

Thermal, Condensation & Acoustic Control for Interior Spaces

Comfort Liner Solutions in Soffit Insulation Systems



Why does Soffit Insulation essential for modern building?

Rapid urbanisation has resulted in the soaring demand for land in cities. Nowadays, urban areas are the prime choice for people to reside because of its accessibility and convenience. To accommodate this growth and preference, the design of modern buildings has evolved to include a variety of functions into a limited area. Resultantly, high-rise buildings have become the default option for people as it provides the highest utilisation level of spatial functionality, allowing all sorts of space to coexist to satisfy an occupant's lifestyle expectations. However, this at the same time creates spatial conflicts that pose a challenge for building designers.



Spatial conflicts do not only exist in mixed development buildings, prevailing also in specialised function buildings like healthcare, warehouse, offices, etc. For instance, healthcare buildings have evolved from multiple independent low rise buildings into a high rise healthcare complex with diversified function space to cater to patients' needs. The significant temperature difference between adjacent floors possess condensation risk that causes mould problems which can severely impair healthcare operations and required high maintenance cost. In addition, the temperature imbalance also results in energy inefficiency for the building due to the high thermal loss between floors.

Soffit insulation can help to reduce the risk of fungal and mould growth, which is a major concern for healthcare buildings.

Similar observations are also found in nowadays warehouse buildings as these establishments are built with multi-ramp structures to increase storage capacity in strategic locations. The exposed beams and soffit of each warehouse floor is then susceptible to thermal inefficiency and condensation risk caused by distinct spatial usages from each floor. Failure to manage these vulnerabilities will result in high energy and operation cost. Besides, the noise generated by the moving vehicles or trucks inside the multi-ramp structures also create acoustic discomfort to warehouse operators, which in long run can lead to workplace health hazards.

Soffit insulation helps to provide a safer workplace through its noise absorption capability on moving vehicles and increases energy efficiency for controlled ambient storage spaces.

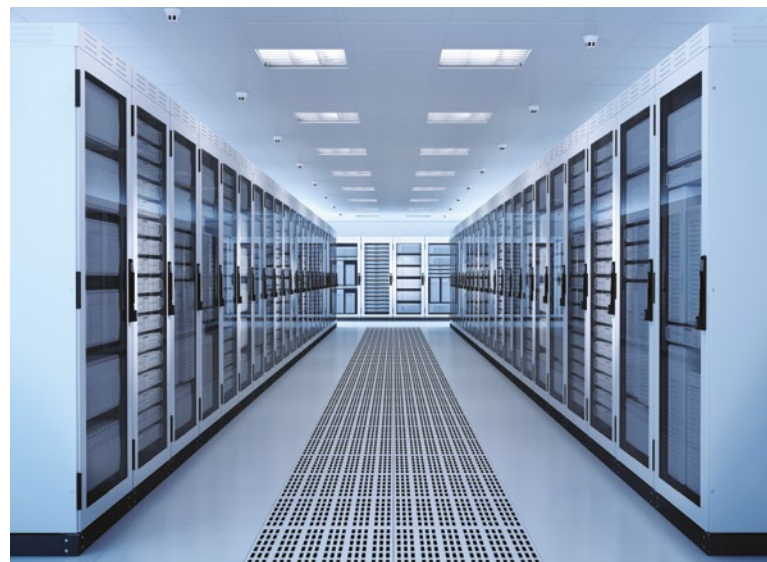


The spatial conflicts are even more obvious for mixed-development buildings, such as residential units alongside leisure destinations or commercial units. The common challenge from these buildings is the noise pollution suffered by residential occupants due to the close proximity to commercial activities. Untreated noise can cause discomfort to the occupants and affect their daily lives. This defeats the purpose of living in an urban building concept as it affects occupants' wellbeing despite the conveniences.

Soffit insulation helps to maintain the acoustic comfort for the occupants in a mixed-development building and provide energy efficiency at the same time.

Thus, insulation is an essential remedy for modern building design as it helps in achieving an optimum spatial utilisation while allowing separation of distinct functional spaces without risking the wellbeing of its occupants. As soffit serves as the only architectural feature that separates the functional spaces between floors, thus, failure to recognize the importance of soffit insulation in building designs will cause reduction in thermal performance and condensation control; ensuing significant consequential losses when the building is occupied and in operation.

Soffit insulation is critical for ensuring the energy efficiency of the data center building/room, which has 24 hour air conditioning and eliminates the risk of condensation in the adjacent space.



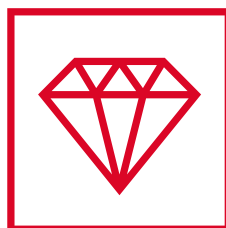
How to choose the Right Material for Soffit Insulation?

Soffit is the largest surface area of a high rise building. The selection of soffit insulation material is important as it significantly impacts the overall building thermal and acoustic efficiency to meet building owners and designers' expectations while delivering resilient and sustainable buildings for the occupants. In countries where stringent building fire safety legislations applies, the use non-combustible material in soffit insulation help to reinforces the compliance with building codes. Also, insulation materials used should also need to deliver robust and long-lasting performance to ensure the efficiency of the building maintenance cost.



Thermal Performance and Condensation Control

The insulation of soffit systems can reduce energy loss by thermal transmission, increasing the energy efficiency of the structure. This is specially made for under floor soffits systems that separate air-conditioned and non-air-conditioned floors. Proper insulation prevents surface and interstitial condensation from occurring and reduces heat transfer between floors.



Just like people, buildings also need to be kept healthy. Presence of mould and fungi on the ceilings or

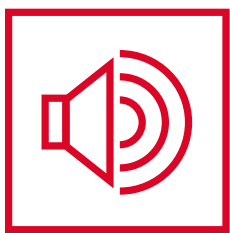
walls usually arise from condensation which can greatly affect the building's safety and value; jeopardising occupants' health and overtime, affecting the value of the property up to 25%.

Stone wool is vapour-permeable, which allows moisture to pass through the building envelope and out of the building. This helps to protect soffit systems against rot, mould, and humidity damage. The 98% porous material of ROCKWOOL stone wool, unlike a closed-cell structure, will naturally and quickly transfer moisture to the cold side of the material and evaporate, ensuring its thermal performance remains unaffected.



The durability of ROCKWOOL stone wool and its thermal performance does not decrease over time, thus remaining stable over the lifetime period of the building. Moreover, ROCKWOOL stone wool insulation does not require any maintenance,

unlike other soffit systems, where the maintenance cost and refurbishment are higher as it requires closure or disruption of business in commercial or shared residential areas.



Acoustic Performance

Noise pollution is a major environmental problem to be considered in new modern building designs. It is crucial that the acoustic performance is taken into consideration

during the building insulation design to ensure the wellbeing of future occupants.

WHO has cited that noises louder than a typical office space can cause sleep disturbance, high blood pressure and high risk of heart disease. Sudden loud noises can also contribute to unneeded stress as it disrupts the health and wellbeing of the occupants. Therefore, it is vital to consider the noise level and sound control during the insulation design especially for the mixed development buildings where residential, commercial and leisure functional spaces are adjacent to each other.

Similar consideration needs to be provided in the interior workspace of warehouses, where loud noises are unavoidable. Occupants in such facilities that are exposed to noisy environments can experience higher levels of stress, causing fatigue. However, with the soffit insulation installed, it can help in absorbing low frequency noises generated in warehouse facilities where a lot of heavy machinery operates and moves around.

If the noise cannot be minimised, then the alternative way is to control it through reducing the noise transfer as much as possible. ROCKWOOL stone wool fibrous material and natural porosity functions as a sound absorber by absorbing and dampening sound waves which is the ideal material in improving room acoustics with proven noise absorption performance of NRC 1.0.



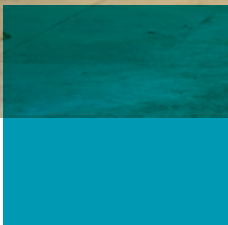
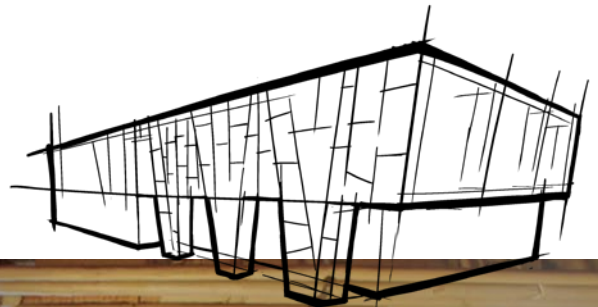
Non-combustibility

With soffit as the structural elements with large surface area, the choices in insulation material can mean the difference between hazards and harmful impacts from

fires and heat damage. Therefore, it is important that the soffit insulation material used is non-combustible, to significantly reduce fire safety risk whilst meeting the building's legislation demand. This is essential for healthcare buildings where there may be hundreds of patients who are immobile or bedridden. Similar could be said for storage facilities where the fire safety property of the soffit material is essential in protecting the goods and property. With ROCKWOOL stone wool fire resilient characteristics, it can hinder

the spread of fire, thus decreasing fire-related damages to its surrounding and reducing financial loss.

ROCKWOOL stone wool is the ideal material for fire resistant structures and it achieved the highest European fire classification, A1, according to EN 13501-1. It can also withstand temperatures exceeding 1000°C and it does not contribute to smoke toxicity. Inhaling toxic smoke from fires can be extremely dangerous and it is one of the causes of most fire-related casualties. In addition to this, ROCKWOOL's stone wool is a natural fire barrier, which contributes to the safe escape of buildings' occupants and will be able to buy time for first responders' intervention.



Comfort Liner SSL950



ROCKWOOL Comfort Liner is the proven solution with an ideal match of properties and performance for a soffit system. It achieves not only the desired thermal performance and condensation control but in many cases exceeds expectations by future-proofing buildings to make them more efficient, healthier, robust and sustainable. ROCKWOOL Comfort Liner also helps create safe, healthy and comfortable acoustic indoor environments that pose no danger to occupants' health and safety.

Property	Description
Product Name	Comfort Liner SSL950
Length	1200mm
Width	600mm
Thickness	50mm 75mm 100mm
Thermal Conductivity	0.034 W/mK
Reaction to Fire	Non-combustible / A1 Fire Classification
Melting Point	More than 1000°C
Facing Options	<ul style="list-style-type: none"> • Single faced black mat tissue facing • Double faced black mat tissue facing • Single faced aluminium foil • Aluminium foil and black mat tissue facing • Multiple sides black mat tissue facing

*Note: Overlay facings are available upon request

Standard and approvals

ROCKWOOL Comfort Liner achieves a reaction to fire classification of A1 or non-combustible as defined in BS EN 13501-1.

Compatibility

ROCKWOOL Comfort Liner is chemically inert and compatible with most materials with which they are likely to come into contact in normal building applications.

Acoustic property

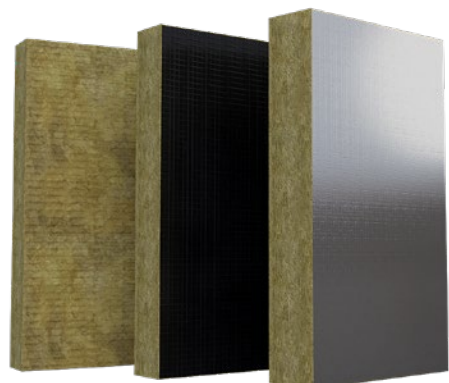
ROCKWOOL Comfort Liner achieves NRC value 1.0

Biological

ROCKWOOL Comfort Liner is non-organic and vapour permeable, and resistant to mould and mildew.

Environmental

The safety of ROCKWOOL stone wool is confirmed by EU directive 97/69/EC, ROCKWOOL fibres are not classified as a possible human carcinogen.





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