

TR 11-199

## R. 511

### 38. CORNWALL COAL Co. N.L.: FIRECLAY FROM "THE GARDENS", ST HELENS

#### Sample

One sample was submitted for a preliminary evaluation for possible use as a refractory material.

#### Summary

The material shows promise as a high temperature insulating or construction material. With water addition it can be hand pressed into bricks of good green strength, which bond at 1000° C to give a firm white product.

At temperatures up to 1200° C the pressed brick shows no signs of distortion, bloating, cracking, nor any other visual faults.

#### Preparation and Testing

The material was sufficiently soft to be hand ground in a mortar and pestle to a fine state of subdivision. The ground material was then hand mixed with 12 per cent water and pressed into brick shapes using a small hand press. Air drying for 24 hours was followed by oven drying at 110° C for a further 24 hours. After evaluation, samples were then fired at various temperatures with two hour soakings, cooled and examined.

#### Test Results

Mix	Dry Green State	FIRED			
		950° C	1000° C	1100° C	1200° C
12% water added to ground material	Water lost on drying 9.7% Contraction Nil	Firing loss 8.7% Total contraction 1% No bonding	Firing loss 8.9% Total contraction 6% Bonded	Firing loss 9% Total contraction 6% Bonded	Firing loss 8.8% Total contraction 10% Bonded

#### Analysis

Chemical analysis indicated the following composition:—

SiO<sub>2</sub> 57%    R<sub>2</sub>O<sub>3</sub> 32%    MgO 1.7%    CaO 2.9%

#### Conclusion

Green pressed bricks are well formed without lamination. Excessive moisture will cause lamination with this material as too will excessive pressing.

Drying is rapid without distortion or severe contraction. Fired bricks are white, smooth, firm and without surface defects.

It would appear from a preliminary examination that very little, if any, clay material is present, and material bonding is taking place due to the small particle size and inherent nature of the material itself. If deposits of this material are sufficiently large, it would merit a detailed investigation as the material shows considerable promise.