Green | Assembly Review
PeltiCool
The Coolest Way to Recover.
Agenda

Overview
Background
Product Vision
Assembly Overview
Components Investigation
PeltiCool

A flexible thermal bandage that utilizes the Peltier effect to reverse its heat flow to provide both cold and hot treatment for acute injuries.
User’s Voice

- Long-lasting
- Flexible
- Clean and dry
Market Opportunity

- Limited use time
- Rigid
- Too much condensation

- Only capable of cooling
- Restrictive bandage types
- Messy refilling method
For use on injuries for which hot and/or cold therapy is prescribed.
Ex: sprain, pulled muscle, minor aches & pains.
Turn on and select desired temperature.
Wait to reach temperature.
Wrap bandage around affected area.
Use as prescribed.
Enjoy the effects of cold and hot therapy.
Unwrap bandage from body and fold.
Store until next use.
Assembly
Fluid Circuit

**Overview**

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**Product Vision**

**Assembly Overview**

**Components Investigation**

- **Heat Exchanger**: Cools Fluid Pushes to Bandage
- **Reservoir**: Pushes Fluid To Heat Exchanger
- **Outlet Tube**: From Bandage To Reservoir
- **Inlet Tube**: To Bandage From Housing
- **Pump**: Distributes Fluid Through Bandage
- **Manifold**: From Housing To Bandage
Electronics-Control

USB Programming Interface

Microcontroller ATMEGA4809

H-Bridge
MOSFET
MOSFET

Peltier
Cooling Fan
Water Pump

Thermocouple Reader

User Interface

OLED Screen
Encoder
Overview

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Electronics-Power

AC Adapter

Battery Charger and Power Path Management

Power Button

MOSFET Load Switch

Buck Converter

22.2V 9000mah Li-Ion Battery (6S2P)

BMS (Battery Management System)

System 24V

System 5V
Electronics-PCB

- 4A Charging Current
- Programming Port: USB-C
- Connectors: Screwless
- Dimensions: 89mm x 78mm
Bandage System

Bandage Tubing
6 x 1/16" ID Silicone Tube

Manifold Subassembly
Manifold Subassembly

- Left Inlet
- Manifold
- Right Outlet
- Fittings
  - Swivel
  - Adapters
Bandage Tubing

Bandage Tubing
Connects to Outlets of Manifold Subassembly

Elastic Thread
Woven Around Tubes for Bandage-like Structure
Sealing System

O-Ring
Seals Fitting to Component

Barbed Fitting
Watertight Seal with Tubing
Housing System

- Housing Lid
  - Vent Holes For Fan

- Access Panel
  - PCB Maintenance

- QD Thru-Holes
  - To/From Bandage

- User Interaction Buttons
  - On/Off; Temp. Set; Screen

Dimensions:
- 105mm
- 280mm
- 172mm
Thank You.
<table>
<thead>
<tr>
<th>Customer Need</th>
<th>Product Attribute</th>
<th>Engineering Spec</th>
</tr>
</thead>
<tbody>
<tr>
<td>flexible multipurpose bandage form</td>
<td>radius of curvature and length</td>
<td>length: &gt; 1m r.o.c: &lt; 1in</td>
</tr>
<tr>
<td>long-lasting use on the go</td>
<td>rechargable battery operating time</td>
<td>~ 2 hours</td>
</tr>
<tr>
<td>portable &amp; compact size</td>
<td>volume</td>
<td>&lt; 5000 cm³</td>
</tr>
<tr>
<td>can conform + maintain form set by user</td>
<td>self-adherence</td>
<td>yes/no</td>
</tr>
<tr>
<td>effectively cools/heats skin</td>
<td>skin surface temperature after treatment</td>
<td>cold: 5 – 15°C hot: 35 – 40°C</td>
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