

A New Pre-Alloyed Powder Process and Products

Curtiss-Wright has developed a versatile new patented* process for the production of alloy, cermet, carbide, and ceramic powders. This process has been studied on a pilot plant scale and results have been obtained on a variety of materials which show that it is technically feasible to produce commercially acceptable powders of many types at cost factors which are favorable.

Curtiss-Wright has also studied, on a semi-pilot scale, the conversion of powders into basic shapes such as strip and rod, and finished products such as cutting tool tips, with results that are very promising.

The powder process mentioned above is primarily useful for the production of metallurgical powders of the following types:

1. Metallic alloys such as stainless and tool steels, nickel and cobalt base alloys, and refractory metal alloys.
2. Cemented carbide powders such as tungsten carbide—cobalt powder mixtures.
3. Cermet powders such as tungsten with 2% thorium oxide and stainless steel with 90% aluminum oxide.
4. Ceramic powders such as ferrites.

The powder manufacturing process is shown diagrammatically in Fig. 1 and consists of the following steps:

1. The desired elements are co-dissolved in an appropriate volatile solvent such as sulfuric or nitric acid. The raw materials consist of commercially available metals, metallic oxides, or alloy scrap. For instance, to manufacture 304 stainless steel, stainless steel scrap and/or the correct proportions of iron turnings, nickel scrap, and ferrochromium are used as starting materials.
2. The solution is filtered and the impurities discarded.
3. This solution is "flash dried". Most of the volatile solvent is quickly evaporated and no

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* Patents issued and pending in U.S. and foreign countries.