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Tests on Molding Sands

In 1927 tests were made in the Molding Sand Laboratory of Cornell University on samples of Texas sands. The sand samples were collected by the Bureau of Econoic Geology and shipped to the Cornell Laboratory, the testing having been carried on in cooperation between the Department of Geology of Cornell University, the American Foundrymen's Association, and the Bureau of Economic Geology.

Following is a record of the samples, giving locality and comments for each, the samples being entered according to laboratory numbers.

1640. Fort Worth. This sample represents the finest grade of sand obtained by screening. From pit at Fort Worth, Texas.

Comment: A very coarse core sand.

1641. Texas Builders Supply Company, molding sand, from pit located 1 mile west of Liberty, Liberty County. It connects with the main line of S.P. RR. by means of a switch. Formation river deposit. The molding sand ranges from 1½ to 2½ feet in thickness and underlies probably 23 acres. There is about 1 foot overburden. It is used for heavy castings.

Comment: Molding sand; good strength, but moderate permeability.

1642. Steel sand, W. D. Hayden Co., dredged from San Jacinto River near Lynchburg, Liberty County, Texas. Covers river bed for several miles, with a varying thickness from a few feet up to 15 feet.

Comment: Core sand, but a rather coarse one.

1643. From Cantu farm, 14.5 miles southeast of San Antonio, Texas, on San Antonio—Cuero highway and 1½ miles from S.P. RR. Formation: Wilcox division of Eocene. Deposit underlies 50 acres. The sample represents an average of several beds, some of which are more clayey than the others.

Comments: Molding sand. Good strength but low permeability, unless considerable water added, viz. 12.4. This may be too much water for good working conditions. Rather high in clay.

1644. Fort Worth Sand & Gravel Company, Fort Worth, Tarrant County, Texas. River deposit. Covers about 12 acres and ranges from 1 to 3 feet in thickness.

Comment: Molding sand. Good strength, not high permeability; would have to be opened up with a more open sand.

1645. J. E. Espey sand pit, 22 miles south of San Antonio, Texas. Geologic age: Wilcox formation of Eocene. Deposit averages 7 to 11 feet in thickness. The overburden is loose sand 2½ to 3 feet thick.

Comment: Molding sand. Good strength and good permeability. Probably best of the whole series sent.

The detailed results of the testing are given in the following table:

Laboratory number	1640*	1641	1642	1643	1644	1645
On 6 screen	—	—	Tr.	—	—	—
On 12	—	—	3.04	—	—	—
On 20	0.14	—	8.46	—	—	—
On 40	3.06	0.24	49.82	0.14	0.70	10.36
On 70	38.26	1.36	30.98	1.44	4.96	57.24
On 100	39.18	10.46	4.96	26.50	10.54	17.26
On 140	11.42	15.04	0.80	23.60	12.26	2.26
On 200	3.96	18.76	0.20	7.00	13.25	0.44
On 270	1.64	13.06	0.18	3.04	11.80	0.36
Thru 270	1.66	21.76	0.20	6.04	22.64	1.76
Clay subs	5.6	19.24	0.54	32.06	23.70	11.10
Total	99.86	99.92	99.18	99.82	99.85	100.78
Dye absorption	156	4720	40	1776	3100	1904
Water percent	Dry	8.7	Dry	8.7	2.6	4.4
		10.8		10.1	5.7	5.1
		12.8		12.4	7.3	6.7
					9.4	8.8
						10.9
Bond strength		392		378	—	337
		397		386	428	336
		370		375	352	292
					312	244
Permeability					30	142
		58		27.8	46	162
	67	67	275	70.0	72	178
		50		253.0	62	205
						63
Comp. lbs. per sq. inch						10.33
		10.5		14.03	13.26	11.0
		9.33		10.17	9.03	6.5
		8.66		8.0	5.9	5.53
Tens. oz. per sq. inch						12.4
		26.17		16.8	27.5	15.7
		21.6		30.1	24.1	11.3
		15.5		29.2	12.9	8.6

*Washed sand.