Human comfort is of paramount importance when it comes to our buildings because ultimately, buildings are built for people.

Buildings are an intrinsic part of the very fabric of society, constructed for a variety of reasons. Buildings are needed to house people, these same people go to work in buildings and they also partake in recreational activities on the weekends. In fact, people spend up to 90 percent of their time inside buildings! Therefore, it is essential that our buildings be designed such that the people who use them will benefit the most.
In the grand scheme of things, buildings occupy a peculiar niche. Although buildings only account for 3 percent of the world’s total land mass, they are however responsible for half of all energy use and account for one third of the world’s carbon emissions. Buildings are thus able to address climate change challenges by being more energy and resource efficient, something that is already being achieved through the proliferation of high performance green buildings.

Green buildings can be viewed as the logical progression building philosophy, essentially ensuring that the buildings constructed are not only good for the environment but also good for the occupants using the buildings. Green buildings are more energy-efficient, require less resources to operate and are fitted-out with sustainable green building materials to create a positive, healthy indoor environment for its occupants.

Over the past decade, the green building movement has blossomed into a global concept, influencing the built environment and positively impacting millions of lives all over the world. We now have the necessary know-how to build our buildings green from a technical point-of-view but we also need to ensure that the buildings we live in can be buildings we can live with.

**THE MULTI COMFORT CONCEPT**

A growing body of research and evidence points at a strong link between better buildings and increased wellbeing among occupants. The World Green Building Council (WorldGBC) puts out several such studies through its Better Places for People programme, aimed at raising awareness of key attributes responsible for creating places that are good for people.

Saint-Gobain, one of the Campaign Partners for the Better Places for People programme, is pushing the sustainability envelope through a concept termed simply as Multi Comfort. True to its name, the Multi Comfort concept looks at multiple elements that contribute to the comfort level of a place. When applied to green building and placemaking, the multi comfort concept helps designers to conceptualise and create places and spaces that are not just environmentally-friendly but also place the occupants at the heart of the buildings. After all, the occupants are the ultimate end-users of any building.

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THE WHOLE BUILDING APPROACH

Increasingly, architects and engineers are focusing on the question of how to achieve a healthy indoor environment that contributes to people’s wellbeing. But the relationships between people’s wellbeing and their indoor environments are quite complex. As a result, indoor environmental factors have largely been dealt with in an individual way, taking factors one at a time and making recommendations for the improvement of each. However, taking a holistic approach to comfort, health and wellbeing in buildings is the way forward.

The Multi Comfort Approach to Green Buildings

By carefully considering all the different areas of comfort that a building can provide, people’s wellbeing within buildings can be bolstered – regardless of the types of buildings and the specific activities taking place inside them.

**FEEL**

This essentially refers to thermal comfort. A balanced thermal environment is necessary to feeling comfortable. Concentration, manual dexterity, and the occurrence of accidents are all influenced by excessively high or low temperatures. Operative Temperature and Relative Humidity in a space determine Global Comfort conditions, depending on what we are wearing and what we are doing. Our bodies are also sensitive to small variations in factors such as Air Velocity and Temperature Gradient. The impact of these Local Discomfort elements must be minimised – so we can fully enjoy the space and function comfortably regardless of the activity.

**Key Considerations:**
- Air temperature
- Surface temperatures
- Humidity
- Absence of draughts

**Good buildings should:**
- Keep indoor temperatures at ideal levels using very little energy
- Have walls that are nice to touch regardless of outside weather
- Have no draughts, even on the floor

**FOUR SENSORY COMFORTS**

Comfort is a state of physical ease and wellbeing in a given environment. Within a building, various conditions are required to enable people to feel comfortable, and to perform their tasks effectively. There are four main considerations that affect people's senses and therefore their perception of comfort inside buildings. These are core to the Multi Comfort standard.
The Multi Comfort Approach to Green Buildings

**SEE**

Visual comfort is crucial for an optimal sense of wellbeing. Light brings architecture to life and brings life to architecture. Different tasks require specific Light Quantity levels with optimum spatial distribution and a good combination of natural and artificial light. A visual connection to the outside world through exterior views allows us to set our biological clock and, together with indoor Space Quality, provides an overall appreciation of indoor aesthetics.

**Key Considerations:**
- Views of outside space and connected to nature
- Light quality
- Luminosity
- Absence of glare

**Good buildings should:**
- Be full of natural light without glare
- Have rich colours, making close-up work easy from even light distribution
- Bring the outdoors inside, connecting you with nature and improving your mood

**HEAR**

Acoustic comfort is characterised by an appropriate Sound level. This means the absence of unwanted sounds, our ability to generate sound without bothering other people, and most importantly, the quality of sounds we do want to hear. In well-balanced sound environments, people are more productive, happier and experience fewer health issues. To address these aspects, depending on the type of building (residential, office, school, healthcare or hotel) and activity, different Room Acoustics comfort descriptors are used.

**Key Considerations:**
- Noise from outdoors and/or neighbours
- Sound vibrations through the structure
- Clarity of hearing, speech intelligibility

**Good buildings should:**
- Protect you from noise – coming from outside or inside
- Allow you to make noise without disturbing others
- Give an improved level of ambient noise
- Allow control over noise reverberation and increase speech intelligibility, making sound places to work and learn
The Multi Comfort Approach to Green Buildings

BREATHE

This aspect deals with indoor air quality. The fresher the air we breathe, the healthier we feel in the buildings we live, work and play in. A constant supply of fresh, clean air in buildings avoids stuffiness and creates an optimally healthy environment, reducing to an absolute minimum the impact of harmful Chemical Pollutants and Particulates. Good design, proper ventilation and specification of the right building materials are essential to increase the supply of fresh air in the building, and to reduce our exposure to indoor pollutants and odours.

Key Considerations:
- Indoor air quality
- Fresh air supply
- Absence of internal pollutants
- Control of odours

Good buildings should:
- Keep outdoor pollution outside
- Have a constant supply of clean, fresh air
- Never feel stuffy nor damp
- Actively break down impurities in indoor air

“By introducing the Saint-Gobain’s Multi Comfort Concept, we aim to inspire the region’s top minds and revolutionise the industry’s standards and building methods. This clearly demonstrates Saint-Gobain’s ambitions to be the region’s leader for sustainable habitat.

The Saint-Gobain Sensorial Lab in Singapore will allow visitors to better understand the 4 Multi Comfort standards and experiencing the different comfort levels of each. This intensifies and enriches our prescription towards our relevant stakeholders.”

SUSTAINABILITY CONSIDERATIONS

Construction has a major environmental impact, particularly in terms of carbon emissions and energy use, material and resource efficiency and people health. Climate change and accelerating urbanisation also highlight the need for good water management and biodiversity.

The environmental impact of buildings over its whole lifecycle should be minimised, after all, the ultimate vision of Multi Comfort is an autonomous and neutral building that actually brings positive effects!
ENERGY & CARBON – TOWARDS ZERO CARBON

The Multi Comfort concept promotes a “fabric first” approach, meaning that the building should first be energy efficient through its highly performing envelope and limit to the unavoidable minimum the needs for heating, cooling and lighting. The remaining needed energy should be supplied with renewable and decarbonised sources and buildings be prepared to produce more energy than they need.

Key Considerations:
- Energy needs for provision and maintenance of indoor comfort
- Energy supply and sourcing
- Smart equipment and smart grid-readiness
- Low impact carbon impact over the whole life cycle

Good buildings should:
- Limit energy needs for the main comfort purposes (heating, cooling and lighting)
- Source and, if possible, supply clean and local energy for residual needs
- Are smart, being able to control consumption and smart-ready for connection to the grid
- Give preference to products and solutions with a lower carbon

MATERIAL AND RESOURCES: TOWARDS CIRCULAR ECONOMY

As a key contributor to resource consumption and waste generation, the construction sector has a role to play in increasing resource efficiency. The linear model where a resource become a waste can be transformed into a circular model where a waste can also become a resource.

Ultimately: Towards a circular economy

Close the loop by reducing to the minimum waste generation, divert residual waste from landfill, and use it as a secondary raw material, while ensuring all of the solutions have no hazardous content.
The Multi Comfort Approach to Green Buildings

DO YOU KNOW THE DIFFERENCE?

Internal recycled content is the name of a material recovered directly during the production process. This waste is reintroduced in the process and does not leave the plant. It is not considered recycling in the traditional sense and as defined by the norm ISO 14021-1999.

SECONDARY (RAW) MATERIAL

Secondary materials are materials recovered from previous use or from waste. They substitute primary materials and are used as an ingredient in another product.

Examples: scrap metal, crushed concrete, glass cullet, recycled wood chips, recycled plastic, etc.

This secondary material is differentiated depending on the phase when the recovery occurs.

- **Pre-consumer waste or material** corresponds to a material that was discarded before it was ready for consumer use. The difference with “internal recycled material” is that it is not reused within the same plant but supplied externally.

- **Post-consumer waste or material** corresponds to a material discarded after someone has used it, collected, sorted and transformed into secondary raw material.

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<table>
<thead>
<tr>
<th>Criteria definition</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong> (Must have)</td>
<td><strong>Recommendations</strong> (Nice to have)</td>
</tr>
<tr>
<td>Maximize recycled content by family of products (see next 2 pages)</td>
<td>Divert waste from landfill, and use it as secondary raw material.</td>
</tr>
<tr>
<td><strong>Job site</strong>: 100% construction waste diverted from landfill</td>
<td><strong>End of life</strong>: Easy to dismantle</td>
</tr>
</tbody>
</table>

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*recycled content claims must conform to ISO 14021-1999 and correspond to the parameter “use of secondary material” in the EPD (Environmental Product Declaration)
Experience Multi Comfort right here in Singapore!

**SOUTH EAST ASIA'S REGIONAL SENSORIAL LAB OPENED IN SINGAPORE**

Saint-Gobain opened the South East Asia (SEA) Sensorial Lab (mini Domo-Lab) in its Singapore common office. The Sensorial Lab serves as a show-case space to strengthen and improve its prescription towards architects, developers, contractors, government agencies, Green Associations and relevant stakeholders. It demonstrates the ambitions of the Saint-Gobain SEA teams to be region's leader for sustainable habitats.

- The thermal module enables visitors to experience a thermal delta between what they see and what they touch.
- The visual module highlights the importance to balance between artificial and natural lights. Experience what human technology has provided.
- The sound forest is a pathway through a labyrinth of materials to experience noise, its correction and comfortable silence.
- The Solutheque highlights the diversity of materials supplied and distributed by Saint-Gobain companies.

Email [E15.INFO@Saint-Gobain.com](mailto:E15.INFO@Saint-Gobain.com) to book a tour! 😊

All text and images courtesy of Saint-Gobain.