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# Spherical powders manufacturing by Induction Plasma technology

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## Résumé

Metal-based Powder Metallurgy (PM) technologies requires satellites-free powders having a spherical shape ensuring the highest packing density achievable, a specific particles size distribution, high flow ability as well as an internal particle structure which is free of pores. Despite the various advantages that commercially available powders can offer in terms of affordability and/or ease of availability, they rarely meet all the requirements listed above. Developing, industrializing and producing a high-performance powder can be achieved using the Inductively-Coupled Plasma (ICP) process developed by Tekna Plasma Systems Inc.. The ICP process is based on the in-flight heating and melting of the individual particles of the feed material, followed by their gradual cooling and solidification before reaching the bottom of the powder processing chamber. The technology allows for operation using a wide range of plasma gas mixtures at atmosphere pressure or soft vacuum. The plasma can be used as a chemical reactor as well as an enthalpy source. Different case studies are presented regarding the manufacturing of titanium-based, nickel-based and aluminium based alloys and their recycling.

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