

ORE103

PARTICLES IN VACUUM COATING TECHNOLOGY

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Particles in coating technology are undesirable, but unfortunately, they can never be completely avoided.

What are particles? - What size? - Where do they come from? - How can they be reduced?

Every coating process is always faced with particles as disturbing variables. Particles impair or destroy the functions of the layers. They interrupt conductor tracks, create short circuits, make holes (diffusion paths for water or ions), prevent correct exposure in photolithography, create defects (display), scatter optical layers (laser mirrors), reduce the yield and much more.

The list is long and the causes of particles are diverse.

The lecture explains the relationships and causes of particle formation in sputtering. Topics like:

- System design, system cleanliness and surfaces
- Vacuum generation, pumping and venting
- Cathode-compartments, shielding, materials, expansion coefficients
- Cathodes-types, planar or rotary cathodes, design,
- Targets, structure, density, composition
- Power supplies, arc handling, bipolar sputtering
- Reactive processes
- And much more

are discussed.

Particular attention is paid to the formation of particles in process technology as a whole and the role of Arc's in the process. For this purpose, some very interesting calculations are presented.

Furthermore, the lecture gives recommendations and tips for reducing particles in everyday use.

Keywords

particles
layerdamage
pinholes
arcing
arc-energy