

## **GUIDELINE FOR MAINTAINING ACCEPTABLE INDOOR AIR QUALITY**

### **INTRODUCTION**

Indoor Air Quality (IAQ) has become of increasing concern for both the occupants of facilities and the people who are responsible for the operation, maintenance and minor projects in them. Over the last several years, complaints and enquiries related to IAQ have risen dramatically. This Bulletin is intended to provide property management staff with broad technical guidelines, which if followed should minimize the likelihood of such occurrences.

An Indoor Air Quality Guideline has been developed for all Government of Alberta Facilities. The guideline provides processes to be followed after a complaint has been made and for proactive testing for early detection of developing problems. It describes the investigative steps to be taken and what professional support is available. It also provides IAQ parameters, which if met should provide a comfortable and healthy indoor environment. It is recommended that this should be read and followed by the responsible staff.

### **GENERAL**

There are four primary considerations for maintaining acceptable indoor air quality.

- Ventilation air. Provides oxygen and dilution of odours.
- Dust. Can affect allergies and may harbor fungi.
- Moisture. Provides sustenance for mould growth and can deteriorate materials.
- Chemicals. Including hazardous materials, can be the source of many health concerns.

These, along with comfort issues such as temperature, humidity, lighting, ergonomics and noise are the source of most problems.

Mould can be a serious health concern for those who have compromised or immature immune systems. Some types of mould can cause occupants to have flu-like symptoms or worse. There are three conditions required for mould to propagate: there must be a moderate temperature, a source of nutrition, and water. Given that moulds are ubiquitous, that occupied buildings have moderate temperatures and that there are many sources of nutrition, then the primary concern, and the one that can most readily be controlled, is water. Any source of moisture should be dealt with and cleaned up immediately, and affected areas should be checked for any sign of mould growth. If there is evidence of mould refer to the Indoor Air Quality Guideline for direction.

These issues will be discussed under the general headings of -

Operation and Maintenance

Construction Products

Cleaning Products

### **OPERATION AND MAINTENANCE**

It is the responsibility of the Facility Manager to ensure that the Preventive Maintenance Program is implemented. All equipment and systems included in the Preventive Maintenance Program must be maintained in accordance with the schedules and tasks and any other information. The upkeep of the information in the Log Sheets or Books is necessary to ensure that representation and responsibility for the work having been performed is accepted.

Items of equipment, systems or any part of those systems, which contact circulated air or can allow moisture to exist, are the primary concern. These will include:

- Air handling systems: Air volumes and distribution is per design. Air pressure gauges calibrated.
- Air conditioning units: Moisture from cooling coil condensation is drained and not allowed to stand or carry over into ducts.
- Chillers, refrigeration and cooling towers: Refrigerant leaks. Condensation from piping or equipment. Water treatment of condenser water.
- Humidifiers: Cleaned of solids and no standing water.
- Gas burners: Heat exchangers leak tested. Safety controls checked. No downdrafts.
- Heating, ventilation and air conditioning controls: Calibrated and checked for operation.
- Air filters: To be changed as required and to have the specified efficiency. No bypass air. Ducts to have no settled dust.
- Floor or other drains: Traps are full. Drain adequately. Flushed frequently.
- Dampers: Outdoor air, zone and mixing dampers operate correctly. Fire dampers are not closed.
- Leaks: Water spillage or ingress through the building envelope must be addressed and wet or damaged materials cleaned or replaced. Frequent cause of mould growth in wall and ceiling assemblies.
- Condensation: Can occur due to cold surfaces from thermal bridging or air leakage through the building envelope or cold equipment and piping. Frequent cause of mould growth in wall and ceiling assemblies.

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ACCEPTABLE INDOOR AIR QUALITY (CONTINUED)****CONSTRUCTION PRODUCTS**

Alberta Infrastructure's Basic Master Specifications have incorporated a number of measures to address air quality. As much as possible, use them to specify products. They may be accessed from [the Alberta Infrastructure Technical Resource Center](#) web page.

What follows is generally included in the applicable specification Sections for some commonly specified products.

**Carpet:**

- Specify product that has an IAQ certification number designated by the Canadian Carpet Institute or the Carpet and Rug Institute in the U.S.
- Specify product that will last at least seven to ten years.
- Off-gas the product before installing it in an occupied building.
- Try to prevent old carpet from going to landfill. Efforts are underway to make this easier.
- When removing old carpet suppress dust release and clean area after new installation is complete.

**Paint:**

- Specify products rated for better environmental performance by the Master Painters Institute in their Specification Manuals for new work and for repainting and refinishing.
- Specify water-based paint for plaster and gypsum board substrates. Water-based paints have seen considerable improvement in performance in the last 15 years. MPI acrylic paints will match the performance of alkyd paints except for extreme scrubability requirements such as might be applicable for some areas of health care facilities.

**Adhesives:**

- Specify low or no volatile organic chemical (VOC) products, available in a wide range of price and quality, for the installation of carpet and resilient flooring. Refer to the Alberta Infrastructure carpet and resilient flooring specifications for detailed wording.
- Avoid use of epoxy and furan mortar and grout for ceramic tile.
- If odours from adhesives are present after installation, increase building fresh air, weather permitting, for 72 hours to improve dilution.

**Wood Panel Products**

- Particleboard is commonly used in the manufacture of millwork and furniture. It is made with adhesive that emits formaldehyde gas for many years.
- Specify factory sealing of normally concealed, unfinished particleboard surfaces with two coats of a suitable non-toxic, water-based sealer.

**CLEANING PRODUCTS**

Janitorial products should be environmentally friendly and have no strong odours or cause allergic reactions.

**Health and Safety Factors:**

- Look for controlled or moderate pH. Extremely high (alkaline) or extremely low (acidic) pH products are more hazardous than those of moderate pH. Products that are closer to pH7 (neutral) are safer than those with extreme pH.
- Identify hazardous ingredients using the Material Safety Data Sheets (MSDS). In many cases, products containing no Workplace Hazardous Materials Information System (WHIMIS) designated hazardous ingredients are available. Avoid products containing a known or suspected carcinogen.
- Select products that are non-irritating or mildly irritating. If information about this is not available, follow the guidelines for controlled pH.
- Select products that protect against accidental poisoning. Typically, products with a LD (Lethal Dose)<sub>50</sub> above five grams per kilogram are outside the range of accidental poisoning risk. (LD<sub>50</sub> indicates the amount of material, which if ingested, would cause 50 percent of test subjects to perish.)
- Choose non-reactive products. This minimizes the risk of mixing two products that produce a toxic gas, fire, or other dangerous reaction.
- Select products containing the minimum of fragrance and dye needed for safety reasons. Fragrances and dyes can help users differentiate between products by color and smell, thereby reducing the risk of inadvertent product misuse – however, some fragrances may cause allergic reactions.
- Avoid heavy metals, such as lead, cadmium, and zinc, which can cause severe health problems and potentially have a negative effect on the environment.
- Wear appropriate personal protective equipment according to MSDSs and manufacturer's directions.
- Choose products that are non-flammable.

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### **Environmental Factors:**

- Select products whose constituent ingredients have been tested as readily biodegradable, the measure of a product's ability to be reabsorbed into the environment. Most cleaning products – at some dilution and over an extended period of time can be termed “biodegradable”.
- Avoid products with demonstrated aquatic toxicity, indicated by a warning against contact with soil or wildlife.
- Eliminate use of ozone-depleting compounds: chlorofluorocarbons (CFCs) and other chlorinated solvents.
- Consider switching to solvent-free or water-based products. Many solvent-based products contain VOCs which can contribute to smog formation. Instead of an alcohol-based glass cleaner, use one that is detergent-based.
- Use water-based wood and gym-floor coatings, and replace chlorinated cleaning solvents with citrus-oil-based, aqueous, and semi-aqueous products.

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