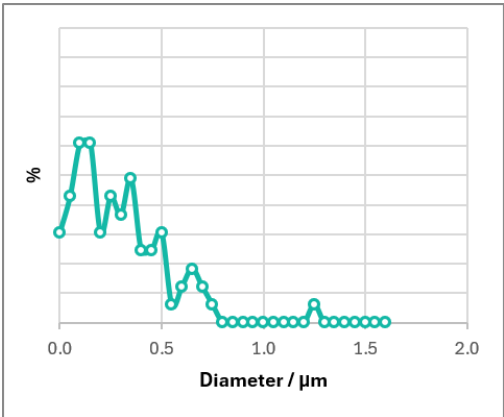
DEFENCE

Technical Properties

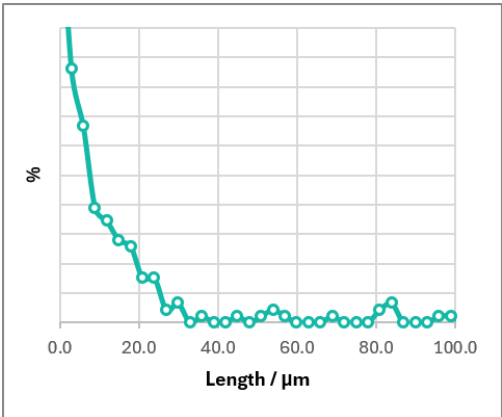
F80

80% silicon nitride fibres. High-performance, high-strength fibres.

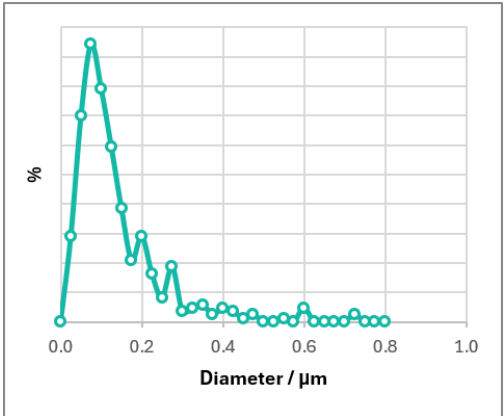
Phase	%	>95 Si ₃ N ₄ (~80 α-Si ₃ N ₄ , ~20 β-Si ₃ N ₄)
Length	µm (d50)	12
Width	µm (d50)	0.3
Free C	%	<0.5
Fe	%	<0.1
SiO ₂	%	<1.0
Other metals	/	Trace only
Relative density	g/cm ³	3.1
Bulk density	g/cm ³	0.5



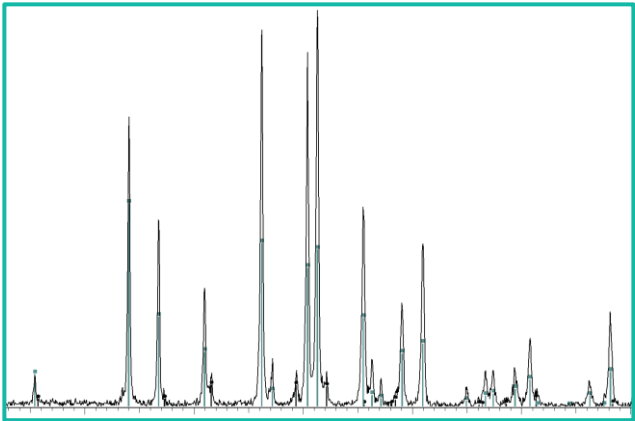
Fibre diameter (SEM)



Fibre Length (microscopy)



B-Si₃N₄ particle diameter (SEM)



Powder XRD

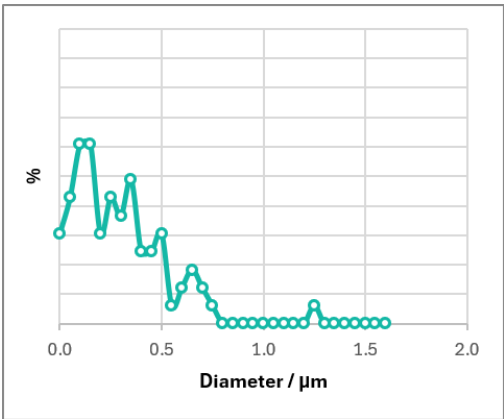
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Technical Properties

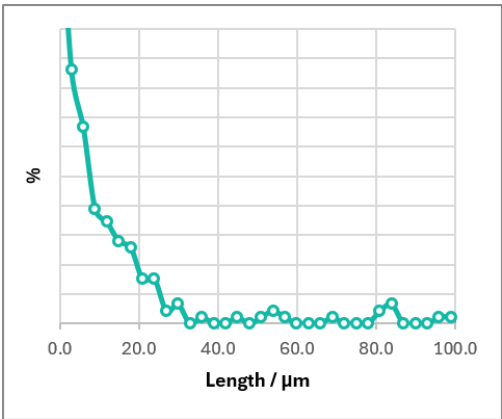
F50

50% silicon nitride fibres. Economy fibres for superior wear properties and higher-loading applications.

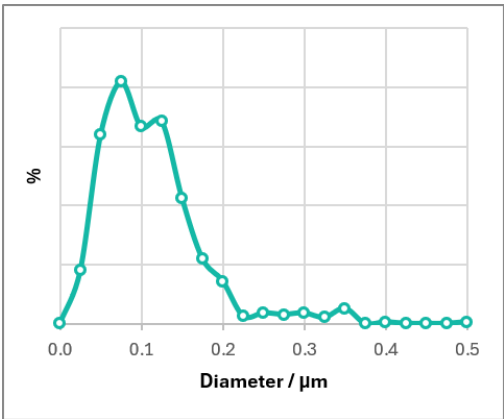
Phase	%	>95 Si ₃ N ₄ (~50 α-Si ₃ N ₄ , ~50 β-Si ₃ N ₄)
Length	µm (d50)	12
Width	µm (d50)	0.3
Free C	%	<0.5
Fe	%	<0.1
SiO ₂	%	<1.0
Other metals	/	Trace only
Relative density	g/cm ³	3.1
Bulk density	g/cm ³	0.5



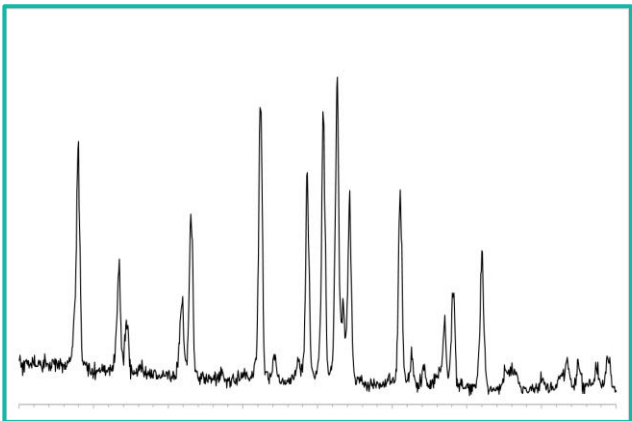
Fibre diameter (SEM)



Fibre Length (microscopy)



B-Si₃N₄ particle diameter (SEM)

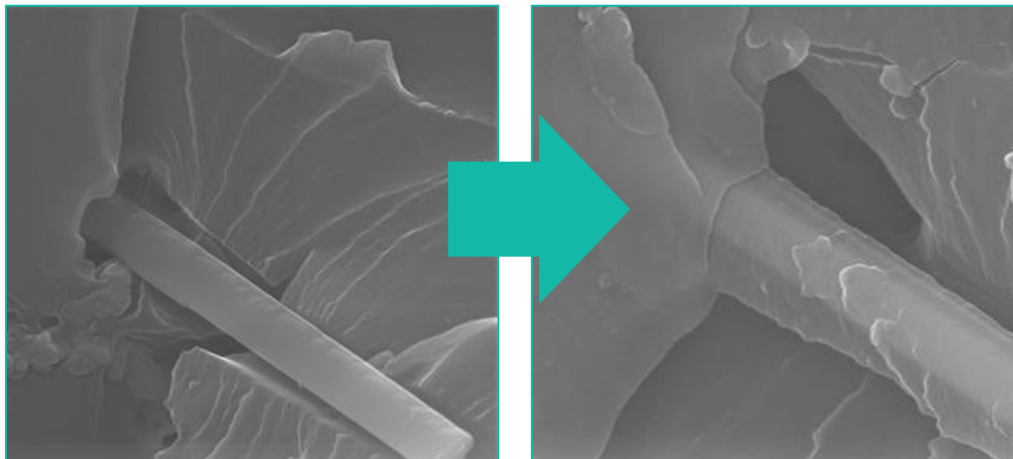


Powder XRD

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Surface Functionalisation

The selected fibre surface can materially influence formulation performance and enable optimisation for the resin system. Surface chemistry can be critical to dispersion and performance in polymer systems. Nuenz can supply silane-treated fibres or recommend suitable surface functionalisation.



Epoxy Functionalisation

Primary functional group:



Variants available:

- Organic linker length
- Organic linker thermal stability

Alternatives:

- Amine

Amine Functionalisation

Primary functional group:



Variants available:

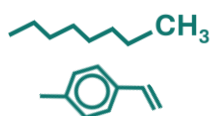
- Organic linker length
- Organic linker functionality (diamine, triamine)

Alternatives:

- Epoxy, acrylic, hydrophobic, unsaturated

Hydrophobic Functionalisation

Primary functional group:



Variants available:

- Organic chain length

Alternatives:

- Unsaturated, acrylic, amine

Acrylic Functionalisation

Primary functional group:

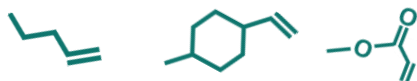


Alternatives:

- Amines

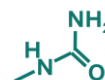
Unsaturated Organic Functionalisation

Primary functional groups:



Polyurethane Functionalisation

Primary functional group:



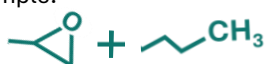
(note stability challenges, consider stable alternates)

Alternatives:

- Amines, acrylates

Hybrid Functionalisation

Primary functional group example:



Variants available:

- Unlimited combinations of above systems

Custom Functionalisation

Available on request.