

TR5-244-246

Reg. Nos. 564, 574-577, 594, 595

## EXTRUSION AND WATER ABSORPTION TESTS ON BORE SAMPLES

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### SUMMARY

A series of six bore samples of clays and sands, obtained from the Prospect Vale property of E. K. Bradford and Son, and submitted by McHugh Brothers Pty. Ltd. of Launceston, have been tested for brick and pipe manufacture by extrusion.

One clay was found to be unsuitable alone for either bricks or pipes, but could be blended with sand for brick manufacture. The remaining clays could be used for both bricks and pipes, preferably with the addition of suitable quantities of sand.

The water absorption of a salt glazed flower pot was also determined. The clay from which this pot was made, was obtained from the same locality.

### DESCRIPTION

- Reg. No. 564. Salt glazed flower pot.  
 Reg. No. 574. Bore sample No. 1. Strong reddish clay.  
 Reg. No. 575. Bore sample No. 2. Strong yellow clay.  
 Reg. No. 576. Bore sample No. 3. Strong buff clay.  
 Reg. No. 577. Bore sample No. 4. Fairly strong yellow sandy clay.  
 Reg. No. 594. Bore sample No. 5. Highly plastic light grey and yellow mottled clay.  
 Reg. No. 595. Bore sample No. 6. Yellow sand.  
 Blend No. B18: Three parts of No. 594 to one part of No. 595.

### PREPARATION AND TESTING

All clays and the blend were prepared by passing once through high speed rolls in a wet condition, and mixing to a suitable consistency for extrusion in a pug-mill. Pipes, and in some cases briquettes were extruded in a laboratory de-airing machine; dried, and fired at various temperatures.

The water absorption of the fired pipes and the flower pot were determined according to the Australian Standard Method for Salt Glazed Pipes, as far as it could be applied. The figures quoted for water absorption were calculated on the basis:—

$$\frac{(\text{Wet weight} - \text{dry weight}) \times 100}{\text{Wet Weight} - \text{weight suspended in water.}} \%$$

### RESULTS

*Extrusion.* Numbers 574-576, were all fairly similar in extrusion properties, having a rough surface without de-airing and a good finish de-aired. The extrusion speed was reasonable, but the clay had to be prepared rather wet to achieve this result.

Number 577 did not extrude particularly well even with de-airing, but could be worked in a fairly stiff condition.

Numbers 594 and B18 extruded pipes very well, both with and without de-airing when prepared in a fairly stiff condition, the surface of No. B18 being slightly grainy. Severe dog-earing occurred on briquettes extruded without de-airing.

### DRYING

Drying characteristics were satisfactory on all pipes, but Nos. 594 and B18 developed core cracks in the briquettes.

The drying contractions for each material differed between the de-aired and not de-aired pipes and the briquettes where these were made, as shown in the following table.

Material	N.D.A. Pipes	Drying Contractions (%)	
		D.A. Pipes	D.A. Briquettes
574	7 $\frac{1}{4}$	7 $\frac{1}{2}$	....
575	7 $\frac{3}{4}$	8 $\frac{1}{4}$	....
576	8	8 $\frac{3}{4}$	....
577	6 $\frac{3}{4}$	6 $\frac{1}{2}$	....
594	7 $\frac{1}{4}$	8 $\frac{1}{4}$	9 $\frac{1}{2}$
B18	7 $\frac{1}{2}$	7 $\frac{1}{2}$	9

NOTE—

N.D.A. = Not de-aired:

D.A. = De-aired.

### FIRING

Firing characteristics were satisfactory on all pipes except No. 594, which cracked badly during firing. The core cracks in No. 594 and B18 briquettes were extended slightly by firing.

Total Contractions after Drying and Firing (%)

Material	N.D.A. Pipes			D.A. Pipes			D.A. Briquettes		
	920°C	1,000°C	1,100°C	920°C	1,000°C	1,100°C	920°C	1,000°C	1,100°C
574	9	12	13	8 $\frac{3}{4}$	11 $\frac{1}{4}$	13 $\frac{1}{4}$	..	..	..
575	9 $\frac{1}{4}$	11 $\frac{1}{4}$	13 $\frac{1}{4}$	9 $\frac{1}{2}$	12 $\frac{1}{2}$	14	..	..	..
576	9 $\frac{1}{4}$	12 $\frac{1}{4}$	14	10 $\frac{1}{4}$	12 $\frac{1}{4}$	14 $\frac{3}{4}$	..	..	..
577	7 $\frac{3}{4}$	8 $\frac{1}{4}$	10 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{3}{4}$	10 $\frac{1}{4}$	..	..	..
594	10	11 $\frac{3}{4}$	16 $\frac{3}{4}$	11	12 $\frac{1}{4}$	18	12 $\frac{1}{4}$	13 $\frac{1}{4}$	19
B18	9 $\frac{1}{4}$	10 $\frac{1}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$	14 $\frac{3}{4}$	10 $\frac{1}{2}$	12	16

Material	Fired Colour		
	920°C	1,000°C	1,100°C
574	Light red	Light red	Red
575	Light red	Light red	Red
576	Pink	Pinkish cream	Cream
577	Light red	Light red	Red
594	Pink	Pale pink	Buff
B18	Light salmon	Pale pink	Buff

## Cold Water Absorption:

Material	24-hour Cold Water Absorption (%)		
	920°C	1,000°C	1,100°C
574 N.D.A.	25½	12	4
574 D.A.	25	15½	2½
575 N.D.A.	25	16	2½
575 D.A.	24½	13½	1
576 N.D.A.	26	18	1
576 D.A.	24	20	½
577 N.D.A.	28½	23	12½
577 D.A.	27	20½	13½
594 N.D.A.	34	33	4
594 D.A.	35	29	4
B18 N.D.A.	33	29½	24
B18 D.A.	33½	26½	24½
564 whole	18½	} Firing temperature is not known.	
564 broken	18		

## ANALYSIS

A partial chemical analysis of the five clays indicates that bauxite is not present in significant amounts.