

Team: InnovationDistillation / Group A4	Score (Out of 100 pts)
1. Frame (Max: 15 pts)	Rating_____
2. Power Transmission (Max: 15 pts)	Rating_____
3. Water Distillation System (Max: 30 pts)	Rating_____
4. Frame, Power, and Distillation Integration (Max: 30 pts)	Rating_____
5. Embedded Intelligence (Max: 10 pts)	Rating_____
	Total:_____

1. Frame (Max Possible: 15 pts)

a. Weight of Frame (Max: 3pts)

- 0 – Weight < 70 lbs
- 1 – Weight < 60 lbs
- 2 – Weight < 50 lbs
- 3 – Weight < 45 lbs

b. Volume (Max: 3pts)

- 0 – Length + Girth < 6 m
- 1 – Length + Girth < 5 m
- 2 – Length + Girth < 4.5 m
- 3 – Length + Girth < 4.2 m

c. Number of discrete parts* to assemble (Max: 3 pts)

- 0 – Parts < 8
- 1 – Parts < 7
- 2 – Parts < 6
- 3 – Parts < 5

*Parts that remain attached after disassembly are considered as one part

d. Durability of frame (Max: 3 pts)

Frame can withstand average rider (180 lbs), pedaling 90 rpm's without any maintenance needs for:

- 0.5 – Time > 15 mins
- 1 – Time > 30 mins
- 2 – Time > 45 mins
- 3 – Time > 60 mins

e. Assembly Time (Max: 3pts)

- 0 – Assembly < 6 mins

- 1 – Assembly < 5 mins
- 2 – Assembly < 4 mins
- 3 – Assembly < 3 mins

2. Power Transmission (Max Possible: 15 pts)

a. Gear / sprocket / Generator Durability (Max: 5 pts)

Barring frame durability, power transmission assembly withstands operation under previously described conditions for:

- 0 – Time < 5 mins
- 1 – Time > 5 mins
- 2 – Time > 15 mins
- 3 – Time > 30 mins
- 4 – Time > 45 mins
- 5 – Time > 60 mins

b. Gear / sprocket / Generator Assembly (Max: 5 pts)

Under continuous operation for amount of time governed by frame durability (Time may be restricted by Frame Durability and will not be graded down for frame failure prior to power connection failures).

- 0 – Assembly deficiencies restrict generator shaft from spinning
- 1 – Limited generator shaft motion: produces < 20 Watts
- 2 – Generator shaft spins adequately to produce > 20 Watts
- 3 – Generator shaft spins sufficiently to produce > 60 Watts
- 4 – Generator shaft spins sufficiently to produce > 100 Watts
- 5 – Generator shaft spins to produce > 150 Watts

c. Gear / sprocket / Generator Flexibility (Max: 5pts)

- 0 – Connections are restricted such that no adjustments can be made
- 1 – One part is adjustable, but highly difficult to accomplish
- 2 – Some parts are adjustable, but difficult to accomplish
- 3 – Some parts are adjustable, giving system some flexibility
- 4 – Most parts are adjustable, giving system adequate flexibility
- 5 – Most parts are easily adjustable, giving system adequate flexibility and rigidity

3. Water Distillation System (Max Possible: 30 pts)

Note: (Water Distillation System refers to the following integrated components: boiler, condenser, heating element, TEC module, piping)

Tests for the following system may be performed with an external power source equivalent to 150 Watts if the previous two sections inadequately provide this energy

a. Boiler / Heating Element (Max: 10 pts)

Heating element raises 200mL of water within boiler to a temperature of 100 C within:

- 0 – Does not accomplish
- 2 – 1 hour
- 4 – 45 mins

- 6 – 35 mins
- 8 – 25 mins
- 10 – 20 mins

b. Boiler / Thermoelectric Module (Max: 10 pts)

Once temperature of water is raised to 100 C TEC operates:

- 0 – Temperature of water decreases continually
- 2 – Temperature of water is maintained, but no significant boiling
- 4 – Boiling steadily for 10 mins without needed switch to heating element
- 6 – Boiling steadily for 15 mins without needed switch to heating element
- 8 – Boiling steadily for 20 mins without needed switch to heating element
- 10 – Boiling steadily for 25 mins without needed switch to heating element

c. Condenser / TEC (Max: 10 pts)

Considering the amount of water boiled through one or several of the tests performed above:

- 0 – 0 % of boiled water condensed
- 2 – 20 % of boiled water condensed
- 4 – 40 % of boiled water condensed
- 6 – 60 % of boiled water condensed
- 8 – 80 % of boiled water condensed
- 10 – 100% of boiled water condensed

4. Frame, Power, Distillation System Integration (Max Possible: 30 pts)

a. Frame and Power Transmission Integration (Max: 10 pts)

Two systems integrate and work together for:

- 0 – Do not have adequate connections
- 2 – 10 mins
- 3 – 20 mins
- 6 – 40 mins
- 8 – 1 hour
- 10 – 1 hour for more than a single use

b. Frame and Distillation System Integration (Max: 10 pts)

- 0 – Two systems completely separate
- 2 – Distillation System inadequately integrated into frame
- 4 – Distillation System attached to frame, but shaking and vibrations limit operation
- 6 – Two systems adequately integrated to work together
- 8 – Two systems complement each other and are space efficient while working together
- 10 – Distillation System rigidly and compactly integrated within the frame in a unique and adequate design

c. Complete System (Max: 10 pts)

Three systems operate to ultimately condense water for:

*If time does not permit boiling/condensing, must determine whether operation for that time period was desired operation. (Water temperature)

0 – 3 systems are not integrated for intended use

2 – 10 mins

4 – 20 mins

6 – 40 mins

8 – 1 hour

10 – 1 hour for more than a single use

5. Embedded Intelligence (Max Possible: 10 pts)

a. Sequential Operation Feasibility (Max: 10 pts)

0 – Inoperable

2 – Operable, but not as intended

4 – Sequential operation shown feasible though compiled and operable program, but switch is not integrated.

6 – Sequential operation shown feasible by using integration of a switch to imitate automatic transitions between the heating element and TEC.

8 – Sequential operation shown feasible by using integration of a switch to imitate automatic transitions between the heating element and TEC. TEC is kept safe from burning up.

10 – Sequential operation shown feasible by using integration of a switch to imitate automatic transitions between the heating element and TEC. Transition points are ideal to continue boiling and condensing of water. TEC is kept safe from burning up.