

## Common Mold Risks in Shoe Factories: Solutions Exist

### I - Introduction

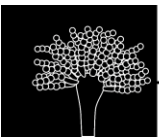
The manufacturing process of shoes involves numerous steps, such as pattern making, cutting, stitching, gluing, baking, nailing, coating, molding, and packaging. Throughout the production process, meticulous attention to various details is crucial to ensure quality control. However, various mold species commonly exist in production environments. Products may become contaminated by mold spores settling from the air, and the operational processes of personnel may also result in contamination as mold spores attach to the product. Therefore, raw materials, packaging materials, equipment used in the manufacturing process, and even building structures are susceptible to mold contamination, leading to mold growth. In summary, raw materials, semi-finished products, and finished products are easily exposed to the risk of mold in an improperly controlled environment.

Based on experiences from the YCM Mold Research Center (MRC), the improper use, storage,

maintenance, or unfavorable environmental conditions of specific materials or equipment can increase the likelihood of mold growth. In the production process, this poses a risk of mold development in the final product. Once mold spores settle or attach, there is a significant chance that visible mold structures will grow during subsequent transportation and storage, raising concerns for quality management.

In the past, brands have encountered mold issues with both raw materials and finished shoes. For this reason, the YCM MRC has occasionally recommended a factory mold risk audit, which involves a thorough analysis of environmental and mold contamination risks to identify factors that may lead to mold growth. This audit serves as a reference for implementing mold-preventive mechanisms in the factory.

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## II • Result

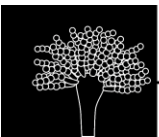
Leveraging years of experience in assessing shoe factories, YCM MRC has identified common visible mold risk

factors (Figure 1). This insight equips factories with actionable information to promptly implement improvements and substantially diminish the risk of mold.



**Figure 1. Common visible mold risks in shoe factories**

a1. Inadequate packaging of raw materials; a2. Accumulation of dust; a3. Utilization of wooden equipment.



### III - Conclusion

The dispersion of mold spores is imperceptible to the human eye. Once these spores settle or attach to the surface of an object, and if the subsequent storage environment is conducive to mold growth, there is a potential for the product to develop mold, impacting its appearance and quality.

Based on YCM MRC's past audit experiences, certain commonly overlooked potential mold risks are prevalent in shoemaking factory environments. For instance, materials, semi-finished products, or finished products in storage should be appropriately packaged and covered to prevent mold spores from settling or absorbing ambient moisture. This prevention is crucial as it serves as the necessary source of moisture for the growth of mold or other microorganisms. In terms of equipment such as fans, dehumidifiers, air conditioners, etc., improper cleaning and maintenance can lead to the accumulation of spores. These spores can easily spread to other areas of the facility through ventilation equipment,

increasing the likelihood of spore settling. YCM MRC has repeatedly observed the presence of *Aspergillus niger*, a prevalent species responsible for mold growth on leather and textile materials, often found in samples collected from fans. Therefore, it is essential to establish an appropriate maintenance mechanism for equipment to prevent spore dispersion and contamination. Another critical factor requiring attention is the use of wooden items. Due to their natural ability to absorb moisture and provide rich nutrients, mold growth on wooden equipment can lead to the contamination of stored items or the surrounding environment.

YCM MRC leverages its professional technology, experience, and an extensive database on mold to assess manufacturing environments and mold risks for factories. It provides immediately actionable improvements for visible risks, establishing a factory-specific mold prevention mechanism to prevent contamination, reduce mold risk, and maintain product quality.