DD 606 : Product Detailing

Product Analysis

Team

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dyson pure cool

Air Purifier

What is it?

Form and Aesthetics

Color scheme goes with the setting of a household and doesn't distract

Low center of mass

Let's it rotate along the horizontal axis also

Different colors for different functionality & manufacturing processes of the product.

Air output

User feedback and interaction

Filter changing

There are indicative switches to remove the filters

Base

Context of Use

Designed for the urban setting, especially for urban homes

Suitable for a room of 450sqft.

Ease of cleaning and safety have been kept in mind
Eg.
1. Bladeless fans
2. No exposed parts

Usecases:
1. Houses
2. Workspaces
3. Small Vendors

Enclosed Spaces with Indoor Pollution

Target Audience

The target audience for this device is **upper middle class households**, where the members are comfortable with **spending a little extra on luxury and quality**.

The device is childproof, as it doesn't have any moving parts exposed such as the blades.

Features and Functionality

Ease of use

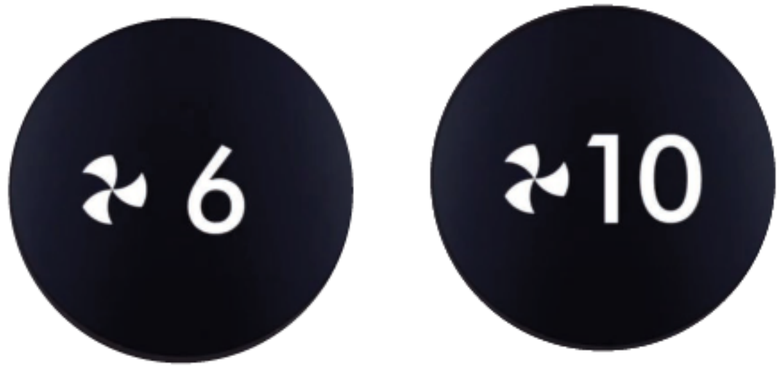
Plug and Play

Single button air purifier

Display

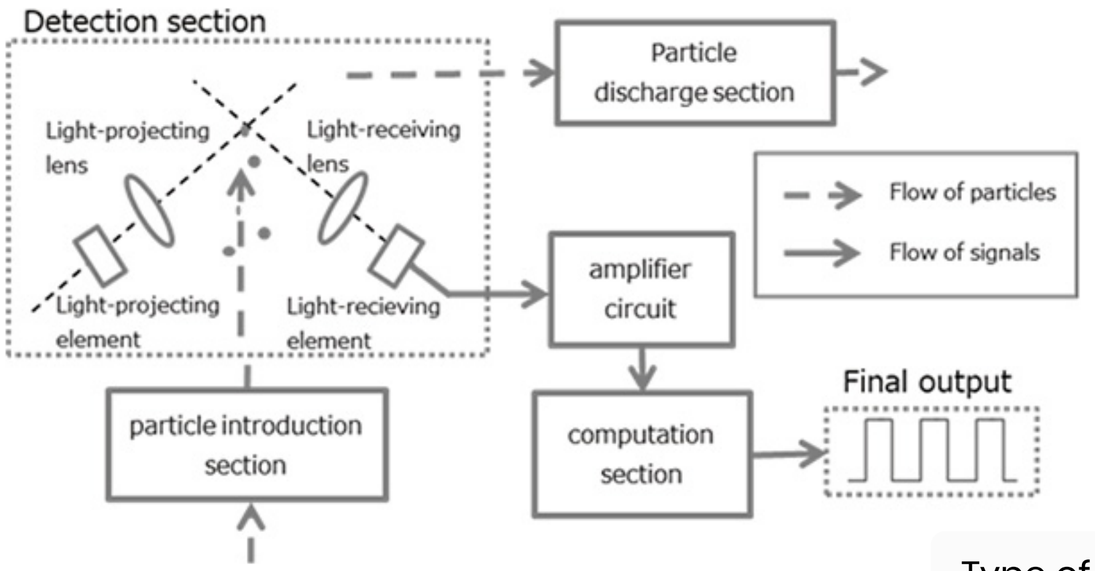
Rotation Angles

Air Multiplier Modes



Fan Speeds

Sensors



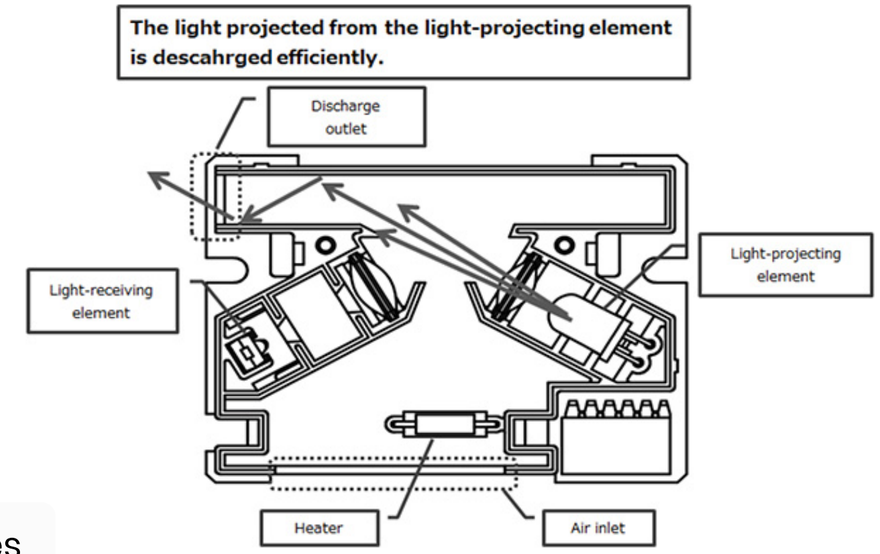


Fig. 5 Conceptual diagram of discharge of stray light

Type of particles

PM2.5 PM10

VOC NO24

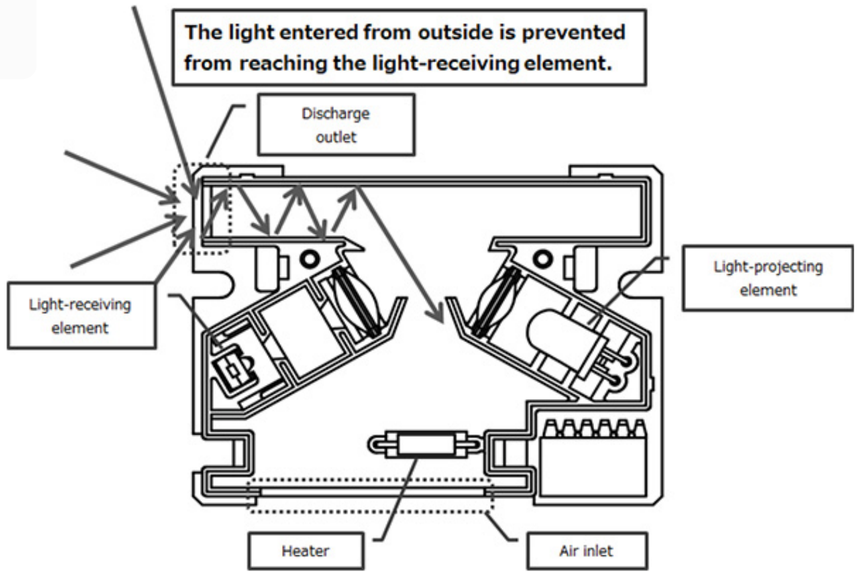
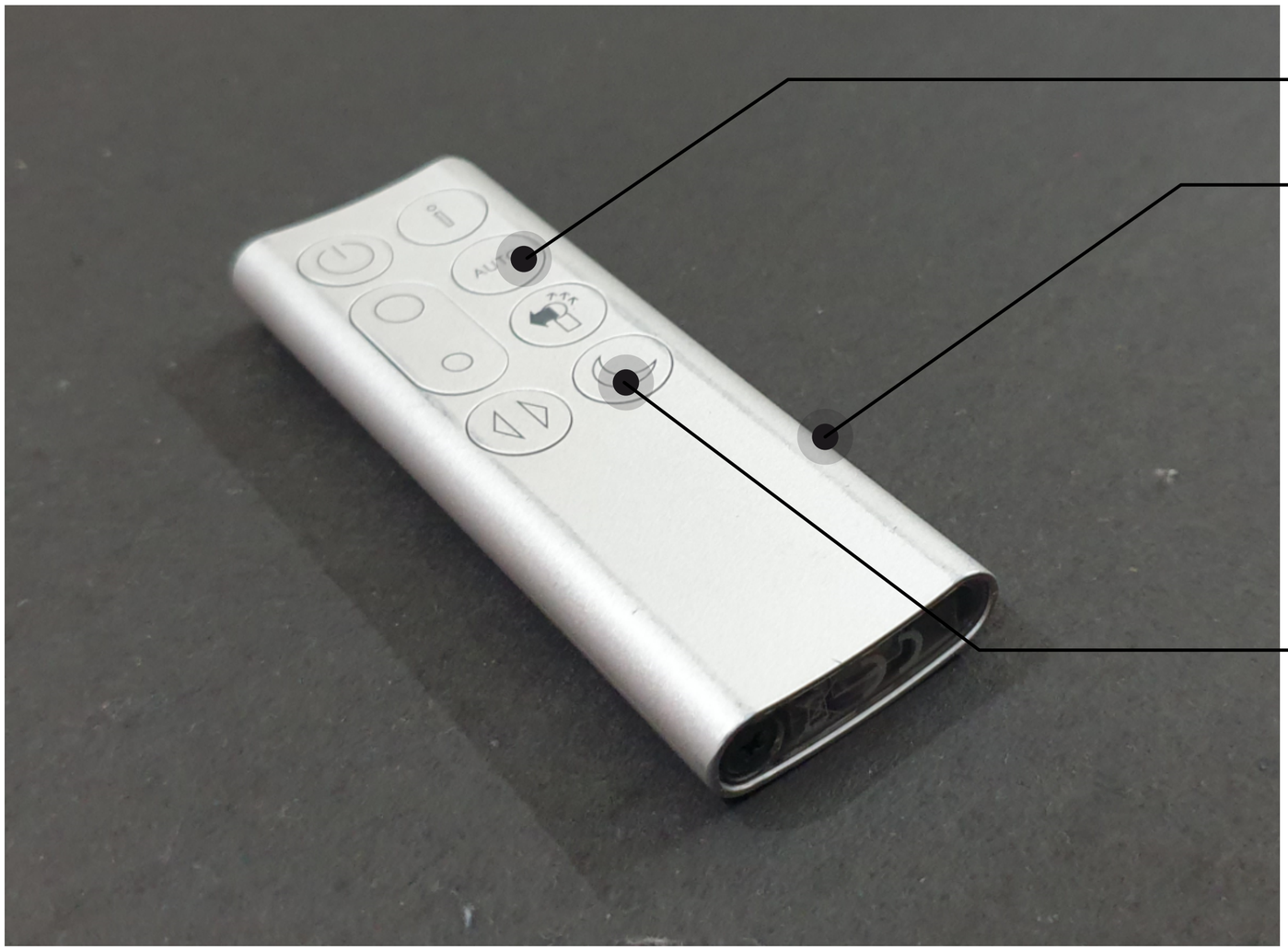


Fig. 6 Conceptual diagram of entrance of ambient light

Remote


Intuitive Button placement
Unique Placement Strategy
Easy to comprehend icons

Filters

Different colors for different functionality & manufacturing processes of the product.

Easy to replace filters

Symmetrical looks and placement

Gives updates when it needs to be change

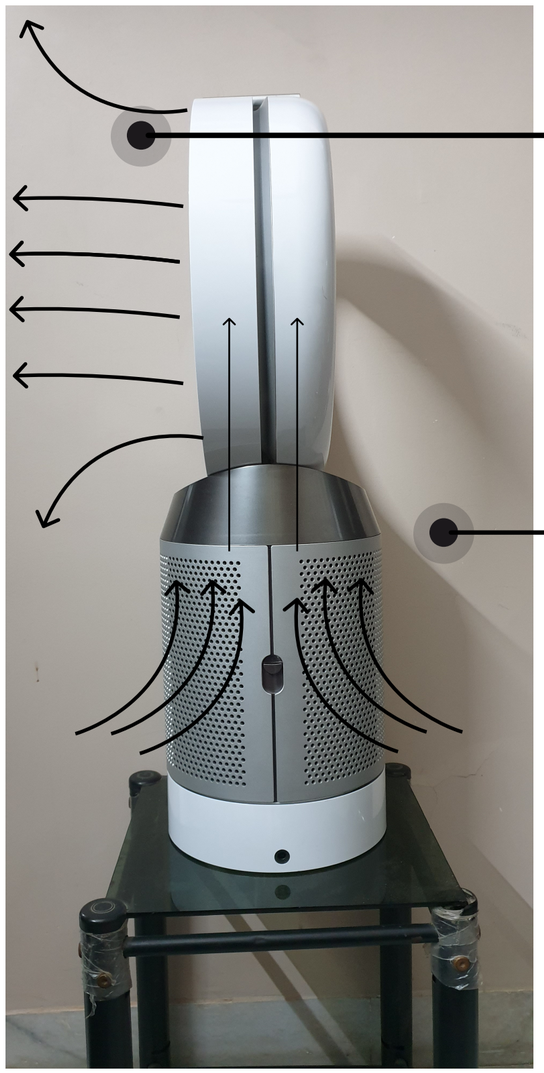
HEPA Activated Carbon
H-13 Glass HEPA which is vacuum sealed and has activated carbon filters

Environmental Impact

Dyson, as a company, states very clearly, that the machine, should it no longer be capable of use, must not be dumped into the waste stream, but instead, given to recycling factories. Dyson also encourages most of its customers to send the old air multipliers, which can no longer be used back to the company for recycling.

How It Works

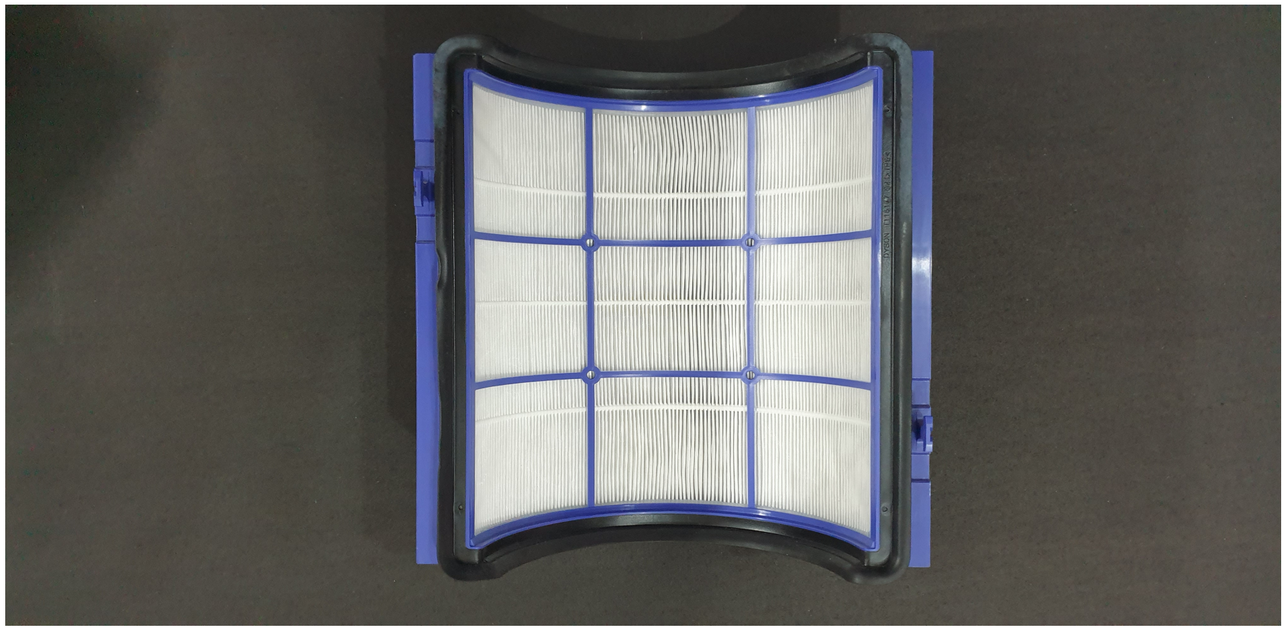
Purification and Circulation Tech



The pure air being discharged creates an area of negative pressure which sucks in the air from both inside and outside the surface of the vent’s rim

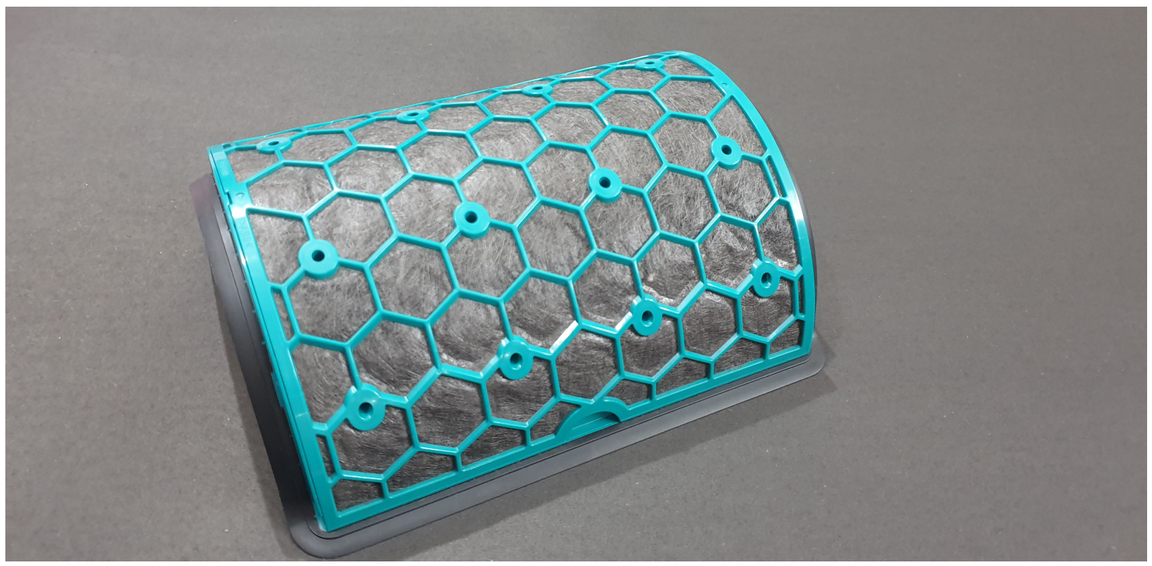
Sucks impure air from the bottom which is passed through two sets of air filters, up the empty vent through the rotating motor and finally across the curvature of the fan

Filters : HEPA



“HEPA” stands for “high-efficiency particulate air” (filter). They can capture viruses, bacteria, pollen, PM2.5, allergens, and more. When large (around 1 micron) particles fly into a HEPA filter, they’re too big to get through, so they get stuck. This is called straining.
Particles this size (0.3-1 micron) can fit between the gaps in the filter, but they are too heavy. They try to follow the air around the filter, but end up getting stuck due to their weight. This is called interception.
Particles smaller than this perform Brownian motion, making the likelihood of them reaching through the filter negligible. This is called diffusion.

Filters : Activated Carbon



The activated carbon filter (for odor reduction) usually consists of carbon-impregnated cloth or foam. This is manufactured by infusing the raw material with powdered activated carbon.
The carbon filter is then wrapped around the inside or outside of the HEPA filter.

Manufacturing

Plastic

Plastic is moulded by Injection Moulding

The plastic used is ABS, a thermoplastic material, which can be easily recycled. This means that a common way of producing ABS plastic is from other ABS plastic (i.e. making ABS from ABS).

HEPA

Mat of randomly aligned fibers, made from either glass or synthetic materials

The glass fibres are created by passing molten glass through very fine pores in a spinning nozzle and are cooled instantly because of their tiny diameters.

The material is folded into an accordion pattern.This filter is enclosed in an open wired grid filter case.

Activated Carbon

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This is manufactured by infusing the raw material with powdered activated carbon.

Filters : Disposal and byproducts:

Byproducts:

1. Non-carbon materials that are distilled from the manufacture of activated carbon, specification filter material, and excess material that must be discarded in the **production of HEPA filters.** Most manufacturers recommend that they be replaced every few years. The used filters cannot be recycled and thus end up in landfills.

2. **Activated carbon** can be recycled, but the cost of handling the small amount of carbon contained in a home air purifier would be prohibitive. Generally, it also ends up in landfills after it is used completely.

3. Dyson Air Purifier doesnot seem to have an electrostatic precipitator and is free from the risk of Ozone emissions.

References

1. https://www.dyson.in/products/air-purifiers/dyson-pure-cool/overview
2.http://www.madehow.com/Volume-7/Air-Purifier.html#:~:text=Activated%20carbon%20is%20produced%20by,contained%20in%20the%20raw%20material
3. https://breathequality.com/dyson-dp04-review/
4.https://www.financialexpress.com/industry/technology/dyson-air-purifiers-decoded-why-they-cost-a-premium-and-are-they-really-worth-it/2110635/
5. https://smarthomeguide.in/dyson-pure-cool-air-purifier-review/
6. https://www.omron.com/global/en/technology/omrontechnics/vol50/011.html
7. https://medium.com/dyson/inside-dyson-s-automated-motor-manufacturing-factory-c3fdbd13a70f
8. https://www.jamesdysonfoundation.com/content/dam/pdf/Standalone_DesignProcess.pdf
9. https://learn.allergyandair.com/activated-carbon-filters/
10. https://smartairfilters.com/en/blog/what-is-hepa-filter-how-hepa-filter-work/
11. https://www.creativemechanisms.com/blog/everything-you-need-to-know-about-abs-plastic
12. https://www.dyson.co.uk/inside-dyson/sustainability/dyson-weee-recycling
13. https://www.omron.com/global/en/technology/omrontechnics/vol50/011.html

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