

TABLE 3—(Continued)

	LIVE OAK COUNTY Continued		MAVERICK COUNTY				McMULLEN COUNTY									
Min. Tech. Lab. No.	60142	60143	60146	60147	60148	60216	60094	60098	60099	60100	60101	60102	60120	60121	60144	60285
Field locality No. ^a	13	15	8	9	10	11	1	3	4	4	5	5	1	2	6A	4
Free lime (carbonates)	Positive	Positive	Slightly positive	Positive	Positive	Positive	Negative	Negative	Positive	Positive	Negative	Negative	Negative	Negative	Positive	Negative
Benzidine test	Greenish	Dark blue	Gray	Greenish gray	Green-gray	Deep blue	Deep blue	Faint blue	Negative	Negative	Blue	Blue	Blue	Blue	Gray-green	Light blue
Color (air-dried)	Buff	Light buff	Dark buff	Dark buff	Dark buff	Greenish Dark gray	Cream	Light cream	Buff	Buff	White	White	Light cream	Light tan	Dark cream	Light cream
Oil absorption—																
Calcline 450° C	....	....	....	....	....	....	....	....	....	....	....	....	70	30	....	31
Air-dried	Slow	Slow	Slow	Medium	Medium	Medium	Slow	51	Medium	Slow	Slow	Slow	69	40	Slow	66
Moisture (H ₂ O-) (%)	7.22	5.78	4.09	2.77	2.12	1.68	11.87	7.45	9.08	5.72	12.63	7.64	3.14	2.35	2.12	6.60
Ignition loss—																
300–600° C (%)	4.39	2.62	2.02	2.29	1.63	2.97	2.23	1.93	4.65	3.13	3.02	2.64	0.73	3.92	2.98	2.08
105–1050° C (%)	16.82	18.05	6.08	12.19	10.34	7.21	4.70	8.09	10.23	20.07	5.98	6.60	9.29	7.89	32.69	7.51
Water of plasticity (Atterberg test)—																
Average (%)	103	33	40	36	26	41	132	69	69	42	113	80	88	92	44	67
Difference (%)	125	13	15	20	13	28	76	22	42	12	58	26	68	74	11	31
Swelling test (percent increase in volume)—																
In distilled water	860	30	35	48	33	43	416	25	84	16	34	2	32	60	46	58
In salt water	50	21	36	33	25	43	86	29	40	12	12	0	32	43	44	26
Slaking test (–100 mesh) (%)	65	28	<5	<5	<5	<5	67	8	41	42	29	15	9	54	<5	<5
Bloating test: 10 minutes at—																
2000° F	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2200° F	....	....	Negative	....	....	....	....	....	Negative	Negative	Negative	Negative	....	....	....	....
2400° F	....	....	....	....	....	....	....	....	Negative	Negative	Negative	Negative	....	....	....	....
Yield of 15 cp. drilling mud (bbl. per ton)—																
Untreated	Low	....	....	....	....	....	Very low	Very low	....	....	Very low	Very low	....	....	....	....
Treated with soda ash	55	....	....	....	....	....	Very low	Very low	....	....	Very low	Very low	....	....	....	....
pH value	9.7	9.3	8.1	8.1	9.0	9.3	7.1	7.7	8.8	8.8	8.7	9.1	8.6	6.7	9.2	8.2
Decolorizing efficiency compared to AOCS official clays—																
Natural with natural (%)	Very low	....	....	....	....	....	18	13	<10	....	14	20	26	44	....	Very low
Activated with activated (%)	20	....	....	....	....	....	27	13	18	....	34	16	10	51	....	12
Firing test—																
Powder—2200° F (1204° C)	Brown	Brown	Red brown	Brown	Gray	Brown	Gray	Cream	Dark brown	Brown	Light gray	Gray	Light gray	Gray	Gray	Cream
2400° F (1316° C)	Fused	Fused	Steel hard	Fused	Fused	Fused	Steel hard	Vitrified	Fused	Fused	Fused	Fused	Fused	Vitrified	Powder	Vitrified
2600° F (1427° C)	....	....	Dark brown	....	....	....	Vitrified	Gray	....	....	....	....	....	Light brown	Green	....
2600° F (1427° C)	....	....	Fused	....	....	....	Brown	Fused	....	....	....	....	....	Fused	Fused	....
Disks, ½-inch diameter— (Approx. cone 02)	....	....	....	....	....	....	....	....	....	....	....	....	Dark cream	....	....	....
(1050° C)	....	....	....	....	....	....	....	....	....	....	....	....	Powder	....	....	....
(Approx. cone 02) 2000° F (1093° C)	....	....	Brown	....	Dark buff	Dark gray	....	....	Red brown	....	....	....	Buff	Brick red	....	Light buff
(1093° C)	....	....	Slightly bloated	....	Steel hard	brown	....	....	>Steel hard	....	....	....	>Steel hard	>Steel hard	....	<Steel hard
(Approx. cone 7) 2200° F (1204° C)	....	....	Brown	....	Dark buff	....	....	....	....	....	....	....	....	....	....	Excessive shrinkage
(1204° C)	....	....	Vitrified	....	Vitrified	....	....	....	....	....	....	....	....	....	....	Light gray
(Approx. cone 15) 2600° F (1427° C)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Vitrified
(1427° C)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Excessive shrinkage
Loss on ignition at—																
105–300° C	2.02	1.83	1.62	1.62	0.58	0.50	1.53	4.90	3.03	1.76	2.24	3.23	6.47	2.34	0.79	4.38
300–450° C	0.93	0.78	0.12	1.03	0.15	1.09	0.38	0.78	0.95	1.01	0.76	0.96	0.24	0.53	0.77	1.31
450–600° C	3.46	1.84	1.90	1.66	1.48	1.88	1.35	1.15	3.70	2.12	2.26	1.68	0.49	3.39	2.21	0.77
600–900° C	10.67	13.87	1.84	7.10	7.93	3.71	0.69	1.14	2.45	14.52	0.63	0.62	1.65	0.54	29.61	1.05
900–1050° C	....	....	0.60	0.16	0.20	0.03	0.19	0.12	0.10	0.66	0.09	0.11	0.44	1.09	....	....
Neutralization value as CaCO ₃	31.0	33.9	3.4	21.2	20.0	12.3	3.3	4.5	12.2	32.2	4.7	3.2	5.8	2.0	71.8	....

Remarks^b (samples arranged by Min. Tech. Lab. numbers)—

No. 60142 A bentonite capable of yielding 55 barrels of 15-cps drilling mud per ton of clay treated with sodium carbonate. It may be possible to increase this yield by varying the chemical treatment. FTR. The oil decolorizing capacity of this bentonite is low even after acid-activation.

No. 60143 NIU as a clay. Contains 33.9% carbonates NV.

No. 60146 NIU as a clay. Bloats noticeably when fired at 2000° F (not enough for lightweight aggregate for concrete).

No. 60147 NIU as a clay. Contains 21.2% carbonates NV.

No. 60148 NIU as a clay ECB. Contains 20.0% carbonates NV.

No. 60216 NIU as a clay ECB. A calcareous clay containing 12.3% carbonates NV. According to the statement with sample 60216 this clay is blended and then used for the manufacture of brick. The high lime content of this clay would normally tend to shorten the firing range.

No. 60094 NIU. A bentonite of very low yield of drilling mud and of low oil decolorizing capacity.

No. 60098 NIU. A fuller's earth of low oil decolorizing capacity and low oil absorbing capacity.

No. 60099 NIU as a clay ECB. A clay containing 12.2% carbonates NV.

No. 60100 NIU as a clay. Contains 32.2% carbonates NV. The rock is approximately 48% quartz, 20% clay, 32% carbonates with a trace of glass. Strong reaction with hydrochloric acid.

No. 60101 NIU. Very low yield of drilling mud. Low oil-decolorizing capacity. A low-grade subbentonite.

No. 60102 NIU. Very low oil-decolorizing capacity. Very low yield of drilling mud. A low-grade subbentonite.

No. 60120 Shows low oil decolorizing capacity even after acid activation. Very low yield of drilling mud. Medium oil absorbing capacity (70% by weight).

No. 60121 A subbentonite of medium oil decolorizing capacity. Acid-activation increases the oil decolorizing capacity to 51% compared to the official AOCS activated clay. Very low yield of drilling mud. Low oil absorbing capacity (40% by weight).

No. 60144 NIU as a clay. Contains 71.8% carbonates NV.

No. 60285 Low oil decolorizing capacity even after acid-activation. Medium oil absorbing capacity. Firing at 2000° F (cone 02) and 2200° F (cone 7) resulted in excessive shrinkage.

^a See Plate 2 for location.

^b The following abbreviations are used:

AOCS= American Oil Chemists' Society.

FTR= Further testing by a specialized laboratory is recommended.

NIU= No important industrial (or commercial) use.

NV= Neutralization value expressed as calcium carbonate.

ECB= With the possible exception of common brick. Clays containing as high as 20% carbonates have been included in this classification because there are several plants in operation in Texas producing brick from such clays. Normally it is not desirable to use clays containing more than 3% carbonates (U.S. Bureau of Mines Bulletin 565). The presence of excessive carbonates (lime and magnesia) causes undue shrinkage and shortening of the firing range. Closely regulated firing is required to overcome the latter.

15-CF= 15-centipoise.