schweigen

simply *silent*

HOME VENTILATION

HEALTH RISKS, SAFETY HAZARDS & REVOLUTIONARY TECHNOLOGY

trace. climate positive organisation

AUSTRALIAN OWNED CERTIFIED

GOOD DESIGN AWARD® WINNER

Schweigen

- Pioneer of silent rangehood innovation
- 100% Australian owned climate-positive company
- Behind Australia's number one selling silent rangehood
- Good Design Award winner for product design & innovation
- More than 150 rangehood and exhaust fan models
- Available from 900+ leading retailers nationwide

National Commercial Manager

Ben Thompson

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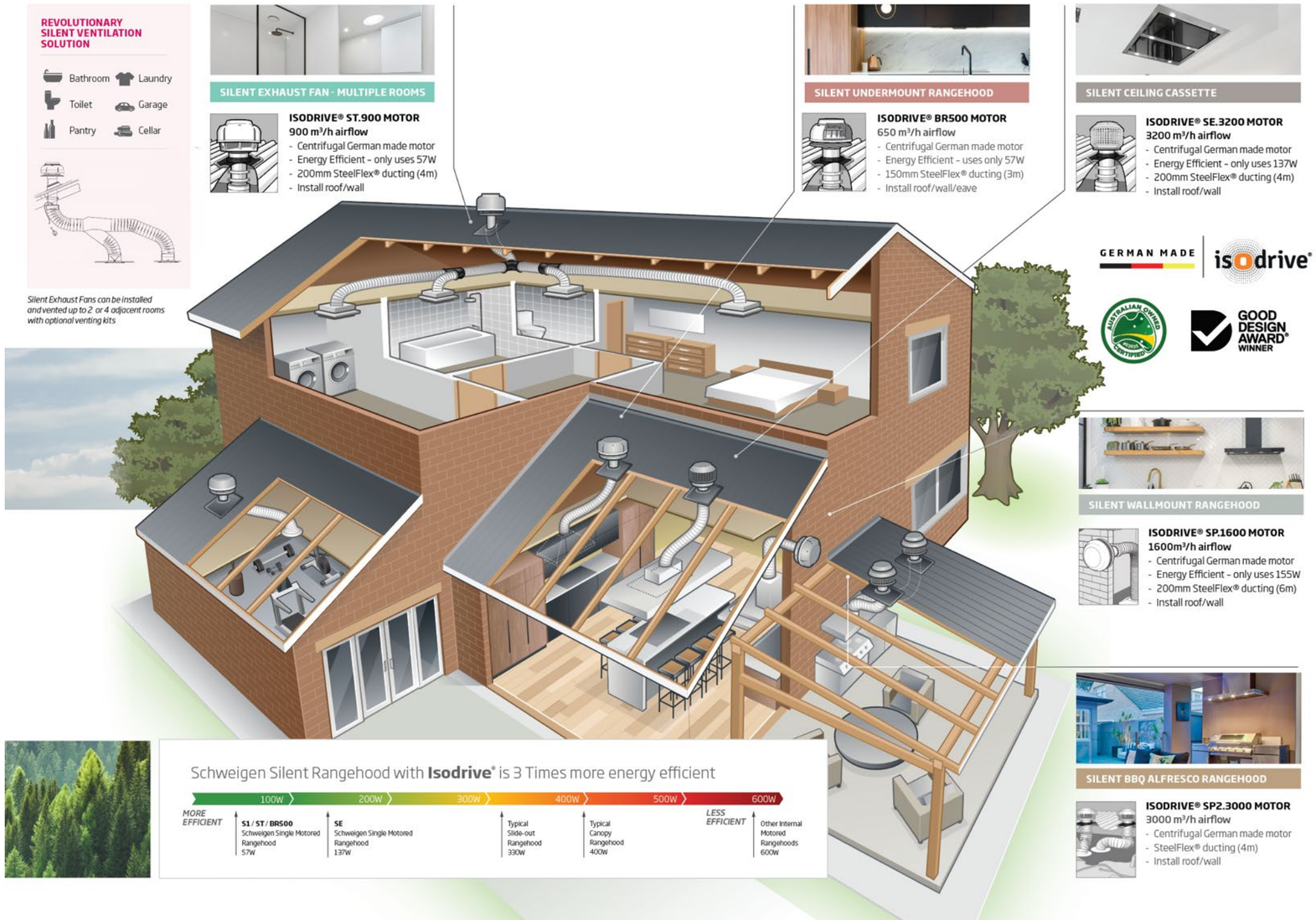
Learning Outcomes

1) Codes and standards governing home ventilation
2) Health risks of improper ventilation
3) Overcoming hazards with ventilation innovation
4) Rangehood specification & installation

1. Home Ventilation

- Air quality is a key focus area of national construction standards
    - A well-ventilated home enhances the wellbeing of its inhabitants
    - Poor air quality endangers health

- Rangehoods and exhaust fans are code-mandated devices that help keep a home habitable



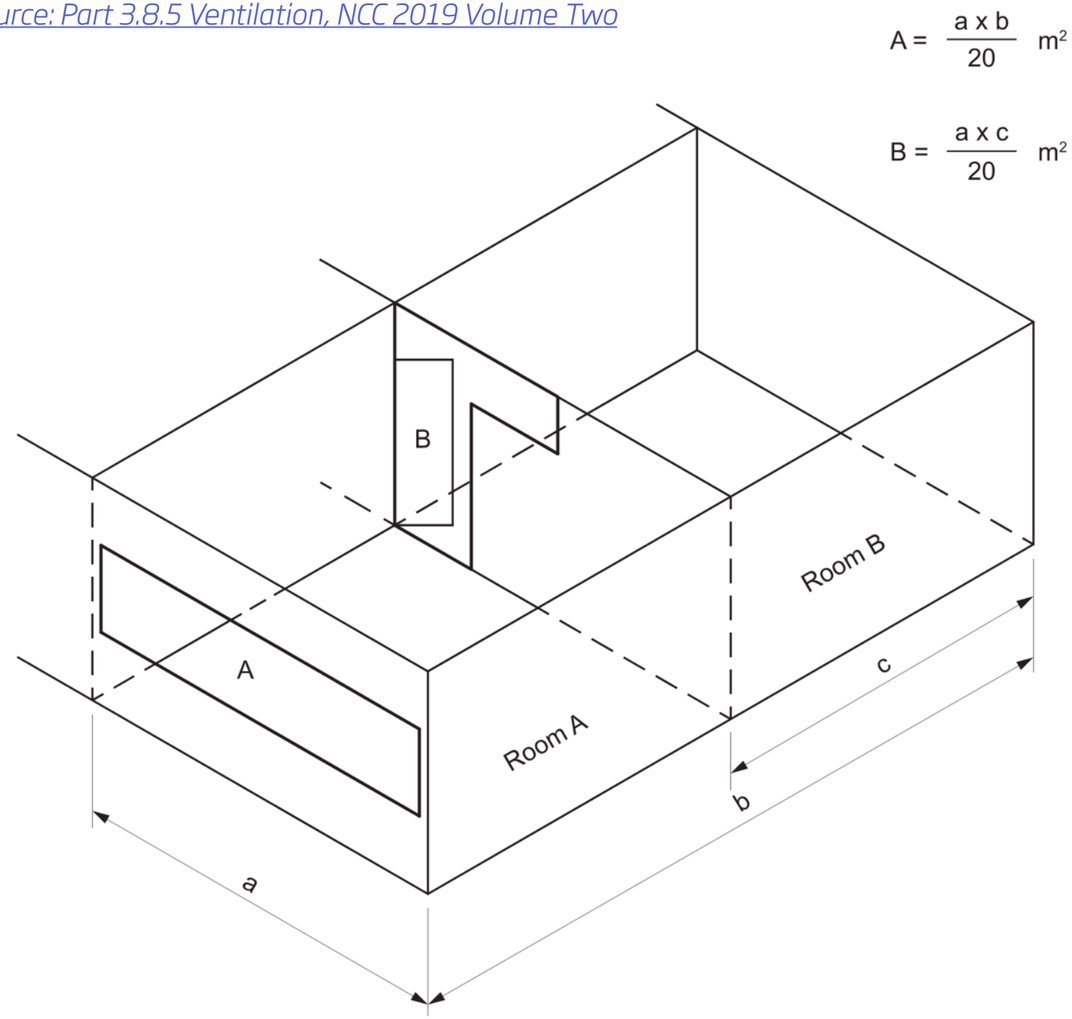
1a. National Construction Code (NCC)

- Rooms occupiable for more than an hour need outdoor ventilation
- 5% ventilation requirement:
    - Size of openings must equal to at least 5% of an area's floor space
    - Source of ventilation may come through an adjoining room
    - Cross ventilation must be achieved in a room with no ceiling fan

Source: [F4.6 Natural Ventilation, National Construction Code 2019 (Amendment)]

Figure 3.8.5.1 Method of determining areas of openings for borrowed ventilation

[Source: Part 3.8.5 Ventilation, NCC 2019 Volume Two]

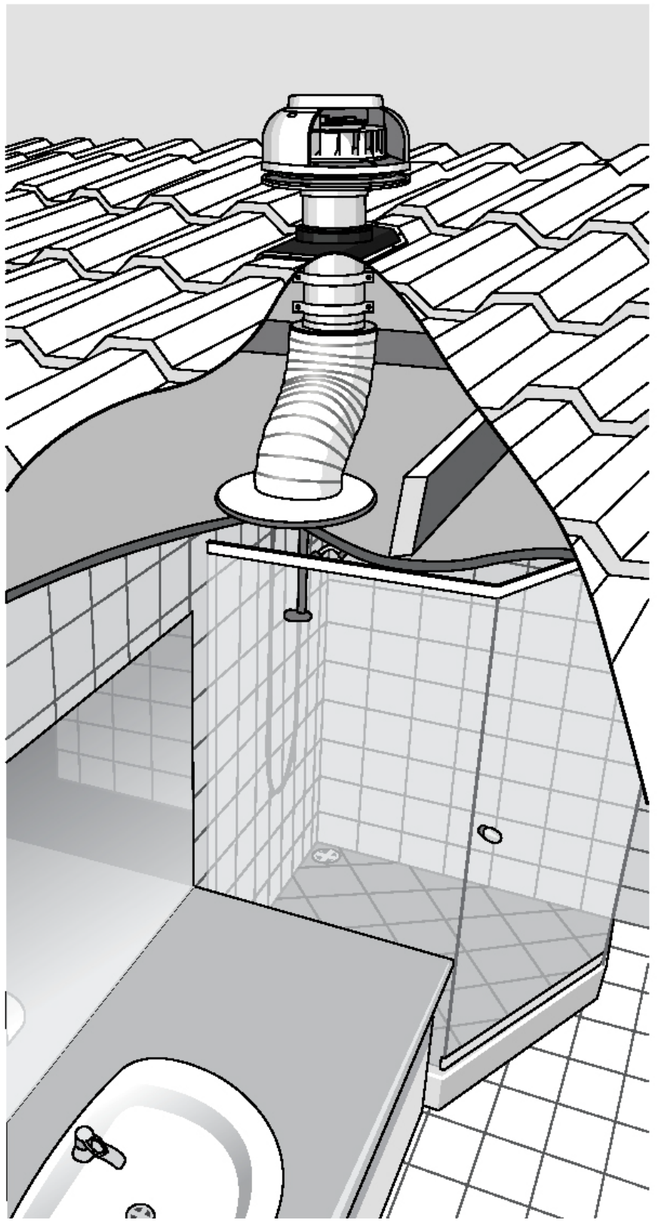


An exhaust fan or other means of mechanical ventilation may be used to ventilate a sanitary compartment, laundry, kitchen or bathroom, or where mechanical ventilation is provided

1a. National Construction Code (NCC)

- Minimum flow rates of exhaust systems:
    - Bathrooms/water closets – minimum of 25 L/s
    - Kitchen/laundry - minimum of 40 L/s

Source: 3.8.7.3 Flow Rate and Discharge of Exhaust Systems, National Construction Code 2019 (Amendment)



1b. Australian Standards (AS)

- Standards that govern installation of mechanical ventilation systems:
  - (AS) 366.1: Air handling and water systems of building
  - (AS) 1668.2: Mechanical ventilation for acceptable indoor air quality

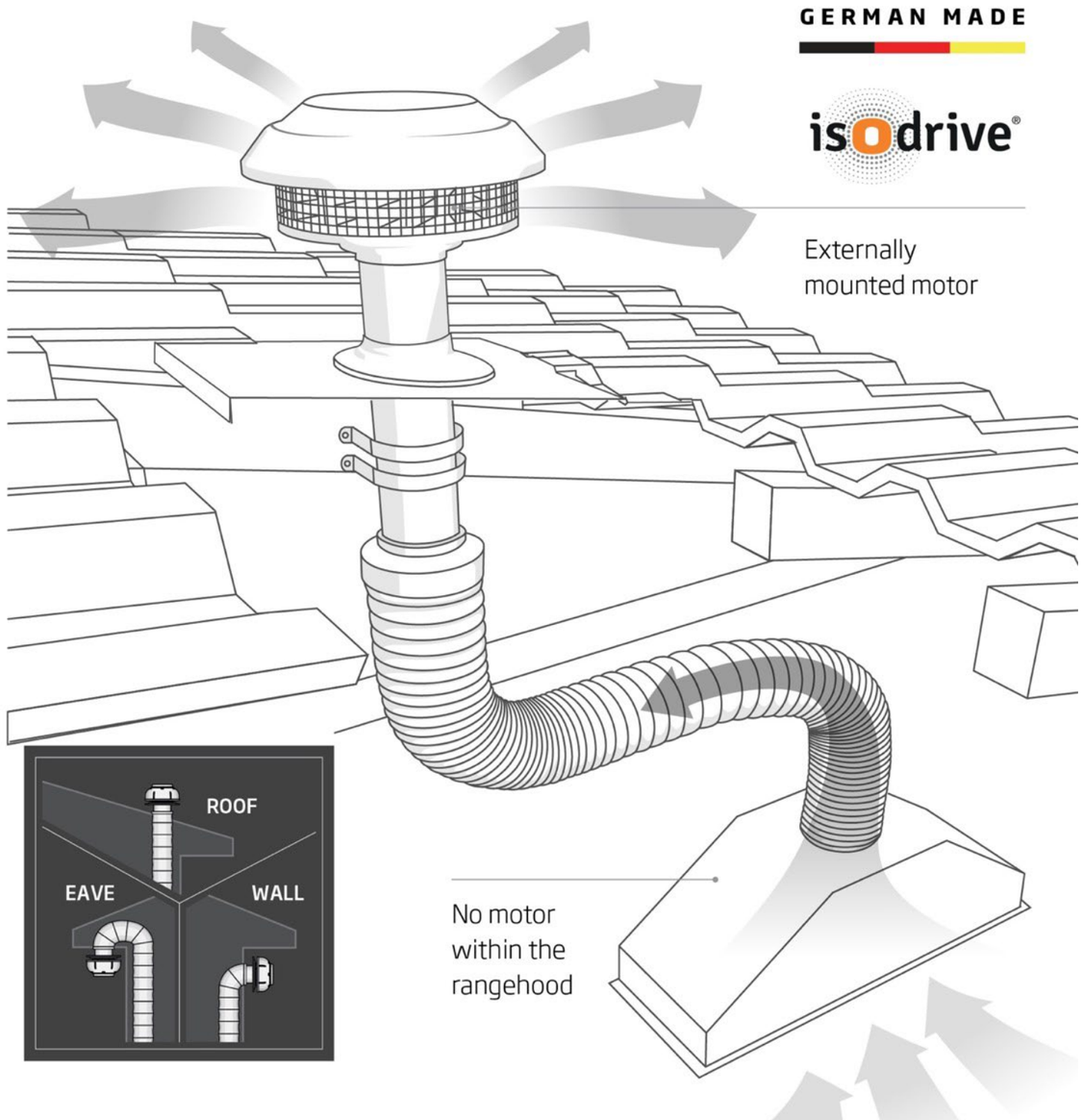
Source: Australian Standards 366.1, 1668.2

1c. Importance of Ducting & Duct Design

- Proper ventilation design involves:
    - Right number, size and position of openable windows
    - Mechanical ventilation systems and where necessary
- To ensure adequate ventilation and optimal air pressure in home

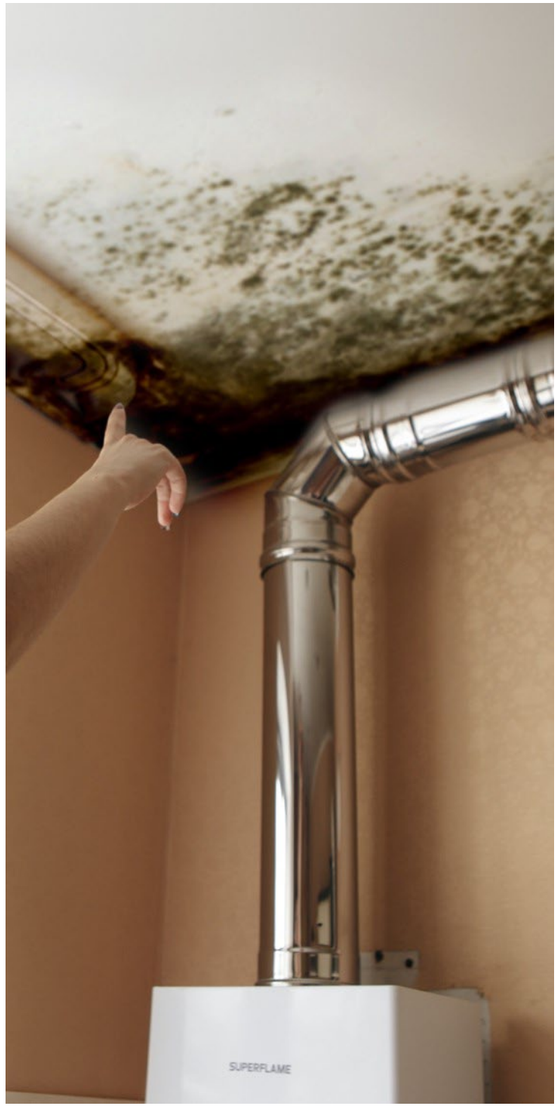
1c. Importance of Ducting & Duct Design

- Kitchen exhaust must ideally be vented outside of homes:
  - Prevents the build up of pollutants and humidity indoors
  - Avoids resulting back pressure that may impact motor performance
- Avoids straining motor and hiking power bills
- Mitigates significant health and fire risks



1c. Importance of Ducting & Duct Design

- Impact of poor ducting and duct design:
  - Prohibits airflow causing noise and turbulence
  - Weakens air extraction and strains motor
  - Contributes to hazardous pollutant build up
  - Harms health and longevity of home structure and contents



1d. Ducted vs Ductless Ventilation Systems

Ducted system

Recirculating Ductless system

- Ducted systems filter and transport polluted air outside the home
- Ductless systems recirculate filtered air back into the home

2. Health Risks of Improper Ventilation – Sick Building Syndrome

- Migraines, headaches, drowsiness and fatigue
- Hypersensitivity – ENT and skin irritation, odour and taste symptoms
- Allergies, asthma and exacerbated respiratory symptoms
- Neurotoxic symptoms, blood and immunity conditions
- Cancer and respiratory diseases from long term exposure

Source: [Department of Agriculture, Water and the Environment > Air Quality > Indoor Air]

2a. Common Air Contaminants

- Household gas usage from stoves, fireplaces and water heaters
- Cooking exhaust – smoke, steam, odours and airborne grease
- VOC off-gassing of building materials, paint and cleaning compounds
- Particulates from dust, allergens and pet dander
- Outdoor pollen, mould spores, dust particles and traffic pollution

Sources: Australian Bureau of Statistics, Climate Council, Australia

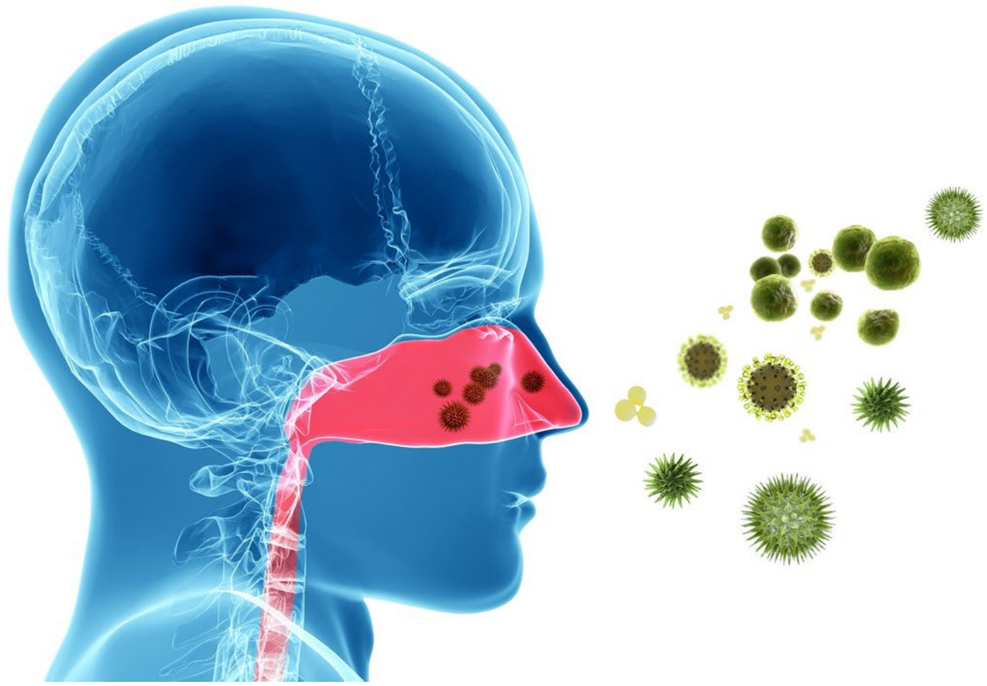
2b. Impact of Elevated Humidity Levels

- Dampness promotes mould, bacteria, virus and dust mite growth
- Suspends water-soluble VOCs (many carcinogenic) in the air

Source: [World Health Organisation]

2b. Impact of Elevated Humidity Levels

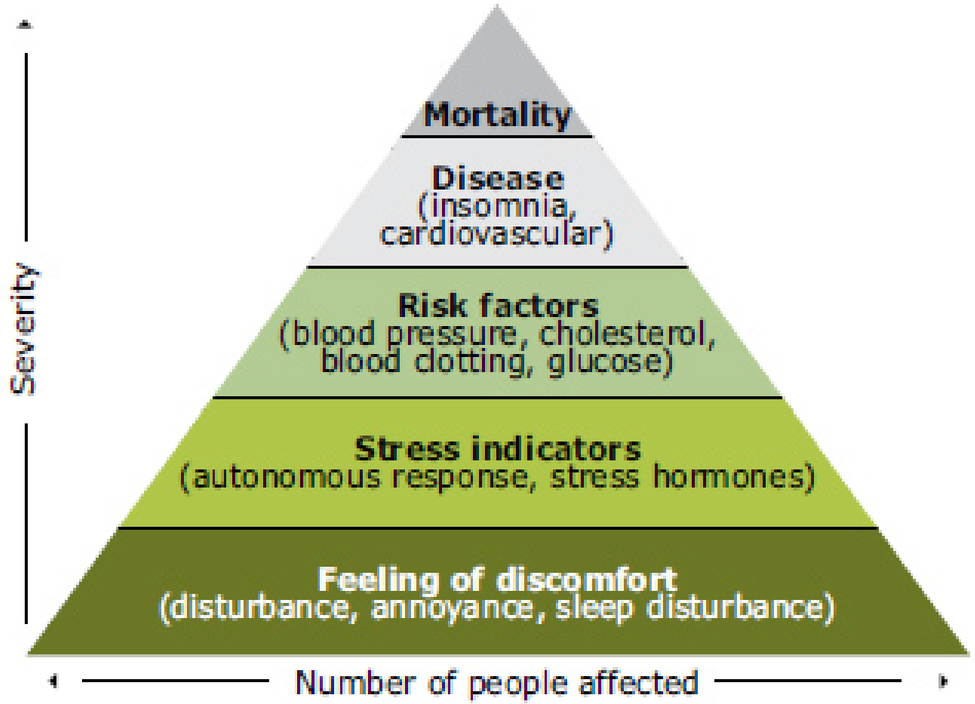
- Exacerbates allergies, respiratory symptoms and diseases
- Introduces heat stress and risk of cardiovascular disease
- Weakened immune systems and chronic lung diseases
- Eczema and nervous system damage from long-term exposure



2c. Impact of Noise Pollution

- Major bugbear in modern and increasingly sealed homes
- Especially in shared spaces repurposed for work and study
- Common culprits with annoying operating sound levels include:
    - Rangehoods
    - Exhaust fans

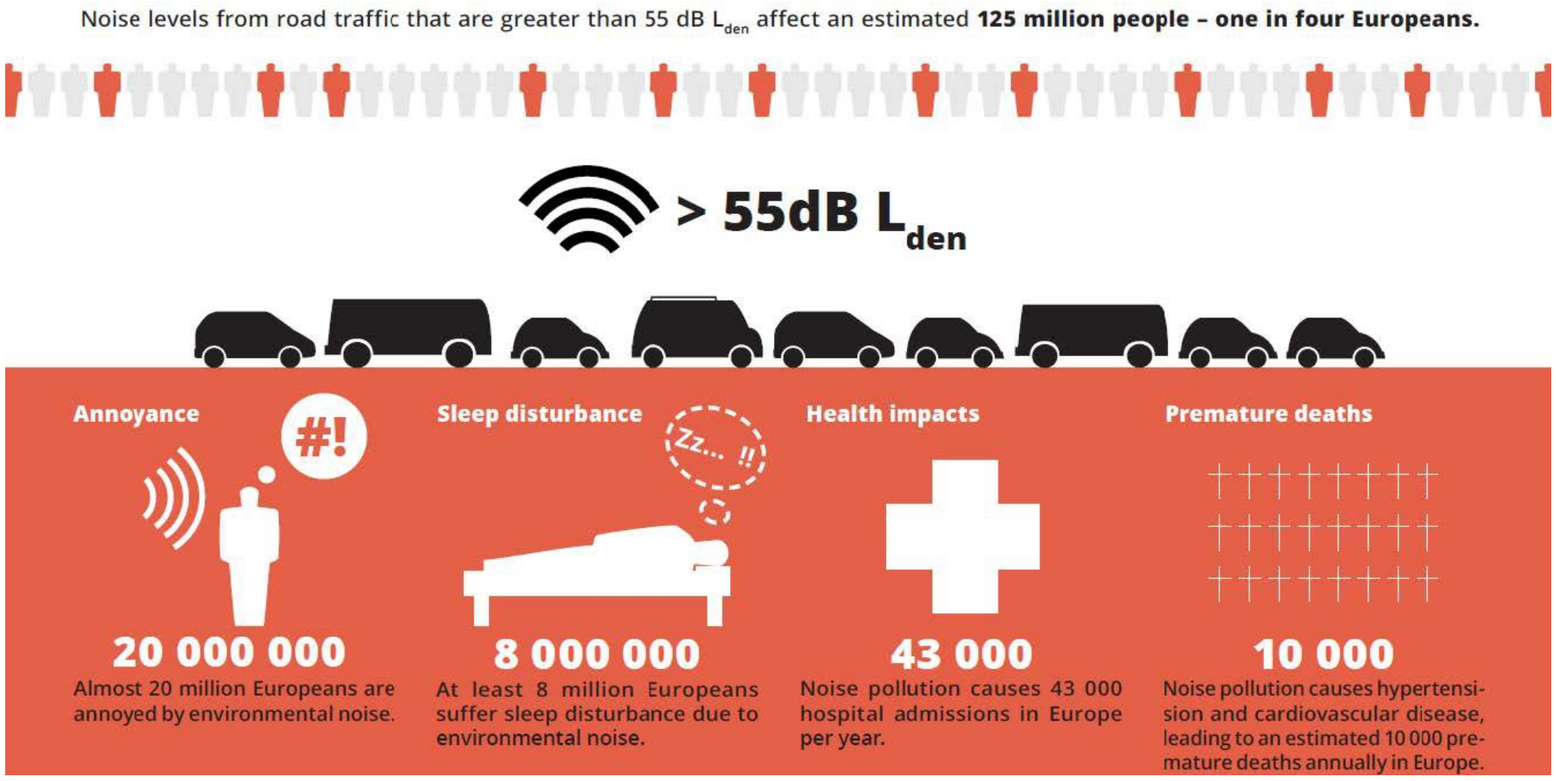
Figure 1.1 Pyramid of noise effects



Source: Babisch, 2002, based on WHO, 1972.

2c. Impact of Noise Pollution

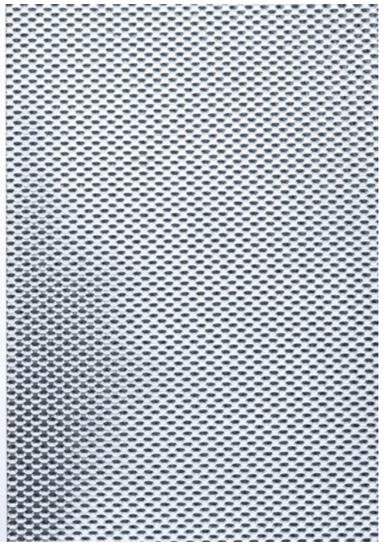
- Prolonged exposure to excessive noise can lead to health concerns:
  - Hearing loss
  - Stress and anxiety
  - Poor concentration
  - Sleeping difficulties
  - High blood pressure and cardiovascular disease



Source: World Health Organisation

2d. Risks of filter inefficiencies

- Indoor air quality gets compromised – impacts health of residents, longevity of house and contents
- Build-up of cooking grease on rangehood internals and ducting - attracting bacteria, mould and pests
- Congealed grease also leads to increased risk of breakdowns and fires



Source: [World Health Organisation]

3. Overcoming Health Hazards with Ventilation Innovation

- Silent rangehoods and exhaust fans
- Powerful and energy-efficient offboard motors
- High performance safety ducting
- High quality mesh filters

3a. Silent Rangehoods & Exhaust Fans

- Silent Rangehoods remove grease, smoke, steam, odours and noise
    - Motors installed outside of homes through the roof, wall or eave
    - Far more effective way of air extraction (by pulling)
    - Canopies designed for airflow efficiency, not noise suppression
    - Lower airflow resistance = better energy-efficiency
    - Whisper quiet operation where cooking happens

More information: [Schweigen - Rangehoods of Sound Design]

3a. Silent Rangehoods & Exhaust Fans

- Silent Exhaust Fans perform whole of home multi-room air extraction:
  - Steam from toilets
  - Odours from bathrooms
  - Condensation from laundries
  - Stale air from bedrooms, garages, wine cellars and more

More information: [Breathe Better with Schweigen Silent Exhaust Fans]

3b. Powerful & Energy-Efficient Offboard Motors

- Offboard motors outperform onboard motors:
  - Silent operation – takes fan and motor noise outside the home
  - Allows use of more powerful motors without fear of noise
  - Expels airborne grease warmer without clogging up ducting
  - Better and more efficient air extraction without pressure drops
  - Built to last with 10-year warranties

More information: About Schweigen Isodrive® Motors

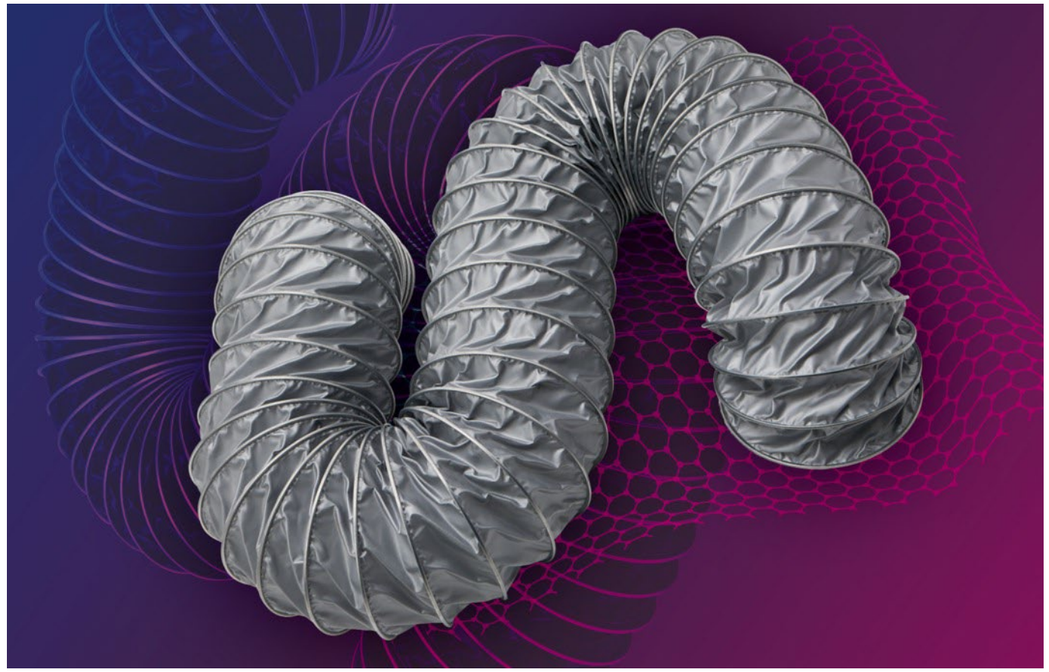
3c. High Performance Safety Ducting

- Included for free with high-end rangehood systems
    - Ultra-strong yet flexible with soft bends
    - Fireproof, pest, crush, tear and puncture proof
    - Acoustically-dampened, antimicrobial-treated and mould resistant
    - Safer and easier to install – right-sized and ready-cut
    - Tested to suit industrial and commercial HVAC applications

More information: About Schweigen SteelFlex™ Safety Ducting

3c. High Performance Safety Ducting

- Advantages of flexible ducting:
  - Soft bends dampen turbulence and noise
  - Easier installation, especially in tight spaces
  - Expensive to Deliver and Warehouse



- Disadvantages of rigid ducting:
  - Create an organ piping or didgeridoo effect
  - Sharp corners increase air turbulence and impairs extraction
  - Difficult to install
  - Expensive to Deliver and Warehouse

3d. High Quality Fine Mesh Filters

- Designed to trap contaminants whilst ensuring maximum airflow
    - Minimizes pressure drops that impact performance
    - Light material construction = quieter performance than baffles
    - Typically easier to remove and dishwasher safe
    - Comes with lifetime warranties from certain manufacturers

More information: [Why Mesh Filters Work Best on Rangehoods]

4. Rangehood Specification & Installation

- Rangehoods take pride of place above the cooktop or grill
    - Influences character of cooking space
    - Contributes to overall functionality and aesthetic

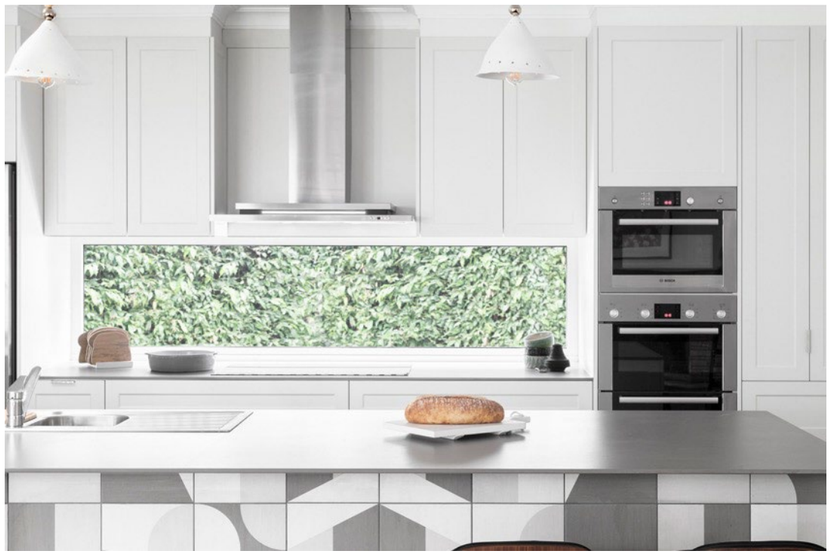
4a. Step 1: Silent or Non-Silent

- Silent Rangehoods are ideal for achieving a quieter kitchen
    - Design allows for more powerful motors outside your home
    - More effective and energy-efficient method of air extraction
    - Cannot be heard over ambient noise in kitchen or outdoors
    - Helps you reclaim the hub of your home

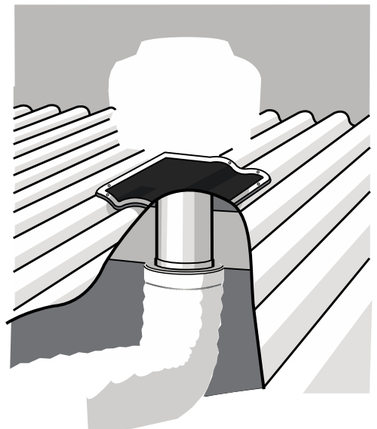
4a. Step 2: Rangehood Style

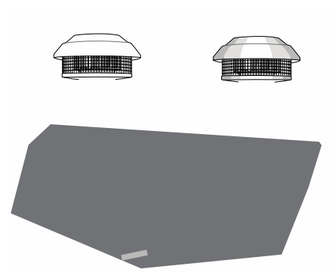
- Undermount Rangehoods
- Wallmount Rangehoods
- Island Mount Rangehoods
- Ceiling Cassettes
- BBQ Alfresco Rangehoods

More information: [Schweigen Consumer Brochure]

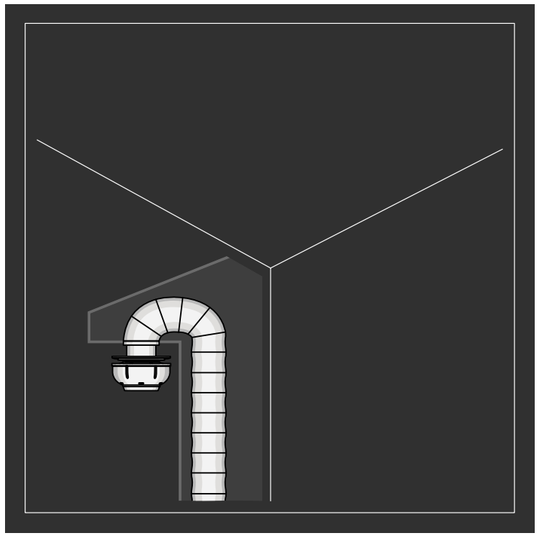


4a. Step 3: Motor Option





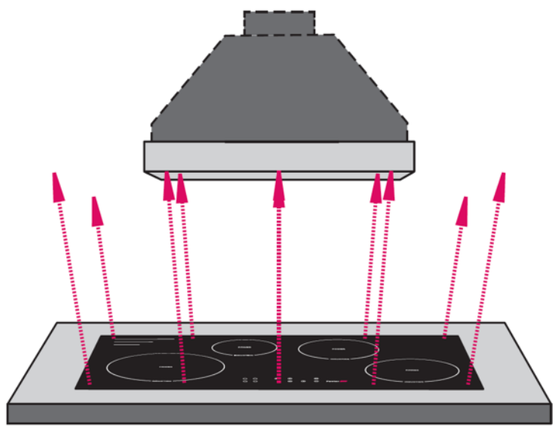
SP2. 3000m³/hr



- Select a motor that best suits the home cook's cooking type
    - Higher airflow motor for high spice, Eastern-style cooking
    - Lower airflow motor for minimal spice, South European cooking

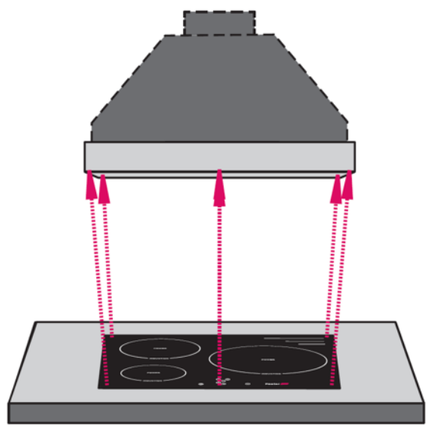
More information: What Extraction Power & Motor?

4b. Installation Guidelines



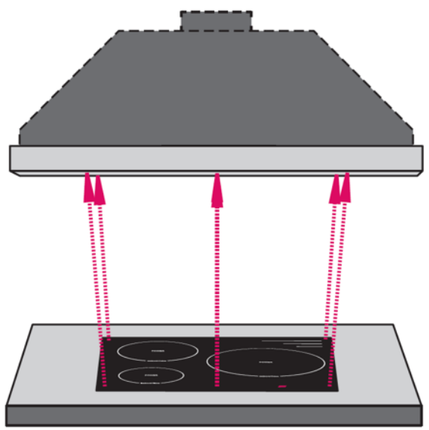
INADEQUATE

Rangehood smaller than cooking zone



ADEQUATE

Rangehood same size as cooking zone



OPTIMAL

Rangehood larger than cooking zone

- Rangehood Size
  - Ideally larger than the cooking zone to ensure optimal capture
  - Most rangehood types are available in 60 and 90 cm width
  - Bigger widths available for more complex cooking setups
    - Outdoor kitchens, BBQs cooktops, teppanyakis etc

4b. Installation Guidelines

- Installation Height
    - Cooktop-specific:
        - Electric: 650-800mm
        - Gas: 650-800mm
        - Induction: 700-800mm

Exceptions apply. Consult council or product manuals for more information.

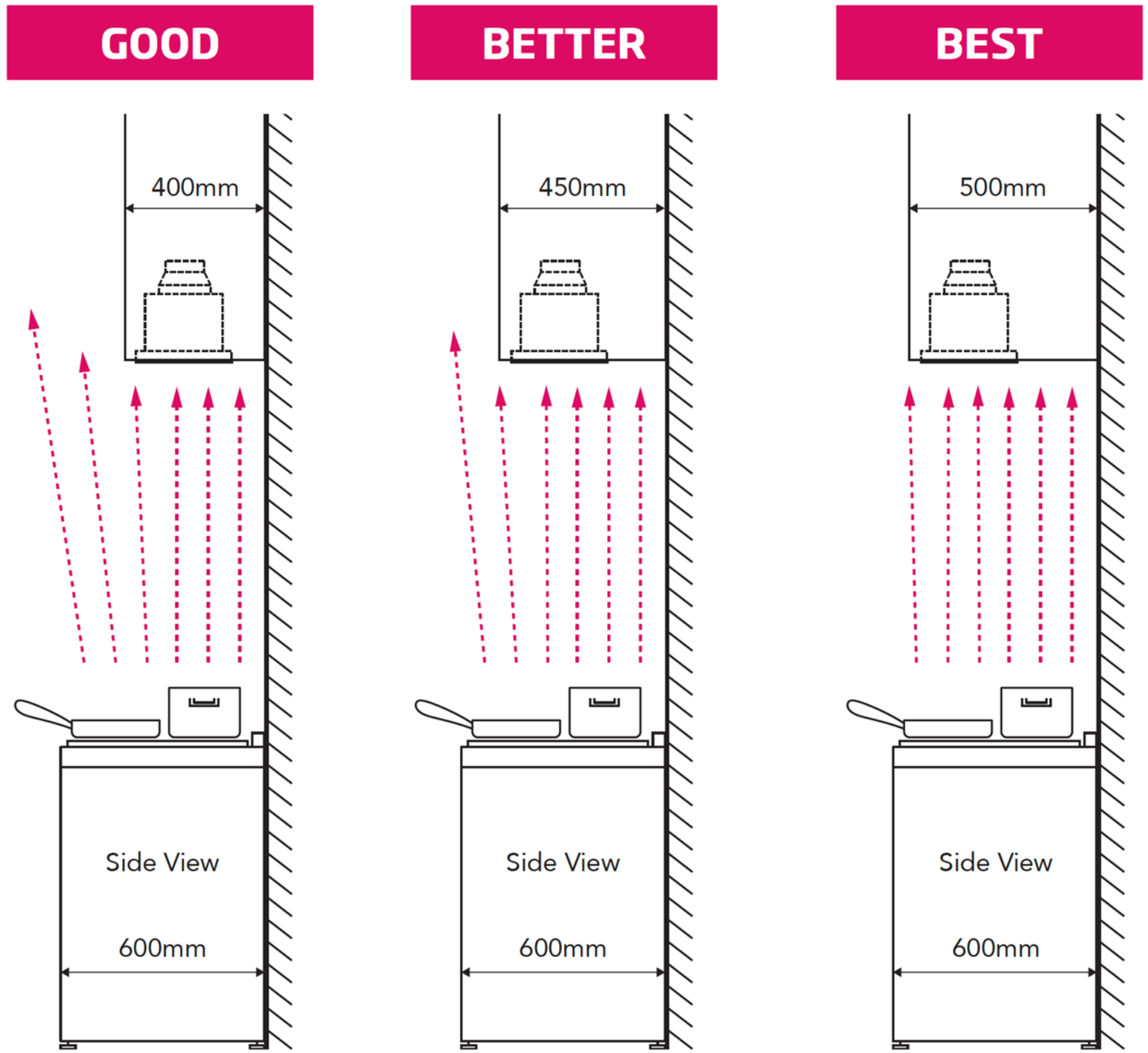
4b. Installation Guidelines

- Installation Height
    - Rangehood-specific:
        - BBQ Alfresco Rangehoods: 1200mm (min)
        - Ceiling Cassettes: 1200-1800mm

Exceptions apply. Consult council or product manuals for more information.

4b. Installation Guidelines

- Installation Depth (over a cooktop 600mm deep):
  - Good: 400mm from wall to front of rangehood
  - Better: 450mm from wall to front of rangehood
  - Best: 500mm from wall to front of rangehood



Exceptions apply. Consult council or product manuals for more information.

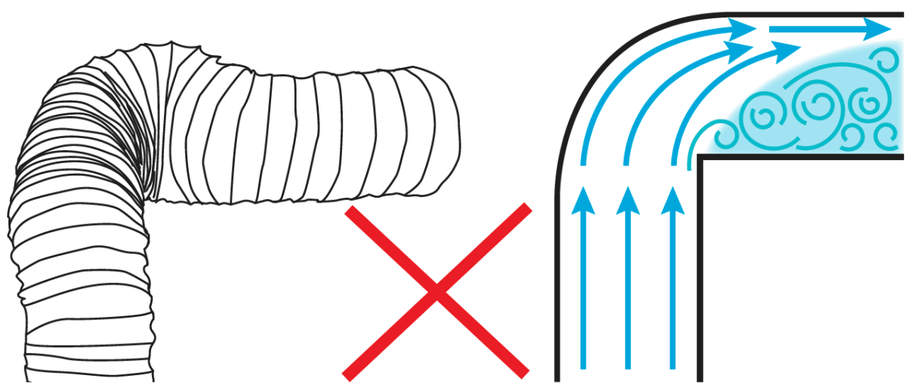
4c. Impact of Improper Installation & Maintenance

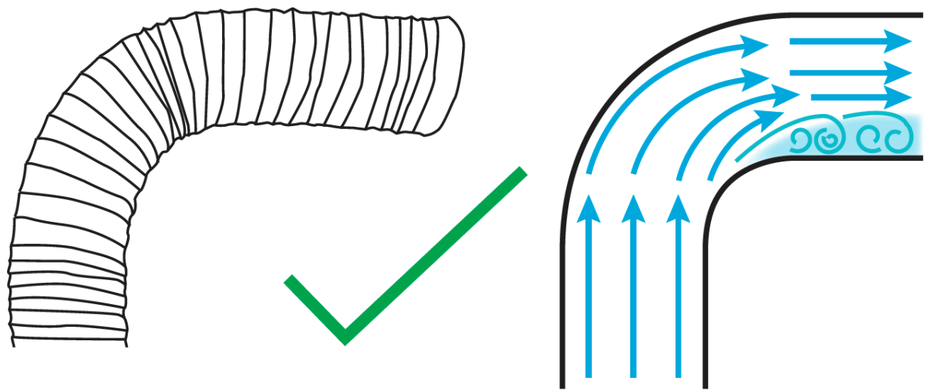
- Good design practice:
  - Fire-rated ducting system should always extend to house exterior
  - Where in doubt, check with state legislation
  - Improper installs are not just ineffective, they are dangerous

Examples of poor maintenance and improper installation

4c. Impact of Improper Installation & Maintenance

- Airflow may be constricted (resulting in reduced airflow and noise)
- Bends and pockets may lead to build-up of pollutants
    - Breeding ground for mould, fungus, bacteria and pests
- Low quality motors may lack suction to extract exhaust out fully
    - Trapped pollutants = combustible fuel load = fire risk

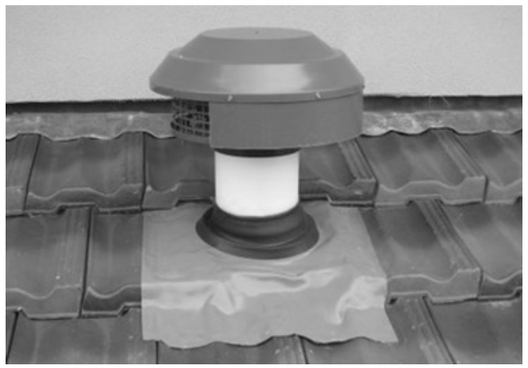




5. Installed Examples

- On Roof
  - Dektite® installation on a tiled roof
  - Dektite® installation on a corrugated roof
  - Twin-motor installation
  - Roof mounted installation on a double-storey house
  - Duct running up roof cavity to roof for a 4-vent install

More information: Installation Examples

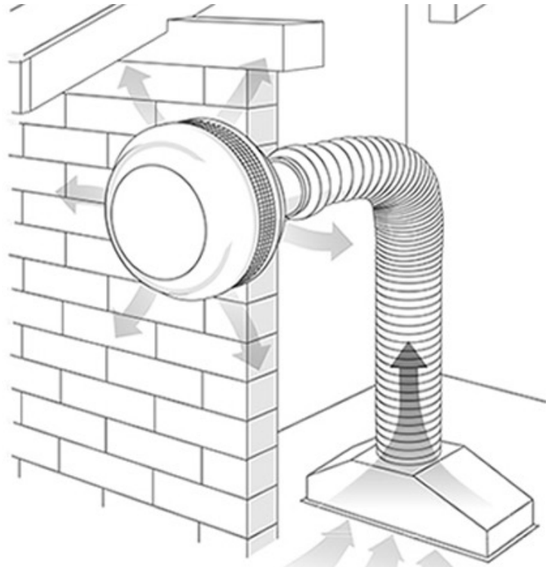





5. Installed Examples

- On Wall
  - Poly-pipe roof install ensuring minimum run
  - COLORBOND® install through the eave of double-storey house
  - COLORBOND® install running horizontally along side of house
  - Other side mounted wall installations

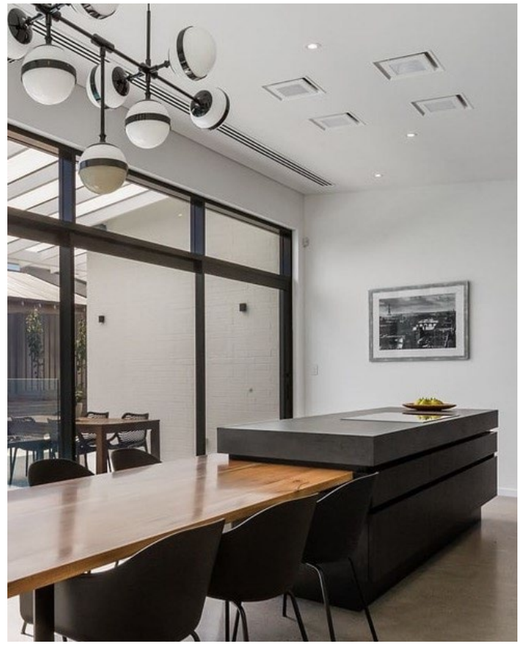
More information: [Installation Examples]

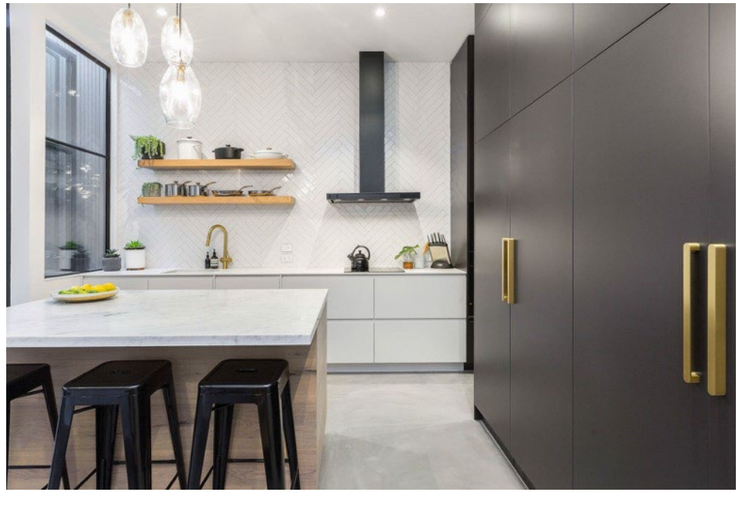


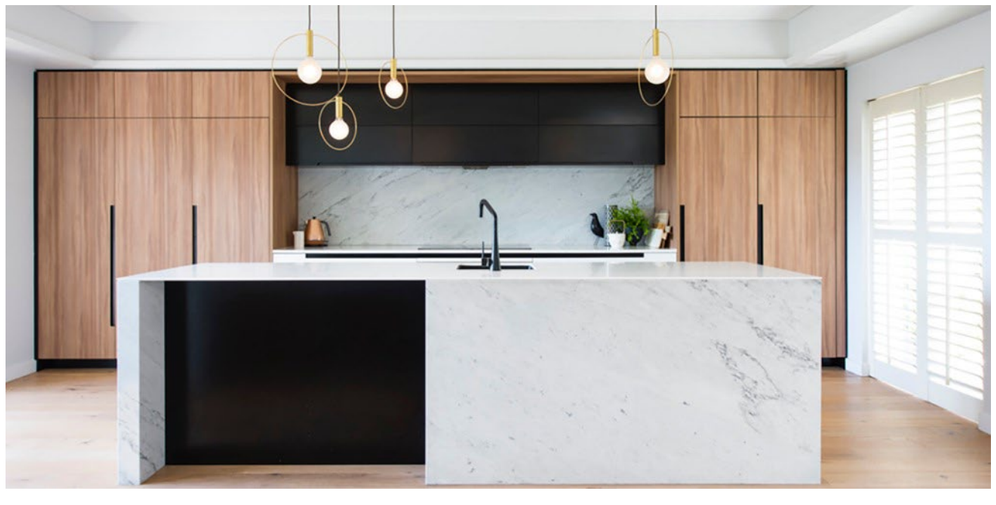
For illustrative purpose only. Please refer to user manual for specific instructions, terms and conditions that apply.

5a. Residential Installations

1. **Aberfeldie Makeover** by Carla Salsone
2. **Baird Residence** by Weststyle
3. **Best of Houzz Design** by First Avenue Homes
4. **International Kitchen of the Year** by KD Kitchen Design
5. **KBDi People's Choice for Kitchen of the Year** by Minosa Design
6. **Monolith House** by RARA Architecture







More information: Schweigen Inspiration Gallery

5b. Commercial Case Studies

BEFORE

- Project: Wesley College, Glen Waverley
  - Required rangehood solution for multiple cooktops in cooking wing
  - Needed to cater for multiple forms and levels of cooking
  - Challenged by 3.6m ceilings and high air displacement in space
  - Teacher-led environment – paramount that rangehoods were silent

5b. Commercial Case Studies

AFTER

- Challenge:
    - Rangehoods required over multiple cooktops in cooking wing
    - Cater for multiple forms and levels of cooking simultaneously
    - Challenged by 3.6m ceilings and high air displacement in space
    - Teacher-led environment – paramount that rangehoods were silent

5b. Commercial Case Studies

- Solution:
  - 12 units of UM4220-12SE Silent Ceiling Cassettes installed
  - Each powered by Isodrive™ motors with 3200 m3/hr airflow
  - All motors mounted on roof and connected with included ducting
  - Energy-efficient solution installed with peace of mind warranties
  - Easy maintenance with dishwater-safe filters

5b. Commercial Case Studies

- Result:
  - Noise and air pollution issues mitigated
  - Health hazard and fire-safety issues addressed
  - Complete customer satisfaction

5b. Commercial Case Studies

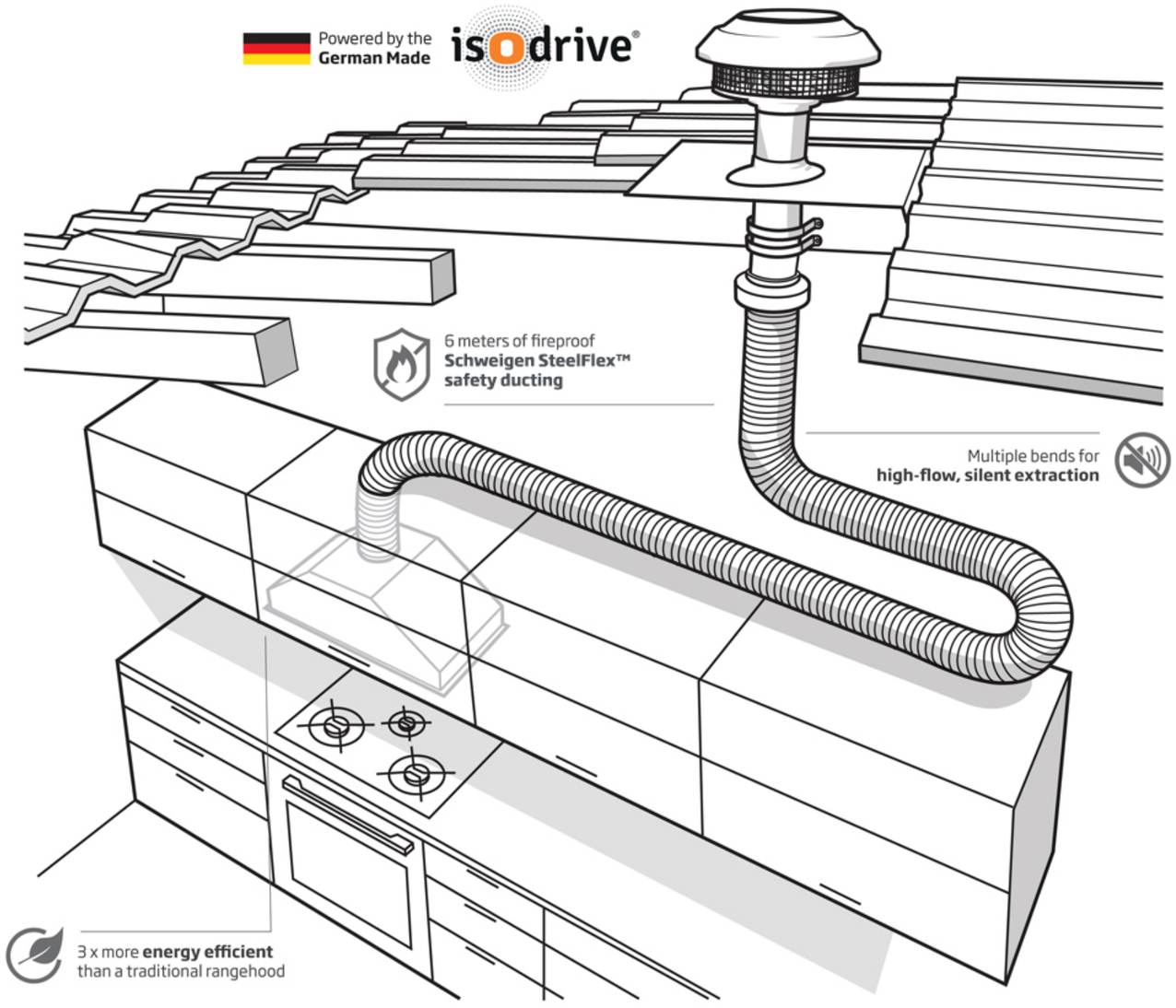
- Harvey Norman Cooking School – *pictured*

- Upcoming Soon
    - Parker Street Project
    - Wye River Project

6. Summary of Presentation

1. Code-mandated ventilation solutions mitigate the health risks of air and noise pollution in increasingly sealed homes.

2. Effective ventilation solutions vent to the outdoors via flexible ducting to fans/motors mounted outside of homes.



6. Summary of Presentation

3. Proper installation and maintenance is essential for the longevity and effectiveness of rangehoods and exhaust fans protecting health and homes.

4. Ventilation innovations include silent rangehoods with energy-efficient offboard motors, high performance safety ducting and high-quality fine mesh filters.

7. Assessment Questions

1. According to the NCC, what is the minimum size of ventilation openings for a room with 300m2 floorspace?

    a. 15m2
    b. 25m2
    c. 50m2
    d. 60m2

7. Assessment Questions

2. There are currently no Australian Standards governing requirements for mechanical ventilation systems. True or false?

    a. True
    b. False

7. Assessment Questions

3. Which of the following statement is true?

    a. All rangehoods need to be vented to the outside
    b. Ducted rangehoods transport cooking exhaust to the outdoors
    c. It is ok for cooking exhaust to be vented into the attic or roof cavity
    d. Ductless rangehoods are just as effective as ducted rangehoods

7. Assessment Questions

4. Ducting into the ceiling cavity can impact the longevity and performance of the rangehood motor primarily because of:

    a. Humidity
    b. Fire risks
    c. Pests
    d. Back Pressure

7. Assessment Questions

5. Which of the following relate to disadvantages of rigid ducting?

    a. Amplifies noise
    b. Tough to install in tight spaces
    c. Contributes to air turbulence and pressure drops
    d. All of the above

7. Assessment Questions

6. Which of the following statements regarding poor air quality are true?

   a. Unventilated household gas contributes to asthma
   b. Humidity increases the concentration of VOC off-gassing
   c. Contaminants can be pulled indoors by heating and cooling systems
   d. All of the above

7. Assessment Questions

7. Which of the following describe health risks associated with an improperly ventilated home?

    a. Allergies, asthma and respiratory symptoms
    b. Weakened immune system and lung diseases
    c. Eczema and nervous system damage
    d. All of the above

7. Assessment Questions

8. What are the 3 key steps to picking a rangehood?
    a. Silent or non-silent, canopy style and motor option
    b. Install location, energy-efficiency and suction power
    c. Construction quality, finish and functions
    d. Integrated lighting, remote-controlled and silent operation

7. Assessment Questions

9. Which of the following describe benefits of having an externally motored rangehood or exhaust fan?

    a. Removal of fan and motor noise to the outside
    b. Extraction of air pollutants to the outdoors
    c. Better and more energy-efficient performance
    d. All of the above

7. Assessment Questions

10. What are some ventilation innovations to consider?

    a. Silent ducted systems with externally mounted motors
    b. Fireproof, crush and pest-proof non-rigid safety ducting
    c. Dishwasher-safe fine mesh filters
    d. All of the above

7. Assessment Questions

11. Where do the most efficient rangehoods have motors at:

    a. Point of extraction
    b. Point of acceleration
    c. Point of ventilation
    d. Point of filtration

7. Assessment Questions

12. Extraction power and performance always comes at the expense of noise.

    a. True
    b. False

7. Assessment Questions

13. Which of the following rangehood installation height is optimal to avoiding condensation from induction cooking?

    a. 600-900mm
    b. 600-700mm
    c. 700-800mm
    d. 750-900mm

7. Assessment Questions

14. Which of these statements regarding silent rangehoods is true?

    a. Silent rangehoods are only available in 600 and 900mm widths.
    b. Silent rangehoods cannot be installed into cabinetry.
    c. Bulkheads are always required for silent ceiling cassettes.
    d. Silent rangehoods may be ducted through the roof, wall or eave.

7. Assessment Questions

Answer Sheet:

1	A
2	B
3	B
4	D
5	D
6	D
7	D

8	A
9	D
10	D
11	C
12	B
13	C
14	D

8. Additional Resources

- Schweigen Commercial Portal
- Schweigen on ArchiPro
- Schweigen on Archify
- Schweigen on Australian Institute of Architects

- Latest Media
  - Consumer Brochure
  - Project Gallery
  - Latest Videos
  - Latest Articles