

Re: Optimum particle size

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- *From:* Uncle Al <UncleAl0@xxxxxxxxxxxxxx>
 - *Date:* Sun, 10 Jul 2005 08:44:30 -0700
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"Dr. Mike" wrote:

- >
- > The particles are hard and inert such as SiC or diamond. I've already
- > successfully rolled 1 mil foils with 2-3 micron particles but I want to
- > put in larger particles. I know what you mean about theory and
- > practice. There is a formula (rule of 7) for achieving maximum packing
- > density of particles. It didn't work for me (but I reached well over 80
- > vol.% without it) and I don't need it here fortunately.
- >
- > You especially should know that I will get better thermal conductivity
- > with large diamonds than with smaller ones. I am also aware of the less
- > than optimum bonding between aluminum and diamond. I hope to take care
- > of that too.

Maximum packing for monodisperse identical particles is achieved for M&Ms. Ultimate packing of a lattice of spheres requires two or three sizes - the lattice itself, then filling its octahedral and/or tetrahedral holes.

Wetting diamond with aluminum is an interesting problem, including moisture-sensitive Al₄C₃ from graphite. Aluminum likes hard Lewis bases. Perhaps a diamond dust surface treatment by oxygen corona discharge or plasma ashing. The diamond surface is normally paved with C-H. A little oxidation could be the needed tie-layer.

Metallization of diamond is SOP for heatsinks. Getting micronized dust metallized without having more metallization than diamond sounds nasty.

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Uncle Al

<http://www.mazepath.com/uncleal/>

(Toxic URL! Unsafe for children and most mammals)

<http://www.mazepath.com/uncleal/qz.pdf>

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- *Follow-Ups:*

Re: Optimum particle size

- ◆ **Re: Optimum particle size**
◇ From: lysdexia

• **References:**

- ◆ **Optimum particle size**
◇ From: Dr. Mike
 - ◆ **Re: Optimum particle size**
◇ From: Uncle Al
 - ◆ **Re: Optimum particle size**
◇ From: Dr. Mike
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