INDUSTRY GUIDELINES FOR INDOOR AIR QUALITY in Singapore

Background

According to the World Health Organization (WHO), air pollution causes

7 MILLION

premature deaths globally each year.

90%

of our time is spent indoors, placing us at health risk when exposed to poor indoor air quality

HEALTH IMPACTS OF POOR INDOOR AIR QUALITY

- Cardiovascular Disease
- Cancer
- Respiratory Disease
- Sick Building Syndrome

WAYS TO ENHANCE AIR QUALITY

Knowledge on how to maintain good indoor air quality is critical in ensuring the health and safety of building occupants.

Consultations were conducted with industry stakeholders to develop 5 guidelines and 3 recommendations to amplify industry efforts to improve indoor air quality.

GUIDELINES 5 & 3 RECOMMENDATIONS

1 Adopt Emission Limits for Products & Furnishings Used Indoors

Direct Control of Emissions Levels through Products & Furnishings

Controls should minimally be applied to products, fixtures and furnishings that cannot be easily removed or changed once installed or applied. These include: **Paints & Coatings, Adhesives** and **Composite Wood.**

A First Step: Reducing Formaldehye Emissions at Source

Formaldehyde is commonly found in building materials and household furnishings. Emissions from these materials are known to be sustained over a long period of time. Formaldehyde is a known carcinogen and it is imperative that its levels in indoor spaces are kept below specified thresholds, or eliminated entirely.

Product	Proposed Emission Limits for Formaldehyde (mg/m3)	Measurement Method
 Adhesives	0.100 (with reference to SS554)	ASTM D5116 or ISO 16000-9
Coatings & Paints 	0.100 (with reference to SS150)	ASTM D5116 or ISO 16000-9 • Additional reference to SS 150:2021 Clause 7.1.12 for sample preparation and test parameters
 Composite Wood	0.124 (in line with Standard EN 13986, E1 standards)	ASTM D5116 or ISO 16000-9

2 Adopt Singapore Standards for Good Indoor Air Quality

Although there are no specific regulations governing indoor air quality in Singapore, building owners, facility managers and occupants can take guidance from the following standards:

Singapore Standard Code of Practice for Indoor Air Quality for Air-Conditioned Buildings (SS554)

Specifies good practices in managing indoor air quality, recommended ranges and limits of certain indoor air quality parameters.

Singapore Standard Code of Practice for Air Quality for Air Conditioning and Mechanical Ventilation Buildings (SS553)

Complements the SS 554 and provides general guidance in the design, construction, installation, testing and commissioning, operation and maintenance of air-conditioning and mechanical ventilation systems.

Singapore Standard Specification for Emulsion Paint for Decorative Purposes (SS150)

Helps manufacturers to reduce emissions from their products.

3 Acquire Certifications

Industry stakeholders are encouraged to acquire certifications as endorsement of their efforts to maintaining good indoor air quality.

Building and Construction Authority (BCA) Green Mark certification scheme:

Continual efforts to improve indoor air quality is one criteria assessed for the BCA Green Mark.

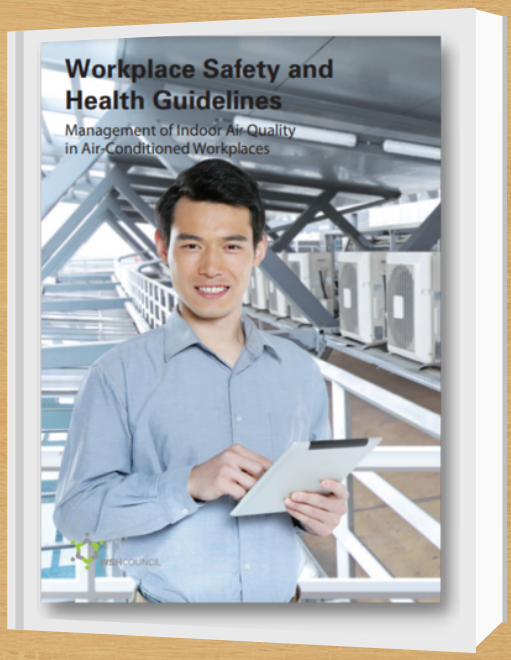
Singapore Green Building Product (SGBP) certification:

The SGBP label recognises products that have been tested and certified as sustainable building products and materials.

Singapore Furniture Industries Council (SFIC) is working towards the development of a sustainability resource guide to assist furniture companies in transforming their business into a more sustainable business model aligned to new and emerging sustainability certification programmes.

4 Implement Workplace Safety and Health Guidelines

Employers should aim to implement Workplace Safety and Health Guidelines for their employees' welfare.



The Workplace Safety and Health (WSH) Guidelines on Management of Indoor Air Quality in Air-Conditioned Workplaces

Provides a practical supplement, on achieving and managing good IAQ, to building owners, facility managers and employees on achieving and managing good indoor air quality at workplaces.

Workplace Safety and Health (General Provisions) Regulations

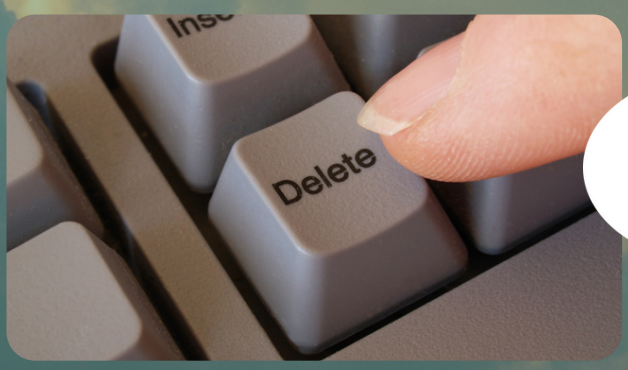
Specifies permissible exposure limits (PELs) to toxic substances for workers.

5 Monitor Indoor Air Quality and Implement Mitigating Measures

Indoor air quality should be monitored after any initial renovation or fit out. If emissions levels do not comply with the proposed limits, actions should be taken to reduce them permissible levels.

DETECT AND MONITOR

Use air quality sensors or environment monitors to track indoor emission levels.



ELIMINATE AND ENHANCE

Eliminate or reduce air pollutants at source. If necessary, ensure effective ventilation and use of air filters/purifiers.

RECOMMENDATIONS

1 REGULATE

The Government can regulate emission limits in the interest of health and well-being

Control Frameworks

1 Pre-Market Registration

Companies are to submit test reports for all products for certification before sale

2 Post-Market Surveillance

Verfication that products sold meet the stipulated emission limits

Concern: Any single framework is insufficiently robust and non-compliant products may still be imported illegally and distributed within the local market.

SOLUTION

Post-Market Control & Voluntary Declaration

Must be supported by a valid emission report submission

Additional administrative burden on companies are incurred due to testing and submission of report, resulting in higher costs that may be passed down to the downstream consumers.

Proposed Timeline

Announcement of the implementation of Regulations

6 months

At least 6 months for suppliers and users to deplete existing stocks

2 years

Regulations to take effect after 2 years to give manufacturers enough time to make changes

RECOMMENDATIONS

2 INCENTIVISE

Incentivise the industry to supply, manufacture and adopt low emitting products and solutions.

Accreditation

Recognise and accredit industry stakeholders that supply or employ low emitting products or solutions to create greater awareness of availability of such products and solutions.

Example: Additional procurement considerations for contractors or vendors using low emitting products.

3 COLLABORATE

Foster greater industry-public sector collaboration to create awareness and availability of low emitting solutions.

Put Together a Database of Low Emitting Products and Solutions

Industry stakeholders may use the database as a reference to source for low emitting products and solutions.

They can also leverage knowledge sharing sessions to engage with fellow industry players on how to identify, acquire and use low emitting products.

Encourage Innovation and Adoption of Low Emitting Products

By facilitating international trade of low emitting products and innovative solutions.

Acknowledgements:

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