

1. Record Nr.	UNINA9910254201103321
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Titolo	Aluminum Matrix Composites Reinforced with Alumina Nanoparticles [[electronic resource] /] / by Riccardo Casati
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-27732-4
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (134 p.)
Collana	PoliMI SpringerBriefs, , 2282-2577
Disciplina	620.118
Soggetti	Nanotechnology Structural materials Metals Manufactures Nanotechnology and Microengineering Structural Materials Metallic Materials Manufacturing, Machines, Tools, Processes
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	State of the Art of Metal Matrix Nanocomposites -- Experimental methods -- Consolidations of Al powder and dry Al <sub>2</sub> O <sub>3</sub> nanoparticles -- Consolidation of Al powder and colloidal suspension of Al <sub>2</sub> O <sub>3</sub> nanoparticles after 2 h ball milling -- Consolidation of Al powder and colloidal suspension of Al <sub>2</sub> O <sub>3</sub> nanoparticles after 16 h ball milling -- Consolidation of Al powder and colloidal suspension of Al <sub>2</sub> O <sub>3</sub> nanoparticles after 24 h ball milling -- Consolidation of micro- and nano-sized Al powder -- Conclusions.
Sommario/riassunto	This book describes the latest efforts to develop aluminum nanocomposites with enhanced damping and mechanical properties and good workability. The nanocomposites exhibited high strength, improved damping behavior and good ductility, making them suitable for use as wires. Since the production of metal matrix nanocomposites by conventional melting processes is considered extremely problematic (because of the poor wettability of the nanoparticles), different powder

metallurgy routes were investigated, including high-energy ball milling and unconventional compaction methods. Special attention was paid to the structural characterization at the micro- and nanoscale, as uniform nanoparticle dispersion in metal matrix is of prime importance. The aluminum nanocomposites displayed an ultrafine microstructure reinforced with alumina nanoparticles produced in situ or added ex situ. The physical, mechanical and functional characteristics of the materials produced were evaluated using different mechanical tests and microstructure investigation techniques. The book presents and discusses the experimental results in detail, and offers suggestions for future research directions.

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