

# SUMMARIZED SAFETY EVALUATION PROCEDURES

Stove _____	Location _____
Tester _____	Date _____

## 1. SHARP EDGES AND POINTS

**Equipment:** Cloth, rag, or loose clothing

**Procedure:**

- a) Rub cloth along exterior surfaces
- b) Note number of times cloth catches / tears

Rating	No. of catches
Poor	four or more
Fair	three
Good	one or two
Best	none

No. \_\_\_\_\_

<b>Result 1</b>	
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Notes:

## 2. COOKSTOVE TIPPING

*(immobile cookstoves get Best rating)*

**Equipment:** Fuel, ruler / tape measure, calculator

**Procedure:**

- a) Set stove on flat surface and load with fuel but do not ignite
- b) Pick a side to tip towards and measure the height of its tallest point, place value into Table A
- c) Slowly tip cookstove in the outward direction from the side chosen until the stove begins to tip on its own
- d) Hold stove tilted where it can overturn and measure new height of the point chosen in part 'b', place value into Table A
- e) Using a calculator, divide the tipped height by the standing height to find the ratio R, place into Table A
- f) Repeat process as many times as there are legs on the stove (or four times for a circular base)
- g) Use the largest ratio in Table A with the metric in Table B to find the most deficient rating for the result

**A**

Run	Starting Height	Tipped Height	Ratio
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____

**B**

Rating	Ratio
Poor	$R > 0.978$
Fair	$0.961 < R < 0.978$
Good	$0.940 < R < 0.961$
Best	$R < 0.940$

<b>Result 2</b>	
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Notes:

**3. CONTAINMENT OF FUEL** (solar stoves receive Best rating)

**Equipment:** Fuel, ruler / tape measure, cookpot

**Procedure:**

- a) The cookstove should be stocked with fuel but not ignited
- b) Place cookpot onto burner
- c) Sum approximate areas through which fuel can be seen
- d) Use the summation of area, A, to find the rating

Rating	Area exposed (cm <sup>2</sup> )
Poor	$A \geq 250$
Fair	$150 \leq A < 250$
Good	$50 \leq A < 150$
Best	$A < 50$

Area \_\_\_\_\_

Notes:

<b>Result 3</b>	
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**4. OBSTRUCTIONS NEAR COOKING SURFACE**

(skirt-stove = Good; solar = Best)

**Equipment:** Ruler / tape measure

**Procedure:**

- a) Inspect cookstove for skirt, do not perform if skirt is present
- b) Measure height difference between the cooking surface and obstructions surrounding the cooking surface
- c) Use the largest height difference, D, to find the rating

Rating	Difference (cm)
Poor	$D \geq 4$
Fair	$2.5 \leq D < 4$
Good	$1 \leq D < 2.5$
Best	$D < 1$

Largest \_\_\_\_\_

Notes:

<b>Result 4</b>	
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**5. SURFACE TEMPERATURE; 6. HEAT TRANSMISSION TO SURROUNDINGS;  
7. TEMPERATURE OF OPERATIONAL CONSTRUCTION**

(solar Result 6 = Poor)

**Equipment:** Fuel, igniter, chalk, ruler / tape measure, hand-held thermocouple

**Procedure:**

- a) Chalk 8 x 8 cm grid onto cookstove and also within an outline of cookstove on the floor if within 5 cm of undercarriage, and within an outline of cookstove onto the wall if within 10 cm, while continuing the grid 16 cm higher up the wall than the top of the cookstove, if stove is mounted to floor or wall, take supplementary wall and floor temperatures by using cookstove surface temperature near where it attaches to floor or wall
- b) Chalk extra thick lines at 0.9m and 1.5m onto cookstove, if applicable c) Ignite fuel and continue up to step 'g' then wait at that step until cookstove has reached max temp (~20 min) before proceeding, adding fuel when necessary
- d) Devise a convenient method to reference your stove by which data corresponds to the point tested
- e) Measure air temp f) Compute values for Tables B by adding air temp to temps located in Tables A
- g) Take data using thermocouple at grid intersections h) Start with wall and floor by moving cookstove away to take measurements for up to one minute, then return cookstove for at least five minutes, taking surface temp and operational construction temp data while waiting, repeat step 'h' until all data points have been checked
- i) Find max temps for all scenarios j) Find which rating is given by the max temp using Tables B
- k) Use most deficient ratings for the results

Air temp \_\_\_\_\_

**SURFACE TEMPERATURE**

		<i>Below child-line (&lt; 0.9 m)</i>		<i>Above child-line (&gt; 0.9 m)</i>	
<b>Rating</b>		<b>Metallic</b>	<b>Nonmetallic</b>	<b>Metallic</b>	<b>Nonmetallic</b>
<b>5A</b>	Poor	$T \geq 50$	$T \geq 58$	$T \geq 66$	$T \geq 74$
	Fair	$44 \leq T < 50$	$52 \leq T < 58$	$60 \leq T < 66$	$68 \leq T < 74$
	Good	$38 \leq T < 44$	$46 \leq T < 52$	$54 \leq T < 60$	$62 \leq T < 68$
	Best	$T < 38$	$T < 46$	$T < 54$	$T < 62$
<b>5B</b>	Poor	$T \geq \underline{\quad}$	$T \geq \underline{\quad}$	$T \geq \underline{\quad}$	$T \geq \underline{\quad}$
	Fair	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Good	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Best	$T < \underline{\quad}$	$T < \underline{\quad}$	$T < \underline{\quad}$	$T < \underline{\quad}$
<b>Max/Rating</b>		$\underline{\quad} / \underline{\quad}$	$\underline{\quad} / \underline{\quad}$	$\underline{\quad} / \underline{\quad}$	$\underline{\quad} / \underline{\quad}$

**HEAT TRANSFER TO THE ENVIRONMENT**

<b>Rating</b>		<b>Floor</b>	<b>Wall</b>
<b>6A</b>	Poor	$T \geq 65$	$T \geq 80$
	Fair	$55 \leq T < 65$	$70 \leq T < 80$
	Good	$45 \leq T < 55$	$60 \leq T < 70$
	Best	$T < 45$	$T < 60$
<b>6B</b>	Poor	$T \geq \underline{\quad}$	$T \geq \underline{\quad}$
	Fair	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Good	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Best	$T < \underline{\quad}$	$T < \underline{\quad}$
<b>Max/Rating</b>		$\underline{\quad} / \underline{\quad}$	$\underline{\quad} / \underline{\quad}$

**HANDLE TEMPERATURE**

<b>Rating</b>		<b>Metallic</b>	<b>Nonmetallic</b>
<b>7A</b>	Poor	$T \geq 32$	$T \geq 44$
	Fair	$26 \leq T < 32$	$38 \leq T < 44$
	Good	$20 \leq T < 26$	$32 \leq T < 38$
	Best	$T < 20$	$T < 32$
<b>7B</b>	Poor	$T \geq \underline{\quad}$	$T \geq \underline{\quad}$
	Fair	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Good	$\underline{\quad} \leq T < \underline{\quad}$	$\underline{\quad} \leq T < \underline{\quad}$
	Best	$T < \underline{\quad}$	$T < \underline{\quad}$
<b>Max/Rating</b>		$\underline{\quad} / \underline{\quad}$	$\underline{\quad} / \underline{\quad}$

<b>Result 5</b>	
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<b>Result 6</b>	
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<b>Result 7</b>	
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Notes:

**8. CHIMNEY SHIELDING**

*(solar stoves and stoves without chimneys receive Best rating)*

**Equipment:** Fuel, igniter, chalk, ruler / tape measure, hand-held thermocouple

**Procedure:**

- a) If the chimney has no protective shielding, surface temperature metrics from Test 5 are used for rating
- b) If the chimney has protective covering, measurements are taken to calculate the average area of gaps, A

<b>Rating</b>	<b>Hole size (cm<sup>2</sup>)</b>
Poor	$A \geq 150$
Fair	$50 \leq A < 150$
Good	$10 \leq A < 50$
Best	$A < 10$

Notes:

Area \_\_\_\_\_

<b>Result 8</b>	
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## 9. FLAMES SURROUNDING COOKPOT

*(solar stoves receive Best rating)*

**Equipment:** Cookpot

**Procedure:**

- a) Keep cookstove fully ablaze from previous tests
- b) Place cookpot into cooking position
- c) Observe the amount of uncovered flames surrounding the cookpot and record a description
- d) Compare description with table to find rating
- e) Remove cookpot

Rating	Amount of Uncovered Flames Touching Cookpot
Poor	entire cookpot and/or handles
Fair	most of cookpot, not handles
Good	less than 4 cm up the sides, not handles
Best	none

<b>Result 9</b>	
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**Description** \_\_\_\_\_

Notes:

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## 10. FLAMES EXITING FUEL CHAMBER, CANISTER, OR PIPES

*(solar stoves = Best)*

**Equipment:** None

**Procedure:**

- a) Keep cookstove fully ablaze from previous tests
- b) Visually inspect the amount, if any, of flames coming out of the fuel chamber, canister, or pipes and record if flames do or not protrude
- c) Consult table to find rating

Rating	Occurrence of Fire
Poor	Flames protrude
Best	Flames are contained

<b>Result 10</b>	
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**Description** \_\_\_\_\_

Notes:

## OVERALL COOKSTOVE SAFETY RATING

To calculate the overall cookstove safety rating, place the point value of each individual rating underneath the "Value" column. Next multiply the individual ratings by their respective weights and place result in "Total" column. A summation of these values is then calculated and placed into the box *SUM*. This value is applied to the overall rating metric to provide the overall safety rating of the stove.

Test	Value	Weight	Total
1	_____	x	1.5 = _____
2	_____	x	3 = _____
3	_____	x	2.5 = _____
4	_____	x	2 = _____
5	_____	x	2 = _____
6	_____	x	2.5 = _____
7	_____	x	2 = _____
8	_____	x	2.5 = _____
9	_____	x	3 = _____
10	_____	x	4 = _____
<b>SUM</b>			<div style="border: 3px double black; width: 80px; height: 20px; margin: 0 auto;"></div>

Individual Rating	Value
Best	4
Good	3
Fair	2
Poor	1
Overall Rating	Total point score
Best	$93 \leq S \leq 100$
Good	$84 \leq S \leq 92$
Fair	$76 \leq S \leq 83$
Poor	$25 \leq S \leq 75$

*Overall Rating*

Notes: