



Pentagon Chemicals

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Certificate of Analysis-Bentonite Powders

FOUNDRY GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	Result
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	32-34
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	400 - 450
Liquid Limit	IS:12446-1988	ml/100 gm	600 - 700
Gel Time 2.5gm/25 ml	IS:12446-1988	second	Instant.
Gelling Index	IS:12446-1988	ml	85-90
Moisture Content % by weight	API Spec. 13A:2004/ ISO 13500: 1998	%	10.0 - 12.0
PH Value 2% slurry	IS:6186-1986	pH	9.5 - 9.9
Green Compression Strength Bentonite :	IS:12446-1988	psi	12.5
Water :10:4 55-60 A.F.S Sand	IS:12446-1988	N/cm ²	0.16-0.20
Wet Tensile Strength	IS:12446-1988		85
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	Minimum

FOUNDRY GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	Result
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	28 - 30
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	350-400
Liquid Limit	IS:12446-1988	ml/100 gm	550 - 650
Gel Time 2.5gm/25 ml	IS:12446-1988	second	Instant.
Gelling Index	IS:12446-1988	ml	75 - 85
Moisture Content % by weight	API Spec. 13A:2004/ ISO 13500: 1998	%	10.0 - 12.0

PH Value 2% slurry	IS:6186-1986	pH	9.5 - 9.9
Green Compression Strength Bentonite : Water :10:4 55-60 A.F.S Sand	IS:1918-1966	psi	12
Wet Tensile Strength	IS:12446-1988	N/cm2	0.16-0.18
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	85 Minimum
Swelling Index	IS:6186-1986	10ml/gm	24-28

DRILLING API-13A SEC-4 GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	REQUIRED	RESULT
Viscometer Dial Reading at 600 rpm	API Spec. 13A:2004/ ISO 13500: 1998	r/min	30	35-40
Yield Point / Plastic Viscosity Ratio	API Spec. 13A:2004/ ISO 13500: 1998	-	3 Max	2.5
Filterate Volume	API Spec. 13A:2004/ ISO 13500: 1998	ML	15 Max	14
Moisture Content	API Spec. 13A:2004/ ISO 13500: 1998	% by weight	10.0 max.	10
Dry Screen Analysis(Residue Greater than 75 Microns)%	API Spec. 13A:2004/ ISO 13500: 1998	% by weight	4.0 max.	3.0 - 4.0

O.C.M.A. GRADE BENTONITE POWDER*/LUMPS

Properties	Protocol	Unit	Required	Result
Yield	OCMA DFCP-4	bbls/2000lbs	90 min	99 - 115
A.P.I. Filterate Loss	OCMA DFCP-4	ml	15.0 max.	13 - 14
Moisture Content	API Spec. 13A:2004/ ISO 13500: 1998	% by weight	15.0 max.	10.0 - 12.0
Dry Screen Analysis 100 Mesh Sieve	OCMA DFCP-4	% by weight	98.0 min.	98.5
Wet Screen Analysis 200 Mesh Sieve residue	OCMA DFCP-4	% by weight	2.5 max	1.75

PILLING GRADE BENTONITE POWDER

Properties	Protocol	Unit	Result
Liquid Limit	IS:12446-1988	ml/100 gm	650-700
Moisture Content	API Spec. 13A:2004/ ISO 13500: 1998	% by wt.	12.0 Max
Dry Screen Analysis (residue on 75 um sieve)	IS:6186-1986	% by. Wt.	25.0 max.
Free Swelling Volume 2gm/100ml	ASTM D 5890:1995	ml	30 CC

PH Value of 5% gel	IS:6186-1986	pH	9.5 - 10.0
Loose Bulk Density	IS:7589-1974	gm/ml	0.85 -1.0
Gel Time 2.5gm/25 ml	IS:12446-1988	second	Instant
Swelling Index	IS:12446-1988	10ml/gm	28
Gelling Index	IS:6186-1986	ml	75
Methylene Blue Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	350 - 400

RHEOLOGICAL CHARACTERISTICS AND YIELD

Mixing 5 minutes on REMI MIXER (at 4000 rpm) in distilled water at 20 degree centigrade

			High Yield 120	High Yield 145	High Yield 180
Concentration in pure mud	G/l		60	40	30
After 1 hour					
Marsh Viscosity (API)	API RP 13B-2,3RD ED:1998	Sec.	40 min	40 min	40
Rigidity (API)		Lbs/100ft2	3 min	3 min	3 min
Filtrate (API)	IS:6186-1986	MI	20 max	20 max	23

PILLING GRADE BENTONITE POWDER

Properties	Protocol	Unit	Result
Aspect			Yellow to reddish brown colour
Liquid Limit	IS:12446-1988	ml/100 gm	550-600
Moisture Content	API Spec. 13A:2004/ ISO 13500: 1998	% by. Wt.	12.0 Max
Dry Screen Analysis (residue on 75 um sieve)	IS:6186-1986	% by. Wt.	25.0 max.
Free Swelling Volume 2gm/100ml	ASTM D 5890:1995	ml	30 CC
PH Value of 5% gel	IS:6186-1986	pH	9.5 - 10.0
Loose Bulk Density	IS:7589-1974	gm/ml	0.85 - 1.0
Gelling Time	IS:12446-1988	second	25
Gelling Index	IS:6186-1986	ml	60
Methylene Blue Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	325 - 375

Specifications For Cattle Feed Grade Bentonite

PROPERTIES	PROTOCOL	UNIT	SPECIFICATION	RESULTS
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	18 to 22	19.00 ML.
Moisture Content % by weight	IS:6186-1986	%	10 to 12%	10.8%
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	350 to 390	369 mg per gm
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	10 to 12 %	10.9%
PH Value 2% slurry Color	IS:6186-1986	pH	8.5 to 9.5 Off green	8.7 Off green
Powder Bulk Density	IS:7589-1974	gm/ml	0.95 to 1.10 gm/cc	0.95 gm/cc
Montmorillonite Quartz	GEN:GL:SOP:A/302/12		93 to 95 % 2 to 3%	94% 2.2%

FOUNDRY GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	Result
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	28 - 30
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	410 - 440
Liquid Limit	IS 2720(PART 5):1985	-	550 - 625
Gel Time 2.5 gm/20 ml	IS:12446-1988	second	Instant
Moisture Content % by weight	API Spec. 13A:2004/ ISO 13500:1998	%	14
PH Value 2% slurry	IS:6186-1986	pH	9.5 - 10.0
Swelling Index	IS:6186-1986	10ml/gm	25
Gelling Index	IS:12446-1988	ml	60 - 70
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	85 Minimum

Cat Litter - Clumping

Properties	Unit	Result
Cat Litter - Large		
Granulometry 1 x 5 mm	%	(+/-) 3

Moisture	%	10.00 - 12.00
Cake Weight	gm	35 - 50
Absorbancy	%	200
Clump Width	cm	5 max
Clump Depth	cm	5 max

Cat Litter - Ultra

Granulometry 0.5x2 mm	%	(+/-) 3
Moisture	%	10.00 - 12.00
Cake Weight	gm	30 - 40
Absorbancy	%	200
Clump Width	cm	4 max
Clump Depth	cm	4 max

Cat Litter - Fine

Granulometry 0.2x1 mm	%	(+/-) 3
Moisture	%	10.00 - 12.00
Cake Weight	gm	30 - 40
Absorbancy	%	200
Clump Width	cm	4 max
Clump Depth	cm	4 max

FOUNDRY GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	Result
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	24-27
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	375-400
Liquid Limit	IS:12446-1988	ml/100 gm	550 - 600
Gel Time 2.5gm/25 ml	IS:12446-1988	second	Instant
Gelling Index	IS:12446-1988	ml	75 - 80
Moisture Content % by weight	API Spec. 13A:2004/ ISO 13500:1998	%	10.0 - 12.0
PH Value 2% slurry	IS:6186-1986	pH	9.5 - 9.8
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	85 Minimum
Swelling Index	IS:6186-1986	10ml/gm	24-28

FOUNDRY GRADE BENTONITE POWDER* / LUMPS

Properties	Protocol	Unit	Result
Free Swelling Volume 2 gm/100ml	ASTM D 5890:1995	ml	18-21
Methylene Blue Absorption Value	API spe 131:2004/ ISO 10416:2002	mg/gm of clay	350-375
Liquid Limit	IS:12446-1988	ml/100 gm	500-525
Gelling Index	IS:12446-1988	ml	65 - 75

Moisture Content % by weight	API Spec. 13A:2004/ ISO 13500: 1998	%	10.0 - 12.0
PH Value 2% slurry	IS:6186-1986	pH	9.0 -9.5
Dry Mesh % Passing 200 B.S.S	IS:6186-1986	%	85 Minimum