

# "Armadillo 1.0"

## A Low-Cost Off-Grid Water Pathogen Testing Device

### What is the Armadillo?

Armadillo is an open source device that enables on-site quantification of waterborne *E.coli* and coliform bacteria. The device utilizes inexpensive bacterial indicating plates and is capable of incubating up to forty on a single battery charge. Once inoculated with small samples of water these bacterial indicating plates are exposed to 37°C for a period of 48 hours inside of the Armadillo after which they display the presence and quantity of potentially harmful bacteria.

### Why is the Armadillo needed?

Water quality improvement projects in developing countries often require on-site analysis and language-independent data visualization. Currently, bacterial indicating plates are incubated by taping them against an engineer's skin for the duration of the incubation which proved to be an irritating and error-prone process. This analysis may also be carried out by external labs, a time expensive process that generates data which is hard to use persuasively with community members. Armadillo offers a simple, low-cost solution.

### How difficult is Armadillo to make?

Armadillo costs less than \$200 and can be assembled in less than 2 hours with parts readily available at a hardware store and/or Amazon. Instructions can be found here: [instructables.com/id/Portable-Petrifilm-Incubator-for-Inexpensive-In-Fi/](https://www.instructables.com/id/Portable-Petrifilm-Incubator-for-Inexpensive-In-Fi/)

### Specifications

- Allows for 65 hours of incubation at 37±1°C<sup>†</sup>
- Material cost under \$150
- Only 2 hours of assembly time required
- Capable of incubating 40 indicating plates per battery charge
- External temperature display
- Weighs only 7 pounds

<sup>†</sup>At external temperatures below 22°C run time may be reduced

### Who created Armadillo?

A collection of students and professionals working at EWB-USA -Greater Austin Chapter.

### Where can I find out more?

Contact us at [instrumentation-members@ewbgreataustin.org](mailto:instrumentation-members@ewbgreataustin.org) with any questions, comments, or concerns.

<https://ewbgreataustin.org/>

<https://github.com/EWB-Austin/petrifilm-incubator>

