

# The Making of Metal Powder – Everything You Need to Know about It

*Are you interested to discover how metal powders are produced? There are various processes used in the powder production, but first, let's take a quick look at what powdered metal actually is.*

## Introduction to Metal Powder

Metal powders are divided and powdered metals used in various industries. They are widely used in the powder metallurgy process when producing solid and strong metal products. These powders can be made from different materials such as steel, stainless steel, copper, nickel, titanium, aluminum, brass, and bronze.

## How Metal Powder is Produced

The basic step in the powder metallurgy process is producing metal powders. In the production, there are four main processes: solid-state reduction process, atomization process, electrolysis process, and chemical process.

- Ø **Solid-State Reduction Process** – This is the first process of the metal powder production where the metal is crushed and then mixed with carbon. Once they are mixed, they are passed through a heater. The reaction takes place in the heater where the oxygen and carbon are reduced from the powder. The result is a cake of sponge metal which is later crushed and divided from all the non-metallic material, and filtered to make powder. The purity of the powder always depends on the purity of the raw materials.
- Ø **Atomization Process** – The molten metal is divided into small amounts of liquid and frozen quickly before they

come into contact. Usually, a thin flow of the molten metal is reduced to pieces by controlling the effect of high-energy jets of liquid or gas. Generally, this process is applicable to almost all metals which can be melted and later used for the production of alloy steels, copper, iron, bronze, brass, tin, aluminum, zinc, lead, tungsten, rhenium, titanium, and other materials.

Ø **Electrolysis Process** –In this process, the suitable conditions such as electrolyte concentration and composition, density, and temperature are chosen. Once the condition is chosen, the metals can be collected in a powdery form. Additional processing such as washing, drying, reducing, strengthening, and crushing is required, especially when it comes to high-density and high-purity powders. Copper is one of the first metals produced by this process. However, magnesium, iron, and chromium powders are produced this way as well. The electrolysis process, due to its related high energy costs, is usually limited to high-value powders including copper powders and etc.

Ø **Chemical Process** – This process includes oxide reduction, a precipitation from solutions, and a thermal decomposition. With using this process, the metal powders can have an excellent variation in features and still have regulated shape and size. The oxide-reduced powders that are produced via the chemical process are often known as spongy because of the pores. The solution precipitated powders can deliver high purity and reduce particle size while the thermal decomposition is mostly used to process carbonyls. Once the metal powders are milled and hardened, can surpass 99.5% purity.

## **Metal Powder and Its Extensive Range of**

## Applications

*Metal powders have a wide range of applications. We are going to present you the most important ones:*

- ü **Industrial Applications** – Powder metallurgy, surface coatings, metallic fillers, component manufacturing for the automotive industry, metal injection molding, diamond tools, and tool making.
- ü **Printing & Screen Printing** – Printing inks, coatings on paper, dusting, and screen printing.
- ü **Architectural & Paints** – Sculptures, cold cast applications, industrial and decorative paints.
- ü **Thermal Surfacing** – powder welding, laser cladding, and flame spraying
- ü **3D Printing or Additive Manufacturing**
- ü **Brazing, Cold Spay, Filters and Foams, MIM or Metal Injection Moulding, Plasma and Thermal Spray**

Metal powders are also used in special applications such as:

- Solid oxide fuel cells (SOFC)
- Co-deposition
- Electromagnetic shielding
- Diamond catalysts
- Hot isostatic pressing
- Food supplements and additions
- Polymer filtration
- Magnetic composites

## Purchase High-Quality Metal Powder

The demand for the powdered metals is increasing day by day. The reason for this is because metal powders are extremely important in a number of industries and fields.

**Tritrust Industrial** as an official supplier of [high purity metal powders](#) can make sure the powders supplied are of an utmost quality.

*Tritrust Industrial as the best source for metal powders on*

*the market can meet your business needs, standards, and specifications.*