

TECHNICAL BULLETIN: 2001.02

Vinyl Coated Fabrics and Pink Staining

Summary:

The effects of microbial growth (including mold and mildew) on upholstery products for marine and other exterior applications have been well documented over the last 25 years. The objective of this Technical Bulletin is to review the causes of this problem and suggest actions to minimize their occurrence and reduce their impact on marine upholstery products.

Background:

Two principal sources of odors and stains are bacteria and fungi, commonly called microorganisms. Bacteria are simple, single-celled organisms. Fungi, which include mold and mildew, can be significantly more complex. A subset of these fungal organisms produces colored by-products as part of the digestive process. These by-products can cause staining and are typically pink, yellow, purple or black.

Four elements are required for mold and mildew growth – spores, a nutrient source, warmth, and moisture. At least one of these elements must be removed to eliminate the problem. The element easiest to control is moisture. Keeping a surface and the ambient air dry can stop mildew growth, but it is very difficult to do in marine environments. Marine upholstery is constantly exposed to rain, splashes and wet bathing suits.

Wind or rain can carry the mold spores, contaminating the surface. Even with regular cleaning, contamination can get into the seams or stitch holes. The vinyl upholstery is only one element of the upholstered construction. Urethane foam of various thicknesses provides the cushion, and the whole seat is usually built on a piece of plywood. If spores carried by rain get inside the cushion, the biological growth cycle can begin. It is quite common for microorganisms growing in the foam cushion to produce colored by-products, the most notable of which is a pink compound. This colored substance is soluble in plasticizer (an ingredient in flexible PVC) and will diffuse and migrate to the vinyl surface. Even though the vinyl compound is protected against mildew growth, pink staining can occur if contact is made with components of a seat that support mildew growth, and this stain cannot be removed by washing.

Precautions:

There are a variety of ways to help mitigate the growth of mildew which can lead to pink staining on marine seating. These actions apply to all components within a boat seat – the total construction.

At the seat fabrication level, every component – foam cushion, padding, wood, thread, upholstery – of the seat needs to be formulated or treated with adequate and efficient antimicrobial additives. All **Nautolex**[®] upholsteries, including **Nautolex** upholstery with **PreFixx**[®] Protective Finish, contain a proven antimicrobial agent in sufficient quantities to provide years of mildew-free use – when constructed using best practices and regularly cleaned and maintained. Seams should be watertight. Seats must be constructed so that the foam cushion does not become saturated with water and dries quickly if it does get wet.

Once in use, upholstery should be frequently, and properly, cleaned with special attention given to crevices and seams, where dirt and water can be trapped. Frequent cleaning with a mild detergent should remove organic matter, dirt or debris which can be a food source for microorganisms. Any observed mildew contamination should be immediately removed by washing with a diluted solution of household bleach in water. All **Nautolex** upholstery with **PreFixx** Protective Finish can be safely cleaned with household bleach/water solution (1:5) without risk to the finish or color. Rinse and dry thoroughly after use.

Upholstery should be kept covered, if possible, when not in use.

These recommendations, when diligently applied, can greatly minimize the occurrence and impact of pink staining on marine upholstery products.

References:

Chemical Fabrics & Films Association, Inc.

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