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### Intermetallic Matrix Composites | ScienceDirect

Dimensional analysis suggests the existence of a non-dimensional size  $w$  defined as  $w = R(E_m/K_m)^2$  (13) where  $R$  is the reinforcement radius,  $K_m$  the matrix Intermetallic-matrix composites: an overview toughness,  $E_m$  the matrix modulus, and  $\epsilon_T$  the misfit strain given by  $\epsilon_T = f(aR, -af) dT/T_0$  (14) with  $(T - T_0)$  being the processing temperature ...

### Intermetallic-matrix composites: An overview - ScienceDirect

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### Intermetallic Matrix Composites - 1st Edition

OF INTERMETALLIC MATRIX COMPOSITES SiC REINFORCED-MoSi<sub>2</sub> ALLOY MATRIX COMPOSITES 123 J.J. Petrovic, R.E. Honnell, and A.K. Vasudevan & Nb REINFORCED MoSi<sub>2</sub> 2 David H. Carter and Patrick L. Martin Ta AN 131 139 J.-M. Yang and S.M. Jeng MICROSTRUCTURES AND MECHANICAL PROPERTIES OF NiAl+Mo IN-SITU EUTECTIC COMPOSITES 147

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### Intermetallic/Metallic Polyphase In-Situ Composites | MRS ...

Intermetallic NiAl-based composites with dramatically higher energy absorption capability and damage tolerance have been demonstrated. The approach consisted of incorporating continuous tubular ...

### Intermetallic Matrix Composites - ResearchGate

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Intermetallic-reinforced light-metal matrix in-situ composites R. A. Varin 1 Metallurgical and Materials Transactions A volume 33, pages 193 - 201 (2002) Cite this article

### Intermetallic-reinforced light-metal matrix in-situ composites

The elongation to fracture at room temperature of these composites range from 12% for the 7.5 vol.% composite down to 2% for the 20 vol.% composite, demonstrating the excellent thermal stability of this material. Fracture occurs by void nucleation at the particle/matrix interface, which is then followed by void growth and coalescence.

### The Mechanical Properties of In-Situ Composites

K. T. Venkateswara Rao, G. R. Odette, and R. O. Ritchie, "On the Contrasting Role of Ductile-Phase Reinforcements in the Fracture Toughness and Fatigue-Crack Propagation Resistance of TiNb/g-TiAl Intermetallic-Matrix Composites," Acta Metallurgica et Materialia, vol. 40(2), 1992, pp. 353-361.

### Gamma-Based TiAl Intermetallics - Berkeley Lab

The strength of the composite is controlled by the strength of Ni<sub>2</sub>Al<sub>3</sub> phase, and the tensile strength and the elongation rate of the composite with 30 vol.% reinforcement volume fraction are 210 ...

### In situ fabrication of $\alpha$ -Al<sub>2</sub>O<sub>3</sub> and Ni<sub>2</sub>Al<sub>3</sub> reinforced ...

$\gamma$ -TiAl intermetallic-matrix composite microstructures re- enforced with (a) 5 vol.%, (b) 10 vol.%, and (c) 15 vol.% of TiNb phase; the TiNb particle thickness is  $\sim 40$  nm. phase, taken along 500-nm slices, were found to vary by up to a factor of 2; however, specimen averages

### DUCTILE-REINFORCEMENT TOUGHENING IN $\gamma$ -TiAl INTERMETALLIC ...

Powder injection moulding techniques were utilized to align short fibres (Al<sub>2</sub>O<sub>3</sub> and SiC) in a variety of intermetallic matrices (NiAl, MoSi<sub>2</sub> and TaTiAl<sub>2</sub>). The alignment was accomplished by extruding a mixture of powders and short fibres with a polymer-based binder through a constricting nozzle. The binder was removed and the powder and fibres were consolidated, producing an aligned short ...

### Structure and properties of aligned short fibre-reinforced ...

Materials, an international, peer-reviewed Open Access journal. Dear Colleagues, Mechanical properties of polycrystalline structural materials, such as metals, alloys and intermetallic compounds, are significantly affected by their microstructures, including phase composition, grain shape and size, grain boundary distribution, dislocation density, dispersed particles and solutes, internal ...

### Materials | Special Issue : Structure and Mechanical ...

The intermetallic compound NiAl has excellent potential for high temperature structural applications but suffers from low temperature brittleness and insufficient high temperature strength. One way to remove these deficiencies is the reinforcement by high strength ceramic fibers. Such intermetallic matrix composites can be conveniently fabricated by the hot pressing of matrix coated fibers.

### Investigations on NiAl composites fabricated by matrix ...

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Aluminum matrix composite materials containing SiC whisker and Saffil alumina short fiber are fabricated by the squeeze casting method. It is demonstrated that the direct squeeze casting infiltration method is suitable for discontinuously reinforced metal matrix composites (MMC's) whose volume fractions are in the range of 0.15-0.3; squeeze casting of compounds for the fabrication of ...

**Fabrication of fibre reinforced nickel aluminide matrix ...**

A series of intermetallic matrix composites reinforced with Al<sub>2</sub>O<sub>3</sub> based fibers were fabricated by pressure casting. The Al<sub>2</sub>O<sub>3</sub> based fibers used were DuPont's 20 μm diameter Fiber FP and PRD-166 fiber, Mitsui's 10 μm diameter Almax fiber, and Saphikon's 125 μm diameter single crystal Al<sub>2</sub>O<sub>3</sub> fiber. The intermetallic matrices employed were alloys based on Ni<sub>3</sub>Al, NiAl, Fe<sub>3</sub>Al, Ti<sub>3</sub> ...

**Processing and characterization of fiber reinforced ...**

Intermetallic matrix composites, with ceramic particle reinforcements, are among the most important candidates for high-temperature structural applications. These composites, however, are not always stronger than their matrix materials at elevated temperatures. Some of the composites have much better high-temperature strength than their matrix materials, such as NiAl and FeAl, while others are ...

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