



KOBE STEEL, LTD.

Advanced Materials Business

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Notes and Requests

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Delivering from Japan to Asia and to the World

Kobelco, a pioneer of atomized steel powder, provides a rapid global supply of high quality products based on its sophisticated technological capabilities and extensive experience.

Shanghai Kobelco (China) Holding Co., Ltd.

1968 : Steel powder business launched

1970 : Sales of atomized steel powder started (first time in Japan)

1992 : Takasago Steel Powder Plant established in Takasago Works

1998 : Takasago Steel Powder Plant certified for ISO9001

1999 : Takasago Works certified for ISO14001

2013 : Plant for magnetic steel powder starts operation

2020 : Mixer capacity reinforced (Mixed powder product 60,000t/year)

2021 : Reduction process capacity reinforced (Steel powder product 110,000t/year)

Tokyo Head Office

Osaka Branch Office

Takasago Works



Kobelco's Powder Features



Main Types of Steel Powder and Example of Applications

	Туре				Features	Applications
	Pure iron powder	High- compressibility pure iron powder	300M	High compressibility		-
			500M			
			300MH	Ultra-high compressibility, high purity		
			300NH			
		High- compactability pure iron powder	250M	High compactability		
			270M			
	Free cutting steel powder		250MS-A	Free cutting, high compactability		-
Stool			400MS-A	Free cutting		
Powder			600MS			
metallurgy	Low alloy steel powder	Pre-alloyed type	44FH30 44FH45	High strength	Sintering, high strength	Auto parts, motorcycle parts, industrial machinery parts, office equipment parts, electrical equipment parts, others
applications			44FH85		Carburizing hardening, high fatigue	
			44FH		Carburizing hardening, high fatigue	
			46F2H		Induction hardening	
			46F3H		Sinter hardening	
			46F4H		Heat treatment, high fatigue	
			4600		High strength	
			94FDH		Sinter hardening	
		Partially alloyed type	4800DF-C	High strength, high toughness		
				Prevents segregation of graphite		
mix powder for powder metallurgy applications		KP series	All product types supported		High-compressibility	-
		KS series			High-machinability	
MAGMEL™	/IAGMEL™ ML seri		ML28D ML-1000	High magnetic	Low frequency supported	Motor cores
for magnetic applications		MH series	MH20D MH-2000	Low core loss	High frequency supported	Noise filters, reactors
ECOMEL™ for purifying soil and groundwater Steel Powder for others			51NJ 53NJ	High adsorption		Heavy metal adsorption
			54NJ 58NJ	High reactivity		VOC degradation
			70KA	High welding		Flux for electrodes
			61NF	High reactivity		Chemical reaction
			70KA 70KB 80AF	High reactivity, high sustainability		Deoxidizers, hand warmers
			80NF	Low cost		



R&D and Production Sites

Kobelco is committed to the development of new products and technology to meet all customers' needs.

In 1992, Kobelco established the PM Center in the Takasago Works to strengthen development on steel powder and mixed powder. The research & development system is centered on the PM Center in collaboration with the Kobe Corporate Research Laboratories (Seishin) and Research & Development Laboratory (Kakogawa).



Takasago Works



PM Center

Manufacturing technology





SEGLESS™ mini mixer High-pressure water atomization testing equipment

Support development of powder composition, particle shapes, and new composition of SEGLESS™

Processing technology

furnace

Support development of steel powder to meet on-site customer needs by using the similar process as that of the customer.



Research & Development Laboratory (Kakogawa)







Mesh belt sintering





evaluation equipment



Magnetic property Two-roller type rolling contact fatigue test machine

Performing basic evaluation on parts manufactured by customers to support the development of steel powder.

Manufacturing Process and Main Facilities



Outline of Main Facilities

Main Facilities	Characteristics				
Electric Arc Furnace	Gives uniform molten steel with a high level cleanliness.				
Atomizer	Consistent steel powder qualities with a unique V-Jet atomizer.				
Sieving & Storage	Excellent uniform particle distribution through a computer controlled system.				
Reduction Furnace	Enables stable operations by various sensor controls.				
Pulverizing & Screening	Consistent steel powder qualities with online continuous system.				
Automatic Packing Machine	Prevents contamination by foreign articles through the use of packaging in closed lines.				
SEGLESS [™] Facility	Provides stable premixed powder in the process to prevent graphite segregation.				



1000kg Flexible container

300M

500kg Flexible container



Steel Powder

Pure Iron powder

Powder metallurgy application

Water atomized pure iron powder has superior compressibility, and it is suitable for large-sized parts with high density and high strength. In addition to standard grade 300M, there are 300MH and 300NH that have high purity by reducing impurity element. They have more superior compressibility.



Flux for electrodes, chemical reaction, deoxidizers, and hand warmers

With its high purity and uniformity, our iron powder has high reactivity and sustainability and is used for variety of purposes.

Pre-alloyed Steel Powder

Pre-alloyed steel powder contains Ni and Mo and has a uniform structure. It can be used for a wide range of applications, as-sintered parts and heat-treated parts.

Sinter-hardening alloyed steel powder is designed to boost hardenability which enables elimination of heat treatment process and is able to produce high strength parts.

SEGLESS[™]

SEGLESS[™] is a premixed powder that prevents graphite segregation.

It inhibits powder dust from graphite and helps to improve the working environment. It reduces variation by graphite segregation

and provides stable quality.

The KP Series high-density SEGLESS[™] and KS Series high-machinability SEGLESS™, will help to achieve even more sophisticated functionality.

High-density SEGLESS[™] (KP series)

Provide high-density green compacts by reducing the amount of lubricant to add. Furthermore provide high-die filling powder with good flowability.



High-machinability SEGLESS[™] (KS series)

High-speed cutting tool life is five to ten times longer compared to that adding MnS powder. Adding a small quantity of this product brings substantial results, and it will not lower density or strength, and keeps sintered compacts clean.

MAGMEL™

MAGMEL[™] is soft magnetic iron powder for compact magnetic core with insulating layer on its surface. It reduces eddy current loss and produces parts with low iron loss.

The compactability of the powder is superior and it will give high magnetic flux density.

We have ML series for low frequency and MH series for high frequency.

Low frequency (for motors) **ML** series

Large particle size reduces hysteresis core loss and high compressibility gives high magnetic flux density.

ECOMEL[™]

ECOMEL[™] is for remediating land and underground water. By using the chemical reaction that occurs on the surface of steel powder, it adsorbs variety of heavy metals and decomposes organic chlorine compounds (VOC). It is used for variety of purposes in civil engineering sectors such as remediating land during urban development, treating contaminated soil during tunneling, and suppressing underground water contamination.



ECOMEL[™] for heavy metals forms insoluble compounds with heavy metal ions in environments where various heavy metal ions are present, stably adsorbing and detoxifying heavy metals.





Dust core for Axial Flux Motor (Density: 7.6g/cm³) MAGMEL[™] ML28D

High frequency (for reactors) MH series

Small particle size reduces eddy current even in the high frequency area.





ECOMEL[™] for VOC degradation decomposes VOC into harmless compounds by dechlorination and hydrogenation under VOC existing environment.