Antimicrobials: What they are and types

An antimicrobial is an agent that is toxic to, or inhibits the growth of, microorganisms such as bacteria and fungi. Antimicrobial agents come in the form of chemicals, including nanoparticles and heavy metals, that are added to products during formulation or as an after treatment.

Common types of treatments used in interiors and furnishings include chemical agents (such as benzo- and methyl-isothiazolinone); metals and metal ions (such as silver, copper, and zinc-based) and nanoparticle versions of these formulations. Antimicrobial agents may be added to surface materials to target bacteria and fungi (but generally not viruses); for anti-odor, anti-stain and anti-mildew purposes, and to protect the product from degradation by microorganisms.

Antimicrobials are, by definition, pesticides

Because the purpose of antimicrobial additives is to control or kill a target organism, they are defined as pesticides. In the United States, the Environmental Protection Agency (EPA) regulates antimicrobial agents used in building products under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA defines a pesticide based on the function the substance provides to a product. The EPA differentiates products incorporating these ingredients based on whether the product aims to protect the public from germ-caused illness (ie., products making a health claim), or whether the agent is added as a preservative for the product itself (ie., a 'treated article' exemption).

This distinction is an important one, because a manufacturer making a health claim about an antimicrobial product must abide by strict advertising protocols. Conversely, manufacturers of treated articles are free to advertise as they see fit, as long as they refrain from making a health claim. Furnishings and textiles containing antimicrobial additives are often classed as "treated articles," and thus can only make claims related to preserving the product. Some products can claim to reduce the surface's colonization by microbes, but these claims must be backed by strong peer-reviewed evidence before health claims could be cited. To date, there are no major studies to support reduced human infection rates for furnishings textiles treated with antimicrobials.

A lack of evidence on health benefits

There is currently no evidence that incorporating antimicrobial additives into interior and furnishing products will reduce human infection or make people healthier. The Centers for Disease Control and Prevention (CDC) concluded in 2003 that antimicrobial additives are an unnecessary component of a hospital's infection control program. The CDC's guidance on infection control states the health of all patients is best ensured through the maintenance of building engineering (HVAC) systems and proper cleaning and disinfecting practices.

Practice Greenhealth, whose recently updated Healthier Hospitals guidance (v2.3, March 2020) recommends avoiding the use of anti-microbial products in hospitals, states: "With rare exceptions, very few data support the use of antimicrobials in furniture as a means of helping reduce healthcare-associated infections (HAIs). [. . .] Moreover, the presence of antimicrobials in furniture may lead to a false sense of security and result in less stringent infection control practices."

The human and environmental impacts of added antimicrobials

While there is little evidence of benefit to human health, there is growing evidence to support that the use of antimicrobials poses risks to human health and the environment. Widespread use of these substances has become associated with a form of microbial resistance known as superbugs. This can happen when antimicrobial agents are used to control target organisms, but do not kill all of the microbes. The survivors go on to develop resistance, and at times immunity, to the antimicrobial and become harder to kill.

Evidence demonstrates that antimicrobial additives can leach from products and find their way into wastewater systems and the larger environment, causing as-yet-to-be fully understood ecological impacts. Aquatic and mammalian toxicity to heavy-metal based antimicrobials have been documented.

In addition to the possibility of superbug creation and impacts on the environment, a number of the active agents used to create antimicrobial treatments have been linked to human health impacts. These include: endocrine disruption, carcinogenicity, reproductive and developmental toxicity, and skin and respiratory sensitization.

The Florence Statement, a consensus document released by a global group of scientists and doctors, urges manufacturers and users to "evaluate the safety of antimicrobials and their transformation products throughout the entire product life cycle, including manufacture, long-term use, disposal, and environmental release." Given the human and environmental impacts that these pesticides carry, their ability to leach out of the products in which they were incorporated, and indications that they contribute to antibiotic resistance, it is difficult to justify using these products in interior environments when there is concurrently little health benefit demonstrated.

Designtex POV

Based on the available evidence, Designtex has been actively removing antimicrobial additives from our standard product offering since 2015. We advise our clients on the selection and use of alternative materials that can contribute to a healthy interior, including our range of highly cleanable products that are appropriate for healthcare and high-performance settings. We have redoubled our research efforts around cleaning and disinfection for our products in order to offer resources on the compatibility of our materials with a range of EPA-approved disinfectants and cleaning agents, including those that target SARS-Cov2 (COVID-19; novel Coronavirus).

If customers wish to pursue an antimicrobial treatment for a specific end use, optional finishing may be arranged on some products. Designtex will provide transparent information on available treatments, but will not make any health claims, and stands by the above position that cleanable, disinfectant-compatible surfaces are the preferred route for combating germs on materials.

Sources

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