

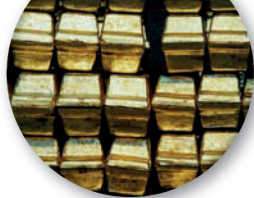


MAKIN METAL POWDERS

A Member of the **GRIMM** Family of Companies

Copper and Copper Alloy Powders
WORLDWIDE

www.makin-metals.com



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INTRODUCTION

We occupy a purpose built 10,000 sqm production facility. Our employees have a long history and a wealth of experience in the copper powder industry with an association stretching nearly 70 years.

MAKIN METAL POWDERS (UK) Ltd is one of the largest producers of copper and copper alloy powders in Europe. As part of the GRINM family of companies, it works in close co-operation with its sister company GRIPM Advanced Materials Co. Ltd, which has the largest Copper and Copper Alloy Powders production base in China.

We are a truly international business, exporting over 70% of our products to Europe, the Far East and the Americas.

Our advanced and highly specialised powders provide the raw material for precision components with key applications throughout the powder metallurgy, automotive, friction, carbon brush, filter and various other industries.

PRODUCTION

Makin Metal Powders (UK) Ltd manufactures Copper Powder, Bronze Powder, Tin Powder, Infiltrants and Press-Ready Pre-Mix Powders along with other related alloys from its facility in Rochdale, United Kingdom.

This first-class production site offers both Water - and Air - Atomising facilities with sieving, sintering and alloying capability.

The continuous process production plant is supported by the technical expertise of a laboratory that offers full physical, mechanical and chemical analysis.



REACHING THE CUSTOMER

A worldwide network

To effectively service world markets we have at our Head Office in the UK a dedicated Customer Service Department. Also, our carefully selected worldwide network of Agents is given special training in our powders and their various end uses and applications. We are in constant communication with all our agents to ensure rapid response and flow of information and first class customer care.

Expert technical support is an integral part of our service. Every new product enquiry, whether through our Agents or direct to MMP (UK) Ltd, is first reviewed and assessed by our Sales and Technical teams prior to developing the most appropriate, efficient, cost-effective samples for testing.

DEVELOPMENT

The flair and flexibility you need.

In addition to core products, many of our powders are individually formulated to meet specific customer requirements. We work closely with world-renowned partners; our advanced laboratory facilities match industry standards, provide full physical and chemical testing, and accurately simulate the powder engineering process. In this way we can be a vital part of your product development programme, creating the powders that will help you to successfully exploit new market opportunities.

Large or small volumes, we have the capacity and flexibility to supply "standard" and specialty powders.

QUALITY

Built in to the production process.

All our systems and processes are ISO 9001 and ISO 14001 accredited.

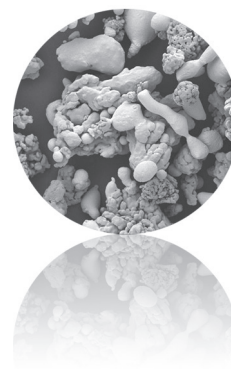
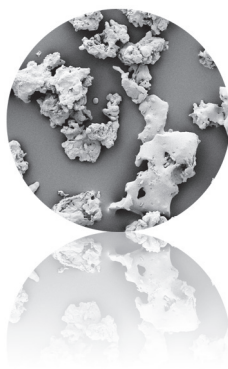
Investment in the latest processing technology and our stringent process control systems ensure exceptionally good batch to batch consistency. The entire process is continually monitored as part of our ongoing improvement programme and, as a measure of its efficiency, core products are available on very short production lead times.





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IRREGULAR COPPER POWDERS

These products display low to medium Apparent Density and facilitate good green strength. Various grades are available to meet specific requirements. Used in dynamo, electric motor and alternator brushes, as a catalyst and in iron powders as an additive. Widely used in sintered parts formulations.

IRREGULAR BRONZE POWDERS

Water atomised in various alloy compositions and grades for use in high density powder metallurgy parts, brake linings, porous bearings and diamond tool matrices. Also used in bronze press-ready premix formulations. Widely used in PTFE and bearings.

SPHERICAL COPPER POWDERS

For use in the manufacture of diamond tools and composite discs, cold casting decorative work, metal spraying and anti-fouling paint formulations.

SPHERICAL BRONZE POWDERS

A variety of alloy compositions including 89/11 Cu/Sn air atomised spherical powders with narrow particle size distribution for use in manufacture of filters. Also used in the diamond tool industry, PTFE, bearings and decorative cold cast figures.

DENDRITIC COPPER POWDERS

FINE GRADES (0-53 micron)

These powders have applications in sintered friction materials, metal carbon brushes, diamond tool setting, anti-fouling paint formulations and cold cast resins.

STANDARD GRADES (0-150 micron)

Powder metallurgy applications e.g. used with tin powder for production of bronze bearings.

IRREGULAR COPPER POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Irregular Copper Powder	CU>99.0	3.0 +/- 0.5	<150
Irregular Copper Powder	CU>99.0	2.8 +/- 0.3	<63
Irregular Copper Powder	CU>99.0	2.8 +/- 0.3	<45

IRREGULAR BRONZE POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Irregular Bronze Powder	Sn10 -20	2.6 to 3.6	<150 <63 <45

SPHERICAL COPPER POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Spherical Copper Powder	CU>99.3	5.0 +/- 0.2	<150
Spherical Copper Powder	CU>99.3	5.0 +/- 0.3	<63
Spherical Copper Powder	CU>99.3	5.0 +/- 0.5	<45

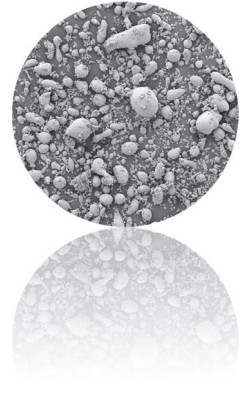
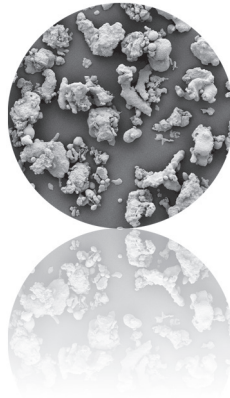
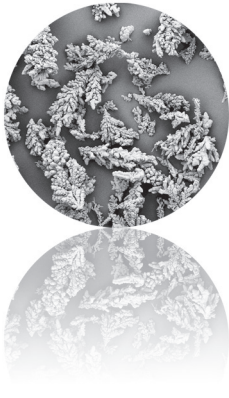
SPHERICAL BRONZE POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Spherical Bronze Powder	Sn11 -20	5.0 +/- 0.5	<75 <45

DENDRITIC COPPER POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Dendritic Copper (Heavy)	CU>99.7	> 2.0	<150
Dendritic Copper (Medium)	CU>99.5	1.5 +/- 0.5	<150
Dendritic Copper (Light)	CU>99.4	<1.0	<63
Dendritic Copper (Medium)	CU>99.5	1.7 +/- 0.5	<45

We also offer a range of other speciality materials such as Sn/Al, copper and bronze.



TIN POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
Tin Powder	Sn>99.7	4.1 +/- 0.3 4.0 +/- 0.2 4.0 +/- 0.2 4.0 +/- 0.2 4.0 +/- 0.2	<150 <75 <53 <45 <25

TIN POWDERS

Spheroidal particle powders are manufactured using high purity refined tin. Several fractions are available for use in a variety of applications including blending with other powders for pressed and sintered parts.

PREMIX POWDERS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	DIMENSIONAL CHANGE %
Large Shrinkage	CU90/Sn10	2.0 - 3.0	-2.0 to -0.8
Medium Shrinkage	CU90/Sn10	2.5 - 2.8	-0.7 to -0.5
Low Shrinkage	CU90/Sn10	2.5 - 3.5	-0.5 to 0
MP-01	CU90/Sn10	2.8 +/- 0.1	-0.2 to 0.2
MP-02	CU90/Sn10	2.8 +/- 0.1	-0.3 to 0.3
Low Growth	CU90/Sn10	2.5 - 3.5	0 to 0.7
Medium Growth	CU90/Sn10	2.7 - 3.5	0.5 to 1.2
High Growth	CU90/Sn10	2.8 - 3.6	1.5 to 3.5
Low Growth High S/S	CU90/Sn10	2.0 - 2.5	-1.2 to -0.5
High Growth High S/S	CU90/Sn10	2.5 - 3.5	0.5 to 1.2

PREMIX POWDERS

Press-ready premix powders formulated to customers individual requirements in terms of alloy composition, dimensional change characteristics, apparent density, green and sintered strengths. Lubricants added according to processing requirements.

PREMIX ADVANTAGES

- Minimal dimensional change variation
- No segregation
- Reduced dimensional change sensitivity to sintering temperature variations
- Elimination of in-plant mixing
- Minimum variation
- Reduced stock levels
- Reduced scrap
- 25 kgs to 1000kgs packaging options

SPECIALITY MATERIALS

PRODUCT GROUP	CHEMICAL COMPOSITION %	APPARENT DENSITY g/cc	PARTICLE SIZE μm
XF-3M Non Residue Infiltrant	CU>97.0	2.7 min	<180
XF-6M Residue Infiltrant	CU>92.5	2.7 min	<180
Dairy Metal Spherical Bronze	CU67/Sn5/Ni27	-	<150
Irregular Zinc Bronze Powder	CU88/Sn10/Zn2	3.3 +/- 0.3	<45
Dendritic Bronze Powder	CU90/Sn10	1.6 +/- 0.3	<150
Dendritic Zinc Bronze Powder	CU88/Sn10/Zn2	2.0 +/- 0.5	<150

SPECIALITY MATERIALS

INFILTRANT GRADES

A range of formulations available to meet specific requirements to enhance properties to sintered iron components with excellent efficiency, minimal erosion and precise control.

DAIRY METAL (Cu/Ni/Sn)

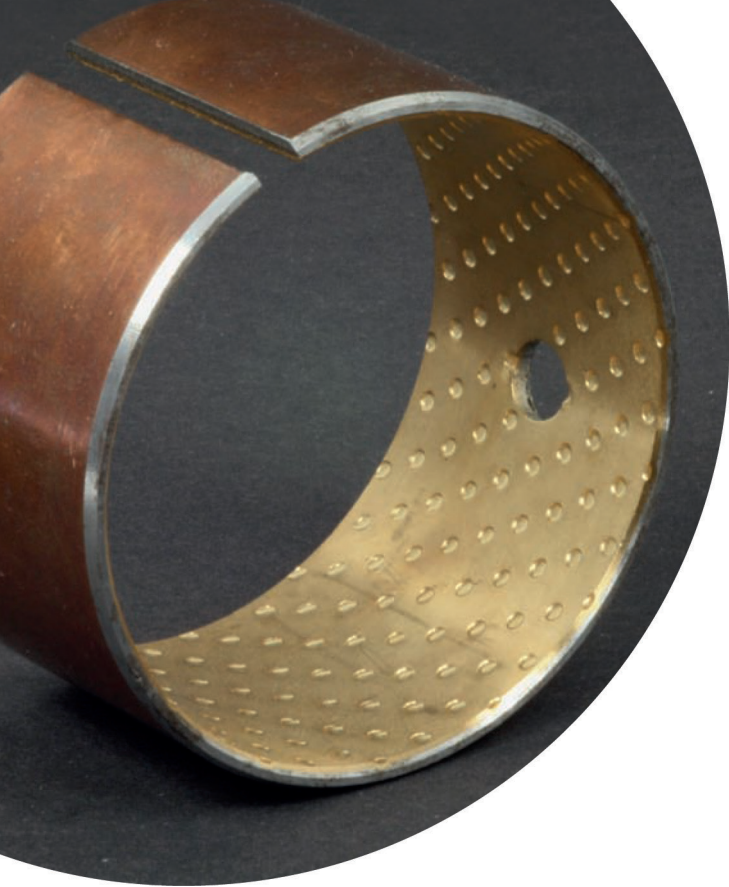
Manufacture of filters for foodstuffs and pharmaceuticals.

BRAZING ALLOYS

Alloys of mainly copper, tin and phosphorus for use in welding and brazing pastes.

ULTRA-FINE POWDERS

Particle sizes with a nominal d(0.50) of 5, 10 and 20 microns.



CODE OF CONDUCT AND BUSINESS ETHICS

Makin Metal Powders (UK) Ltd recognises its responsibility to its employees, customers, suppliers, partners, associates, shareholders and other stakeholders as well as to the wider community.

More specifically, we:

- support and respect the protection of human rights
- support the freedom of association and recognise the right to collective bargaining
- support the elimination of all forms of forced and compulsory labour
- support the abolition of child labour
- support the elimination of all forms of discrimination
- are opposed to corruption in all its forms, including bribery

The company endeavours to abide by all legal requirements in connection with the conduct of our business in both action and spirit and tries to ensure that all stakeholders do likewise. Breach of this policy by any stakeholder may result in serious consequences.

Furthermore, Makin Metal Powders (UK) Ltd actively supports a Conflict-Free Sourcing policy and requires suppliers to comply with CFS principles.

CONTACT US

We hope this short overview of MAKIN METAL POWDERS (UK) LTD has brought our products, capabilities, markets and corporate aims and credentials into clear focus.

Our modern production facility in Rochdale lies close to the North West motorway system, and is only 30 minutes from Manchester International Airport.

For advice on how our powders and technical expertise can benefit your business, please phone or fax directly to Makin, or contact your local Agent (details can be found on our website).

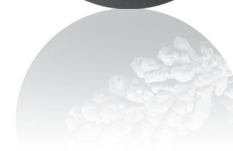
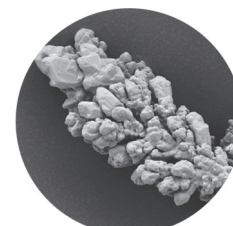
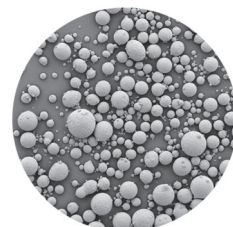


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