

TABLE 3—(Continued)

	JIM WELLS COUNTY			KARNES COUNTY									KLEBERG COUNTY		
Min. Tech. Lab. No.	60271	60272	60273	60197	60198	60326	60327	60328	60329	60330	60331	60332	60274	60275	60276
Field locality No. ^a	1	2	3	2	3	6	8	9	10	11	12	13	1	2	4
Free lime (carbonates)	Positive	Positive	Positive	Negative	Negative	Negative	Negative	Positive	Positive	Positive	Negative	Negative	Positive	Positive	Positive
Benzidine test	Very faint blue	Faint blue	Faint blue	Bluish gray	Pale light blue	Dark blue	Very faint blue	Dark blue	Blue	Blue	Light blue	Light blue	Gray	Slight blue	Slight blue
Color (air-dried)	Light tan	Light tan	Tan	Light tan	Greenish dark cream	Dark cream	Brown	Greenish dark cream	Light buff	Light buff	Light buff	Light tan	Light tan	Buff	Light brown
Oil absorption—															
Calcline 450°C	----	----	----	101	70	84	----	----	----	----	----	----	----	----	----
Air-dried	Fast	Fast	Fast	84	58	39	Fast	Fast	Fast	Slow	44	Medium	Fast	Fast	Fast
Moisture (H ₂ O–) (%)	5.74	4.53	7.19	6.43	7.92	8.06	4.21	8.45	6.68	3.71	7.73	8.60	4.18	4.82	5.10
Ignition loss—															
300–600°C (%)	3.08	8.04	2.73	3.85	2.40	2.79	1.69	3.84	4.55	2.79	2.56	2.64	4.21	1.71	2.33
105–1050°C (%)	16.42	12.91	5.53	8.53	6.99	6.26	3.95	9.16	11.21	11.97	7.48	5.88	17.32	3.71	4.10
Water of plasticity (Atterberg test)—															
Average (%)	75	42	54	76	57	88	36	59	65	35	57	96	44	48	48
Difference (%)	92	48	60	38	36	89	37	50	67	12	32	92	55	57	48
Swelling test (percent increase in volume)—															
In distilled water	100	81	132	76	54	212	95	113	165	22	122	269	62	138	128
In salt water	71	76	59	56	31	108	70	78	110	26	83	118	57	46	77
Slaking test (–100 mesh) (%)	22	23	41	<2	<1	45	28	35	74	<5	39	62	23	46	54
Bloating test: 10 minutes at—															
2000°F	----	----	Negative	----	Negative	----	----	----	----	----	----	----	----	----	----
2200°F	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2400°F	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Yield of 15 cp. drilling mud (bbl. per ton)—															
Untreated	----	----	----	----	----	Very low	----	----	----	----	----	Very low	----	----	----
Treated with soda ash	----	----	----	----	----	49	----	----	----	----	----	52	----	----	----
pH value	9.2	9.1	9.0	8.7	8.7	8.2	7.2	8.3	8.9	8.7	8.1	8.8	9.4	9.4	9.6
Decolorizing efficiency compared to AOCS official clays—															
Natural with natural (%)	----	----	----	30	----	54	----	----	----	----	----	45	----	----	----
Activated with activated (%)	----	----	----	50	----	117	----	----	----	----	----	51	----	----	----
Firing test—															
Powder—2200°F (1204°C)	Light brown Fused	Buff Fused	Dark gray Fused	Cream Sintered	Greenish gray >Steel hard	Light brown Sintered	Dark brown Sintered	Brown Fused	Brown Fused	Greenish buff Fused	Buff Steel hard	Greenish gray Fused	Buff Fused	Dark gray >Steel hard	Dark brown Vitrified
2400°F (1316°C)	----	----	----	Gray >Steel hard	Greenish brown Fused	Brown Fused	Friable Black Vitrified	----	----	----	Brown Fused	----	----	Brown Vitrified	----
2600°F (1427°C)	----	----	----	Gray Fused	----	----	----	----	----	----	----	----	----	----	----
Disks, ½-inch diameter— (Approx. cone 02) 2000°F (1093°C)	----	----	Dark red Brown Vitrified	----	----	----	----	Mottled Brown, buff Steel hard	----	----	----	----	----	Red brown —Steel hard	----
(Approx. cone 7) 2200°F (1204°C)	----	----	----	Cream Vitrified	----	----	----	----	----	----	----	----	----	Dark brown Steel hard	----
(Approx. cone 15) 2400°F (1427°C)	----	----	----	Light gray Vitrified	----	----	----	----	----	----	----	----	----	----	----
Loss on ignition at—															
105–300°C	1.80	1.22	1.51	3.82	3.63	2.71	1.93	2.29	2.08	2.21	4.43	2.75	1.16	1.13	1.34
300–450°C	1.30	1.81	1.27	2.75	1.32	0.79	0.53	0.44	0.94	0.53	1.70	1.88	0.98	1.18	1.48
450–600°C	1.78	6.23	1.46	1.10	1.08	2.00	1.16	3.40	3.61	2.26	0.86	0.76	3.23	0.53	0.85
600–900°C	} 11.54	} 3.65	} 1.28	0.79	0.93	} 0.76	} 0.33	} 3.03	} 4.58	} 6.97	} 0.49	} 0.52	} 11.95	} 0.87	} 0.43
900–1050°C															
Neutralization value as CaCO ₃	30.6	24.7	7.31	----	----	----	----	11.5	15.9	18.4	----	----	33.7	2.9	2.0

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

- No. 60271 NIIU as a clay. A calcareous clay containing 30.6% carbonates NV.
No. 60272 NIIU as a clay. A silty calcareous clay containing 24.7% carbonates NV.
No. 60273 NIIU as a clay. Vitrifies at 2000°F (approximate cone 02). A silty calcareous clay containing 7.3% carbonates NV.
No. 60197 The oil decolorizing capacity of this clay after acid-activation is 50% compared with the AOCS official activated earth. The oil absorbing capacity is 84% and it increases to 101% when the clay is calcined at 450°C. Commercial oil-absorbing floor sweeps absorb 110% of their weight. Firing at 2200°F (cone 7) and 2400°F (cone 12) results in excessive shrinkage.
No. 60198 When calcined at 450°C, it absorbs 70% of its weight of 20W lubricating oil (commercial oil-absorbing floor sweeps absorb over 110%).
No. 60326 A subbentonite with a very high oil decolorizing capacity when acid-activated (117% compared with the official AOCS activated earth). FTR. When calcined the oil absorbing capacity is 84% (Commercial oil-absorbing floor sweeps absorb 110%). FTR. The yield of 15-cp drilling mud is low even after treatment with sodium carbonate. It may be possible that this clay could be used as an accessory clay in drilling mud formulation.
No. 60327 NIIU as a clay. High content of silt and sand.
No. 60328 NIIU as a clay. ECB. A calcareous clay containing 11.5% carbonates NV.
No. 60329 NIIU as a clay. A calcareous clay containing 15.9% carbonates NV.
No. 60330 NIIU as a clay. Sandy, almost nonplastic, calcareous material containing 18.4% carbonates NV.
No. 60331 Low oil absorbing capacity (44%) when air-dried. NIIU as a clay.
No. 60332 A bentonite capable of yielding 52 barrels of 15-cp drilling mud per ton of clay, treated with sodium carbonate. FTR. The oil decolorizing capacity of this sample, when acid-activated is 51% compared to the AOCS official activated earth.
No. 60274 NIIU as a clay. A silty calcareous clay containing 33.7% carbonates NV.
No. 60275 NIIU as a clay. A silty clay containing 2.9% carbonates NV.
No. 60276 NIIU as a clay. A silty clay containing 2.0% carbonates NV.

^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.

NIIU—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-CP—15-centipoise.