



Quality through  
innovation.

# Metal powders for sintering technology

Powder metallurgy

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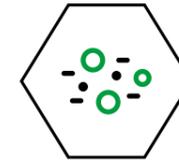
Product range for  
ferrous sintered parts

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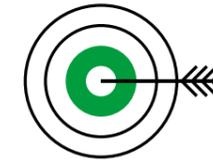
Product range for non  
ferrous sintered parts

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**POMETON S.p.A. HAS OVER  
70 YEARS EXPERIENCE  
IN METALLURGY, METAL  
POWDERS AND GRANULES.  
SUPPLY OF METALS IN POWDER  
AND GRANULES IS THE CORE  
BUSINESS OF THE GROUP  
WHICH CONSISTS OF TWO  
MANUFACTURING FACILITIES  
AND 5 SUBSIDIARIES.**



POWDERS



MISSION



VISION

### Pometon powders

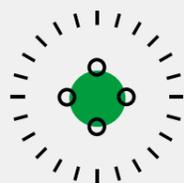
Powders and granules are produced by atomization and electrolysis. To achieve the required properties powders can be further processed by mechanical treatment, crushing, reduction/annealing, sieving, furnace bonding, mixing and homogenizing. **Pometon metals are used worldwide** for a variety of applications in Powder Metallurgy, welding, chemical, blasting, friction compounds, metallurgy and machining tools; just to name a few. Sintering is the most demanding application because of complexity of technical and quality requirements, type and number of materials utilized.

### Mission and values

Our **Mission** is to be the preferred partner in the market of high quality fine metal powders, enabling our customers to achieve greater efficiency. Our **Values** are: **Respect** for our people, our customers, our suppliers and the community. **Integrity** and to have the courage to make promises and to honour them. **Flexibility**, to adapt our products, processes, and organisation to the ever evolving marketplace.

### Vision

To be the **point of reference** in the Metal Powders and Granules industry for product quality, technical support and delivery performance. To unlock the potential of Metal Powders through innovation, development and the support of new applications. To always value our customers, and to strive every day for a **cleaner, safer and happier world**.



## Powder metallurgy

Powder Metallurgy is probably the most versatile technology to create metal components for mass production, with numerous advantages compared to traditional technologies:

- > Production of parts with complex shapes;
- > Production of parts with excellent structural and wear performance;
- > Flexibility in the formulation of alloys to meet specific customers requirements;
- > Excellent performance in stress and vibration absorption;
- > High precision, tolerances and excellent surface finish;
- > Ability to produce parts with thight tolerances;

Pometon supports the production and research of Ferrous and Non Ferrous sintered components with a comprehensive range of powders that include base metal materials to complex ready-to-press formulas, increasing production rates and cost efficiency. Our R&D department is always trying to develop alternative materials and solutions including the development of alternative metals and powders that are less price sensitive to fluctuation in the metals market.



## Product range for ferrous sintered parts

- > Iron based atomised powders;
- > Iron phosphorous based atomised powders;
- > Diffusion Bonded powders;
- > Prealloyed atomised and Diffusion Bonded powders;
- > Copper powders;
- > Premix for Infiltration;
- > Premix (ready to press) powders.



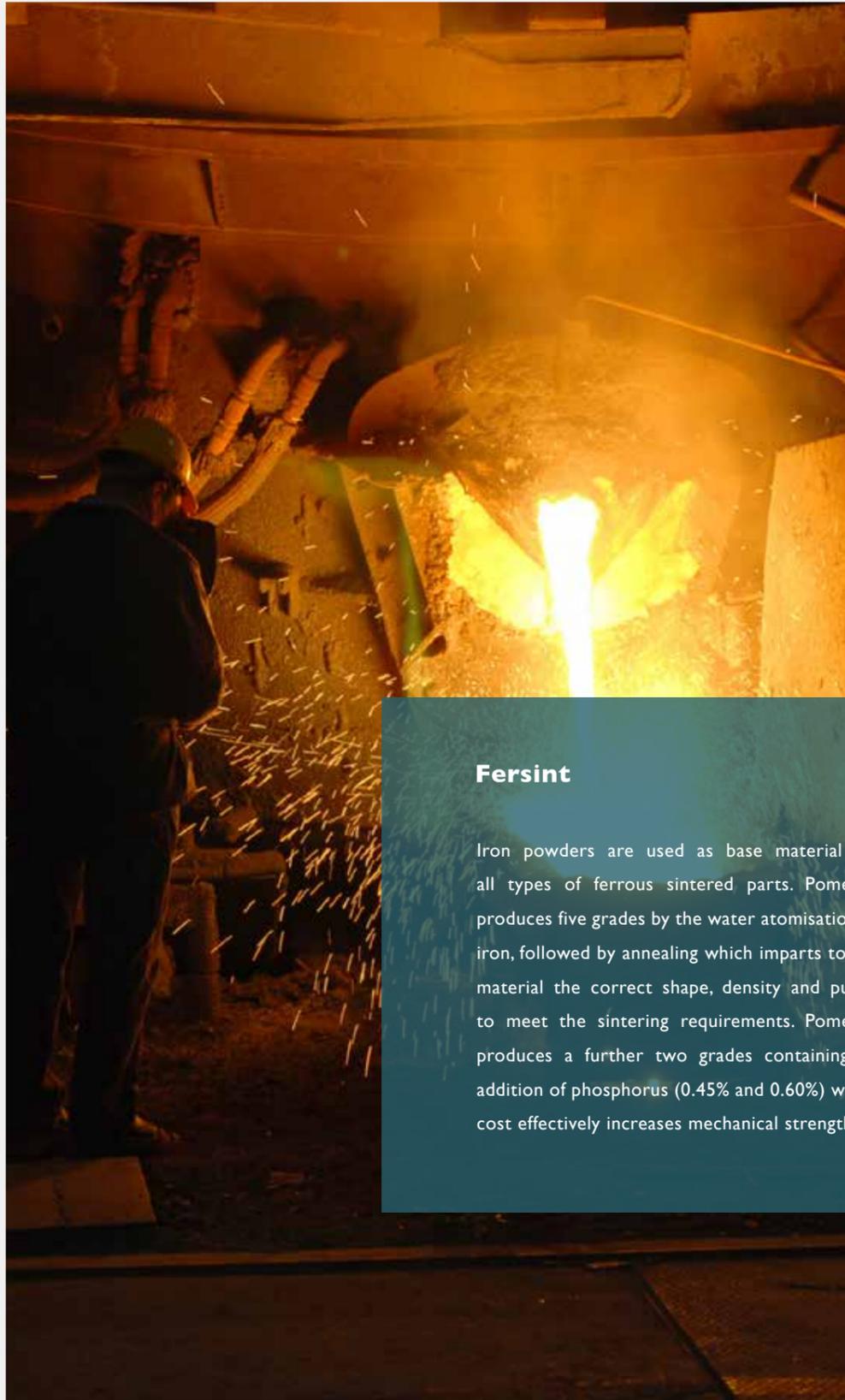
## Product range for non ferrous sintered parts

- > Copper and tin based powders;
- > Brass and bronze powders;
- > Non ferrous premix (ready to press) powders.



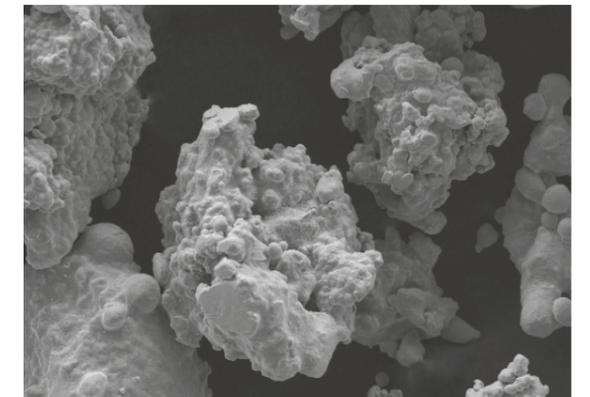
## Base material grades

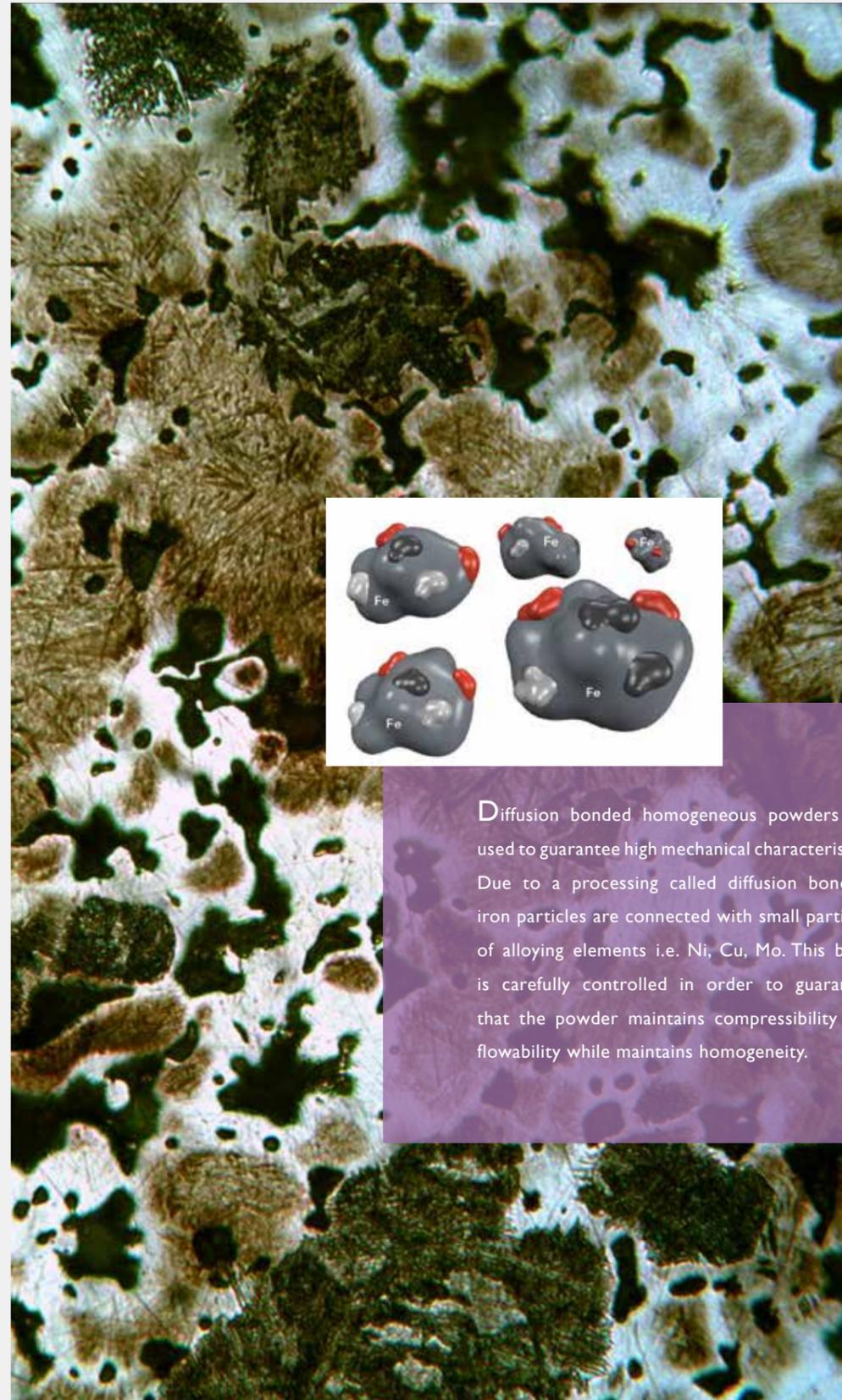
Powder Family	Grade	Apparent Density (g/cm <sup>3</sup> )	Particle Size	Flowability (s/50 g)	Compressibility (g/cm <sup>3</sup> )	Green Strength (N/mm <sup>2</sup> )	Max Chemical %			Added elements (%)
							O <sub>t</sub>	C	S	
Base powders FERSINT	RI 180/2.6	2.60 - 2.70	< 250 μm	35 Max	7.00 min	17.0 min	0.15	0.01	0.01	-
	RI 180/2.8	2.70 - 2.90	< 250 μm	30 Max	7.05 min	16.0 min	0.15	0.01	0.01	-
	RI 180/3.0	2.95 - 3.05	< 250 μm	28 Max	7.05 min	14.0 min	0.10	0.01	0.01	-
	RI 180/3.0 SC	3.00 - 3.10	< 250 μm	26 Max	7.15 min	12.0 min	0.06	0.005	0.01	-
	RI 212/2.9	2.80 - 3.00	< 250 μm	30 Max	7.10 min	7.5 min	0.15	0.01	0.01	-
	P 45	3.05 - 3.25	< 250 μm	35 Max	7.00 min	15.0 min	0.15	0.03	0.02	P 0.45
	P 60	3.05 - 3.25	< 250 μm	35 Max	7.00 min	15.0 min	0.15	0.04	0.02	P 0.60



### Fersint

Iron powders are used as base material for all types of ferrous sintered parts. Pometon produces five grades by the water atomisation of iron, followed by annealing which imparts to the material the correct shape, density and purity to meet the sintering requirements. Pometon produces a further two grades containing an addition of phosphorus (0.45% and 0.60%) which cost effectively increases mechanical strength.





Diffusion bonded homogeneous powders are used to guarantee high mechanical characteristics. Due to a processing called diffusion bonding, iron particles are connected with small particles of alloying elements i.e. Ni, Cu, Mo. This bond is carefully controlled in order to guarantee that the powder maintains compressibility and flowability while maintains homogeneity.

## Alloyed grades

Powder Family	Grade	Apparent Density (g/cm <sup>3</sup> )	Particle Size	Flowability (s/50 g)	Compressibility (g/cm <sup>3</sup> )	Green Strength (N/mm <sup>2</sup> )	Added elements (%)		
							Cu	Ni	Mo
FERALLOY (Diffusion Bonded Treatment)	<b>DB 1</b>	2.95 - 3.05	< 250 µm	28 Max	7.08 min	16.0 min	1.5	1.75	0.5
	<b>DB 2</b>	2.95 - 3.05	< 250 µm	28 Max	7.08 min	16.0 min	1.5	4	0.5
	<b>DB 2 SM</b>	2.95 - 3.05	< 250 µm	30 Max	7.05 min	16.0 min	1.5	4	-
	<b>DB 3</b>	2.95 - 3.05	< 250 µm	28 Max	7.05 min	14.5 min	1.5	2.3	0.5
	<b>Ni 2</b>	2.90 - 3.10	< 250 µm	35 Max	7.00 min	12.0 min	-	2	-
	<b>Cu 10</b>	2.75 - 3.05	< 250 µm	30 Max	-	-	10	-	-
FERALLOY (Prealloyed + DB)	<b>ST 085</b>	2.95 - 3.15	< 250 µm	26 Max	7.00 min	12.0 min	-	-	0.85
	<b>ST 0</b>	2.95 - 3.15	< 250 µm	26 Max	7.00 min	12.0 min	-	-	1.5
	<b>ST 1</b>	3.00 - 3.15	< 250 µm	26 Max	7.00 min	12.0 min	2	-	1.5
	<b>ST 2</b>	3.00 - 3.15	< 250 µm	26 Max	7.00 min	12.0 min	-	2	1.5
	<b>ST 3</b>	3.00 - 3.15	< 250 µm	26 Max	7.00 min	12.0 min	2	4	1.5
	<b>M CU 8</b>	2.90 - 3.10	< 250 µm	29 Max	-	-	8	-	-
	<b>M CU 20</b>	2.90 - 3.10	< 250 µm	29 Max	-	-	20	-	-

Diffusion Bonded powders offer a compressibility almost comparable to that of pure iron powder. When the Diffusion Bond treatment is applied to Iron based powder, but the desired mechanical characteristics are not achieved, Pometon recommends Feralloy ST for applications that require higher mechanical strength. **Feralloy ST** family is based on a prealloy of Iron and Molybdenum. It can be supplied pure grade (ST0) or with other alloying elements added with Diffusion Bond process grades (ST1 – ST2 – ST3).





Pometon has developed grades of high strength and cost effective PM steels. These grades are a mix of alloying elements (e.g. Cr, Mo, Ni, Cu, Mn) in different and predetermined concentrations. The main purpose is to achieve an optimum balance between compressibility, hardenability and other sintered properties while minimising the use of high cost metals. ECOSint is the first PM grade using all these elements together, adequately combining them and taking full advantage of the multiple interactions among the alloying elements.

## ECOSint Powders

Grade	Chemical composition (%)						Physical properties					
	Ot	Cr	Mo	Mn	Ni	Cu	Fill density (g/cm <sup>3</sup> )	Particle Size	Flowability (s/50 g)	Compressibility (g/cm <sup>3</sup> )	Green Strength (N/mm <sup>2</sup> )	
ECOSint	A	< 0.25	1.4	0.8	0.2	0.4	0	2.9	< 250 µm	22	6.90 min	14.0 min
	B	< 0.25	1.4	0.8	0.2	0.9	0	2.9	< 250 µm	22	6.90 min	14.0 min
	C	< 0.25	1.4	0.8	0.2	0.9	1	2.9	< 250 µm	22	6.90 min	14.0 min
ECOSint HCr	A	< 0.25	2	0.8	0.2	0.4	0	2.9	< 250 µm	22	6.90 min	14.0 min

### The lowest critical cooling rate for PM steels

Material	Total alloy content (without C and Fe)	Critical cooling rate (°C/s)
ECOSint A + 0.6 C	2.8	1.5
ECOSint B + 0.6 C	3.3	0.8 - 1.0
ECOSint C + 0.6 C	4.3	0.45 - 0.8
ECOSint HCr A + 0.6 C	3.4	0.17 - 0.45
ECOSint HCr A + 1 Cu + 0.6 C	4.4	0.17 - 0.45

ECOSint powders are **high performance** PM steels but with the minimum alloying content in the market for sinter-hardening grades. These novel PM steels, with enhanced hardenability, offers PM parts producers the opportunity to obtain the benefits of sinter-hardening with the added advantages of lower production cost economy through slower than normal cooling rates.



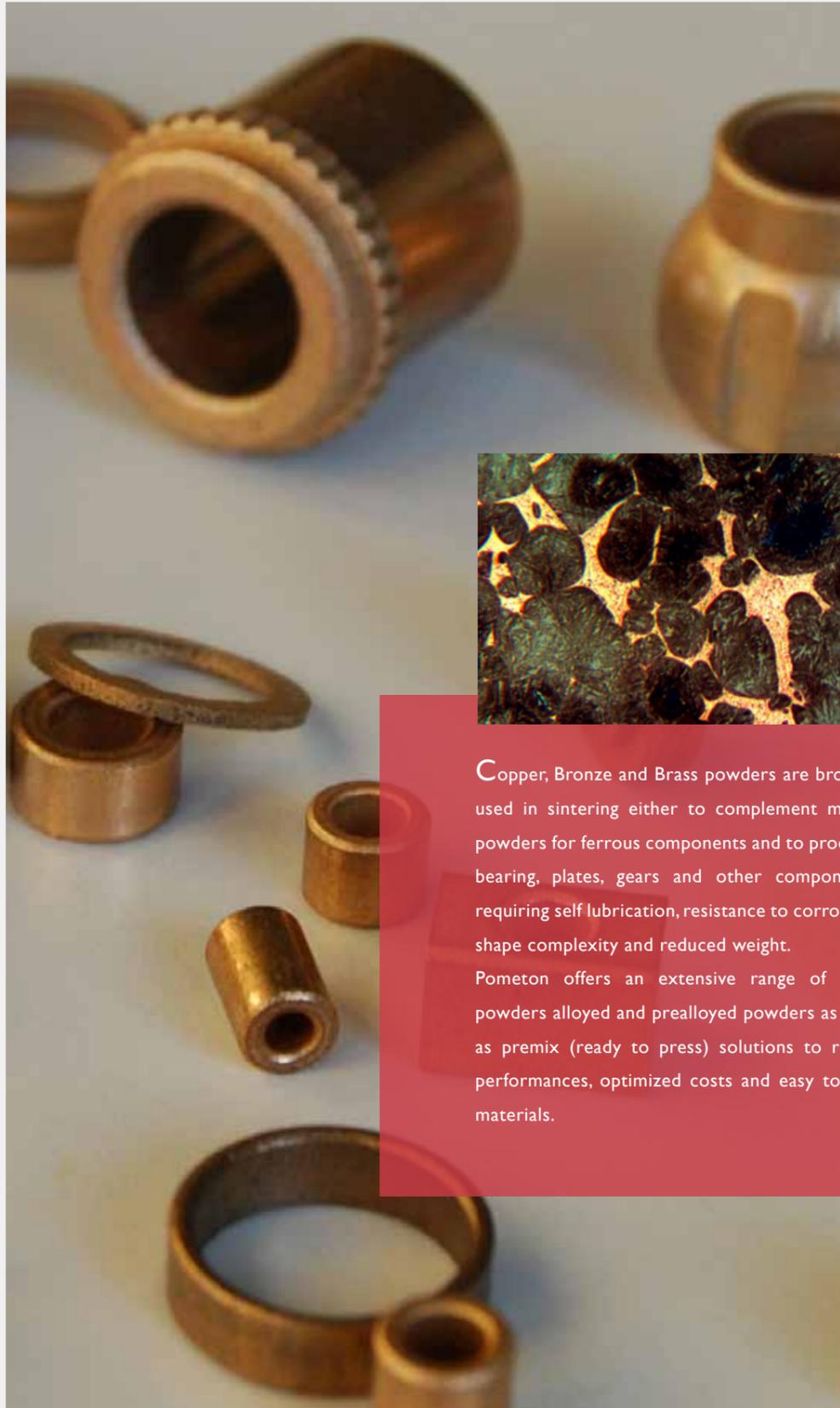
## Non Ferrous Powders

Grade	Product group	Chemical composition	Total Oxygen (% max)	Flowability (s/50 g)	Apparent Density (g/cm <sup>3</sup> )	Typical use
Cu SE	Copper electrolytic powder	Cu 99.7% min	0.15	45 max	2.30 ± 0.10	Base material for Bronze sintering
Cu PM 100	Copper atomised powder	Cu 99.5% min	0.15	45 max	2.40 ± 0.10	Base material for Bronze sintering
Cu WRCP	Copper atomised and reduced powder	Cu 99.6% min	0.20	35 max	2.75 ± 0.10	Base material for Bronze sintering
Cu W 150	Copper atomised powder	Cu 99.6% min	0.20	-	3.40 ± 0.30	Additive to ferrous sintering
Cu SB	Copper electrolytic powder	Cu 99.8% min	0.15	40 max	2.45 ± 0.10	Additive to ferrous sintering
Sn 75F	Tin atomised powder	Sn > 99.7%	-	-	3.70 ± 0.30	Alloying element for Bronze sintering
CuSn10 W250	Bronze atomised powder	Sn 10%	0.15	-	2.95 ± 0.15	Bronze sintering from prealloyed powder
CuSn10 U10	Bronze powder (Diffusion Bond)	Sn 10%	0.15	40 max	2.45 ± 2.70	Bronze sintering from prealloyed powder
CuZn30 OT 212	Brass atomised powder	Zn 30%	0.15	45 max	3.20 ± 0.30	Bronze sintering from prealloyed powder

## Infiltrant grades

Pometon offers a range of ready to use copper grades specifically developed for the process of infiltration.

Grade	Product group	Chemical composition	Lubricant (%)	Flowability (s/50 g)	Apparent Density (g/cm <sup>3</sup> )	Typical use
Cu IN 200	Copper for infiltration	Mn 0.6% Fe 2%	0.4	45 max	3.00 ± 0.20	Standard infiltration powder
Cu IN L401	Copper for infiltration	Mn 0.8% Fe 2.9% Zn 0.4%	0.4	45 max	3.20 ± 0.20	Lower residues formation
Cu IN P401	Copper for infiltration	Mn 0.6% Fe 2.2% Zn 0.4%	0.4	-	2.35 ± 0.15	High green strength infiltration powder



Copper, Bronze and Brass powders are broadly used in sintering either to complement mixed powders for ferrous components and to produce bearing, plates, gears and other components requiring self lubrication, resistance to corrosion, shape complexity and reduced weight.

Pometon offers an extensive range of base powders alloyed and prealloyed powders as well as premix (ready to press) solutions to reach performances, optimized costs and easy to use materials.



## Premix grades

PREMIX GRADES ARE BASED ON ELEMENTAL POWDERS WITH ALLOYING ELEMENTS, ADDITIVES AND GRAPHITE.

Pometon's range of Iron and Bronze powder includes Premix grades. These powders are supplied **Ready To Press**.

Each unique grade is as a result of co-operation with customers to develop a ready to use powder suitable for a particular component.

### Range

- > Ferrous premix based on elemental iron;
- > Ferrous premix based on prealloyed and/or diffusion bonded powders;
- > Premix of ferrous and non ferrous powders;
- > Bronze premix;
- > Premix of copper.

Our Technical Department is at the customer's disposal to develop new grades of powders.



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