SINTERING MATERIALS AND ATTACHMENT METHODS USING SAME

FIELD OF THE TECHNOLOGY

One or more aspects relate generally to methods for attachment of various components, and more specifically to sintering materials and techniques used for such attachment.

BACKGROUND OF THE INVENTION

Sintering has emerged as an alternative technology to conventional soldering. Sintering typically involves high temperature and high pressure processing to attach various components of an assembly.

BRIEF SUMMARY OF THE INVENTION

In accordance with one or more embodiments, a composition may include a metal powder having a d_{50} range of about 0.001 to about 10 micrometers, the metal powder comprising about 30 to about 95 wt% of the paste, a binder having a softening point between about 50 and about 170 °C, the binder comprising about 0.1 to about 5 wt% of the paste, and a solvent in an amount sufficient to dissolve at least the binder.

In some embodiments, the metal powder may comprise gold, palladium, silver, copper, aluminum, silver palladium alloy or gold palladium alloy. The metal powder may comprise silver particles. In at least some embodiments, the metal powder may comprise nanoparticles. The metal powder may comprise coated metal particles. In some embodiments, the composition may further include one or more functional additives.

In accordance with one or more embodiments, a film may comprise a layer of a composition including a metal powder having a d_{50} range of about 0.001 to about 10 micrometers, the metal powder comprising about 30 to about 95 wt% of the paste, a binder having a softening point between about 50 and about 170 °C, the binder comprising about 0.1 to about 5 wt% of the paste, and a solvent in an amount sufficient to dissolve at least the binder. In some embodiments, the film may have a dry thickness of about 5 to about 300 microns.

In some embodiments, the layer of the composition is on a polymeric, glass, metal or ceramic substrate. A polymeric substrate may comprise polyester. A polymeric substrate may comprise a release coating.