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WATER BOILING TESTS RESULTS FOR ECOZOOM JET B
(WITH 50% CERAMIC FIBER INSULATION) CHARCOAL STOVE

1.0 INTRODUCTION

The Water Boiling Tests (WBT) with ambient emissions were carried out at the University of Nairobi, Department of Chemistry Laboratories and were conducted on the following stoves:

2.0 METHODOLOGY

2.1 WATER BOILING TESTS.

These tests were done according to WBT version 4.2.3 Methodology and were completed on **28/03/2015**.

2.0 EMISSION TESTS

The emissions were carried out in a typical kitchen environment. The kitchen dimensions were as follows:-

2.1 KITCHEN DIMENSIONS

HEIGHT-8.3FT -WIDTH-9.5FT -LENGTH -11.3FT

WINDOWS: - W1-HEIGHT-2.2FT; -WIDTH-2.8FT; W2-HEIGHT-2.8FT -WIDTH-2.1FT

DOORS: - D1-HEIGHT-6.6FT -WIDTH-2.92FT; D2-HEIGHT-6.6FT-WIDTH-4.8FT

2.2. CARBON MONOXIDE (CO) AND CARBON DIOXIDE (CO₂).

Ambient concentrations of CO CO₂ and PM_{2.5} emissions were measured 1 meter away and 1 meter above the stove. Real-time measurements of CO and CO₂ were taken using a TSI IAQ-CALC 7545 (TSI Inc., The TSI IAQ-CALCs were calibrated immediately before deployment with NIST traceable zero and span gases, and again following deployment to check for any potential changes in response.

The reported values were average for each phase: Cold start phase, hot start phase and simmering phases.

2.3 PARTICULATE MATTER PM_{2.5}

The particulate matter (PM_{2.5}), and which are particles suspended in the air and with an aerodynamic diameter of less than 2.5 micrometers, were monitored with UCB Particle and Temperature Sensor (UCB-PATs). UCB data logger has a detection limit of between 30- 25,000 µg/m³, a logging interval of between 1-240 minutes and a storage capacity of 32768 records. The reported values were average for each phase: Cold start phase, hot start phase and simmering phase

3.0: RESULTS

3.1 CHARCOAL STOVES

The summary of WBT and emissions data results for EcoZoom Jet B (With 50% Ceramic fiber Insulation) charcoal stove is summarized in table 3.0

Table 3.0: Data for EcoZoom Jet B (With 50% Ceramic fiber Insulation) charcoal stove.

Parameter	Units	EcoZoom Jet B With 50% Ceramic fiber Insulation)
Time to boil	Min	27
Burning rate	g/min	4
Thermal efficiency	%	45%
Specific fuel consumption	g/liter	38
Fuel Consumption	grams	145
CO₂	ppm	826
CO	ppm	44
Particulate(PM_{2.5})	µg/m ³	73



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