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We Have Mold on the Leather. What is next?

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Leather and Mold

Mold control is needed to protect wet, finished leather and leather articles. Economic impacts resulting from discoloration or staining of leather due to mold can be significant. Also, moldy leather can present a safety issue for leather workers and consumers. Just adding more fungicide to leather is not the solution; additional methods can be used to control it. Effective treatment and prevention programs require a combination of properly applied fungicides and management practices to control environmental conditions in the tannery and the warehouse.

Where do mold spores come from?

Mold spores are everywhere. They are too small to be seen by the naked eye, are easily made airborne, and can be carried over large distances on air currents. Any open surface may be exposed to significant levels of mold contamination. In adverse conditions the spores can be inactive for some time and, once the proper growth conditions are present, they can germinate. In the tannery the mold spores can contaminate wet, crust and finished leathers.

How do we know if the Leather is protected against fungi?

It is very difficult to guarantee that leather is 100% protected against fungi. For wet leathers we use a rule of thumb that has been developed with historical data of a practical/economical amount of actives (ppms of fungicide addition) in the leather and data generated from the 4-week Tropical Chamber results to determine the degree of protection. There are no standards for fungicide dosing (ppm) that will ensure full protection of the leather; however, our dosing strategies are backed by years of experience. Fungicides can be used during tannage and in the retannage.

There is a need for a standard method for crust and finished leathers to ensure an effective, compliant and safe mold protection program (e.g., an ASTM D4576 version for finished leathers).

What to do with moldy wet leather?

When moldy wet leather is identified, immediately isolate all leather that might be affected. Here are some recommendations:

- Collect molded leather and non-molded leather to test for residual fungicide. This data is important for troubleshooting and assessing the need for adjustments to the fungal program.
- Wash the moldy wet leather and treat with additional dosage of fungicide per label instructions as quickly as possible. Some stains might be removed after washing, others not.
- Sanitize the equipment and work area (including walls and floor) to prevent future mold outbreaks.
- Review the fungicide dosages, and adjust if needed.

Wet white leather might be also contaminated with bacteria, andvegetable-tanned leather is susceptible to yeast growth.

Safety note: Follow all facility safety protocols and only use products that are properly registered for their intended use. For safety reasons the fungicides cannot be sprayed. Only a small number of active fungicides are registered and approved for use in leather globally; the use labels restrict how these products can be safely applied.

Safe transport, storage, and handling of fungicides is important for protection of the workers and environment.

Sanitizing surfaces

Sanitization is recommended after mold outbreak and as an hygienic measure to keep surfaces without contamination.

- Use a sanitizer solution as recommended by the label to apply a uniform light coat of the sanitizer on the surfaces. Rinse with clean water.
- Periodically measure airborne spore counts in the work areas after sanitization.

Mold on crust and finished leather

Many variables provide the opportunity for mold to grow on crust and finished leather. The addition of fungicide in retanning and finishing is recommended in place of high moisture and temperature or when conditions for properly handling leather are not available.

Keep leathers properly packed, dry and clean to avoid contamination. In the tannery the leather must be dried well and quickly.

Mold on finished articles

Finished articles are also vulnerable to mold due to excess moisture, transportation and/or storage. There are companies that specialize in cleaning, disinfecting, and refinishing the finished articles.

Problems associated with mold in the leather:

- Discoloration or staining. This is the main contributor for the reduced value of the leather. Some stains
  are almost impossible to remove.
- The loss of fats and fatty material is the biggest chemical change on moldy leather.
- Fats are the main nutrient and carbon source for fungal growth in the leather.
- Odor – production of volatile organic compounds causes odor.

Safety issues with handling moldy leather:

- Some molds produce spores and mycotoxins that can result in allergic reactions, asthma, infections, and serious diseases of the lungs. Workers can be exposed by inhaling spores and toxins into the lungs or ingesting them after directly handling mold-contaminated materials.
- In addition, workers can be exposed to volatile organic compounds released during the metabolic processes associated with mold growth.
- Symptoms can include irritation to the skin, eyes, and nose as well as flu-like symptoms such as wheezing, coughing, fever, fatigue, and difficulty breathing.
- Individuals with allergies, asthma, and other respiratory conditions are at the greatest risk of adverse health effects from mold exposure.
- Employers are responsible for providing a safe work environment for their employees, including protecting workers from the health hazards of mold.
- In addition, quality standards for leather require protection against mold.
- For these reasons, effective microbial control programs are critical in the leather industry.
- This includes good housekeeping practices in storage areas and processing equipment, managing environmental conditions, and effective treatment programs.

European Biocidal Products Regulation Status:

Active substance approvals are pending for Product Type 9 (Leather). The next step in the process is the review of dossiers submitted by commercial applicants by the assigned Evaluating Competent Authority. Upon completion of the review and approval of the active substance, commercial companies can apply for authorization of Products containing the approved Active Substances at the Union level or the National level. Biocidal products containing active substances in the Review Program can be placed on the market (subject to national laws) pending the final decision on the active substance.