

Industrial Design Portfolio

XingHan Gao (Peter)





I am Peter, nice to meet you!

Industrial designer skilled in research-driven design, product development, and manufacturability. I collaborate with teams and design leads to create distinctive, brand-focused products while bringing energy and curiosity throughout the design process.

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DianShi Stationery (Writech) – Product Design Intern



POSCO China – Public Relations Intern



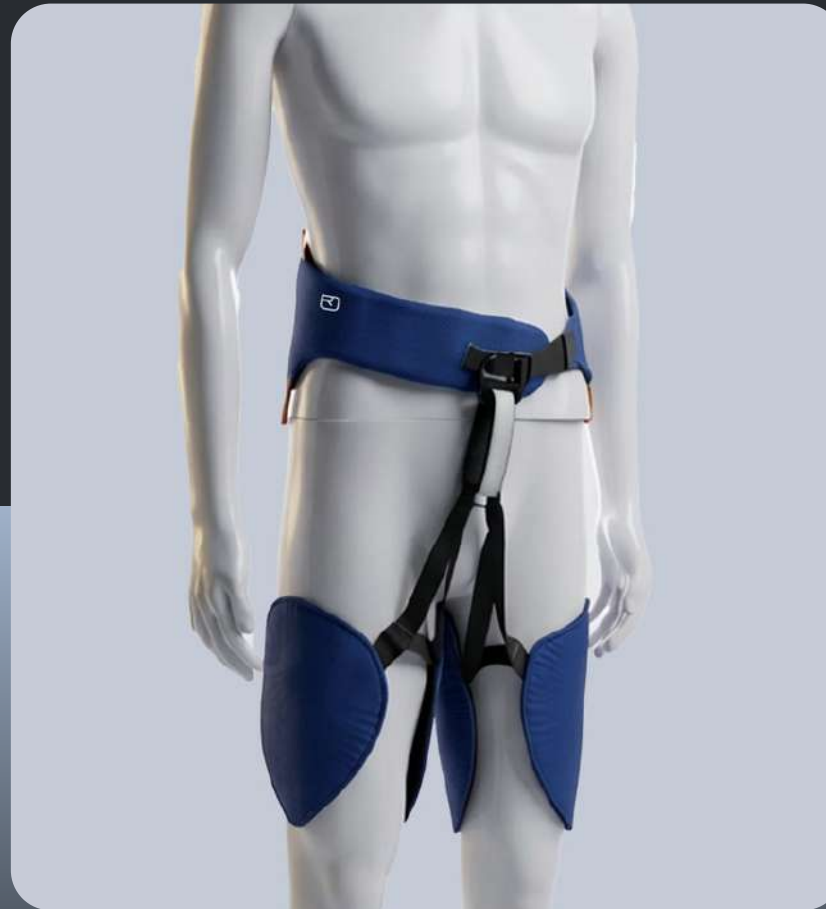
ArtCenter College of Design – Product Design Instagram Manager



LEGO FLOW STUDIO

Stop motion kit

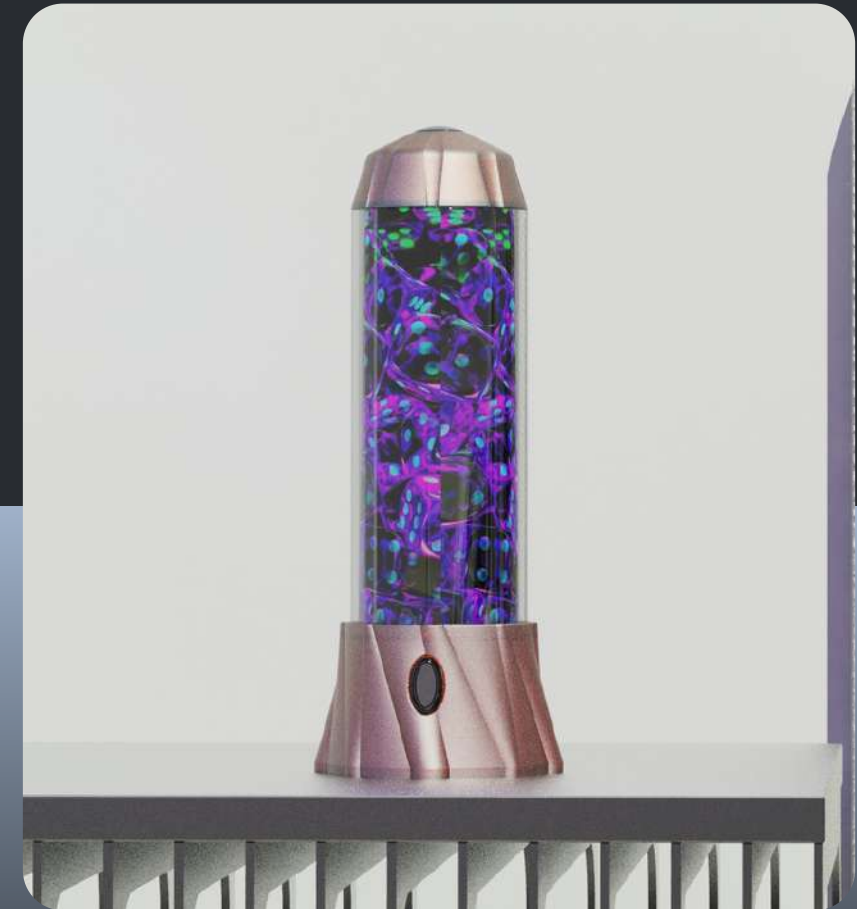
01



KLUFLIT AXIS HARNESS

Mountaineering harness

02



ORIEL LAVA LAMP

Lava lamp redesign

03



LEGO® Flow Studio

<https://www.peterprotasiodesign.com/about>



Stop-Motion Filming

A multifunctional kit packed into a portable suitcase.









- Young Kids (4–9): High engagement and purchase activity.
- Pre-teens (7–12): Peak interest in building and creativity.
- Teens (13–17): Less frequent play, but continued interest in building.

**Children's engagement with
LEGO often declines around
ages 9–12**



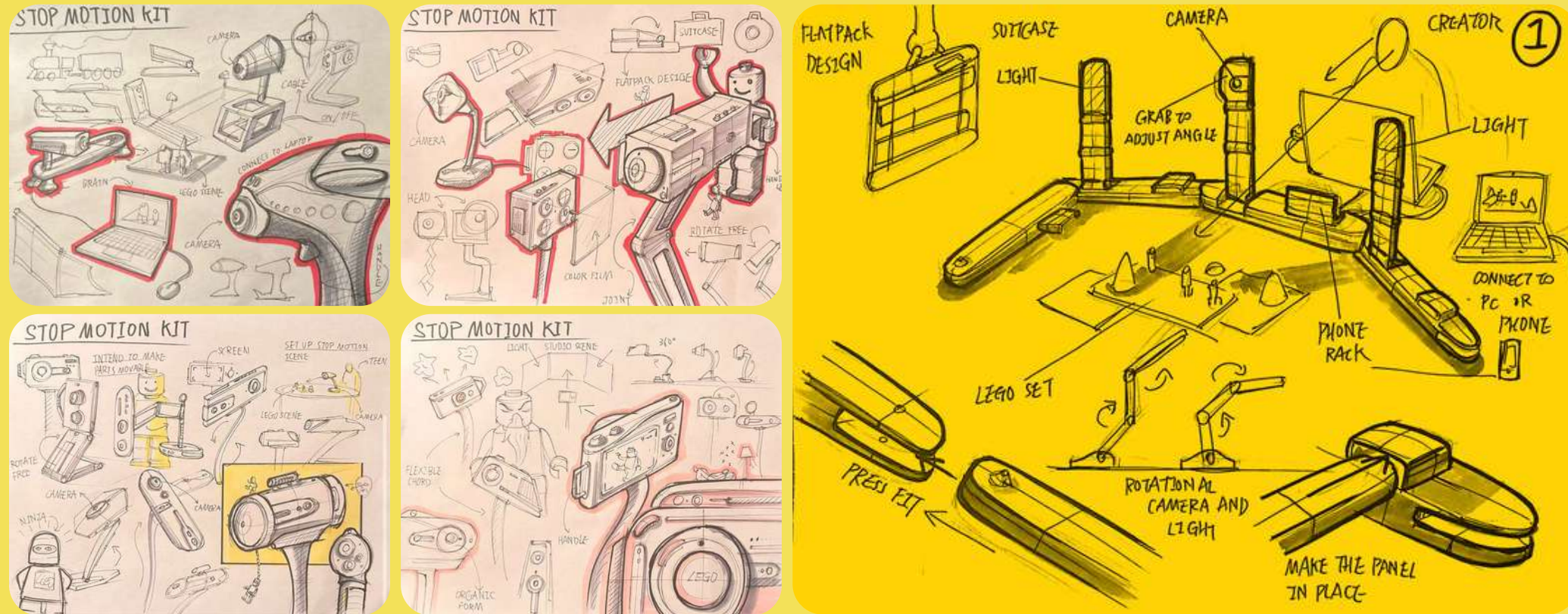
- Many sets become static displays and are rarely played with again.
- **36 billion LEGO bricks produced each year.**

Over 115 tons of LEGO waste each year.

Extend the lifecycle of LEGO products by giving players
new ways to engage with their existing sets.

Play through storytelling



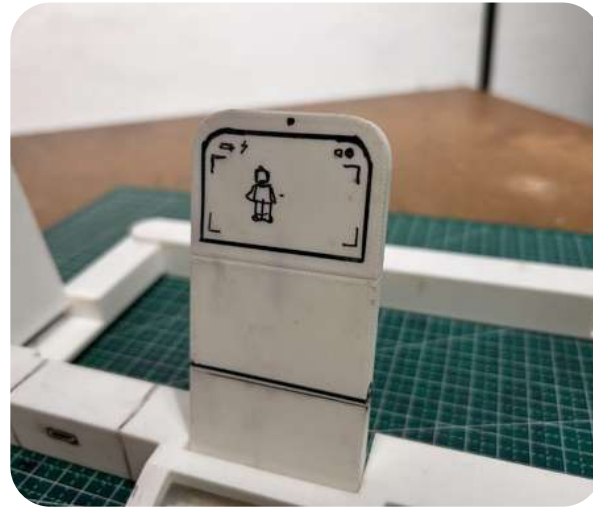


Stop-Motion Filming

Greater engagement encourages continued interest in LEGO products

Lets users turn their existing LEGO bricks into animated stories.





Play System Mockups

Elevated play experience.

Define how each play element works together to create a LEGO stop-motion film.

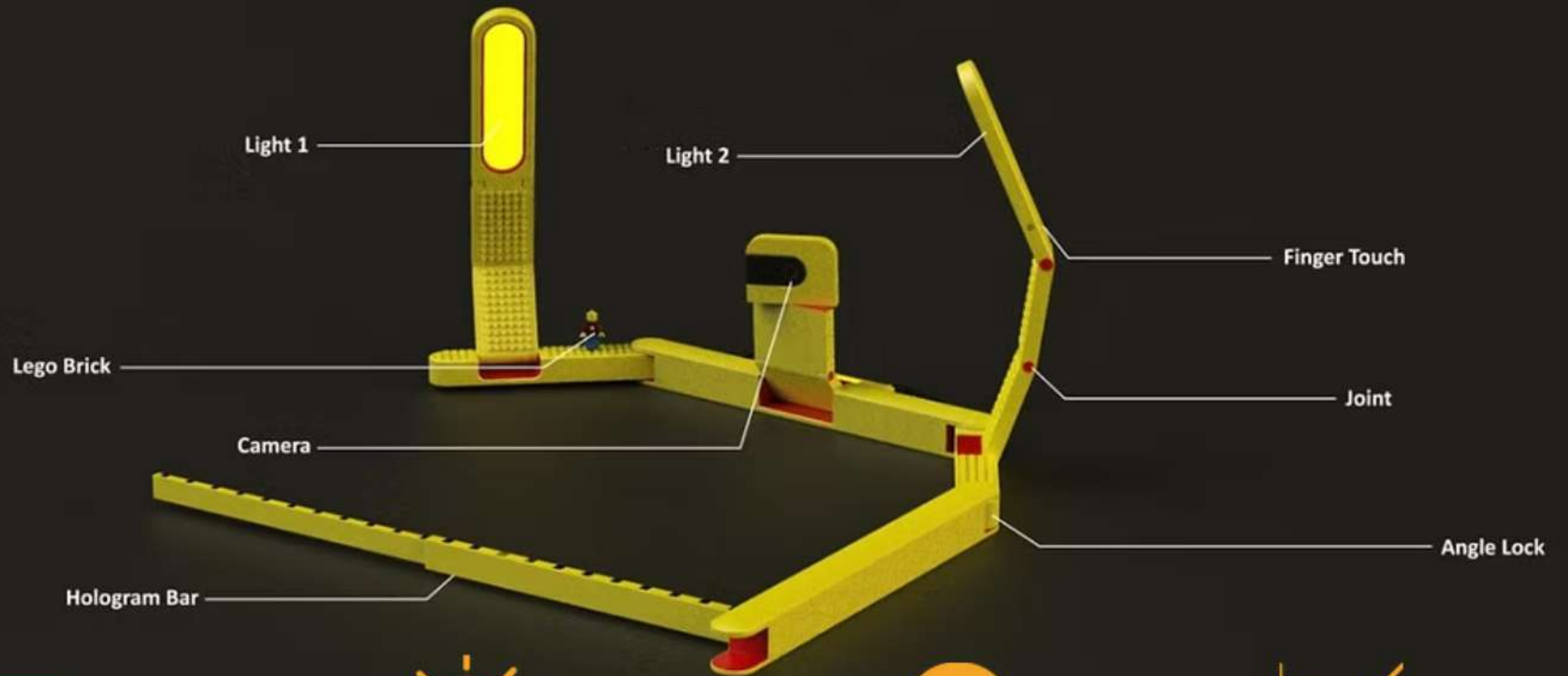


LEGO Flow Studio turns existing bricks into tools for storytelling.





Reactivates unused LEGO sets as storytelling tools through stop-motion.



2 hours charging
8 hours battery life



Varies light colors and
mode for illumination

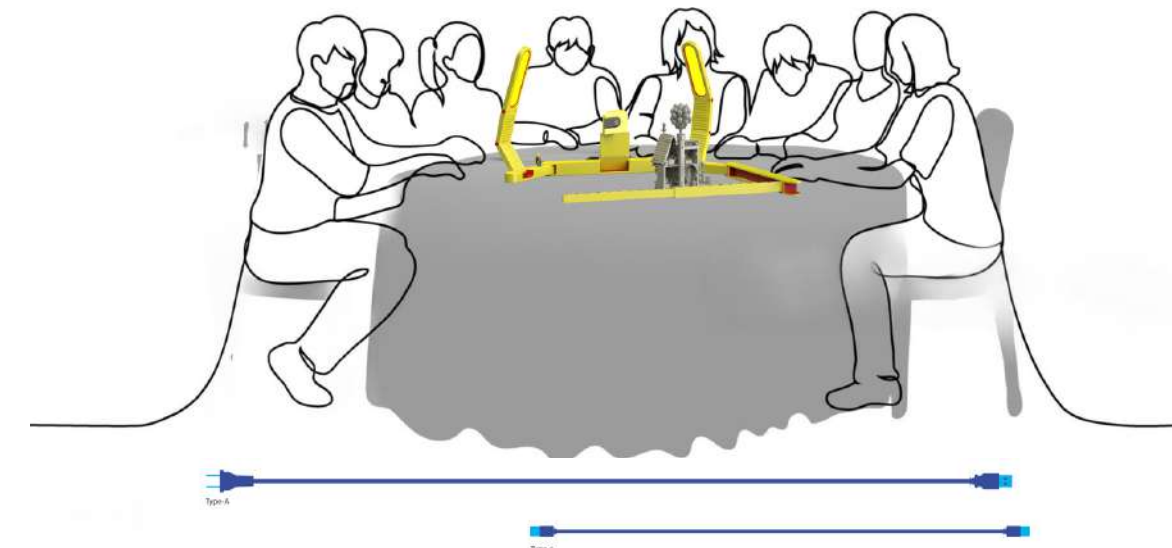
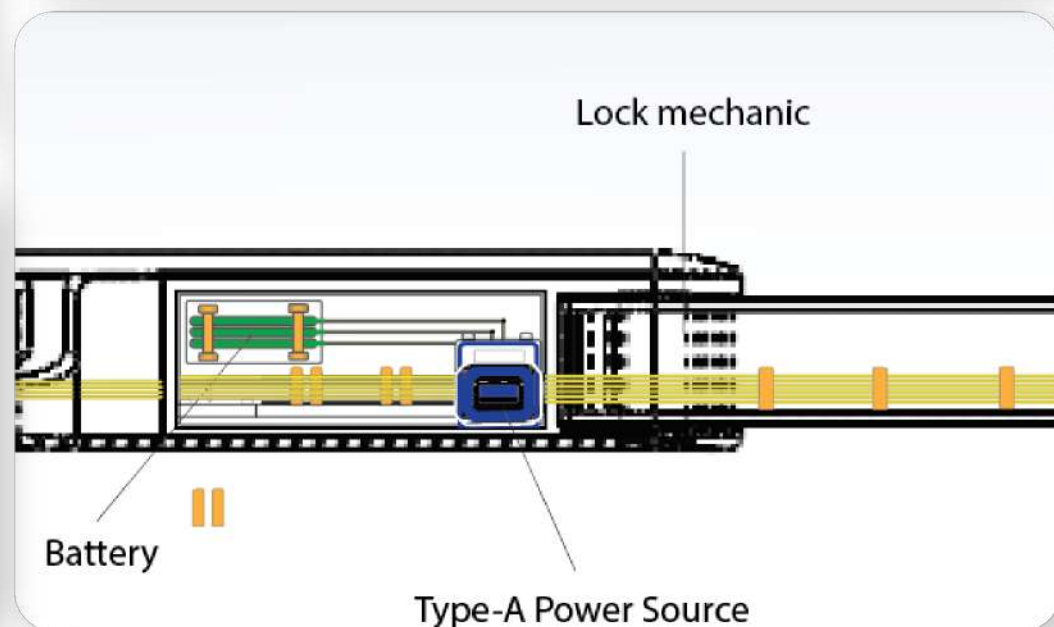
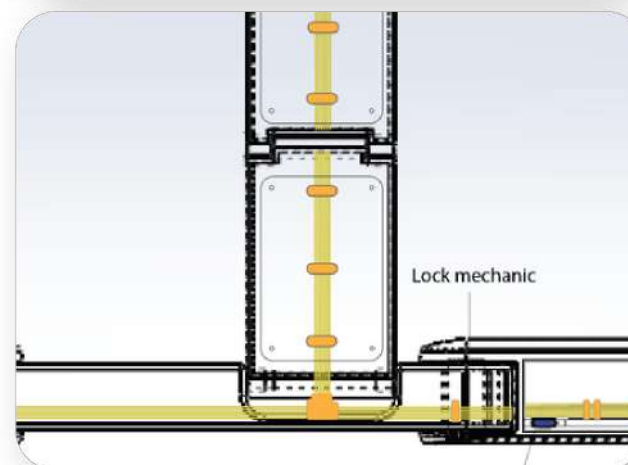
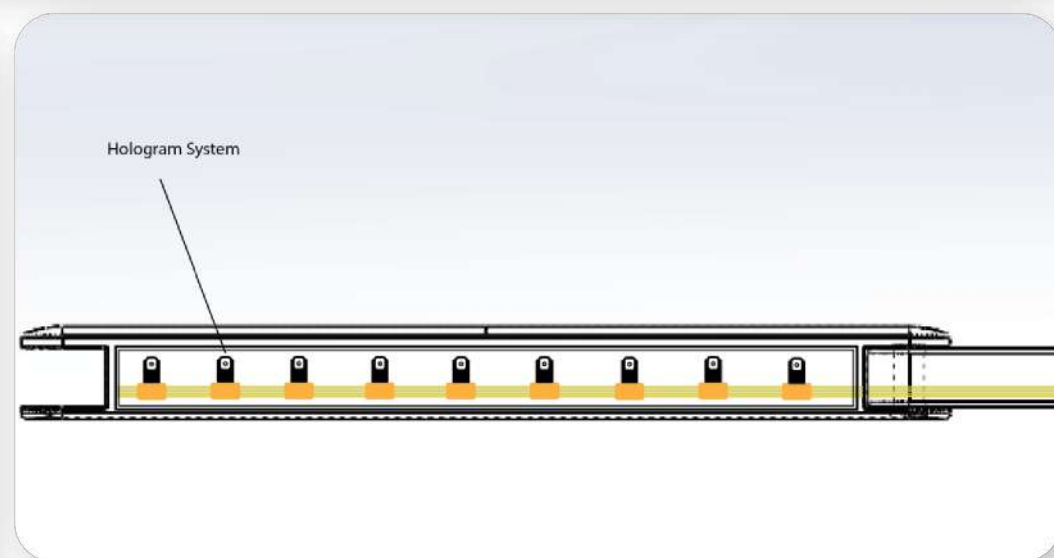
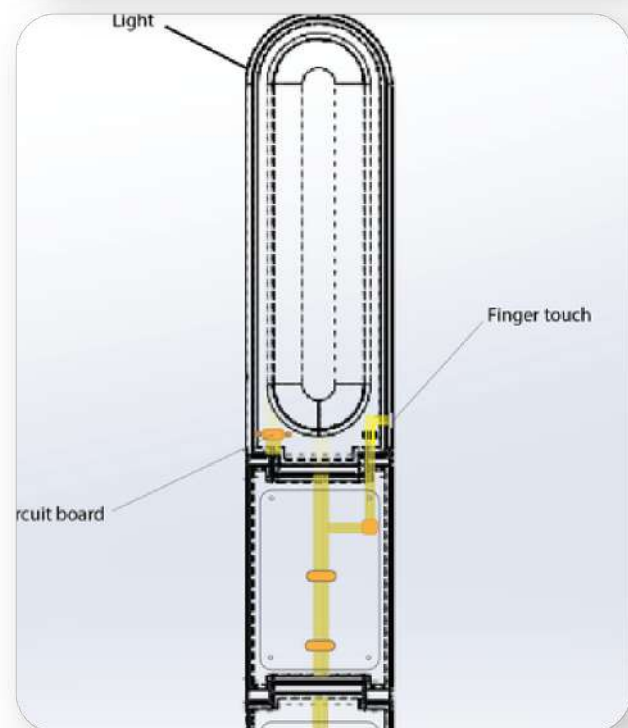
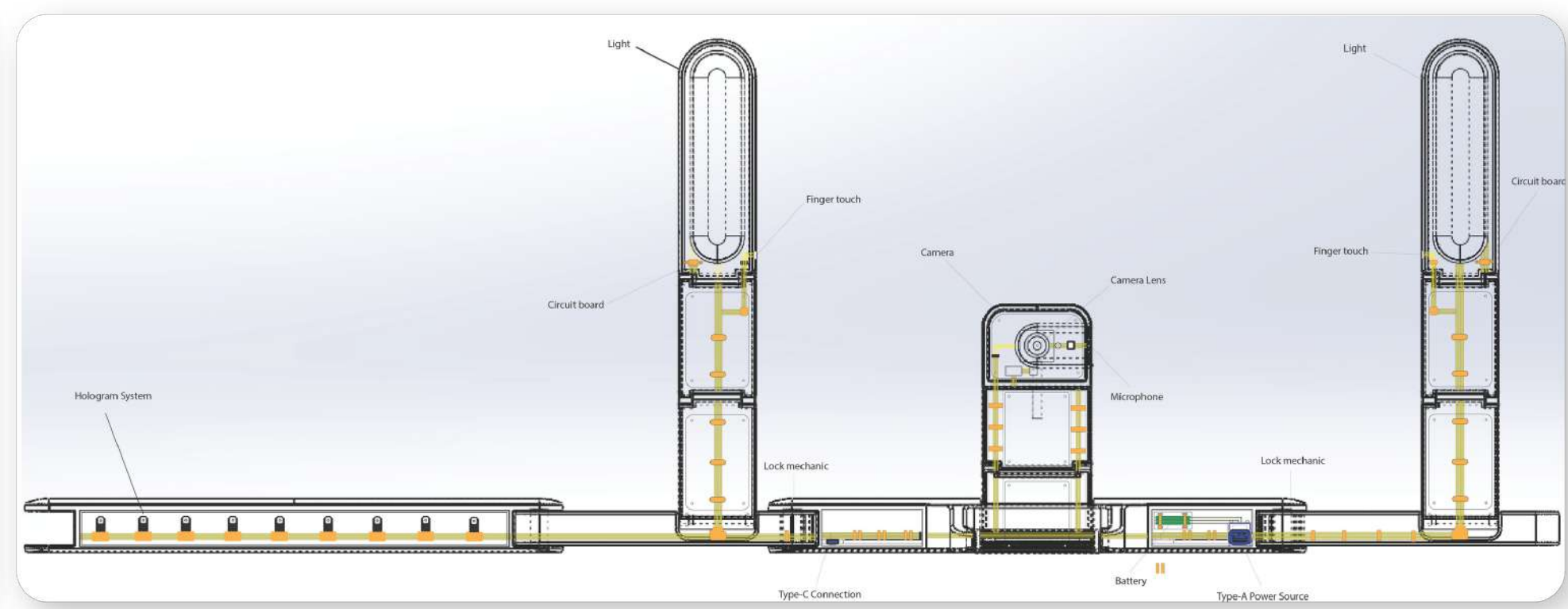
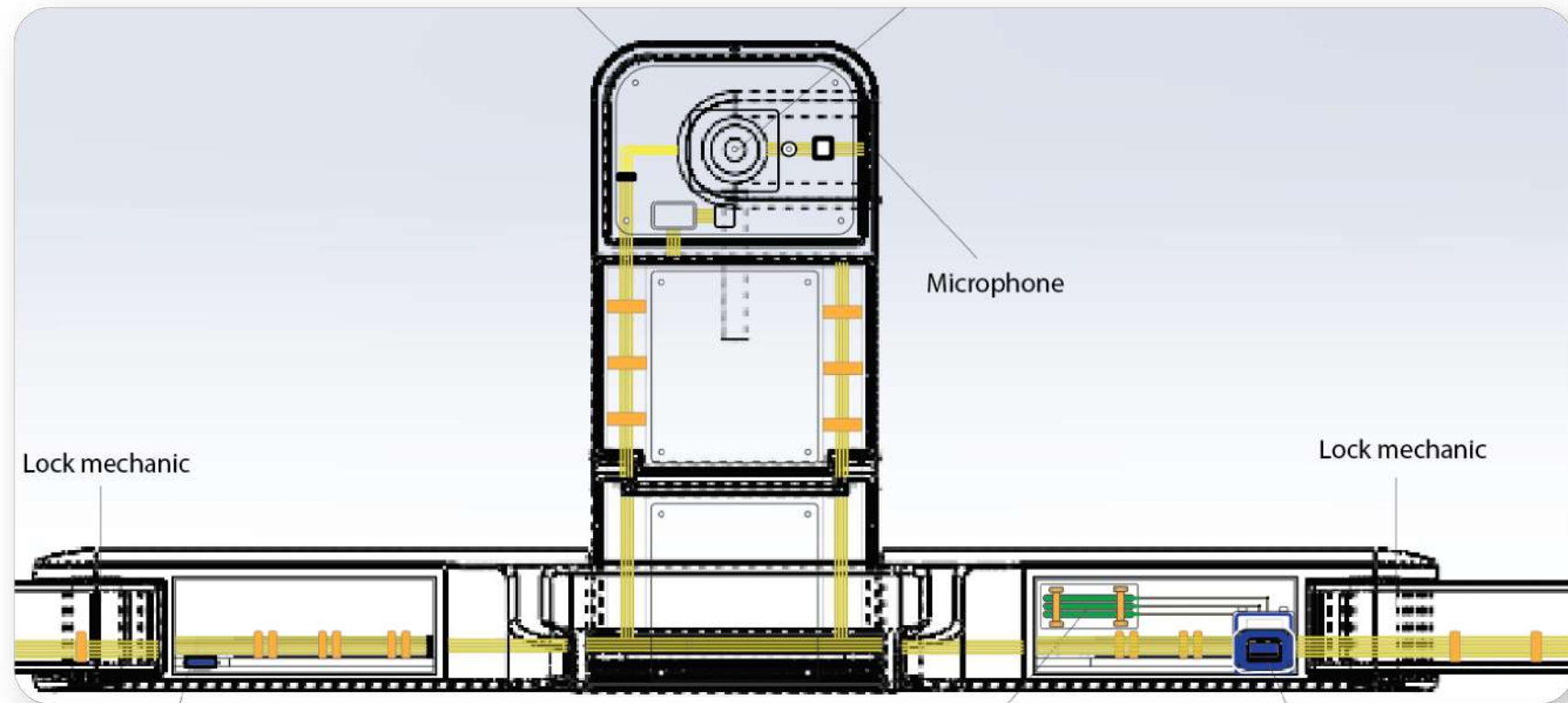


Dubbing your character
customized sound



Control the motion angle
with 360 degree flexibility

Sustained play **drives demand** for new sets



Design for Manufacturing



Volumetric study used to optimize internal component placement and guide the manufacturing strategy.



LEGO® Flow Studio 2024

- Creative Camera
- Scene Lighting
- Story Mic
- Animation Engine



LEGO® SMART Play 2026

- Synthesized Audio Engine
- Character Dialogue
- Environmental Music
- Action Sound Effects

ORIEL LAVA LAMP

<https://www.peterprotasiodesign.com/lava-lamp-redesign>





+75% 
of users are **under 35** years old



Long warm
up time

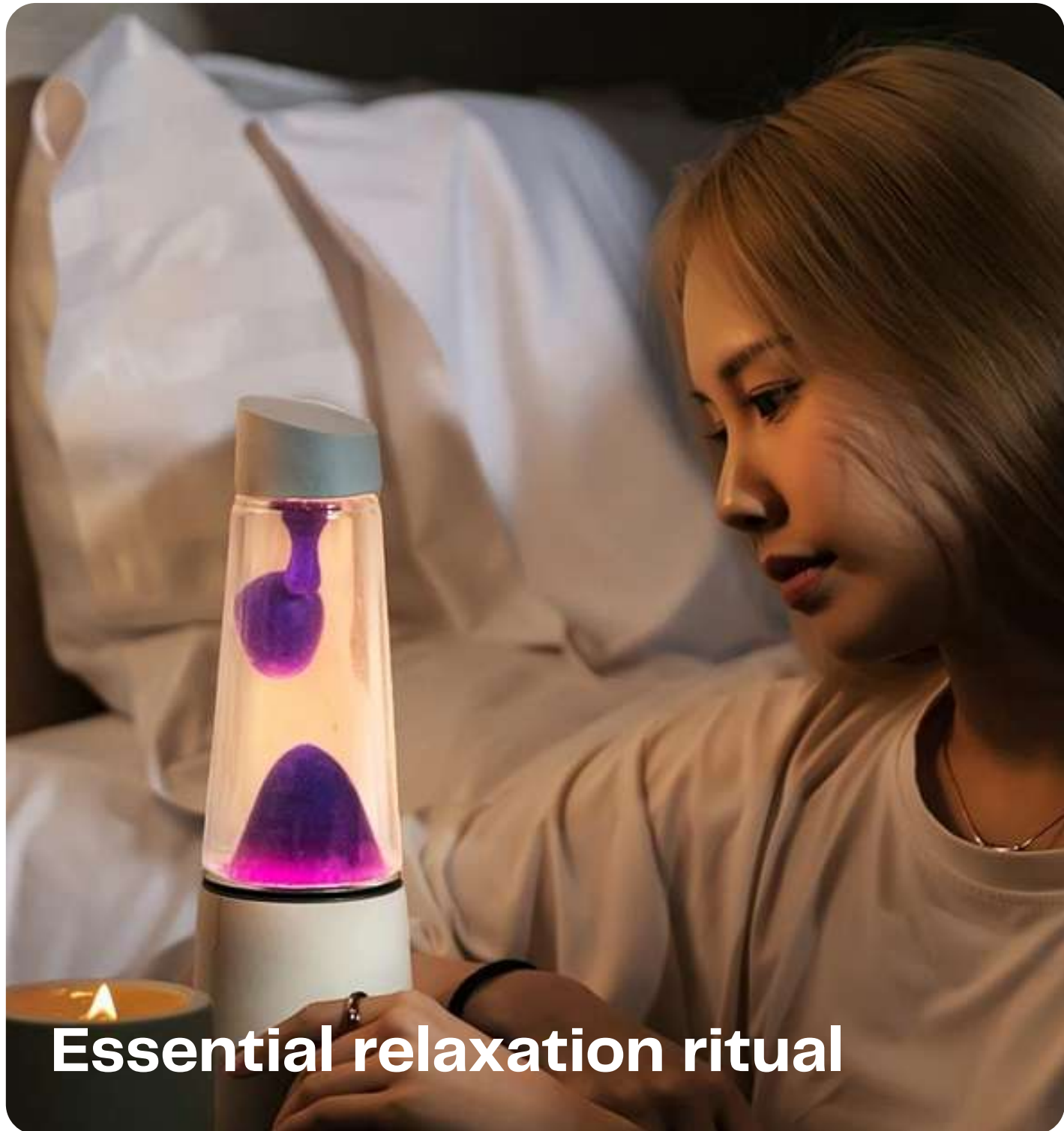


Unattended
heat risk



Sealed fluid limits
repair and reuse





Essential relaxation ritual

45% use for home decoration and ambient lighting



Long warm-up time

7–10pm Peak usage as users return home from work.

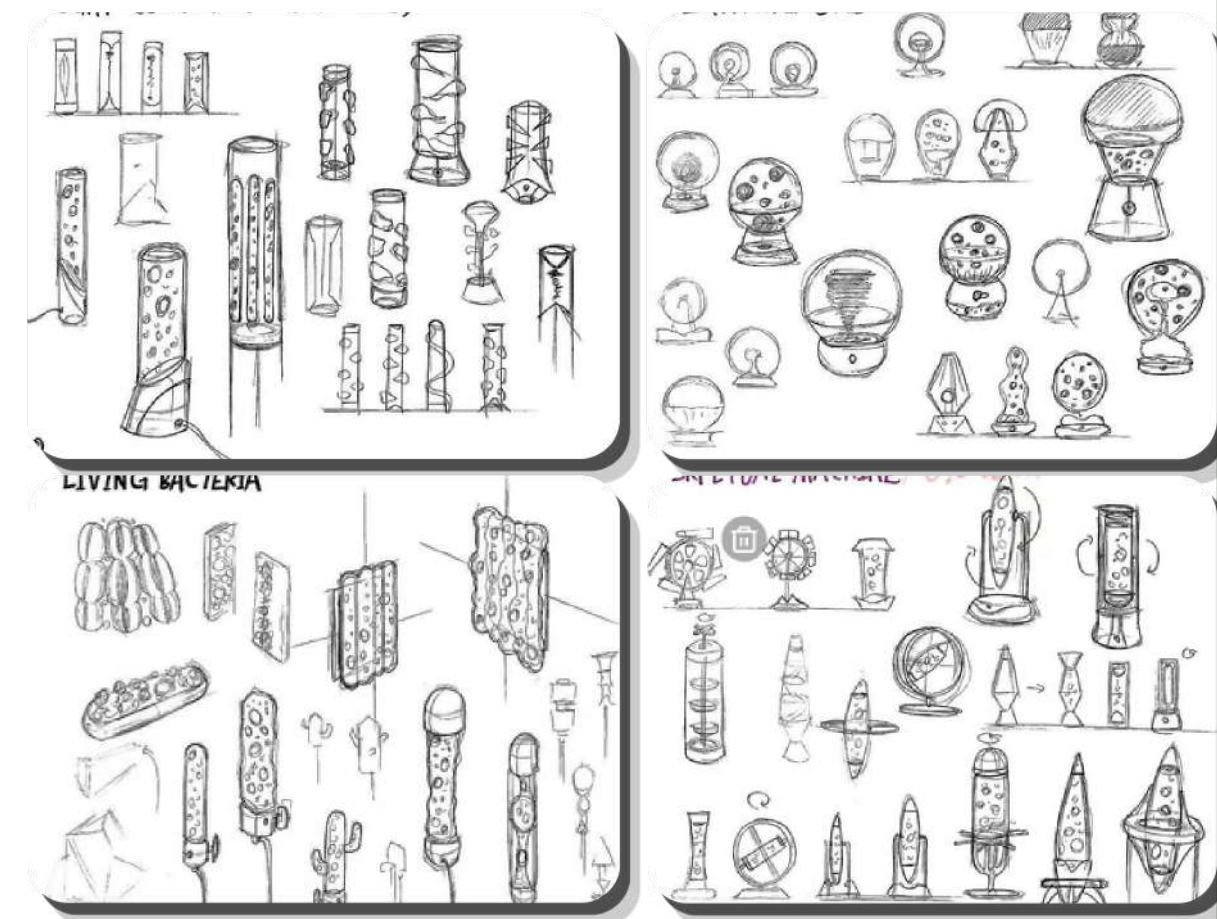


Failed Ritual

Innovation

This redesign celebrates the enduring character of the lava lamp while giving it **a renewed purpose for a more sustainable future.**





Exploring form, mounting, and serviceability

Exploring ways to reduce warm-up time and eliminate sealed-fluid waste.





Mockups for a successful ritual

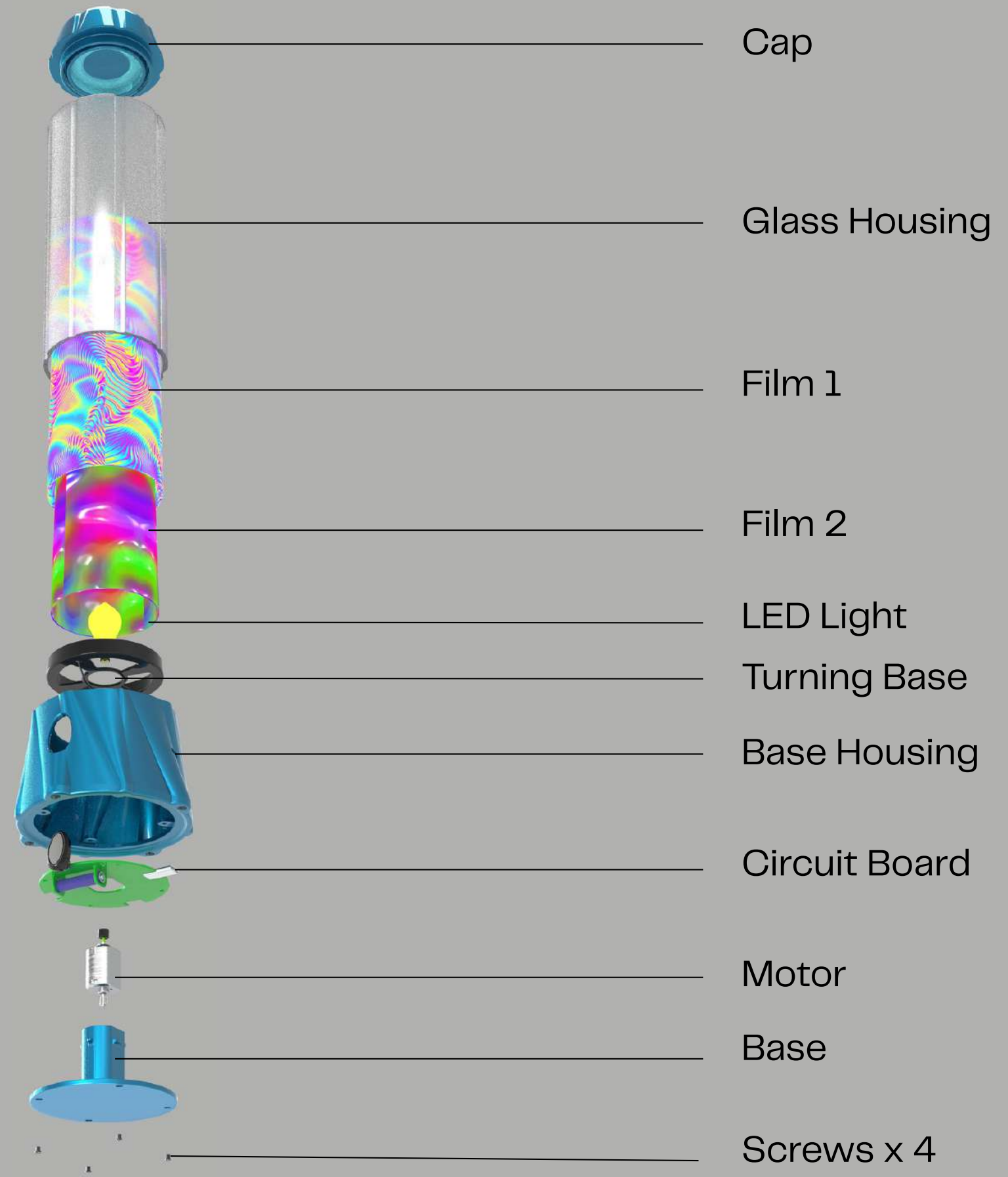
Physical mockups were used to test form, lighting, motion, and user interaction.

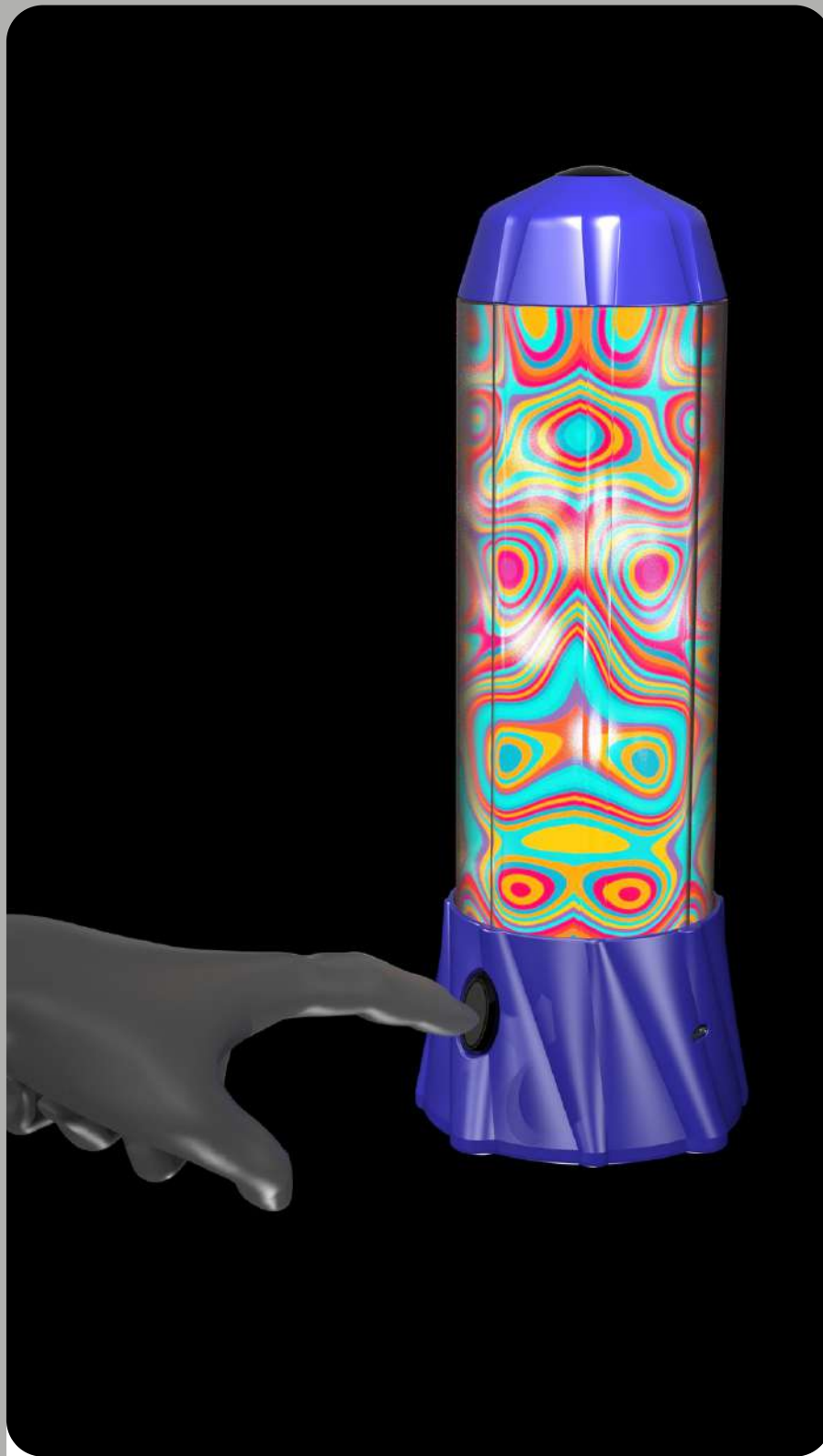






Oriel Lava Lamp delivers ambient motion in minutes instead of hours, making the ritual **more practical** and **reducing heat-related risks**.





POWER BUTTON

- Touch-sensitive button for quick activation.
- Eliminates long, tangled power cords.



ROTATION MECHANISM

- A DC motor rotates the lamp.
- Without chemicals and heat



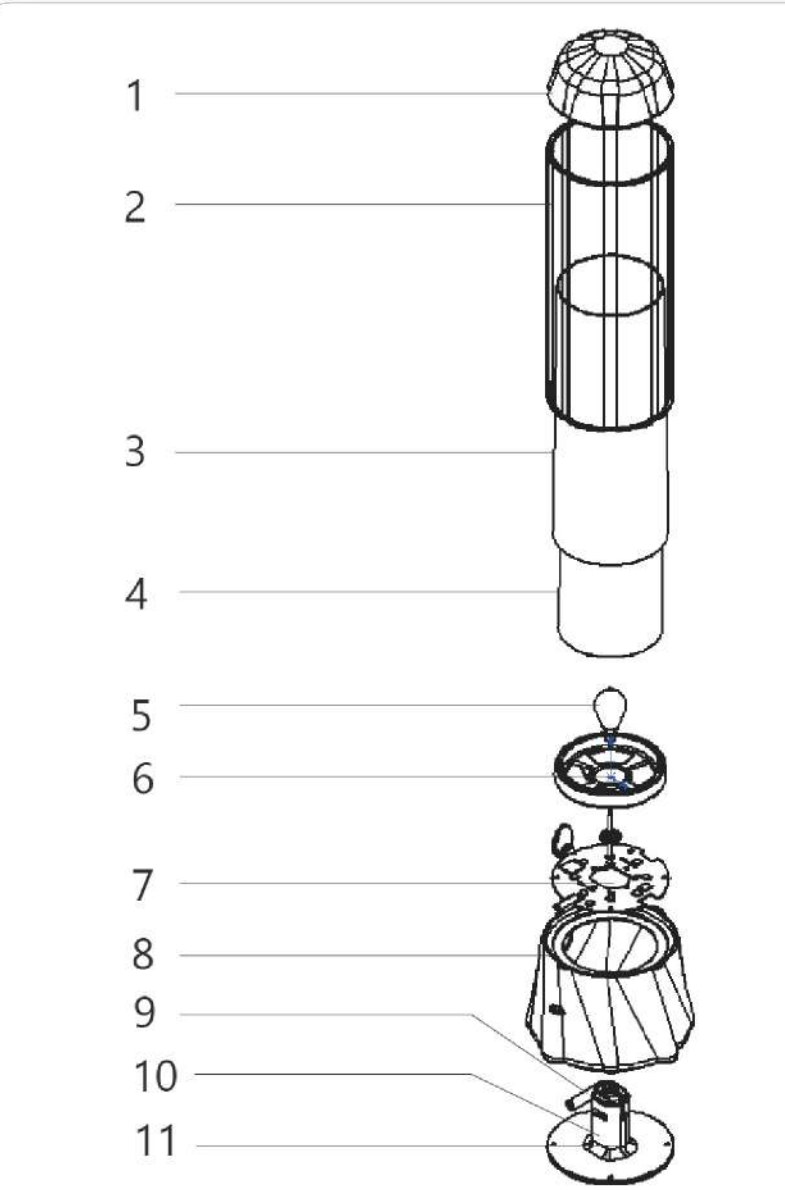
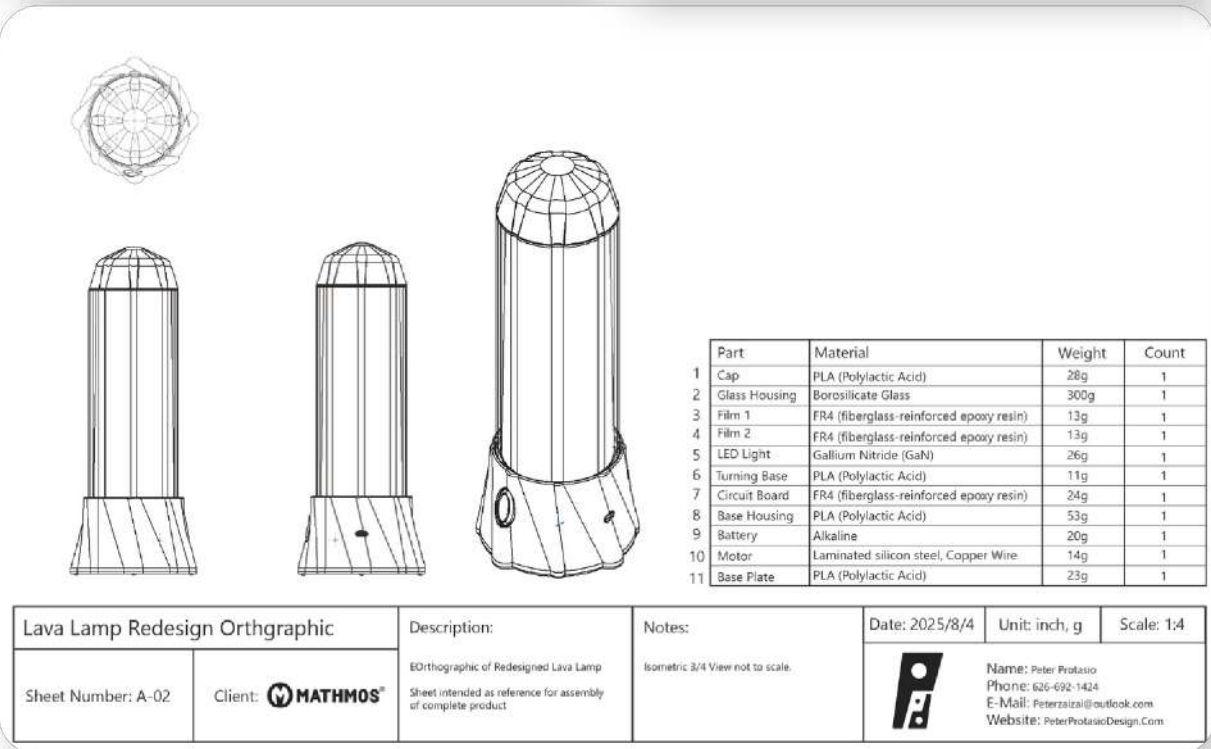
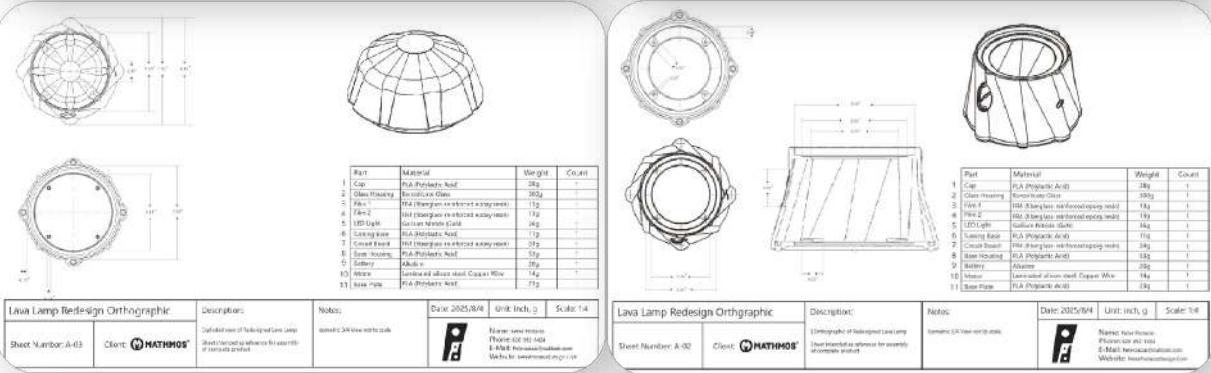
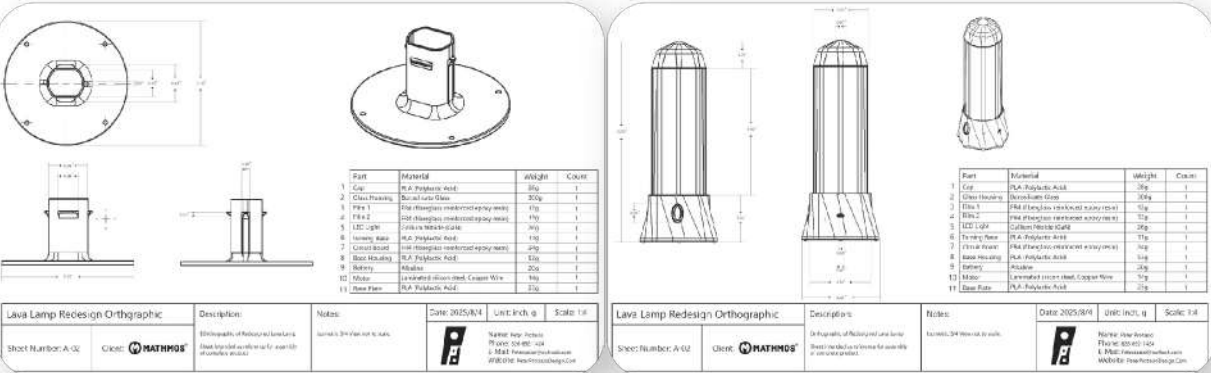
COLOR FILMS

- LED light illuminates the color films
- Two rotating colored films create a lava-lamp-like flowing effect.

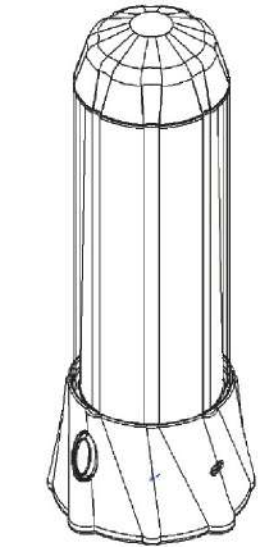


USB-C CHARGING

- Modern Power Solution – Powered via USB-C for universal compatibility.

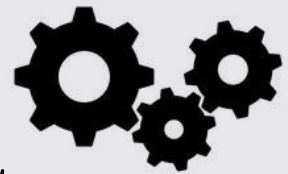


Lava Lamp Redesign Exploded View		Description:	Notes:	Date: 2025/8/4	Unit: inch, g	Scale: 1:4
Sheet Number: A-02	Client: MATHMOS®	Exploded view of Redesigned Lava Lamp Sheet intended as reference for assembly of complete product	Isometric 3/4 View not to scale.	 Name: Peter Protasio Phone: 626-692-1424 E-Mail: Peterzaizai@outlook.com Website: PeterProtasioDesign.Com		



	Part	Material	Weight	Count
1	Cap	PLA (Polylactic Acid)	28g	1
2	Glass Housing	Borosilicate Glass	300g	1
3	Film 1	FR4 (fiberglass-reinforced epoxy resin)	13g	1
4	Film 2	FR4 (fiberglass-reinforced epoxy resin)	13g	1
5	LED Light	Gallium Nitride (GaN)	26g	1
6	Turning Base	PLA (Polylactic Acid)	11g	1
7	Circuit Board	FR4 (fiberglass-reinforced epoxy resin)	24g	1
8	Base Housing	PLA (Polylactic Acid)	53g	1
9	Battery	Alkaline	20g	1
10	Motor	Laminated silicon steel, Copper Wire	14g	1
11	Base Plate	PLA (Polylactic Acid)	23g	1

Design for Manufacturing



Detailed manufacturing drawings prepared to communicate assembly, component relationships, and production requirements.

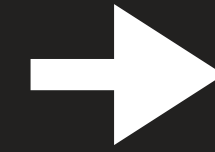


ORIGINAL

Total Impact

Per Function Unit-10x1 year of use

3.87kg CO2eq



REDESIGN

Total Impact

Per Function Unit-10x1 year of use

1.36kg CO2eq

Oriel Lava Lamp

- Instant heat-up with **no warm-up delay**
- **Extended lifespan**
- **Customizable lighting patterns for different styles**
- Reduced electricity consumption during operation



KLUFLIT AXIS HARNES

<https://www.peterprotasiodesign.com/kluflit-harness>



Ortovoxx is a **mentor** in the mountains— teaching **safety**, nurturing **awareness**, and **protecting** the world it explores.

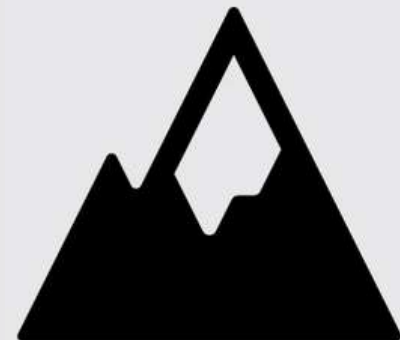




The West Buttress Headwall on Denali is **the most dangerous sections** of the climb.



A steep **45–50°** snow and ice slope



Above the **14,000–footcamp**



Climbers use **fixed ropes ascending** to the ridge





Crevasses

+50% of deaths occur on descent.



Rapid weather shifts



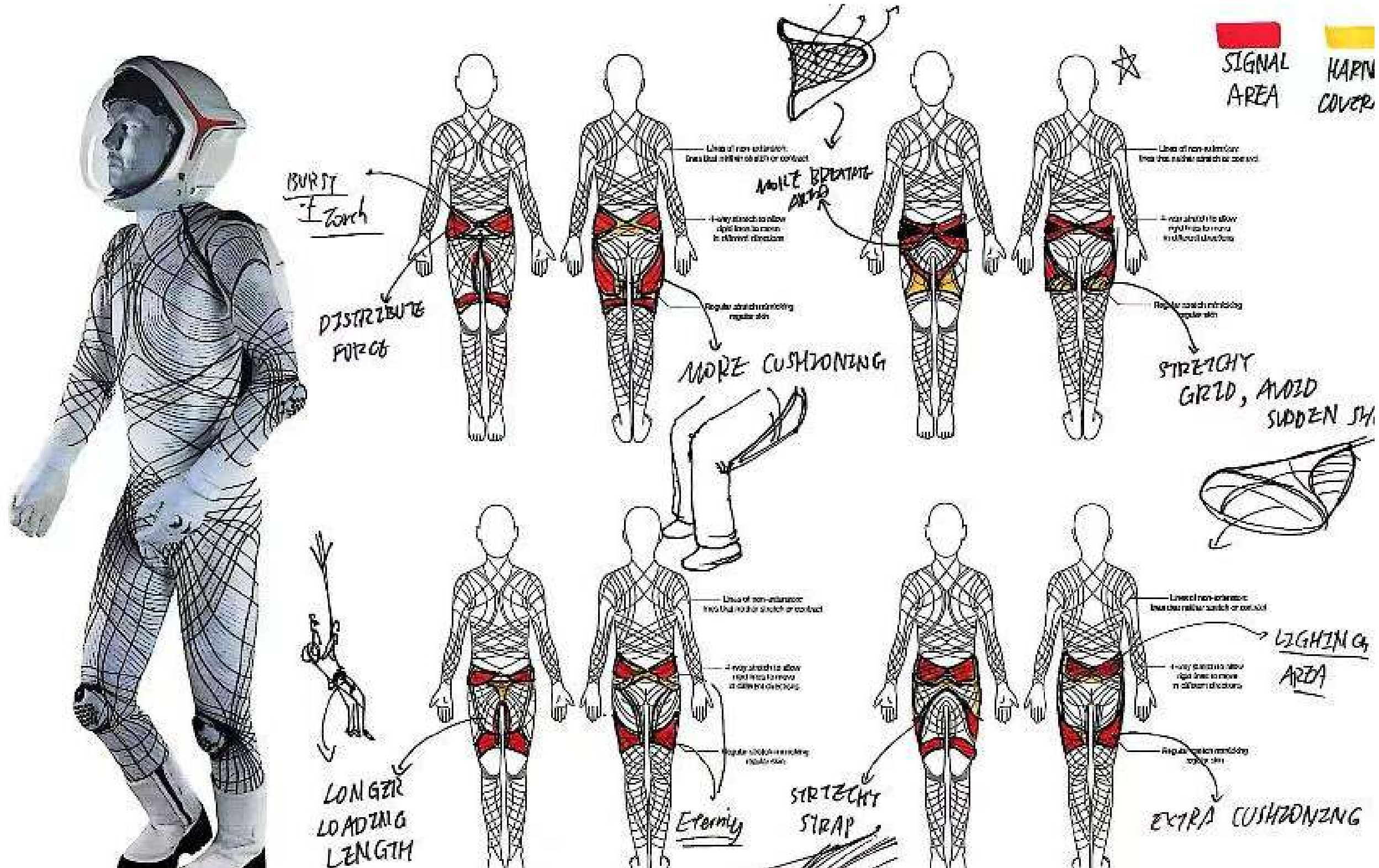
Avalanche and icefall hazards

45% of fatalities on Denali are from falls.



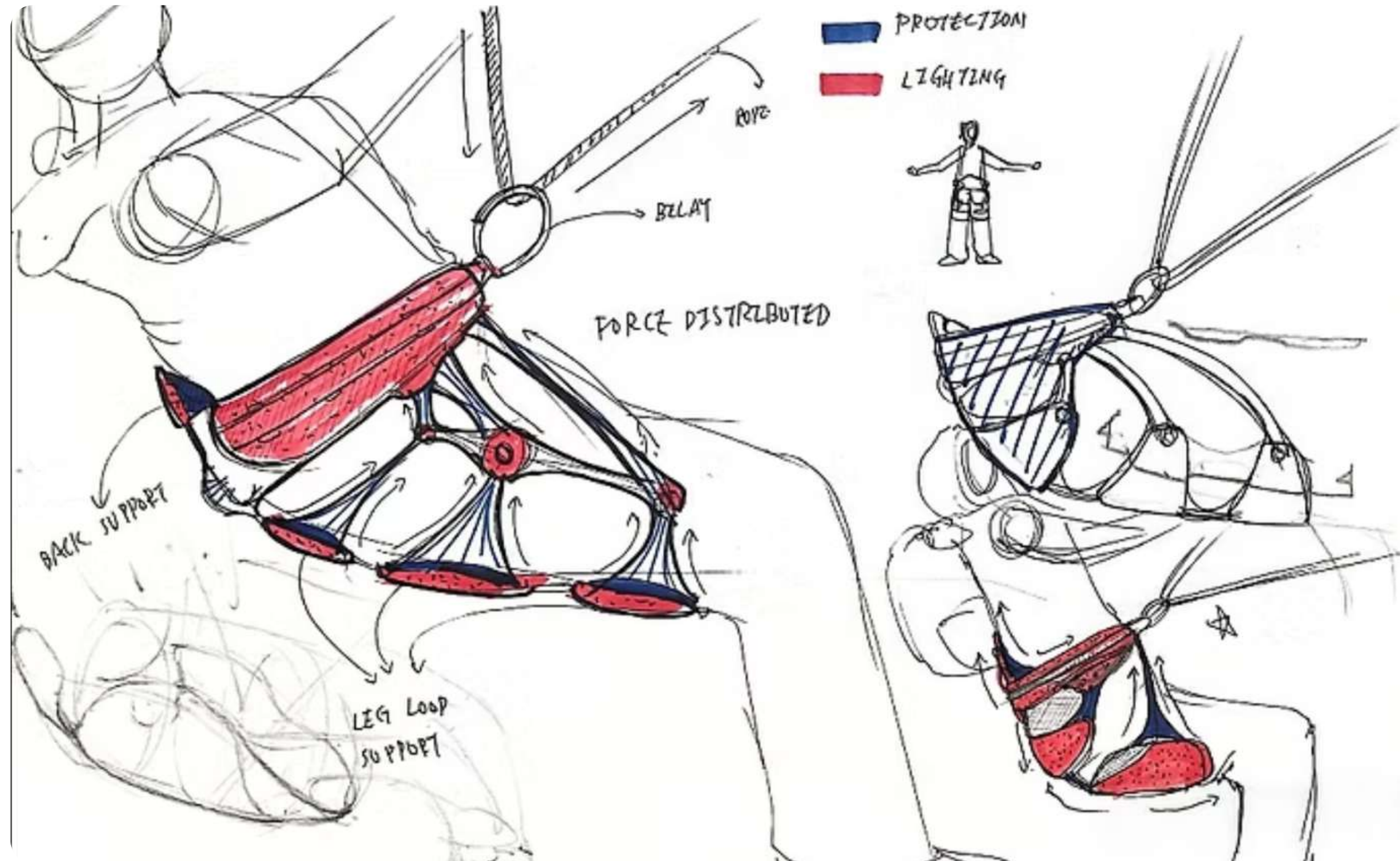
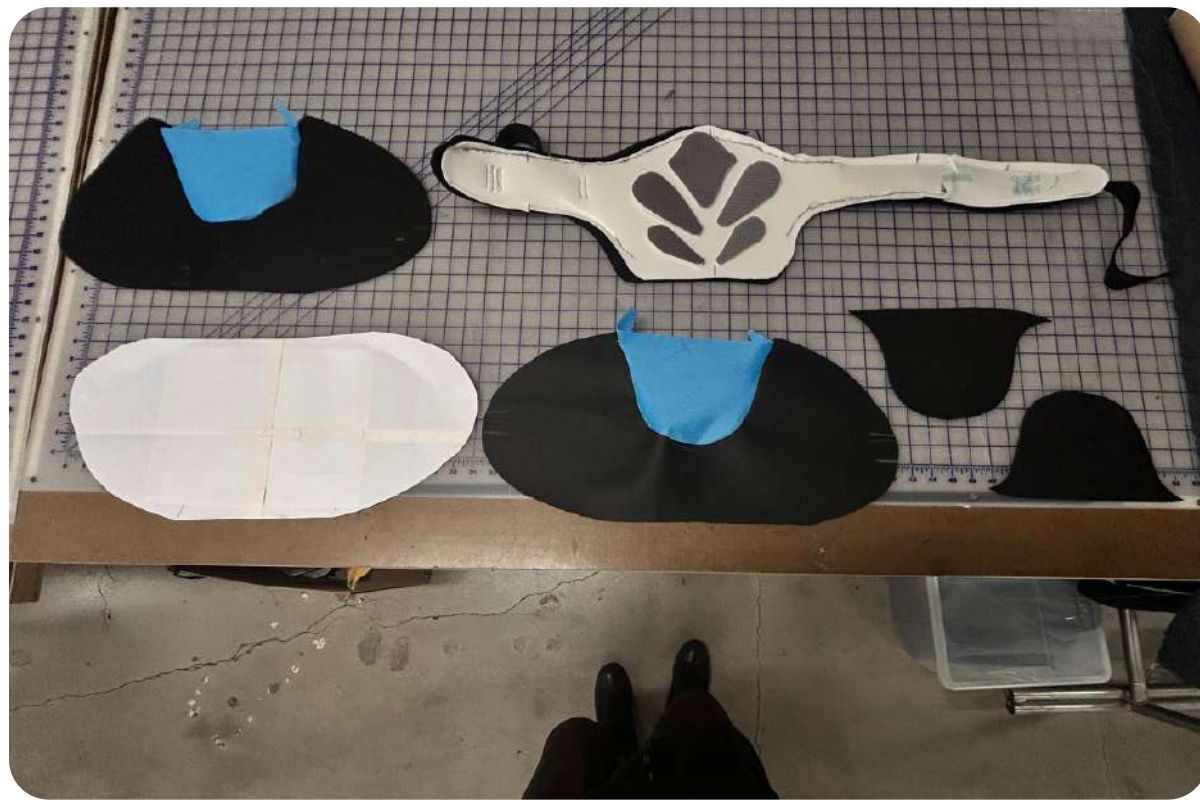


Designing around the risk



From mountaineering harness to crevasse rescue system

Extension-line studies help determine the safest and most comfortable harness configuration.



Designed to cradle the body inside a crevasse

Reduces pressure points that can restrict circulation while helping maintain body warmth.



A person is rappelling down a steep, icy crevasse. They are wearing a blue and orange climbing harness, a blue helmet, and a blue jacket. The person is holding a rope and is positioned in the center of the frame. The background is a vast, icy landscape with a clear blue sky.

Kluflit Rescue Harness is designed to support safer crevasse rescue with emergency lighting and additional cushioning.

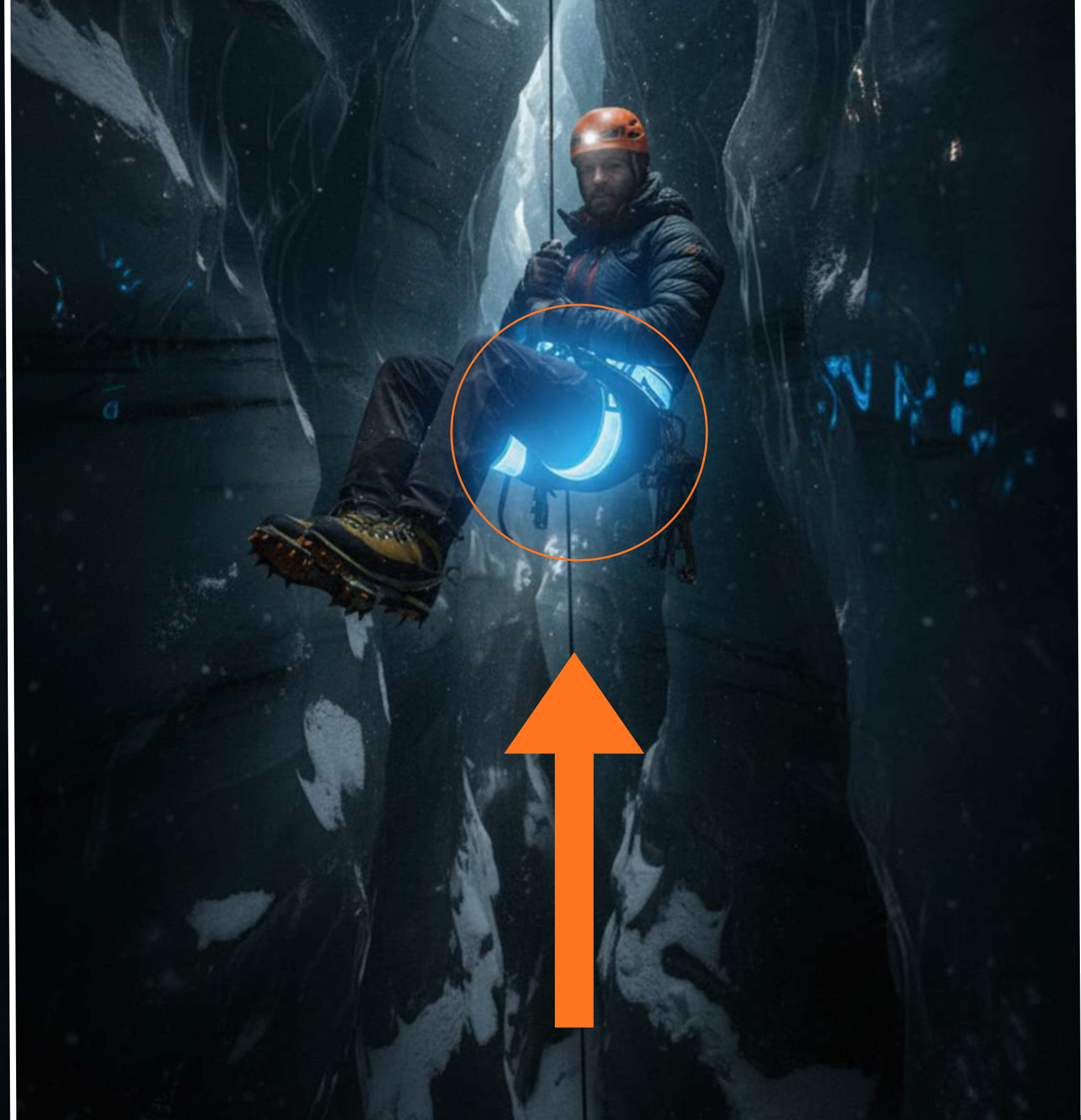
Smart Textile System

Textile construction integrated with **emergency lighting**.



Magnetorheological Fluid Deployment

Enhances comfort by offering **extra cushioning** and structural body support.

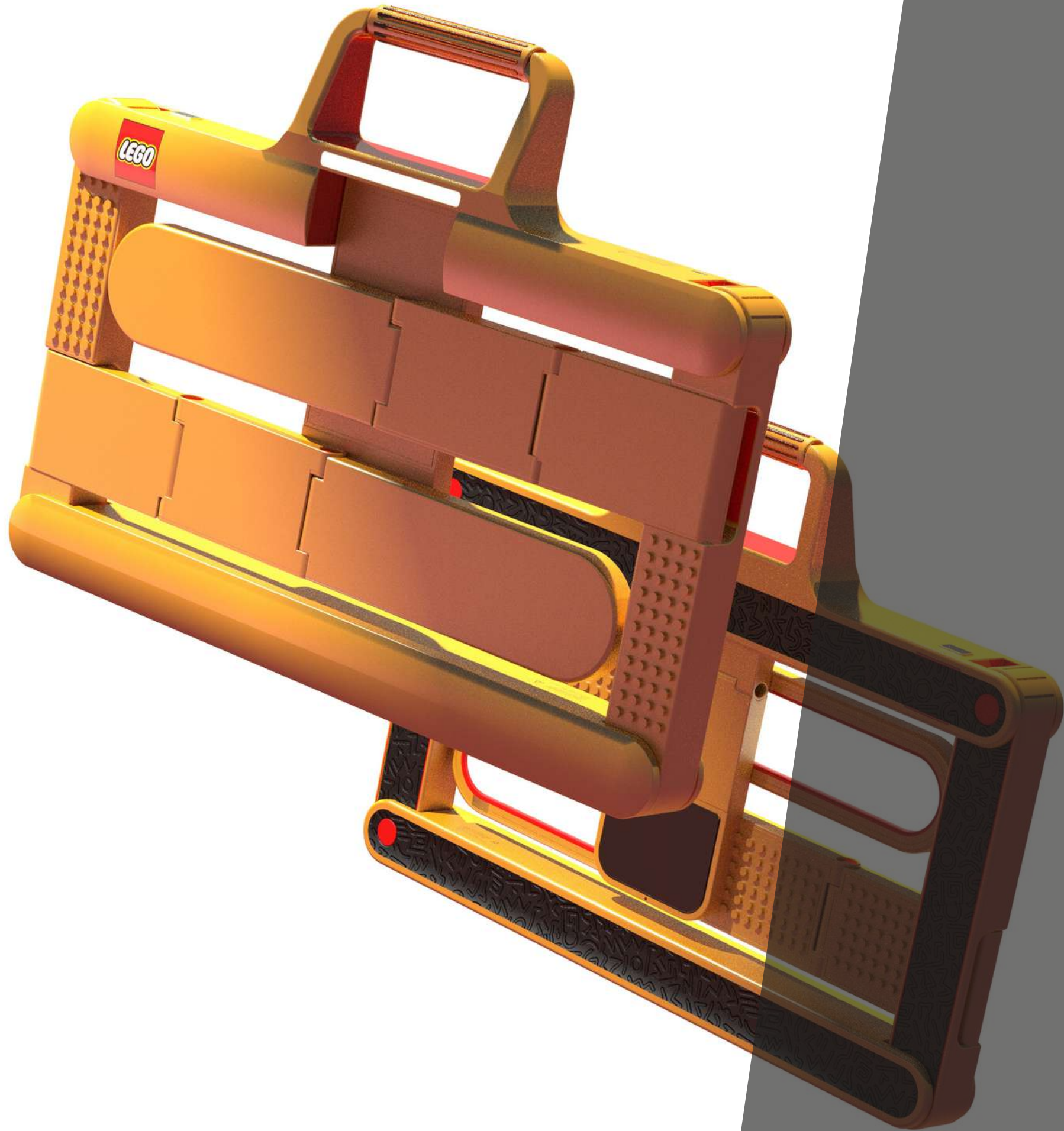


Teammates use the rope system to pull the climber to safety.



Klufit Rescue Harness

- Reduces the risk of suspension trauma through **enhanced leg and back support.**
- Improves visibility in crevasse scenarios with **integrated emergency lighting.**
- Provides rescue teams with more time and clearer location cues.



Let's connect!

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