

中聚金属纳米粉体产品简介

金属纳米粉是指粉体粒径在1~100nm的金属颗粒多晶材料，具有独特的物理、化学效应，因此表现出一系列与普通多晶体和非晶态粉体材料有本质区别的力、磁、光、电、声、光催化和化学催化等性能，从而可广泛应用于电池、陶瓷电容器、大规模集成电路、催化剂、磁流变液体、隐身吸波材料、润滑材料、高性能磁记录材料、生物医药材料、高性能抛光材料以及各种纳米复合材料添加剂等方面，是目前国民经济各行业及军工高技术产品中重要的基础原材料，具有极大的市场应用前景，其规模化生产对创新、节约、环保型社会的建立具有重要意义。

Metallic nanometer powder refers to the powder APS within 1-100nm metallic grain polycrystalline material with the particular physical and chemical effect. It essentially differs from the the common polycrystalline and amorphous materials. The metallic nanometer particles are widely used in the batteries, ceramics capacitor, LSI, crystallizer, magnetorheological fluid stability, absorbing materials, lubricate material, high performance magnetism recording material, biological medicine industries and etc. It is the key role for the development of both the traditional and high-tech industries at home and abroad. It enjoys a bright market prospect.

金属纳米粉体制备技术是相关高科技产品开发和应用的關鍵，其主要要求和发展方向是：粒子表面清洁；粒子形状、粒径以及粒度分布可以控制；粒子团聚倾向小；容易收集；有较好的热稳定性；易保存；生产效率高，产率、产量大等。但目前国内外产业化中普遍存在粉体纯净度低、产率低、成本高等问题。

The equipment for making the metallic nanometer powder is the key for the development and application of its related high-tech products. Its main requirement and development orientation are: the clean surface of the particles; controlling the shape, the size and distribution of the particles; less clusters; easy for being collected and kept; ideal heat stability; high production capacity and efficiency while the most often problems for the industrialization of the nanometer powders at home and abroad are low purity, low production capacity and high cost.

针对这些问题我公司与南京工业大学合作成功研究开发了年产吨级高质量、高产率、高均匀混合单质纳米复合金属粉体的连续制备设备及工艺，并成功实现了15~200nm不同粒度纳米Fe、Ni、Cu、Ag、Sn、Bi等单质金属粉体和高均匀混合纳米Cu-Ni-Sn粉体的批量生产。与国内外相关技术对比分析结果表明：本公司在纳米金属粉体制备的质量提高、产率提高和成本降低等方面具有较大优势，在粒度相同情况下，铜粉产率提高了1.5倍，镍粉产率提高了2倍，银粉产率提高了5倍，铁粉产率提高了35倍，同时成功制备了高均匀混合纳米Cu-Ni-Sn单质复合粉体。基本解决了现有纳米金属粉气相法生产中存在的产率低、成本高、纯净度低等问题。

In order to solve these problems, our company, on the base on the successful co-operation with the Nanjing University of Technology, has developed the continuous nanometer powder production equipment and technology with an annual output of tons of high-quality, high yield single-mixed Nano-composite metal powders and 15 ~ 200nm different single nano-size Fe, Ni, Cu, Ag, Sn, Bi and evenly mixed nano-Cu-Ni-Sn powder. Comparison with the related technologies analysis at home and abroad shows that: our nano metal powders have a greater advantage in improving the quality, productivity enhancement and cost reduction. Under the condition of the same size, the copper production increased by 1.5 times, Nickel powder yield increased 2 times the rate of silver production increased 5 times the rate of iron production increased 35-fold while the line can also produce the mixed high quality nano-Cu-Ni-Sn single compound Powders, basically solving the existing nano-powder metal gas production in the presence of low-yield, high-cost, low purity issues.

以都有为院士为首的鉴定专家组一致认为：本公司采用的纳米金属粉体连续制备技术中的生产线采用高真空直流电弧等离子体蒸发的工艺连续高效制备高纯度纳米金属及金属复合粉体是本项目的主要创新点；在系统设计、粒度控制、粉体分级等方面具有显著特色。制备工艺中采用的复合蒸发坩埚技术可大幅度提高制备产率，提高能量利用率，降低成本，具有创新性。总体达到国际先进、国内领先水平。

To have academicians led by the expert group agreed that the identification of: the Company's use of nano-metal powders in preparation for the production line for high vacuum evaporation of the DC arc plasma technology for efficient preparation of high purity metals and metal nano-composite powders are The project's main innovation; in system design, control size, grade powder in such areas as a significant feature. Preparation technique used in composite Evaporation crucible technology can significantly increase the yield of preparation, to improve energy efficiency, reduce costs and innovative. Reached the international advanced overall, the leading domestic level.

我公司采用气相法生产的各系列金属纳米粉，具有纯度高(99.7%以上)，球形度高，粒度分布范围窄，结晶度高，利于分散等特点。该产品的各项指标均达到2004年颁布的有关纳米粉体的国家标准(中国唯一已颁布的纳米粉体相关标准)，现已在国家标准的框架内严格制定出企业标准。可按用户要求提供15~200nm范围内的各种金属单质纳米金属粉体和2~3种高均匀混合纳米复合金属粉体。

Our gas production of the series of nano metal powder with high purity (99.7%), high ball, the size distribution of narrow-range, high crystallinity, and conducive to the spread and so on. The indicators are enacted in 2004 to meet the relevant national standards for nano-powder (the only China has promulgated standards related to nano-powder), now the national standard strictly within the framework of the development of a corporate standard. Users can request for 15 ~ 200nm within the scope of a variety of metal nano-quality single-metal powder and 2 to 3 kinds of high-uniform nano-hybrid composite

图片展示：



图 1 等离子体蒸发纳米金属粉体连续制备生产线图片
continuous metal nano-powder production line of plasma evaporation