

# HomeFit

# Technical Manual

V2.2  
Issue Date: May 2022

## HomeFit supporters

HomeFit is powered by the following leading organisations:



## Table 1: Change Log

Date	Version	Changes logged
12 November 2018	1	<ul style="list-style-type: none"> <li>Original version created and launched</li> </ul>
Updated: 12/3/19	1.1	<ul style="list-style-type: none"> <li>Advisory report texts revised and updated to include comments on compliant features</li> <li>Changed height of rangehood from no more than 750mm above cooktop, to between 650-900mm of the cooktop</li> <li>Removed the option for meeting subfloor ventilation standard in fully enclosed subfloors by way of ventilation holes to - to reflect Healthy Homes Standards (HHS)</li> <li>Indicative R-value table added (Insulation Chapter)</li> </ul>
Updated 16/9/19	2	<ul style="list-style-type: none"> <li>Changes made to HomeFit in response to the introduction of the Healthy Homes Standards for rental properties, which have been adopted as minimum standard for HomeFit.</li> <li>Ceiling insulation requirement upgraded to R2.9 (Zone 1) and R3.3 (Zone 3) for all installs post 1 July 2016 as required by HHS</li> <li>Ceiling insulation for HomeFit optional and HomeFit PLUS requirements upgraded to R3.6 (Zone 1-2) and R4 (Zone 3)</li> <li>Ceiling insulation for HomeFit PLUS optional requirement upgraded to R4/5</li> <li>Heating calculator in app is superseded by MBIE heating calculator and the assessment of heater capacity changed to mandatory requirement (with tolerance for existing heaters)</li> <li>Requirements for heating changed; minimum 1.5kW, must be fixed, have a thermostat (if electric), in the main living area only. In the case of open plan living areas, include connecting spaces such as stairs, upstairs landings and</li> </ul>

		<p>additional rooms off the main living area or above the main living area</p> <ul style="list-style-type: none"> <li>• Extractor fans installed post 1 July 2019 must meet mandatory minimum flow rates. This has moved from HomeFit PLUS to HomeFit mandatory to meet HHS</li> <li>• The diameter of mechanical extractor ducting has been added as an alternative means of establishing the adequacy of ventilation systems in order to align with HHS</li> <li>• Openable windows must comprise 5% of the floor area of any given habitable space and must be able to be fixed open as required by HHS</li> <li>• Addition of drainage provisions as required by HHS</li> <li>• Minor amends to guidance on draught proofing</li> </ul>
<p>Updated 30/9/20</p>	<p>2.1</p>	<ul style="list-style-type: none"> <li>• Addition of information on the HomeFit webapp, the HomeFit API, Pricing and Certification in HomeFit: How it works</li> <li>• Additional clarification on recessed downlights and apartments in Insulation section</li> <li>• Some changes to How to assess and What to submit for rating in External Moisture, Insulation, Curtains and Smoke Alarms sections.</li> </ul>
<p>Updated 312/3/22</p>	<p>2.2</p>	<ul style="list-style-type: none"> <li>• Improvements to the recessed downlights, inaccessible subfloor spaces and kitchen extract fan settings for more detailed assessment and reporting to the owner</li> <li>• Addition of a “No HomeFit” button to the HomeFit Assessor app to allow generation of a report on RTA and Healthy Homes Standards only</li> </ul>

Updated  
12/5/22

- Changes to the heating and ventilation requirements for the Healthy Homes Standards and HomeFit as a result of Government regulation updates

## Acknowledgements

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### Steering Group

Tony Moore (Christchurch City Council)	Robyn Phipps (Massey University)
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Verney Ryan (Beacon Pathway)	John Swarbrick (Rinnai)
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# Contents

HomeFit supporters .....	2
Table 1: Change Log .....	3
Contents .....	7
Introduction .....	8
HomeFit: how it works .....	9
The HomeFit standard .....	12
Table 2: Summary of HomeFit requirements .....	13
Table 3: Summary of HomeFit PLUS requirements .....	14
Presence of mould .....	15
Main living space can be adequately heated.....	18
Energy-efficient hot water supply.....	27
Adequate ventilation .....	31
Adequate protection from external moisture .....	37
Ceiling, subfloor and wall insulation .....	42
Heat loss from windows.....	52
Energy-efficient fixed lighting - optional.....	55
Draught-free building fabric .....	57
Moisture from drying clothes - optional.....	60
Smoke alarms.....	62
Hot water safety – optional .....	64
Water efficiency – optional.....	67
<i>Table 1: Change Log.....</i>	<i>3</i>
<i>Table 2: Summary of HomeFit requirements .....</i>	<i>13</i>
<i>Table 3: Summary of HomeFit PLUS requirements.....</i>	<i>14</i>
<i>Table 4: Indicative fuels and heater types .....</i>	<i>19</i>
<i>Table 5: Allowance for inaccessible roof spaces of a house (pre-1978).....</i>	<i>44</i>
<i>Table 6: Better insulation levels for HomeFit PLUS.....</i>	<i>46</i>
<i>Table 7: Best insulation levels for HomeFit PLUS optional.....</i>	<i>46</i>
<i>Table 8: Indicative R-value table* .....</i>	<i>48</i>

## Introduction

### What is HomeFit

HomeFit is an inspection-based assessment of the health, comfort, energy efficiency and safety of a New Zealand home. It covers a range of topics that a panel of experts believes to be essential for a home to be liveable.

HomeFit also includes a higher standard called HomeFit PLUS, for a home that is warmer, drier, more comfortable and energy efficient than HomeFit.

### Marketing a home

Homes that have been formally assessed by a qualified HomeFit assessor and achieve the HomeFit or HomeFit PLUS standard can be marketed as meeting HomeFit when being sold or rented.

### What HomeFit does not cover

To keep the cost of HomeFit to an affordable level, the scope of the scheme has been limited to a number of distinct topics that most commonly impact the health, comfort and energy efficiency of New Zealand homes. The presence of smoke alarms has been added to align with the Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016. Hot water safety and water efficiency are included as they were considered by the technical working group to be important.

HomeFit does not cover the overall condition or integrity of the building; for example, building envelope water tightness (leaky buildings), structural integrity, rising damp or anything else not expressly described in this technical manual. However, HomeFit does include working and efficient guttering and downpipes as these are required under the Healthy Homes Standards.

### Eligibility

HomeFit allows all types of homes to be assessed; to be eligible, however, homes must not be new to market (i.e. they must have had at least one owner/occupier). This is to ensure that they have been lived in for a period so that problems that emerge from daily use can be identified using the tool. New build homes are assessed with a different tool, Homestar, which considers a much wider range of environmental features.

Homes assessed for HomeFit must also be “self-contained”. This means that they must have at least one working bathroom with toilet and shower and/or bath and at least one kitchen with an oven, food preparation area and food storage space. Homes must be a single dwelling, therefore sleepouts (that meet the requirements above), granny flats and apartments with separate entrances, must be assessed separately.

## HomeFit: how it works

### Registration

Consumers will normally first hear about the HomeFit process through advertising and promotion of the HomeFit Online Check ([www.homefit.org.nz](http://www.homefit.org.nz)). The HomeFit Online Check gives consumers an indication of whether their home meets HomeFit through a 23-question survey. They can save the free assessment from the Online Check for further review and/or improvement as they make improvements to the home. The online check provides a directory of installers and assessors that the consumer can send their self-assessment for independent verification and, once it meets the standard, certification.

### Find a HomeFit Assessor

While use of the HomeFit Online Check is free, to be certified the consumer will need to pay a qualified HomeFit Assessor to carry out the on-site assessment and submit evidence to NZGBC that the home meets the HomeFit criteria.

The consumer is prompted to contact an assessor via the Assessor Directory and request an assessment. At this stage they must confirm they have read the HomeFit terms and conditions. If they follow the prompt from a completed assessment, a reference code will be sent to the assessor, which provides a useful guide to see what work may still need to be done. The HomeFit Assessor will quote for their service, visit and assess the property, and submit the assessment to NZGBC.

If an assessor is contacted by other means, it's their responsibility to ensure that the Terms and Conditions of assessment (the Registration Agreement, available on the password enabled Assessor Resources page at [nzgbc.org.nz/homefit](http://nzgbc.org.nz/homefit)) is signed and returned to NZGBC.

### The HomeFit webapp

This is the normal method for conducting an assessment. The HomeFit webapp is an online app that an assessor uses on site or on return to the office after an assessment. The assessor is advised to take a printed copy of the webapp questionnaire in case there is no internet access on site. Copies of the questionnaire are available on the [Assessor Resources](#) page.

### The HomeFit API

Alternatively, some larger assessor organisations are uploading the results of their own questionnaire to the HomeFit webapp through an application programme interface. This will suit assessors who have an established Healthy Homes Standards process and wish to add the additional requirements to show how the rental property can also meet the HomeFit standard.

### Assessment

To undertake a HomeFit assessment, the HomeFit Assessor must review the home against the criteria from the Technical Manual. The HomeFit Assessor must use the guidance in the Technical Manual and personally sight, or seek documentary evidence to support the presence of, each attribute of the home that complies with the criteria.

When the HomeFit Assessor has completed the assessment they must submit it, along with all the audit documentation (typically photos), to the NZGBC for audit and verification.

## Auditing

As the certification body, NZGBC is responsible for ensuring the quality and consistency of HomeFit assessments. This is done through an audit process.

NZGBC employs third party, independent auditors to audit the first five submissions of each HomeFit Assessor and thereafter a random selection of submissions from each assessor. An assessor who completes five audit passes is deemed independent and can then forward any further assessments directly to the consumer.

Since HomeFit assessments should be provided promptly - for example before the sale of a property - audited assessments, after the first five, will not be required to resubmit if faults are found by the auditor. Instead, the principle is that audits are carried out on the assessors rather than the assessment so that, ultimately, sanctions could be taken against an assessor (e.g. withdrawal of assessor status).

A newly qualified assessor is allowed up to two resubmissions on a failed audit of any one of their first five assessments. If this audit limit is exceeded, an assessor may be required to undertake further training.

## Assessment and audit fees

Assessors are responsible for engaging with the homeowner to arrange the home visit and charge for their service. Assessment fees are likely to vary depending on the assessor's costs and travel times to the site and the number of site visits. Additional visits (to check that improvements have been made) should be negotiated when arranging the initial visit to prevent confusion.

Assessors are also responsible for collecting the NZGBC HomeFit fee (which covers the administration and audit costs of the NZGBC) and this should be included in the fees they charge their client. NZGBC recommends a range of \$100-200 plus GST per visit, plus the HomeFit fee, which can vary depending on the volume of assessments being undertaken by assessor companies (for a list of current fees, please contact NZGBC by emailing [assessments@homefit.org.nz](mailto:assessments@homefit.org.nz)).

The HomeFit fee is valid for one year from the date the initial assessment was submitted. This enables the homeowner time to make the required improvements and reapply for certification without an additional HomeFit fee. For any additional submissions, a further HomeFit fee will be payable.

Assessors may be able to accept evidence from the homeowner that improvements have been made (photographs, receipts etc) to lower costs and travel impacts. However, this evidence will need to be included in a follow up submission, and will be subject to audit, so assessors should allow for this in their agreement with the homeowner.

## Health and safety

The assessment of homes under HomeFit requires a physical inspection of existing homes and this carries inherent health and safety risks. These submission guidelines do not expressly outline any health and safety policy about inspections (for example minimum accessible dimensions for

subfloors and ceilings). These must be addressed in a risk-based health and safety policy developed by each individual assessor organisation (see HomeFit Assessor Agreement).

NZS 4246:2016 gives guidance (in appendix B) on the inspection of properties for the purposes of installing insulation and should be referred to when developing a health and safety policy. The standard highlights many of the common risks found when inspecting properties. These include, but are not limited to:

- Foil insulation
- Working in confined spaces
- Working at height

Inspectors should prepare a specific site-based risk assessment and controls for managing risk when visiting each property.

## Conflicts of interest

Installers and suppliers of products and services recommended in the HomeFit advisory report (such as insulation, LED lighting, etc) may become HomeFit assessors and may offer the HomeFit assessment service. However, these suppliers must declare their interests to homeowners/landlords prior to engagement.

In some cases, HomeFit assessors may also offer (and charge for) minor additional on-site remedial services to help homeowners bring their properties up to the standard. These could include the cleaning of mould, replacement of light bulbs and the correction of hot water cylinder temperatures (if qualified to do so). This is to ensure that homes do not fail for minor infringements of the guidelines.

However, contracts for major items of work such as new insulation, replacement of light fittings, and the installation of heating and ventilation systems must be discussed and agreed independently of the assessment. In practice, this could mean leaving a business card or making a follow up appointment to discuss options.

The NZGBC reserves the right to de-list HomeFit Assessors or installers that have been found to pressure-sell assessments or products or infringe the terms of the assessor agreement.

## The HomeFit standard

### HomeFit

The HomeFit standard sets out the minimum requirements for a home to be considered warm, dry and healthy. This standard is achieved by complying with all the items on the HomeFit mandatory list and at least 3 items from the HomeFit optional list.

### HomeFit PLUS

Homes that achieve HomeFit may reach the HomeFit PLUS standard by achieving higher insulation levels, energy-efficient heating and any 6 items from an additional list. HomeFit PLUS recognises homes with additional features that improve health and comfort to occupants beyond the acceptable minimum.

### Know your zone

HomeFit has different minimum standards for insulation depending on the location of the home in New Zealand. If the home is in the South Island or in the Central Plateau of the North Island (areas around Taupo, Ohakune, Mount Ruapehu and Mount Tongariro) it is in Zone 3. Anywhere else is either Zone 1 or Zone 2.

### Healthy Homes Standards (HHS)

The Residential Tenancies (Healthy Homes Standards) Regulations 2019 (HHS) set minimum standards for insulation, heating, ventilation, moisture exclusion, drainage and draught control for rental homes. The Healthy Homes Standards under the HHS were approved by Cabinet in May 2019 and have been formulated into regulations enforceable from 1 July 2019.

This version of the HomeFit tool (v2.2) and manual covers the HHS, with updates summarised in the Change log (see above). The HomeFit standard *meets* or *exceeds* the Healthy Homes Standards. Compliance with HHS, HomeFit, and the requirements in the Residential Tenancies (Smoke Alarms) Regulations 2016 (RTA) are summarised at the beginning of the HomeFit Property Report. This can be emailed to a landlord and saved or printed for attachment to a Tenancy Agreement.

A "No HomeFit" button is available in the General tab of the Assessor App for assessments to the RTA and Healthy Homes Standards only. In the report, HomeFit criteria and certification is judged "not applicable" if this button is checked. Recommendations for upgrading to HomeFit are still included in the advisory section of the report.

## Table 2: Summary of HomeFit requirements

<b>HomeFit mandatory</b>	<b>The home must achieve all of the following for HomeFit:</b>
<i>Mould</i>	Home is free of visible mould
<i>Space heating</i>	Living space can be adequately heated with a compliant heat source
<i>Hot water system</i>	Hot water is generated by either an instantaneous system, a gas water heater, an A-grade or MEPS compliant electric cylinder, or older cylinder with wrap and lagging
<i>Shower flow rate</i>	Shower flow rate is no more than 9 L/min.
<i>Ventilation</i>	Kitchens and bathrooms have mechanical extract to outside and other living spaces have adequate ventilation
<i>Ground moisture</i>	Ground vapour barrier, adequate subfloor ventilation, no obvious signs of pooling water or pipework leaks (where accessible) in the subfloor
<i>Drainage</i>	All drains, gutters, spouting and downpipes are in good working order
<i>Ceiling insulation</i>	Minimum 120mm bulk insulant correctly installed to all accessible roof spaces, including over downlights - ceiling insulation installed post 1 July 2016 must meet R2.9 (Zone 1 and 2) or R3.3 (Zone 3)
<i>Underfloor insulation</i>	Minimum 60mm bulk insulant correctly installed to all accessible floor spaces - R1.3 is acceptable where insulation is thinner than 60mm
<i>Windows</i>	Windows in all living rooms and bedrooms are either fitted with good curtains <i>or</i> are double glazed
<i>Draught-free</i>	The home has no obvious air leaks - holes or large gaps in windows, doors, walls, floors, or ceilings
<i>Smoke alarms</i>	The home is fitted with smoke alarms within at least 3m of all bedrooms and at least one on each floor
<b>HomeFit optional</b>	<b>The home must achieve at least 3 of the following:</b>
<i>Ceiling insulation</i>	Zone 1 and 2: minimum R3.6, Zone 3: minimum R4
<i>Windows</i>	Windows in all living rooms and bedrooms are both double glazed <i>and</i> are fitted with good curtains
<i>Lighting</i>	At least 80% (by number) of all <i>fixed</i> interior lamps in habitable spaces are LED or Fluorescent
<i>Clothes drying</i>	Clothes dryers are either vented to the outside or are condensing/heat pump dryers. Alternatively, there is an external covered washing line
<i>Safe hot water</i>	Hot water at the tap is no more than 55°C
<i>Improved water efficiency</i>	Toilets are dual flush

## Table 3: Summary of HomeFit PLUS requirements

### HomeFit PLUS mandatory

*Space heating*

**The home must achieve HomeFit and all of the following to achieve HomeFit PLUS:**

The main living area has an energy-efficient, fixed heating source that meets the heating capacity of the main living area

*Ventilation*

Kitchen extract must be via dedicated rangehood between 650mm and 900mm of cooker and all extract fans must have an adequate flow rate

*Ceiling insulation*

Zone 1 and 2: minimum R3.6, Zone 3: minimum R4

*Underfloor insulation*

Minimum R1.3 installed to all accessible floor spaces

*Wall insulation*

Insulation must be present in 80% of external walls

### HomeFit PLUS optional

**The home must achieve 6 of the following for HomeFit PLUS:**

*Improved hot water system*

The home has a heat pump hot water system or solar hot water system

*Improved ventilation*

The home is fitted with balanced heat recovery ventilation serving the living spaces, bedrooms, bathrooms and kitchen as a minimum

*Ceiling insulation*

Zone 1 and 2: Minimum R4, Zone 3: Minimum R5

*Underfloor insulation*

Minimum R1.8

*Windows*

Windows in all living rooms and bedrooms are both double glazed *and* are fitted with good curtains

*Lighting*

At least 80% (by number) of all *fixed* interior lamps in habitable spaces are LED

*Clothes drying*

Clothes dryers (if present) are either vented to the outside or are condensing/heat pump dryers. Alternatively, there is an external covered washing line

*Safe hot water*

Hot water at the tap is no more than 55°C

*Improved water efficiency*

Toilets are dual flush

*Rainwater harvesting*

The home has a rainwater harvesting system

## Presence of mould

### Summary

A HomeFit home must be free of visible mould.

### Why this is important

Mould grows in conditions of high moisture and low temperature and is therefore an indicator of dampness in the home. Nearly half (49%) of the homes inspected in the BRANZ House Condition Survey (2015) had some signs of visible mould and nearly 10% of rental properties had *large* patches of mould.

The presence of mould in a home indicates inadequate management of temperature (too cold) and moisture (too damp). Solving this issue requires a mix of home-based features (e.g. insulation/draught stopping/curtains, good heating, and mechanical extract ventilation of kitchens and bathrooms) and good occupant behaviour (e.g. heating/airing the home, not drying washing inside and avoiding unflued gas heaters). It is important to keep on top of even small specks of mould: these can easily be cleaned, and their reoccurrence managed by heating and airing. The BRANZ House Condition Survey observed mould less often in heated homes with insulation and ventilation.

Damp and mould can affect the durability of your home (through decay of timber, plasterboard and other building materials) and can have serious health consequences for people with respiratory illnesses, including asthma and some forms of gastroenteritis. Damp homes can directly worsen the symptoms of illnesses such as asthma, bronchitis and other breathing disorders as well as encouraging the spread of dust mites which can further exacerbate asthma and allergies.

### Detail of what is required

There should be no visible mould in the home. Note that it is possible for mould to be present inside the cavities of building elements (through interstitial condensation or through leaks in the building fabric, such as exterior cladding). Mould inside these cavities is not assessed in HomeFit because this process would require invasive investigations.

### How to assess

Note as you enter the home if there is a damp, mouldy smell and inspect the property closely for the presence of mould. Walls, ceilings, flooring (e.g. carpet should not be rotting), window frames and glazing, and curtains/blinds should be assessed. Mould is mostly likely to be found on the coldest walls in, or adjacent to, wet rooms (kitchen, bathroom, laundry), and can be behind furniture (it is not necessary to assess or note mould on items of furniture). Small specks of mould on shower/basin/bath grout or window frames (wood and aluminium) should also be disregarded: as it is very difficult to 100% exclude mould from these places.

## Advisory report text

### *General advice to keep your home mould free:*

1. Keep the heat in. Do all you can to improve insulation (ceiling, underfloor) and install well fitted double layered curtains that you open when on sunny days and shut before it gets cold;
2. Heat your home effectively; and,
3. Remove the moisture regularly by using extractor fans in kitchens and bathrooms and venting any clothes dryer to the outside. Try to avoid drying clothes on racks inside as this can release surprisingly large volumes of moisture into the air, making it harder to heat. Research says that, during the cold season, New Zealanders should air their homes 1-2 times a day by opening most of the doors and windows for 15 minutes to let the moisture that has built up from your indoor activities escape. Think of how long you might air the home after burning toast. This is more effective than leaving a window open all the time, letting the heat out and cold in, and ensures you're breathing nice, fresh air.

### *Home has no visible mould*

No dampness or visible mould is a good sign that this home is warm and dry. It's possible there may be mould in other less accessible places in the home or at certain times of the year, so keep an eye out. You can clean mould using a solution of 70mls of white vinegar and 30mls of water sprayed on affected areas. Leave for up to an hour and then wipe it off with a clean damp cloth. Be particularly wary of mould appearing in wardrobes and other enclosed spaces, and continue airing to ensure you're breathing nice, fresh air.

### *Home has visible mould*

Your home has some areas of visible mould. This could be a sign that your home doesn't have enough insulation, ventilation, and/or isn't getting heated enough. It's possible there is a problem with water entering from the outside, maybe through holes in your roof or cladding. You could have a leak, like a broken pipe, or there might be ground moisture rising through your floor. It's a good idea to seek professional advice to remedy any moisture issues in your home.

If your home has extensive blackened areas and large patches of mould, bigger than 1m<sup>2</sup>, then your home has a serious damp problem and you should seek professional advice as soon as possible. Sometimes small patches of mould are the first indication of a major issue. If the area is hard to clean and it's obvious that the mould has penetrated beyond the surface and into the building material, treat this seriously too, as there may be a significant problem with the fabric of the building and it could need replacement.

Small patches of surface mould, smaller than an A4 sheet of paper, can be cleaned using this method from [Eco Design Advisors](#):

- You can treat mouldy areas with a solution of 70 percent white vinegar to 30 percent water (not 100% vinegar) or using methylated spirits or isopropyl alcohol which you can buy from supermarkets and hardware stores. The acidity in the solution will kill the mould.
- Spray or wipe the solution over the mould areas and leave it for around 30 minutes. Make sure you clean it off well, rinsing the dead material away.
- Rinse the cloth you are using regularly in water and use gloves. When you are finished, be sure to clean the cloth or throw it away so that mould spores don't spread.
- For especially bad areas, use a mask, safety glasses and gloves to avoid inhaling mould spores or getting in your eyes.
- You can keep mould at bay by regularly spraying vinegar on mouldy areas to stop it growing.

- Please don't use bleach as this can release unhealthy fumes into your home over a long period of time and is ineffective at treating mould.
- Keep children and people who have allergies or a weakened immune system out of the room during mould treatment. Air the room well until all fumes have evaporated and it smells fresh again. Make sure you keep all chemicals well away from children and open flames or fire. Please don't smoke or use candles when you're handling methylated spirits or isopropyl alcohol.
- These treatments may discolour some materials so might not be appropriate for all surfaces. Check with the manufacturer if you're unsure.

The mould needs cleaning up and steps should be taken to make sure it doesn't re-appear before your home can meet the HomeFit standard.

## What to submit for the rating

### All dwellings

Tick yes /no box for 'spaces are free of visible mould'.

PASS: Confirm that there is no visible mould.

FAIL: Describe extent of visible mould (beyond odd specks on bathroom grouting etc.) and photograph mould found (at least one picture per room with infestation).

## References

- 1) BRANZ 2015 House Condition Survey: Comparison of House Condition by Tenure. Vicki White, Mark Jones, Vicki Cowan, Saera Chun <https://www.branz.co.nz/pubs/research-reports/sr370/>
- 2) Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses. Vicki White and Mark Jones, <https://www.branz.co.nz/pubs/research-reports/sr372/>
- 3) This has since been updated with the findings of the 2018-19 Pilot Housing Survey, which included a truncated questionnaire based on the 2105 HCS. Initial findings can be found here <https://www.branz.co.nz/pubs/research-reports/sr456-assessing-condition-new-zealand-housing-survey-methods-and-findings/>
- 4) Housing Improvement Regulations 1947 Every house shall be free from dampness. [http://www.legislation.govt.nz/regulation/public/1947/0200/latest/DLM3565.html?search=sw\\_096be8ed80ba08aa\\_regulation+15\\_25\\_se&p=1&sr=10](http://www.legislation.govt.nz/regulation/public/1947/0200/latest/DLM3565.html?search=sw_096be8ed80ba08aa_regulation+15_25_se&p=1&sr=10)
- 5) Phipps, R. October 2007. Indoor Environment Quality. Report TE220 for Beacon Pathway Limited.
- 6) World Health Organisation Regional Office for Europe (2009). WHO guidelines for indoor air quality: dampness and mould. [www.euro.who.int/document/E92645.pdf](http://www.euro.who.int/document/E92645.pdf). This report summarises the scientific evidence on health problems of building moisture and biological agents. They conclude that to avoid the significant adverse health impacts we should prevent (or minimise) persistent dampness and microbial growth on interior surfaces and in building structures. While people who already have respiratory issues are very susceptible, the report notes that dampness and mould may impact on otherwise healthy occupants too. The report notes that, while few intervention studies were available at the time, results show that remediation of damp can reduce adverse health outcomes. They say that the increasing prevalence of asthma and allergies in many countries increases the number of people who are susceptible to damp mouldy buildings.
- 7) Alexandra C Carswell et al. Costs of Childhood Hospitalisation for Asthma. Department of Public Health, University of Otago, Wellington, 2015. This undergraduate paper did an economic analysis of the costs of asthma. They found at a national level the costs of childhood (<15years) hospitalisations in 2013 to be \$2.1m in non-health care costs (e.g. time off work for parents, expenses, schooling) plus \$7.6m in health care costs.
- 8) <http://www.otago.ac.nz/wellington/news/otago661987.html>. This research found that mould in houses can trigger a child's first asthma attack. Also noted more mould, more wheezing.

## Main living space can be adequately heated

### Summary

The main living space in a HomeFit home must be able to be adequately and cost-effectively heated. Smaller living spaces with a heat load equal to or less than 2.4kW may be heated with a fixed electric heater. Larger spaces must have fixed, energy-efficient heating. In both cases the heat source must be clean burning and must meet the required heating demand of the space.

### Why this is important

The World Health Organisation recommends a minimum indoor temperature of 18°C (ideally higher if babies or elderly people live in the home). New Zealand homes regularly fall outside this comfort zone with consequent health implications for their occupants.

Electric resistive heaters are the most common form of space heating in New Zealand, but these are expensive to run for long periods of time, especially in large rooms. Electric resistive heaters may be adequate for smaller living spaces, but more energy-efficient heating types are available, and for larger spaces we require either heat pumps, flued gas fires or clean-burning wood fires or pellet burners to meet HomeFit.

### Detail of what is required

In all cases, the heat source must be fixed, clean burning, and able to heat the largest living space to a minimum of 18°C to meet the HomeFit standard. For Healthy Homes Standards (2019), there is no requirement for it to be clean burning. However, emission standards may apply in affected airsheds under the National Emissions Standards for Air Quality (NESAQ). In those areas, check the regulations with your local authority. If the largest living space has a heating load greater than 2.4kW, the heat source must be cost-effective or be otherwise deemed a “qualifying heater” under the HHS.

Unflued gas heaters are not acceptable in any form for either standard as they release large amounts of moisture, nitrogen oxides and carbon monoxide indoors. This is harmful for the health of the occupants, especially those with respiratory illnesses.

Unblocked open fires are also not acceptable as they create draughts and release harmful particulates into the air. Open fireplaces may only be present if they are blocked and there is a separate source of acceptable heating provided.

#### **Fixed heat source**

A “fixed” heat source must be permanently attached to the fabric of the building, but does not need to be hardwired, i.e. plug in heaters that are fixed to a wall comply.

#### **Clean burning**

Any solid fuel burning heat source that does not meet the National Environmental Standards for Air Quality at the date of testing is considered “non-clean burning” (see wood burners that meet [Ministry for the Environment regulations here](#)). The NESAQ requires wood burners to have a discharge of less than 1.5 grams of particulates for each kilogram of dry wood burned (g/kg) and a

thermal efficiency of at least 65%. Non-clean burning fuels other than wood (or wood pellet) such as coal and diesel/oil are not permitted for HomeFit, but may comply with the HHS.

### **Cost effective**

Cost effective means that the heating has a running cost of less than 20c per kWh (delivered heat).

### **Qualifying heater**

Under the HHS, the main living room must have one or more qualifying heaters with a total heating capacity that meets the heating demand of the living space. The formulas for determining the heat demand are designed to ensure that only heat sources capable of maintaining the living room temperature at 18°C can meet the Healthy Homes Standards.

Qualifying heaters are prescribed in order to exclude various types of heaters that are dangerous, unhealthy, inefficient, or unreasonably expensive for tenants to operate.

**Table 4: Indicative fuels and heater types**

Fuel type	Assuming fuel costs as follows (2022 prices)
Electricity	28c/kWh
Firewood	\$100/m <sup>3</sup>
Wood pellets	13c/kWh
Natural gas	12c/kWh
LPG (45kg bottles)	\$110-180
<b>Heat sources are deemed to be cost effective and clean burning, either as standalone heating or as central heating (ducted or through radiators/underfloor pipes):</b>	
Electric heat pump (air or ground source)	
Flued LPG/natural gas burner/boiler	
Pellet or wood burner/ boiler that meets the NES	
<b>Heat sources that are <i>not</i> deemed to be cost effective and clean burning:</b>	
Electric resistance heater (panel, convection, fan assisted) except in living spaces with a heat loss equal to or less than 2.4kW (and if so, the heater must have a thermostat, be fixed and be a minimum 1.5kW).	
Oil burner/boiler (diesel)	
Older wood/solid fuel burner (including all coal burners) that do not meet the NES	
Open fireplace	
Unflued gas heaters (fixed or portable)	

### **Able to heat the largest living space to a minimum of 18°C**

“Able to heat the largest living space to a minimum of 18°C” means either that the main living space

- a) has a fixed cost-effective heat source installed that can meet the heating demand of that space, with a minimum of 1.5kW capacity *or*
- b) is small enough and sufficiently well insulated to be cost-effectively heated by an electric resistive heater (minimum 1.5kW) that can meet the heating demand of that space

The main living space includes all open plan areas such as kitchens or dining rooms connected to the living space without a dividing door.

The HomeFit App includes a link to the [Tenancy Services calculator](#) used to determine the heating demand of the living space. The resulting heat demand (kW) from this calculator is inputted into the HomeFit Assessor app along with the output of the heat source (kW) read from its label. The results of this calculator can be provided in a PDF format as evidence that the heater provided is or is not large enough to meet the heating demand of the main living area.

## Healthy Homes Standards – additional guidance

The HHS requires the heating demand to be met with a heat source that has equal, or greater heat output bar the following:

- Where a heater was installed before 1 July 2019, it will comply with the Healthy Homes Standards *if* it is a qualifying heater (see definition above) and it is sized to meet at least 80% of the calculated heating demand of the living space.
- If a qualifying heater was installed before 1 July 2019 but is not big enough to meet the calculated heating demand, a fixed electric resistance heater can be installed to meet the shortfall in heating demand provided that the shortfall is less than 2.4kW and the electric resistance heater is fitted with a thermostat. The qualifying heater will need to be replaced with one meeting the calculated heat demand if the shortfall is greater than 2.4kW.
- These exceptions only apply to heat sources installed before 1 July 2019. Therefore, as soon as a heat source is replaced, it must be replaced by a device that meets all the requirements of the heating standard. Any heat source installed after 1 July 2019 needs to meet the heating standard requirement in readiness for the Healthy Homes Standards compliance date.

## HomeFit PLUS

A HomeFit PLUS home must have a fixed, cost-effective, clean-burning heat source in the main living space, able to adequately heat the living room to 18°C, as for HomeFit, with the exception that electric resistive heating (either fixed or portable) is not permitted.

## Passive House standard

Homes that are certified to the Passive House standard will generally have acceptable indoor temperatures for most of the year without space heating and meet this requirement by default.

## How to assess

### *HomeFit and the Healthy Homes Standards*

First check if there is a fixed, cost-effective, clean-burning heating source and determine its age and kW output. This information can be found on the name plate, or if not, request receipt from homeowner as proof of installation date and check the model online for heating output. Fail the heat source if this information cannot be found.

Wood burners must be confirmed to be clean burning. Find the make and model of the wood burner and confirm that it meets [Ministry for the Environment standards here](#). If the homeowner cannot

provide evidence of the make and model of the wood burner (e.g. nameplate, receipt, operating instructions) then this must be failed.

Next, estimate the heat demand of the room by using the [Tenancy Services calculator](#). If the home has one of the complying heat sources in the Table 4 above and is sized to meet the heating demand of the living space, no further evidence is required to be submitted.

If the home has a heat source that is not on the default acceptable list but is believed to be both clean burning and cost effective, the assessor will need to submit additional evidence to NZGBC. Evidence of its fuel source, efficiency and tested emissions (if solid fuel) must be submitted alongside the provided calculator. Fuel costs must follow the format in the table provided above to ensure consistency.

### **HomeFit PLUS**

The presence and heat output of a fixed, cost-effective, clean-burning heat source should be evidenced during the site inspection. Electric resistive heating (either fixed or portable) is not permitted.

If the fixed heating source is a wood burner, then this will have to be confirmed as clean burning. Find the make and model of the wood burner and confirm that it meets [Ministry for the Environment standards](#) here.

## **Advisory report text**

### **Heater is able to heat the main living space**

Your living room has a heat source that is adequately sized to meet the HomeFit and Healthy Homes Standards and can heat the room to 18°C, which is the minimum temperature recommended by the World Health Organisation. Using this to heat your home regularly will make a big difference to the health of the people living in it and will help keep the air dry to prevent mould.

Largest living space {demand}

Heat source {output}

### **The main living space needs a better heat source**

Your living room does not have a heat source that can adequately heat the room to 18°C, which is the minimum temperature recommended by the World Health Organisation. This does not comply with HomeFit or the Healthy Homes Standards and is unhealthy for the occupants. To meet the HomeFit Standard, you'll need to explore installing a cost-effective heating option that is sized to meet the heating demand of the room. An adequately sized heat pump, clean-burning wood fire or pellet burner would meet the HomeFit PLUS standard and will comply with the Healthy Homes Standards for rental properties.

Largest living space {demand}

Heat source {output}

If the difference between the heating demand and the heat output of your main heat source is less than 2.4kW and your heat source was installed before 1 July 2019, you can top up to the required heating demand with an electric resistance heater that is fixed in place. If your heater was installed

after 1 July 2019, it needs to be upgraded to have a heat output equal to or greater than the heating demand.

### ***The main living space is heated with a heat pump***

Heat pumps are generally regarded as the most efficient way to heat the living areas of your home and will meet the HomeFit and Healthy Homes Standards as long as they're adequately sized to heat the space. Typically, heat pumps use between half to a third of the energy of a standard electric heater to provide the same amount of heat, making them very cost-effective to run. Check you're using it effectively by having a read of this information about using heat pumps wisely on the [Gen Less website](#) or on [The Eco Design Advisor website](#).

### ***The main living space is heated with a flued, clean burning wood or pellet fire***

Wood fires and pellet burners can be an efficient way to heat the living areas of your home and will meet the HomeFit and Healthy Homes Standards as long as they're adequately sized to heat the space. Wood is renewable and carbon neutral when harvested from sustainably managed forests, making it a more environmentally friendly form of energy than fossil fuels.

Pellet fires are fuelled by waste from timber manufacturing, easy to refuel and are very clean burning. They use some electricity to power the pellet feeder and fan. The cost of pellets is comparable with other efficient heating fuels.

Wood fires are also good for disaster resilience as they work during power cuts and many free-standing models can be used for cooking as well as heating. Some wood fires come with a wetback system to heat water.

Modern wood fires that were installed after 2005 are relatively efficient and clean burning compared with older burners and open fires. Be careful that you're only burning dry, untreated and paint-free wood to make sure the air quality in your home stays safe. Try not to dampen the fire overnight and make sure to have the chimney swept regularly, otherwise your smouldering fire might be contributing to local air pollution. You can find some tips and tricks on lighting a smoke-free, efficient fire [here](#).

### ***The main living space is heated with a flued gas heater or central heating***

Flued gas fires are relatively efficient and clean burning compared with wood fires and will meet the HomeFit and Healthy Homes Standards as long as they're adequately sized to heat the space. If your fire is connected to the gas mains it will be more cost effective than using bottled gas, but gas is a fossil fuel and will contribute to climate change. Central heating can be a cost-effective option in larger homes if the home is well-insulated because you won't have to use several heaters in different parts of the home at the same time.

### ***HomeFit PLUS and HHS compliant heating source***

You have an innovative method of heating your home and the assessor has deemed it to be compliant with HomeFit PLUS and the Healthy Homes Standards.

### ***Home is a Passive House and meets heating requirements for the HHS and HomeFit***

Your home meets the HomeFit standard as it is a certified Passive House which means it is highly energy efficient.

***The main living space is heated with fixed electric resistive heating and the heat demand is less than 2.4kW***

Living space {demand}

Heat source {output}

This means your living space is small enough and sufficiently well insulated to be cost-effectively heated with this type of heating and complies with the HomeFit and Healthy Homes Standards. Fixed electric resistive heating is not a very efficient heat source and we recommend you explore more cost-effective heating options like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

***The main living space is heated with fixed electric resistive heating, but it does not meet the heat demand***

Living space {demand}

Heat source {output}

Your fixed electric resistance heater is too small to cost-effectively meet the heat demand of your living space and does not meet the HomeFit and Healthy Homes Standards. We recommend you explore more cost-effective heating options like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

***The main living space does not have any fixed heat source***

Living space {demand}

You'll need to install an adequately sized heat source that meets this heating demand to make this home healthier for its occupants and compliant with the HomeFit and the Healthy Homes Standards for rental properties.

If the heating demand is less than 2.4 kW, you could install a fixed electric resistance heater provided its heat output can meet this demand (check the label). We recommend you explore more cost-effective heating options like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

***The main living space is heated with fixed electric resistive heating, but the heat demand is greater than 2.4kW***

Living space {demand}

Heat source {output}

Your heat source does not have a high enough output to meet this demand. The living space is too big or insufficiently insulated to be cost-effectively heated with a fixed electric resistive heat source and does not meet the HomeFit or the Healthy Homes Standards.

You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

### ***The main living space is heated with an unflued gas heater***

Living space {demand}

Unflued gas heaters do not meet the HomeFit or the Healthy Homes Standards as they release large amounts of moisture and toxic fumes into your air which make it hard to heat and extremely unhealthy. Unflued gas heaters should never be used in enclosed spaces like bedrooms, and a window should always be left open to avoid toxic gasses building up, which makes them highly inefficient. They can be quite dangerous for the occupants of the house and we strongly recommend using a different form of heating as these heaters are illegal in some counties, including Australia.

You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

### ***The main living space is heated with an open fireplace***

Living space {demand}

Open fireplaces are cosy to sit next to in the winter while they're burning but, unfortunately, the rest of the time they act like a giant hole leaking warm air out of your house, like having a window open all the time which is why they don't meet the HomeFit or the Healthy Homes Standards. They can produce large quantities of smoke and have been banned in some areas that suffer from air pollution.

Removing an open fireplace can be expensive and difficult, so we recommend blocking it off either temporarily or permanently.

To temporarily block the chimney, a rubbish bag filled with shredded clothing works well. Make sure the bag is visible so that no one tries to light a fire in a blocked chimney. To permanently disable the fireplace, you'll need a contractor to cap or remove the chimney altogether.

You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner, which could even be installed inside or in front of the open fireplace, then sealed to prevent draughts. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

### ***The heat source in the main living space is not clean burning***

Living space {demand}

This is compliant with the Healthy Homes Standards, but burners that are not clean burning don't meet HomeFit as they are inefficient, costly, and release harmful particles into the air. You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner that meets the [Ministry for the Environment regulations](#). These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

**The heat source in the main living space is not clean burning and does not meet the heat demand**

Living space {demand}

Heat source {output}

You'll need to upgrade your heat source to meet the Healthy Homes and HomeFit Standards. Burners that are not clean burning don't meet HomeFit as they are inefficient, costly, and release harmful particles into the air. You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner that meets the [Ministry for the Environment regulations](#). These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

**The main living space is heated with a non-compliant heat source**

Living space {demand}

Your heat source is not compliant with the HomeFit or the Healthy Homes Standards as it is either not clean burning or it is not cost effective to run.

You'll need to install a more cost-effective heating option like a heat pump or clean-burning wood fire or pellet burner. These options would meet the HomeFit PLUS standard and the Healthy Homes Standards if they have a heat output that meets the heating demand of the room.

**General advice for operating heat sources cost effectively**

- In most situations, it costs less money to switch your heater on and off when you need it rather than to try and maintain a constant temperature either overnight or during the day when you're out.
- Turning up your heating excessively (or turning down your aircon in summer) will just waste power without reaching the desired temperature any faster. As a rule, set your thermostat for no less than 18°C (in summer) and no more than 22°C (in winter).
- Many heaters are only big enough to heat one room so close doors and curtains in the evening to trap heat.
- Use draught excluders (or door snakes) under doors to keep heat from escaping into other parts of the home.
- More information on types of space heating can be found on the [Gen Less website](#).

**What to submit for the rating**

<b>HomeFit and HomeFit PLUS: Non-centrally heated and centrally heated dwellings</b>
<p>Photograph of the heater type in the main living space. Photograph of any heating system remote from the main living space (e.g. ducted heat pump, central heating boiler).</p> <p>Photograph of name plate, receipt or other documentation showing the heater's output.</p> <p>Confirmation that there are no open fires or unflued gas heaters.</p> <p>PDF of Tenancy Services heating tool report.</p>
<b>Dwellings that are Passive House certified.</b>
Passive House certificate

## References

- 1) BRANZ 2015 House Condition Survey: Comparison of House Condition by Tenure. Vicki White, Mark Jones, Vicki Cowan, Saera Chun <https://www.branz.co.nz/pubs/research-reports/sr370/>
- 2) Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses. Vicki White and Mark Jones, <https://www.branz.co.nz/pubs/research-reports/sr372/>
- 3) Tenancy services guidance on heating to meet the Healthy Homes Standards <https://www.tenancy.govt.nz/healthy-homes/heating-standard/>

## Energy-efficient hot water supply

### Summary

A HomeFit home must have an energy-efficient hot water supply.

### Why this is important

According to the BRANZ HEEP studies, water heating accounts for around a third of the energy use in an average New Zealand home. The most cost-effective ways to reduce hot water energy consumption in a typical home are to reduce the flow rate of showers and properly insulate any hot water cylinders.

According to the BRANZ HEEP report, 33% of shower flow rates are more than 9 litres per minute and 43% of cylinders in New Zealand homes are poorly insulated.

### Detail of what is required

#### *Shower flow rate 9 litres/minute or less*

All showers in the home (including ensuite) must have a shower flow rate of 9 litres/minute or less.

#### *Either instantaneous hot water or well-insulated cylinder*

Hot water generation should either be instantaneous (electric or gas), gas fired cylinder, hot water heat pump (cylinder or separate condenser) or come from a well-insulated electric hot water cylinder (which could be heated by electricity, solar or wetback systems).

A well-insulated cylinder is defined as:

- factory-fitted with A-grade insulation or Minimum Energy Performance Standards (MEPS) compliant. This may be marked on the side of the cylinder. Cylinders manufactured from 2003 onwards will be compliant by default and the date of manufacture is often marked on the cylinder.
- retrofitted with cylinder wrap. Note, only electric cylinders or hot water calorifiers can be retrofitted with cylinder wrap. Gas cylinders cannot be retrofitted in this way for reasons of safety and are in any case compliant by default. Heat pump hot water cylinders are also compliant by default.
- having insulation installed to the first metre of hot water distribution pipework or more if the cylinder is outside the thermal envelope (e.g. cylinders in subfloor spaces often have hot water pipe running the length of the house). Lagged pipes on cylinders inside the thermal envelope are recommended but not required for HomeFit.

#### *Exceptions*

In some cases, a cylinder will have insufficient clearance to allow for the installation of cylinder wrap. This is acceptable but needs to be noted on the HomeFit advisory report together with photographic evidence that the cylinder cannot be wrapped. Use your discretion when judging how difficult it would be to wrap the cylinder. Wrapping three quarters of the cylinder (and stuffing more insulation down the gap at the back) will improve cylinder performance.

## HomeFit PLUS – optional measure: heat pump or solar hot water

The installation of either heat pump hot water heating or solar hot water heating (solar thermal or solar photovoltaic) contributes to the achievement of HomeFit PLUS. To be eligible, all showers and the main kitchen tap hot water supply must come from a heat pump or solar hot water system. If the system uses solar PV, it must be connected to the hot water supply by timer, controller or similar to ensure it is using solar as its primary energy supply (the system may be boosted by electric element, instantaneous gas or similar, but not as its primary supply).

### How to assess

#### *HomeFit*

The shower flow rate should be assessed by timing how fast it takes to fill a bucket. Turn the shower mixer onto its maximum capacity, achieve a suitable average showering temperature and run the water into a bucket for 15 seconds. Measure how much water is in the bucket and then multiply this figure by four to get the flow rate in litres/minute.

Alternatively, if the WELS rating of the shower(s) is known, this must be at least 3 Star WELS.

Determine the type of hot water system(s) present. Where electric hot water cylinders are present inspect the name plate label to find out if it is A-grade, MEPS compliant or manufactured from 2003 onwards. If the cylinder is not A-grade or MEPS compliant determine whether it has been retrofitted with cylinder wrap.

#### *HomeFit PLUS*

The presence of either (or both) solar hot water heating or heat pump hot water heating should be evidenced during the site visit. Confirm that they feed all showers and the main kitchen tap as a minimum.

### Advisory report text

#### *All showers have flow rates of 9 litres/minute or less*

Your shower flow rates:

*{showerflow}*

Shower flow rates of 9 litres a minute will save \$240 or more a year for a household of three compared with a flow rate of 12 litres/minute. You can save even more water by trying to keep showers to no more than 4 minutes. A simple egg timer or alarm can often help motivate children to get out of the shower!

#### *The hot water system meets the HomeFit standard for energy efficiency*

Having a well-insulated, efficient hot water system has a big impact on energy savings. If you want to make this system even more efficient, try lagging at least the first metre of the hot water pipe (look for this special pipe insulation at your local hardware store).

#### *The hot water system meets the HomeFit PLUS standard for an energy efficiency*

Your home has a solar hot water system, heat pump hot water system, or some other hot water system that is deemed to be compliant with HomeFit PLUS. This will have a big impact on energy savings.

***One or more showers have flow rates more than 9 litres/minute***

Your shower flow rates:

{showerflow}

You'll need to swap your shower heads for ones with more efficient flow rates of 9 litres per minute (or less) or install inexpensive shower flow restrictors to meet the HomeFit standard. Shower flow rates of 9 litres a minute will save \$240 or more a year for a household of three compared to flow rate of 12 litres/minute. Even reducing the flow rate by 3 litres per minute could save a household of three around \$240 per year.

***The home has an electric hot water cylinder that is inadequately insulated***

Insulating your cylinder can have a big impact on your electricity bill and is really worth doing. Cylinder wraps are cheaply available from most hardware stores and are easy to fit. Make sure to lag at least the first metre of hot water pipe (look for this special pipe insulation at your local hardware store). If your cylinder is on the outside of your home or under it then lag as much of the pipe as possible.

***The home has a coal or diesel/oil boiler or other hot water system that does not comply with HomeFit***

You'll need to upgrade to a more efficient hot water system if you want to meet the HomeFit standard. An efficient cylinder or instantaneous heater using gas or electricity, a heat pump water heater, or a solar water heater or wetback (with electric or gas back up) are all good options.

***General advice***

How much hot water your household uses, and the electricity and gas prices in your area, determine if it is cost effective to pay more upfront for a highly efficient water heating system. Choosing a system that uses renewable energy, such as solar or a heat pump, also reduces the environmental impact of your hot water use.

The temperature of the water should be at least 60°C at the cylinder (to prevent the growth of Legionella bacteria), but not much higher than this. Even an extra 10°C on the thermostat of your hot water system could be costing you \$25 a year with a modern cylinder, or twice that with an older one. Depending on your cylinder, you may need an electrician or plumber to adjust your thermostat.

For more information on hot water choices, see Gen Less [Hot Water](#).

**What to submit for the rating?**

<b>All dwellings</b>
Photograph of showers head(s) flow volume and input flow rate in litres/minute
Photograph of hot water cylinder name plate showing:

- cylinder grade or MEPS compliance, where present
- cylinder wrap and lagging or lack thereof
- if relevant, evidence that the cylinder cannot be wrapped

Photograph of other forms of compliant hot water generation including instantaneous, heat pump and solar hot water systems.

## References

- 1) BRANZ Energy use in New Zealand Households - final HEEP report,  
<https://www.branz.co.nz/pubs/research-reports/sr221/>
- 2) AS/NZS 4692.2:2005 Electric water heaters - Minimum Energy Performance Standard  
<https://www.standards.govt.nz/shop/asnz-4692-22005/>

## Adequate ventilation

### Summary

A HomeFit home must have adequate means of ventilating kitchens, bathrooms, living spaces and bedrooms.

### Why this is important

Kitchens and bathrooms are major sources of moisture in the home. Fitting dedicated mechanical extract systems to these rooms will help to reduce moisture levels and reduce the risk of mould and other problems associated with high humidity levels.

According to the [BRANZ House Condition Survey 2015](#), homes without mechanical extract in the kitchen were three times more likely to have visible mould while bathrooms without extracts make the home twice as likely to have mould.

Other habitable spaces also require ventilation with outdoor air. New Zealanders often rely on opening windows, but mechanical ventilation is becoming more prevalent as air tightness of homes improves and lifestyle changes affect people's attitudes to good airing habits.

### Detail of what is required

Mechanical kitchen and bathroom extract systems ducted to outside must be installed to meet both HomeFit and the Healthy Homes Standards (HHS) for rental properties. Kitchen extract systems may either be a dedicated rangehood located over the hob or a separate extract fan. Any extract fan installed before July 2019 will comply as long as it is ducted outside.

Extract fans installed after 1 July 2019 must have a flow rate of 50 litres/second (kitchens) or 25 litres/second (bathrooms). Alternatively, ducting must have a diameter of at least 150mm (kitchens) or 120mm (bathrooms). Shower enclosures (such as shower domes) are valuable additions to bathrooms but are not recognised as alternative means of compliance for HomeFit or the HHS.

Combined bathroom heat/fan/light units are available, but not all have fans and ducting that meet the required size (120mm diameter) or flow rate (25 litres per second). They also intrude into the ceiling space and as such will compromise the integrity of ceiling insulation. Include these in the number of recessed downlights which will fail the insulation criteria if more than 20% are non-IC or CA-rated fittings.

Separate WCs need only have a mechanical extract if no openable windows are present. There is no requirement to measure the flow rate/diameter of duct.

Other habitable spaces must have some means of ventilation; either mechanical ventilation or at least one openable window, door or openable skylight. Homes that are ventilated by openable windows must have window(s) that can be fixed in the open position with net openable area (the face area of the openable windows) of at least 5% of floor area.

Rooms can be ventilated from adjacent rooms (as per NZBC G4) but the adjacent room must meet all the following requirements:

- have window(s) that can be fixed in the open position with a net openable area of at least 5% of floor area of both rooms
- have a permanent opening between the two spaces
- the furthest distance between the back wall of the internal room and the window must be less than 6m.

## HomeFit PLUS

### *Mandatory*

Kitchen and bathroom fan requirements for HomeFit PLUS are the same as for HomeFit with the addition that the kitchen rangehood is between 650mm and 900mm of the stovetop/hob, ducted outside. The flow rate must be no less than 50 litres per second, or all exhaust ducting must have a diameter no less than 150mm.

Extract fans in bathrooms must have a flow rate no less than 25 litres per second or all exhaust ducting must have a diameter no less than 120mm.

As with HomeFit, separate WCs need only have a mechanical extract if no openable windows are present and there is no requirement to measure the flow rate/diameter of duct.

### *Additional advisory*

For new installations, any ducting should be insulated to R1. This is important to prevent condensation developing in the ducts. Preferably, advise installing rigid ducting (not flexible) which enables better air flow volumes due to lower resistance but will still need to be insulated. If flexible ducting is used, then this should be cut to the correct length. Flexible ducting should be fully extended, as straight as possible, and taut. Run on timers (6 minutes or more) are recommended to help dry out the ducting after use. Homeowners should avoid installing loud fans, particularly for kitchen rangehoods which are notoriously underused where they are noisy. Recommend that homeowners choose fans with low setting of less than 50dBA.

### *Optional measure: balanced heat recovery ventilation*

The installation of balanced heat recovery ventilation contributes to the achievement of HomeFit PLUS. This may either come from a single heat recovery unit ducted to each room or from individual heat recovery units per room. In either case, mechanical ventilation must be provided to each habitable space (kitchen, living areas, bathrooms and bedrooms).

Ducting in such systems needs to be entirely inside the insulated envelope. Alternatively, if ducting must be run outside the insulated envelope (roof space) then it must be overlaid with 150mm of insulation blanket installed in a manner to be free of air gaps. This is to minimise energy loss in winter, and to reduce energy gains in summer.

Heat recovery ventilation is most suited to well-insulated, airtight homes in colder climates. Positive pressure ventilation systems do not meet this standard as they often do not introduce fresh air from outside and do not extract stale air outside.

## How to assess

### *HomeFit*

The presence of mechanical kitchen and bathroom extract systems together with ventilation in other living spaces (either openable windows or mechanical systems) should be evidenced during the site inspection. For HomeFit and Healthy Homes Standards, it is not necessary to establish the flow rate (amount of air being vented through the extract systems) unless the fan was installed after 1 July 2019. If you are unsure of the age of the fan, ask the homeowner to provide receipts showing date of purchase. If in doubt, ask homeowner for the model and check flow rate at the manufacturer/retailer's website. You can measure the diameter of the ducting (if accessible) or the external grille, taking care to measure the effective duct opening (the circular area), rather than the square area of the grille face.

Windows in each habitable room should be inspected and confirmed to be openable. Where rooms do not have openable windows, the presence of mechanical ventilation should be confirmed. Balanced mechanical ventilation, positive pressure ventilation or whole house extract systems are all acceptable; however, all outdoor air intakes and exhausts must be to outside (i.e. air should not be taken from, nor exhausted to, the ceiling void).

### *Not acceptable*

Kitchen and bathroom extract systems must vent directly to outside. Recirculating rangehoods and other systems that vent to other parts of the home including the ceiling space are not acceptable except where homes have been built since 1 January 2019 to the 2008 Building Code and where mechanical ventilation is sufficient to allow the use of a recirculating rangehood. A recirculating rangehood option has been added to the Assessor App which will assess a fail for both Healthy Homes Standards and HomeFit. Where there is a recirculating rangehood but ventilation is met by a mechanical ventilation system, choose the option of a fan extracting outside installed before 2019 in order to show a pass for both Healthy Homes Standards and HomeFit. Where possible, confirm that ducting running through a ceiling space is intact and still fully connected.

### *HomeFit PLUS*

Verify that the kitchen rangehood is between 650mm and 900mm of the cooker. Confirm the flow rates or fan and duct diameters of kitchen and bathroom extracts (either through measuring the physical diameter of the fan grille or supplying a spec sheet).

The presence of balanced heat recovery ventilation should be evidenced during the site visit and at least one supply and/or extract terminal confirmed in each kitchen, living room, bathroom and bedroom.

## Advisory report text

### *The home has a kitchen extract that meets the HomeFit and Healthy Homes Standards*

Your home has a kitchen extract ducted outside which meets the HomeFit and Healthy Homes Standards. If you want to meet the HomeFit PLUS standard, you'll need a dedicated rangehood located between 650mm and 900mm above each hob or stove with a flow rate of 50 litres per second or with ducting at least 150mm in diameter. Make sure you use extractors every time you cook and keep lids on pots to reduce steam to make sure the air in your home is healthy and dry.

***Home has a kitchen extract that meets the HomeFit PLUS and Healthy Homes Standards***

Your home has a kitchen rangehood that meets the HomeFit PLUS and Healthy Homes Standards. Remember to use it every time you cook and keep lids on pots to reduce steam to make sure the air in your home is healthy and dry.

***The home is not fitted with kitchen extract ducted to the outside***

You'll need to install a kitchen extract that is ducted to the outside and meets a flow rate of 50 litres/second to meet the HomeFit and Healthy Homes Standards. Kitchen rangehoods and extractor fans exhaust moisture from cooking at the source which means you shouldn't need to open windows while cooking and the cooking moisture won't migrate through your home. Kitchen rangehoods also capture grease and other cooking pollutants to keep the air in your home safe and healthy. A properly sized kitchen rangehood with flow rate of at least 50 litres/sec, located between 650mm and 900mm above the hob or stove, and ducted to the outside is required to meet the HomeFit PLUS standard.

***The home is fitted with kitchen extract ducted to the outside that doesn't meet the required flow rate***

You have a kitchen extract that is ducted to the outside, but it doesn't meet the flow rate requirements of the HomeFit and Healthy Homes Standards. Extracts installed after 1 July 2019 must have a flow rate of at least 50 litres/sec. To meet the HomeFit PLUS standard, it must be a rangehood located between 650mm and 900mm above the hob or stove.

***The home is fitted with a bathroom extract that meets HomeFit and Healthy Homes Standards***

Remember to use your bathroom extract fan every time you shower or set it on a timer to turn on automatically when you turn on the lights. This doesn't use much energy compared to the cost of heating a damp home. If you need to change your fan in future, pick one with a flow rate of at least 25 litre/second to meet HomeFit PLUS.

***The home is fitted with a bathroom extract that meets the HomeFit PLUS and Healthy Homes Standards***

Remember to use your bathroom extract fan every time you shower or set it on a timer to turn on automatically when you turn on the lights to keep the air in your home dry and healthy. This doesn't use much energy compared to the cost of heating a damp home.

***Home is not fitted with a bathroom extract venting outside***

You don't have an externally vented extract fan installed in every bathroom in your home. You'll need to install an extract fan with a minimum flow rate of flow rate of 25 litres/second in each bathroom to meet the HomeFit and Healthy Homes Standards. Bathroom extract fans, if installed properly, exhaust moisture from showering outside, which means you shouldn't need to open windows while showering and the bathroom moisture won't migrate through your home.

When you're installing extract fans, try to position them above the main source of steam where possible (usually the shower). You should fit them with timers that switch the extracts on when you turn on the lights and keeps them running for a set time after the occupant has left the bathroom to keep the air in your home dry and healthy. This doesn't use much energy compared to the cost of

heating a damp home. Internal toilets that don't have an opening window will also need a fan installed to meet the standards.

### ***Home has a bathroom extract that does not meet the HomeFit and Healthy Homes Standards***

Your home has an extract fan in the bathroom that was installed after 1 July 2019 but doesn't meet the HomeFit and Healthy Homes Standards. Extract fans in the bathroom need to have a flow rate of 25 litres/second *or* ducting with a diameter of at least 120mm. You'll need to replace this. Bathroom extract fans, if installed properly, exhaust moisture from showering outside, which means you shouldn't need to open windows while showering and the bathroom moisture won't migrate through your home.

When you're installing extract fans, try to position them above the main source of steam where possible (usually the shower). You should fit them with timers that switch the extracts on when you turn on the lights and keeps them running for a set time after the occupant has left the bathroom to keep the air in your home dry and healthy. This doesn't use much energy compared to the cost of heating a damp home.

### ***Bathroom and/or kitchen extract ducting does not meet the HomeFit and Healthy Homes Standards***

Your bathroom and/or kitchen extract does not meet the HomeFit or Healthy Homes Standards because we were unable to inspect its ducting, or if we did inspect it, it was not ventilating outside or the ducting was not intact. This means that moist air might be vented back into the building which is unhealthy for the occupants and can make the home damp. Check the condition of your ducting and ensure it is well-fitted to an external grille to meet the HomeFit and the Healthy Homes Standards.

### ***Home has ventilation in living areas that meets the HomeFit and Healthy Homes Standards***

Your home has either openable windows or mechanical ventilation in all living areas. Opening these for half an hour once or twice a day will let in fresh air and remove the damp air that makes the home harder to heat. Good ventilation makes a big difference to the health of the homes occupants and reduces the build-up of harmful gases from day to day activities.

### ***At least one bedroom, toilet or living area does not have a means of ventilation***

You need to make sure every bedroom, toilet and living area has either openable window or mechanical ventilation to meet the HomeFit or Healthy Homes Standards. Opening these for half an hour once or twice a day will let in fresh air and remove the damp air that makes the home harder to heat. Good ventilation makes a big difference to the health of the homes occupants and reduces the build-up of harmful gases from day to day activities.

### ***Home has a balanced ventilation system that meets the HomeFit PLUS optional standard***

Your home is fitted with a balanced heat recovery ventilation system that gives you extra points towards HomeFit PLUS. Heat recovery ventilation is well suited to well-insulated, airtight homes in colder climates. It lets in fresh air while removing the damp air that makes the home harder to heat. Good ventilation makes a big difference to the health of the homes occupants and reduces the build-up of harmful gases from day to day activities.

Make sure you air the house for at least half an hour each day, preferably in the middle of the day when you won't be losing valuable heat. This will replace stale air with fresh air and remove moisture from your home.

Ventilating your bedroom overnight promotes better sleep as it maintains air quality and reduces the build-up of harmful gases as well as reducing excessive moisture and the risk of mould growth. In more airtight newer homes (1990s onwards) keep a window slightly ajar - a finger's width should be enough in winter. Use security stays, bolts or latches, or lockable fly screens, for your comfort and peace of mind. During cold winter nights, use an electric heater on a low thermostat setting in your bedroom.

To avoid condensation problems, ventilate when you turn off the heating, for example before you leave the home in the morning.

For more information and advice, look at the Eco Design Advisor [Moisture and condensation factsheet](#).

## What to submit for the rating

HomeFit
<p>Photographs of the bathroom and kitchen extract systems including internal and external ventilation terminals (such as the rangehood), where applicable.</p> <p>Receipts/specification sheets of mechanical ventilation equipment, showing date purchased and/or ducting flow rates/diameters, and/or photographs of measured diameters.</p> <p>Photographs of ducting where not connected or not intact.</p> <p>Photographs of windows in rooms where windows cannot be opened and/any mechanical ventilation inlets and outlets in those rooms with receipts/spec sheets showing type of ventilation system</p>
HomeFit PLUS
<p>Photographs of the whole house ventilation system unit/controller, or of a heat recovery ventilation unit/controller and supply/extract terminals in each room.</p>

## References

- 1) BRANZ 2015 House Condition Survey: Comparison of House Condition by Tenure. Vicki White, Mark Jones, Vicki Cowan, Saera Chun <https://www.branz.co.nz/pubs/research-reports/sr370/>
- 2) Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses. Vicki White and Mark Jones, <https://www.branz.co.nz/pubs/research-reports/sr372/>
- 3) This has since been updated with the findings of the 2018-19 Pilot Housing Survey, which included a truncated questionnaire based on the 2105 HCS. Initial findings can be found here <https://www.branz.co.nz/pubs/research-reports/sr456-assessing-condition-new-zealand-housing-survey-methods-and-findings/>
- 4) Tenancy services guidance on ventilation to meet the Healthy Homes Standards <https://www.tenancy.govt.nz/healthy-homes/ventilation-standard/>

## Adequate protection from external moisture

### Summary

A HomeFit home must have adequate protection from external moisture both from the elements and from ground moisture, to reduce the likelihood of moisture entering the home. Homes with no subfloor (e.g. ground floor is concrete slab on grade or upper floor apartments) or elevated homes (e.g. pole houses) are compliant by default. Drainage must also be in good order; all gutters and downpipes must be securely connected to drains and free from vegetation or other blockages.

### Why this is important

Damp is a major problem in New Zealand homes, with resulting mould affecting 49% of homes (BRANZ, 2015) so it is important that your home is protected from moisture from external sources as well as internal. A key source of moisture coming into a house from the outside is from the ground underneath the floor.

The subfloor is often a damp environment: BRANZ's House Condition Survey of 2015 found over 50% of NZ homes with subfloors had inadequate levels of subfloor ventilation. Even when you look under your house and the ground looks dry, BRANZ research says an average of 0.4 litres of water can evaporate from 1m<sup>2</sup> of uncovered ground in 24 hours. In a 150m<sup>2</sup> house that's up to 60 litres/day on average.

This moisture works its way into the house and can have a significant impact on the level of internal moisture and deterioration of building materials. It adds to the moisture load of your home which has several key negative impacts. Damp air is harder to heat (you spend more on heating and still can't get the temperature up to comfortable healthy levels); and damp air and mould can worsen symptoms of illnesses such as asthma, bronchitis, other breathing disorders and some forms of gastroenteritis.

Similarly, water can enter the house through junctions such as eaves, so efficient drainage of roof and ground water is essential to keeping homes free from dampness. Overflowing stormwater also creates slip hazards on footpaths and potentially causes rising damp through floor slabs or flooded subfloor spaces. Vegetation/garden beds building up along the base of the home are another leading cause of rising damp.

While HomeFit does not replace a full weathertightness survey, it follows the Healthy Homes Standards for good drainage of rental properties, by requiring all properties to have efficient, well-connected gutters, downpipes and drains, as well as recognising other groundwater drainage systems such as swales, slot-drains, raingardens and soakage pits.

### Detail of what is required

All subfloors must be dry, and any *enclosed* subfloors must have a correctly installed *ground moisture barrier* that is in good condition and covers at least 80% of total subfloor. "Correctly installed" means that the polythene sheets overlap each other by 150mm, flap up the foundation wall by 50mm and are taped to piles. On sloping sites, the lower-most edge of the polythene should be at least 50mm short of the foundation wall to allow any moisture that may get on top of it to drain away.

A dry subfloor means that there is no evidence of pooling water or obvious leaks in any subfloors (which may appear as damp patches and/or mould on piles or on framing perimeter foundations).

### *Enclosed subfloor*

A subfloor space is enclosed if the airflow into and out of the space is significantly obstructed along at least 50% of the perimeter of the subfloor space by 1 or more of the following:

- a masonry foundation wall
- cement boards, timber skirting, or other cladding
- other parts of the building or any adjoining structure
- any other permanent or semi-permanent structure that significantly obstructs airflow
- rock, soil, or other similar material.

### *Exceptions*

Homes that have a concrete slab ground floor are compliant by default<sup>1</sup>. Homes that have inaccessible subfloors are also exempt from the Healthy Homes Standards, but not from HomeFit. Inaccessible is defined as being impracticable to install a ground vapour barrier without major building work. Simply not having an opening to the subfloor (e.g. a hatch) is not grounds for marking as inaccessible. HomeFit does not consider homes without ground vapour barriers to pass, because they are still at risk of moisture from the subfloor making its way into the home. While building work to access the subfloor may be impracticable, it is not impossible (e.g. when repiling).

### *Drainage*

Gutters, downpipes and drains must be connected and in good working order. They must have no vegetation growing in gutters or signs of stormwater overflowing onto footpaths, under the subfloor, or around the floor slab. Small quantities of moss or lichen growing on the outside of downpipes or on footpaths and gutters is acceptable if this does not create a slip hazard or reflect a more serious maintenance issue.

## How to assess

You will require a good torch and suitable clothing (strong shoes and overalls) as you may need to crawl to assess subfloor. You are not expected to climb up to or onto the roof to check gutters are clear for HomeFit compliance purposes, and you should NEVER use equipment supplied by occupants, such as ladders, *unless* they are explicitly designed for homeowner access purposes, such as stairs to parapets or dropdown ceiling ladders.

### *Dry subfloor*

Assess if the home is protected from moisture by going into the subfloor space.

Actively search to rule out pooling water or obvious leaks. Note if subfloor smells musty or damp. Fail the home if there is evidence of pooling water and/or obvious current leaks.

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<sup>1</sup> Note that where a home has a mixture of ground floor types, or where the subfloor is accessible e.g. suspended concrete slab above ground or concrete basement ceiling with conditioned space above, any subfloors present must comply with the above criteria, unless it is a pole house.

Where required, review ground moisture barrier to ensure it is well installed, covers at least 80% of total floor area, and is in good condition (i.e. not ripped).

### ***Well-ventilated subfloor***

Assess if the home has adequate subfloor ventilation by making observations while in the subfloor. These should be confirmed by walking the perimeter of the building.

- If the subfloor space is clad with base boards, pass the home as long as they have a continuous 20mm gap (or hit and miss (paling) cladding with at least 10mm spacing) on at least two sides of the home.
- If the subfloor space is clad with trellis, pass the home as long as this is present on at least two sides of the home.
- Note that if the home is elevated (i.e. a pole house), has a completely open subfloor on at least 2 sides or has a concrete slab-on-grade ground floor, it is exempt from the requirement for a moisture barrier.

### ***Drainage in good working order***

Check around the house and in the subfloor space to confirm that there is:

- no discharging of rainwater from downpipes into the subfloor or onto the ground adjacent to the house
- no surface water from surrounding ground, paths or driveways flowing under the building
- no water rising through damaged brick, concrete masonry or concrete foundations, or concrete floors.

## **Advisory report text**

### ***Home has good protection from ground moisture***

Your home is well protected from rising damp because you either have a concrete slab floor, a groundsheet (sometimes called a ground moisture barrier) covering the soil under your home, or there is good ventilation in your subfloor and no sign of ponding or leaks.

Good protection from rising damp helps keep the air in your home dry and makes it easier to heat. If there's a groundsheet, make sure it covers all the soil under the home, is not ripped, and is taped around piles. You should check in your underfloor space regularly to make sure that there are no leaking pipes and water isn't getting underneath the home and ponding on top of the groundsheet. If you have a slab floor, check from time to time to see if there is water coming up through it.

### ***Home needs better protection from ground moisture***

You need to install a ground moisture barrier, or groundsheet to meet the HomeFit and Healthy Homes Standards. This will protect your home from ground moisture, which can be a significant source of dampness and makes it harder to heat. Damp causes mould issues in your home, which is unhealthy for the occupants and can affect the durability of the building materials. We suggest contacting an insulation installer or maybe your local energy trust who can give you a quote for the installation of a ground moisture barrier, or groundsheet. Alternatively, a DIY install can cost as little as \$200.

Your home may have pooling water underneath which can be a sign of a drainage or plumbing issue that requires immediate attention. Call a plumber to find the source of leaks or a drainage company to deal with site-based issues that may be causing water to flow under your home. If you think it is an issue with the stormwater system, call your local council.

**Home has good protection from external moisture**

From initial inspection, your gutters, downpipes and drains are connected and efficiently drain roof and ground stormwater away from the house, which means your home meets the HomeFit and Healthy Homes Standards for drainage.

It's a good idea to check drainage annually, ideally in autumn before the onset of the winter rainy season. Check gutters are not blocked by leaves and silt and that drains around the house are clear of debris. You can run your hose through them to check the water drains as it should. If you have gardens beds around your home, make sure they're at least 200mm below the level of the ground floor and at least 200mm away from basement walls or your concrete floor slab.

**Home needs better protection from external moisture**

You need to fix any issues your assessor has identified with your gutters, downpipes or drains to meet the HomeFit and Healthy Homes Standards for drainage. At the moment storm water coming from the roof and along the ground is not draining away from the house properly. We recommend you contact one of these professionals:

- A member of New Zealand Institute of Building Surveyors (NZIBS)
- A member of Building Officials Institute of New Zealand (BOINZ)
- A licensed building practitioner (plumber/drainlayer or builder)

External moisture entering the home can make it damp and hard to heat, which is unhealthy for the occupants and causes mould issues. It may also affect the durability of the building materials which can make the home unsafe.

**Subfloor is inaccessible**

Having an inaccessible subfloor meets the Healthy Homes Standards (HHS) for ground moisture, but it doesn't meet the HomeFit standard. Under the HHS, houses with inaccessible subfloor spaces are compliant, as they are difficult to retrofit. The HomeFit standard acknowledges that they are difficult to retrofit but the house is still at risk of cold and damp without adequate subfloor moisture protection.

**General advice**

For a home to perform well, WHO recommends relative humidity (the amount of moisture in the air) inside our homes should fall in the range between 40%-60%. New Zealand's climate means many regions have moderate to high humidity, so our 'natural' humidity is often in excess of this WHO recommended band. As a result, it's critical for the health of our homes and people to exclude all direct sources of moisture. Regular checking and maintenance of your subfloor space is important. Keep vents clear and check the condition of your ground moisture barrier annually. In addition, checking and maintaining roof, guttering, downpipes and cladding is critical to keeping your house weathertight.

**What to submit for the rating**

<b>All dwellings</b>
Tick yes/no subfloor able to be accessed. Tick yes / no subfloor smells musty

**PASS**

Take photo of ground moisture barrier and confirm that it covers at least 80% of subfloor, is well installed and in good condition.

Confirm that these elements of subfloor meet HomeFit requirements:

- No pooling water
- No leaks/broken pipes
- Subfloor open on at least two sides (take a picture)
- Gutters, downpipes and drains are working efficiently

**FAIL**

- Water in subfloor: take picture of any pooling water, broken pipes or leaks
- Ground moisture barrier inadequate: take picture to show coverage less than 80% of floor area and/or poor condition
- Subfloor: take picture of stored material that would reduce effectiveness of ventilation
- Inaccessible subfloor: take picture showing subfloor access restriction
- Take a picture showing signs of spouting, downpipes, gutters and drains not working efficiently, e.g. slime or moss on footpaths around home, missing sections of downpipe, ground sump missing a collar

## References

- 1) NZS 3604:2011 Timber framed buildings
- 2) NZS 4246:2016 Energy efficiency – Installing bulk thermal insulation in residential buildings
- 3) Installation of Ground Moisture Barriers: Eco Design Advisor factsheet:  
<http://ecodesignadvisor.org.nz/resources/ground-moisture-barriers-guide-installation/>
- 4) BRANZ 2015 House Condition Survey: Comparison of House Condition by Tenure. Vicki White, Mark Jones, Vicki Cowan, Saera Chun <https://www.branz.co.nz/pubs/research-reports/sr370/>
- 5) Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses. Vicki White and Mark Jones,  
<https://www.branz.co.nz/pubs/research-reports/sr372/>
- 6) This has since been updated with the findings of the 2018-19 Pilot Housing Survey, which included a truncated questionnaire based on the 2105 HCS. Initial findings can be found here  
<https://www.branz.co.nz/pubs/research-reports/sr456-assessing-condition-new-zealand-housing-survey-methods-and-findings/>
- 7) BRANZ 2010 House Condition Survey reports more extensively on the subfloor (data analysis and reporting from 2015 still to come). Key insights include:
  - A high proportion of both rented (74%) and owner-occupied homes (72%) had no ground moisture barrier. This is now understood to be a critical intervention that reduces the moisture load in homes.
  - Concrete vents (common in houses built between 1940s-1970s) only have 50% clear space and so permit little air movement; this was not anticipated when first installed.
  - Higher proportion of blocked vents found in owner-occupied homes often due to ‘improvements’ to the property, such as gardens (vegetation blocking vents, raised beds) and additions of decks which may cover vents.
- 8) Tenancy Services Moisture Ingress and Drainage Standard, 2019,  
<https://www.tenancy.govt.nz/healthy-homes/moisture-and-drainage-standard/>

## Ceiling, subfloor and wall insulation

### Summary

A HomeFit home must have adequate insulation in ceilings and subfloors (where present).

### Why this is important

According to the House Condition Survey 2015 at least 40% of homes do not have adequate ceiling insulation and over 50% of homes with a subfloor do not have enough bulk insulation in the subfloor.

These combine to give an estimated that 830,000 New Zealand properties (more than half the stock) could benefit from retrofit insulation. Cold temperatures and high humidity levels in homes are a leading cause of respiratory health problems such as asthma in New Zealand.

Insulating your home is the single most effective thing you can do to keep your home warm and to save energy and money. A well-insulated home provides year-round comfort; it is cooler in summer and warmer in winter, and a warmer home is a drier, healthier home.

### Detail of what is required

#### **Acceptable types of insulation:**

- Expanded (EPS) or extruded (XPS) polystyrene
- Macerated paper
- Mineral/glasswool segments or rolls
- Blown glasswool
- Polyester
- PIR/PUR
- Sheep wool

#### **Unacceptable types of insulation:**

- Foil or foil board (when installed in walls, subfloor, as roofing underlay, or as ceiling insulation). Note that foil in good condition meets the standards for subfloors in existing homes under the Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016 and the Healthy Homes Standards 2019 (HHS)
- Loose polystyrene beads or polystyrene packaging chips in ceilings.

#### **Condition of insulation**

Insulation must be in good condition, with no gaps, settlement below nominal loft or compression, vermin nests or entrance holes, dampness, or patches of mould.

#### **Standard of installation**

Installation should comply with the standards set out in NZS4246:2016, in order to achieve the required R-values, with the downlights exception noted below. Inadequacies in the installation can substantially compromise the performance of the product. As such, there should be no:

- Tucking in or folds

- Gaps around downlights (unless required by NZS4246, but this would fail the HomeFit standard)
- Compression of product – maintaining the nominal thickness is essential to its performance.

The insulation must cover all accessible parts of the floor or ceiling of the habitable spaces of the dwelling, except where clearances are required as per NZS4246:2016.

### **Ceilings**

A HomeFit and HHS compliant home must have insulation installed in the ceiling with a minimum R-value of 2.9 for Zone 1 and 2 homes and R3.3 for Zone 3. Insulation installed since 2009 should have the product label clearly displayed, which can be used to confirm R-value. Where labels are not present on the installed product, a continuous depth of 120mm or greater will be accepted for homes insulated prior to 1 July 2016 (the date the RTA came into force).

In all instances, the insulation should have its original thickness maintained throughout the ceiling, as per the nominal thickness stated on the label or, where not labelled, a minimum of 120mm. The insulation should be installed in accordance with NZS 4246:2016.

For RTA compliance, the ceiling insulation depth is generally accepted at 70mm. However, this does not meet the requirements of HomeFit or the Healthy Homes Standards, unless labelled with an R-value of 2.9. It should be noted that rental homes with existing insulation (i.e. installed before July 2016) will be required to meet the minimum depth of 120mm by July 2021 for any new tenancies. *All* rental properties must be compliant by July 2024. Therefore, in these instances, we recommend upgrading to the HomeFit and HHS standard. Any new insulation installed (from 1 July 2016) needs to meet the R-value requirements of the standards (R3.3 for Zone 3 and R2.9 for elsewhere).

Note that foil does not comply with HomeFit or HHS and should be removed and replaced with a compliant bulk insulant according to NZS4246:2016 and WorkSafe and EnergySafe Code of Practice NZECP55. The retrofitting or repair of foil insulation has been banned since 1 July 2016 due to significant electrical risks.

### **Accessible ceilings**

All homes with accessible ceilings must be inspected to check for condition, quality and safety of installation. Where the ceiling space is accessible, this space must have insulation of an appropriate condition and standard of installation fitted across its entirety.

### **Inaccessible ceilings**

It may not be possible to access some or all the ceiling space, such as in an A-frame or skillion roof construction. Ceilings that are inaccessible in pre-1978 homes are deemed to comply with the RTA and HHS but not with HomeFit, unless evidence can be produced proving they are insulated to the required level, or if this area makes up less than the areas outlined in the following table:

**Table 5: Allowance for inaccessible roof spaces of a house (pre-1978)**

Bedrooms	Allowed inaccessible roof area (m <sup>2</sup> )
1	6
2	10
3	14
4	18
5	22

Any inaccessible roof space built after 1978 can be deemed compliant as the Building Code required ceiling insulation from this date.

In accordance with the insulation requirements of the Residential Tenancies Act 1986 (RTA), and the Healthy Homes Standards 2019 (HHS), where any ceiling space that would normally be accessible (e.g. pitched profile roof) is inaccessible due to a lack of designated access point, this space may not be designated inaccessible unless significant structural building work would be required to create access. Access can be created either temporarily (e.g. removing a panel), or permanently (e.g. a hatch into a ceiling space).

### **Downlights**

Downlights in roof spaces (i.e. not between floors) marked CA80, CA90, CA135, IC, IC-F or IC-4 that have insulation safely installed around and/or over to NZS 4246:2016 are deemed compliant with HomeFit. Any downlight is compliant with the RTA and HHS provided clearances are in accordance with NZS4246. Any other downlight (no mark or any other mark) is deemed non-compliant for HomeFit as the clearance gaps or openings required significantly compromise the effectiveness of the insulation.

Note that combined heat lamp, lighting and ventilation systems in bathrooms require a gap from insulation, like older recessed downlights. As these are particularly common, an exception can be made for them. However, they should be included in the total count of downlights, and if non-IC or CA-rated fittings exceed 20% of the total, this will fail the ceiling insulation criteria.

### **Subfloors**

A HomeFit home must have insulation installed to the subfloor with a minimum declared R-value of 1.3. Insulation installed since 2009 should have the product label clearly displayed, which can be used to confirm R-value. Where labels are not present on the installed product, a continuous depth of 60mm or greater will be accepted for HomeFit. To meet HomeFit PLUS, documented evidence of the R-value is required e.g. label, receipt.

Undamaged foil or bulk insulation of any thickness complies with the RTA standards and the Healthy Homes Standards providing it is still in good condition, was installed to the standards of the building code at the time and that a landlord has evidence to prove that.

An optional measure for HomeFit PLUS is best underfloor insulation (which may include lining board being added below the joists) to achieve R1.8.

All homes with accessible underfloor spaces must be inspected to check for condition, quality and safety of installation. Where the underfloor space is accessible, this space must have insulation of an appropriate condition and standard of installation fitted across the entirety of the thermal envelope taking into consideration clearances required under NZS4246.

Note that foil is deemed non-compliant for HomeFit and should be removed and replaced with a compliant bulk insulant according to the NZS4246:2016 and WorkSafe and EnergySafe Code of Practice NZECP55. The retrofitting or repair of foil insulation has been banned since 1 July 2016 due to significant electrical risks.

### *Inaccessible floors*

It may not be possible to access some or all of the subfloor space due to insufficient clearance from the ground. Homes with inaccessible floors in pre-1978 homes are deemed to comply with the HHS but not with HomeFit, unless evidence of compliant insulation can be produced, or if this area makes up 20% or less of the floor area. Floors that are inaccessible in post-1978 homes are deemed to comply with HomeFit and the HHS, as underfloor insulation was required from this date.

In accordance with the HHS, where any subfloor space is inaccessible due to a lack of designated access point, this space may not be designated inaccessible unless significant structural building work would be required to create access. Access can be created either temporarily (e.g. removing a panel), or permanently (e.g. an entrance hatch).

### *Slab floors*

Any part of a home that lies on a concrete slab is deemed to comply with both the HHS and HomeFit. To achieve the mandatory standard for HomeFit PLUS, a slab must have either underslab or edge insulation *and* achieve a minimum declared R-value of 1.3 (uninsulated slabs that meet R1.3 by virtue of their size do not comply with HomeFit PLUS). To achieve an optional measure for HomeFit PLUS, the slab must meet R1.8, which can be achieved by adding edge insulation to an insulated slab.

### *Apartments*

Top floor apartments automatically meet the underfloor insulation requirements for HomeFit PLUS, as the instance of having a void space under part or all of the apartment is unlikely. Evidence of ceiling insulation must be provided.

Similarly, bottom floor apartments automatically meet the ceiling insulation requirements for HomeFit PLUS, but evidence of underfloor insulation must be provided.

Mid-floor apartments are not required to show evidence of either underfloor or ceiling insulation to meet HomeFit PLUS.

Any apartments with void space above and/or below (e.g. an exposed deck above or a garage below) must have evidence that these void areas are insulated in order to meet the relevant HomeFit/HomeFit PLUS standards.

### *Outbuildings and garages*

Uninhabited enclosed spaces such as garages are excluded from the insulation requirements, except where a wall, floor or ceiling is adjoining habitable space. For example, in the instance that a garage

has habitable space above, the underside of the floor between the habitable space and garage needs to be insulated according to the subfloor requirements.

### **Better insulation levels**

Homes that meet the better insulation levels of HomeFit PLUS (see below) can use this to meet one of the 3 optional criteria required to meet the overall HomeFit standard.

## **HomeFit PLUS**

A HomeFit PLUS home must have better insulation levels in ceilings and subfloors and a minimum of 80% of walls surrounding the thermal envelope must be insulated.

**Table 6: Better insulation levels for HomeFit PLUS**

	Climate Zones 1&2	Climate Zone 3
Ceiling	R3.6	R4
Floor	R1.3	
Walls	Any insulation if 80% coverage	

### **Walls**

Most walls would be deemed inaccessible and therefore compliance with HomeFit PLUS can be demonstrated either with documentary evidence or with the age of the property.

Valid documentary evidence would include consent drawings or receipts/invoices for work completed.

Homes built during or after 1978 are deemed to comply since wall insulation was required in new homes after this date.

Note that foil or foil board, where identifiable, is deemed non-compliant. Refer to NZS4246:2016 and WorkSafe and EnergySafe Code of Practice NZECP55. The retrofitting or repair of foil insulation has been banned since 1 July 2016 due to significant electrical risks.

### **Best insulation levels**

HomeFit PLUS homes must achieve at least 6 further optional measures in order to meet the standard. Insulation levels as indicated in the table below contribute one of these further optional measures.

**Table 7: Best insulation levels for HomeFit PLUS optional**

	Climate Zones 1&2	Climate Zone 3
Ceiling	R4	R5
Floor	R1.8	

## How to assess

You will require a good torch and suitable clothing (strong shoes and overalls) as you may need to crawl under the house to assess the subfloor. You will also require a ruler or other means of measuring the depth of insulation.

Inspect the ceiling and subfloor spaces to determine the:

- a) condition of insulation
- b) quality of installation
- c) safety of insulation installation (particularly in relation to lighting, electrical and heating equipment)
- d) depth of insulation *and/or* R-value of insulation

Insulation should consistently meet or exceed the required R-value or depth across the space being assessed. Please apply discretion here as some bulk insulants (e.g. polystyrene) can achieve required R-values with less than the stated minimum depth standards. See Table 8 below. Whether the insulation is installed correctly (e.g. fixings to stop underfloor segments from falling; gaps only where required) is the most important factor.

Where foil insulation is present, refer to NZECP55 and NZS4246:2016 for important safety information and guidance before proceeding with insulation inspection or any other work in the subfloor or ceiling space.

Inspect all downlights to determine whether they are IC rated or CA80, CA195 or CA135. IC rated downlights will be clearly marked as such. Note that downlights that are IC rated or better should be abutted and covered (excluding drivers/transformers as required), as per NZS4246:2016. If downlights are non-IC rated, determine if there is enough clearance around the downlights according to NZS4246:2016. The 80/20 rule applies here too; if unable to inspect one in five lamps, and all others pass, then deem the downlights to be compliant.

Acceptable evidence of insulation includes photographs and/or documentary evidence such as invoices. If unable to assess to above guidelines, mark as fail and advise homeowner to engage a qualified electrician or insulation supplier to assess.

Where there is a mixture of IC/CA and non-IC/CA, the app v2.2 allows for ticking multiple boxes and potentially allowing for several advisories depending on insulation coverage. If so, ensure that you fill out insulation coverage for both IC/CA and non-IC/CA lamps.

### **Indicative R-values**

The following table shows indicative insulation values for various types of insulants. If there is no label or other documented evidence of the R-value of the insulation, you may use this table to verify if the insulation meets one or other of the HomeFit or Healthy Homes Standards.

**Table 8: Indicative R-value table\***

Thickness (mm)	50	70	100	120	150	250
Foil (air gap)			0.8			
Polyester (low density)	0.9	1.2	1.8	2.1	2.7	4.5
Sheep wool	0.9	1.3	1.9	2.2	2.8	4.7
Glass wool (low density)	1.0	1.4	2.0	2.4	3.0	5.0
Polystyrene (EPS)	1.2	1.6	2.4	2.8	3.6	6.0
Polystyrene (XPS)	1.7	2.4	3.5	4.2	5.2	
Polyurethane (PUR)	1.9	2.6	3.8	4.5		
Polyisocyanurate (PIR)	2.0	2.8	4.0			
*Source: Design Navigator extrapolated						

### Slab Floors

Verify whether the floor has underslab and/or edge insulation, or otherwise meets the required R-values by reviewing the documented evidence. Where edge insulation is visible, the entire perimeter of the house must be accessible to be checked for compliance.

## Advisory report text

### **Ceiling insulation meets RTA but needs an upgrade to meet HomeFit and HHS**

It's a good idea to upgrade your ceiling insulation, especially if your home is a rental property, to meet the HHS and HomeFit standard. You'll need insulation with a minimum R-value of 2.9 to meet these standards, but we recommend a minimum R3.6 in the North Island (excluding Central Plateau) and R4 in the South Island and Central Plateau to meet the HomeFit PLUS standard.

The government's Warmer Kiwi Homes programme provides grants for ceiling and underfloor insulation to eligible homeowners (owner-occupiers) on low incomes. For more information, see [Funding for Insulation](#). Other financial assistance can be found on the [HomeFit finance options](#) page.

### **Ceiling insulation meets the HomeFit and Healthy Homes Standards**

This will do a good job at reducing the heat loss of your home, but it could be improved. We recommend installing insulation with a minimum value of R3.6 in the North Island (excluding Central Plateau) and R4 in the South Island and Central Plateau to meet the HomeFit PLUS standard.

### **Ceiling insulation meets the minimum standard for HomeFit PLUS**

This will do a really good job at reducing the heat loss of your home, but it could be improved. We recommend installing insulation with a minimum value of R4 insulation in the North Island (excluding Central Plateau) and R5 in the South Island and Central Plateau which will give your home additional points towards the HomeFit PLUS standard.

### ***Ceiling insulation meets the standard for HomeFit PLUS optional point***

You have a very high standard of ceiling insulation in your home which will be making a big difference to the energy efficiency of your home.

### ***Ceiling insulation is inadequate and does not meet the RTA, HHS, or HomeFit***

Your home has inadequate or no ceiling insulation and fails to meet the Residential Tenancies Act, Healthy Homes Standards and HomeFit. We recommend installing insulation with a minimum value of R3.6 in the North Island (excluding Central Plateau) and R4 in the South Island and Central Plateau to meet or exceed the requirements for HomeFit and HomeFit PLUS standard. The government's Warmer Kiwi Homes programme provides grants for ceiling and underfloor insulation to eligible homeowners (owner-occupiers) on low incomes. For more information, see [Funding for Insulation](#). Other financial assistance can be found on the [HomeFit finance options](#) page.

### ***Ceiling is inaccessible and complies with RTA and HSS, but not HomeFit***

Having an inaccessible ceiling space meets the Residential Tenancies Act and Healthy Homes Standards (HHS) due to the age of your home, but it doesn't meet the HomeFit standard. Under the RTA and HHS, houses with inaccessible ceiling spaces built before 1978 are compliant, as they are difficult to retrofit. The HomeFit standard acknowledges that they are difficult to retrofit but the house is at risk of cold and damp without adequate ceiling insulation. We suggest that you investigate specialist options for insulating your inaccessible ceiling to improve the comfort of the occupants and meet the HomeFit standard.

### ***There are non-compliant downlights in your ceiling that need replacing***

These downlights require a surrounding gap in the insulation which makes it less effective and prevents your home from meeting the HomeFit standard for ceiling insulation. These lights comply with the Residential Tenancies Act and Healthy Homes Standards but will need to be replaced to meet the HomeFit standard. Choose lights with surface mounted fittings or an IC-rating that means it is safe to install a continuous layer of insulation over the top. Make sure any holes in the ceiling that result are sealed or plastered.

### ***The downlights in your ceiling need to be covered or abutted with insulation***

Your ceiling has downlights with IC or CA ratings that can be safely covered or abutted with insulation but right now there are gaps in the surrounding insulation which prevents your home from meeting the HomeFit standard for ceiling insulation. This is a source of heat loss that can be easily fixed. Right now, they are compliant with the Residential Tenancies Act and Healthy Homes Standards, but we recommend having a qualified insulation installer check this and cover the downlights with insulation to help keep your home warm. Please note that ONLY IC-rated downlights can be covered with insulation. Covering older (non-IC rated) recessed downlights is a fire risk. These will need to be replaced with IC-rated ones before they can be safely insulated.

### ***The downlights in your ceiling might be unsafe***

The downlights in your ceiling are likely to be covered or abutted to (up against) with insulation in a manner that is unsafe as they are not IC or CA rated to allow this. You need to check this as insulation fitted over the top of non-IC downlights, or up against non-CA downlights could be a potential fire hazard and prevents your home from meeting the HomeFit standard for ceiling insulation. Cutting gaps in the surrounding insulation will reduce the fire risk, but we recommend

replacing these with lights that have surface mounted fittings or an IC-rating to meet the HomeFit standard. You could safely install a continuous layer of insulation over the top of these. Make sure any holes in the ceiling that result are sealed or plastered.

***Home has a slab or suspended floor with adequate insulation for HomeFit***

This will help prevent heat loss from your home but could be improved. If you have a suspended floor and can upgrade, we recommend installing insulation with a minimum value of R1.8 to meet or exceed the requirements for the HomeFit PLUS optional standard. If you have a slab and would like to find out how to improve its insulation, contact a specialist slab edge insulation supplier.

***Home has slab or suspended floor with insulation that meets the HomeFit PLUS mandatory standard***

Your home is very well insulated below the floor and meets the HomeFit PLUS mandatory standard. If you have a suspended floor and can upgrade, we recommend installing insulation with a minimum value of R1.8 to meet or exceed the requirements for the HomeFit PLUS optional standard. If you have a slab and would like to find out how to improve its insulation, contact a specialist slab edge insulation supplier.

***Home has slab or suspended floor with insulation that meets the HomeFit PLUS optional point***

Your home exceeds the HomeFit PLUS mandatory standard for insulation below the floor and meets the best standard for an additional optional point.

***Home does not meet the RTA, HHS or HomeFit standards for insulation below the floor***

Your underfloor space either has no insulation, or foil insulation in poor condition which could be a serious source of heat loss. Your assessor was able to access the underfloor space which means you should be able to upgrade this. You can meet the three standards by installing insulation with a minimum R-value of 1.3 in the space under your suspended floor, but we recommend a minimum of R1.8 which has little additional cost and will meet or exceed the requirements for HomeFit PLUS.

Be careful if you need to remove foil insulation as it can be an electrical risk. Contact an electrician and turn off the power before doing any work.

The government's Warmer Kiwi Homes programme provides grants for ceiling and underfloor insulation to eligible homeowners (owner-occupiers) on low incomes. For more information, see [Funding for Insulation](#). Other financial assistance can be found on the [HomeFit finance options](#) page.

***Home does not meet the HomeFit standard for underfloor insulation but passes the RTA and HHS standards***

The underfloor space in your home is inaccessible for assessment, or the insulation present is either insufficient or a foil insulant that doesn't meet the HomeFit standard. Undamaged foil or bulk insulation of any thickness, or inaccessible underfloor spaces comply with the RTA and Healthy Home Standards but are considered inadequate for HomeFit. If you are considering upgrading you can meet the three standards by installing insulation with a minimum R-value of 1.3 in the space under your suspended floor, but we recommend a minimum of R1.8 which has little additional cost and will meet or exceed the requirements for HomeFit PLUS.

Be careful if you need to remove foil insulation as it can be an electrical risk. Contact an electrician and turn off the power before doing any work.

The government’s Warmer Kiwi Homes programme provides grants for ceiling and underfloor insulation to eligible homeowners (owner-occupiers) on low incomes. For more information, see [Funding for Insulation](#). Other financial assistance can be found on the [HomeFit finance options](#) page.

### **Home has enough insulation in the walls to meet HomeFit PLUS**

All or most of the exterior walls in your home are fitted with insulation that meets or exceed the requirements for HomeFit PLUS. This could reduce heat loss from your home by as much as 25% and makes the home far more comfortable for the occupants.

### **Home has insufficient insulation in the walls**

It’s a good idea to consider installing or upgrading the insulation in your walls if you’re planning a renovation. Wall insulation is not a requirement for HomeFit but can significantly reduce the heat loss of a home. A home with 80% or more of exterior walls fitted with insulation will meet or exceed the requirements for HomeFit PLUS. You can find guidance for retrofitting wall insulation on the [Gen Less wall insulation page](#).

## **What to submit for the rating**

All dwellings
<p>Photographs of insulation where present or documentary evidence insulation has been installed to HomeFit or HomeFit PLUS requirements.</p> <p>Acceptable documentary evidence would include consent drawings or receipts/invoices for work completed.</p> <p>Tick yes/no to subfloor accessible and ceiling space accessible.</p> <p>Tick yes/no to the recessed downlights options. Take photographs of examples of types of compliant and non-compliant downlights (1 per type).</p> <p>Select R-values range or depth of insulation.</p> <p>Tick yes/no to wall insulation present.</p>

## **References**

- 1) NZS4246:2016: <https://www.tenancy.govt.nz/assets/Uploads/Tenancy/NZS-42462016-Energy-efficiency-Installing-bulk-thermal-insulation-in-residential-buildings.pdf> (free download via Tenancy Services website)
- 2) Insulation Requirements: A Guide for Landlords: <https://www.tenancy.govt.nz/maintenance-and-inspections/insulation/compulsory-insulation/>
- 3) Warm Up New Zealand Quality Manual: <https://www.energywise.govt.nz/assets/Resources-Energywise/WUNZ-Healthy-Homes-quality-manual-July-2017.pdf>
- 4) NZECP 55:2016: <https://www.energysafety.govt.nz/documents/legislation-policy/electricity-act-regulations-codes/standards-and-codes-of-practice/nzecz-55-july-2016.pdf>
- 5) Tenancy services guidance on insulation to meet the Healthy Homes Standards <https://www.tenancy.govt.nz/healthy-homes/insulation-standard/>

## Heat loss from windows

### Summary

Good curtains/blinds and double glazing are measures that count towards the achievement of HomeFit and HomeFit PLUS. To be eligible, good curtains/blinds and/or double glazing must be present in all living spaces and bedrooms.

### Why this is important

The heat loss from windows can account for 40% or more of the total heat lost in a typical, otherwise reasonably well-insulated home. Once ceilings and floors are insulated, windows are usually the weakest part of the thermal envelope.

Well-installed curtains and blinds can help to reduce heat loss through windows. “Sealing” the curtain or blind - in other words stopping air movement between the window and the room - is much more important than the material it is made from.

Good double glazing can be twice as thermally efficient as single glazing and will significantly reduce cold draughts from windows.

### Detail of what is required

All windows in living spaces and bedrooms must have good curtains, blinds or double glazing. Any windows in the kitchen area of an open plan kitchen/living room may be excluded. Having both compliant blinds/curtains *and* double-glazing counts as one optional measure towards HomeFit or HomeFit Plus achievement.

#### **Curtains**

“Good” means that curtains are:

- floor-length and touch the floor, or have pelmets above them or close-fitting tracks with only a minimal air gap between the top of the curtain and the wall (sill-length curtains are less effective)
- fitted tightly against the wall or window frame
- wider than the window frame
- double layer

#### **Blinds**

“Good” blinds must have a snug fit with the window frame, creating a good seal to trap the air in the gap between them and the window. Roman blinds and pleated (cellular, or honeycomb) blinds are often good; roller, wooden and Venetian blinds are usually not.

#### **Double Glazing**

All types of double and secondary glazing are acceptable but must, as with curtain and blinds, be present in all living rooms and bedrooms. A combination of good curtains/blinds in some rooms with glazing in the others is acceptable.

## How to assess

The presence of good curtains/blinds and double glazing or secondary glazing should be evidenced during the site inspection.

### Advisory report text

#### *Windows in living spaces and bedrooms are protected from heat loss*

You have either good curtains or blinds, or double glazing, in all living spaces and bedrooms which reduces heat loss and improves the thermal efficiency of your home.

These meet the HomeFit Standard, but if you're considering upgrading, make sure you choose curtains or blinds that are double-layered and close-fitting to the window with no gaps around them that allow heat to escape.

It's a good idea to open curtains and blinds during the day, even if you're not using the room, and close them just before it gets dark. This allows your home to gain heat from the sun during the day, and better retain it overnight. In summer, closing curtains and blinds on the side facing the sun and opening windows will help keep your home cool.

If you're planning major refurbishment, we recommend replacing window units with double glazing (IGUs) or retrofitting double glazed panes of glass. For more information on choosing double glazing refer to the Gen Less website [here](#).

#### *Windows in living spaces and bedrooms are very well protected from heat loss*

You have good curtains or blinds and double glazing in all living spaces and bedrooms. These measures are very effective at reducing heat loss and improves the thermal efficiency of your home and meets the HomeFit PLUS Standard. It's a good idea to open curtains and blinds during the day, even if you're not using the room, and close them just before it gets dark. This allows your home to gain heat from the sun during the day, and better retain it overnight. In summer, closing curtains and blinds on the side facing the sun and opening windows will help keep your home cool.

#### *Windows in living spaces and bedrooms need better protection from heat loss*

You'll need to install good curtains or blinds, or double glazing in all living spaces and bedrooms to meet the HomeFit standard. Without these measures your home is leaking significant amounts of heat through the windows making it harder to keep warm. In a typical, otherwise reasonably well-insulated home, heat loss from windows can account for 40% or more of the total heat lost.

To meet the HomeFit standard, the curtains you choose must be either floor length (touching the floor), have pelmets above them, or have close-fitting tracks with only a minimal air gap between the top of the curtain and the wall. Sill length curtains are not as effective. They also need to be double layered and either fitted tightly against the wall or window frame or be wider than the window frame.

If you prefer blinds, they must have a snug fit with the window frame that creates a good seal to trap the air in the gap between them and the window. If there are any gaps around the blinds, they will not be very effective. Pleated blinds (sometimes described as 'honeycomb' or 'cellular' blinds) can be even more effective, but only if they can be installed without any gaps around them. Roller blinds and wooden or venetian blinds are unlikely to meet the HomeFit standard.

It's a good idea to open curtains and blinds during the day, even if you're not using the room, and close them just before it gets dark. This allows your home to gain heat from the sun during the day, and better retain it overnight. In summer, close curtains and blinds on the side facing the sun and open windows to help keep your home cool.

If you're considering a major refurbishment, consider replacing window units with double glazing (IGUs), or retrofitting double glazed panes of glass. For more information on choosing double glazing refer to the [Gen Less window insulation](#) page.

## What to submit for the rating?

All dwellings
Photographs of examples of compliant curtains/blinds and ALL cases of non-compliant curtains or blinds as well as examples of double and secondary glazing with comments on how well they meet the criteria.

## References

- 1) BRANZ 2015 House Condition Survey: Comparison of House Condition by Tenure. Vicki White, Mark Jones, Vicki Cowan, Saera Chun <https://www.branz.co.nz/pubs/research-reports/sr370/>
- 2) Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses. Vicki White and Mark Jones, <https://www.branz.co.nz/pubs/research-reports/sr372/>
- 3) This has since been updated with the findings of the 2018-19 Pilot Housing Survey, which included a truncated questionnaire based on the 2105 HCS. Initial findings can be found here <https://www.branz.co.nz/pubs/research-reports/sr456-assessing-condition-new-zealand-housing-survey-methods-and-findings/>

## Energy-efficient fixed lighting - optional

### Summary

Energy-efficient lighting is an optional measure that can count towards the achievement of HomeFit and HomeFit PLUS.

### Why this is important

Efficient, long-lasting lights not only provide an appropriate level of lighting for your home, they also save money on both power bills and replacement costs. On top of this, efficient lighting reduces demand on the electricity grid during evening peak-periods where the mostly renewable grid is supplemented by non-renewable forms of electricity generation. While incandescent light bulbs are still available for purchase in New Zealand, a typical 60W incandescent produces more heat than light and can be replaced by an affordably priced 9W LED that lasts significantly longer.

### Detail of what is required

At least 80% by count of lamps in fixed light fittings must be energy efficient. Energy efficient is defined as having a lamp efficacy of more than 35 lumens per watt. "Fixed" means permanently wired. Any lighting plugged into a standard wall socket is excluded.

Fluorescent T5/T8 batons, any compact fluorescent (CFL) or light emitting diodes (LED) comply with this criterion by default. These could be both retrofit LED/CFL light bulbs fitting into standard screw / bayonet fittings as well as recessed downlights, fluorescent batons or other dedicated fittings.

Note that specific requirements regarding non-IC or CA90, CA135 or CA195 downlights are outlined in the Insulation and Draught-free building fabric criteria.

### HomeFit PLUS – optional Measure: LED Lighting

The installation of LED lighting contributes to the achievement of HomeFit PLUS. To meet the criteria at least 80% by count of lamps (bulbs as opposed to light fittings) in fixed light fittings must be LED.

### How to assess

Assessment should be via a walk-through visual audit of interior lighting. Where the assessor is unsure of the bulb type, ask the tenant/homeowner, check available packaging or test the light bulb by turning it on and seeing if it is hot. An LED or CFL bulb should be cool to touch but be careful not to touch halogen bulbs as they can be very delicate. The assessor should not attempt to physically remove the light bulb to inspect it but may ask the homeowner to.

### Advisory report text

#### *General advice*

Most recessed downlights installed before mid-2012 allow draughts through the hole in the ceiling and require safety gaps in the ceiling insulation, reducing its ability to hold in the heat. Their incandescent or halogen bulbs are inefficient and result in high running costs. We recommend

replacing these lights with LED equivalents. Choose lights with surface mounted or suspended fittings, or an IC-rating that means it is safe to install a continuous layer of insulation over the top. Make sure any holes in the ceiling that result are sealed or plastered. For more information on energy efficient lighting see [here](#).

### ***At least 80% of lights in your home are LEDs or CFLs***

Great, these are efficient light choices and meet the HomeFit standard. If you are upgrading remaining inefficient bulbs or replacing blown bulbs, choose LEDs. Existing CFLs meet the HomeFit standard but LEDs are more efficient, long lasting, and cost effective. If any of your lights are recessed into your ceiling, ensure they are enclosed and able to be covered or closely fitted with insulation (IC or CA rated downlights). If they are not IC or CA rated, they will not meet the insulation criteria of HomeFit.

### ***At least 80% of lights in your home are LEDs***

Great, these are efficient light choices and meet the HomeFit PLUS standard. LEDs are efficient, long lasting, and cost-effective. If any of your lights are recessed into your ceiling, ensure they are enclosed and able to be covered or closely fitted with insulation (IC or CA rated downlights). If they are not IC or CA rated, they will not meet the insulation criteria of HomeFit.

### ***Some lights are not LEDs or CFLs***

You need to improve the energy efficiency of the lights in your home. It's easy to swap the poor performers for LEDs. Existing CFLs meet the HomeFit standard but LEDs are more efficient, long lasting, and cost effective. LEDs come with a range of colour temperatures which allows you to recreate the familiar effect of incandescent lighting without the energy waste or cost. Every supermarket and hardware store will generally stock LED bulbs at a reasonable price. If any of your lights are recessed into your ceiling, ensure they are enclosed and able to be covered or closely fitted with insulation (IC or CA rated downlights). If they are not IC or CA rated, they will not meet the insulation criteria of HomeFit.

## **What to submit for the rating?**

All dwellings
Photographs of types of compliant and non-compliant lighting. Record of the total number of lamps and the number of non-compliant lamps.

## **References**

- 1) <https://genless.govt.nz/individuals/lower-energy-homes/appliances/led-lighting/>

## Draught-free building fabric

### Summary

A HomeFit home must have no obvious air leaks. This includes gaps, holes or other obvious air leakage paths from inside to outside through (or around) windows, doors, walls, ceilings or other key pathways.

### Why this is important

Keeping the heat in is a key element for good home performance and the overall comfort and health of a dwelling. When you turn on your heaters, you want to warm up your home, not your neighbourhood. A significant, and often invisible, source of heat loss are the small gaps and connections between the inside of your home and the outside.

In an uninsulated home, heat loss from draughts is estimated to be less than 10%. As the thermal envelope of a home improves (e.g. insulation, glazing, curtains), the significance of heat loss via draughts increases. In a well-insulated home heat loss from draughts can be as high as half. As a HomeFit home is required to have ceiling and underfloor insulation it is important that major sources of air leakage are also managed to minimise heat loss and not undermine the investment made in insulation. Major sources of draughts in these homes are poorly fitting doors and windows and open fires.

Luckily, there are many simple DIY solutions to plug draughts to keep you warm and save money. See [draught stopping](#) for some of these tips.

For HomeFit and the Healthy Homes Standards, unreasonable gaps or holes cannot be temporarily remedied by relying on tenants to install temporary draught stopping products. Landlords must address the draught by fixing something to the home or remedying the gap long-term. For example, where an external door allows an unreasonable draught into the home, a landlord should install or fix a draught excluder to the door instead of using temporary measures such as draught snakes/sausages.

### Detail of what is required

A HomeFit home has the following key elements that mean the building fabric is draught free:

- All external doors, windows and ceiling access hatches in each room must be intact (i.e. not broken, no holes) and can be closed effectively (well fitting). Cracked glazing that does not have an opening to outside is acceptable.
- When doors and windows are fully closed, all gaps wider than 3mm will have an effective draught stopping solution in place (brush, foam or rubber strips, v-seal).
- The interior linings of all external walls, floors and ceilings must be intact (no holes - watch out for old, unused extractor fans that have been replaced but not blocked up). Strip wooden flooring is often a source of uncontrolled draughts; there should be no gaps wider than 3mm.
- As per the heating criteria, open fires must be unused and adequately blocked up to prevent draughts (a chimney on an open fireplace is a major source of heat loss). This means the fireplace is effectively boarded up, or the chimney is blocked (taking care that future occupants understand the fireplace is unusable).
- Cat flaps and pet doors should either be locked shut or boarded up (if not in use) or intact with brush strips so there are no gaps wider than 3mm around the door. The flap should stay shut and not open in the wind.

- Single-glazed louvre windows (often found in laundry and toilets) are a major source of draughts and should have a draught solution applied, such as secondary glazing.
- Ceiling downlights must be IC or CA80, CA90 or CA135 rated and abutted or covered with insulation as per NZS 4246:2016, or not be part of the thermal envelope (e.g. downlights on mid-floor between storeys of a home). Note these criteria are included in the insulation section.

Mechanical extractor fans, essential for moisture removal in kitchen and bathrooms, are not included in this section.

## How to assess

**Building fabric:** visual inspection of internal ceilings, walls (internal walls between rooms are not an issue; focus on the inside of external walls), floors, windows and doors to confirm no holes, cracks, missing panes, etc.

**External doors:** inspect all external doors and confirm they are intact and well-fitted when closed. If the gap in a closed door is more than 3mm, confirm an effective draught stopping solution is in place.

**Windows:** visual inspection of all windows (when closed). If gaps are present, inspect to see if a suitable draught stopping method is in place. This could be done when checking that windows can be opened for the ventilation requirement. Where louvre windows are present, these should have an effective draught stopping solution in place. If the gap in a closed window is more than 3mm wide, confirm an effective draught stopping solution is in place. Alternatively, feel if there is a noticeable draught (if a windy day) or if there is daylight showing through.

**Open fires:** inspect open fireplaces and connected chimneys to confirm they are adequately closed off to prevent draughts.

**Ceiling downlights:** could be checked when inspecting ceiling insulation. Old downlights that are not marked as IC or CA80, CA195 or CA135 rated fail the HomeFit draught criterion but do meet the Healthy Homes Standards.

## Advisory report text

### *Home is free of sources of draughts*

Your home is free of large gaps in windows, doors, walls and the building envelope which meets the HomeFit and the Healthy Homes Standards.

### *Home has gaps that are causing draughts*

Your assessor has identified holes in the building fabric that need to be blocked to improve the comfort of your home and reduce your power bills by preventing warm air from escaping.

Start by tightening any loose hinges and catches or latches. Windows and doors that don't fit in their frames snugly need to be repaired by a qualified builder. Check your hardware store for the right types of weather stripping to seal gaps around doors and windows. Door or window trims can be sealed using a clear or paintable sealant and draught excluders can be used for gaps under doors (use brush strip types for internal doors, and spring-loaded automatic seals for external doors). It's a good idea to replace damaged rubber seals around aluminium joinery.

Extractor fans that aren't in use, open fireplaces, older recessed downlights, unintended gaps around electrical or plumbing fittings, and draughty cat flaps should all be sealed up. Sources of draughts will need to be permanently fixed to meet the HomeFit and Healthy Homes standards – a draught sausage won't be enough!

## What to submit for the rating?

All dwellings
<p><b>PASS:</b></p> <p>Confirm each of these features of the home meet the draught proof standard outlined in 'how to assess':</p> <ul style="list-style-type: none"> <li>• External doors</li> <li>• All windows, including louvred windows</li> <li>• Open fireplace</li> <li>• Exposed wooden floorboards</li> <li>• Any downlights</li> <li>• Any pet doors</li> </ul> <p><b>FAIL (submit photo as evidence for ALL of these points where true):</b></p> <ul style="list-style-type: none"> <li>• Building fabric has holes</li> <li>• External doors – there is a gap of 3mm or more with no effective draught stopping solution in place.</li> <li>• Windows (all) – there is a gap of 3mm or more with no effective draught stopping solution in place.</li> <li>• Louvered windows with no effective draught stopping solution in place.</li> <li>• Open fire is not adequately draught proofed (fireplace blocked off or chimney blocked)</li> <li>• Wooden floorboards – there are gaps in exposed floorboards of 3mm or more</li> <li>• Downlights – any downlights inside the thermal envelope that are not closed (CA) or integrated (IC)</li> <li>• Pet-door – broken, loose (swinging in wind) or with gaps of 3mm or more</li> </ul>

## References

- 1) EECA draught stopping <https://genless.govt.nz/individuals/lower-energy-homes/home-ventilation/draughts>
- 2) Tenancy services guidance on draught stopping to meet the Healthy Homes Standards <https://www.tenancy.govt.nz/assets/Uploads/files/healthy-homes-standards-draught-stopping.pdf>

## Moisture from drying clothes - optional

### Summary

Minimising the risk of moisture from the drying of clothes is an optional measure that counts towards the achievement of HomeFit and HomeFit PLUS.

### Why this is important

Clothes drying is a major source of moisture in New Zealand homes leading to damp and potentially mould. Vented clothes dryers can release as much as 5 litres of moisture per load so it's important this moisture is vented outside.

### Detail of what is required

Clothes dryers must generally be vented outside. Exceptions include condensing and heat pump dryers that drain moisture either into a water tank or to an outside drain. Combination washer-dryers are generally condensing.

If the home does not have a clothes dryer, then it must either have a permanent external covered washing line or ducting in place for the future installation of a clothes dryer (say by a prospective purchaser or tenant).

### How to assess

The presence of any clothes dryers should be determined on site. Condensing or heat pump dryers have either a removable water tank or connect to a drain. These are acceptable.

If no water tank or drain connection is provided, then the dryer is likely to be a conventional vented dryer. Check for the presence of ducting and confirm that it is routed to outside with a permanent grille on an external wall.

If the home has no clothes dryer, confirm that the home has ducting installed for a future installation or, alternatively, a permanent external covered washing line to discourage the drying of clothes indoors. This could be, for example, a covered balcony (provided no covenants in place disallow clothes drying), covered deck or car port. Conservatories are also acceptable if they can be ventilated (openable windows) and are closed off from the rest of the home.

### Advisory report text

#### ***Home has a permanent means of drying clothes***

Having a system in place for drying clothes without introducing moisture into the home contributes to your HomeFit or HomeFit PLUS rating. Make sure you use your outdoor line or clothes drier, and not indoor racks as this can contribute to the formation of mould.

#### ***Home has no permanent means of drying clothes***

It's really important to be able to dry clothes without introducing moisture into the home. To gain points towards the HomeFit or HomeFit PLUS standard, you'll need a clothes dryer that vents

outside, ducting to the outside for a future clothes dryer or covered outdoor washing line. Without one of these options, occupants are likely to dry clothes inside on racks. Indoor clothes drying is a major source of moisture in New Zealand homes and can contribute to the formation of mould.

### What to submit for the rating?

All dwellings
Photographs of any clothes dryers present in the home and if neither non-condensing nor heat pump dryers, photographs of any ducting to outside. Photographs of permanent external covered areas with a washing line.

## Smoke alarms

### Summary

A HomeFit home must be fitted with appropriately installed and working smoke alarms.

### Why this is important

According to the New Zealand Fire Service there were over 42,000 residential house fires causing nearly 200 fatalities in New Zealand between 2005 and 2015. In most cases the fatalities were in houses with no working smoke alarms. These simple devices are very effective at detecting fires early and allowing occupants to evacuate. Moreover, any new house or one undergoing major renovation requiring consent will need smoke alarms as part of its building consent.

The Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016 (RTA) require smoke alarms in homes that are rented. The HomeFit requirements for smoke alarms are identical to the RTA amendment requirements.

### Detail of what is required

#### *Where smoke alarms are needed*

There must be at least one working smoke alarm within 3 metres of each bedroom door or, alternatively, one working smoke alarm installed in every room where a person sleeps.

In addition:

- a) There must be at least one smoke alarm on each level within the household unit.
- b) Smoke alarms must be audible to sleeping occupants through closed doors.
- c) Sleepouts are a part of the household unit and therefore must include smoke alarm(s).
- d) Smoke alarms should be installed on or near the ceiling in accordance with NZS4514 and the manufacturer's instructions. Further guidance on the location of smoke alarms according to NZS4514 can be found on the [Tenancy Services smoke alarms](#) page.

### How to assess

The presence of compliant smoke alarms should be evidenced during the site inspection. A visual inspection should be made to check that they are located as required above and by the RTA Amendment.

All smoke alarms should be tested to ensure that they are fully working.

### Advisory report text

#### *Home has smoke alarms that are compliant with RTA and HomeFit*

Your home has smoke alarms that meet the requirements for HomeFit and the Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016 (RTA).

If you are installing new smoke alarms or if you are replacing an existing smoke alarm, you must install photoelectric smoke alarms that are hard wired or have long life batteries with a life span of at least 8 years.

***Home does not have adequate smoke alarms that comply with RTA or HomeFit***

Your home needs to have smoke alarms installed EITHER within 3m of each bedroom OR in each room used for sleeping AND on each level of any multi-storey home to meet the standard for HomeFit and the Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016 (RTA). Guidance can be found on the [Tenancy Services smoke alarms](#) page.

If you are installing new smoke alarms or if you are replacing an existing smoke alarm, you must install photoelectric smoke alarms that are hard wired or have long life batteries with a life span of at least 8 years.

Smoke alarms must comply with one of the following manufacturing standards: Australian Standard AS3786:1993; or equivalent international standard: UL217 (USA), ULCS531 (Canada), BS5446: Part 1 (United Kingdom), BS EN 14604 (United Kingdom) or ISO12239 (International); compliance should be prominently displayed on the packaging and on the alarm.

**What to submit for the rating?**

<b>All dwellings</b>
Photographs of compliant and non-compliant smoke alarm(s). Tick both boxes to indicate there are smoke alarms and that you have tested them.

**References**

- 1) Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016  
<https://www.legislation.govt.nz/regulation/public/2016/0128/16.0/DLM6856201.html>
- 2) Tenancy services guidance on smoke alarms to meet the Healthy Homes Standards  
<https://www.tenancy.govt.nz/assets/Uploads/Tenancy/smoke-alarm-requirements.pdf>

## Hot water safety – optional

### Summary

Minimising the risk of scalding from taps in bathrooms and/or kitchens is an optional measure that counts towards the achievement of HomeFit PLUS. Legionella risk is also assessed and flagged in the advisory report.

### Why this is important

Hot water coming out of the taps in kitchens and bathrooms must not be hot enough to scald skin. The recommended maximum tap temperature is 55°C, or 45°C where households include elderly (slower reaction time and thinner skin) or very young (sensitive skin) people. At the same time, hot water systems must heat water to high enough temperatures to avoid Legionella bacteria, which can lead to serious and notifiable illness. The bacteria can't survive when the water temperature exceeds 60°C, so thermostats on cylinders which store hot water should be set at not less than 60°C. If you have a solar hot water system or otherwise control/time your hot water heating, cylinders storing the water should have a controller to ensure the water regularly reaches 60°C. To balance water heating to exclude Legionella bacteria but deliver water safely at the tap, mixing devices (such as tempering valves) are often used to introduce cold water into the system between the water heater outlet and the tap. In short, water should be stored at a temperature of 60°C in the cylinder to avoid Legionella but delivered at 55°C or less at the taps to avoid scalding.

### Detail of what is required

The hot water temperature at the nearest tap to all sources of hot water (typically bathroom and kitchen) should not exceed 57°C. Where hot water from cylinders is recorded below 45°C this will not be recorded as a fail, but applicants will be informed that the hot water system may be at risk of Legionella.

### How to assess

You will need a hand-held thermometer (ideally with a digital read-out).

Visually inspect each hot water system and confirm there are no visible leaks. Measure the temperature of hot water in bathrooms and kitchens to check if temperatures exceed 55°C. Tap water temperature that is too low should also be investigated to address Legionella risk. Check that any stored water is at a temperature of 60°C in the cylinder to avoid Legionella but delivered at 55°C or less at the taps to avoid scalding.

Assessment procedure:

- Ask householder how many hot water systems they have (look for more than one)
- Visually inspect each hot water systems for leaks.
- Choose the hot tap in the kitchen and bathroom (don't use the shower) as both are important for scalding risk. (Note: Checking taps in both areas reduces risk of assessor missing a second hot water system but be vigilant).
- Run hot tap until temperature stabilises (usually at least 30 seconds), hold thermometer under running tap until temperature steady, and note temperature. If using an infrared thermometer, water should be run into a cup for enough time to stabilise hot water temperature before recording.

**Awarding pass/fail:**

- PASS if temperature at the taps does not exceed 55°C
- FAIL if the temperature is greater than 57°C. Tap water 60°C or higher is considered too hot and is not acceptable. A thermometer reading of 58°C/59°C is within a margin of error which means it could be 60°C and be too hot, therefore 58°C or 59°C should be regarded as a FAIL.

## Advisory report text

### *Hot water temperature at the tap is safe*

The temperature of your hot water has been measured at less than 55°C which meets the HomeFit and HomeFit PLUS optional standards for safe hot water as it reduces the scalding risk.

### *Hot water temperature at the tap is too high and is unsafe*

The temperature of your hot water at the tap is a scalding risk as it is more than 55°C.

If your home uses a hot water cylinder, there are several reasons why your tap water may be too hot:

- The hot water cylinder thermostat is set too high and should be adjusted to 60°C. This is the minimum temperature which avoids Legionella bacteria but does not deliver scalding hot water to your taps. Having your thermostat set too high can shorten your cylinder life, risk scalding tap users, and waste energy by losing heat from water sitting in the cylinder (standing losses). We recommend you ask a plumber or electrician to adjust your thermostat.
- The hot water cylinder thermostat is broken (thermostat is set to 60°C but the water is a higher temperature in the cylinder). This should be fixed immediately. High temperatures shorten cylinder life, risk scalding and can waste energy. You should urgently ask an electrician or plumber to help you solve this.
- You either don't have a tempering valve, it's failed, or someone has adjusted it. This valve delivers cooler water at the tap than is heated in the cylinder. A plumber or electrician can assess the problem and fix this.

If your water is heated by instantaneous gas or instantaneous electric you should be able to manually set the system to deliver hot water below 55°C.

## What to submit for the rating?

All dwellings
<p>Take a photograph of the measured taps and the temperature measuring device recorded temperature.</p> <p>PASS – record the temperature measured for each tap in comments. If the home achieves a HomeFit pass for this section but the temperature is less than or equal to 45°C, add commentary (e.g. 'cylinder recently emptied', or 'tempering valve working, and cylinder temperature confirmed at 60°C')</p> <p>FAIL – record the temperature measured for each tap (add commentary if cold temperatures cannot be explained by high use prior to assessment or specifically adjusted tempering valve)</p>

## Additional advice

Related standards are covered in the Building Code clause G12 (water supplies), specifically G12.3.6 which states “water must be delivered at a temperature that avoids the likelihood of scalding”. It covers bathrooms (personal washing, showering or bathing) and kitchens (utensil washing).

Assessors should note the following quirks in hot water systems:

- Hot water systems installed before the 1993 revisions to the Building Code often don't have a tempering valve and old tempering valves may have failed. Solar systems and wetbacks can present risks for extremely high temperatures in cylinders and care is required when assessing older systems.
- Upgrades of older systems (e.g. through renovations) mean they should have tempering valve and thermostat set at 55-60°C.
- Hot water cylinders installed since 1993 should all have a tempering valve as part of the system and should have tap temperature at 55°C or below.
- Thermostats and thermostat settings are not adequate indicators of hot water cylinder minimum and maximum temperatures – many do not function accurately.

If you have the competency to assess Legionella risk, then we suggest the following:

- Carry out additional assessment if the hot water is sourced from a cylinder and the temperature at the hot tap is consistently below 45°C, as this may indicate Legionella risk if the cylinder is failing to heat the water sufficiently (or the thermostat is set too low). There are valid reasons that the tap temperature could be below 45°C:
  - The tempering valve may be set to deliver water at lower temperatures; in this situation, an infrared thermometer could be used to gauge the temperature by measuring the hot water exit pipe temperature, at the top of the cylinder, after running the water. This can help to assess whether the cylinder is reaching the required 60°C temperature.
  - If you are assessing a house soon after the household has emptied the cylinder (showers, dishes etc.), then the cylinder may not be back to its thermostatically controlled temperature. Ask the homeowner about any hot water usage in the hours prior to assessment and recheck temperature at the top of the cylinder at the end of the assessment (once enough time to reheat cylinder has passed).

## Water efficiency – optional

### Detail of what is required

Dual-flush toilets are an optional requirement for the achievement of both HomeFit and HomeFit PLUS. Rainwater harvesting is an optional requirement for the achievement of HomeFit PLUS. The following are required to demonstrate compliance.

#### *Dual flush toilets*

All toilets in a home (including ensuite bathrooms) must be dual flush. Dual flush means that the toilet has two buttons or handles offering higher and lower flush volumes. HomeFit uses the presence of a dual flush as an indication of low flush volume since dual flush toilets are easy to assess (actual flush volume is hard to assess) and dual flush toilets tend to be more modern and higher performing.

#### *Rainwater harvesting*

Rainwater tanks must be of 1000 litre capacity or more and must be available for either garden watering or connected to at least one toilet/hot water cylinder/washing machine.

### Why this is important

Dual flush toilets and rainwater harvesting are recognised in HomeFit PLUS as cost-effective means of reducing mains water usage and gaining resilience in times of drought or civil defence emergency. Dual flush toilets that meet WELS 4 Star (4.5 litres full flush/3 litres half flush) are no more expensive than toilets with higher flush rates. Rainwater tanks of 1000L or higher capacity can be paid back within 10-15 years (in areas with water rates). For those who pay for their water in general rates, the benefit in terms of reduction in Council water supply costs is similar. [See BRANZ study SR391 \*The Cost of Homestar\*](#).

### How to assess

The presence of compliant dual flush toilets should be evidenced during the site inspection. Similarly, for rainwater systems, check that the tank has a tap for garden use or that plumbing allows for connection to at least one toilet/hot water cylinder.

### Advisory report text

#### *All the toilets in your home are dual flush*

Your home has dual flush toilets, which are recognised in HomeFit and HomeFit PLUS as a cost-effective means of reducing mains water usage.

#### *Home has a rainwater tank that meets the HomeFit PLUS optional standard*

Rainwater harvesting is recognised in HomeFit PLUS as cost-effective means of reducing mains water usage and gaining resilience in times of drought or civil defence emergency.

***One or more toilets in your home is not dual flush***

Installing dual flush toilets improves the water efficiency of your home. Dual flush toilets are recognised in HomeFit and HomeFit PLUS as a cost-effective means of reducing mains water usage. Dual flush toilets that meet WELS 4 Star (4.5 litres full flush/3 litres half flush) are no more expensive than toilets with higher flush rates.

***No rainwater tank or rainwater tank does not meet the HomeFit PLUS optional standard***

Rainwater harvesting is recognised in HomeFit PLUS as a cost-effective means of reducing mains water usage and gaining resilience in times of drought or civil defence emergency. Rainwater tanks of 1000 litres or higher capacity can be paid back within 10-15 years (in areas with water rates). For those who pay for their water in general rates, the benefit in terms of reduction in Council water supply costs is similar.

**What to submit for the rating?**

<b>All dwellings</b>
Photographs of all toilets clearly showing the dual flush mechanism
Photographs of rainwater system

**References**

- 1) Smarter Homes on water use: <https://www.smarterhomes.org.nz/smart-guides/water-and-waste/efficient-use-of-water/>