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FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 7 OF 1968.

COMBUSTION PROPERTIES OF MIXTURES OF SMOKELESS
FUELS AND WOOD.

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Many smokeless fuels are of low reactivity and thus not very suitable for use in open fire places as the ignition delay is unduly long and the rate of heat release low.

It would appear that these properties may be modified in a favourable sense by mixing woodchips with such fuels. This obviously increases the quantity of smoke generated, but woodsmoke is generally considered to be less objectionable than that produced by coal.

Two types of smokeless fuel were used in the experiments, performed to test the feasibility of the scheme, viz. Klippoortje char (of 4% V.M. and 19% ash) and anthracite (10% volatile matter, 10.2% ash). The wood, admixed to these fuels, was cut in $1\frac{1}{2}$ " cubes. Wood additions equal to 10, 20 and 30 and 40% of the smokeless fuel weight, were investigated. In addition, wood, char and anthracite were tested separately.

The experiments were performed in an open fireplace as used for the testing of domestic solid fuels according to B.S.3142.

The results of the experiments are best judged by inspection of the attached diagrams, figures 1 and 2. The addition of 20% of wood is adequate to achieve ignition times of less than 45 minutes, which in previous reports was considered to be very good.

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CHIEF RESEARCH OFFICER.

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FIG. 1
NATAL AMMONIUM
ANTHRACITE.

WITH 10% 20% 30% 40%
 WOODBLOCKS OF
 UNIFORM SIZE $1\frac{1}{2}$ ".

- PURE ANTHRACITE.
- · - · - 10% MIXTURE)
- · - · - 20% ") WOOD
- · - · - 30% ") BLOCKS
- · - · - 40% ")

TIME TO ATTAIN 200 BTU/hr./ft²

ANTHRACITE	58 MIN.
10% MIXTURE	60 MIN.
20% MIXTURE	35 MIN.
30% MIXTURE	30 MIN.
40% MIXTURE	24 MIN.

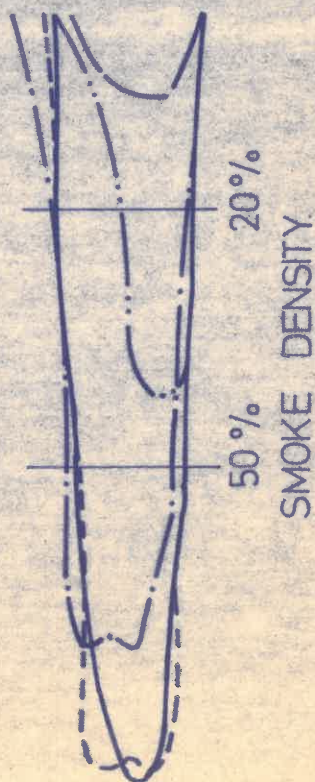
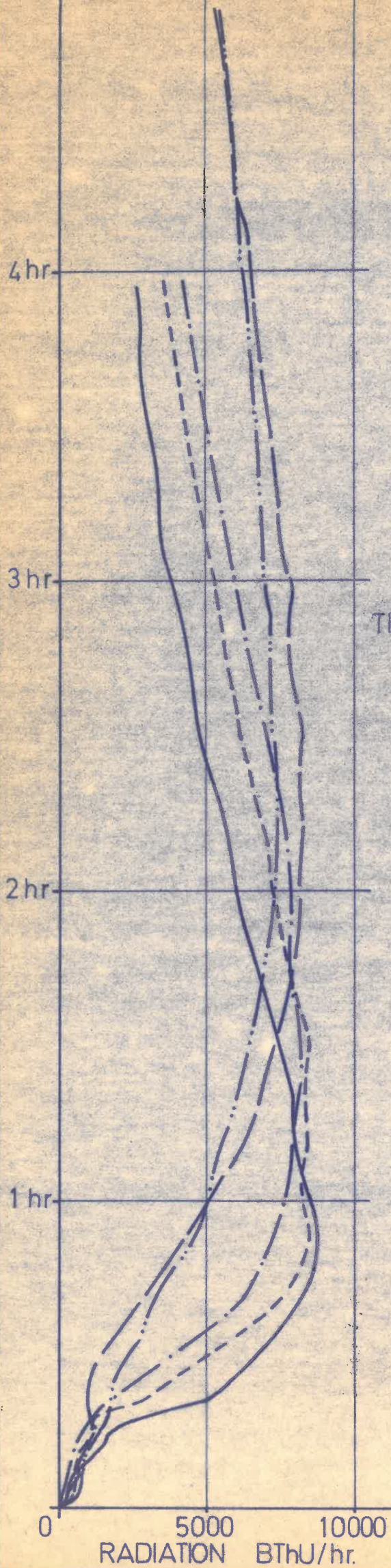


FIG. 2

KLIPPOORTJE CHAR

WITH 10% 20% 30% 40% WOOD -
BLOCKS OF UNIFORM SIZE $\frac{1}{2}$ "

- PURE CHAR.
- - - - - 10% MIX. } WOOD -
- · - · - 20% " } BLOCKS.
- · · - · 30% " }
- - - - - 40% " }
- - - - - PURE WOOD.

TIME TO ATTAIN 200 BTU/ft²/hr.

CHAR	77 MIN.
" + 10% WOODBLOCKS	60 MIN.
" + 20% "	41 MIN.
" + 30% "	39 MIN.
" + 40% "	34 MIN.
PURE WOODBLOCKS.	16 MIN.

