

Cradle to Cradle Café

Gezonde kantoren

Facts and [#alternative facts](#)

ir. Tim Beuker, WELL AP

BBA Binnenmilieu

Introductie BBA Binnenmilieu

- Adviesbureau gespecialiseerd in binnenmilieu en gezondheid
- Opgericht in 1996, sinds 2014 dochter van DGMR
- 20 jaar ervaring met binnenmilieu, gezondheid, comfort en productiviteit
- Auteur van o.a. Programma van Eisen Frisse Scholen, AI-24, NEN-EN 15251, ISSO-publicatie 74
- Evidence-based advies

Verbetering comfort, gezondheid en productiviteit?



1



2

HET NIEUWE WERKEN

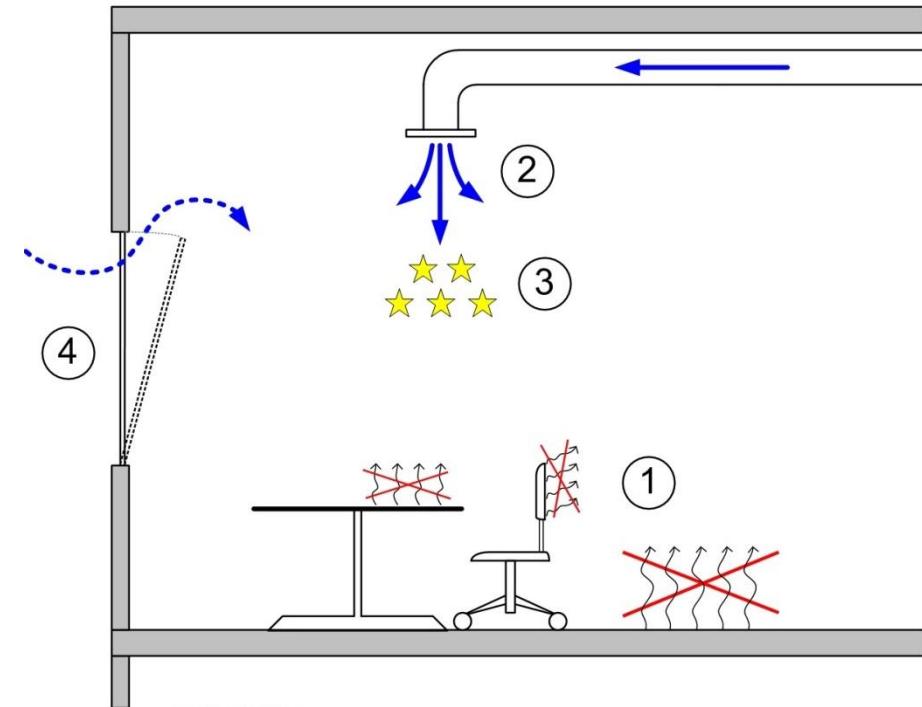
3



4

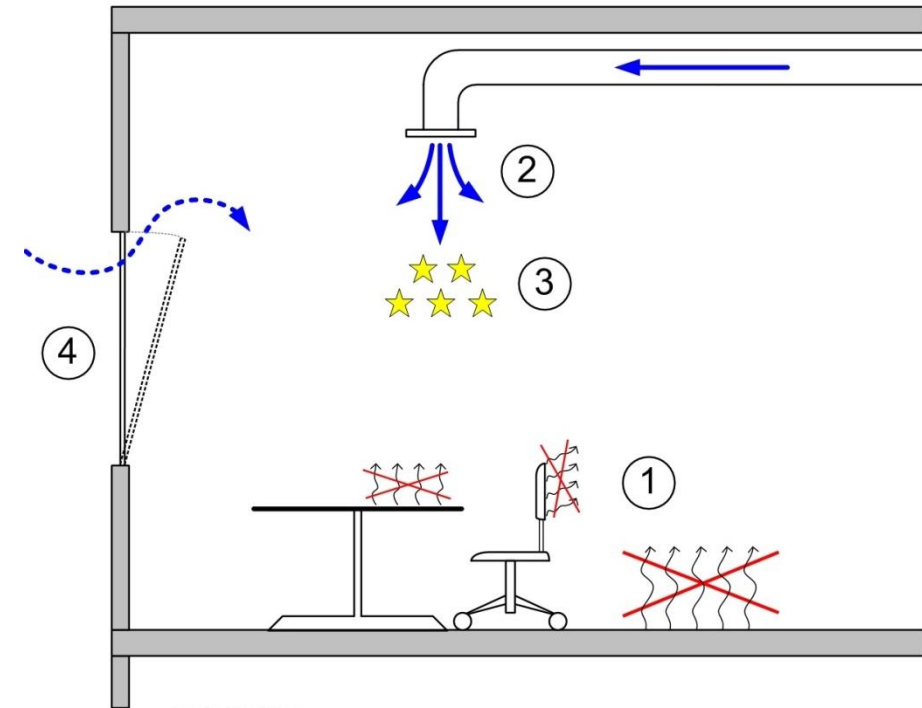
Goede binnenluchtkwaliteit door:

1. Emissie-arme materialen, meubilair
2. Adequate verse luchttoevoerhoeveelheid
2. Goede toevoerluchtkwaliteit
4. Spuiventilatie mogelijkheid



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Materiaalemissies



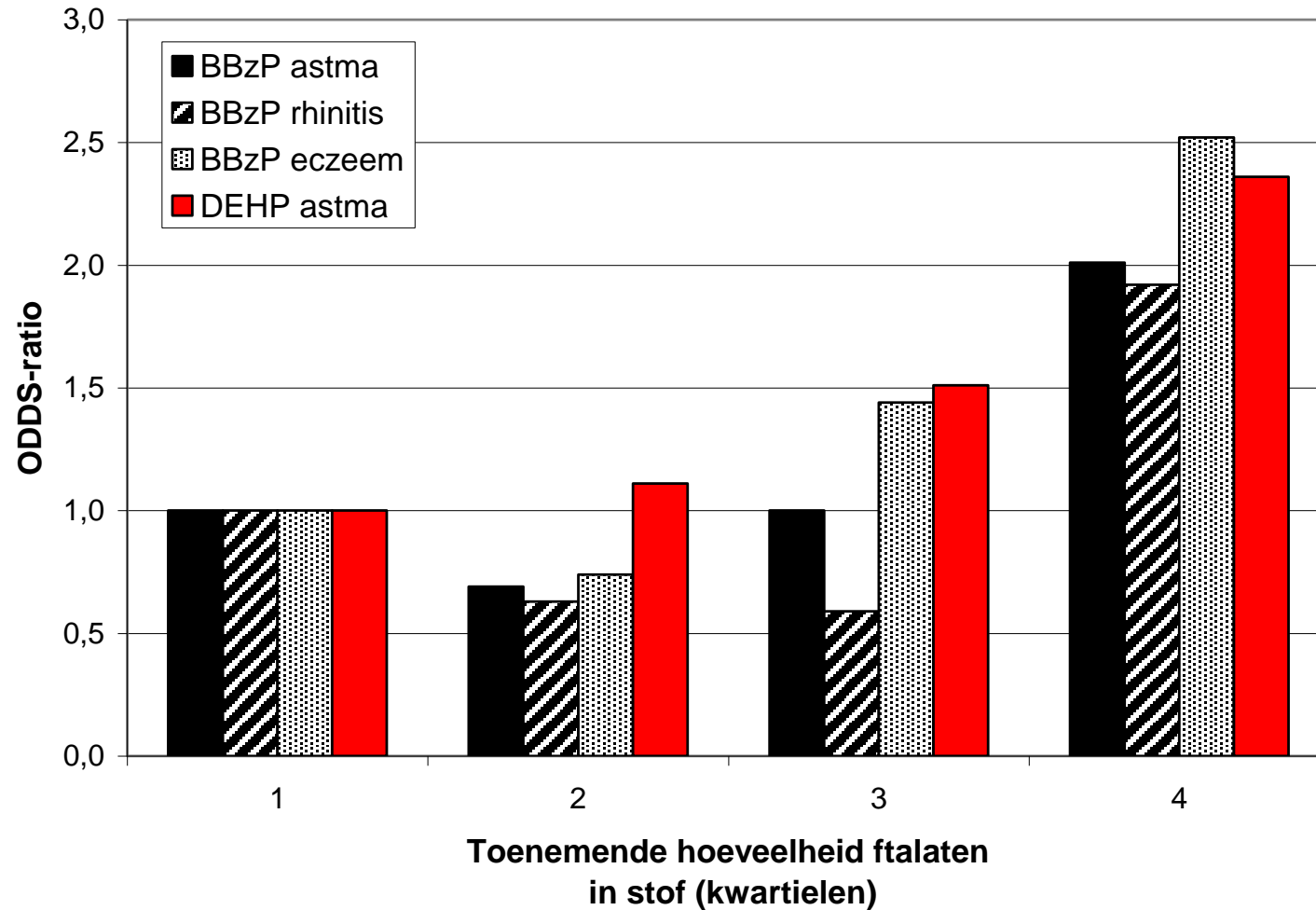
Korte termijn gezondheidseffecten zelf ervaren?



Citroengeranium



Lange termijn gezondheidseffecten



Bron: Bornehag et al, 2004

Voorkomen?

- Gebruik alleen materialen en meubilair met emissielabel, bijv.:

The image shows a Cradle to Cradle Certified logo on the left and a certification card on the right. The card contains the following information:

- PRODUCT NAME**
- Company Name**
- Protocol Version**

Below the product information, there are five certification levels: **BASIC**, **BRONZE**, **SILVER**, **GOLD**, and **PLATINUM**. The **BRONZE** level is highlighted in the image.

A checklist of criteria is shown below the certification levels, with a blue box highlighting the first row:

Criteria	Material Health	Material Reutilization	Renewable Energy	Water Stewardship	Social Fairness
MATERIAL HEALTH	✓				
MATERIAL REUTILIZATION		✓			
RENEWABLE ENERGY			✓		
WATER STEWARDSHIP				✓	
SOCIAL FAIRNESS					✓



SILVER

Carpet XYZ

ISSUED TO: Carpet Company Name

ASSESSED BY:
Assessor

EXPIRES: January X, 2017

STANDARD: v3.0

ASSESSED SCENARIOS:
Manufacture, Installation, Use as insulation, Collection, Recycling

PRODUCTS COVERED:
Carpet A, Carpet B, Carpet C

PRODUCT OPTIMIZATION SUMMARY

- Cradle to Cradle Certified™* Banned List compliant
- Material Health optimization strategy developed
- No exposure from carcinogens, mutagens, or reproductive toxicants
- Meets VOC emissions testing requirements
- Product is fully optimized - does not contain any GREY or x-assessed chemicals
- Process chemicals have been identified and none are GREY or x-assessed

**Vanaf
Gold**

PERCENTAGE OF MATERIALS ASSESSED BY WEIGHT

99-100%

Inventory threshold for chemicals in each material = 100 ppm

ASSESSMENT RATING BY WEIGHT



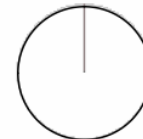
A or B: 15.3-25%



C: 60-67.3%

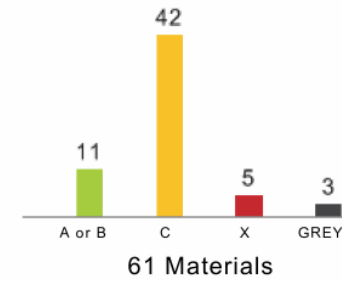


X: 13-17.3%



GREY 0-1%

PRODUCT OPTIMIZATION



SAMPLE CERTIFICATE

CERT NO. MHC2315



SILVER

Carpet XYZ

ISSUED TO: Carpet Company Name

ASSESSED BY:
Assessor

EXPIRES: January X, 2017

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ASSESSED SCENARIOS:
Manufacture, Installation, Use as insulation, Collection, Recycling

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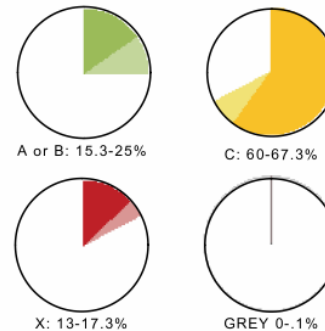
**Vanaf
Bronze**

PERCENTAGE OF
MATERIALS ASSESSED
BY WEIGHT

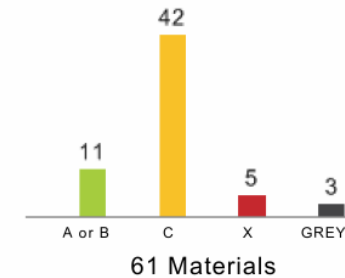
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Inventory threshold for chemicals
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ASSESSMENT RATING
BY WEIGHT



PRODUCT OPTIMIZATION



SAMPLE CERTIFICATE

CERT NO. MHC2315

Ahrend BALANCE

KONINKLIJKE AHREND NV



Cradle to Cradle Certified Product Scorecard

MATERIAL HEALTH

Silver

Floor Tiles

ROYAL MOSA



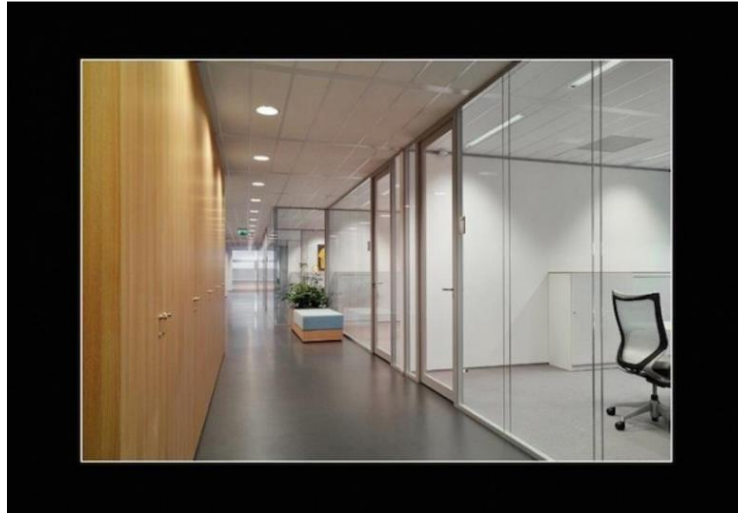
Cradle to Cradle Certified Product Scorecard

MATERIAL HEALTH

Gold

QbiQ Partition Walls and Glass Solutions

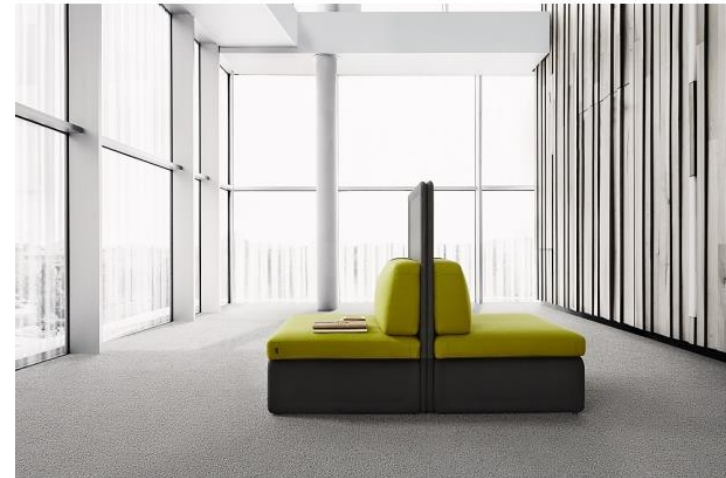
QBIQ B.V.



Cradle to Cradle Certified Product Scorecard	
MATERIAL HEALTH	Bronze

EcoBase® PA6 Solution Dyed Carpet Tiles Gold

DESSO B.V.

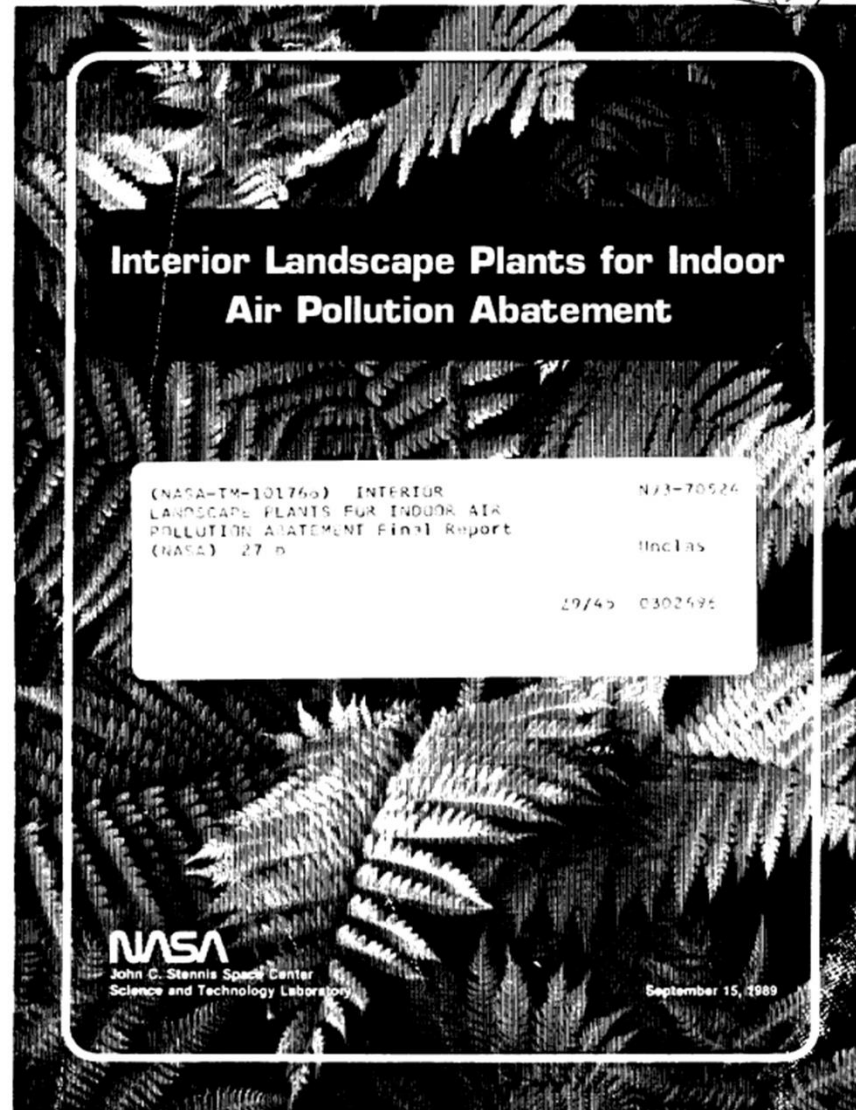


Cradle to Cradle Certified Product Scorecard	
MATERIAL HEALTH	Platinum

Verbetering binnenluchtkwaliteit?

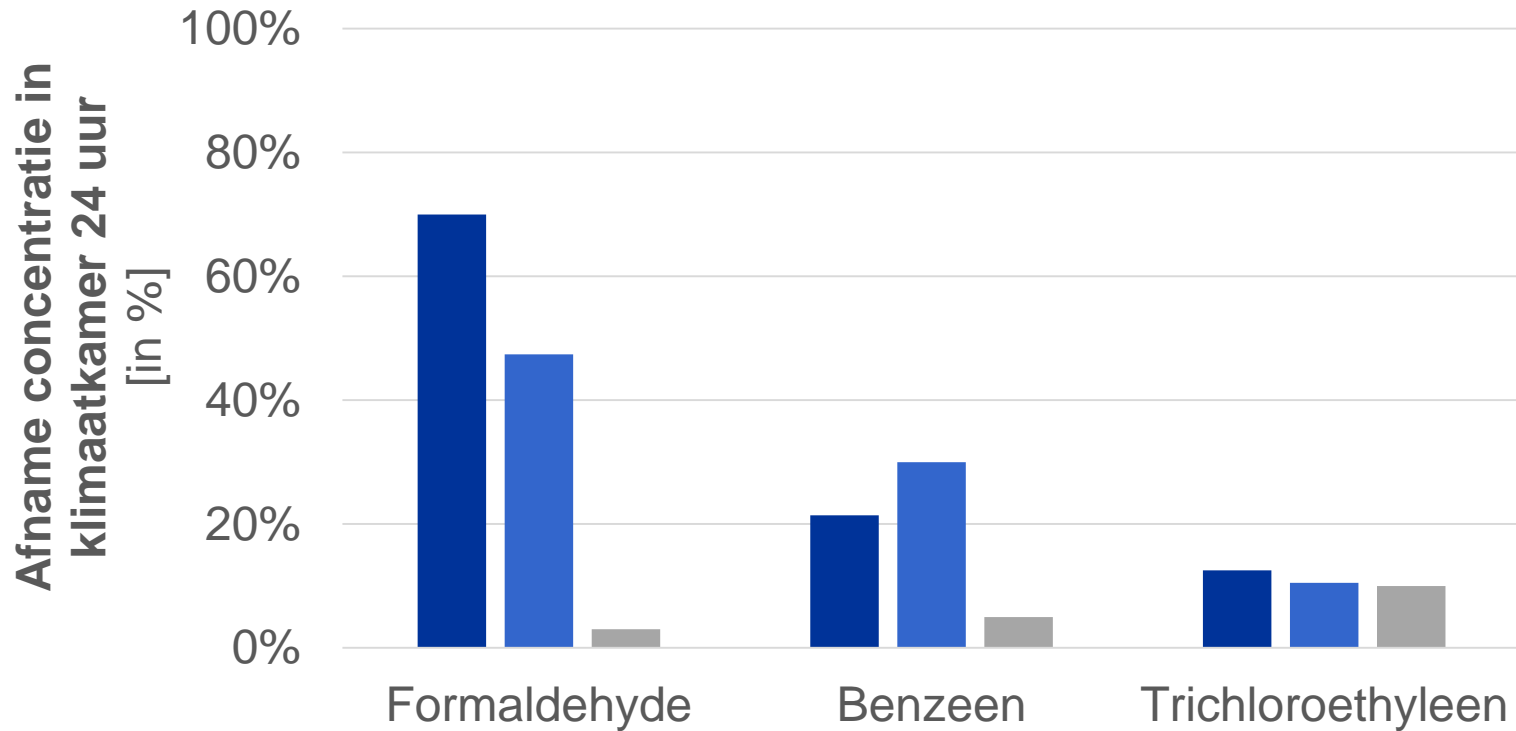


Fact or **#alternative fact**?



Wolverton B.C. et al (1989) Interior Landscape Plants for Indoor Air Pollution Abatement, NASA

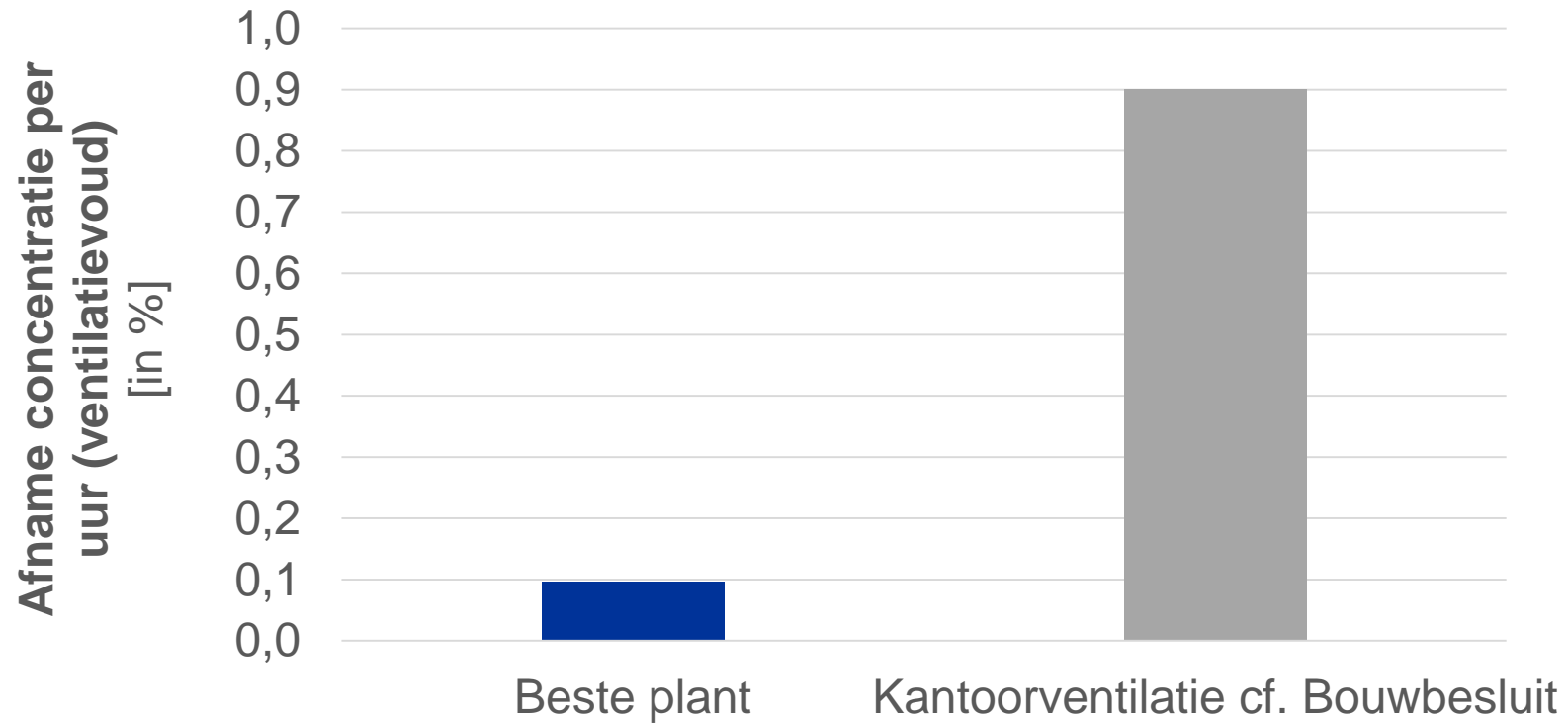
Afname luchtverontreiniging



- Draecaena fragrans massangeana
- Ficus Benjamina
- Lege klimaatkamer

O.b.v.: Wolverton B.C. et al (1989) Interior Landscape Plants for Indoor Air Pollution Abatement, NASA

Afname luchtverontreiniging



Afname luchtverontreiniging

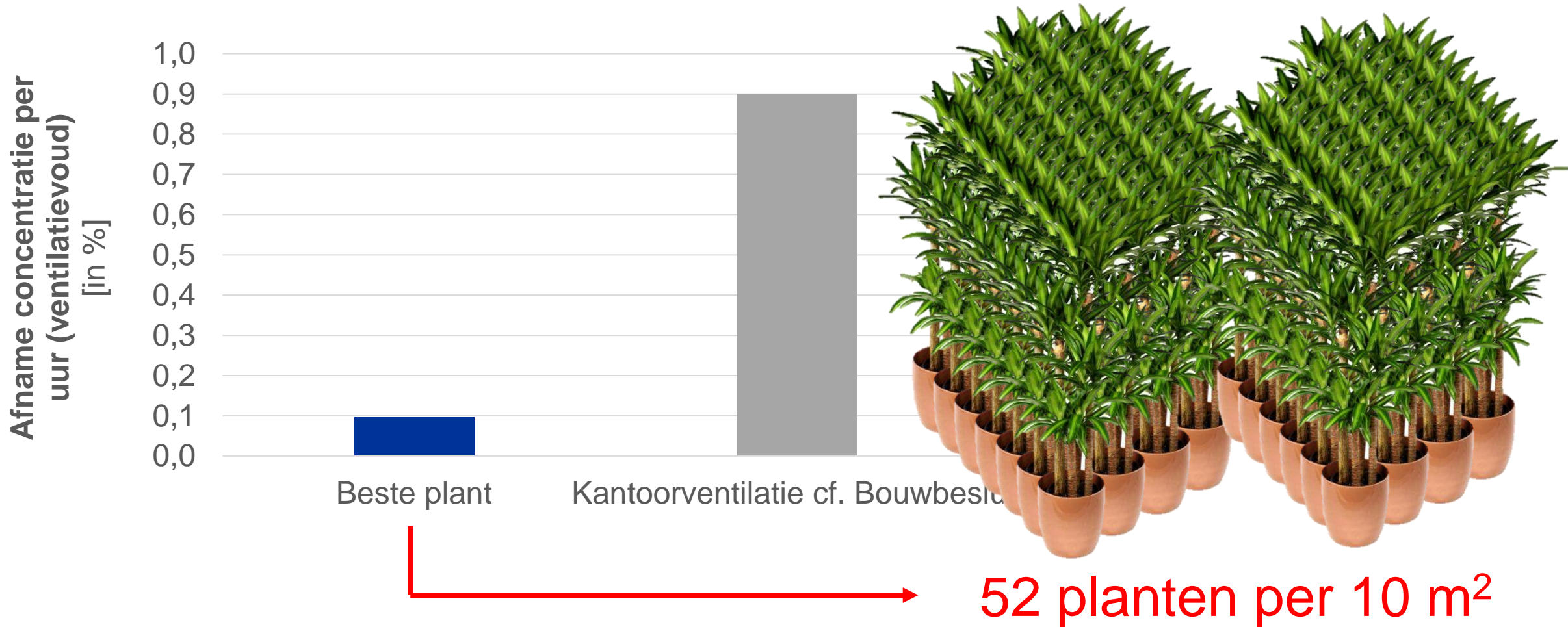
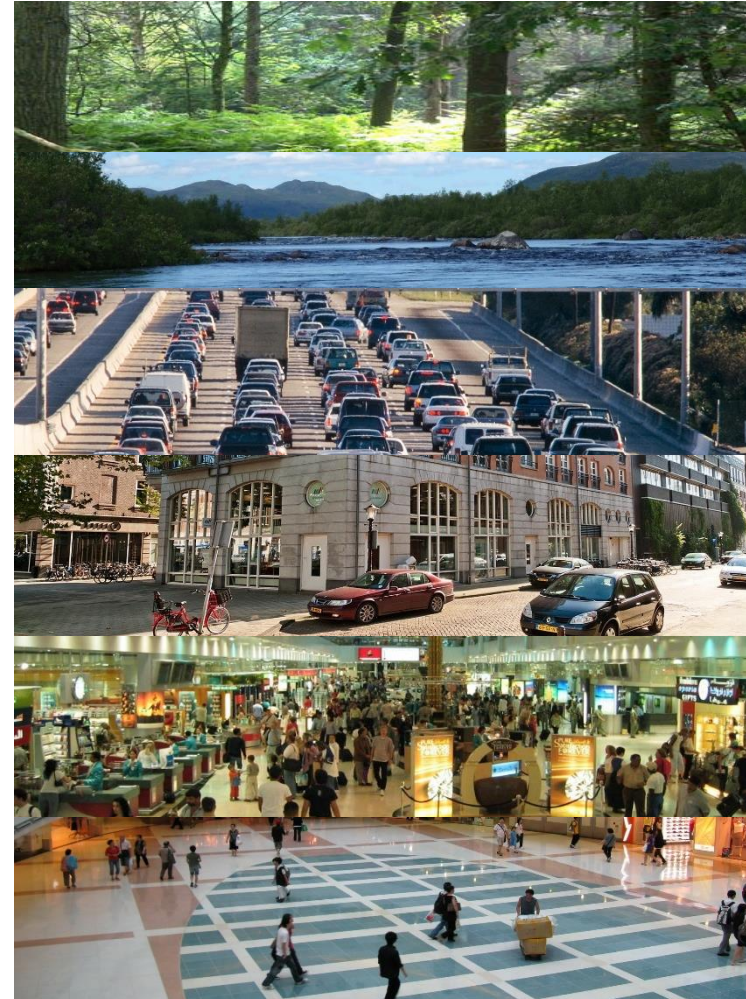
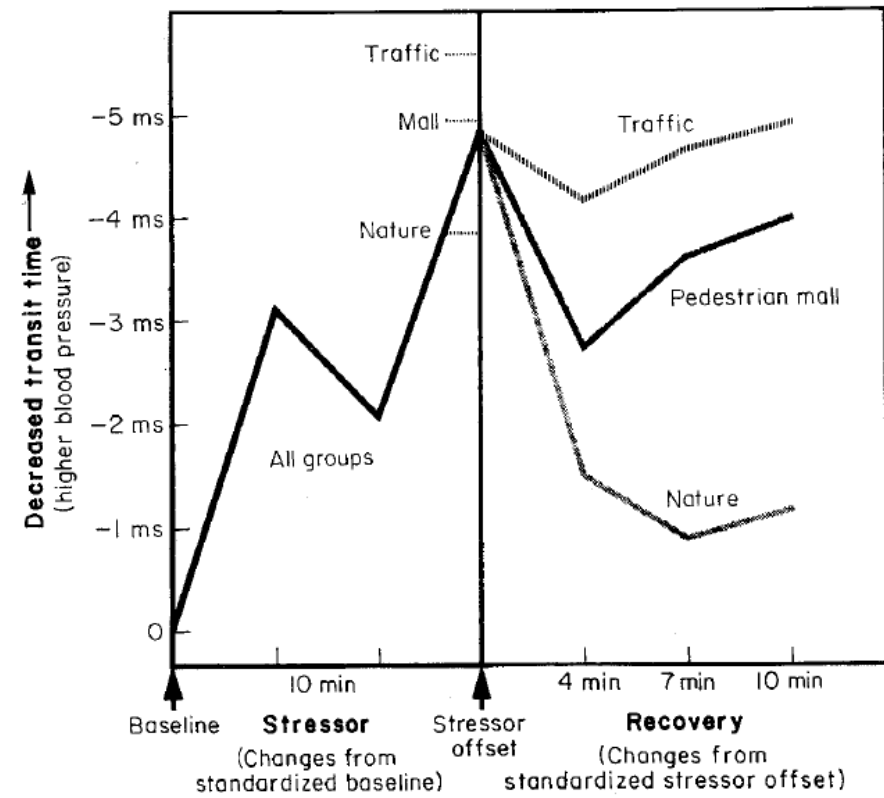
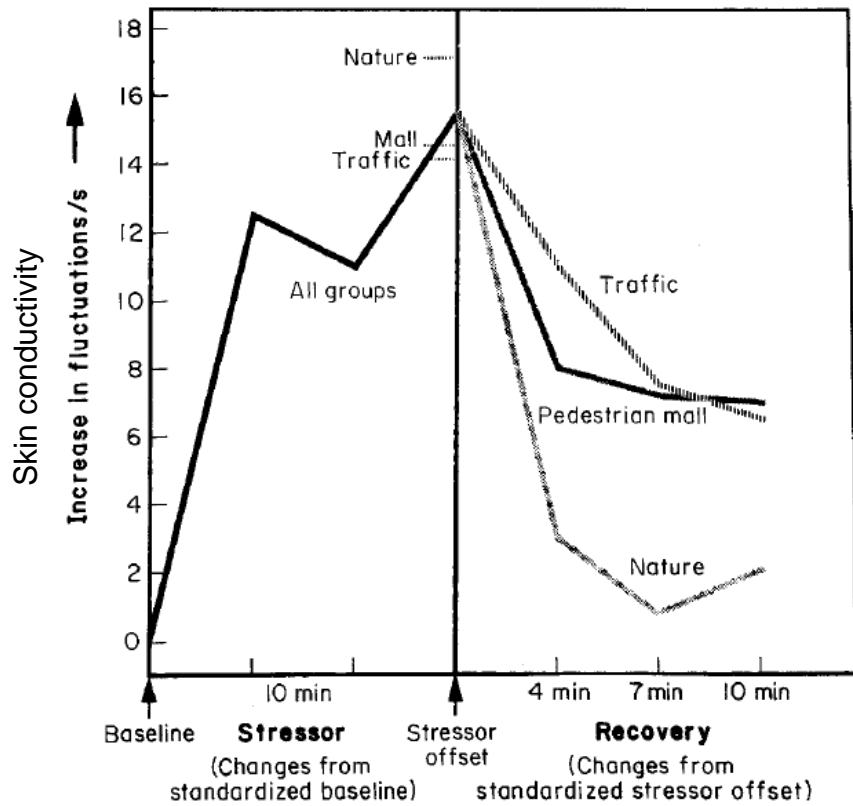


TABLE 1
Environments displayed during stress recovery period

Environment	Visual content	Sounds
Nature Vegetation	Setting dominated by trees and other vegetation; some openness among trees; occasional light breeze in background; no people or animals.	Birds, light breeze. Range of dB levels: 42–64.
Water	Setting dominated by trees and a fast-moving stream; waves and ripples visible on stream surface. No people or animals.	Constant 63–64 dB from stream.
Urban Heavy traffic	Commercial street with moderately heavy traffic (24 vehicles/min) and no pedestrians or animals. Two-way traffic; wide variety of vehicles (e.g. large and small trucks, buses). Traffic moving at 35–45 mph.	Range of dB levels: 65–93.
Light traffic	Same commercial street as above, but during light traffic conditions (4 vehicles/min). No pedestrians. Two-way traffic moving at 35–45 mph. Less variety in vehicles than during heavy traffic conditions.	Range of dB levels: 64–85.
Urban Many pedestrians	Pedestrianized, traffic-free outdoor shopping mall with many people (35 persons passing/min). Two-way movement. Several store facades; moderate depth or openness; no animals.	Voices, footsteps, and other people noises. Range of dB levels: 65–78.
Few pedestrians	Same traffic-free shopping area as above, but with fewer people (7 persons passing/min). No animals.	Range of dB levels: 52–72.



Bron: Ulrich et al (1991) *Stress recovery during exposure to natural and urban environments*



Bron: Ulrich et al (1991) Stress recovery during exposure to natural and urban environments

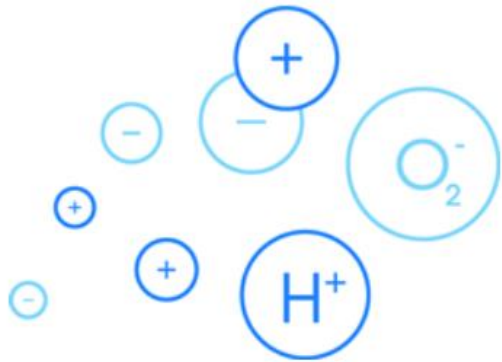
Verbetering binnenluchtkwaliteit?



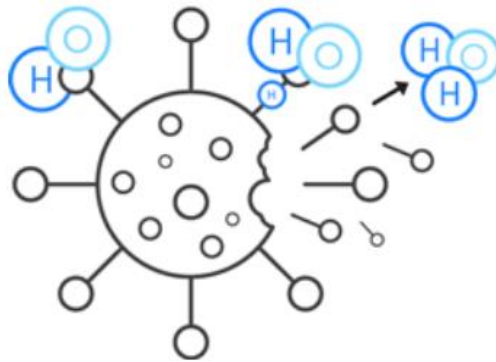
Fact or **#alternative fact**?

Werking ionisator volgens fabrikant

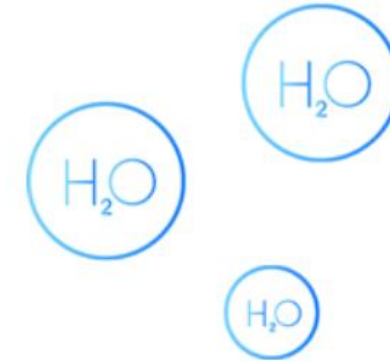
STEP 1.



STEP 2.

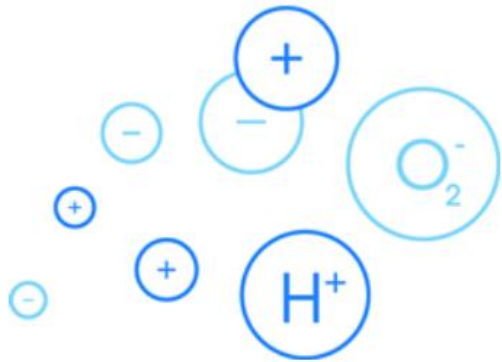


STEP 3.



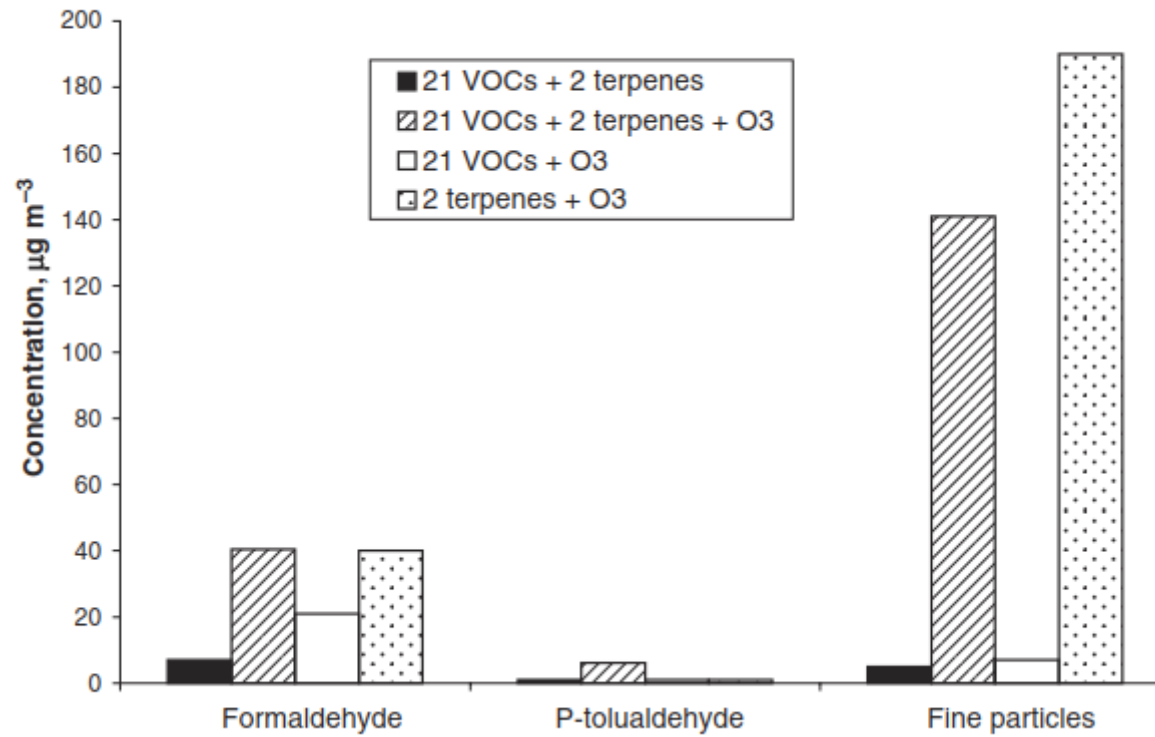
Werking ionisator in de praktijk

STEP 1.



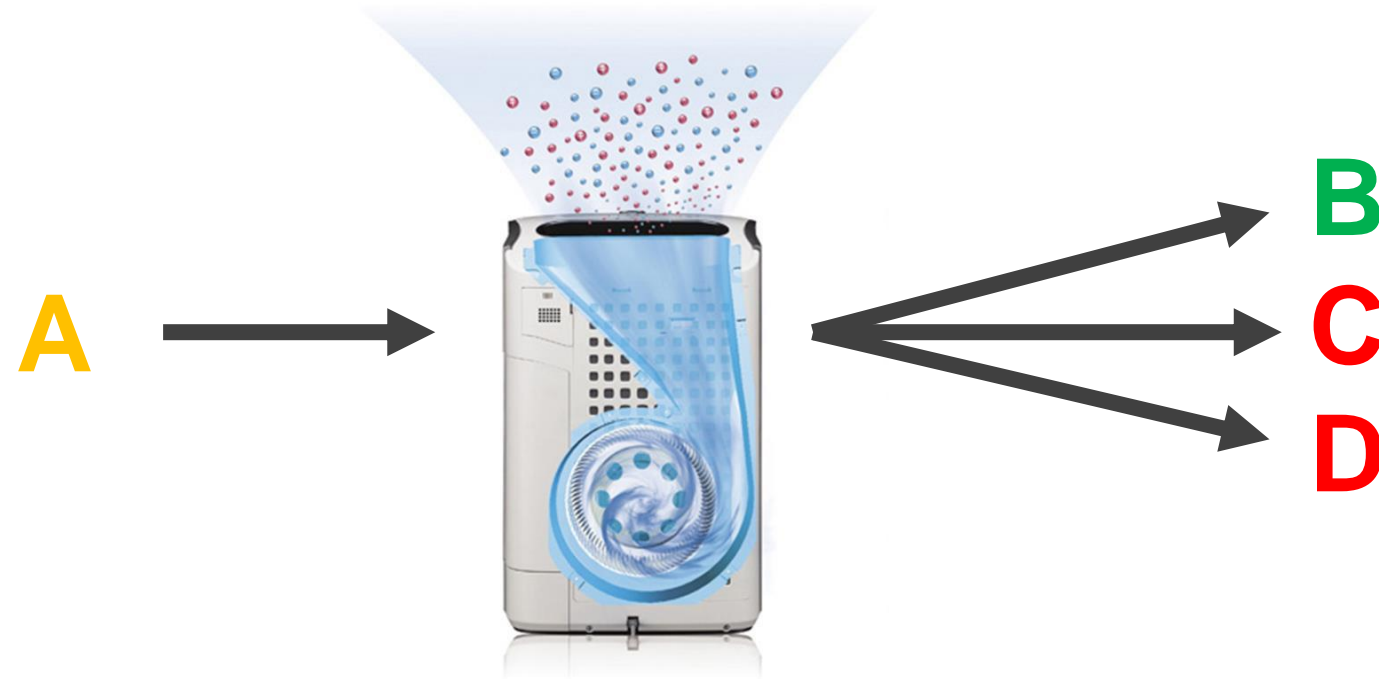
STEP 2.

STEP 3.



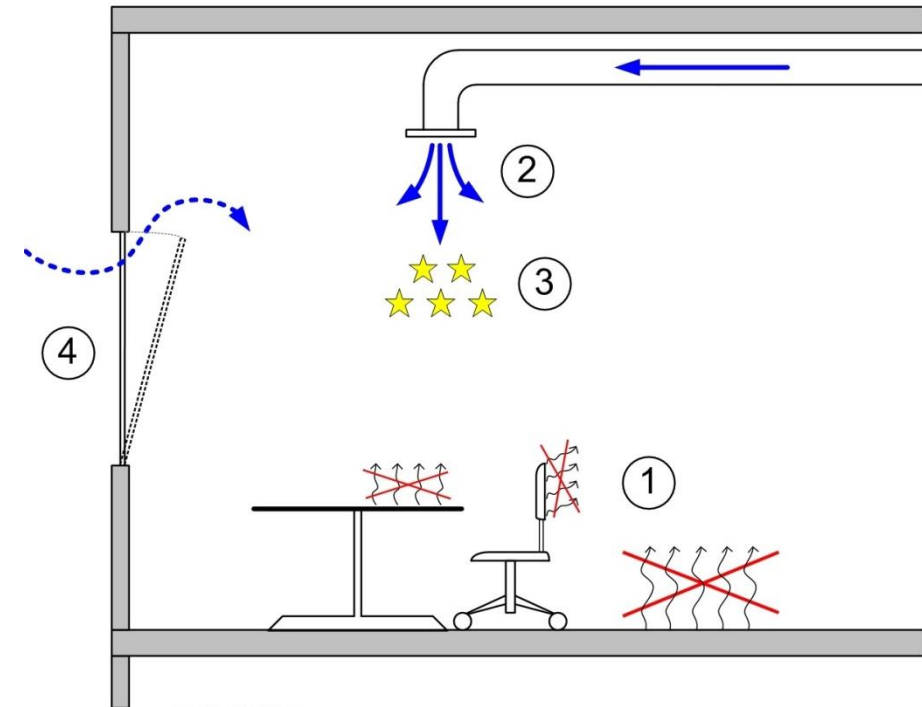
Bron: Weschler (2004) *Chemical reactions among indoor pollutants: what we've learned in the new millennium*

Algemeen principe luchtreinigers



Wel goede binnenluchtkwaliteit door:

1. Emissie-arme materialen, meubilair
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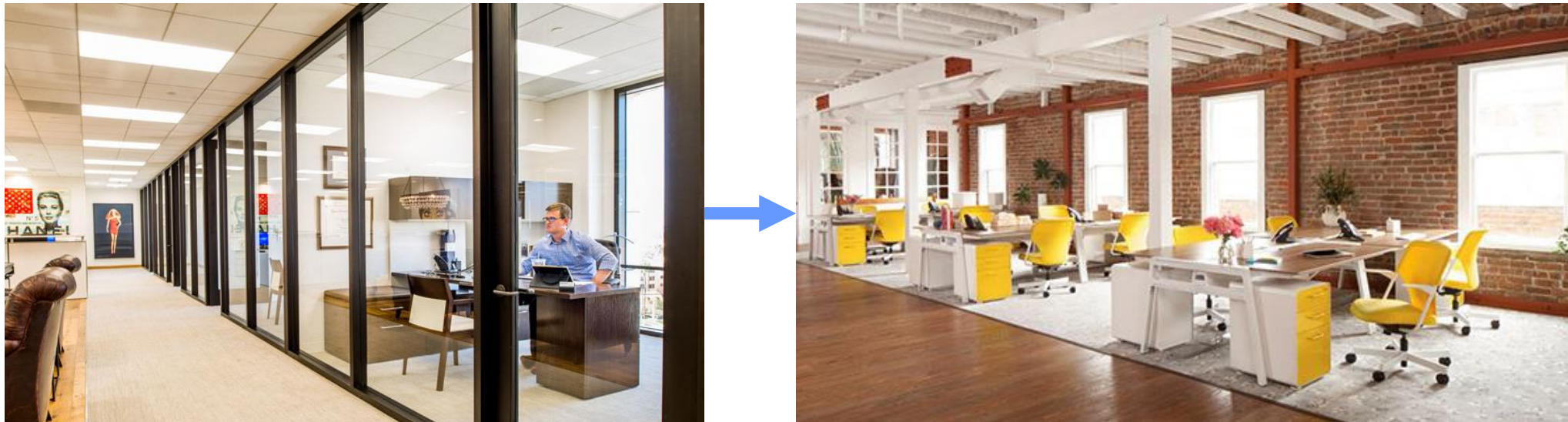


Verbetering comfort, gezondheid en productiviteit?

**HET
NIEUWE
WERKEN**

Fact or **#alternative fact**?

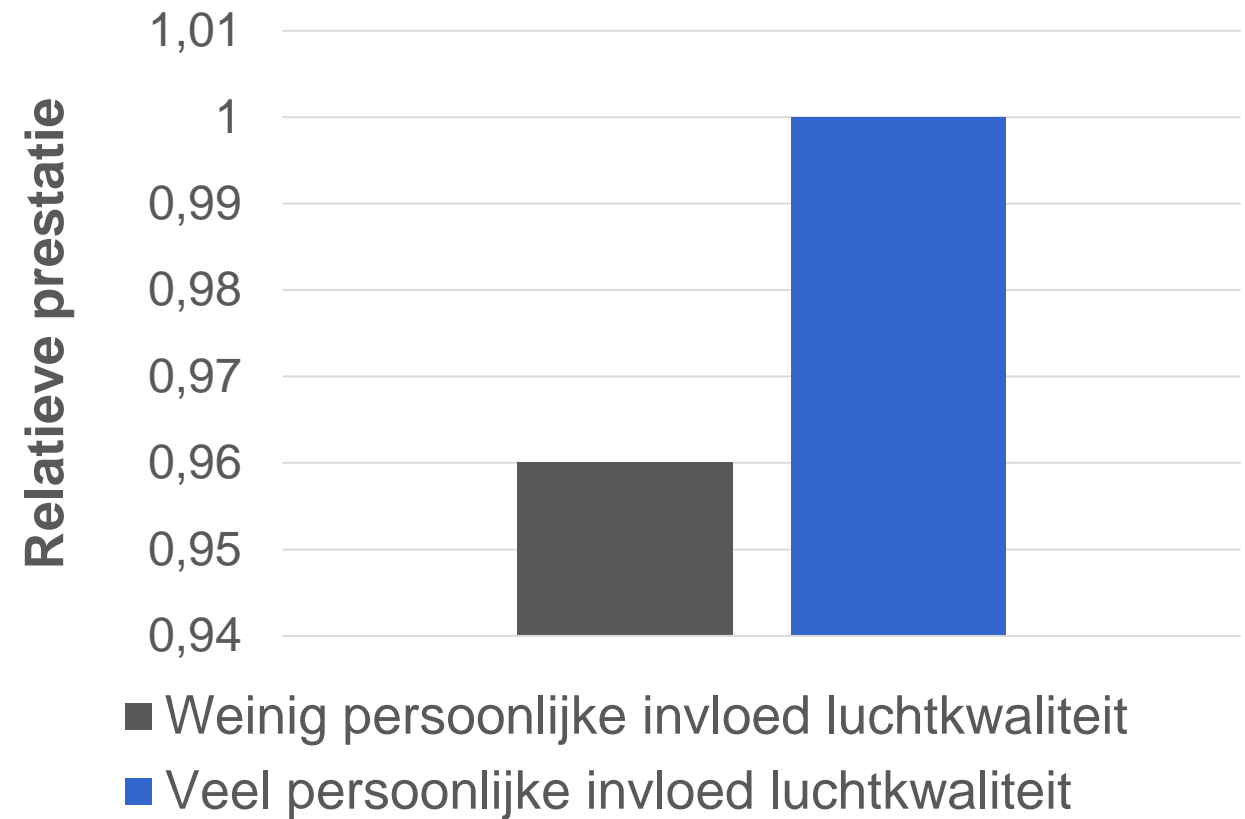
Verbetering comfort, gezondheid en productiviteit?



Fact or **#alternative fact**?

Effect open werkruimte op productiviteit:

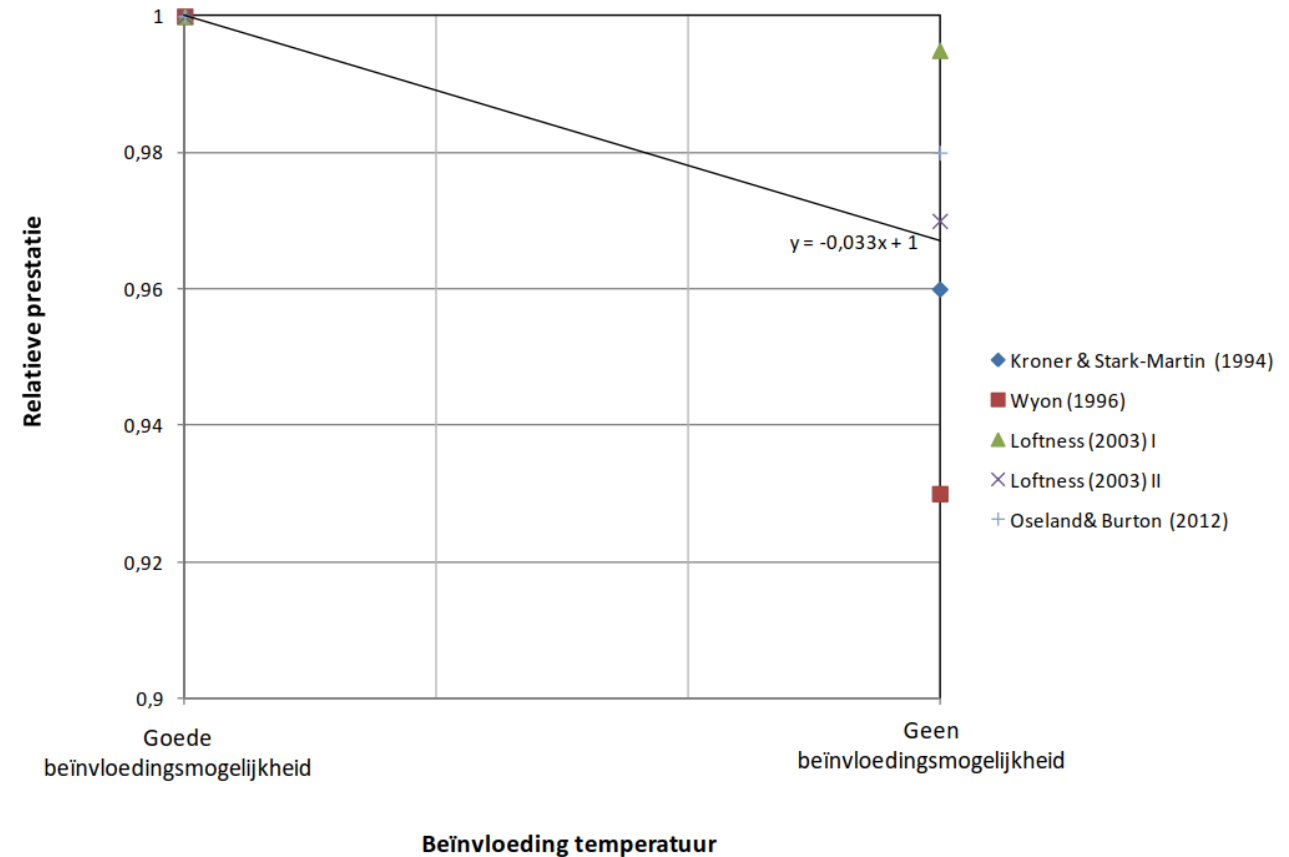
- Geen (bruikbaar) te openen raam: **-4 %**



Bron: BBA Binnenmilieu (2015) Kentallen binnenmilieu & productiviteit ten behoeve van de EET value case tool, Platform 31

Effect open werkruimte op productiviteit:

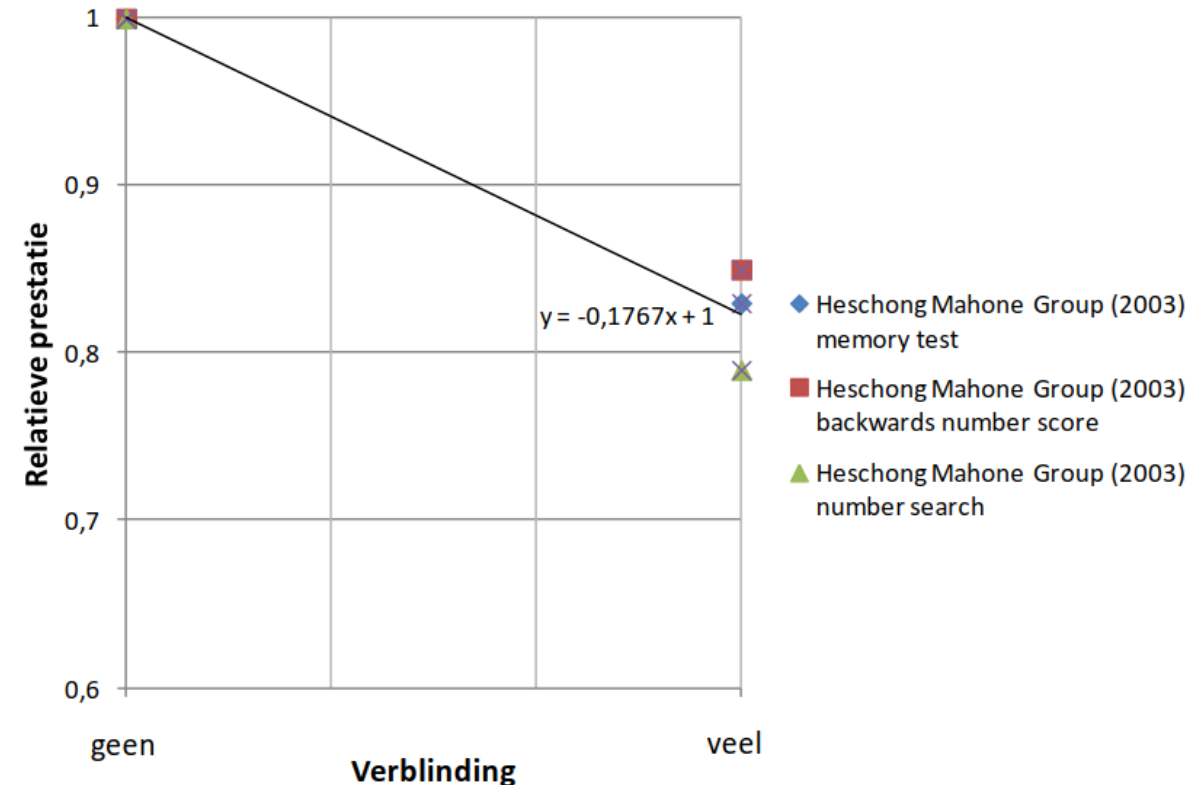
- Geen (bruikbaar) te openen raam: - 4%
- Geen temperatuurbeïnvloeding: - 3%



Bron: BBA Binnenmilieu (2015) Kentallen binnenmilieu & productiviteit ten behoeve van de EET value case tool, Platform 31

Effect open werkruimte op productiviteit:

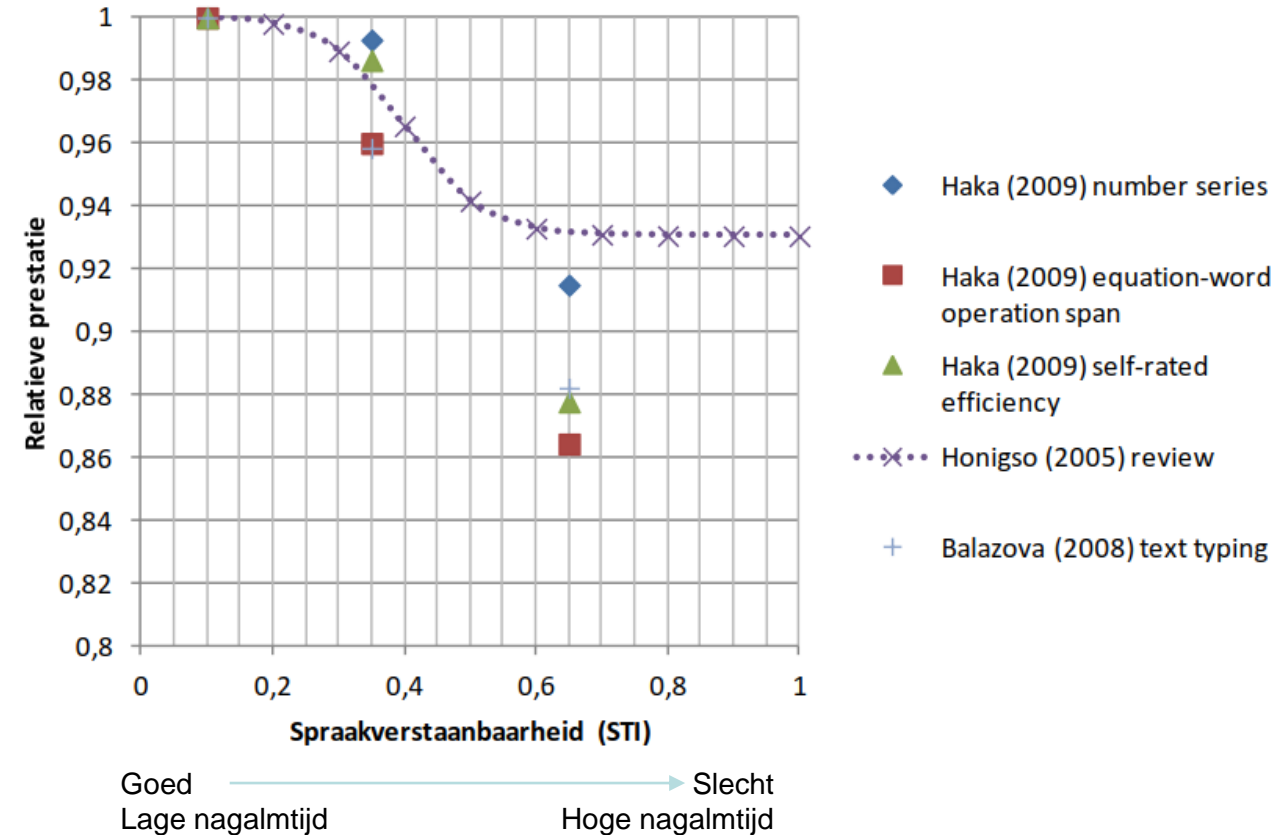
- Geen (bruikbaar) te openen raam: - 4%
- Geen temperatuurbeïnvloeding: - 3%
- Lichtwering niet te gebruiken: **-3 tot -5 %**



Bron: BBA Binnenmilieu (2015) Kentallen binnenmilieu & productiviteit ten behoeve van de EET value case tool, Platform 31

Effect open werkruimte op productiviteit:

- Geen (bruikbaar) te openen raam: **- 4%**
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- Hinderlijk betekenisvol geluid: **-3 tot -7 %**



Bron: BBA Binnenmilieu (2015) Kentallen binnenmilieu & productiviteit ten behoeve van de EET value case tool, Platform 31

Wel productiviteit bevorderen:

- Werkomgeving af te stemmen op werkzaamheden
- Weinig betekenisvol geluid
- Voldoende persoonlijke beïnvloeding (licht, geluid, lucht, temperatuur)

Verbetering comfort, gezondheid en productiviteit?



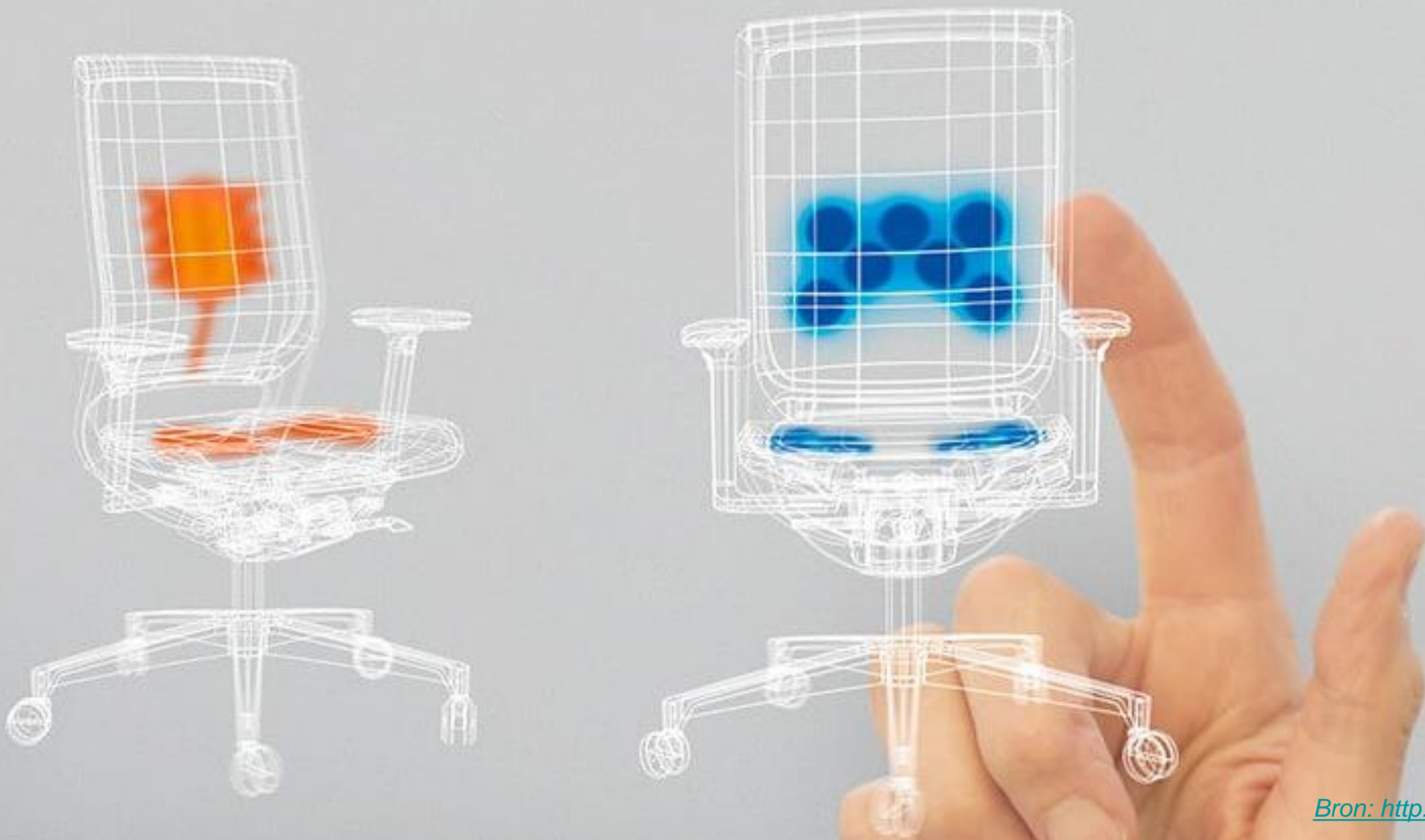
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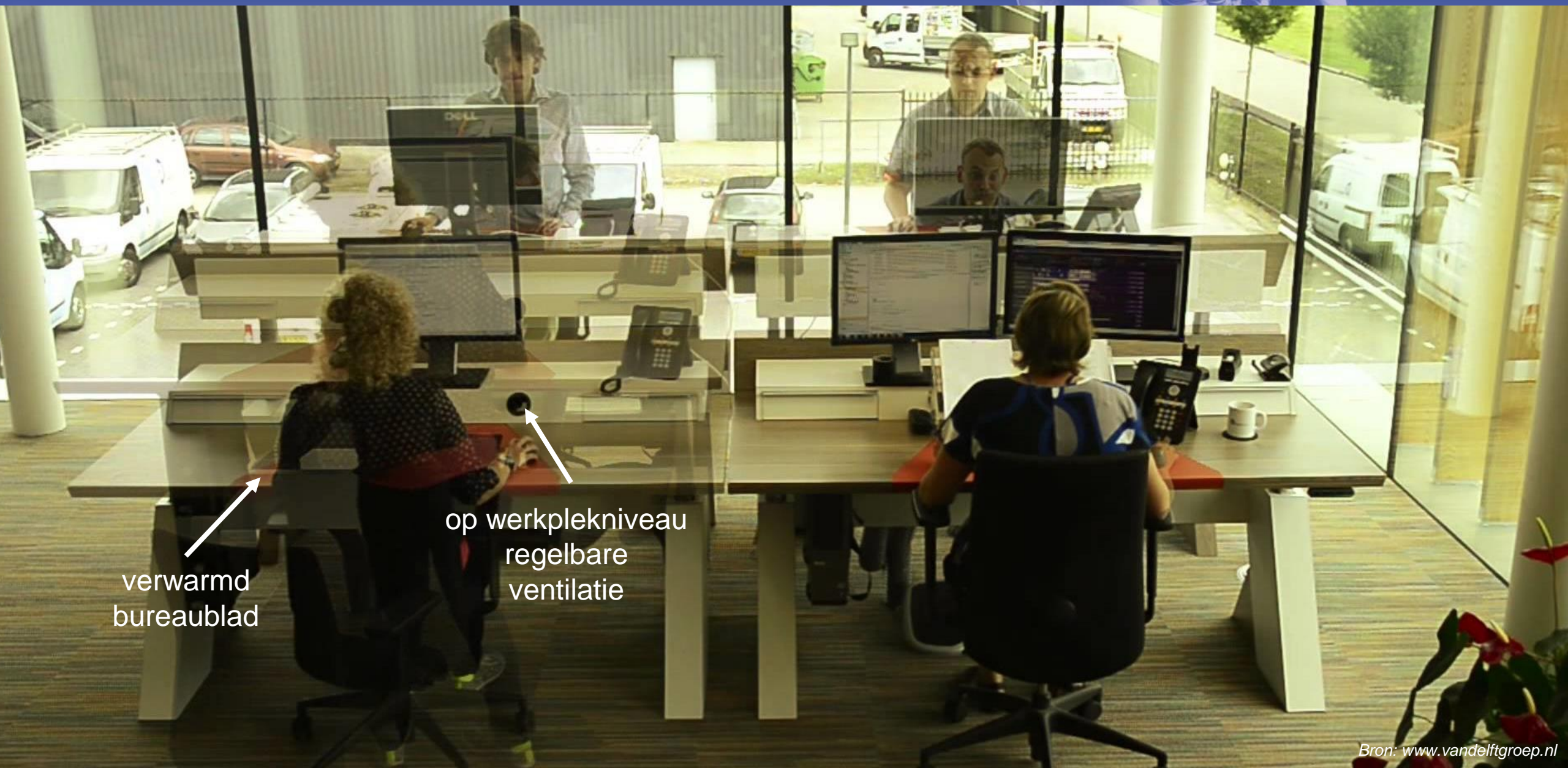
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- Geen (bruikbaar) te openen raam: - 4%
- Geen temperatuurbeïnvloeding: - 3%
- ~~Lichtwering niet te gebruiken: -3 tot -5%~~
- ~~Hinderlijk betekenisvol geluid: -3 tot -7%~~



Bron: <http://www.kloeber-klimastuhl.com>



verwarmd
bureaublad

op werkplekniveau
regelbare
ventilatie

Bron: www.vandelftgroep.nl

Verbetering comfort, gezondheid en productiviteit?



1



2

**HET
NIEUWE
WERKEN**

#alternative fact

3



4



ir. Tim Beuker
tb-bba@binnenmilieu.nl
088-2229494

Productiviteit i.r.t. meerkosten gezond gebouw:

Voorbeeld:

- Investeringskosten welzijnsbevorderende maatregelen: €50 per m²
- Omzet: €10.000,- per m² per jaar
- Gewenste terugverdientijd maatregelen: 1 jaar
- Benodigde productiviteitsstijging: **+0,005%**