

TABLE 3—(Continued)

	REAL COUNTY					REFUGIO COUNTY		SAN PATRICIO COUNTY								
Min. Tech. Lab. No.	60122	60123	60124	60125	60126	60340	60341	60182	60298	60299	60300	60301	60302	60303	60304	60305
Field locality No. <sup>a</sup>	1A	1B	1C	2	3	1	2	1A	3	4	5	6	7	8	9	10
Free lime (carbonates)	Negative	Negative	Positive	Negative	Negative	Positive	Positive	Negative	Positive	Positive	Positive	Positive	Negative	Positive	Positive	Positive
Benzidine test	Faint blue	Faint blue	Faint blue	Faint blue	Faint blue	Greenish blue	Very faint greenish blue	Light blue	Slightly greenish blue	Slightly blue	Slightly blue	Slightly blue	Slightly blue	Slightly blue	Very slight blue	Blue
Color (air-dried)	Pinkish cream	Pink	Pinkish cream	Pinkish	Light gray	Light gray	Greenish buff	Dark cream Greenish tinge	Buff	Dark gray	Dark gray	Buff	Greenish buff	Tan	Green gray	Light buff
Oil absorption—																
Calcine 450°C	34	61	44	....	....	....	....	....	....	....	....	....	....	....	....	....
Air-dried	48	63	48	Slow	Slow	Fast	Fast	Medium	Medium	Medium	Medium	Fast	Fast	Medium	Fast	Fast
Moisture (H <sub>2</sub> O-) (%)	2.26	1.39	3.33	0.42	0.43	3.08	4.53	11.38	6.06	3.99	4.27	4.81	4.34	4.76	6.03	5.28
Ignition loss—																
300–600°C (%)	9.88	9.71	11.56	4.64	6.45	1.81	4.00	3.07	4.42	1.86	1.75	2.74	1.99	8.89	3.12	5.26
105–1050°C (%)	13.80	23.02	15.37	5.89	8.35	4.16	9.69	5.80	6.33	3.77	4.06	4.65	3.65	11.98	5.55	10.59
Water of plasticity (Atterberg test)—																
Average (%)	63	50	66	29	32	35	83	103	86	48	47	65	79	68	68	74
Difference (%)	40	16	38	24	18	33	99	99	97	44	42	65	94	72	81	90
Swelling test (percent increase in volume)—																
In distilled water	80	62	93	43	58	100	465	512	562	119	123	205	Naturally dispersed	181	338	314
In salt water	65	76	48	48	58	55	105	83	86	81	68	76	100	100	95	114
Slaking test (–100 mesh) (%)	<5	<5	<5	<2	18	33	46	65	48	31	36	37	<5	36	59	54
Bloating test: 10 minutes at—																
2000°F	....	....	....	....	....	....	....	....	Negative	....	....	....	....	Negative	....	....
2200°F	....	....	....	....	....	....	....	Positive	Negative	....	....	....	....	....	....	....
2400°F	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Yield of 15 cp. drilling mud (bbl. per ton)—																
Untreated	....	....	....	....	....	....	Very low	47	Very low	....	....	....	Very low	....	....	....
Treated with soda ash	....	....	....	....	....	....	58	66	49	....	....	....	Very low	....	49	49
pH value	7.3	8.2	8.5	7.6	8.1	8.5	9.3	8.0	9.4	8.8	9.2	9.1	9.0	8.3	9.2	8.8
Decolorizing efficiency compared to AOCs official clays—																
Natural with natural (%)	49	34	....	....	....	....	16	Very low	Very low	....	....	....	Very low	....	....	....
Activated with activated (%)	39	31	....	....	....	....	....	49	....	....	....	....	22	....	....	....
Firing test—																
Powder—2200°F (1204°C)	White Powder	Cream Powder	Pink-white Powder	Gray Powder	Cream Powder	Dark buff Steel hard	Dark brown Fused	Red-brown Fused	Dark gray Fused	Brown >Steel hard	Brown >Steel hard	Brown Vitrified	Red brown Steel hard	Brown Fused	Brown Vitrified	Buff Fused
2400°F (1316°C)	Cream Powder	Dark cream Powder	Cream Powder	Dark gray Sintered Friable	Cream Powder	>Steel hard	....	....	....	....	....	....	Brown Vitrified	....	....	....
2600°F (1427°C)	Cream Sintered Friable	Light buff Friable	Light cream Powder	Dark brown Fused	Tan Sintered	Brown Fused	....	....	....	....	....	....	....	....	....	....
Disks, ½-inch diameter— (Approx. cone 02) 2000°F (1093°C)	....	....	....	Gray —Steel hard	Mottled brown Buff Steel hard	....	....	....	....	....	....	....	....	....	....	....
(Approx. cone 7) 2200°F (1204°C)	....	....	....	Gray Steel hard	....	....	....	....	....	....	....	....	....	....	....	....
(Approx. cone 15) 2600°F (1427°C)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Loss on ignition at—																
105–300°C	1.81	8.87	2.34	0.71	0.70	1.81	2.33	2.07	1.56	1.73	2.13	1.54	1.48	1.85	1.58	2.02
300–450°C	0.67	1.74	1.88	1.08	2.30	0.92	1.88	1.70	1.73	1.79	1.70	2.51	1.91	2.49	0.99	2.10
450–600°C	9.21	7.97	9.68	3.56	4.15	0.89	2.12	1.37	2.69	0.07	0.05	0.23	0.08	6.40	2.13	3.16
600–900°C	1.57	3.89	1.26	0.40	0.96	0.54	3.36	0.59	0.35	0.18	0.18	0.37	0.18	1.24	0.85	3.31
900–1050°C	0.54	0.55	0.21	0.14	0.24			0.07								
Neutralization value as CaCO <sub>3</sub>	1.8	2.1	2.9	....	....	3.25	10.9	....	8.25	2.2	1.86	4.7	1.7	17.2	4.8	14.3

Remarks<sup>b</sup> (samples arranged by Min. Tech. Lab. numbers)—

No. 60122 Should be further tested as a refractory by a specialized laboratory. Low oil absorbing capacity. Medium oil decolorizing capacity.

No. 60123 Medium oil absorbing capacity 63%. Should be further tested as a refractory by a specialized laboratory.

No. 60124 Should be further tested as a refractory by a specialized laboratory. Low oil absorbing capacity.

No. 60125 NIU as a clay.

No. 60126 NIU as a clay.

No. 60340 NIU as a clay. A sandy and silty clay containing 3.3% carbonates NV.

No. 60341 A bentonite capable of yielding 58 barrels of 15-cp drilling mud per ton of clay treated with sodium carbonate. FTR. The oil decolorizing capacity is low. Contains 10.9% carbonates NV.

No. 60182 This bentonite is a premium drilling clay with a yield of 47 barrels of 15-cp drilling mud per ton of air dried clay. This yield is increased to 66 barrels when the clay is treated with sodium carbonate. FTR. The oil decolorizing capacity is medium (49%) even after acid-activation. Pellets of this clay bloated to an apparent density of 50 pounds per cubic foot when heated 10 minutes at 2200°F. FTR as a lightweight aggregate for concrete.

No. 60298 A silty bentonite capable of yielding 49 barrels of 15-cp drilling mud per ton of clay treated with sodium carbonate. FTR. Very low oil decolorizing capacity. Contains 8.3% carbonates NV.

No. 60299 NIU as a clay. A silty clay with 60% quartz.

No. 60300 NIU as a clay. High silt content, about 60% quartz and 40% clay.

No. 60301 NIU as a clay. High silt content, 60% quartz.

No. 60302 NIU as a clay. High silt content, 70% quartz.

No. 60303 NIU as a clay. High silt content. Contains 17.2% carbonates NV.

No. 60304 A silty bentonite capable of yielding 49 barrels of 15-cp drilling mud per ton of clay treated with sodium carbonate. FTR.

No. 60305 A bentonite capable of yielding 49 barrels of 15-cp drilling mud per ton of clay treated with sodium carbonate. FTR. Contains 14.3% carbonates NV.

<sup>a</sup> See Plate 2 for location.

<sup>b</sup> 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-CP—15-centipoise.