Fletcher Insulation
Building Better, Together

WHITEPAPER

Insulation solutions for offices and warehouses

A holistic approach to designing and specifying for healthier commercial environments, sustainably

Contents

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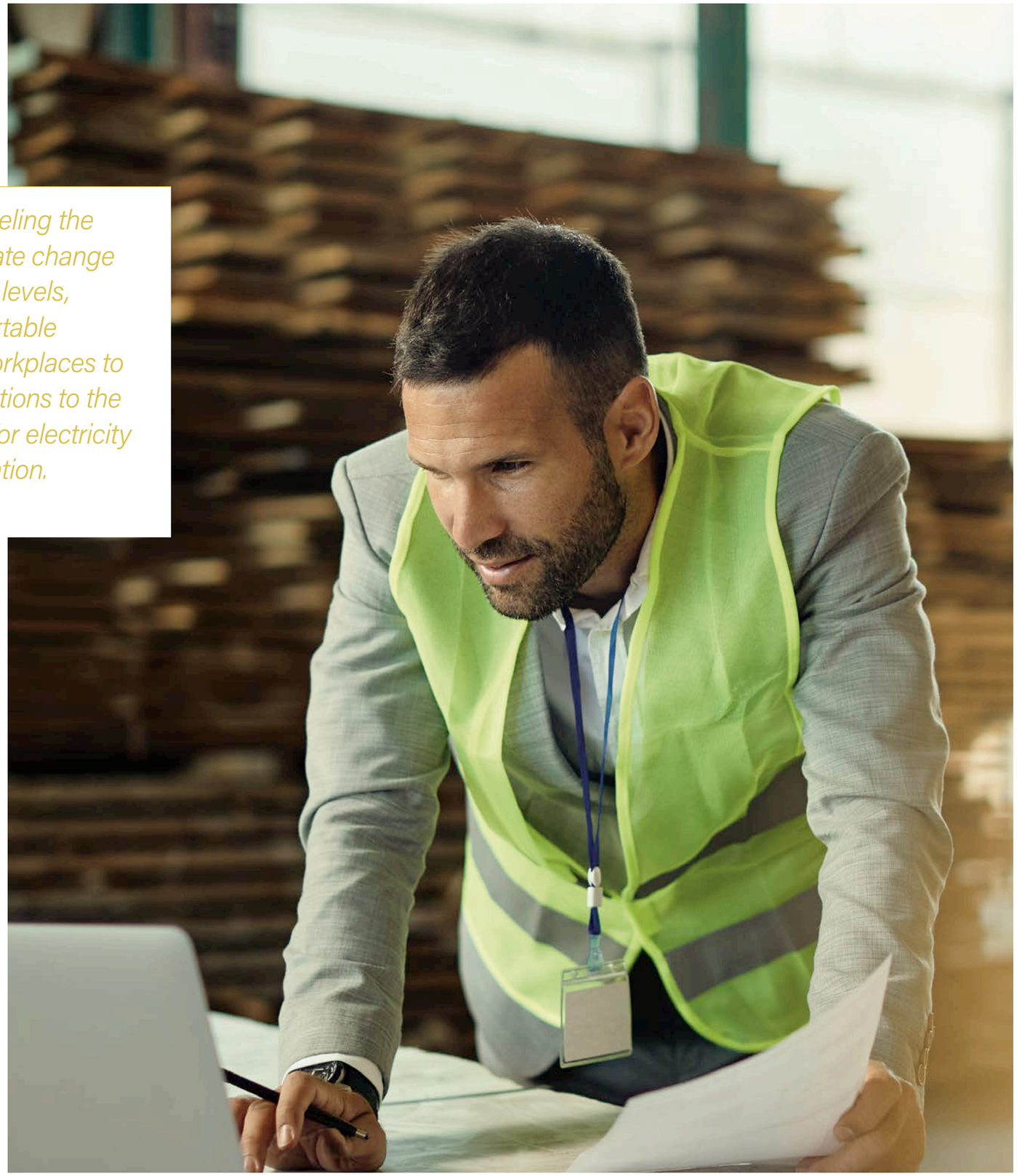


Introduction

Workplace design and its effect on productivity and absenteeism have been topics of increasing discussion among architects, designers, and engineers in recent years. Views, daylighting, indoor air quality, and thermal comfort are all examples of indoor environmental factors that have been shown to significantly improve employee health and wellbeing. These design elements should be incorporated into workplace designs, with an emphasis on strategies that have been shown to enhance operations and user experience.

Climate change is another issue with far-reaching impacts on the daily lives of employees and workers. In a recent study, employees described a variety of direct and indirect effects of climate-related events on their ability to perform their jobs effectively.[1] Workers are feeling the effects of climate change on a variety of levels, from uncomfortable homes and workplaces to climatic disruptions to the infrastructure for electricity and transportation.

A holistic approach to workplace design is needed to address these concerns in a sustainable manner. Insulation is crucial for improving the comfort and productivity of workplaces while also contributing to the energy efficiency of commercial buildings. Whether you are designing an open-plan office space, a large warehouse, or a multi-use building, insulation that is thoughtfully and carefully specified can help to control noise, temperature, condensation, and air quality while containing energy costs through passive cooling and warming.

Linking health and productivity with the built environment

The majority of people's waking hours are spent at work. It follows that workplaces that offer thermal and acoustic comfort to support employees' wellbeing are workplaces that are more productive and more successful at retaining and attracting talent.

Typical warehouse conditions are very different from those in most office settings. The requirement to support those who work in them, however, unites them. Designers can now incorporate appealing aesthetics while still creating an environment that supports increased productivity based on well-researched design principles and a growing body of evidence linking health with the built environment.

Environmental factors, including noise and visual disturbances, have been shown to have an effect on employee satisfaction, engagement, and productivity in open-plan workplaces.[2] For instance, it has been shown that sound disturbances can lower cognitive function, lower motivation, and raise stress levels.[3]

Other studies have demonstrated that indoor temperature, air quality and light can illicit both negative mental and physical reactions from employees in sub-optimal environments.[4] "Sick building syndrome", for example, became a concern when it was discovered that poor indoor air quality in offices was making people ill.[5] Temperature, in particular, has been strongly linked to productivity and satisfaction.[6]

When properly designed and specified within a high-performing building envelope, insulation will help you maintain the desired temperature in your office or warehouse throughout the year, protecting it from the cold in the winter and excess heat in the summer.

The role of insulation

Indoor environmental quality can be improved by using design strategies like improving thermal control, effective ventilation, increased natural lighting, and so on. By taking these actions, you can increase the market value of the building, lower potential liabilities, and maintain higher productivity.

Insulation is one of the most effective methods for creating a healthier indoor environment. When properly designed and specified within a high-performing building envelope, insulation will help you maintain the desired temperature in your office or warehouse throughout the year, protecting it from the cold in the winter and excess heat in the summer. A building with good insulation will use very little additional energy for heating and cooling.

There are special types of insulation for specific applications. For example, insulation can be specially designed to reflect or absorb noise, which is useful to improving sound quality within a space where acoustic control is essential.

In office environments, air-conditioning systems have historically been used to regulate indoor temperatures, whilst for warehouses it's been a mix of conditioned and unconditioned depending on their use. Insulation plays an essential role in reducing the thermal loads on buildings, so there's less reliance on artificial heating and cooling systems and as a result, lowered energy costs.

A holistic approach to office and warehouse design

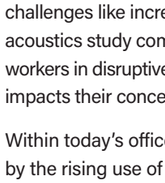
The importance of acoustic comfort

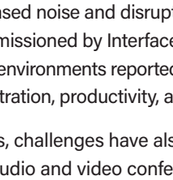
Today's open-plan, agile workspaces require excellent acoustic design. These open-plan layouts may encourage teamwork and facilitate communication, but they also come with extra challenges like increased noise and disruption. In a workplace acoustics study commissioned by Interface, Inc., 69% of office workers in disruptive environments reported that noise negatively impacts their concentration, productivity, and creativity.[7]

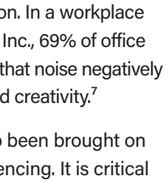
Within today's offices, challenges have also been brought on by the rising use of audio and video conferencing. It is critical that the workspace has a good acoustic environment that supports comfortable and clear communication without disturbing others, especially given the shift to hybrid workforces where some team members may be working from home, and others at the office.

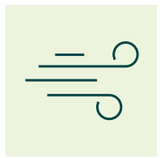
A lack of sound insulation between adjacent spaces is often a contributor to a poor acoustic environment. Even rain falling on a metal roof, which is a common characteristic of warehouse complexes, can become a noise distraction. The installation of wall and ceiling insulation, along with privacy and acoustic panels, was shown to significantly improve speech intelligibility and communication within an office environment.[8] Sound absorbing materials are also recommended inside work spaces to reduce reverberation times.[9]

Workers' health and safety may be at danger due to noise from machinery, external sources, and other internally generated noise and vibration. In addition to endangering their hearing, excessive noise can prevent people from hearing instructions, warnings, or approaching machinery or automobiles. Although it is advised that personnel in more industrial settings wear personal protection equipment (PPE), insulation provides acoustic absorption and noise isolation that can help make a warehouse environment safer.[10]







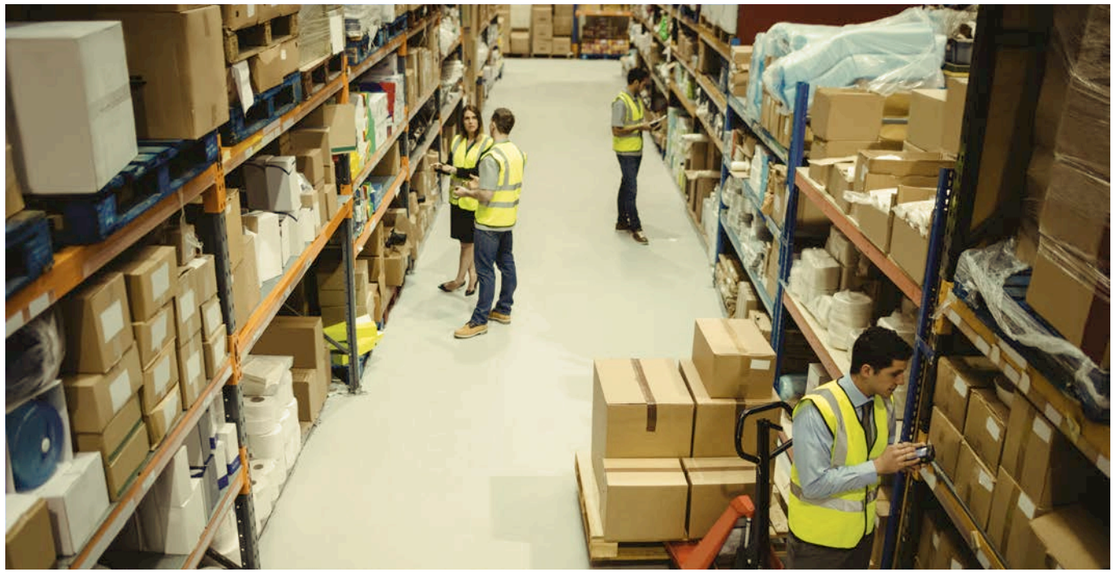


Controlling indoor thermal comfort, air quality and building condensation

Australian companies have a duty of care to look out for their employees in addition to trying to establish a highly productive work environment. The wellbeing of occupants is supported by a well-maintained indoor environment. Employees are better able to concentrate on their task and are more productive when they are working in a setting that is thermally comfortable[11] and has good indoor air quality.[12]

The most effective long-term strategy to ensure overall thermal comfort is insulation. As a result of better heat retention and improved wall and ceiling surface temperatures, a well-insulated building offers high-quality thermal comfort during the winter. Insulation can also protect against summertime heat, keeping interiors cooler. To ensure ideal thermal conditions all year long, insulation should be combined with other design components like ventilation, high-performance glazing, and air conditioning.

Wall insulation helps to maintain a consistent temperature and with the right sarking installed, in combination, they reduce the likelihood of moisture and humidity buildup. Uncontrolled moisture within a building not only causes structural damage but also negatively impacts indoor air quality. It is crucial to specify the proper material layers so that the structure can maintain airtightness while allowing extra humidity to escape the envelope to reduce the chance of condensation.



Protecting people and buildings from fire

The use of fire-resistant building materials protects occupants should a fire break out in their workplace. It is also a best practice approach to mitigating property and equipment damage, and minimising interruption to a business' daily operations. Fire containment is especially important in warehouses because highly flammable materials may be stored therein.

Insulation installed in external and internal walls, floors, ceilings, roofs, and around Heating, Ventilation and Air Conditioning (HVAC) applications, is an integral part of fire safety control within any commercial building. It is essential designers specify insulation that is made of non-combustible, fire-resistant materials as required by the National Construction Code (NCC).

Non-combustibility is assessed through the small-scale test AS 1530.1:1994 "Methods for fire tests on building materials, components and structures, Part 1: Combustibility test for materials". Building systems are assessed through standard test methods for determining fire resistance level (AS 1530.4:2014 "Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance tests for elements of construction") and lining material fire hazard or spread (AS 5637.1:2015 "Determination of fire hazard properties, Part 1: Wall and ceiling linings").

As well as NCC compliance, designers and commercial building owners must also consider the standards and minimum requirements of insurers. Choosing insulation that fails to meet these specifications could mean higher insurance premiums.

For the good of the planet

As the cost of energy rises, businesses are looking for ways to conserve their operating costs. There is also increasing pressure from consumers for businesses to reduce their carbon and environmental footprint.

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 make it easier for the building to satisfy the energy efficiency requirements in Section J of the NCC. Improved thermal performance is also a key requirement for achieving certification under sustainable building rating schemes such as Green Star, the WELL Building Standard and LEED (Leadership in Energy and Environmental Design).

Look for insulation with zero Ozone Depletion Potential (ODP), which refers to products that have no substances that contribute to stratospheric ozone depletion. Make sure to only specify products that do not contain volatile organic compounds to maintain good indoor air quality. A number of products feature these qualities in addition to recycled content, which raises their sustainability credentials even further.

Find out more online at
www.insulation.com.au

Insulation for better workplace environments

FLETCHER INSULATION

Fletcher Insulation specialises in developing industry-leading insulation solutions. Their technical team supports architects and specifiers to design the best commercial environments, including offices and warehouses.

With a focus on people, Fletcher Insulation has designed a range of insulation solutions to support the wellbeing, comfort and productivity of employees, helping companies achieve better business outcomes, reduce costs and attract the right talent.

With a holistic approach to developing the best insulation solutions for all types of commercial buildings, Fletcher Insulation considers a range of performance parameters. These include energy efficiency, thermal bridging, fire resistance, internal comfort, acoustics, condensation management, air tightness, and durability.

Roofing

The Permastop® range of building blankets has outstanding thermal and acoustic properties and also minimise the risk of condensation that can form in metal roof cladding. To reduce thermal bridging, Roof Razor can be used as an insulation spacer in combination with Permastop®, allowing full recovery of the insulation blanket between the safety wire mesh and metal cladding.

For office buildings with a concrete roof structure, your best choice is Pink® Thermal Slab with its excellent thermal and acoustic absorption properties. This product drives energy efficiency and helps control noise and temperature fluctuations common to concrete roofs. Pink® Thermal Slab provides excellent fire performance for ceiling lining applications, achieving a AS 5637.1 Group 1 NCC fire classification.

External walls

For warehouses with structural steel framing and external wall cladding, the Permastop® range of building blankets is ideal. The Pink® Partition range of glasswool insulation may be specified for offices with concrete external walls. The product can be installed between wall framing and offers proven non-combustibility, acoustic performance and sustainability.

For offices with a structural steel frame and external wall cladding, Sisalation® Vapawrap Residential Wall Wrap can be used in combination with Pink® Partition insulation between studs for colder climates. For hotter, more humid climates, specifiers use Sisalation® Multipurpose EHD (456) Sarking taped and sealed, combined with Pink® Partition insulation.

Concrete slabs and soffits

For offices, Pink® Thermal Slab is a highly effective soffit insulation material. It is a combination of two materials: a medium density semi-rigid glasswool board offering effective acoustic performance made from up to 80% recycled glass; and Sisalation® Heavy Duty 450 Facing Foil laminate for condensation control. The laminate is adhered to one side and the semi-rigid board is available in various thicknesses.

Fitout applications

Specially designed for use in commercial metal-framed partitions, wall systems and suspended ceilings, Pink® Partition insulation is an ideal product for partition walls in commercial fit-out projects such as offices where acoustic control is essential. Like all Fletcher Insulation glasswool insulation products, Australian-made Pink® Partition is non-combustible, helping protect employees and property should a fire occur.

For plant and machinery rooms with stud walls where both thermal and acoustic performance is important, FI48 Rigid Insulation is recommended. It is a high-density rigid glasswool board offering superior thermal and acoustic performance and is non-combustible (AS1530.1). In similar environments featuring under slab soffits, Pink® Thermal Slab is recommended.

Soundlag 4525C is an excellent insulation product for reducing noise break-out from pipes, valves, fan housings, and ductwork in commercial and industrial buildings.

HVAC

Fletcher Insulation's HVAC products help commercial businesses operate more sustainably. With proven thermal performance, these insulation products help contain the cost of heating and cooling and create a more comfortable environment for all employees. They also offer sound attenuation products to complete their holistic systems approach by minimising noise when the is operating.

With a holistic approach to developing the best insulation solutions for all types of commercial buildings, Fletcher Insulation considers a range of performance parameters.

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