

# The Review of Laser Engineering

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### Synthesis of Metal Nanoparticles and Fabrication for Functional Micro-Composite Circuits by Laser Ablation

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**Abstract:** The purpose of this research is to develop new fabricating technology for a heat-resistant microcircuit substrate with high quality nanoparticles synthesized using Nd:YAG lasers. The nanoparticles of refractory metals such as tungsten (W) and molybdenum (Mo) could be synthesized using the laser ablation method to increase the source materials for nanoparticles. The geometric standard deviation ( $\sigma_g$ ) value of the nanoparticle diameter should be controlled to less than a 1.2 with a 20 to 50 nm diameter and new nanocomposite materials are synthesized by mixing more than two kinds of nanoparticles. As for micropatterning using nanoparticles films, we produced fine lines with W nanoparticles, micro-coils with W, platinum (Pt), gold (Au), and capacitors using Au/BaTiO<sub>3</sub>/Au multi-layer thin films by the laser ablation/gas deposition method.

**Key Words:** [Nanoparticle](#), [Pulsed laser ablation](#), [Differential mobility analyzer](#), [Classification](#), [Gas deposition](#)

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