

One step manufacturing process of complex parts by SPS sintering

Current methods for manufacturing complex parts are not fully satisfactory: loss of material, length of process, materials with imperfect performances... Spark Plasma Sintering (SPS) is a rapid densification technique which allows to get materials exhibiting higher performances. Combining this technology with a method for producing complex shapes is today possible.

DESCRIPTION*

- Manufacturing process of complex parts to nearest dimensions, so called "near net shape":
 - Use of a sacrificial material (possibly of different and less expensive kind)
 - Creation of mobile interfaces
 - Evolution of the mobile interface during the densification: support the formation of the part to its final dimensions
- One step process
- Manufacture of several parts in a single matrix
- Fast production of high performances parts



Photos: CIRIMAT/TTT

TECHNICAL SPECIFICATIONS

Material for final part	Unconstrained choice (metals and alloys, ceramics...)
Material for mobile interface	<ul style="list-style-type: none"> - Non-reactive to sintering under implementation conditions - Non-reactive to the material to be sintered
Sacrificial material	<ul style="list-style-type: none"> - Requires sintering parameters near those of the final material - Not limited formatting method (conventional sintering, additive fab, SPS...)

*Technology requiring license rights.

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COMPETITIVE ADVANTAGES

- Complex geometry
- Homogeneity of Density & Microstructure
- "Near net shape"
- Reduced loss of material
- Reduced manufacturing cost
- Manufacturing simplification & speeding up
- Parts with high mechanical performances

APPLICATIONS

- Turbine turbocharger
- Turbine blade
- Piston pin
- Valve
- Bearing ball
- Watchcase
- Dental implant
- Biomedical prosthesis

INTELLECTUAL PROPERTY

- Patent pending

DEVELOPMENT STAGE

- Technology validated at lab level



LABORATORY

- Team Nanocomposites and Carbon Nanotubes



CONTACT

T. +33 (0)5 62 25 50 60
systemes@toulouse-tech-transfer.com
www.toulouse-tech-transfer.com