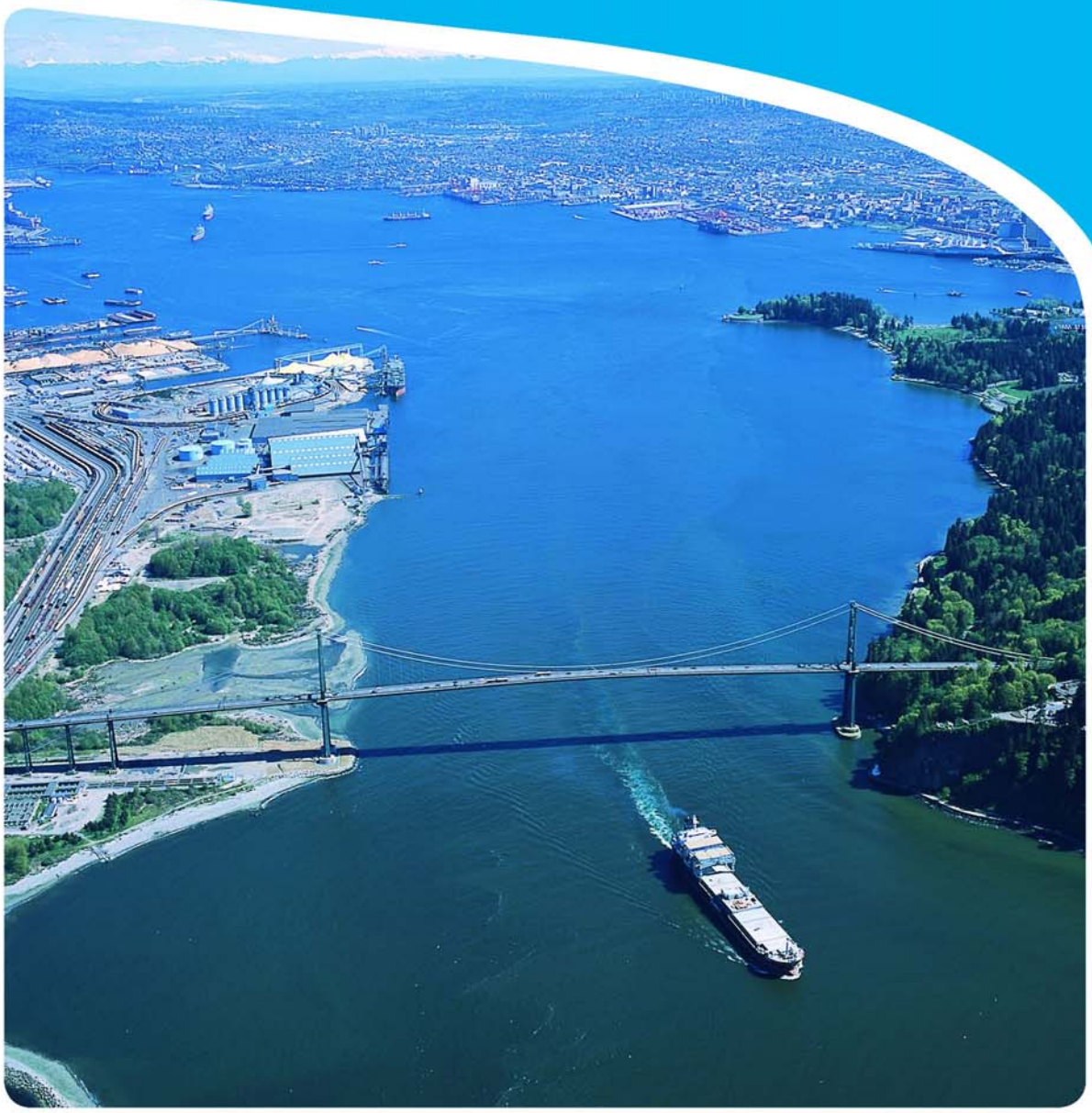
Mould Handling Guidlines



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Purpose
This document details procedures for minimizing workers' exposure to fungal mould when significant contamination is encountered in the ship's hold.

Overview
Mould is part of the natural environment. The word "mould" is a non-scientific term that generally refers to filamentous fungi. Such fungi are often visible as colonies on food and building materials, appearing on close inspection as multicellular filaments called hyphae. Thousands of species of mould exist world-wide, and moulds can be found anywhere, indoors or out, any time of the year. Moulds play an important role in nature by digesting and breaking down dead plant and animal matter. Moulds reproduce by producing tiny spores, just like plants produce seeds. Spores can be spread by air currents, or picked up and brushed off by passing animals or humans. Once these spores settle on a damp spot, they may begin growing and digesting whatever they land on. Mould needs both food and water to survive, and moulds thrive in damp environments.

Common types of moulds include, *Stachybotrys chartarum* (also known as *Stachybotrys atra); Aspergillus sp.; Penicillium sp.; Fusarium sp.; Trichoderma sp. ; Memnoniella sp.; Cladosporum sp.; Alternaria sp.*

Health Effects
The presence of mould does not always mean that health problems will occur. However, for some people the inhalation of, or contact with mould, fragments of the moulds, or spores can lead to health problems or make certain health conditions worse.

In addition, many of these moulds make "mycotoxins". Mycotoxins are metabolites or by-products from the moulds that have been identified as being toxic to humans. These toxins can slowly wear down the immune system and can lead to allergic or respiratory problems.

In general, the most commonly reported symptoms include:

- runny nose or nasal congestion
- eye irritation
- cough or congestion
- aggravation of asthma
- fatigue
- headaches, and
- difficulty concentrating.

Moulds can also make worse the symptoms of allergies including wheezing, chest tightness, shortness of breath as well as nasal congestion and eye irritation. People who are immuno-suppressed, or recovering from surgery are usually more susceptible to health problems from moulds.

Legislation

The Canada Labour Code (CLC), Part II, defines a "hazardous substance" as, "…[a] biological or physical agent that, by reason of a property that the agent possesses, is hazardous to the safety or health of a person exposed to it". Pursuant to the CLC, The Marine Occupational Safety and Health (MOSH) Regulations, PART VIII, Hazardous Substances, requires investigation and assessment of workers who may be endangered by exposure to a hazardous substance, and to control worker exposure in excess of levels set by the American Conference of Governmental Industrial Hygienists (ACGIH) in its publication *Threshold Limit Values and Biological Exposure Indices for 1986-1987*. However, **there are no standards or recommendations for concentrations of mould levels by the ACGIH or any other North American jurisdiction or agency**. Instead, this guideline will employ the principles of hazard recognition and prevention detailed in Part XIX of the Canadian Occupational Safety and Health (COSH) Regulations.

Literature

Much of the available information regarding workplace mould exposure is presented in the context of building contamination and indoor air quality. Moisture intrusion in buildings promotes mould growth, which can introduce spores and mould fragments into enclosed air spaces. Consequently, the literature recommends assessment of contamination levels in the context of indoor spaces, and remediation responses that assume mould will be disturbed indoors.

Response to Mould Contamination

Communication

When report of mould contamination is received, the supervisor will investigate, notify any affected workers, and review with the workers the following:

- Mould grows on organic material, like wood, and is present everywhere
- High moisture levels promote mould growth
- Allergic-type reaction to moulds may occur after inhalation or skin contact
- Workers with respiratory illness, diabetes or suppressed immune systems are at higher risk of adverse health effects
- PPE to prevent inhalation and skin contact is available on request (or if required, depending on level of contamination)
- Care should be taken not to disturb the mould, if possible
- Dust concentrations or dried mould should be misted or sprayed with water before handling
- Workers exposed to moulds should wash their hands and face before eating
- Mouldy material must be disposed of in a bin available for that purpose
- There is a protocol of progressive response, depending on the level of contamination. All response levels involve the safety committee.

Assessment
Visual inspection can determine the level of contamination. **The type of mould that is present does not affect the work procedures that should be followed.** Air sampling for fungal material is not necessary unless the source of mould is unclear, or if specific health concerns are a problem. Similarly, surface testing is unnecessary unless the type of mould must be determined for health reasons. Assessment is based on estimated contaminated pieces and square footage. All assessments must be recorded in writing.

Response

- the primary function of PPE is to prevent inhalation and ingestion of mould and to avoid contact with skin or eyes. The level of PPE protection rises with the level of contamination
- The use of cleaners or biocide is not recommended as dead mould can still cause health problems and cleaners can harm the environment
- Contaminated wood should be disposed in a landfill via regular means, due regard given to minimizing airborne exposure to others (I.e., keeping the disposal bins covered). Contaminated PPE should be disposed of similarly
- Employees must be fit-tested for respirator use.

Protocol

If mould is encountered in a ship's hold in significant quantity, the supervisor in charge will investigate and determine the level of response required as follows:

Level 1, Few (1-10) pieces of dunnage that have some levels of fungal staining (total area less than 10 ft^2). Low levels of contamination include dunnage with small sections of light staining, than does not appear to be "thick" or significantly raised from the wood.

PPE (on request)	Containment	Comments
• N95 disposable respirator • Gloves • Goggles	• Unprotected workers permitted • Regular bins for disposal	Supervisor records details of contamination and response provided and forwards a copy to the safety committee

Level 2, Moderately Contaminated, > 10 pieces of dunnage (10-30 sq. ft.) with low levels of fungal contamination, light or heavy staining, but no surface completely covered.

PPE (required)	Containment	Comments
• N95 disposable respirator • Gloves • Goggles	• Unprotected workers prohibited within 10 ft of contaminated area • Dust suppression. Mist or spray, if required • Covered bins for disposal	Supervisor records details of contamination and response provided and forwards a copy to the safety committee

Example of moderate contamination

Level 3, High Levels of Contamination, numerous pieces of dunnage that have heavy "thick" mould growth on at least one full surface. If only a few pieces of dunnage (< 5) are present with heavy growth, procedures for moderate amounts of contamination should be followed. *(30-100 sq. ft.)*

PPE (required)	Containment	Comments
• ½ face respirators with P100 cartridges • Gloves • Goggles • Disposable coveralls with head coverings	• Unprotected workers prohibited within 10 ft perimeter of contamination • Dust suppression. Mist or spray, if required • Covered bins for disposal • Duct tape at ankles and wrists	As above, but assessment must be in consultation with safety committee member or delegate 10 ft. perimeter to be delineated with tape or signs

Examples of "thick" mould growth on one full surface

Extremely High Levels of Contamination
If fungal contamination extends significantly beyond the dunnage and bulkheads, an assessment should be completed by a qualified individual, and specific work procedures should be developed for each situation.

References

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