#	JAPAN CODE	Sample Code	Sample Code	Sample Code	Mine Square(m2)	Minimum mining depth	Suggested uses
1	A	N-A	A BM80	Sample 1	2kilometer m2	50m	cat litter
2	B	N-B	B Z1		20m*1500m	15m	
3	C	N-C	C Z2		25m*1500m	20m	Casting-drilling
4	D		D TF1				
5	E	N-E	E RZ3		2000m*500m	15m	
6	F	N-F	F RZ4		2000m*500m	15m	
7	G	N-G	G TF2		16km2	50m	
8	H	N-H					
9	I	N-I					
10	J	N-J					
11	K	N-K					
12	L	N-L					
13	M	N-M					
14	N	N-N					
15	O	N-O	O TF3		16km2	50m	
16	P	N-P	P		16km2	50m	
17	Q	N-Q					
18	R	N-R			6km2	50m	
19	S	N-S			18km2	100m	
20	T	N-T					casting
21	U	N-U			1km2	50m	cattle food
22	V	N-V			1km2	50m	cattle food
23	W	N-W					
24	X	N-X					cattle food
25	Y	N-Y					

Sample Code	Bentonite Sample – CODE: **N-A**
Sample Shape	8 – 80 mesh crush size
Sample Color	White
Sample Quantity	1.5 kg x 5 bag
Test Result	Simple Inspection Report as Below

1
N-A

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104141-A	65.90	13.01	3.20	2.88	0.65	0.33	0.03	0.97	0.04	2.92	0.18	8.72

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104141-A	41	N	N	15	-	N	N	N	59	10891

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104141-A	N	N	186	46	-	172	292	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	48	60
Montmorillonite Bentonite(%)	32%	39%
Mg of MB/g of Bentonite	171	214
meq of MB/100g of Bentonite	48	60

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104141	20	364.38	415.01	474.96	556.56

Sample Code	Bentonite Sample – CODE: **N-A**
Sample Shape	8 – 80 mesh crush size
Sample Color	White
Sample Quantity	1.5 kg x 5 bag
Test Result	Simple Inspection Report as Below

1
N-A

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-B**
Sample Shape	Rock(Ore)
Sample Color	Brown on surface
Sample Quantity	4 kg x 1 bag
Test Result	Simple Inspection Report as Below

2

N-B

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104142-B	57.55	11.53	9.37	2.97	0.20	0.14	0.03	4.64	0.02	3.20	0.04	5.49

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104142-B	N	N	14	N	-	N	N	N	50	47728

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104142-B	25	N	108	30	-	57	168	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	68	88
Montmorillonite Bentonite(%)	45%	58%
Mg of MB/g of Bentonite	242	313
meq of MB/100g of Bentonite	68	88

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104142	20	457.33	508.85	575.79	688.19

Sample Code	Bentonite Sample – CODE: **N-B**
Sample Shape	Rock(Ore)
Sample Color	Brown on surface
Sample Quantity	4 kg x 1 bag
Test Result	Simple Inspection Report as Below

2
N-B

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-C**
Sample Shape	Rock (Ore) & Powder
Sample Color	White
Sample Quantity	5 kg x 1 bag
Test Result	Simple Inspection Report as Below

3

N-C

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104143-C	66.52	14.22	2.05	3.09	0.19	0.14	0.05	1.84	0.01	3.11	0.04	8.07

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104143-C	148	N	N	N	-	N	N	N	35	6006

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104143-C	N	82	289	26	-	83	70	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	68	88
Montmorillonite Bentonite(%)	45%	58%
Mg of MB/g of Bentonite	242	313
meq of MB/100g of Bentonite	68	88

Bentonite Swell Index

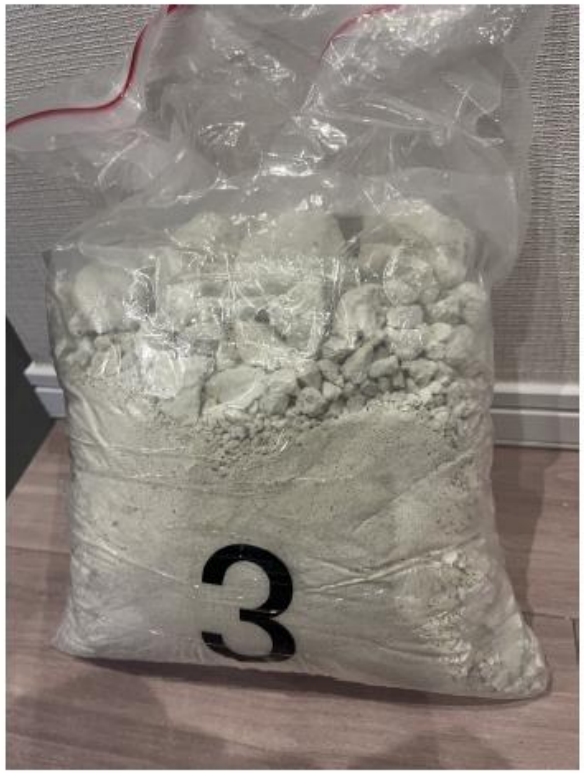
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104143	20	388.40	421.75	487.49	642.67

Sample Code	Bentonite Sample – CODE: **N-C**
Sample Shape	Rock (Ore) & Powder
Sample Color	White
Sample Quantity	5 kg x 1 bag
Test Result	Simple Inspection Report as Below

3
N-C

Picture of Product



Sample Code	
Sample Shape	
Sample Color	
Sample Quantity	
Test Result	

4
N-D

N-D does not exist.

Sample Code	Bentonite Sample – CODE: **N-E**
Sample Shape	Sand
Sample Color	White/Gray
Sample Quantity	5.7 kg x 1 bag
Test Result	Simple Inspection Report as Below

5
N-E

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
95688-1-200	52.70	16.40	2.03	4.80	1.02	0.27	0.07	2.47	0.03	5.16	0.59	14.16

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
95688-1-200	N	N	72	N	-	N	11	N	65	2219

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
95688-1-200	32	52	193	53	-	75	186	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	64	84
Montmorillonite Bentonite(%)	42%	55%
Mg of MB/g of Bentonite	228	297
meq of MB/100g of Bentonite	64	84

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
95688	15	247.66	257.14	279.95	299.00

Sample Code	Bentonite Sample – CODE: **N-E**
Sample Shape	Sand
Sample Color	White/Gray
Sample Quantity	5.7 kg x 1 bag
Test Result	Simple Inspection Report as Below

5
N-E

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-F**
Sample Shape	Rock&Powder
Sample Color	White/Gray
Sample Quantity	6.6 kg x 1 bag
Test Result	Simple Inspection Report as Below

6

N-F

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
95689-2	56.10	11.53	1.90	4.67	0.77	0.28	0.12	6.44	0.04	3.82	1.33	12.91

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
95689-2	124	N	N	N	-	N	N	N	63	5216

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
95689-2	N	41	270	56	-	72	85	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	40	51
Montmorillonite Bentonite(%)	26%	34%
Mg of MB/g of Bentonite	141	183
meq of MB/100g of Bentonite	40	51

Bentonite Swell Index

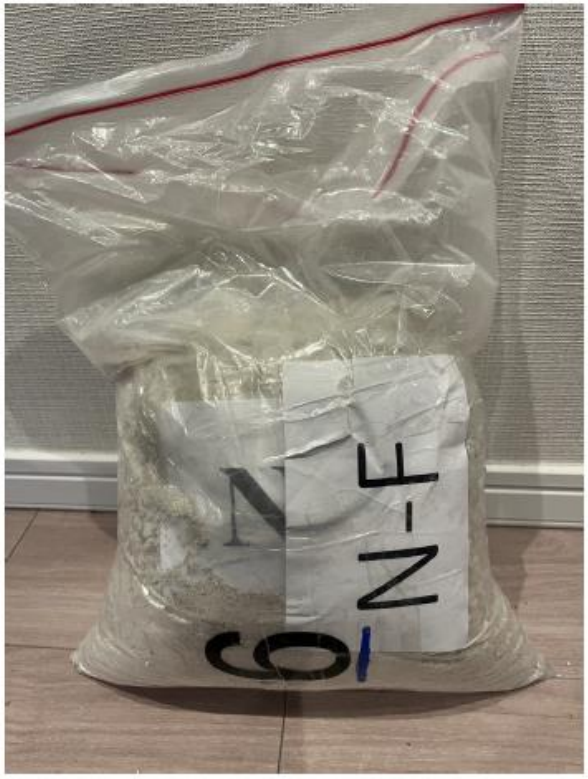
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

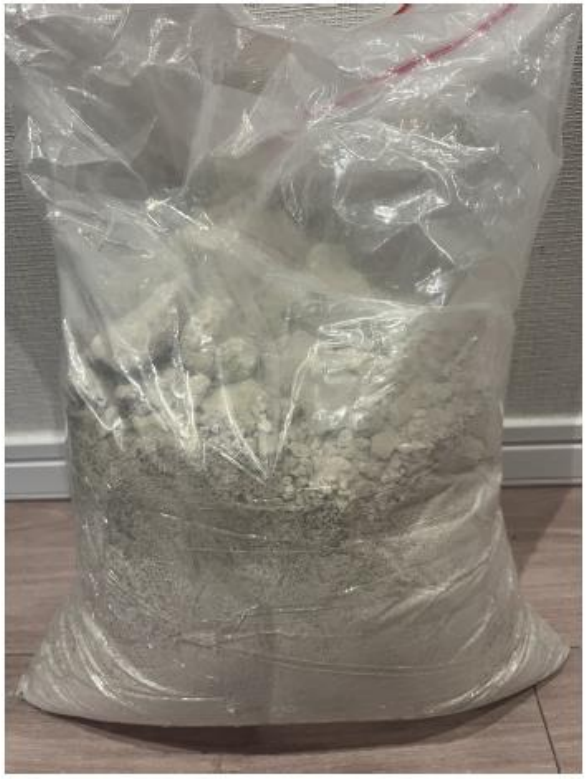
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
95689	<8*	159.00	152.73	153.14	169.59

Sample Code	Bentonite Sample – CODE: **N-F**
Sample Shape	Rock&Powder
Sample Color	White/Gray
Sample Quantity	6.6 kg x 1 bag
Test Result	Simple Inspection Report as Below

6
N-F

Picture of Product





Sample Code	Bentonite Sample – CODE: **N-G**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	1.8kg x 1 bag
Test Result	Simple Inspection Report as Below

7

N-G

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104144-G	60.49	16.20	3.48	4.33	0.79	0.10	0.02	0.47	0.01	6.26	0.42	6.51

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104144-G	N	N	10	33	-	N	N	3	14	6823

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104144-G	N	32	1169	22	-	181	952	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	60	76
Montmorillonite Bentonite(%)	39%	50%
Mg of MB/g of Bentonite	214	270
meq of MB/100g of Bentonite	60	76

Bentonite Swell Index

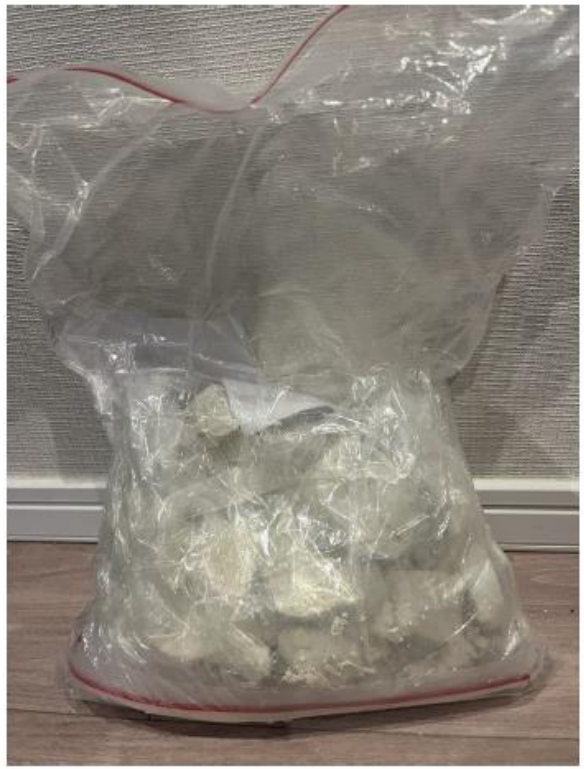
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104144	18*	459.28	518.99	568.65	659.00

Sample Code	Bentonite Sample – CODE: **N-G**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	1.8kg x 1 bag
Test Result	Simple Inspection Report as Below

7
N-G

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-H**
Sample Shape	Small rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	4.4kg x 1 bag
Test Result	Simple Inspection Report as Below

8

N-H

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104145-H	56.03	12.31	1.75	3.89	0.65	0.60	0.03	2.69	0.12	5.24	2.96	13.42

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104145-H	N	N	5	14	-	84	N	N	72	1738

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104145-H	528	52	167	112	-	150	73	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	64	104
Montmorillonite Bentonite(%)	42%	68%
Mg of MB/g of Bentonite	228	370
meq of MB/100g of Bentonite	64	104

Bentonite Swell Index

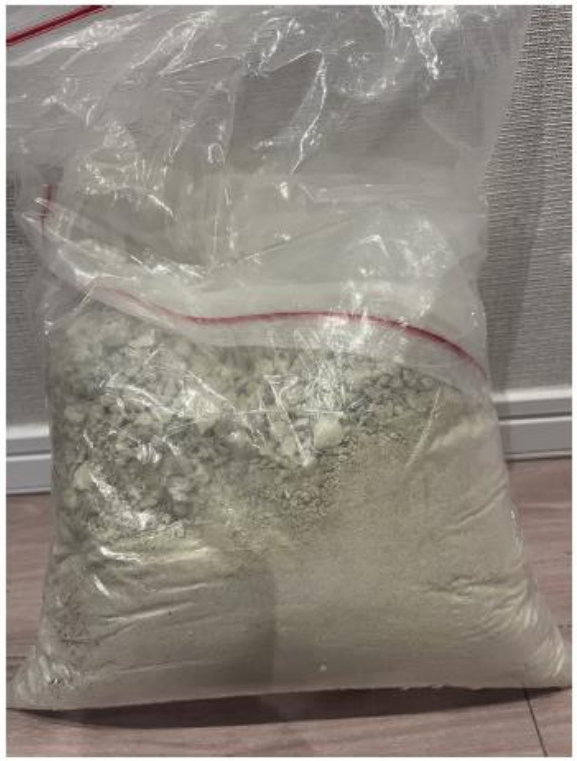
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104145	10	215.11	222.76	223.05	224.94

Sample Code	Bentonite Sample – CODE: **N-H**
Sample Shape	Small rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	4.4kg x 1 bag
Test Result	Simple Inspection Report as Below

8
N-H

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-I**
Sample Shape	Rock(Ore)
Sample Color	Gray
Sample Quantity	4.6kg x 1 bag
Test Result	Simple Inspection Report as Below

9

N-I

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104146-I	60.66	13.41	1.91	4.29	0.88	0.55	0.02	1.03	0.07	4.77	0.04	12.09

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104146-I	N	N	N	12	-	6	7	N	42	1853

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104146-I	16	32	455	81	-	160	108	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	68	92
Montmorillonite Bentonite(%)	45%	61%
Mg of MB/g of Bentonite	242	327
meq of MB/100g of Bentonite	68	92

Bentonite Swell Index

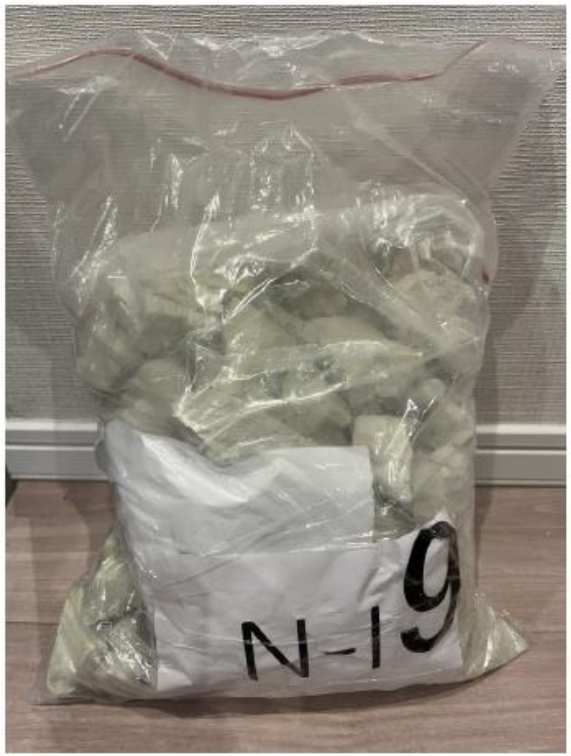
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104146	19	374.13	429.75	510.40	659.46

Sample Code	Bentonite Sample – CODE: **N-I**
Sample Shape	Rock(Ore)
Sample Color	Gray
Sample Quantity	4.6kg x 1 bag
Test Result	Simple Inspection Report as Below

9
N-I

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-J**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	4.9kg x 1 bag
Test Result	Simple Inspection Report as Below

10
N-J

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104147-J	59.17	14.97	5.15	3.16	1.42	0.27	0.13	1.76	0.52	5.74	0.09	6.21

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104147-J	N	N	35	25	-	23	6	N	33	13574

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104147-J	N	64	111	57	-	59	90	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	56	64
Montmorillonite Bentonite(%)	37%	42%
Mg of MB/g of Bentonite	199	228
meq of MB/100g of Bentonite	56	64

Bentonite Swell Index

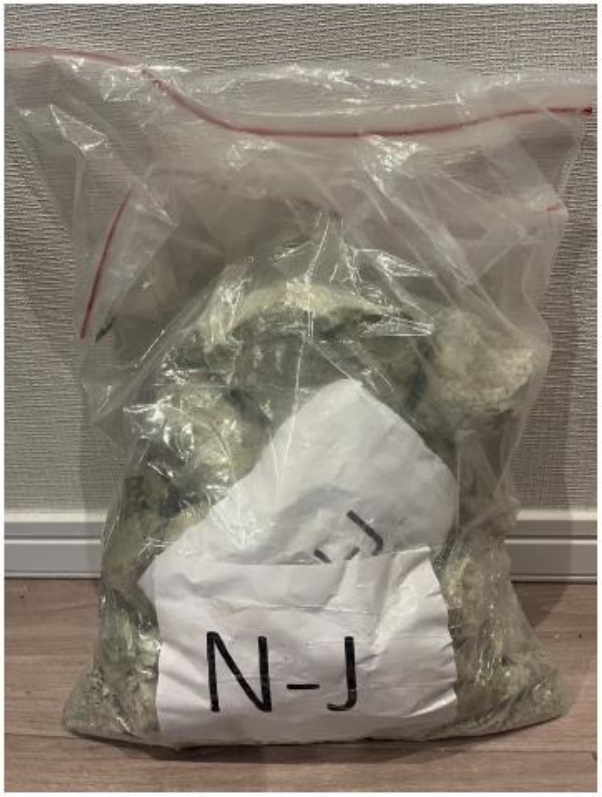
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104147	20	455.17	501.52	574.50	797.81

Sample Code	Bentonite Sample – CODE: **N-J**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	4.9kg x 1 bag
Test Result	Simple Inspection Report as Below

10
N-J

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-K**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	5.6kg x 1 bag
Test Result	Simple Inspection Report as Below

11
N-K

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104148-K	59.36	14.17	2.14	4.36	0.63	0.61	0.03	0.79	0.10	4.87	0.08	12.52

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104148-K	N	N	28	N	-	N	10	N	60	2817

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104148-K	N	N	143	91	-	147	110	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	92	104
Montmorillonite Bentonite(%)	61%	68%
Mg of MB/g of Bentonite	327	370
meq of MB/100g of Bentonite	92	104

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104148	33*	606.63	705.93	847.72	1493.75

Sample Code	Bentonite Sample – CODE: **N-K**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	5.6kg x 1 bag
Test Result	Simple Inspection Report as Below

11
N-K

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-L**
Sample Shape	Small Rock(Ore)
Sample Color	Gray
Sample Quantity	4.3kg x 1 bag
Test Result	Simple Inspection Report as Below

12

N-L

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104149-L	52.22	14.77	2.18	5.16	1.29	0.87	0.05	1.36	0.17	8.17	0.24	13.09

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104149-L	N	25	102	63	-	101	N	N	22	3169

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104149-L	207	N	206	146	-	174	119	N

IS 12446(2007): Bentonite for use in foundries (MTD14: foundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	94	106
Montmorillonite Bentonite(%)	62%	70%
Mg of MB/g of Bentonite	335	377
meq of MB/100g of Bentonite	94	106

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

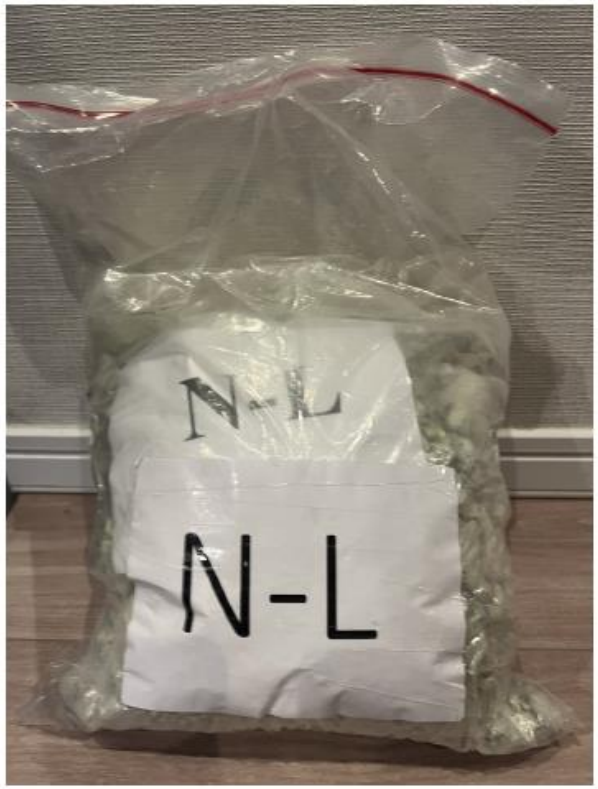
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104149	26	565.01	611.78	681.41	1067.78

Sample Code	Bentonite Sample – CODE: **N-L**
Sample Shape	Small Rock(Ore)
Sample Color	Gray
Sample Quantity	4.3kg x 1 bag
Test Result	Simple Inspection Report as Below

12

N-L

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-M**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	5.8kg x 1 bag
Test Result	Simple Inspection Report as Below

13

N-M

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104150-M	69.42	14.37	3.02	3.01	0.70	0.09	0.02	0.78	0.04	2.82	0.11	5.30

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104150-M	N	N	11	N	-	N	5	N	25	2781

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104150-M	N	16	143	23	-	47	104	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	48	56
Montmorillonite Bentonite(%)	32%	37%
Mg of MB/g of Bentonite	171	199
meq of MB/100g of Bentonite	48	56

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

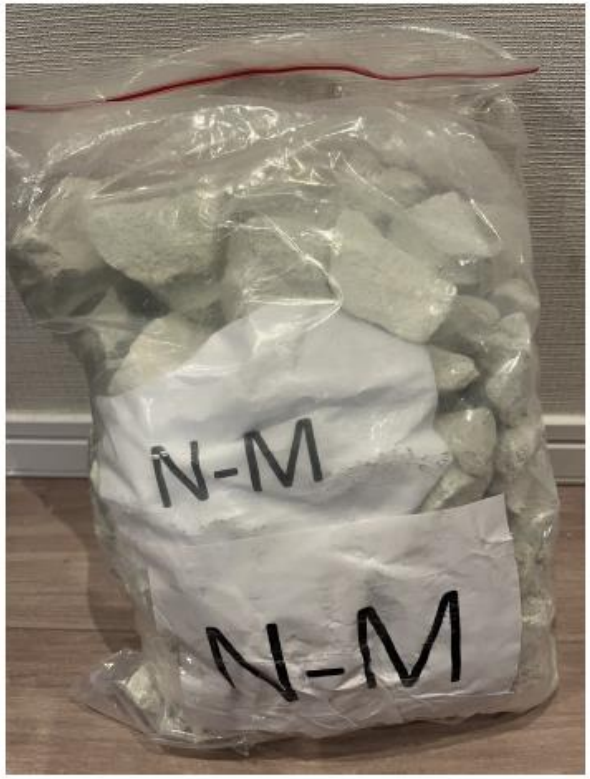
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104150	16*	500.85	527.55	557.81	630.73

Sample Code	Bentonite Sample – CODE: **N-M**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	5.8kg x 1 bag
Test Result	Simple Inspection Report as Below

13

N-M

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-N**
Sample Shape	Small Rock(Ore)
Sample Color	Gray/Blue
Sample Quantity	3.6kg x 1 bag
Test Result	Simple Inspection Report as Below

14

N-N

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104151-N	59.96	14.21	1.65	4.60	1.31	0.88	0.04	1.21	0.19	7.54	0.06	8.13

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104151-N	105	4	94	22	-	81	N	N	70	1087

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104151-N	N	25	277	121	-	188	105	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	86	100
Montmorillonite Bentonite(%)	57%	66%
Mg of MB/g of Bentonite	306	356
meq of MB/100g of Bentonite	86	100

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

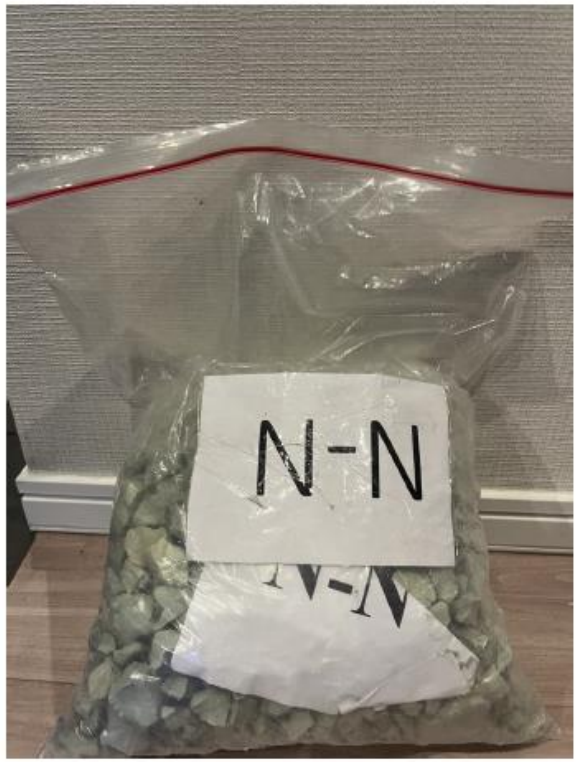
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104151	16	384.57	410.58	419.43	526.64

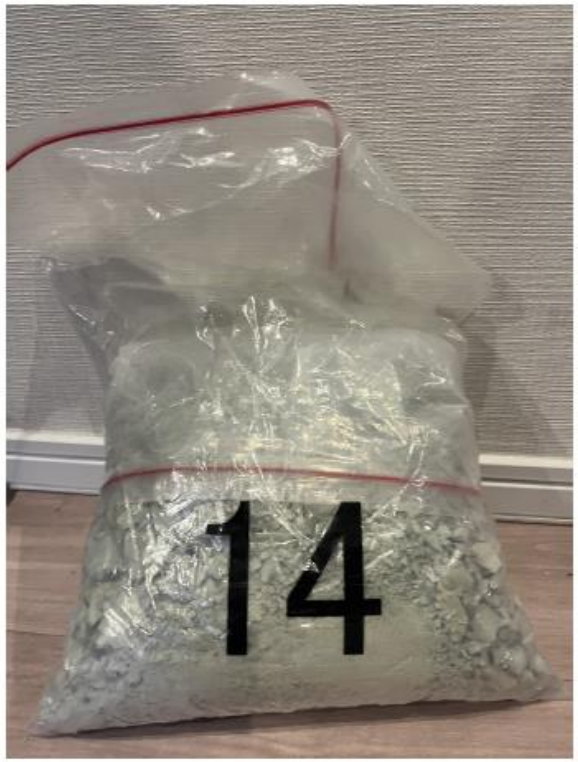
Sample Code	Bentonite Sample – CODE: **N-N**
Sample Shape	Small Rock(Ore)
Sample Color	Gray/Blue
Sample Quantity	3.6kg x 1 bag
Test Result	Simple Inspection Report as Below

14

N-N

Picture of Product





Sample Code	Bentonite Sample – CODE: **N-O**
Sample Shape	Rock(Ore) & Powder
Sample Color	White
Sample Quantity	1.5kg x 1 bag
Test Result	Simple Inspection Report as Below

15
N-O

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104152-0	63.51	13.76	2.29	4.32	0.06	0.39	0.01	0.92	0.03	3.95	0.01	10.19

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104152-0	216	N	N	N	-	N	N	N	55	4786

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104152-0	N	133	139	54	-	155	107	N

IS 12446(2007): Bentonite for use in foundries (MTD14: foundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	88	110
Montmorillonite Bentonite(%)	58%	72%
Mg of MB/g of Bentonite	313	391
meq of MB/100g of Bentonite	88	110

Bentonite Swell Index

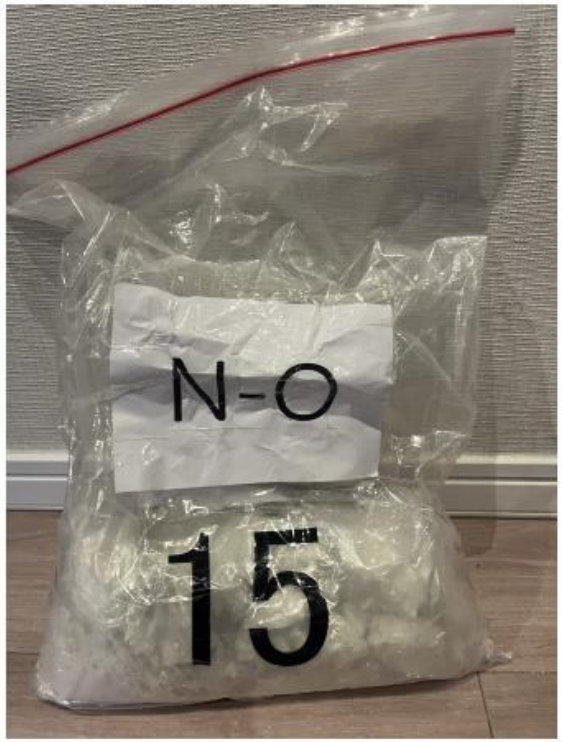
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104152	24	371.28	433.79	549.14	795.34

Sample Code	Bentonite Sample – CODE: **N-O**
Sample Shape	Rock(Ore) & Powder
Sample Color	White
Sample Quantity	1.5kg x 1 bag
Test Result	Simple Inspection Report as Below

15
N-O

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-P**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	3.4kg x 1 bag
Test Result	Simple Inspection Report as Below

16

N-P

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104153-P	63.07	15.14	2.88	4.23	0.36	0.06	0.02	0.91	0.01	3.34	0.05	9.64

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104153-P	N	N	N	51	-	N	N	N	15	2463

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104153-P	N	58	123	16	-	75	128	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	80	94
Montmorillonite Bentonite(%)	53%	62%
Mg of MB/g of Bentonite	285	335
meq of MB/100g of Bentonite	80	94

Bentonite Swell Index

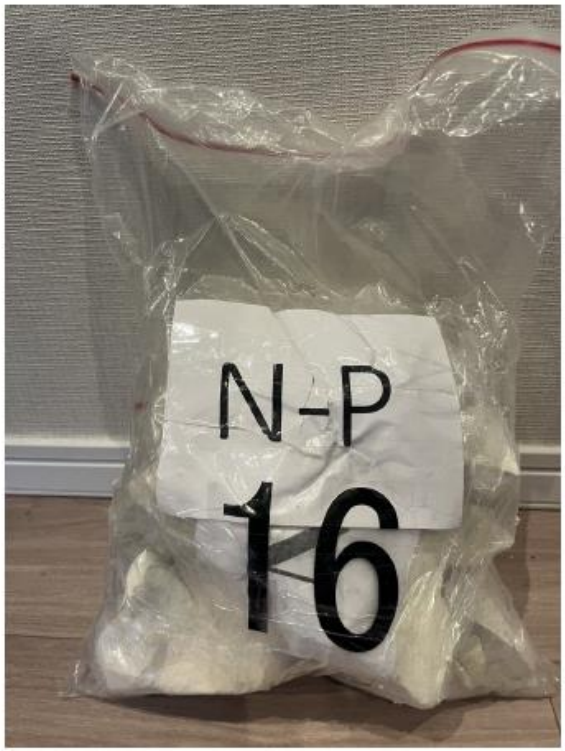
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104153	23	544.60	619.62	664.39	762.83

Sample Code	Bentonite Sample – CODE: **N-P**
Sample Shape	Rock(Ore)
Sample Color	White
Sample Quantity	3.4kg x 1 bag
Test Result	Simple Inspection Report as Below

16
N-P

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-Q**
Sample Shape	Rock(Ore) & Powder
Sample Color	White
Sample Quantity	4.5kg x 1 bag
Test Result	Simple Inspection Report as Below

17

N-Q

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104154-G	59.22	14.90	1.32	4.99	0.61	0.72	0.03	2.16	0.14	6.94	0.05	8.84

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104154-G	N	N	23	12	-	N	N	N	49	N

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104154-G	90	47	231	110	-	149	71	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	92	116
Montmorillonite Bentonite(%)	61%	76%
Mg of MB/g of Bentonite	327	413
meq of MB/100g of Bentonite	92	116

Bentonite Swell Index

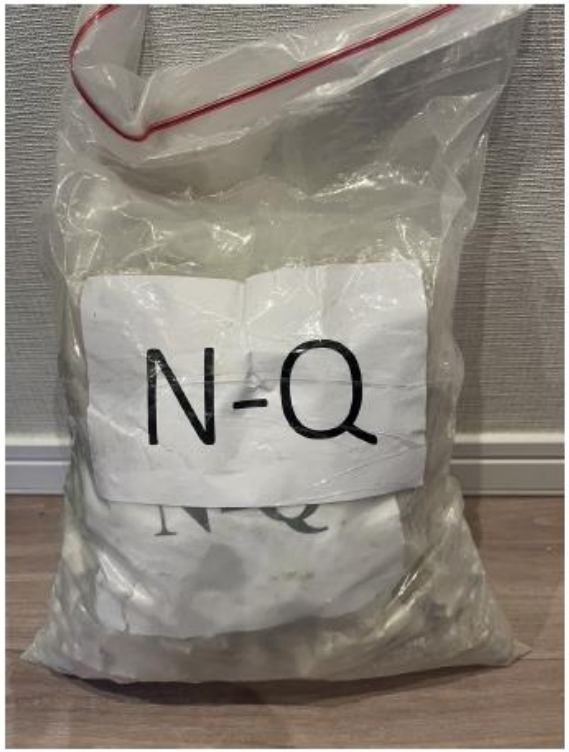
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104154	8	274.13	285.60	295.56	301.26

Sample Code	Bentonite Sample – CODE: **N-Q**
Sample Shape	Rock(Ore) & Powder
Sample Color	White
Sample Quantity	4.5kg x 1 bag
Test Result	Simple Inspection Report as Below

17
N-Q

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-R**
Sample Shape	Rock(Ore)
Sample Color	Gray
Sample Quantity	4.6kg x 1 bag
Test Result	Simple Inspection Report as Below

18

N-R

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104155-R	59.09	16.74	2.70	4.68	0.58	0.74	0.07	1.98	0.16	6.53	0.04	6.51

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104155-R	N	1	30	7	-	N	1	N	51	1255

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104155-R	N	75	143	105	-	125	45	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	88	112
Montmorillonite Bentonite(%)	58%	74%
Mg of MB/g of Bentonite	313	399
meq of MB/100g of Bentonite	88	112

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104155	25	553.90	595.25	634.80	696.92

Sample Code	Bentonite Sample – CODE: **N-R**
Sample Shape	Rock(Ore)
Sample Color	Gray
Sample Quantity	4.6kg x 1 bag
Test Result	Simple Inspection Report as Below

18
N-R

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-S**
Sample Shape	Sand & Powder
Sample Color	White
Sample Quantity	5.1kg x 1 bag
Test Result	Simple Inspection Report as Below

19
N-S

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104156-S	68.89	12.69	3.22	3.28	1.04	0.29	0.02	0.59	0.02	3.97	0.27	4.74

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104156-S	N	N	N	N	-	N	N	N	66	9287

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104156-S	N	13	74	41	-	179	121	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	58	74
Montmorillonite Bentonite(%)	38%	49%
Mg of MB/g of Bentonite	206	263
meq of MB/100g of Bentonite	58	74

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104156	21	448.56	558.77	632.96	898.55

Sample Code	Bentonite Sample – CODE: **N-S**
Sample Shape	Sand & Powder
Sample Color	White
Sample Quantity	5.1kg x 1 bag
Test Result	Simple Inspection Report as Below

19
N-S

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-T**
Sample Shape	Small Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	5.5kg x 1 bag
Test Result	Simple Inspection Report as Below

20

N-T

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104157-T	54.84	14.92	1.91	4.83	0.87	0.77	0.08	1.36	0.14	7.04	0.08	12.98

Sample	Be	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104157-T	N	21	21	7	-	18	N	N	24	1098

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104157-T	N	80	165	122	-	174	98	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	100	116
Montmorillonite Bentonite(%)	66%	76%
Mg of MB/g of Bentonite	356	413
meq of MB/100g of Bentonite	100	116

Bentonite Swell Index

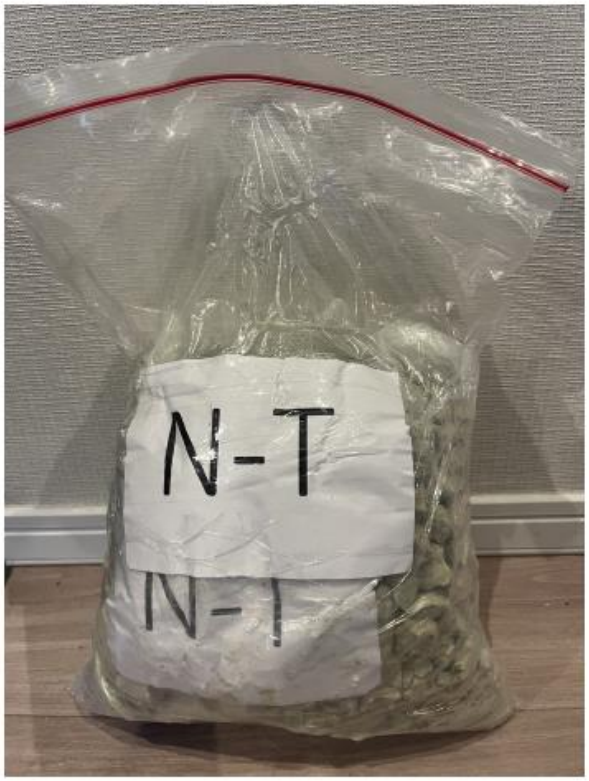
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104157	28	637.34	671.05	730.56	874.30

Sample Code	Bentonite Sample – CODE: **N-T**
Sample Shape	Small Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	5.5kg x 1 bag
Test Result	Simple Inspection Report as Below

20
N-T

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-U**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	6.3kg x 1 bag
Test Result	Simple Inspection Report as Below

21

N-U

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104158-4	50.54	10.58	1.97	2.34	0.64	0.11	0.06	7.79	0.02	2.45	13.24	10.18

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104158-4	N	N	N	5	-	N	N	N	60	292

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104158-4	N	42	252	31	-	73	51	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	28	36
Montmorillonite Bentonite(%)	18%	24%
Mg of MB/g of Bentonite	100	128
meq of MB/100g of Bentonite	28	36

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104158	<8	122.81	127.91	128.81	137.31

Sample Code	Bentonite Sample – CODE: **N-U**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	6.3kg x 1 bag
Test Result	Simple Inspection Report as Below

21
N-U

Picture of Product

Sample Code	Bentonite Sample – CODE: **N-V**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	5.2kg x 1 bag
Test Result	Simple Inspection Report as Below

22

N-V

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104159-V	65.81	14.93	2.33	3.44	0.32	0.17	0.05	1.26	0.02	3.82	0.09	7.57

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104159-V	22	N	56	N	-	N	N	14	33	1340

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104159-V	76	27	123	34	-	82	142	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	76	102
Montmorillonite Bentonite(%)	50%	67%
Mg of MB/g of Bentonite	270	363
meq of MB/100g of Bentonite	76	102

Bentonite Swell Index

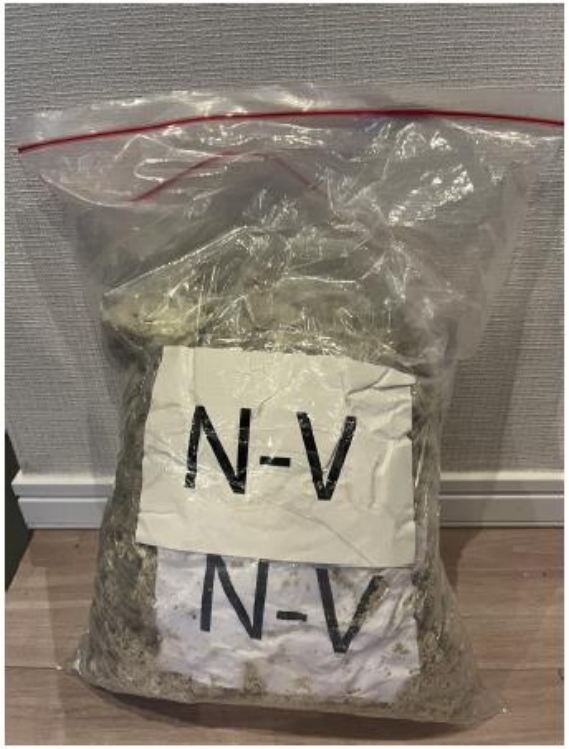
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104159	30	735.23	778.72	860.08	1128.35

Sample Code	Bentonite Sample – CODE: **N-V**
Sample Shape	Rock(Ore) & Powder
Sample Color	Gray
Sample Quantity	5.2kg x 1 bag
Test Result	Simple Inspection Report as Below

22
N-V

Picture of Product



Sample Code	Bentonite Sample – CODE: **N-W**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	4.4kg x 1 bag
Test Result	Simple Inspection Report as Below

23

N-W

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104160-W	57.16	14.47	1.78	4.83	1.00	0.73	0.07	3.92	0.16	5.91	0.85	8.79

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104160-W	603	N	15	19	-	N	N	6	72	1832

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104160-W	N	20	328	105	-	191	78	N

IS 12446(2007): Bentonite for use in foundries (MTD14: froundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	64	100
Montmorillonite Bentonite(%)	42%	66%
Mg of MB/g of Bentonite	228	356
meq of MB/100g of Bentonite	64	100

Bentonite Swell Index

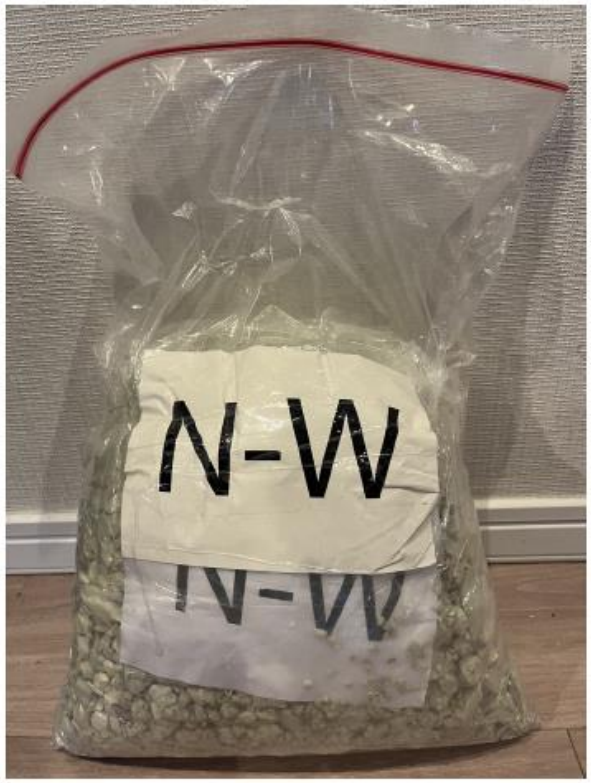
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

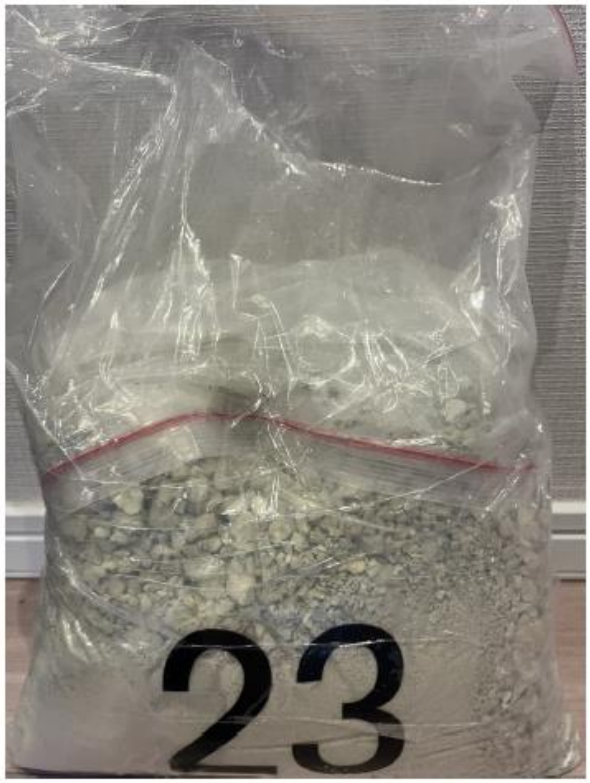
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104160	12	233.54	241.88	242.61	257.10

Sample Code	Bentonite Sample – CODE: **N-W**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	4.4kg x 1 bag
Test Result	Simple Inspection Report as Below

23
N-W

Picture of Product





Sample Code	Bentonite Sample – CODE: **N-X**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	2.6kg x 1 bag
Test Result	Simple Inspection Report as Below

24

N-X

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104161-X	53.69	13.39	2.83	4.55	1.00	0.76	0.12	2.87	0.14	6.98	3.18	10.05

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104161-X	20	11	88	36	-	60	N	N	52	3546

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104161-X	16	4	172	127	-	164	73	N

IS 12446(2007): Bentonite for use in foundries (MTD14: foundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	52	92
Montmorillonite Bentonite(%)	34%	61%
Mg of MB/g of Bentonite	185	327
meq of MB/100g of Bentonite	52	92

Bentonite Swell Index

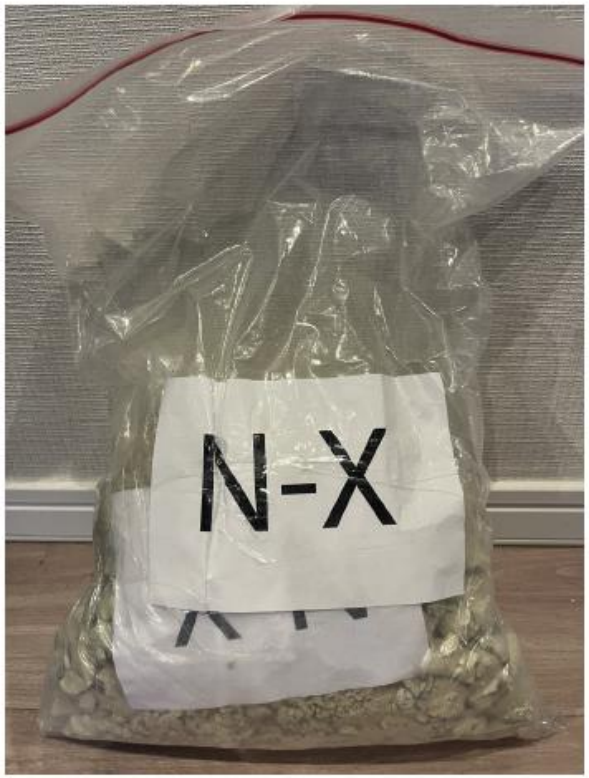
To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

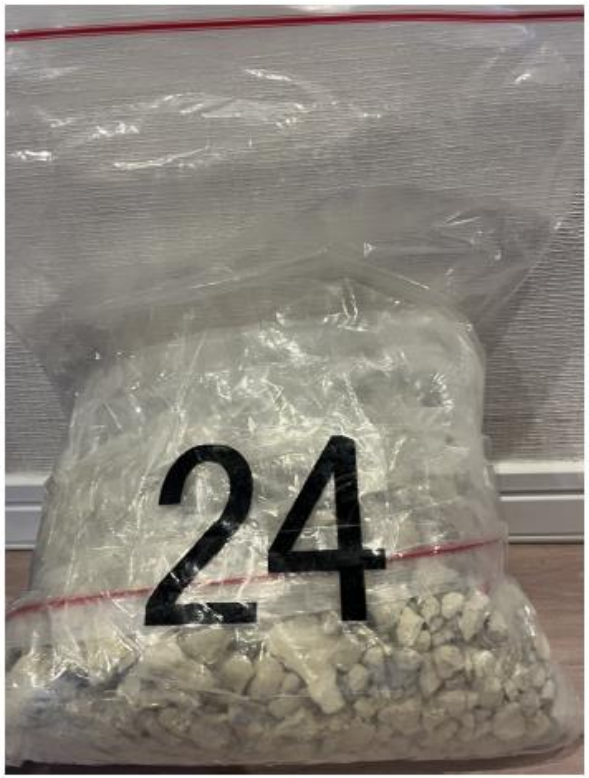
Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104161	14	198.84	210.69	222.48	225.84

Sample Code	Bentonite Sample – CODE: **N-X**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	2.6kg x 1 bag
Test Result	Simple Inspection Report as Below

24
N-X

Picture of Product





Sample Code	Bentonite Sample – CODE: **N-Y**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	4.9kg x 1 bag
Test Result	Simple Inspection Report as Below

25

N-Y

Elemental Composition of Bentonite

Following Character was inspected by method **XRF (X-ray fluorescence)** to determine the elemental composition of materials.

Sample	SiO2	Al2O3	Na2O	MgO	K2O	TiO2	MnO	CaO	P2O5	Fe2O3	SO3	LOI
	%	%	%	%	%	%	%	%	%	%	%	%
104162-Y	68.58	14.64	1.74	1.68	1.39	0.14	0.04	1.90	0.02	3.57	0.04	6.21

Sample	Ba	Co	Cr	Cu	Nb	Ni	U	Th	Ce	Cl
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104162-Y	N	N	N	N	-	N	N	N	24	192

Sample	Pb	La	Sr	V	Sb	Zr	Zn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
104162-Y	N	95	85	30	-	84	1	N

IS 12446(2007): Bentonite for use in foundries (MTD14: foundry)

Using a saturated tetra sodium per phosphate soulition TSPP	NO	YES
The volume of Methlin Blue consumed per gram of dry bentonite (cc)	80	96
Montmorillonite Bentonite(%)	53%	63%
Mg of MB/g of Bentonite	285	342
meq of MB/100g of Bentonite	80	96

Bentonite Swell Index

To perform these tests, a 2g sample of dried and finely ground bentonite clay is dispersed into a 100 ml graduated cylinder, a minimum of 10 minutes must pass between additions to allow for full hydration and settlement of the clay to bottom of the cylinder. This steps are followed until entire 2g sample has been added to the cylinder. The sample is then covered and protected from disturbances for period of 24 hours at which time the level of settled and swollen clay is recorded.

Sample	Swell Index	Water Absorption			
		Percent Next 1 hour	Percent Next 3 hour	Percent Next 4 hour	Percent Next 24 hour
		%	%	%	%
104162	11*	341.76	369.31	481.53	686.93

Sample Code	Bentonite Sample – CODE: **N-Y**
Sample Shape	Small Rock(Ore)
Sample Color	White/Gray
Sample Quantity	4.9kg x 1 bag
Test Result	Simple Inspection Report as Below

25
N-Y

Picture of Product