TR8-242-243

R. 432, R. 433, R. 434 AND R. 435

14. CLAY FROM GLEN DHU. LAUNCESTON

Samples

Four samples were submitted by Campbell's Pottery Works, Launceston, to be tested for the manufacture of pipes by de-aired extrusion. The following descriptions were supplied with the samples:—

R.432: Brown clay—3 parts, sand—1 part.
R.433: Brown clay—3 parts, grog—1 part.
R.434: White clay—3 parts, sand—1 part.
R.435: White clay—3 parts, grog—1 part.

Clay samples were obtained from the Company's property at Glen Dhu, Launceston, and the sand from Perth.

Preparation and Testing

All samples were thoroughly mixed and the required water incorporated by hand mixing, then subjected to a pass through crushing rolls in a semi-dry state, further hand mixing and finally two stages of pugging in a Rawdon pug mill.

The pugged samples were extruded through a pipe forming die under a vacuum of 28 inches of mercury. Test pieces were cut, allowed to dry naturally for several days and finally finished in an electric oven at 105°C. The test pieces were then fired at the temperatures shown with two hours soaking at the maximum temperatures. The per cent moisture, firing losses and contractions for drying and firing were determined.

For comparative purposes a sample of pug from Campbell's Pottery Works was also submitted to the above procedures. In addition this sample was extruded without de-airing and the test pieces, so made, dried and fired as above.

Summary

1. All blends tested are suitable for the manufacture of ceramic pipes by de-aired extrusion.
2. All pugs extruded smoothly and freely and pipes cut easily without distortion. All extruded columns exhibit good green strength.

3. Pipes from sample R.432 show longitudinal surface cracks when fired at 1100°C. Pipes from this sample fired at 1050° show no such faults.
4. All test pieces appear to be well fired at both temperatures and no faults were observed except that noted in paragraph 3.
5. Pug from Campbell's Pottery Works had a higher moisture content than samples pugged at the Department of Mines Laboratory. Drying and firing contractions are also greater than dryer mix. De-aired extrusion of this pug results in better strength green ware than does non de-aired extrusion, but is still less than the green strength of the other columns.

Test Results

Moisture content

A = Moisture content of the extruded pipe, per cent.
B = Water added to the dry sample, per cent.

Sample No.	A	B
R.432	15.6	18.5
R.433	18.6	22.9
R.434	17.7	21.5
R.435	16.7	20.0
Pug ex Campbell's	20.4	25.6

Loss of weight on firing

These determinations are based on the test pieces dried at 105°C.

	Firing Loss—Per Cent Weight	
Sample No.	1050°C	1100°C
R.432	5.9	5.6
R.433	7.0	6.7
R.434	5.8	5.3
R.435	5.3	4.8
Pug ex Campbell's	9.9	9.1

Contractions on drying and firing

These determinations are based on the original green test pieces. Contractions on drying are reported individually and figures reported under "firing" represent additional per cent contractions on firing to the indicated temperatures.

	Per Cent Contractions		
		Firing	
Sample No.	Drying	1050°C	1100°C
R.432	5	1½	2½
R.433	6	2	4
R.434	6	1½	2½
R.435	6	1½	2½
Pug ex Campbell DA	7½	2½	2½
Pug ex Campbell NDA	8	2	2