

Preservatives and advocacy for
preservation of formulated
adhesives and sealants

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Why
terminology is
important

Biocide

Preservative



preservative

/prɪˈzəːvətɪv/

noun

plural noun: **preservatives**

a substance used to preserve foodstuffs, wood, or other materials against decay.
"salt has been used for centuries as a preservative"

Preserving things is good – Killing things is bad!



biocide

/ˈbɪəsiɪd/

noun

plural noun: **biocides**

1. a poisonous substance, especially a pesticide.
2. the destruction of life.

Preservatives - definition



The term “preservatives” refers to the functional name for a wide variety of compounds that help slow or prevent bacterial growth in a wide range of products.

These compounds can be natural or synthetic. Preservatives play important roles in many products people use every day – for example, by helping prevent the growth of harmful microorganisms and protect products from spoilage or contamination.

The development and cost of preservatives



Over the years, scientists have developed chemical agents - known as antimicrobial agents, biocides or preservatives - to combat the growth and proliferation of harmful microorganisms in various industrial applications



A substantial amount of money is lost every year due to microbiological contamination of adhesives and sealants in their manufacturing facilities. Since contamination by microorganisms can occur at various points before, during and even after manufacture, early use of an effective preservative is essential.

The fate of small biocide companies

Anti-innovation?



BIOCIDAL PRODUCTS CONTAIN ACTIVE INGREDIENTS THAT ARE USED TO **PROTECT** PEOPLE AND ARTICLES AGAINST PESTS OR BACTERIA AS AND WHEN NEEDED.



THE BIOCIDAL PRODUCTS REGULATION (BPR) PUTS THE ONUS ON COMPANIES TO GENERATE DATA PROVING THAT THE SUBSTANCE OR PRODUCT THEY WANT TO SELL IS SAFE AND EFFECTIVE



IT HAS TAKEN MANY SMES BY SURPRISE HOW COSTLY AND TIME-CONSUMING THIS PROCESS REALLY IS. 'I THOUGHT IT WOULD COST US HALF AS MUCH AS IT HAS,' ONE SME ADMITTED



INDUSTRY REPORTS HAVE FOUND THAT THE AVERAGE COST FOR A PRODUCT AUTHORISATION UNDER THE BPR IS THREE TIMES HIGHER THAN IT WAS UNDER ITS PREDECESSOR LAW, THE BIOCIDAL PRODUCTS DIRECTIVE (BPD)



THE LAW'S DATA REQUIREMENTS ARE MUCH MORE RIGOROUS THAN THOSE UNDER REACH. THEY INCLUDE, FOR EXAMPLE, INFORMATION ON EFFICACY AND THE IMPACT ON NON-TARGET ORGANISMS.



MEMBER STATE AUTHORITIES AND ECHA CHARGE UP TO HUNDREDS OF THOUSANDS OF EUROS TO EVALUATE AN APPROVAL APPLICATION

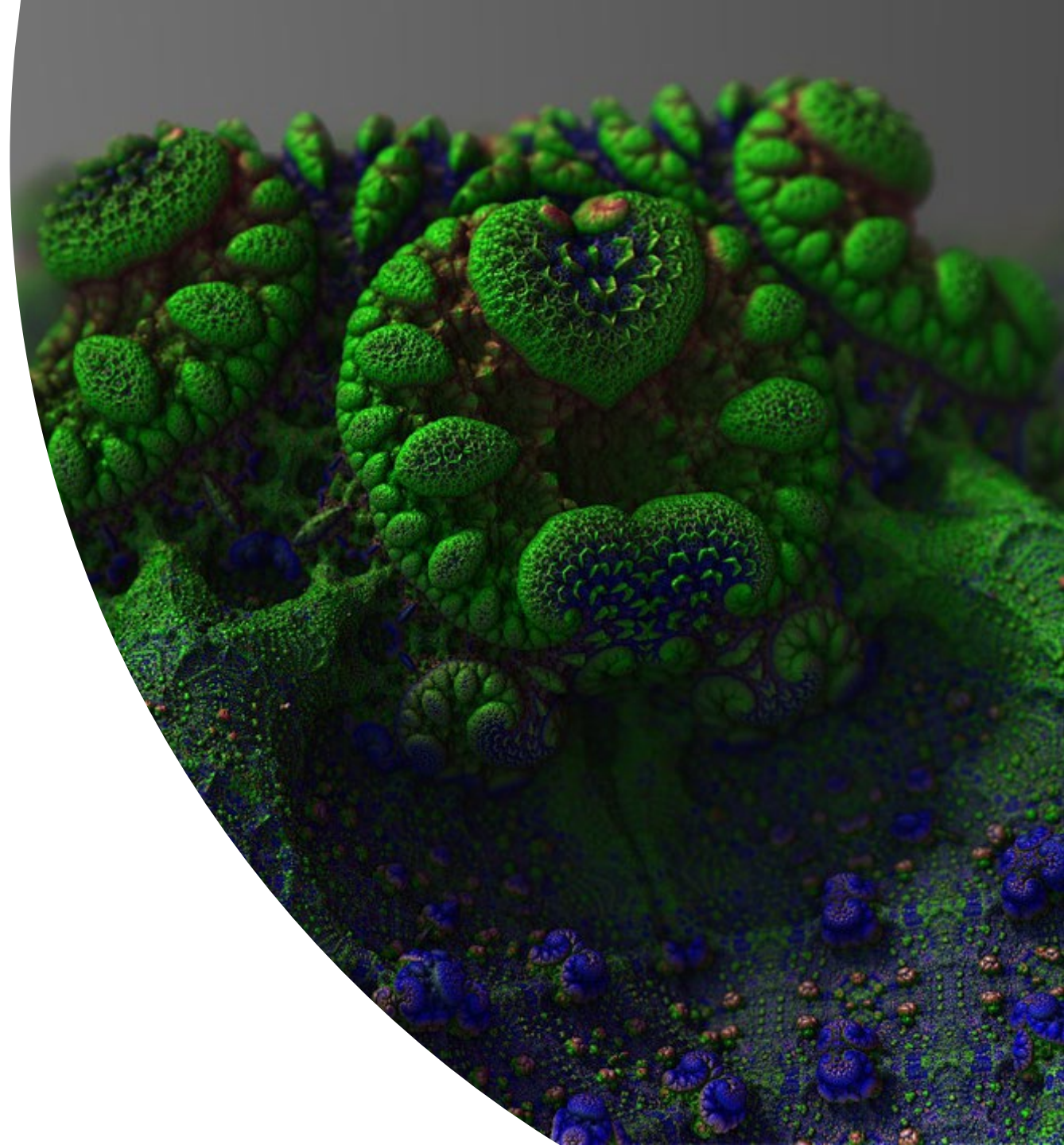


SMES, WITHOUT THE IN-HOUSE RESOURCES TO HANDLE IT, ARE USUALLY FORCED TO HIRE A CONSULTANCY TO SUBMIT THEIR APPLICATION BECAUSE THE PROCESS IS TOO COMPLEX

Microorganisms!

Microorganisms can breakdown adhesive or sealant products before their service life is complete or, in some cases, even before their service life has even begun. These microorganisms include bacteria, fungi, yeast, and mould.

Microorganisms exist everywhere **especially where water and appropriate nutrients are available for their growth and survival.** They **thrive primarily at 20°-30°C and high humidity.**



Given their relatively simple needs for life, microorganisms can attach and grow in many adhesive and sealant products that contain water or naturally-based ingredients. Good source of food include:



Starch



Dextrin



Cellulose



Animal fats, and



Vegetable oils



Polymers that contain aliphatic hydroxyl and ester groups

Polycaprolactone
Polyester-based urethanes, and
Biopolymers

The Challenge

Formulation additives are a nutrition source and become the focus of any biological attack

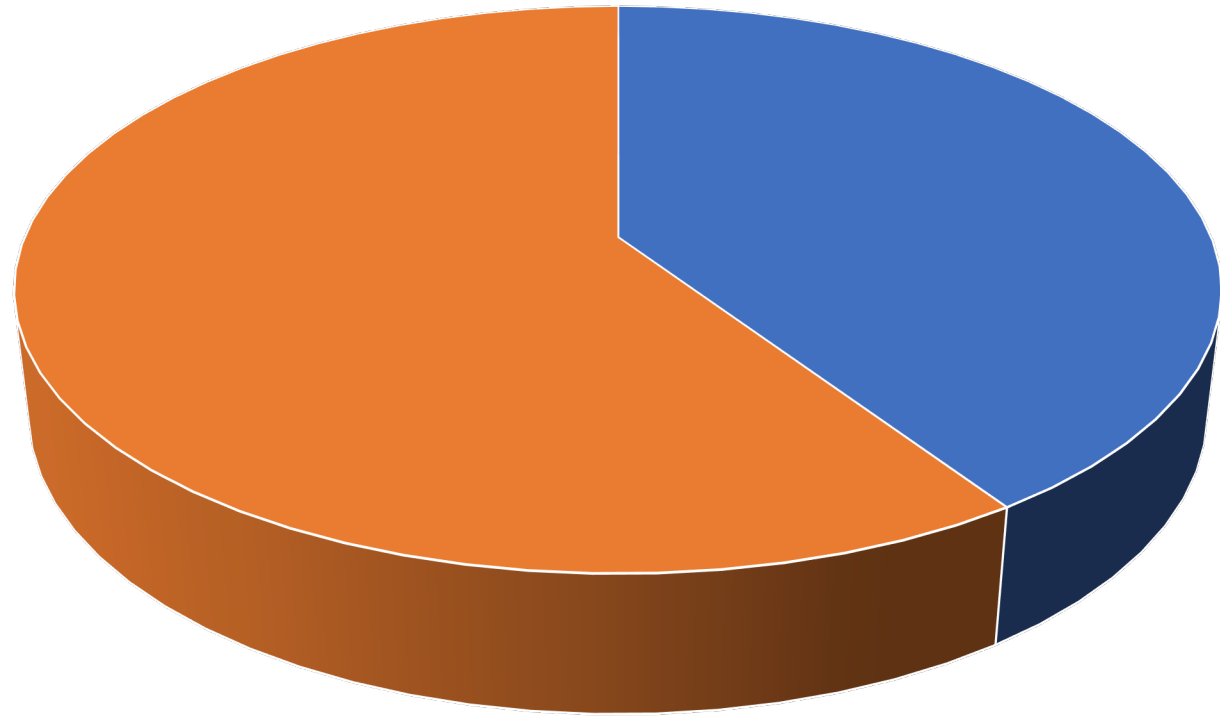
- **When the adhesive or sealant is in liquid form.** The microbes can feed off the moist environment and nutrients supplied by additives and raw materials.
- **After the adhesive or sealant is applied and cured.** Microbial attack can occur on the finished surfaces of the polymer film.

Microbial contamination can manifest itself in a number of ways. There are **primarily two stages** in which microbial infection can become dominant:

Uncertainty and High Information Demand!

Functionality

- Prevention of infestation
- biocide-free systems



A world without preservatives

Bacteria can double population in 20 minutes

Unpleasant odours

Loss of product consistency and colour

Mould and bacterial growth that could lead to human infection and allergies

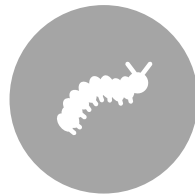
Product spoilage at manufacturing facility leading to loss of production

Increase in solvent based products conflicting with atmospheric emissions

The criticality of Preservation



Antimicrobial products are critical to ensuring longer shelf lives and protecting buildings and infrastructure from pests and microbial damage.



Many A&S are treated with in-can preservatives, with a smaller amount treated with dry-film preservatives. Water based A&S in particular, could not exist without the use of biocides as in-can preservatives.



The latex emulsions and aqueous bases used to manufacture WB A&S provide the perfect combination of food and water essential for microbial growth.



Without biocides, WB A&S would fail in storage, typically presenting a loss of viscosity, malodour and product breakdown.



Untreated WB A&S formulations can produce sufficient microorganism growth generating gases that can potentially cause container failure.



Antimicrobial preservatives therefore are crucial not just to product preservation, but to product safety.

Protection of Construction products



WB products are more prone to contamination from bacteria, yeasts and fungi because microbes flourish in wet environments. Biocides therefore have become even more important to preserve most critical building materials, including concrete, wood, drywall, and asphalt shingles.



Many construction projects involve concrete additives or admixtures, which rely heavily on biocidal products. For example, because lignosulfonate solutions (used as plasticizers in making concrete) are highly susceptible to bacterial and yeast contamination, it is not uncommon for inadequately protected drums of this material to explode as a result of carbon dioxide build-up from yeast fermentation. Preservation with appropriate biocides inhibits this build-up, protecting product integrity and worker safety.



Preservation with biocides also prevents the early failure of many construction materials while in service. For example, regions with high heat and humidity much of the year take their toll on many building materials, especially roofing shingles. However, by incorporating biocides during manufacture, shingles maintain their appearance and integrity for significantly longer periods of time than those left untreated. Extending the useful life of these products not only helps conserve manufacturing resources and energy, but also plays decreases waste streams destined for landfills. Biocide use is essential in reducing unnecessary construction materials' deterioration and waste generation.



Biocides constitute some of the smallest inputs to the manufacture of construction materials, their value is enormous.

Loss of effective tools

The **Biocide Product Regulation** is gradually phasing out effective tools without considering their benefits and the impact that these decisions may have on economy.

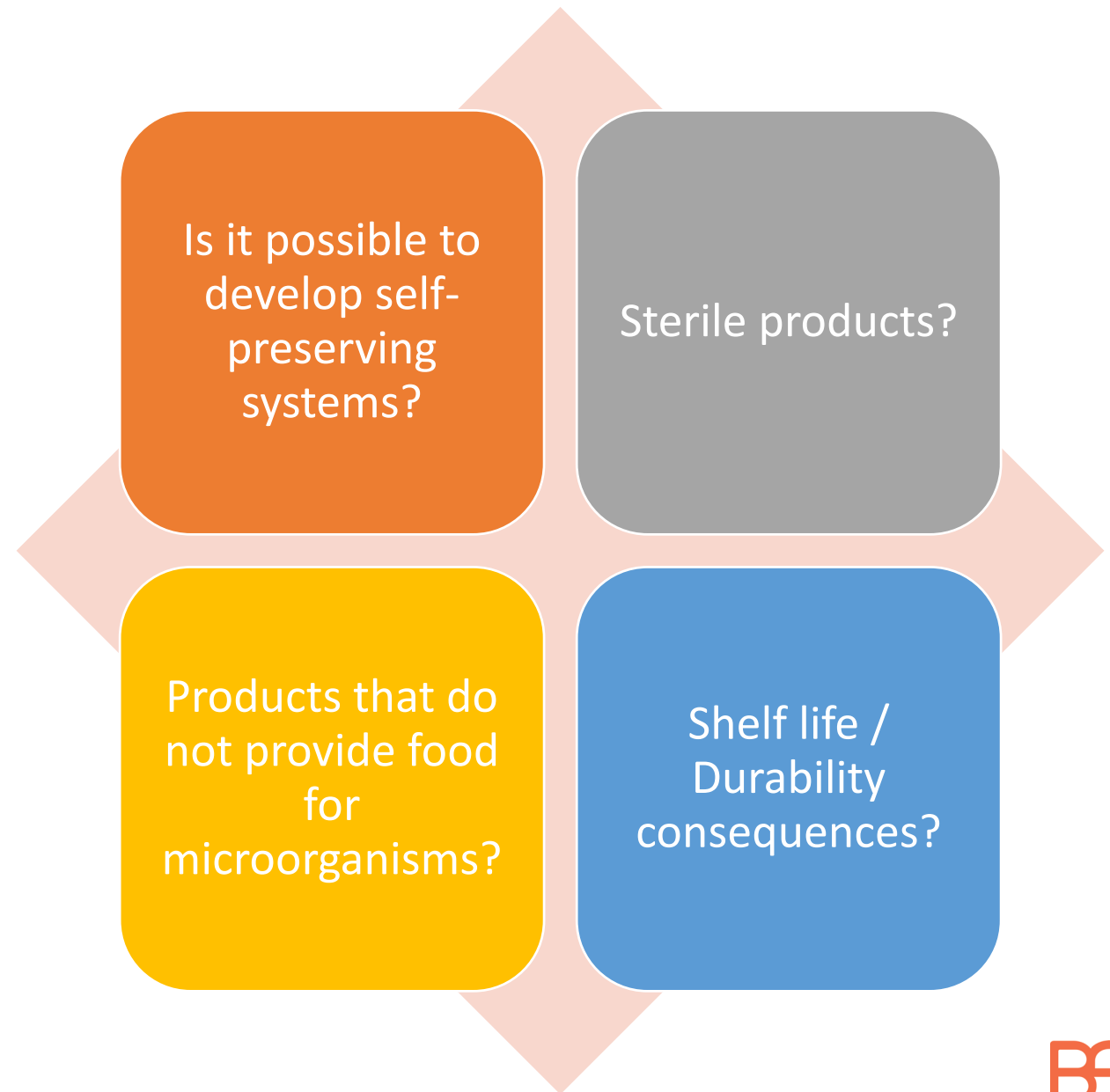


In a **position paper**, the German associations VdL, Deutsche Bauchemie, and IVK have only recently emphasised that on behalf of labour and consumer protection a **holistic view** of the preservation of environmentally and health friendly products is mandatory.



According to the paper, there is an acute danger that due to isolated analysis all eligible preservatives will be limited in their application to an extent that effective preservation of water-based products will no longer be possible.

Innovation



Conclusion

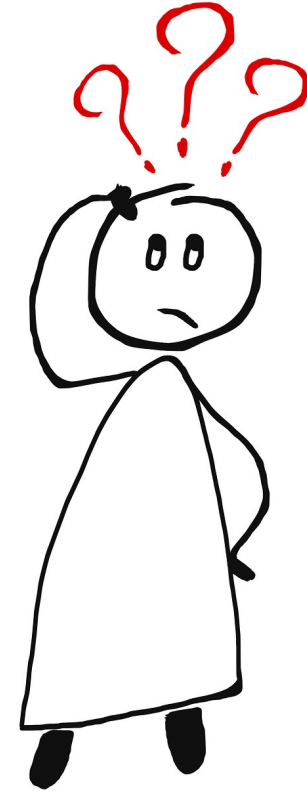


- A&S Manufacturers need to retain a selection of biocide/preservation options
- Raw Material suppliers may start to add more biocide and label to ensure protection and expect their customers to deplete below the labelling limit
- As the EC is not adopting a holistic approach, the expectation is that the available biocides that can be used below a labelling limit will continue to decrease

Or – we all label

People still buy and use home cleaning products!





Thankyou for your attention

Any Questions?

