

16/6.

WU/1A/113

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 3 OF 1968.

4264

TESTING OF A MAGAZINE EQUIPPED PROTOTYPE OF
A DOMESTIC COOKING AND HEATING STOVE FOR
THE SMOKELESS COMBUSTION OF BITUMINOUS
COALS AS MINED IN SOUTH AFRICA.

(Design: Mr. de Bly)

by

H.T. SORGNIT

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 3 OF 1968.

TESTING OF A MAGAZINE EQUIPPED PROTOTYPE OF
A DOMESTIC COOKING AND HEATING STOVE FOR
THE SMOKELESS COMBUSTION OF BITUMINOUS
COALS AS MINED IN SOUTH AFRICA.

(Design: Mr. de Bly)

In a discussion between Mr. de Bly and Dr. Sorgnit on January 11th, 1968 the following points were elaborated.

1. ALTERATIONS MADE TO THE EXISTING PROTOTYPE.

During the course of some preliminary tests carried out by Mr. de Bly at the Fuel Research Institute the following alterations were made on this prototype which have to be observed as basic and permanent:

- (a) All the holes for secondary air in the front plate underneath the door are closed completely.
- (b) The air intake for the secondary air to the hollow separating wall inside the combustion chamber is extended down to the slide for the grate by covering the relevant two adjoining cooling finns (ribs).
- (c) The grate is covered up in the front portion for 2".
- (d) Four holes of $\frac{3}{8}$ " diameter are drilled into the damper.
- (e) One $\frac{3}{8}$ " diameter hole in the wall of the magazine allows for the vapours from the green coal in the magazine to escape into the flues.

2. PURPOSE OF THIS STOVE.

As indicated already by the title of this memo, this stove has to cope with the following tasks in an average household:

- (a) To cook any type of food;
- (b) To provide for spare heating if required.

Besides...../

Besides these requirements the manufacturer claims the following additional advantages of this design:

- (a) The construction is economical;
- (b) all components can be produced by adopting mass production methods;
- (c) the assembly of the components can be carried out by unskilled labour;
- (d) the transport of the components requires a minimum of volume;
- (e) this basic design can be extended to provide for water heating and baking facilities.

3. TESTING OF PROTOTYPE STOVE.

This stove was designed in cooperation with the TRANSVAAL COAL OWNERS ASSOCIATION and the FUEL RESEARCH INSTITUTE and should be tested according to the standard testing procedures of the Fuel Research Institute.

Besides, it seems to be advisable to find out to what extent this stove will cope with the specific cooking attitudes of the Bantu population. This means that at least the following vital questions should be answered:

- (a) How long does it take to get this stove from the "banked" condition to the stage of cooking food (boiling water)?
- (b) How long does it take the stove to get from a "full load" into a "banked" condition when the damper is closed before the fire has had a chance to "come down"?
- (c) Are there, for the various cooking patterns, always the appropriate temperatures available on the plate of the stove?
- (d) What are the smoke patterns that may occur under the most extreme conditions?

The behaviour of all cast iron parts over fairly extensive periods of operation should be established.

PRETORIA
18th January, 1968.

H.T. SORGNIT
Senior Research Officer.