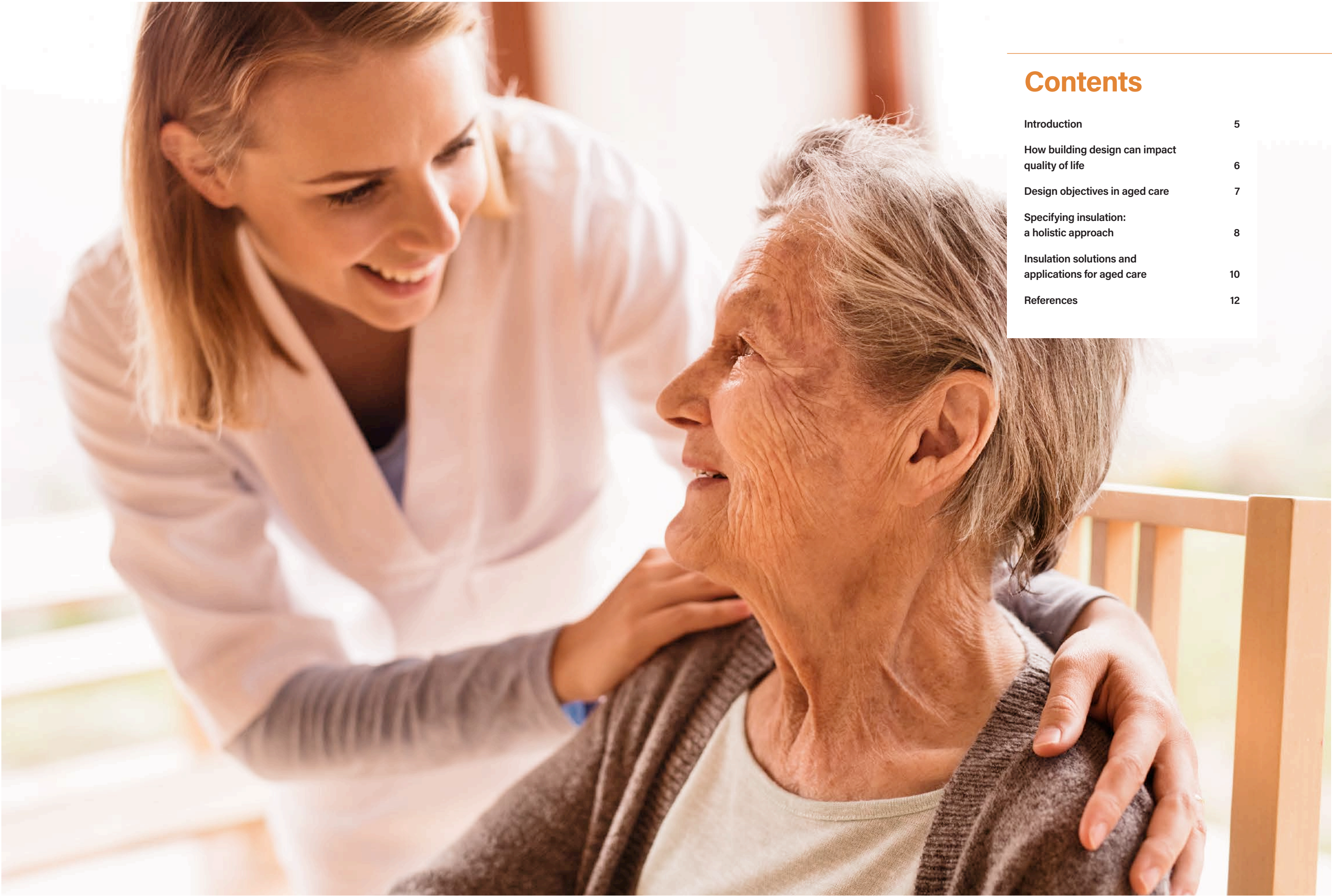




Insulation solutions for aged care

A holistic approach to designing and specifying healthy, human-centred buildings for people in care, sustainably

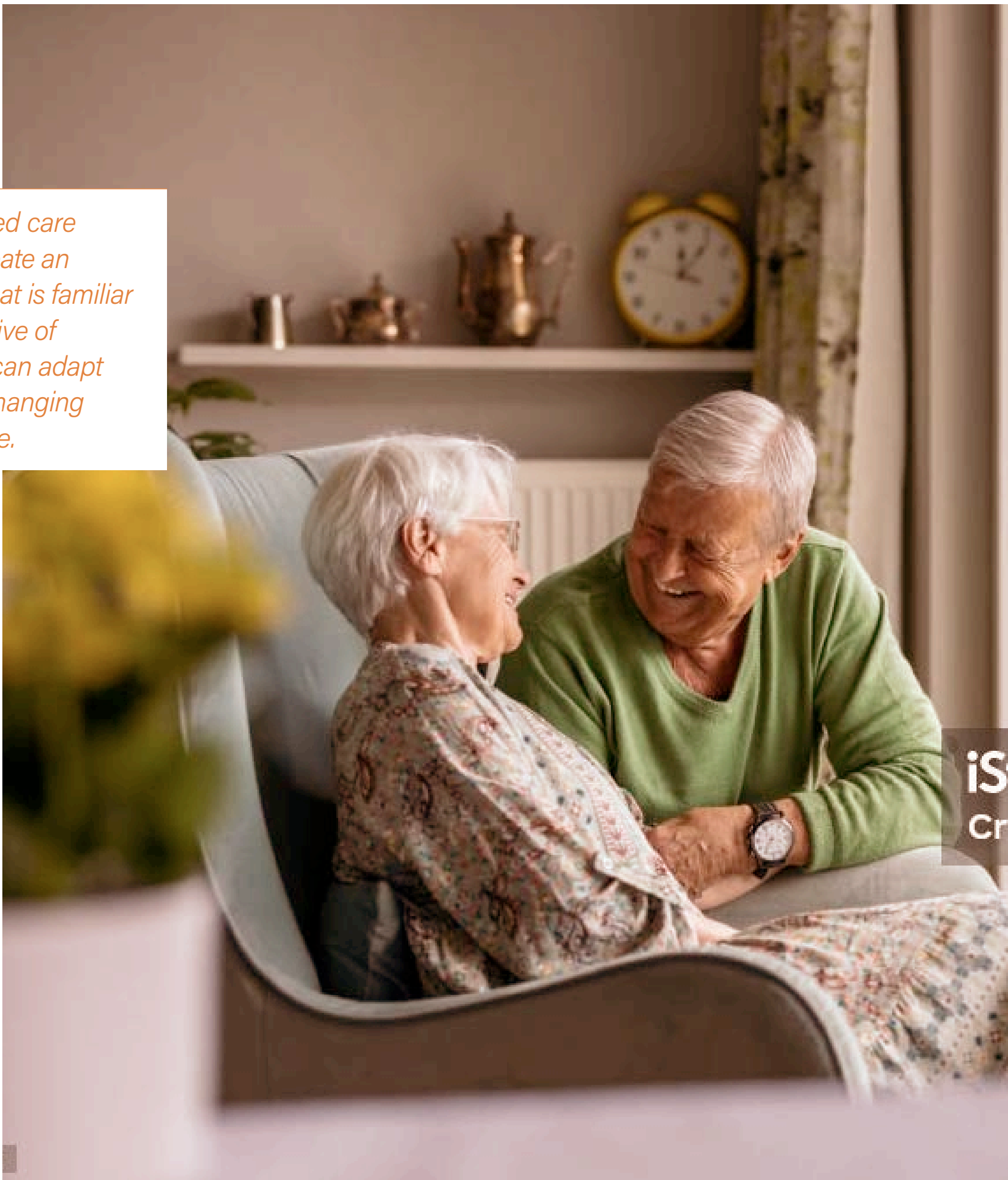


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Introduction

Due to rising life expectancy and declining fertility rates, Australia's population is rapidly ageing. Both the population's average age and the proportion of older people within the broader population are rising.¹ At 30 June 2020, there were an estimated 4.2 million older Australians (aged 65 and over), making up 16% of the country's total population.² It is projected that between 21% and 23% of the population will be over the age of 65 by 2066.

As we get older, our health needs become more complex. The modern aged care facility is designed to meet these needs, with the aim of preserving residents' wellbeing, quality of life, and overall dignity while assisting caregivers in delivering high-quality care in a safe and effective manner.

It is well established that the built environment has a significant impact on the health and wellbeing of occupants. Insulation, in particular, plays a critical role in creating aged care environments that are healthy and sustainable. Insulation is crucial for thermal comfort, which is an important design consideration as older people often have trouble adjusting to temperature extremes. Additionally, insulation within walls and ceilings can offer excellent noise control and create peaceful living spaces.

There is an operational element as well. Many residential aged care facilities struggle to control their maintenance and operating costs as well as their environmental emissions. Inadequate funding for aged care has been a problem for a decade, and the pandemic's effects have added to cost pressures.³ Long-lasting, sustainable insulation solutions help contain energy demand and reduce operational costs through passive cooling and warming.

In this whitepaper, we investigate a holistic approach to designing aged care facilities to create sustainable, healthy, and comfortable environments for all older Australians in care. In particular, we discuss the role of insulation in raising the quality of aged care buildings.



How building design can impact quality of life

The Royal Commission into Aged Care Quality and Safety noted that 'high quality' aged care services always put older people first.⁴ This ethos applies to building design and the quality of the indoor environment.

Indoor environmental quality (IEQ) directly impacts the health and experience of older people living in care facilities.⁵ Older people living in residential and nursing care homes spend a large proportion of their time within the boundaries of the home and may depend on the environment to compensate for their physical or cognitive frailties. The indoor air quality, temperature, lighting, visual comfort, and acoustic comfort are the main IEQ factors that affect their experience.⁶

Some studies highlight the specific challenges encountered by older residents, such as those with dementia, in spaces with poor IEQ. For instance, a study conducted in the

United Kingdom found that the biological effects of aging on thermogenesis and a decline in thermosensitivity 'blunt' an older person's perception of the temperature of their surroundings.⁷

Dementia patients are more sensitive to temperature changes, according to the UK study, making them more susceptible to extreme cold and heat. Their predicament is made more challenging by the fact that they frequently struggle to express their needs to care facility staff.

According to research conducted by Audiology Australia, dementia patients are also sensitive to their environment's sound, and either too much or too little noise can make them confused, agitated, and aggressive.⁸ Many residents may also be unable to change their thermal or acoustic environment due to a lack of mobility.⁹

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A holistic approach to building insulation encompasses all relevant IEQ factors as well as the need to comply with the relevant standards and building codes, reduce operating costs and enhance sustainability outcomes.

Design objectives in aged care

According to the final report on the development of the draft National Aged Care Design Principles and Guidelines, the goal of aged care design is to create an environment that is familiar to and supportive of residents and can adapt to meet their changing needs over time.¹⁰ The draft Guidelines recognise the importance of acoustic comfort, clean air and comfortable temperatures in creating a space that supports the physical, cognitive and psychological wellbeing of residents.

Keeping these objectives in mind will help building projects meet the health and safety needs of ageing Australians. A holistic approach to building insulation encompasses all relevant IEQ factors as well as the need to comply with the relevant standards and building codes (particularly in relation to fire safety), reduce operating costs and enhance sustainability outcomes.



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Specifying insulation: a holistic approach

A supportive acoustic environment

Age causes a decline in hearing ability. Particularly impacted is speech comprehension, which has an effect on the capacity for interpersonal communication. The acoustic environment can have a positive or negative impact on a person's mood if they have dementia or other impairment. The psychological benefits of a positive acoustic environment may result in residents feeling less isolated and less anxious.¹¹

In addition, the physical health impacts of noise for aged care residents should not be overlooked. Excessive noise can be harmful to health, interrupt sleep and prevent elderly patients in nursing homes from regaining their hearing.¹²

Residents in aged care homes have better hearing environments when outside noise and interior reverberations are minimised. To create more comfortable surroundings, sound insulation should be incorporated both within and between rooms, as well as in walls, roofs, ceilings, and services. Insulation products have sound absorption properties, which can aid in minimising sound echoing back into the room or traveling through a wall, ceiling or floor into an adjacent space.



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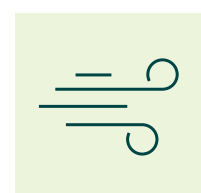
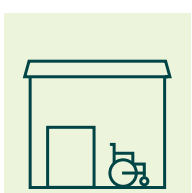
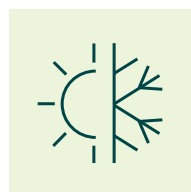
Controlling indoor thermal comfort, air quality and building condensation

Age makes people more susceptible to temperature extremes. Due to chronic illnesses and the side effects of medication, their bodies are typically less effective at adjusting to temperature changes. Spending too much time in an environment that is not thermally comfortable or with poor indoor air quality can lead to a decline in physical and mental health.

Insulation is an effective way to provide a comfortable and thermally efficient indoor environment for aged care residents. Additionally, it reduces energy costs and prevents excessive emissions brought on by ineffective heating and cooling systems.

With appropriate insulation installed in all parts of the thermal envelope (walls, ceiling and floor), you can maintain the desired indoor temperature throughout the year. As a result of better heat retention, an insulated building can keep indoor spaces comfortable in winter. During warmer months, an insulated building ensures interiors remain cool by protecting against the summertime heat. Insulation should be used in conjunction with other design elements like ventilation, high-performance glazing, and passive heating and cooling measures to ensure ideal thermal conditions at all times.

This also reduces the likelihood of moisture and humidity buildup, which could contribute to mould growth. Note that seniors are at high risk of health problems from mould exposure due to declining lung function.



To create a healthy indoor environment, it is crucial to select environmentally friendly, bio-soluble insulation materials.

Protecting people and buildings from fire

Passive systems help keep fires contained to the room where they first start, giving firefighters time to arrive on the scene and building occupants time to evacuate. Fire containment is especially important in aged care facilities because residents are more likely to have limited mobility and physical and mental impairment.

An essential component of any building's fire safety control is the installation of insulation in exterior and interior walls, floors, ceilings, roofs, and around HVAC systems. The movement of smoke and fire from one area to another is impeded by non-combustible or/and fire resistant insulation, which also helps to ensure the building maintains its structural integrity.

It is mandatory to comply with the National Construction Code, but facility owners also need to consider standards and minimum requirement imposed by insurers. Higher insurance costs may result from choosing insulation that does not meet these requirements.

Embedding sustainability in aged care

Heating and cooling account for 30% of the total energy consumption and 44% of the electricity use in aged care facilities.¹³ Insulation material in the building envelope can reduce energy consumption for heating or cooling by raising the thermal resistance of the building envelope. This can assist in fulfilling the energy use requirements in Section J of the NCC.

To create a healthy indoor environment, it is crucial to select environmentally friendly, bio-soluble insulation materials. Look for insulation that has no Ozone Depletion Potential (ODP), which is a term used to describe products that do not contain any elements that cause stratospheric ozone depletion.

Make sure to only buy products that do not contain volatile organic compounds to support healthy indoor air quality. Several products have these features and also use recycled materials to enhance their sustainability credentials.

Insulation solutions and applications for aged care

With a focus on people, Fletcher Insulation has designed a range of insulation solutions for the aged care sector to support the health and wellbeing of residents, reduce energy costs and deliver sustainable buildings that will stand the test of time.

To develop the best insulation solutions, Fletcher Insulation takes a holistic approach. They consider a broad range of performance parameters including energy efficiency, thermal comfort, acoustic comfort, fire resistance, indoor air quality, condensation management, thermal bridging, air tightness, and durability.

Below we consider various applications in aged care facilities for insulation products from Fletcher Insulation's comprehensive range.

Roofing

Effective roof insulation will help reduce noise disturbance and provide a protective thermal, condensation control, and fire-resistant layer.

The Permastop® range of building blankets are ideal for metal roof construction. Made from up to 80% recycled content, Permastop® products offer outstanding thermal and acoustic properties, which means they reduce heat transfer, minimise internal reverberation and external noise, and reduce the risk of condensation forming under metal roof cladding.

To reduce thermal bridging, we recommend using Roof Razor® combined with Permastop®. Roof Razor allows full recovery of the insulation blanket between the safety wire mesh and metal cladding. By combining these products, you'll achieve optimum thermal performance, plus your building will meet or exceed NCC requirements.

The best choice for aged care buildings with concrete roofs is Pink® Thermal Slab, a high-performing thermal and acoustic insulation solution that drives energy efficiency and helps control noise and temperature fluctuations. This product is CodeMark certified for AS 4859.1 thermal performance providing confidence and certainty through the issue of a Certificate of Conformity and achieves an AS 5637.1 Group 1 NCC fire classification.

For concrete structures where aesthetics are not critical, the Permastop® range is ideal for insulating buildings with a concrete roof. Permastop offers overall energy efficiency, keeping buildings cooler in summer and warmer in colder climates.



External walls

Incorporating universal hearing-friendly design principles in the design of aged care buildings is essential for people's wellbeing and their ability to communicate easily. External wall insulation helps deliver a positive acoustic environment, alongside other benefits including energy efficiency, temperature regulation and fire safety.

With its outstanding, high-performance acoustic capabilities, the Pink® Partition range of glasswool insulation is ideal for aged care buildings. It offers proven non-combustibility and excellent thermal and acoustic performance. Plus, it is available in a comprehensive range of R-values, densities, and thicknesses.

Sisalation® Vapawrap® Vapour Permeable Residential Wall Wrap offers protection from the elements. An effective water barrier and water vapour permeable membrane, it is designed to minimise draughts and the risk of condensation, enabling bulk insulation to perform more effectively.



Ceilings and partitions

Pink Partition® is Australian made with up to 80% recycled content. It is ideal for creating a comfortable and safe environment in aged care buildings. It is Codemark certified for AS4859.1 thermal performance with compliance for the NCC 2022 performance requirements for thermal insulation.

Like all Fletcher Insulation glasswool insulation products, Pink Partition is non-combustible. Not only does it protect lives, but it helps reduce damage should a fire break out.

Pink Partition insulation provides excellent thermal insulation properties, with R-values ranging from R1.2 to R3.0. Keeping buildings cooler in summer and warmer in winter helps meet the thermal comfort needs of everyone living and working in aged care homes.

With its superior acoustic properties, Pink Partition insulation reduces background noise and sound transmission between residents' rooms and between floors, helping to maintain a more tranquil living environment.

Services and plant rooms

Aged care buildings accommodate services for residential, healthcare, office, and commercial kitchen and laundry applications.

Acting as a noise barrier and a noise absorber, Soundlag 4525C is an excellent insulation product for reducing noise break-out from pipes, valves, fan housings, and ductwork.

Pink Partition insulation is ideal for insulating concrete or stud walls. It is an effective noise barrier and a noise absorber in plant and machinery rooms. Pink® Thermal Slab may be specified in similar environments. Pink® Thermal Slab is fire-safe and controls noise levels and temperature fluctuations in concrete roofs, floors, and walls.

HVAC

Effective Heating, Ventilation and Air Conditioning (HVAC) systems help maintain safe, comfortable conditions for residents often confined indoors and unable to regulate their temperature or sound environment independently.

The thermal properties of Fletcher Insulation's HVAC insulation products offer both efficient temperature control and safe indoor air quality. A more efficient HVAC system also means containing maintenance outlays and minimising emissions and energy costs. Their sound attenuation products complete the holistic systems approach by dampening HVAC system noise.

Aged care buildings accommodate services for residential, healthcare, office, and commercial kitchen and laundry applications.

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All information provided correct as of October 2023.

