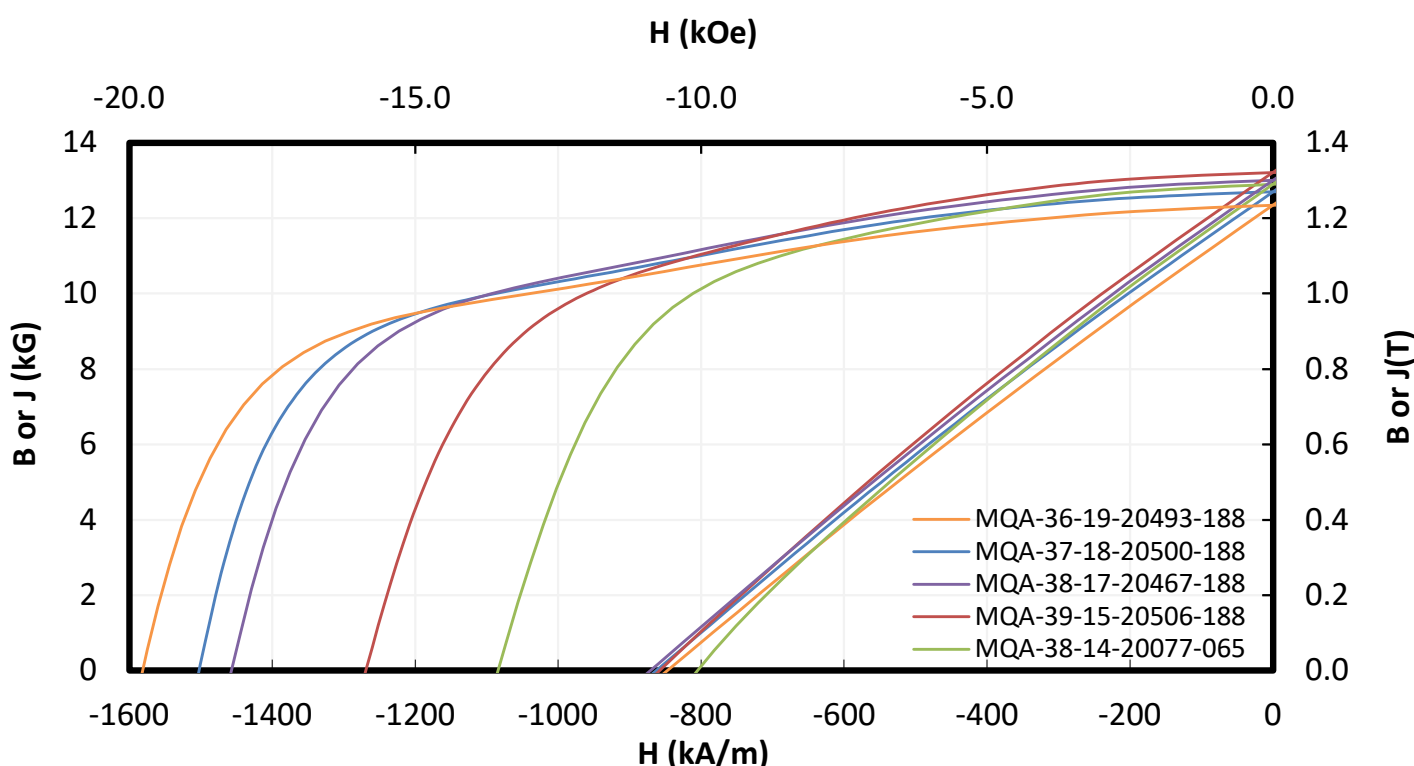


- MQA has **substantially** higher energy product and remanence than isotropic powders
- Competitive with existing powders for anisotropic bonded magnets
- MQA grades will
 - Provide flexibility for the motor designs of the future
 - Improve motor efficiency
 - Further reduce the weight and size of the motor

		MQA-36-19 -20493-188	MQA-37-18 -20500-188	MQA-38-17 -20467-188	MQA-39-15 -20506-188	MQA-38-14 -20077-065
Residual Induction, B_r	mT	1235	1269	1299	1317	1283
	(kG)	(12.4)	(12.7)	(13.0)	(13.2)	(12.8)
Energy Product, $(BH)_{max}$	kJ/m ³	275	289	298	306	286
	(MGOe)	(34.5)	(36.3)	(37.5)	(38.4)	(36.0)
Intrinsic Coercivity, H_{ci}	kA/m	1576	1491	1448	1265	1084
	(kOe)	(19.8)	(18.7)	(18.2)	(15.9)	(13.6)
Coercive Force, H_c	kA/m	844	857	863	851	801
	(kOe)	(10.6)	(10.8)	(10.9)	(10.7)	(10.1)

Powder Characteristics



Properties indicated based on development samples; mass production powder properties may vary

MQA™-36-19-20493-188

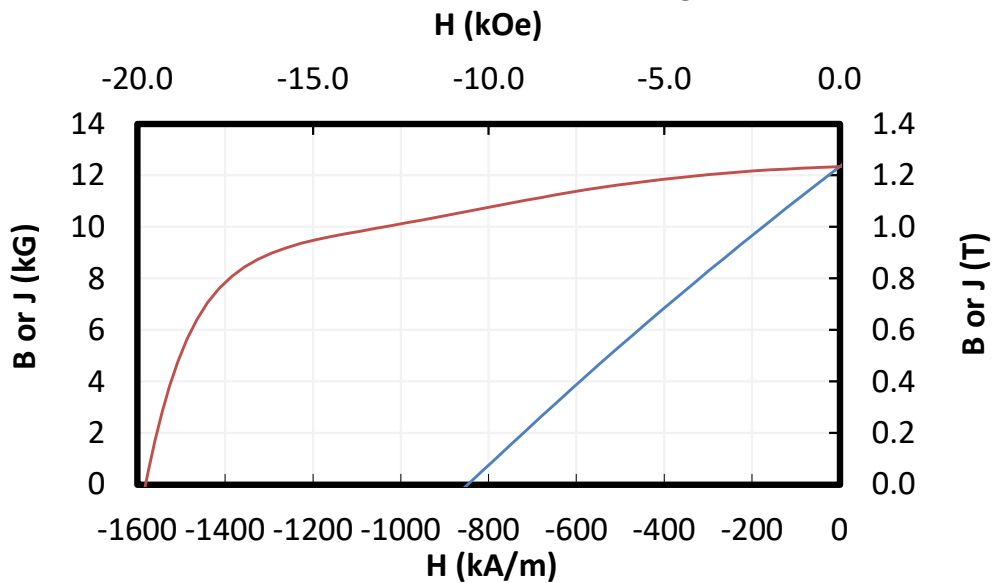
**ANISOTROPIC
POWDER**

BENEFITS

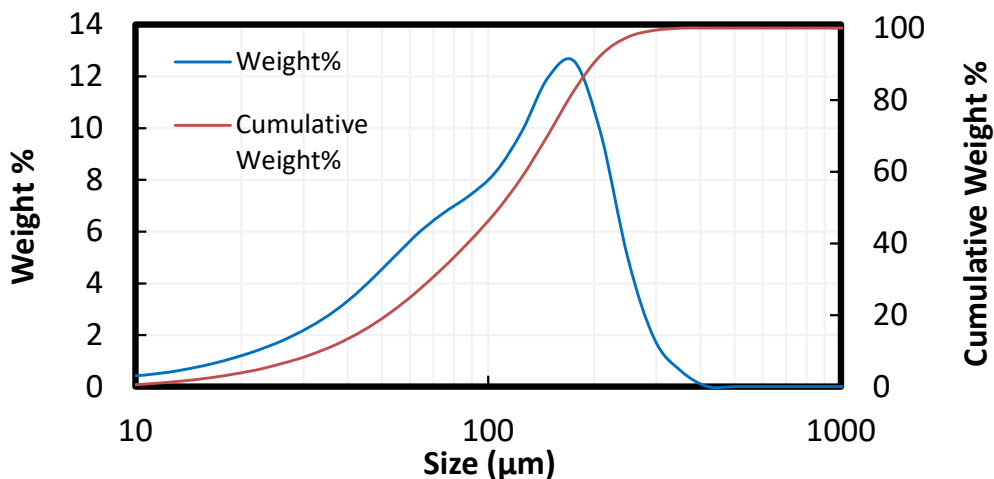
- MQA™-36-19 has the highest coercivity among the MQA grades
- MQA™-36-19 is suitable for high temperature applications up to 150°C
- Dysprosium and Cobalt free

POWDER CHARACTERISTICS

	<u>SI</u>	<u>CGS</u>
Residual Induction, B_r	1235 mT	12.4 kG
Energy Product, $(BH)_{max}$	275 kJ/m ³	34.5 MGOe
Intrinsic Coercivity, H_{ci}	1576 kA/m	19.8 kOe
Coercive Force, H_c	844 kA/m	10.6 kOe
Temperature Coefficient of B_r , α to 100°C	-0.13 %/°C	
Temperature Coefficient of H_{ci} , β to 100°C	-0.60 %/°C	
Curie Temperature, T_c	311 °C	
Powder Density	7.51 g/cm ³	



PHYSICAL CHARACTERISTICS



MQA™-37-18-20500-188

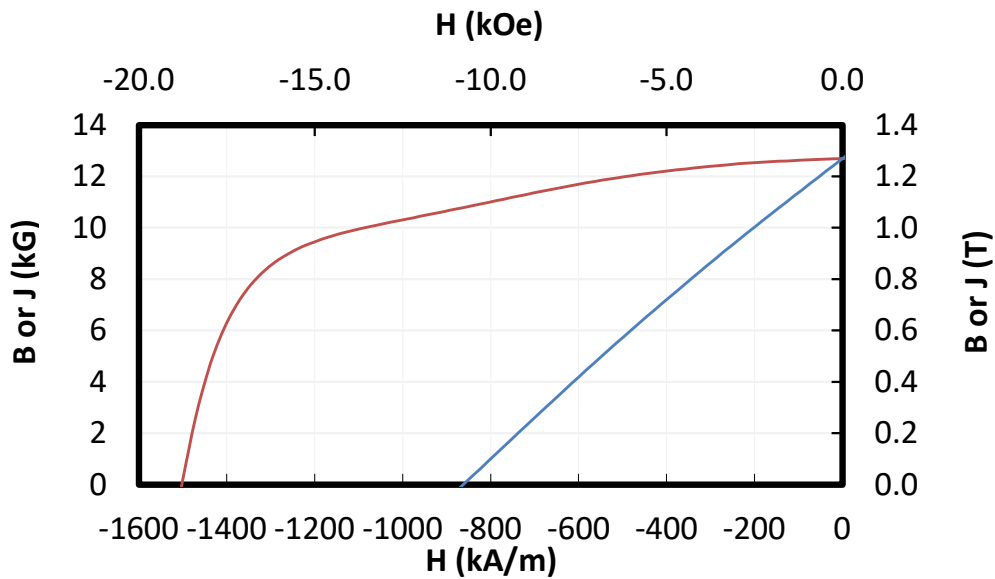
**ANISOTROPIC
POWDER**

BENEFITS

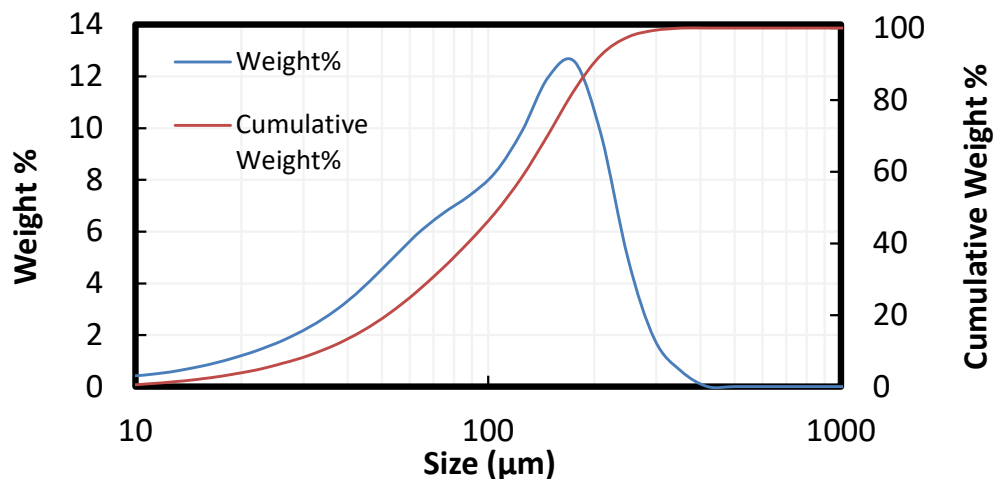
- MQA™-37-18 enables IM magnets up to 12 MGOe and CM magnets up to 17 MGOe
- MQA™-37-18 combines higher energy bonded magnets with good aging performance up to 140°C
- Dysprosium and Cobalt free

POWDER CHARACTERISTICS

	<u>SI</u>	<u>CGS</u>
Residual Induction, B_r	1269 mT	12.7 kG
Energy Product, $(BH)_{max}$	289 kJ/m ³	36.3 MGOe
Intrinsic Coercivity, H_{ci}	1491 kA/m	18.7 kOe
Coercive Force, H_c	857 kA/m	10.8 kOe
Temperature Coefficient of B_r , α to 100°C	-0.13 %/°C	
Temperature Coefficient of H_{ci} , β to 100°C	-0.60 %/°C	
Curie Temperature, T_c	311 °C	
Powder Density	7.54 g/cm ³	



PHYSICAL CHARACTERISTICS



MQA™-38-17-20467-188

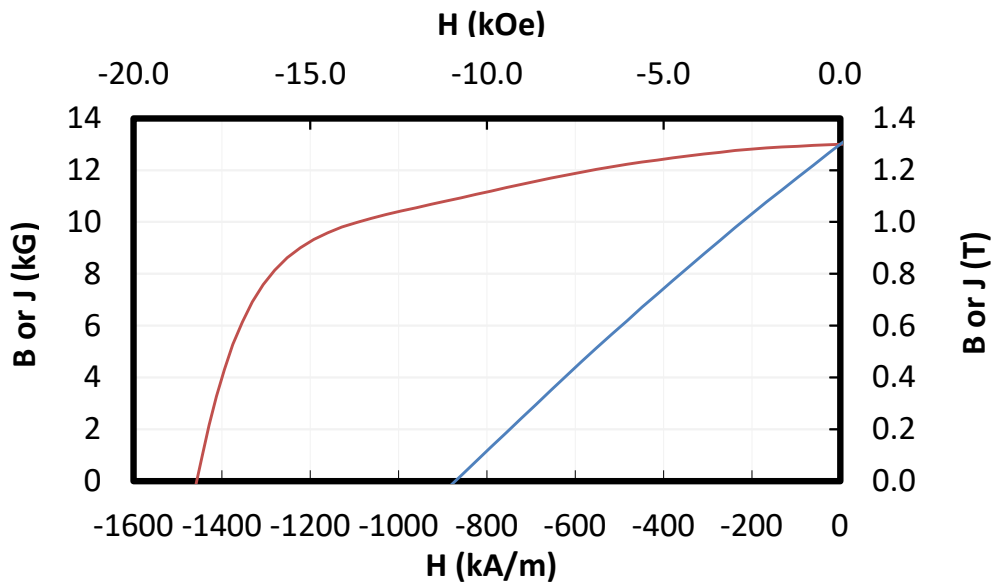
**ANISOTROPIC
POWDER**

BENEFITS

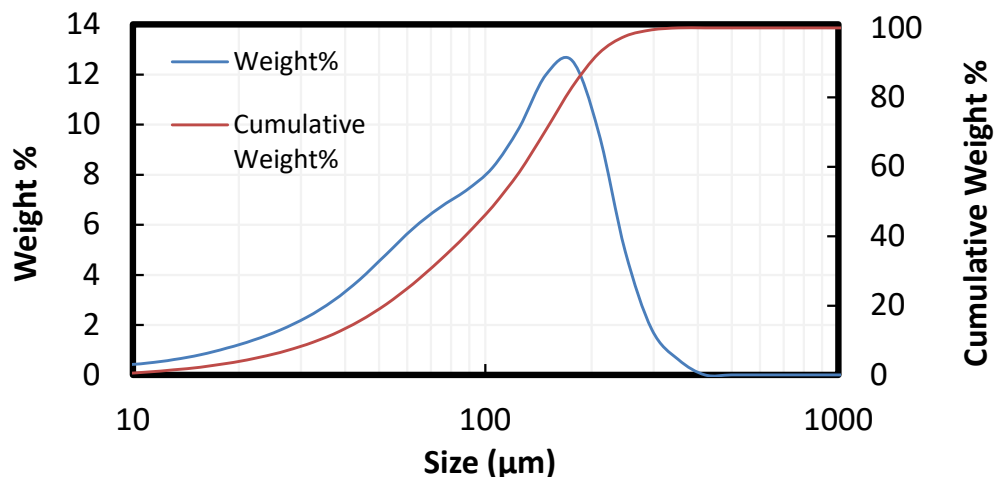
- MQA™-38-17 has higher energy product and remanence than isotropic powders
- MQA™-38-17 is a high temperature grade powder with improved aging performance
- Dysprosium and Cobalt free

POWDER CHARACTERISTICS

	<u>SI</u>	<u>CGS</u>
Residual Induction, B_r	1299 mT	13.0 kG
Energy Product, $(BH)_{max}$	298 kJ/m ³	37.5 MGOe
Intrinsic Coercivity, H_{ci}	1448 kA/m	18.2 kOe
Coercive Force, H_c	863 kA/m	10.9 kOe
Temperature Coefficient of B_r , α to 100°C	-0.14 %/°C	
Temperature Coefficient of H_{ci} , β to 100°C	-0.62 %/°C	
Curie Temperature, T_c	311 °C	
Powder Density	7.57 g/cm ³	



PHYSICAL CHARACTERISTICS



MQA™-39-15-20506-188

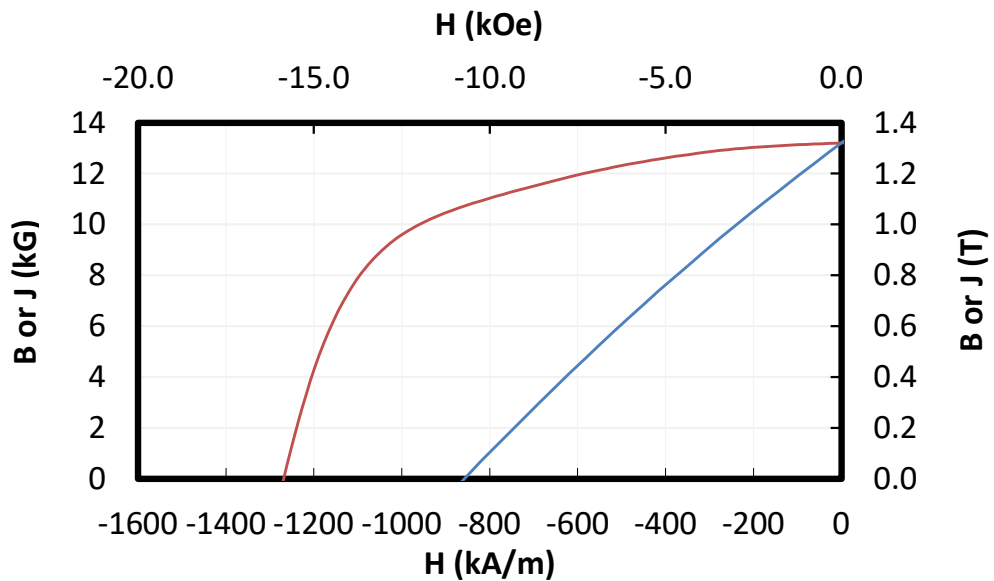
**ANISOTROPIC
POWDER**

BENEFITS

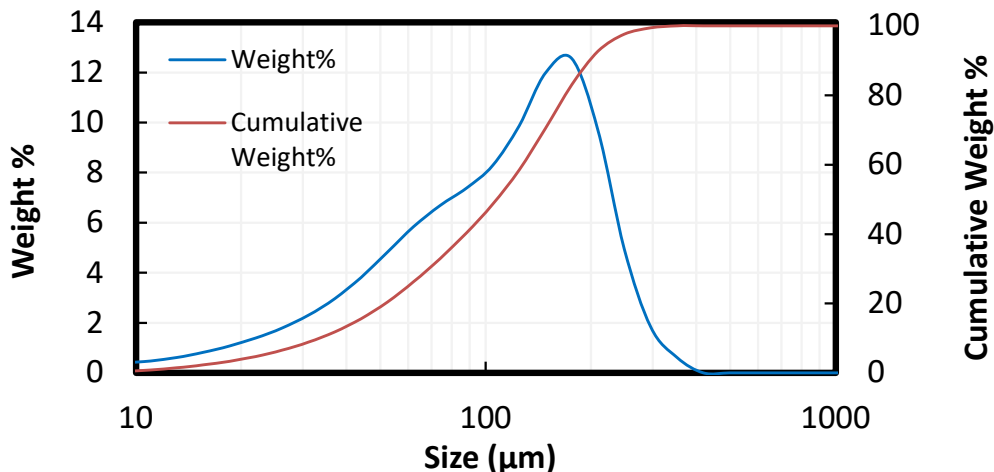
- MQA™-39-15-20506 has the highest energy product among the MQA grades
- Dysprosium and Cobalt free

POWDER CHARACTERISTICS

	<u>SI</u>	<u>CGS</u>
Residual Induction, B_r	1317 mT	13.2 kG
Energy Product, $(BH)_{max}$	306 kJ/m ³	38.4 MGOe
Intrinsic Coercivity, H_{ci}	1265 kA/m	15.9 kOe
Coercive Force, H_c	851 kA/m	10.7 kOe
Temperature Coefficient of B_r , α to 100°C	-0.14 %/°C	
Temperature Coefficient of H_{ci} , β to 100°C	-0.66 %/°C	
Curie Temperature, T_c	311 °C	
Powder Density	7.57 g/cm ³	



PHYSICAL CHARACTERISTICS



MQA™-38-14-20077-065

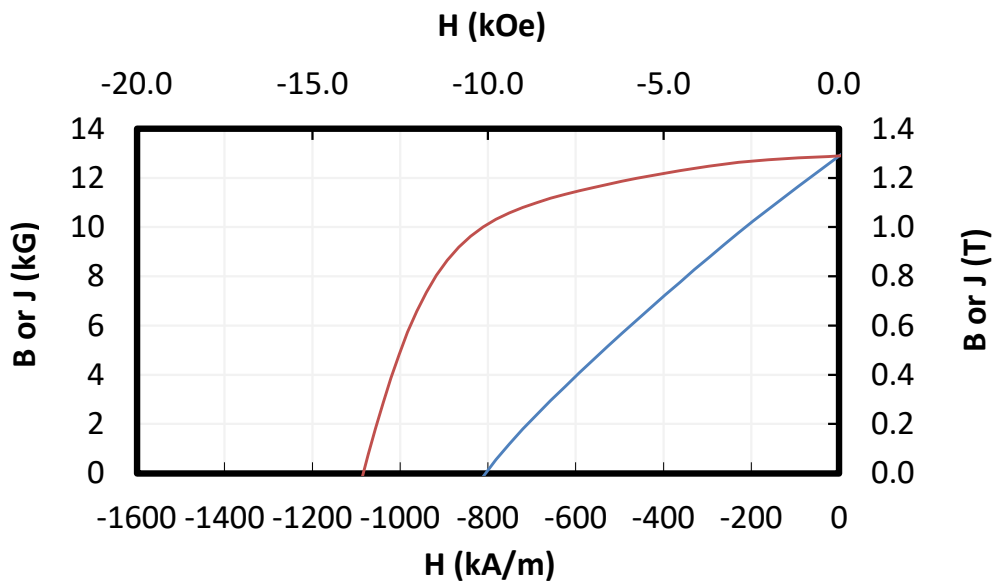
**ANISOTROPIC
POWDER**

BENEFITS

- MQA™-38-14 has higher energy product and remanence than isotropic powders

POWDER CHARACTERISTICS

	<u>SI</u>	<u>CGS</u>
Residual Induction, B_r	1283 mT	12.8 kG
Energy Product, $(BH)_{max}$	286 kJ/m ³	36.0 MGOe
Intrinsic Coercivity, H_{ci}	1084 kA/m	13.6 kOe
Coercive Force, H_c	801 kA/m	10.1 kOe
Temperature Coefficient of B_r , α to 100°C	-0.09 %/°C	
Temperature Coefficient of H_{ci} , β to 100°C	-0.66 %/°C	
Curie Temperature, T_c	369 °C	
Powder Density	7.51 g/cm ³	



PHYSICAL CHARACTERISTICS

