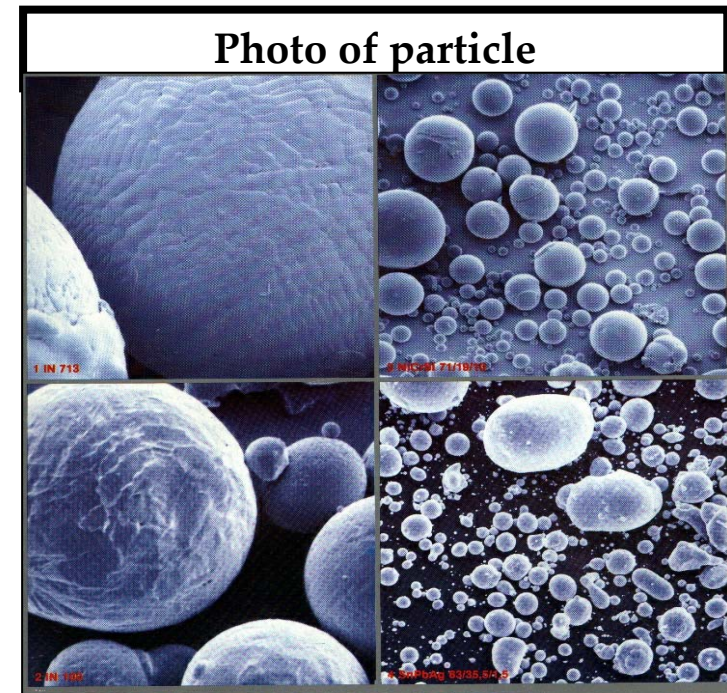


The characteristic of Our Powder

- ◎ Powder production using vacuum melting-gas atomizing process.
- ◎ High purity (low Oxygen).
- ◎ Special-shape powder superior in formability compressibility and compactability.
- ◎ Particle size between several μm and 100 μm available.
- ◎ Free selection of alloy designs is possible to match the intended purpose



Production equipment (A01)



ALD Vacuum melting



ALD gas atomizing

Production equipment (A02)



Production equipment (05)



- 01 : ICP-Emission spectrometry ,
PERKIN ELMER, OPTIMA 3200L.**
- 02 : Carbon / sulfur analyzer, HORIBA, EMIA-8200.**
- 03 : Oxygen / nitrogen analyzer, HORIBA, EMGA-520.**
- 04 : Laser scattering particle size distribution analyzer,
HORIBA, LA-920**
- 05 : High temperature differential thermal analyzer,
TA INSTRUMENT, 1600DTA**
- 06 : High temperature and high pressure
X-RD analyzer, PHILIPS.**

Inspection and analysis equipment(01)



ICP-Emission spectrometry , PERKIN ELMER, OPTIMA 3200L.

Inspection and analysis equipment(02)



Inspection and analysis equipment(03)



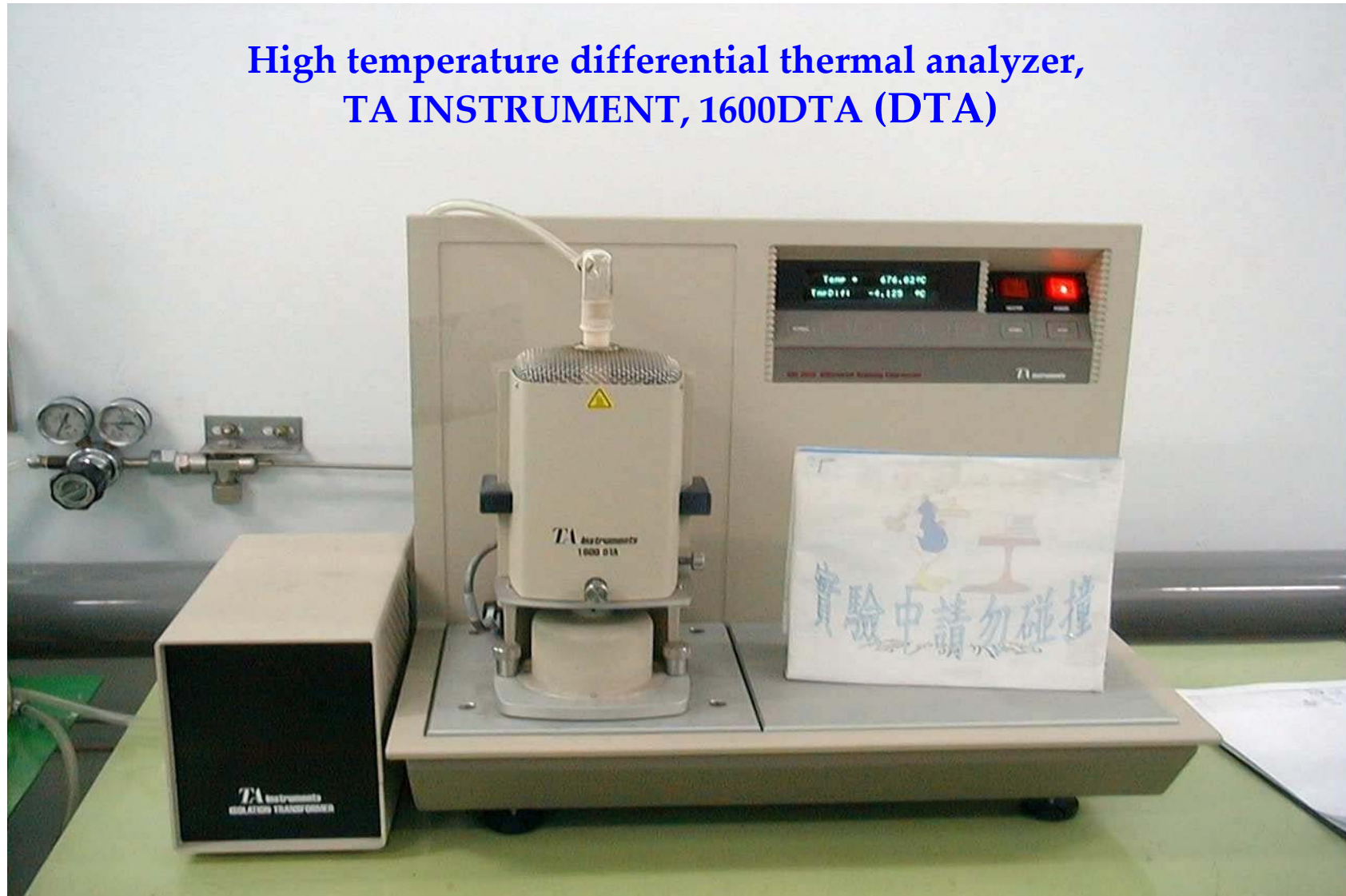
Inspection and analysis equipment(04)



**Laser scattering particle size
distribution analyzer
HORIBA, LA-920**

Inspection and analysis equipment(05)

High temperature differential thermal analyzer,
TA INSTRUMENT, 1600DTA (DTA)



Inspection and analysis equipment(06)



**X-ray
High temperature and high pressure X-RD analyzer, PHILIPS.**

Production application

Power Material	
NiMH battery powder	AB5
Metal Injection Moulding	
Stainless Steel	303L 、 304L 、 316L 、 410L 、 420 、 440C 430L 、 17-4PH
High speed 、 Tooling stainless	A30 、 440 V 、 420V 、 SKD11 、 M7 、 T15 、 M2
Ni Metal	NiCr 、 NiCrW
Low profile steel	AISI4340 、 4630 、 4650 、 8%Ni Steel
Laser component	Invr(Fe36Ni) 、 Kovar(F-15,FeNiCo)
Magnetism material	
Clutch powder	FeCr 、 FeCoCr 、 FeCo 、 SiFe
Enhanced Magnetism material	NdFeB 、 NiFe

※ Stainless steel powder

Grade	Standard Chemical Composition				
	Fe	Cr	Ni	Mo	C
304L	Bal	19	10		0.02
308L	Bal	20	11		0.07
309L	Bal	23	13.5		0.02
310	Bal	25	20.5		0.2
316L	Bal	17	11	2	0.02
410L	Bal	12.5			0.02
440C	Bal	17		0.75	1.1
630L	Bal	3	16	Cu : 3.0	0.02

※ High-speed and other Tool steel powder

Grade	Standard Chemical Composition						
	Fe	C	Cr	V	W	Mo	Co
T15	Bal	1.5	4.0	5.0	12.0		5.0
M2	Bal	1.0	4.0	2.0	6.0	5.0	
D2	Bal	1.5	12.0	1.0		1.0	
440V	Bal	2.2	17.5	5.7		0.5	

※ Nickel Alloy and Magnetic material powder

Grade	Standard Chemical Composition				
	Fe	Ni	Mo	Si	Al
Fe-8Ni	Bal	8.0			
Inver	Bal	36.0			
PB-47	Bal	47.0			
NiFe	Bal	50.0			
PC-78	Bal	78.0	4.0		
Fe-3Si	Bal			3.5	
Fe-5.5Si	Bal			3.5	
FeAlSi	Bal			3.5	5.5

※ other Alloy powder

Grade	Standard Chemical Composition					
	Fe	Ni	C	Si		
NiFeAl	Bal	30.0			Al : 10.0	
NiCu	Bal	30.0			Al : 5.0	Cu : 10
NiCrW	2.5	Bal	0.66	4.0	W : 9.6	B : 2.9
FeCMnSi	Bal		0.5	2.5	Mn : 8.0	
4340	Bal	1.8	0.35	Cr : 0.8	Mo : 0.25	Mn : 0.8

List of Ultra-fine MIM Powders

List of Ultra-fine MIM Powders: Representative Grade Its Chemical composition																
		Chemical Composition (%)														
	Alloy Grade	C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Nb	Co	W	V	Fe	O
Stainless Steel	303	0.019%	0.8%	0.1%	0.020%	0.200%	16.5%	13.6%	\	2.0%	\	\	\	\	Bal	\
Stainless Steel	304L	0.017%	0.8%	0.1%	0.025%	0.005%	18.2%	10.8%	\	\	\	\	\	\	Bal	\
Stainless Steel	316L	0.017%	0.8%	0.1%	0.025%	0.005%	17.0%	12.8%	2.1%	\	\	\	\	\	Bal	\
Stainless Steel	317L	0.017%	0.8%	0.1%	0.025%	0.005%	19.5%	14.5%	3.3%	\	\	\	\	\	Bal	\
Stainless Steel	410L	0.017%	0.8%	0.1%	0.025%	0.005%	12.5%	0.2%	\	\	\	5.0%	\	\	Bal	\
Stainless Steel	430L	0.017%	0.8%	0.1%	0.025%	0.005%	16.5%	0.2%	\	\	\	\	\	\	Bal	\
Stainless Steel	434L	0.017%	0.8%	0.1%	0.025%	0.005%	16.9%	0.2%	1.0%	\	\	\	\	\	Bal	\
Stainless Steel	440A	0.700%	0.8%	0.1%	0.025%	0.005%	17.0%	0.2%	\	\	\	\	\	\	Bal	\
Stainless Steel	440C	1.000%	0.8%	0.1%	0.025%	0.005%	17.0%	0.2%	\	\	\	\	\	\	Bal	\
Stainless Steel	17-4PH	0.040%	0.8%	0.1%	0.025%	0.005%	16.5%	4.1%	\	4.0%	0.3%	\	\	\	Bal	\
Fe-Ni Alloy	Invar	0.008%	0.1%	0.1%	0.005%	0.002%	0.1%	36.0%	\	\	\	\	\	\	Bal	\
Fe-Ni Alloy	PB-47	0.008%	0.1%	0.1%	0.005%	0.002%	0.1%	47.5%	\	\	\	\	\	\	Bal	\
Fe-Ni Alloy	50%Ni-Fe	0.008%	0.1%	0.1%	0.005%	0.002%	0.1%	50.0%	\	\	\	\	\	\	Bal	\
Fe-Ni Alloy	PC-78	0.008%	0.1%	0.1%	0.005%	0.002%	0.1%	79.8%	5.2%	\	\	\	\	\	Bal	\
Fe-Co Alloy	50%Co-Fe	0.005%	0.1%	0.1%	0.005%	0.004%	0.1%	\	\	\	\	50.0%	\	\	Bal	\
Fe-Co Alloy	Permendur	0.005%	0.1%	0.1%	0.005%	0.003%	0.1%	\	\	\	\	49.0%	\	2.0%	Bal	\
Fe-Ni-Co Alloy	Super Invar	0.004%	0.1%	\	0.004%	0.004%	0.1%	32.0%	\	\	\	5.5%	\	\	Bal	\
Fe-Ni-Co Alloy	Kovar(F-15)	0.010%	0.1%	\	0.002%	0.003%	0.1%	29.2%	\	\	\	16.7%	\	\	Bal	\
Alnico Alloy	Alnico 2	0.008%	0.3%	\	0.005%	0.003%	\	26.9%	\	4.1%	\	2.5%	Al=12.5%	\	Bal	\
Alnico Alloy	Alnico 6	0.010%	0.2%	\	0.005%	0.001%	\	18.1%	\	3.4%	\	25.8%	Al=7.3%	\	Bal	\
Alnico Alloy	Alnico 8	0.008%	0.3%	\	0.005%	0.005%	\	13.5%	\	3.2%	0.5%	36.5%	Al=7.4%	\	Bal	\
Fe-Si Alloy	Fe-3%Si	0.008%	3.0%	0.1%	0.005%	0.005%	0.1%	\	\	\	\	\	\	\	Bal	\
Fe-Si Alloy	Fe-5.5%Si	0.008%	5.2%	0.1%	0.005%	0.005%	0.1%	\	\	\	\	\	\	\	Bal	\
Fe-Si-Al	Sendust	0.020%	9.7%	0.1%	0.005%	0.005%	\	\	\	\	\	\	Al=6.0%	\	Bal	\
	SKH-57	1.26%	0.3%	0.1%	0.016%	0.016%	4.3%	\	3.6%	\	\	9.4%	9.3%	3.4%	Bal	\
OTHER	Hastelloy	\	0.7%	0.2%	0.002%	0.005%	15.5%	Bal	16.3%	\	\	2.0%	4.2%	\	Bal	\
	SCM-415	0.15%	0.2%	0.1%	0.015%	0.005%	1.1%	\	0.2%	\	\	\	\	\	Bal	\

Powder

Alloy Grade		C	Si	B	Fe	Cr	Ni	Mo	Mn	W	Co	Hardness	Particle Distribution		Other
		%	%	%	%	%	%	%	%	%	%	HV	um	um	%
Nickle-Base	1616-02	0.20%	1.00%	\	0.50%	20.00%	Bal	\	0.75%	\	\	280	53	20	\
Nickle-Base	276	<0.02%	0.10%	\	0.70%	15.20%	Bal	16.00%	\	3.80%	2.00%	260	53	20	\
Nickle-Base	1640-02	0.25%	3.50%	1.60%	2.50%	7.50%	Bal	\	\	\	\	380	53	20	\
Nickle-Base	1645-02	0.35%	3.70%	1.80%	2.60%	8.90%	Bal	\	\	\	\	450	53	20	\
Nickle-Base	1650-02	0.45%	3.90%	2.30%	2.90%	11.00%	Bal	\	\	\	\	570	53	20	\
Nickle-Base	1660-02	0.75%	4.30%	3.10%	3.70%	14.80%	Bal	\	\	\	\	780	53	20	\
Nickle-Base	1660-22	0.90%	4.30%	3.30%	4.20%	16.30%	Bal	\	\	\	\	820	53	20	\
Cobalt-Base	2637-.02	1.10%	1.00%	\	1.50%	28.50%	1.50%	\	\	4.40%	Bal	380	53	20	\
Cobalt-Base	2640-.02	1.70%	1.20%	\	1.20%	25.70%	22.80%	\	\	12.50%	Bal	400	53	20	\
Iron-Base	316L	<0.03%	0.80%	\	Bal	17.00%	12.00%	2.50%	1.50%	\	\	180	53	20	\
Iron-Base	316HIC	0.11%	0.80%	\	Bal	17.00%	12.00%	2.20%	0.20%	\	\	180	75	45	\
Iron-Base	3650.- 02	1.80%	1.30%	\	Bal	28.00%	16.00%	4.50%	0.80%	\	\	500	53	20	\