

## Typical Analysis

### RARE EARTH

#### BASTNASITE (SHANDONG)

CODE #	TREO (%min)	Loss on ignition (%max)
RE0101	68	20

PACKING: Nylon plastic woven bag with inner plastic bag of 50 kgs net each.

Below data for reference only			
P2O5(max)	CaO	BaO	Fe2O3
1	2.5	1.5	3.5

#### MIXED RARE EARTH CLORIDE

CODE #	Chemical Compositions (%)					
	REO(min)	CeO2/REO	La2O3/REO	Pr6O11/REO	Nd2O3/REO	Eu2O3/REO
RE0201	45	45-50	22-25	5	15	0.175-0.2

PACKING: Iron drum with inner double plastic bags of 50~200 kgs net each.

#### RARE EARTH CHLORIDE WITHOUT EUROPIUM

CODE #	Chemical Compositions (%)							
	REO (min)	Impurities (max)						
		Eu2O3/REO	Fe2O3	ThO2	BaO	CaO	SO4=	PO4=
RE0301	48	0.05	0.07	0.03	0.8	3.0	0.03	0.01
RE0302	45	0.05	0.07	0.03	0.8	3.0	0.03	0.01

PACKING: Iron drum with inner double plastic bags of 50~200 kgs net each.

#### RE FLUORIDE

CODE #	GRADES	Chemical Compositions (%)				bulk density (Topped) G/cm3
		REO (min)	CeO2/REO (min)	F(min)	H2O(max)	
RE0401	REF3-1	78-83	48	26	0.5	1.4-3.3

PACKING: In plastic bags with iron drum outside net 50~200 kgs.

#### SM-EU-GD-CONCENTRATE

CODE #	REO min(%)	Eu2O3 min(%)	Sm2O3 min(%)	Gd2O3 min(%)
RE0501	92	8	30	10

PACKING: In plastic box with inner sealed double plastic bags of 50 or 10 kgs net each.

#### YTTRIUM-RICH RARE EARTH OXIDE

CODE #	TERO (%min)	Y2O3/TREO (%min)
RE0601	92	60

PACKING: Iron drum with inner plastic bag of 50 kgs net each.

#### Below data for reference only, based on REO (%)

La2O3	CeO2	Pr6O11	Nd2O3	Sm2O3	Eu2O3	Gd2O3
1.82	0.37	0.74	3	2.82	0.12	6.85
Tb4O7	Dy2O3	Ho2O3	Er2O3	Tm2O3	Yb2O3	Lu2O3
1.29	6.67	1.64	4.85	0.7	2.46	0.36

### EUROPIUM-RICH RARE EARTH OXIDE

CODE #	TREO (%min)	Eu2O3/TREO
RE0701	92	0.5

PACKING: Iron drum with inner plastic bag of 50 kgs net each.

### Below data for reference only, based on REO (%)

La2O3	CeO2	Pr6O11	Nd2O3	Sm2O3	Gd2O3	Tb4O7
43.7	2.38	9.02	31.65	3.9	3	0.1
Dy2O3	Ho2O3	Er2O3	Tm2O3	Yb2O3	Lu2O3	Y2O3
0.1	0.1	0.1	0.1	0.26	0.1	8-12.00

### LANTHANUM OXIDE

Chemical Compositions (%)													
		RE impurities/REO						Non-Re Impurities					
CODE #	GRADES	Purity %	CeO2	Pr6O11	Nd2O3	Sm2O3	Y2O3	Fe2O3	SiO2	CaO	CuO	NiO	PbO2
RE0801	La2O3-04	99.99	0.002	0.002	0.001	0.001	0.001	0.0005	0.005	0.005	0.0005	0.001	0.005
RE0802	La2O3-1	99.95	0.002	0.002	0.001	0.001	0.001	0.0005			0.0005	0.001	0.002
RE0803	La2O3-2	99.90	0.10	0.10	0.10	0.10	0.10	0.001	0.001	0.01			
RE0804	La2O3-3	99.50			0.50			0.005	0.01	0.05			
RE0805	La2O3-4	99.00			1.00			0.05	0.05	0.15			

PACKING: 5 or 10 kgs in double plastic bags, iron drum outside net 50 kgs.

### CERIUM OXIDE

CODE #	GRADES	Relative purity	(La2O3+Pr6O11+Sm2O3+Y2O3+Nd2O3)/REO	Fe2O3%	SiO2 %	CaO%
RE0901	CeO2-0	99.99	0.01	0.001	0.05	0.05
RE0902	CeO2-1	99.95	0.05	0.005	0.05	0.05
RE0903	CeO2-2	99.90	0.1	0.005	0.05	0.05
RE0904	CeO2-3	99.50	0.5	0.05	0.01	0.1

PACKING: Iron drum with double plastic bags inside net 50 kgs.

### NEODYMIUM OXIDE

Chemical compositions (%)					
impurities max					
		RE impurities/REO	Impurities		
CODE #	GRADES	Relative purity	(La+Ce+Pr+Sm+Y)xOy	Fe2O3	CaO
RE1001	Nd2O3-1	99.9	0.1	0.001	0.03
RE1002	Nd2O3-2	99	1	0.01	0.05
RE1003	Nd2O3-3	95	5	0.02	0.1
RE1004	Nd2O3-4	85	15	0.1	0.5

PACKING: Plastic bottle (or bags) inside iron drum (or plastic box) outside, net 1, 5, or 10 kgs.

### SAMARIUM OXIDE

		RE Impurities (% max)	Non-RE Impurities (ppm max)				
CODE #	GRADES	Sm2O3/REO (%min)	(Pr6O11+Nd2O3+Eu2O3+Gd2O3+Y2O3)/REO	Fe2O3	SiO2	CaO	Cl
RE1101	Sm2O3-1	99.9	0.1	10	50	500	50
RE1102	Sm2O3-2	99.5	0.5	50	100	500	50
RE1103	Sm2O3-3	99	1	100	100	1000	50
RE1104	Sm2O3-4	95	5	100	100	1000	50

PACKING: Iron drum of 40 kgs net each with inner sealed double plastic bags of 5 kgs or 10 kgs net each.

### EUROPIUM OXIDE

Chemical Compositions											
		RE impurities/REO (ppm max).					impurities (ppm max).				
CODE #	GRADES	Eu2O3/REO %	CeO2	Pr6O11	Dy2O3	Other REO	Fe2O3	CaO	CuO	PbO	NiO
RE1201	1	99.99	5	10	10		7	10	6	10	10
RE1202	2	99.95		500			14	20	10	10	10

PACKING: In wooden case with inner sealed plastic bottle (drum) of 5 kgs net each.

### GADOLINIUM OXIDE

CODE #	GRADES	Gd2O3/REO	(Sm+Eu+Tb+Dy+Y)2O3/REO	Fe2O3%	SiO2%	CaO%
RE1301	1	99.99%	0.01%	0.001	0.005	0.01
RE1302	2	99.95%	0.05%	0.001	0.001	0.02
RE1303	3	99.90%	0.10%	0.002	0.01	0.03
RE1304	4	99.50%	0.50%	0.005	0.01	0.05
RE1303	5	95.00%	5.00%	0.05	0.1	0.1

PACKING: In drum or plastic box with double plastic bags of 1-5 kg net each.

### YTTRIUM OXIDE

CODE #	GRADES	Y2O3/REO (%min)	Impurities (% max)			
			RE Impurities/REO	Fe2O3	SiO2	CaO
RE1401	Y2O3-1	99.9999	A : 0.0001	0.001	0.005	0.02
RE1402	Y2O3-2	99.999	A : 0.001	0.001	0.005	0.02
RE1403	Y2O3-3	99.99	B : 0.01	0.001	0.005	0.02
RE1404	Y2O3-4	99.95	B : 0.05	0.001	0.005	0.02
RE1405	Y2O3-5	99.9	B : 0.10	0.001	0.005	0.02

NOTE: A= Gd2O3+Tb4O7+Dy2O3+Ho2O3/REO.

B= CeO2+Nd2O3+Sm2O3+Gd2O3+Tb4O7+Dy2O3+Ho2O3+Er2O3+Yb2O3/REO

CODE #	Fluorescent Grade: Impurities (% max)								
	CeO2/REO	Pr6O11/REO	Tb4O7/REO	Dy2O3/REO	Fe	Ca	Cu	Ni	Pb
RE1406	0.005	0.001	0.003	0.0035	0.0005	7E-04	0.0005	0.001	0.001

PACKING: In wooden case of 10 kgs net each, with plastic bottles of 1 or 2 or 5 kgs net each, or plastic bags of 5 kgs net each.

### MISCHMETALL

CODE #	(% min)		Impurities (% max)			
	REM	Ce/REM	Fe	Si	S	P
RE1501	98	45	1	0.2	0.02	0.01

WIRE: Diam. o/ 3.3-3.7 mm

one coil of 5 or 10 kgs net weight.

PACKING: Iron drum of 50 kgs net each, ingots embedded in paraffin wax.

INGOT: Rectangular ingots of 0.5 kg net each.

ROD:

Codes	Diam. X Length (mm)
XtBCe45-1	O/ 8 x 800-900
XtBCe45-2	O/ 10 x 1100
XtBCe45-3	O/ 14 x 1000

### RE SILICIDE FERROALLOY

CODE #	Codes	REM (min)	Chemical Compositions (%)				FE
			Si	Mn	Ca	Ti	
			(max)				
RE1601	RESiFe-1	30	30	5	5	2.5	Balance
RE1602	RESiFe-2	30	30	5	5	1	Balance
RE1603	RESiFe-3	30	30	5	5	0.5	Balance

MELTING POINT: 1080 - 1250 \*c

SPECIFIC GRAVITY: 4.7-5.4

SIZE: 0-3mm, 3-30mm, or as requested.

PACKING: In iron drums of 50 kgs net each.

### RE-MG SILICIDE FEBROALLOY

CODE #	Codes	Chemical Compositions (%)						
		REM	Mg	Si	Mn	Ca	Ti	Fe
RE1701	FeSi Mg 8 RE5	4-<6	7-<9	44	4	4	2	Balance
RE1702	FeSi Mg 8 RE7	6-<8	7-<9	44	4	4	2	Balance
RE1703	FeSi Mg 10 RE7	6-<8	7-<11	44	4	4	2	Balance
RE1704	FeSi Mg 8 RE9	8-<10	7-<9	44	4	4	2	Balance
RE1705	FeSi Mg 10 RE9	8-<10	9-<11	44	4	4	2	Balance
RE1706	FeSi Mg 8 RE11	10-<13	7-<10	44	4	4	2	Balance
RE1707	FeSi Mg 13 RE14	13-<15	12-<15	42	4	5	2	Balance
RE1708	FeSi Mg 8 RE16	15-<17	7-<10	42	4	5	2	Balance
RE1709	FeSi Mg 8 RE518	17-<20	7-<10	42	4	5	2	Balance
RE1710	FeSi Mg 10 RE21	20-<23	9-<11	42	4	5	2	Balance

MELTING POINT: 980-1190 °C.

SPECIFIC GRAVITY: 4-4.1.

SIZE: 3-25, or as required.

PACKING: Iron drum of 50 kgs net each.

### RE-CO PERMANENT MAGNETS

CODE #	CATEGORY	Code	Br(Gs)	Hc(Oe)	(BH) max	D(g/cm3)
					(MGOe)	
RE1801	SmCo Type Magnet	SmCo-16	>8000	>7000	15-17	>8
RE1802		SmCo-18	>8500	>7500	17-19	>8
RE1803	SmCo Bonded Magnet	SmCo-B8	5000-6000	4000-5000	7--9	>6
RE1804	SmPrCo Type Magnet	SmPrCo-16	>8000	>7000	15-17	>7.9
RE1805		SmPrCo-18	>8500	>7500	17-19	>7.9
RE1806		SmPrCo-20	>9000	>8000	19-23	>7.9
RE1807	Ce(CoCuFe)x Type Magnet	CeCoCuFe-9	6000-7000	>4000	8--10	>8
RE1808		CeCoCuFe-11	6500-7500	>3800	10--12	>8
RE1809	2:17 Sm2(CoCuFeZr)17 Magnet	SCCF22	>9500	>8000	20-22	>8.2
RE1810		SCCF25	>10000	>8500	22-27	>8.2
RE1811	Nd-Fe-B Magnet	NFB-25	>10000	>7000	22-26	>7.2
RE1812		NFB-30	>10500	>7500	27-32	>7.2
RE1813		NFB-	>11500	>6000	32-35	>7.2

### SM-CO ALLOY POWDER

CODE #	CATEGORY		Codes	Sm (%)	Co (%)	Ca	Fe	O2	Particle Size (u)
						(%min)			
RE1901	SmCo-RFU Alloy Powder	Fine Powder	SmCo--RFU--FP	35.1+ .5	64.9+ .5	0.15	0.1	0.6	5+ .1
		Coarse Powder	SmCo--RFU--CP	35.1+ .5	64.9+ .5	0.23	0.1	0.3	18+ .5
RE1902	SmCo-Base Alloy Powder	Fine Powder	SmCo-BFP	34.1+ .5	65.9+ .5	0.15	0.1	0.6	5+ .1
RE1903		Coarse Powder	SmCo-BCP	34.1+ .5	65.9+ .5	0.23	0.1	0.3	18+ .1
RE1904	SmCo-Additive Alloy Powder	Fine Powder	SmCo-AFP	42.0+ .5	58.0+ .5	0.15	0.1	0.6	5+ .1
RE1905		Coarse Powder	SmCo-ACP	42.0+ .5	58.0+ .5	0.23	0.1	0.3	18+ .5

PACKING: Wooden case with inner vacuum sealed plastic bags of 1 kgs net each.

### ND-FE ALLOY

CODE #	Nd/REM min (%)	Nd about (%)	Fe about (%)	Ce max (%)	Pr max (%)	O about (%)
RE2001	95	78	20	0.5	0.5	0.15

PACKING: In steel drums, 50 kgs net each embedded in paraffin wax.

rare earth

**LANTHANUM RICH MISCHMETALL**

CODE #	Code	REM min (%)	La/REM min (%)	Fe max (%)	Si max (%)	S max (%)	P max (%)
RE2101	RELa-40	98	40	1	0.2	0.02	0.01

PACKING: In steel drums 50 kgs net each embedded in paraffin wax.

**LANTHANUM METAL**

CODE #	Code	La/REM (% min)	Impurities (% max)				
			*RE	Fe	Si	S	P
RE2201	La-3	99.5	0.5	0.5	0.07	0.02	0.01

\*RE= (Ce+Pr+Nd+Sm+Y) / REM

PACKING: In steel drums, 50 kgs net each, embedded in paraffin wax.

**CERIUM METAL**

CODE #	Code	Ce/REM (% min)	Impurities (% max)				
			*RE	Fe	Si	S	P
RE2301	Ce-3	99.5	0.5	0.5	0.07	0.02	0.01

\*RE= (La+Pr+Nd) / REM

PACKING: In steel drums, 50 kgs net each embedded in paraffin wax.

**SAMARIUM METAL**

CODE #	Code	Sm/REM (%min)	Impurities (% max)				
			*RE	Fe	Si	Ca	C
RE2401	Sm-2	99.9	0.1	0.005	0.005	0.05	0.05
RE2402	Sm-3	99.5	0.5	0.005	0.01	0.05	0.05
RE2403	Sm-4	99	1	0.01	0.01	0.1	0.05

\*RE = (Pr+Nd+Eu+Gd+Y) / REM

PACKING: In sealed tins with argon, 2 kgs net each.

**YTTRIUM METAL**

CODE #	Code	RE Impurities max (%)	Non-RE Impurities (% max)								
			Cu	Ni	Fe	Al	Si	Ca	S	P	C
RE2501	Y-4	1	0.05	0.05	0.1	0.05	0.05	0.15	0.02	0.02	0.05

PACKING: In sealed iron drum 2 kg net each.

**POLISHING POWDER**

CODE #	Codes	REO (%min)	CeO2/REO (%min)	Impurities (% max)					Physical properties	
				F	SO4=	CaO	SiO2	Si	Average size(u)	Specific gravity (G/cm2)
RE2601	A-8	90	99	-	-	0.1	0.1	-	-	-
RE2602	739	90	80	5--7	-	-	-	2	0-1.1	6-6.8
RE2603	771	80	48	-	16	-	-	-	1--5	5.8-6.7
RE2604	797	90	48	5--7	-	-	-	0.2-2	0.1-1.0	7-Jun

PACKING: Inside double plastic bags net 1 kg, outside-plastic box net 5, 10 or 20 kgs.