

## **SmokeCloak**

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**Particle Filter** 

• ~25 µm





**On-Helmet** 

## **Background**



Severity of wildfires has increased in recent years due to climate change

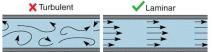
Wildland firefighters inhale dust, ash, and soot, which cause negative respiratory conditions



No dedicated respiratory technology that meets wildland firefighting needs

## **Objectives**

- 1. Meets NFPA & OSHA Standards:
  - ✓ Environmental resistance: heat (150°F), water resistant (IPX3), & impact
- 2. Fulfills customer requests:
  - ✓ Compatibility: compatible with existing gear, face shapes, & tasks
  - ✓ Experience: lightweight (<2.5)
    </p> lbs), no facial contact, quiet (<90 dB)
  - ✓ Price: \$80 per unit
    - \$42.50 to manufacture
- 3. Core functionality objective:
  - ✓ Produces air curtain that deflects particles in 10 mph headwind for 4+ hours
    - Particle deflection
  - No entrainment



Water resistant

### **Rectangular Outlet Nozzle**

- Adjustable outlet angle
- Ideal range 30-45° from
- · Designed for laminar flow

ScotchWeld

## **Helmet-Mount Buckle**

Bonded with DP8010

Easy attachment

# **Future Work**

Adaptable

& Versatile

**User Impact** 

"We don't wear respirators or

anything... Do they make them? Yeah. But it gets so hot, you can't

breathe."

~BMFPD Chief John Benson

No Vision

Obstruction.

- Refine & expand design
- Multiple helmet styles
- Higher operable windspeed
- o Finer particle filtration
- · Move to injection molding
- \$100k initial investment
- Secure contracts & partnerships
- **Expand to secondary** markets
- Construction
- Civilian

**On-Off Switch** 

Intuitive

Out of the way

# Want: 1800 < Reynolds Number (RE) < 2100 SmokeCloak RE vs Time Upper Limit Lower Limit

40mm Tubeaxial Fan

**Loc-Line Hose** 

shapes

Fits all face

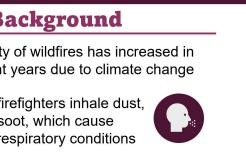
Adjustable length

Easy to

Use

• 18.4 CFM

• 3.7 Watts



**Battery Pack** 

8 AA's = 12V

- face
- - **Test Results**

Blowing ash & dust with 10 mph direct headwind

**BREATHING ZONE** 

With SmokeCloak

**BREATHING ZON** 

Without SmokeCloak

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