



# Evaporation-Based Method For Manufacturing And Recycling Of Metal Matrix Nanocomposites

Tech ID: 27222 / UC Case 2015-523-0

## SUMMARY

UCLA researchers in the Department of Mechanical and Aerospace Engineering have developed a new method to manufacture and recycle metal matrix nanocomposites.

## BACKGROUND

Metal matrix nanocomposites (MMNCs) have applications in a variety of industries including: metal casting, defense, aerospace, automobile, and electronics. These industries have strong demand for lightweight, strong, and ductile materials, and MMNCs meet these requirements. However, current technologies are not scalable and struggle to yield high quality MMNCs with uniform deposition of nanoparticles onto the metal matrix. Additionally, with the increasing need for MMNCs recycling of these nanocomposites will become important; currently no technology addresses this issue.

## INNOVATION

UCLA Prof. Xiaochun Li and colleagues have developed a novel evaporation based method for the creation of MMNCs with a high level of uniformity, significantly larger size particles, and higher deposition of particles onto the metal matrix. Additionally the technology allows for recycling after the evaporation deposition stage, allowing for recovery of both the metal and nanoparticle components of the reaction.

## APPLICATIONS

Manufacturing and recycling of MMNCs for use in the:

- ▶ Automotive industry
- ▶ Defense sector
- ▶ Aerospace industry
- ▶ Metal casting
- ▶ Electronics manufacturing

## ADVANTAGES

- ▶ Produces high quality, high uniformity MMNCs at a much larger scale compared to previous technologies
- ▶ Allows for recycling of both the metal and nanocomposite material

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,513,759	12/24/2019	2015-523

## CONTACT

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## INVENTORS

- ▶ Li, Xiaochun

## OTHER INFORMATION

### KEYWORDS

Metal matrix nanocomposites, MMNCs, nanocomposite, matrix nanomaterial, matrix nanocomposites, metal matrix, evaporation deposition, nanoparticle deposition, nanoparticle recycling, metal matric nanocomposite recycling

### CATEGORIZED AS

- ▶ **Materials & Chemicals**
  - ▶ Composites
  - ▶ Nanomaterials
  - ▶ Other
- ▶ **Nanotechnology**
  - ▶ Electronics
  - ▶ Materials
  - ▶ NanoBio
- ▶ **Transportation**
  - ▶ Aerospace
  - ▶ Automotive

### RELATED CASES

2015-523-0

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Concentration Of Nanoparticles By Zone Heating Method](#)

- ▶ [Scalable Manufacturing of Copper Nanocomposites with Tunable Properties](#)
- ▶ [Super Ceramics With Self-Dispersed Nanoparticles Via Casting](#)

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