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INSTITUTE OF ENGINEERING; UNIVERSITY OF ALGARVE; CAMPUS DA PENHA; FARO-PORTUGAL

**Study of most efficient interior colors for solar box
cookers**

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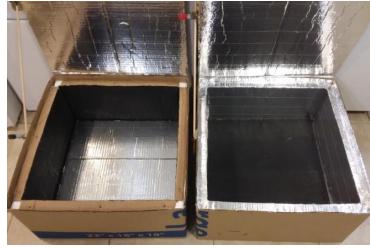
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Which Interior Color for Solar Box Cookers gets Hottest?



TEST 1

Black Sides/Black Bottom
vs
Foil Sides/ Foil Bottom
BS/BB vs FS/FB



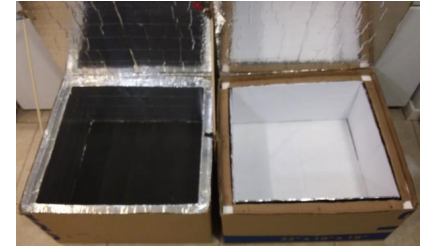
TEST 2

Black Sides/Foil Bottom
vs
Foil Sides/Black Bottom
BS/FB vs FS/BB



TEST 3

Black Sides/Black Bottom
vs
Foil Sides/Black Bottom
BB/BB vs FS/BB

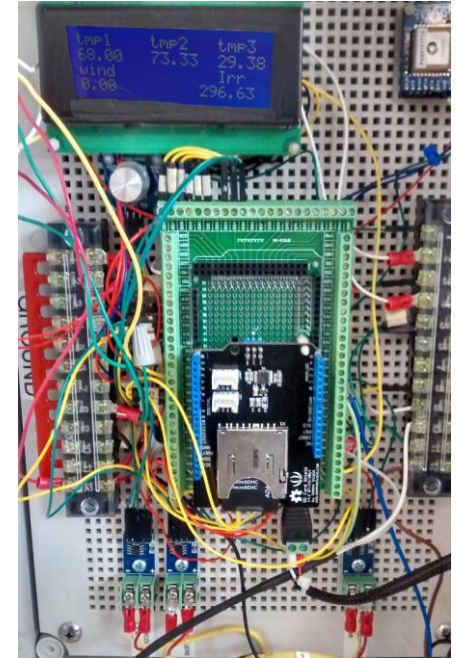
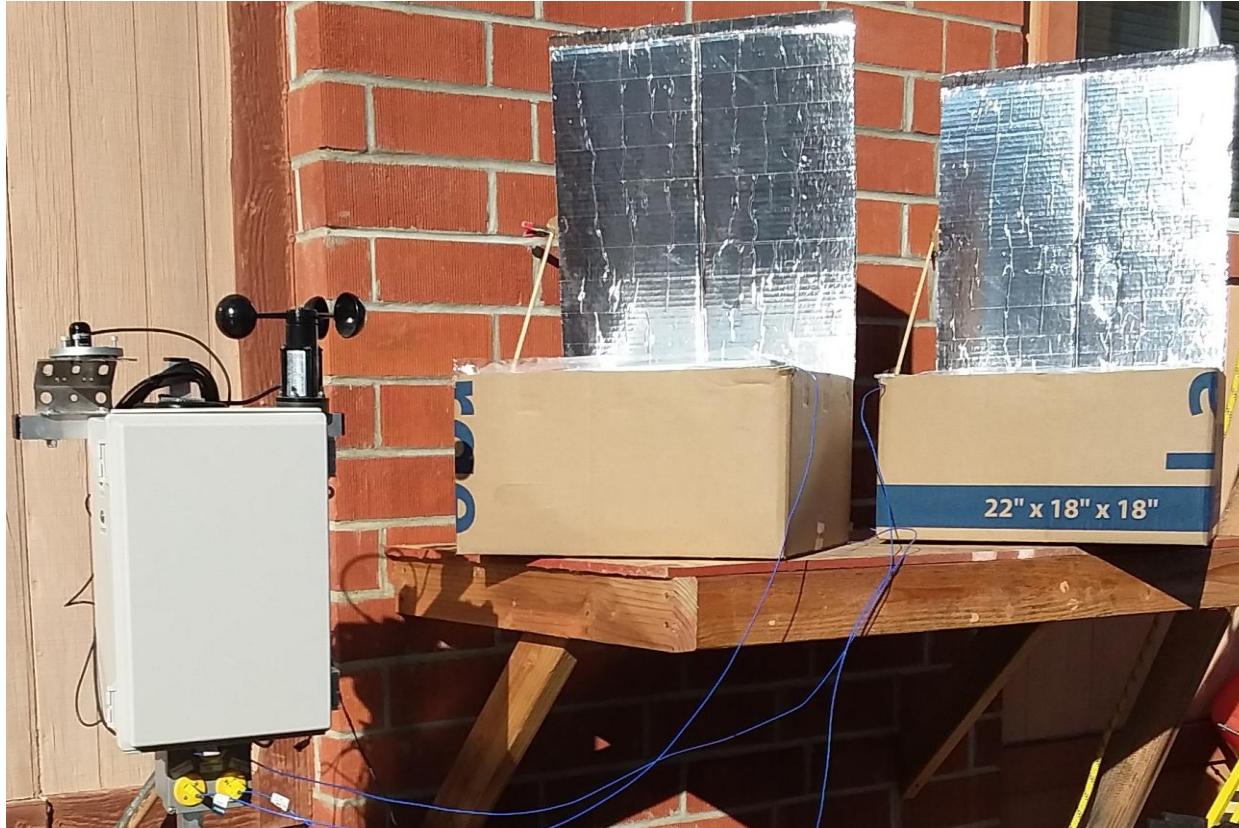


TEST 4

Foil Sides/Black Bottom
vs
White Sides/White Bottom
FS/BB vs WS/WB

Four (4) Tests follow Comparing Two(2) Solar Cookers at a Time.

Setting up for the testing of the box cookers



Setup for the interior of the box cookers



Black Pan with one liter of water on a rack



Thermocouple location in water



Pan position in box

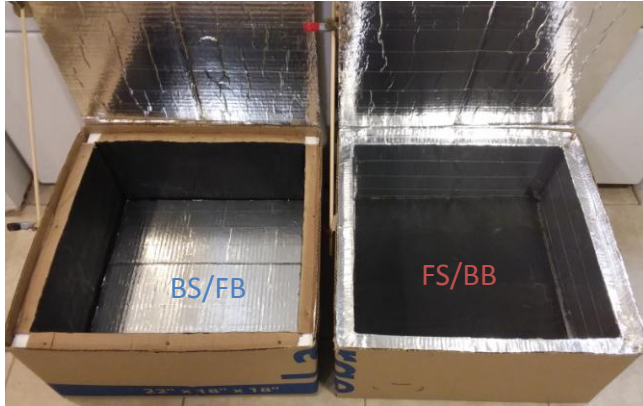


Oven bag stretched in screen frame for glazing

Test Results from Black Sides/Foil Bottom

VS

Foil Sides/Black Bottom



TEST 2

Black Sides /Foil Bottom (BS/FB)

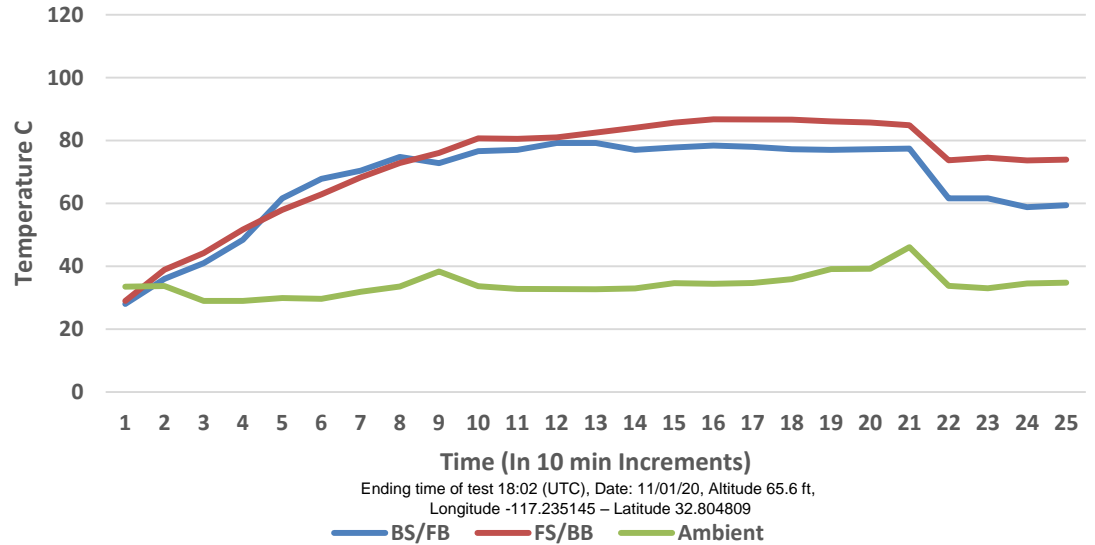
Vs

Foil Sides/Black Bottom (FS/BB)

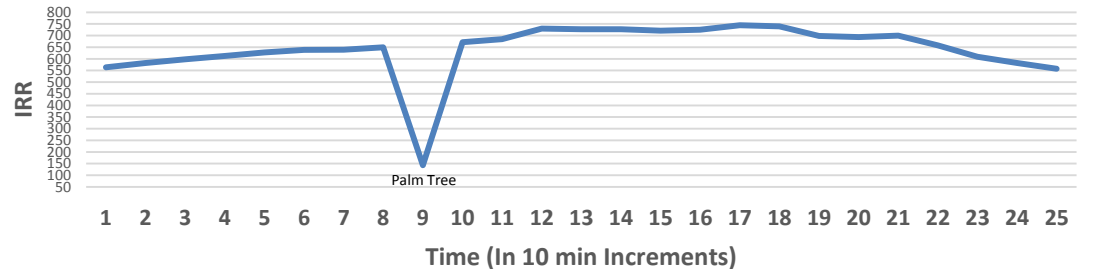
Four (4) Hour Test

Winner FS/BB

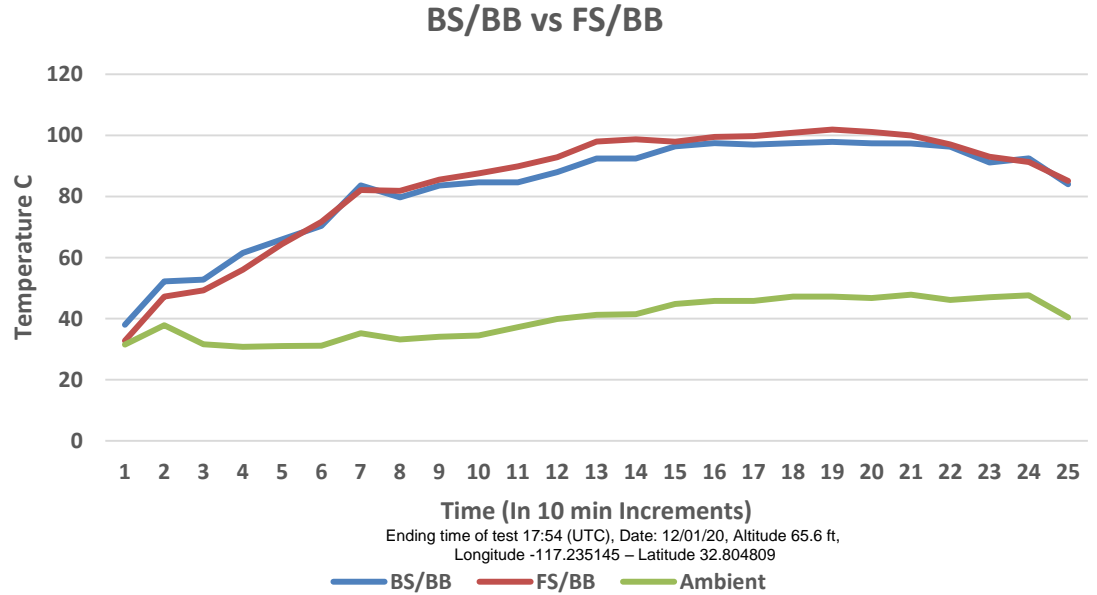
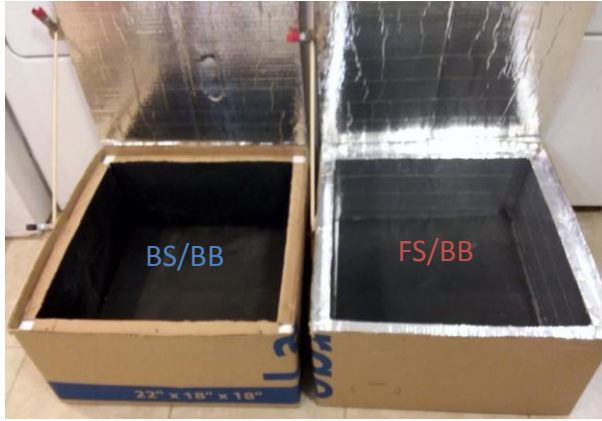
BS/FB vs FS/BB



Irradiance Measurement

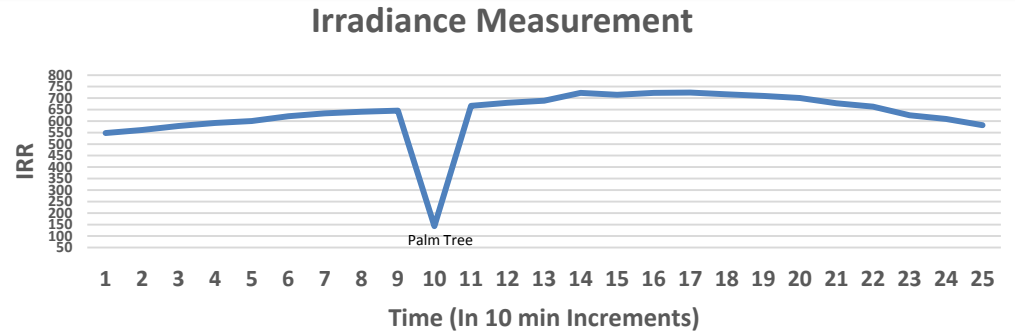


**Test Results from Black Sides/Black Bottom
vs
Foil Sides/Black Bottom**



TEST 3

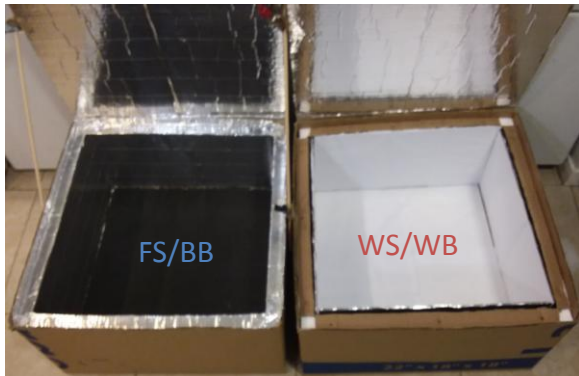
Black Sides /Black Bottom (BS/BB)
Vs
Foil Sides/Black Bottom (FS/BB)
Four (4) Hour Test
Winner FS/BB



Test Results from Foil Sides/Black Bottom

vs

White Sides/White Bottom



Test 4

Foil Sides /Black Bottom (FS/BB)

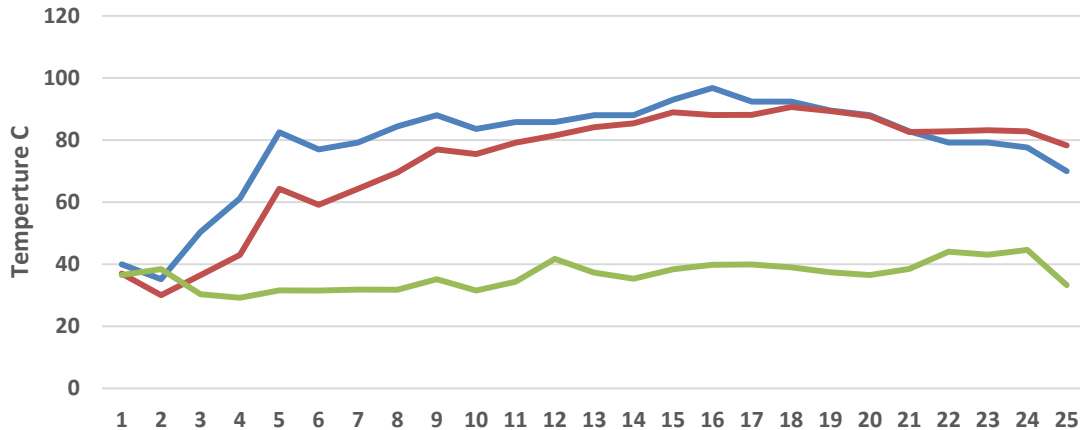
Vs

White Sides/White Bottom (WS/WB)

Four (4) Hour Test

Winner FS/BB

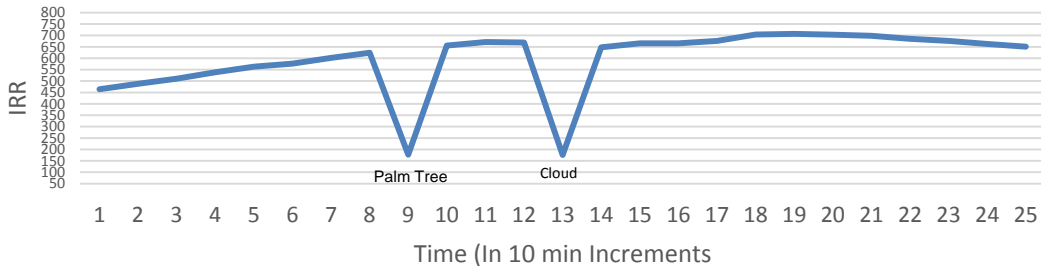
FS/BB vs WS/WB



Ending time of test 17:27 (UTC), Date: 12/13/20, Altitude 65.6 ft,
Longitude -117.235145 – Latitude 32.804809

— FS/BB — WS/WB — Ambient

Irradiance Measurement



STUDY OF THE MOST EFFICIENT INTERIOR COLORS FOR SOLAR BOX COOKERS

The question many new solar cooks ask is

“What interior color combinations for a solar cooker gets the hottest?”

To answer this question I conducted four (4) tests using five different interior colors.

Test #1	BS/BB vs FS/FB	The winner by 4 degrees C	BS/BB
Test #2	BS/FB vs FS/BB	The winner by 8 degrees C	FS/BB
Test #3	BS/BB vs FS/BB	The winner by 4 degrees C	FS/BB
Test #4	FS/BB vs WS/WB	The winner by 8 degrees C	FS/BB



The data shows that the box with Foil Sides and Black Bottom was superior by only 4 to 8 degrees C in each test. All interior colors combinations reached the minimum temperature requirement of 65.5 degrees C to pasteurize water.