Mineral Solutions for Tableware

Technical datasheets

Imerys Ceramics, world leading supplier of industrial solutions

From our mines and installations we have developed a comprehensive offering for the ceramic industries.

Imerys Ceramics is the European leading supplier of mineral solutions for the tableware industry.

Customers worldwide include the most prestigious brands

Imerys Ceramics' tailor-made offering to tableware manufacturers include:

- high quality products
- laboratories dedicated to tableware formulation
- state of the art technical service
- on-site production support

IMERYS Ceramics

BALL CLAYS

TYPICAL DATA		Hywite Superb	Hywite Magnum
CHEMICAL ANALYSIS (mass %)	SiO_2	49	49
	Al_2O_3	33	31
	Fe_2O_3	1.1	1.2
	TiO_2	0.9	0.9
	CaO	0.2	0.2
	MgO	0.3	0.3
	K_2O	1.8	2
	Na_2O	0.2	0.2
	L.O.I.	14	14.5
	Carbon	2.5	3.2
PARTICLE SIZE ANALYSIS (mass %)	> 125 µm	1.5	1.5
	> 53 µm	2.5	2
	< 5 µm	94	96
	< 2 µm	84	87
	< 1 µm	75	79
	< 0.5 µm	63	66
SURFACE AREA	M.B.I** ($mg\ g^{-1}$)	26	34
MoR	Dried at 110°C ($MN\ m^{-2}$)	5.5	7.5
	Dried at 110°C (p.s.i)	780	1065
CASTING DATA	Casting concentration (mass %)	65	62.5
	Deflocculant demand for slips of* (0.7 Pa.s)	0.9	0.9
	Deflocculant demand for slips of* (0.5 Pa.s)	1.3	1.3
CERAMIC CHARACTERISTICS at 1180°C	Water absorption (mass %)	6.5	5.5
	Brightness (%)	72	70
	Contraction (%)	14	14
CERAMIC CHARACTERISTICS at 1240°C	Water absorption (mass %)	4	3.5
	Brightness (%)	68	65
	Contraction (%)	15	15

** M.B.I.: Methylene Blue Index - the amount of methylene blue dye required to saturate the surface of the clay.

FELDSPARS & PEGMATITES

TYPICAL DATA		RF4	EA43S	Minspar 200	Premium RF 200# / RF 325#	XS100P	XQ010P
CHEMICAL ANALYSIS (mass %)	SiO_2	73.0 ± 2.0	70.8	68.8	66.5 ± 1.0	82.5	83.5
	Al_2O_3	15.4 ± 1.0	17	18.5	18.2 ± 1.0	9.7	9.5
	Fe_2O_3	0.2 ± 0.05	0.27	0.09	max. 0.06	0.1	0.12
	TiO_2	0.05 ± 0.02	0.04	0.02	-	0.06	0.16
	CaO	0.7 ± 0.3	0.30	1.5	0.25	0.02	0.03
	MgO	0.1 ± 0.1	0.10	< 0.01	0.03	0.07	0.06
	K_2O	3.7 ± 0.5	4.45	4.1	12.5	6.9	4.65
	Na_2O	3.9 ± 0.5	5.95	6.5	2.50	0.29	0.22
	P_2O_5	0.2 ± 0.05	-	0.1	-	-	-
	L.O.I	1.4 ± 0.5	0.7	0.3	< 0.3	0.6	1.55
PARTICLE SIZE ANALYSIS (mass %)	> 80 µm	3	-	-	-	-	-
	> 63 µm	7	-	-	-	1.5	-
	> 50 µm	14	-	-	-	-	10
	> 40 µm	19	-	-	-	-	-
	D50 µm	17		12	-	12	-

HALLOYSITE

TYPICAL DATA		Filtercake	Premium	Premium Granules
CHEMICAL ANALYSIS (mass %)	SiO_2	49.5	49.5	49.5
	Al_2O_3	35.5	35.5	35.5
	Fe_2O_3	0.29	0.29	0.29
	TiO_2	0.09	0.09	0.09
	K_2O	0.01	0.01	0.01
	CaO	0.02	0.02	0.02
	MgO	0.02	0.02	0.02
	Na_2O	0.04	0.04	0.04
	L.O.I	13.8	13.8	13.8
PARTICLE SIZE ANALYSIS (%)	#240 mesh	< 0.1	< 0.1	< 0.1
MoR	Dried at 110°C (MN m^{-2})	3.4	2.9	2.9
	Dried at 110°C (psi)	493	421	421
CERAMIC CHARACTERISTICS AT 1180°C (%)	L*	98.7	98.7	98.7
	Concentration	10.8	10.9	10.9
PHYSICAL PROPERTIES	Specific gravity	2.55	2.55	2.55
	Moisture content (%)	37	3	5
SURFACE AREA (m^2/gm)		25	25	25
DELIVERY FORM		Extruded 25 kg blocks	Hammer milled powder	Granules

KAOLINS

TYPICAL DATA		SSP	SSP05	Standard Porcelain	Grolleg	Treviscoe	CR Super	BIP	BSP	MRD Standard
CHEMICAL ANALYSIS (mass %)	SiO_2	48	48	48	49	49	45.8	49.0	50.5	46.0
	Al_2O_3	37	37	36.5	36	36	38.8	35.1 ± 1.5	34.9	38.5
	Fe_2O_3	0.47	0.56	0.68	0.75	0.83	0.57	0.36 ± 0.05	0.6	1.00
	TiO_2	0.01	0.03	0.02	0.02	0.03	0.55	Max. < 0.10	0.01	0.05
	CaO	0.10	0.10	0.07	0.06	0.07	Traces	0.10	0.10	0.01
	MgO	0.25	0.25	0.3	0.3	0.3	Traces	0.10	0.10	0.01
	K_2O	1.2	1.2	1.65	1.85	2.3	Traces	1.8 ± 0.4	2.00	1.05
	Na_2O	0.15	0.15	0.1	0.1	0.14	Traces	0.20	0.10	0.01
	L.O.I	12.8	12.8	12.5	12	11.7	14.00	11.7 ± 1.2	11.6	13.0
MINERALOGICAL ANALYSIS (mass %)	Kaolinite / Halloysite	95	95	87	83	83	-	81	84	82
	Quartz	-	-	-	-	-	-	4	4	2
	Feldspar	0	0	2	2	2	-	-	-	5
	Micaceous material	4	4	8	10	12	-	13	10	11
	Other minerals	1	1	3	2	3	-	2	2	4
PARTICLE SIZE ANALYSIS (mass %)	> 53 µm	0.05	0.05	0.04	0.05	0.1	-	0.24	0.58	2.0
	< 5 µm	1	1	4	8	18	-	63	61	34.3
	< 2 µm	85	85	70	58	42	78-84	41	38	32
SURFACE AREA	(m^2g^{-1})	23.6	22.3	14.6	11.5	9.7	-	12.6	10.4	13.5
MoR	At 80% RH (MN m^{-2})	2.7	2.7	1.4	1	0.75	-	0.5	0.4	0.3
	At 80% RH (p.s.i)	383	383	200	140	106	47	78	64	36
	Dried at 110°C (MN m^{-2})	5.5	5.5	3.2	2.6	1.7	-	2.0	1.5	0.5
	Dried at 110°C (p.s.i)	780	780	450	365	240	-	284	213	70
CASTING DATA	Casting concentration (mass %)	57	57	62	61	63	-	65.7	66.3	68.7
	Deflocculant demand (mass % P84)	1.7	1.7	0.55	0.5	0.45	-	0.20	0.46	1.18
	Casting rate (mm² min^{-1})	0.25	0.25	0.2	0.5	1.20	-	1.2	1.6	5

PRESSING BODIES

TYPICAL DATA		PP606B	PP117B	PP097B	PP935B	PP943B	PP049B	PP410B	VP545B	VP403B	VP251B	VP001B	BP900B
		Porcelain	Porcelain	Porcelain	Porcelain	Porcelain	Porcelain	Porcelain	Vitreous	Vitreous	Vitreous	Vitreous	Bone China
FIRING TEMPERATURE (°C)		1380-1400	1380-1400	1380-1400	1380-1420	1380-1400	1380-1400	1250-1300	1220-1280	1220-1280	1220-1250	1200-1230	1255-1265
ATMOSPHERE		Reducing	Reducing	Reducing	Reducing	Reducing	Reducing	Reducing	Oxidizing	Oxidizing	Oxidizing	Oxidizing	Oxidizing
CHEMICAL ANALYSIS (mass %)	SiO_2	71.2	68.1	44.02	67.8	68.3	70.10	68.4	57.0	68.6	47.9	67.5	33
	Al_2O_3	24.5	27.7	50.7	27	26	25.53	25.2	36.6	24	45.7	26	16.2
	TiO_2	0.06	0.07	0.11	0.1	0.18	0.04	0.06	0.08	0.22	0.07	0.09	0.05
	Fe_2O_3	0.25	0.49	0.41	0.54	0.52	0.37	0.48	0.23	0.59	0.39	0.31	0.32
	MgO	0.16	0.17	0.19	0.19	0.19	0.18	0.45	0.36	0.71	0.56	0.77	0.70
	CaO	0.17	0.13	0.22	0.10	0.22	0.17	0.4	0.59	0.84	1.02	1.13	26.4
	Na_2O	0.72	0.33	0.83	0.21	0.26	0.61	0.22	1.10	0.2	1.68	2.29	0.80
	K_2O	3.06	2.73	3.45	3.65	3.85	2.92	4.5	3.72	4.5	2.77	0.93	2.50
	L.O.I	7.6	8.7	6.8	7.95	7.62	7.8	7.55	6.40	7.85	7.9	8.9	6.0
PARTICLE SIZE ANALYSIS (mass %)	> 0.5 mm	2	2	1	7	12	2	7	7	9	2.5	1	8
	0.4 - 0.5 mm	10	20	6.5	17	23	10	23	19	18	9	8	19
	0.315 - 0.4 mm	25	25	18	35	28	21	33	30	30	16	17	27
	0.2 - 0.315 mm	40	35	46	30	26	45	26	31	30	45	44	33
	0.1 - 0.2 mm	22	16	26	10	10	21	10	11	11	25	25	10
	< 0.1 mm	2	≤ 4	≤ 5	1	1	<5	1	2	2	2.5	2.5	1
MoR (MPa)	Dried at 110°C	4.5	4	4.3	4.8	5	3.6	4.5	5.5	5	4	4.3	4.0
FIRED BENDING STRENGTH	MPa	75	75	110	64	61	70	65	75	65	90	75	75
CERAMIC CHARACTERISTICS	L* Lightness	91.7	88.5	90.4	87.0	86.3	87.8	87.8	92.7	84.5	91.1	87.8	95.6
	a* + red /- green	-1	-1	-0.4	-1.1	-0.8	-0.9	-1.1	-0.8	-1.2	-0.3	-0.8	-0.8
	b* + yell. /- blue	-0.6	-0.2	1.5	0.8	0.9	-1.1	1.1	4.4	7.7	6.3	3.8	2.4
	Shrinkage (%)	11	11.3	12	11	10.5	11.5	11	11.1	10.8	12	11.4	11.3

TRANSPARENT GLAZES

TYPICAL DATA		ES185T	ER204Z	ER302T	EP230T	EN562T	EN103T	EK619T	EH457T	EH091T	EE478T
FIRING TEMPERATURE (°C)		1400-1420	1380-1420	1380-1400	1360-1380	1340-1380	1350-1360	1280-1300	1220-1260	1230-1250	1160-1180
ATMOSPHERE		Reducing	Reducing	Reducing	Reducing	Reducing	Reducing	Reducing	Oxidizing	Oxidizing	Oxidizing
CHEMICAL ANALYSIS (mass %)	SiO_2	76.2	72.9	73.8	73.1	73.4	73	71.7	65.9	61.98	58.26
	Al_2O_3	13.8	14.3	12.48	13.3	12	12.3	10.4	12.5	9.25	0.13
	TiO_2	0.03	0.1	0.03	0.03	0.06	0.03	0.03	0.09	0.02	0.02
	Fe_2O_3	0.24	0.18	0.1	0.12	0.13	0.11	0.08	0.15	0.13	0.1
	MgO	1.79	1.9	2.51	2.44	2.3	2.59	0.88	1.5	2.02	1.01
	CaO	6	7.7	8.45	8.41	9.1	9.09	12.22	15.4	7.69	7.67
	Na_2O	0.83	0.5	0.34	0.25	0.3	0.29	1.36	0.6	0.62	0.45
	K_2O	1.7	2.1	2.27	2.28	2.5	2.56	3.32	2.6	4.29	4.8
	BaO	-	-	-	-	-	-	-	-	6.7	7.14
	ZnO	-	-	-	-	-	-	-	-	7.3	11.2
	L.O.I	6.8	7.9	11.7	8.5	9.5	9.5	10	12.4	8.2	8
PARTICLE SIZE ANALYSIS (mass %)	> 63 µm	< 0.02	-	-	< 0.02	-	< 0.02	< 0.02	-	< 0.02	< 0.02
	> 20 µm	-	< 0.2	-	-	< 1.5	-	-	< 1.5	-	-
	D50 µm	3.8	3.6	4.1	3.8	3.8	3.8	4.2	3.8	5	-
DELIVERY FORM		Powder	Liquid	Powder	Powder	Spray-dried	Powder	Powder	Spray-dried	Powder	Powder

IMERYS Ceramics

www.imerys-ceramics.com

These values do not represent a specification. The data quoted are determined by the use of Imerys Standard Test Methods, copies of which will be supplied on request. Every precaution is taken in production to ensure the products conform to our published data. Since the products are based on naturally occurring materials, we reserve the right to change these data should it become necessary. Sales are in accordance with our "Conditions of Sale", copies of which will be supplied on request.