

# METAL ADDITIVES FOR PLASTICS

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Fine metal powders engineered  
to improve the performance of  
critical polymer compounds.



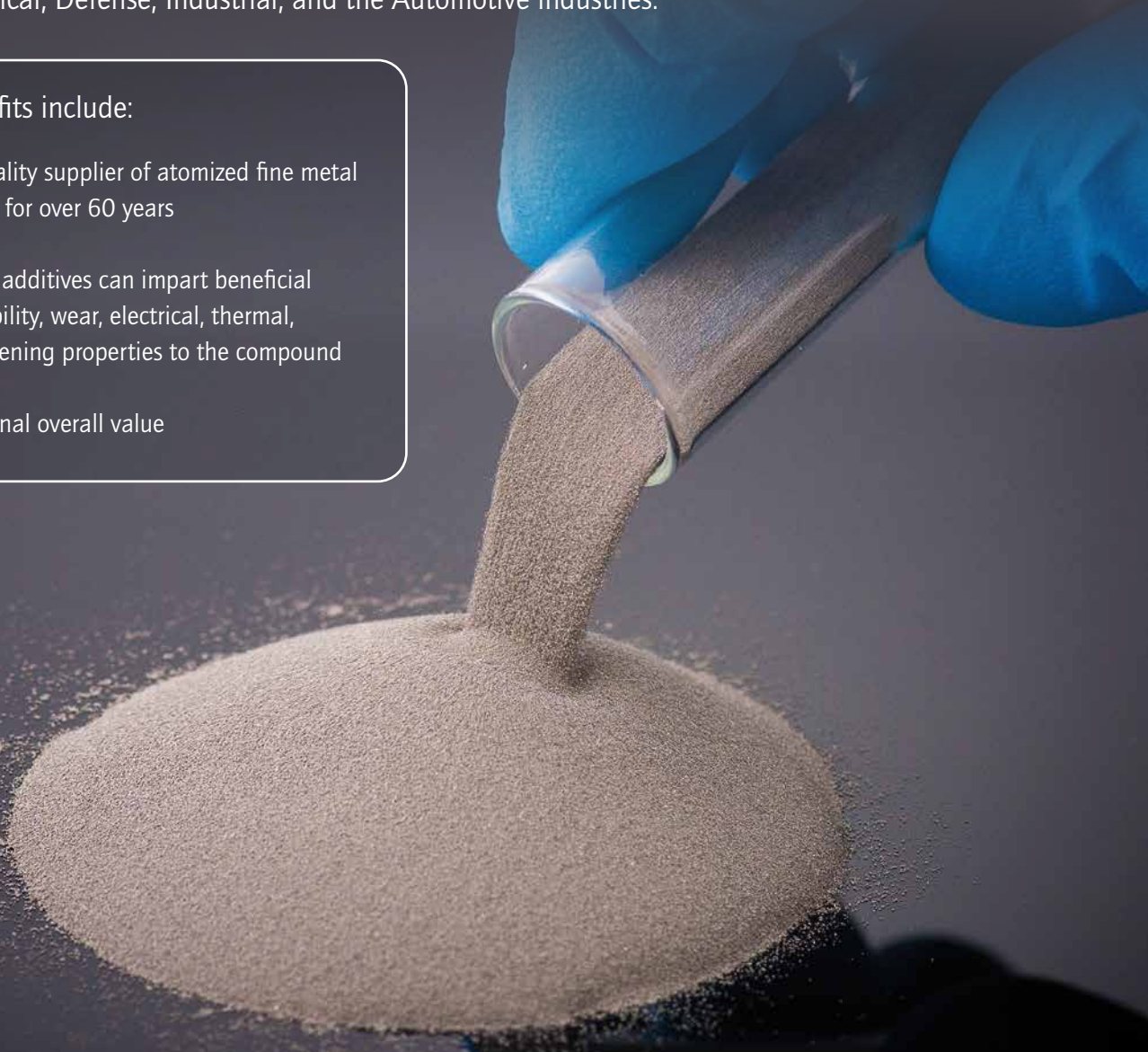
As a world class manufacturer of metallic powders used as plastic additives and fillers, we engineer **stainless steel and bronze powders** in fine and coarse mesh sizes that are uniquely suited for critical plastic compounding applications.

#### ADVANTAGES

Our high performance 300 and 400 series stainless steel powders, as well as bronze powders offer numerous advantages for engineered and detectable compounds. Our metal additive powders are used in sectors where performance and quality are crucial such as Food, Pharmaceutical, Defense, Industrial, and the Automotive industries.

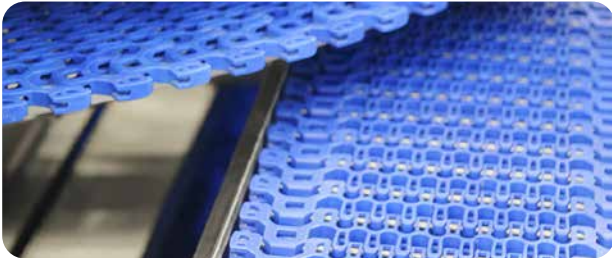
Key benefits include:

- High-quality supplier of atomized fine metal powders for over 60 years
- Metallic additives can impart beneficial detectability, wear, electrical, thermal, or dampening properties to the compound
- Exceptional overall value



## Applications

Our metal powders are used as fillers or reinforcement for plastics to improve a large variety of properties of the compound. When included as an additive, the following properties can be modified:



### METAL AND X-RAY DETECTABILITY

The 2011 FDA Food Safety Modernization Act (FSMA) and European Union Regulation No 10/2011 require food industry implementation of detectability for plastics that contact food or could contaminate food. Addition of our metal alloys imparts magnetic and X-Ray detectability to help avoid foreign object contamination in food, beverage, and pharmaceutical products.



### MAGNETIC PROPERTIES

When a polymer is compounded with certain metal alloys, the magnetic properties of the product can be controlled to allow for conveyance, e.g., the movement of parts by magnets, or adhesion in a variety of automotive and industrial applications.



### VIBRATION AND SONIC DAMPENING

The Addition of metal powders to the compound creates a composite material whose vibration, density and acoustic properties can be modified and controlled.



### WEAR RESISTANCE

Inclusion of tough, hard metallic particles imparts improved wear properties to components manufactured with metallic additives and fillers. These materials are also known as polymer matrix composites (PMC).



### ANTI-STATIC PROPERTIES

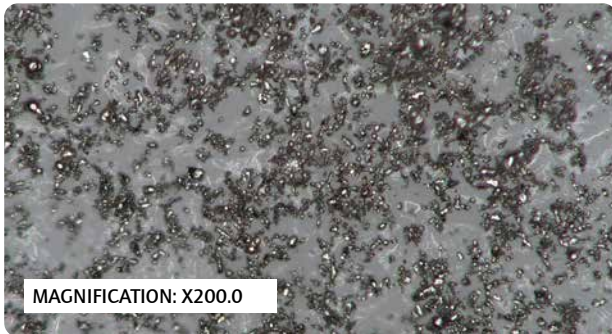
Addition of metal powders can increase the electrical conductivity of the material. This can result in anti-static or even conductive properties.

**STAINLESS STEEL POWDER**

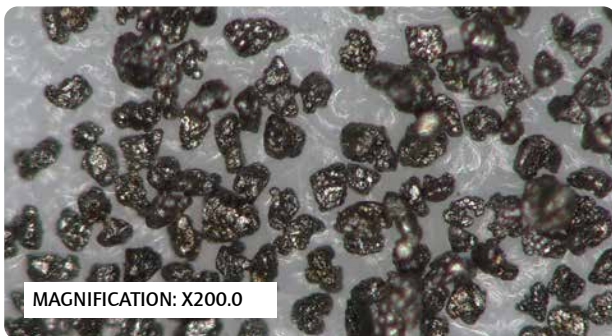
We offer several different alloys and sizes of material specifically tailored for polymer compounding.

**Grades:** Our metallurgists and engineers have worked to develop our polymer compounding products from 316L, 304L, 430L, and 410L alloys, among others

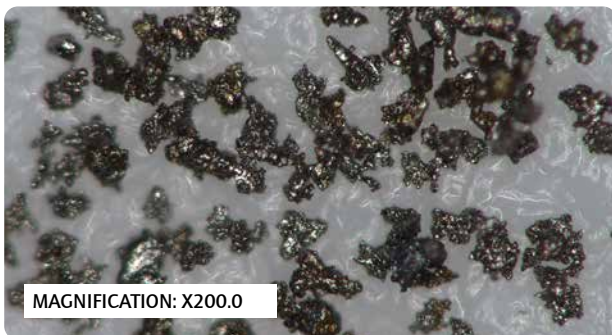
**Sizes:** The above grades are typically offered in fine sizes and with surface areas suited to suspension in a variety of polymers.

**304L Plastic Compounding Fine**

Plastic Compounding Fine Powder has a particle size of approximately 30µm, with distribution <50µm.

**430L Plastic Compounding Coarse**  
(Low surface area)

Plastic Compounding Coarse Powder has a particle size of approximately 100µm, with material 75-125µm.

**430L Plastic Compounding Coarse**  
(High surface area)

Plastic Compounding Coarse Powder has a particle size of approximately 100µm, with material 75-125µm.

## BRONZE POWDER

In PTFE compounding, bronze powder is used as a functional filler, typically at 40–60% by weight, to significantly improve the performance of the base polymer.

Our pure bronze powder reinforces the PTFE matrix and provides mechanical improvements, including:

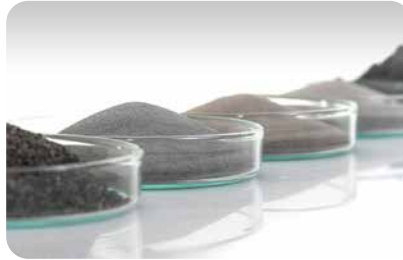
- **Improved wear resistance** for longer service life
- **Increased thermal conductivity** for better heat dissipation in dynamic applications
- **Enhanced compressive strength** for handling greater loads
- **Reduced creep** to minimize long-term deformation

### Typical Benefits and Properties of Bronze-Filled PTFE

The table summarizes the typical property changes and advantages when bronze powder is added to PTFE.



PROPERTY	DESCRIPTION	BENEFITS
Coefficient of friction	Still low, but slightly higher than virgin PTFE.	Improved wear resistance and reduced creep allow reliable performance even with the small increase in friction.
Hardness	Higher than pure PTFE.	Enhanced compressive strength for handling greater loads and reducing surface deformation.
Temperature range	–200 °C to +260 °C (similar to PTFE).	Maintains PTFE's broad operational temperature window while improving heat dissipation through increased thermal conductivity.
Chemical resistance	Slightly reduced compared to virgin PTFE (bronze can oxidize in certain environments).	Suitable for many industrial environments while gaining mechanical improvements from bronze reinforcement.

**CHEMICAL COMPOSITION**

	<b>316L</b>	<b>304L</b>	<b>410L</b>	<b>430L</b>	<b>BRONZE</b>
Chromium	16.0 - 18.0%	18 - 20%	11.5 - 13.5%	16.0 - 18.0%	-
Nickel	10.0 - 14.0%	8 - 12%	-	-	-
Molybdenum	2.0 - 3.0%	-	-	-	-
Manganese	1.0% max	1.0% max	1.0% max	1.0% max	0.2 max
Silicon	1.0% max	1.0% max	1.0% max	1.0% max	-
Carbon	0.03% max	0.03% max	0.03% max	0.03% max	0.1 max
Sulfur	0.03% max	0.03% max	0.03% max	0.03% max	0.05 max
Phosphorus	0.045% max	0.045% max	0.04% max	0.04% max	0.05 max
Iron	Balance	Balance	Balance	Balance	0.25 max
Copper	-	-	-	-	Balance
Tin	-	-	-	-	9 - 11%
Zinc	-	-	-	-	0.5 max



## ABOUT AMETEK SPECIALTY METAL PRODUCTS

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AMETEK Specialty Metal Products consists of six leading manufacturers of advanced metal products based in the USA and UK: Fine Tubes, Superior Tube, AMETEK Eighty Four, COINING, Hamilton Precision Metals, and AMETEK Wallingford.

Our extensive product range includes thermal management materials, metal tubes, strip, shaped wire, clad plate, powder, bonding wire and ribbon, solder preforms, and bond pads.

From powering aircrafts and space rockets, to advancing medical care, and accelerating the transition to renewable energy – our precision materials enable technological innovations.

AMETEK Specialty Metal Products is a business of AMETEK Inc., a leading global provider of industrial technology solutions serving a diverse set of attractive niche markets.

**EIGHTY FOUR / AMETEK®**  
SPECIALTY METAL PRODUCTS

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