Modern cleaners

Elevating metal pretreatment for sustainable industrial cleaning

General Metal Finishing

Cleaning Stripping Pretreatment

atotech.com



mks | Atotech

Modern cleaners, the breakthrough in industrial cleaning technology

2-Component concept:

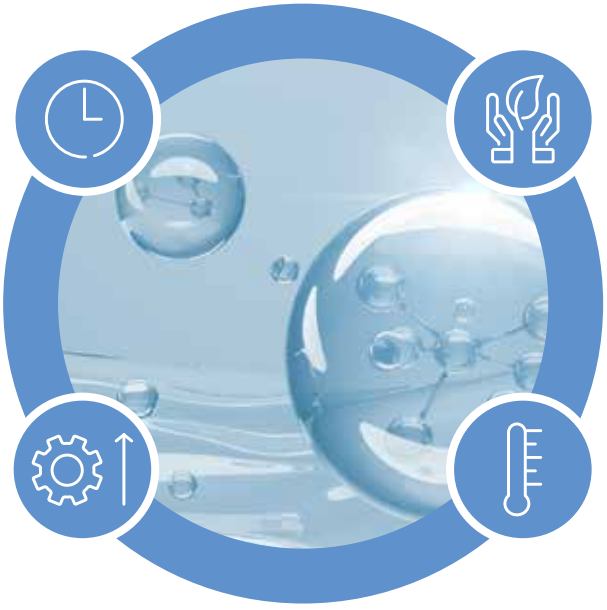
The innovative 2-Component concept combines compatible additives and builders for optimized performance. Customizable formulations cater to diverse cleaning needs, offering versatility and efficiency.

Extended bath life:
Advanced formulations in Modern cleaners facilitate an extended bath lifespan.

Prolonged bath life reduces maintenance frequency and waste generation.

High performance:
Modern cleaners deliver exceptional cleaning performance, ensuring thorough removal of contaminants.

High efficacy guarantees superior results, enhancing operational efficiency.



Sustainable raw materials:
Utilization of degradable raw materials in Modern cleaners promotes sustainability.

Ingredients sourced responsibly to minimize environmental impact.

Low temperature cleaning:
Modern cleaners operate at lower temperatures, reducing energy consumption.

Decreased temperature requirements contribute to lower carbon footprint.

Modern cleaners embody sustainability, efficiency, and high performance in industrial cleaning. By embracing these innovative solutions, industries can achieve cleaner operations while reducing environmental footprint and costs.

Modern cleaners redefine efficiency and environmental responsibility

For common industrial metal surface cleaning, alkaline aqueous cleaners dominate pretreatment. A diverse array of cleaner types caters to various cleaning needs, including immersion soak cleaners, emulsifying agents, displacement (also known as de-emulsifying or rejecting), electrolytic cleaners, spray cleaners and ultrasonic cleaners.

These cleaners are formulated through a combination of builders, surfactants, and additives, each contributing to the cleaner's efficacy, with synergistic effects enhancing overall performance. They typically utilize builders such as hydroxides, carbonates, silicates, phosphates, and borates, alongside surfactants categorized as non-ionic, anionic, amphoteric, and cationic, and additives including chelators, reducing agents, solvents, dispersants, inhibitors, amines, sulfates, and chlorides. They are commonly provided in the form of a powder all-in-one, liquid all-in-one or additive packages, necessary to provide versatility when meeting cleaning requirements.

Identified issues with conventional cleaners prompted a shift towards environmentally friendlier pretreatment products, which prioritize minimizing environmental impact. MKS' Atotech developed Modern cleaner toolbox products that combine a cleaning additive package with a builder package that can also utilize auxiliary equipment to increase efficiency. These Modern cleaners aim to avoid undesirable chemicals, lower chemical usage, utilize readily available raw materials, reduce bath temperatures, prolong bath lifetime, minimize wastewater discharge, and simplify wastewater treatment processes, thus paving the way for more sustainable pretreatment practices.

A 2-Component concept for better product formulation and economics

The Modern cleaner 2-Component concept represents a game-changer in the realm of industrial cleaning solutions. By segregating builders and certain additives, it greatly minimizes the risk of chemical interactions and enhances product stability. Our innovative approach maintains the advantages of liquid products, such as easy handling, enhanced safety for users, and improved formulation flexibility. By increasing the concentrations of additives, we not only minimize manufacturing and container costs but are also able to reduce process costs. Furthermore, it leads to a reduction in products shipped, stored, and used, contributing to both economic and environmental sustainability.



An approach to sustainable cleaning formulations

In assessing conventional cleaners, issues related to formulations containing substances of concern have surfaced, highlighting significant environmental implications. The selection of raw materials profoundly affects the environmental footprint of cleaning and pretreatment products. When employing formulations containing harmful chemicals repercussions can be severe, ranging from increased exposure risks to employees, direct environmental harm, and the necessity for specialized wastewater treatment. Furthermore, high chemical concentrations exacerbate pollution levels, while elevated operating temperatures contribute to higher energy consumption and waste production. At MKS' Atotech, prioritizing minimal environmental impact is integral to product development, with a focus on optimizing formulations to mitigate environmental harm.

While complete avoidance of undesirable chemicals may not always be feasible, efforts are directed towards minimizing their presence whenever possible. MKS' Atotech opts for raw materials that are not listed as current or anticipated substances of concern.

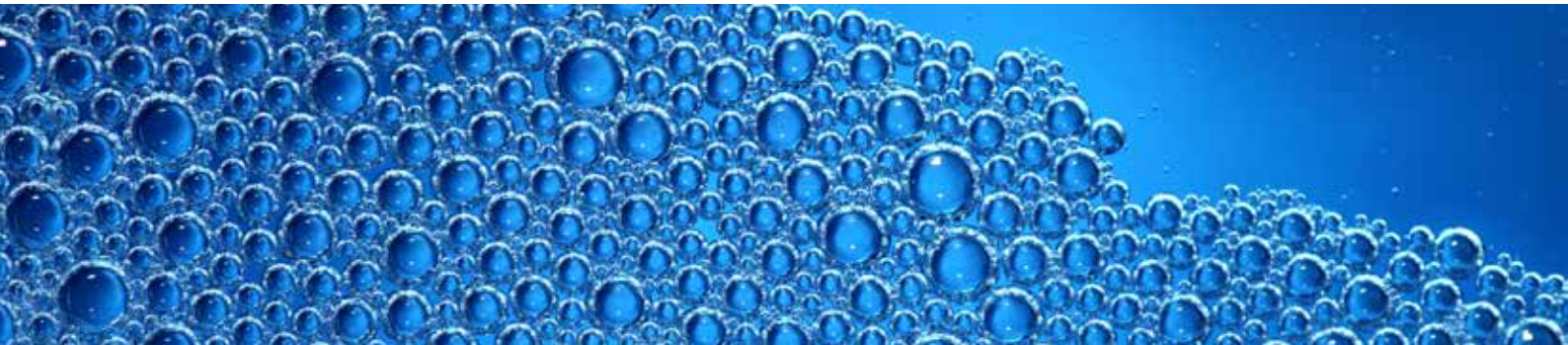
Commonly identified undesirable chemicals include CMR substances, NPEs (nonylphenol ethoxylates), APEs (alkylphenol ethoxylates), surfactants with limited biodegradability, amines, hard chelators and complexers, boron compounds, phosphor compounds, nitrates, and nitrites, highlighting the need for vigilant selection and formulation practices to ensure environmentally responsible pretreatment processes.

When formulating Modern cleaners, MKS' Atotech focuses on selecting raw materials that are readily accessible and sustainable. The builders and additives used are globally available and guarantee long-term availability, ensuring a steady and dependable supply chain.

Low temperature cleaning redefines efficiency and sustainability

Traditionally, industrial cleaners, particularly soak cleaners, rely on high bath temperatures to ensure effective cleaning within short processing times. This high temperature approach is typically required to balance key factors influencing cleaning performance, including chemistry formulation, concentration, short processing times for high throughput, and the absence of agitation of parts or the solution. The utilization of high bath temperatures serves as a compensatory measure for any deficiencies in these factors.

The emergence of low temperature Modern cleaners presents a significant breakthrough in industrial cleaning technology. Despite operating at lower temperatures, these cleaners maintain equivalent cleaning efficiency, ensuring thorough removal of contaminants from metal surfaces. Remarkably, they boast identical cleaning times compared to traditional cleaners. Furthermore, low temperature Modern cleaners demonstrate comparable performance in terms of reject rates, highlighting their reliability and consistency in delivering high-quality results. By reducing energy consumption and environmental impact while upholding performance standards, modern low temperature cleaners offer a sustainable and cost-effective solution for industrial cleaning applications.





Strategies for extending cleaner bath lifespan in industrial operations

Extending the lifetime of a cleaner bath is crucial for maintaining efficient and cost-effective cleaning processes in industrial settings. Numerous factors influence the lifespan of the bath, with contamination levels and the volume of parts processed over time being key determinants. Conventional cleaner degreasers often struggle with a short solution life, primarily due to the organic soils introduced during the cleaning process. This limitation poses various challenges for applicators, including declining cleaning performance over time, increased waste for disposal or treatment, higher chemical expenses, and elevated maintenance needs.

Robust Modern cleaners promote the natural degradation of organic soils removed and emulsified during the cleaning process. By exhibiting exceptional oil capacity, they significantly extend the lifetime of the bath. This longevity translates into minimized downtime and reduced maintenance costs, facilitating uninterrupted productivity and efficiency in industrial operations.

Utilizing UniPrep ISOtect, a specialized equipment which is designed to enhance the efficiency of oil degradation plays a significant role in extending bath longevity by mitigating contamination buildup. The equipment is particularly effective in high oil loading applications when used alongside Modern cleaners long-life cleaning processes. While the formulation of cleaners, particularly the inclusion of builders, plays a role in this process, the primary influencers are the additives utilized.

Features and benefits

- Reduced environmental impact
- Compliance with environmental and health regulations
- Low temperature operation with high energy efficiency, saving costs
- Superior cleaning performance for improved cleaning results and quality
- Product versatility for various applications and substrates
- Long-term viability and resource preservation
- Simplified inventory management and application customization

UniClean® A101 | B201

Introducing UniClean A101 and UniClean B201, our first Modern cleaner toolbox products that revolutionizes industrial cleaning by implementing a whole new level of sustainability and efficiency. Our Modern cleaner system comprises an additive package UniClean A101 and a builder package UniClean B201, both steering clear of undesirable chemicals, such as phosphates, hard chelators, and amines. It operates at ultra-low temperatures, remarkably reducing energy consumption and CO_2 emissions.

By optimizing both product formulations with compatible additives and raw materials, utilizing specific newer substances, our medium alkaline cleaner process can operate as an emulsifying immersion soak cleaner and is also suitable for ultrasonic applications.

Possessing advanced oil degradation, long life and conductivity control compatibilities at ultra-low temperatures, this sustainable cleaner delivers outstanding cleaning performance with extend bath lifetime. The cleaner combination is extremely versatile and adaptable, catering to a wide range of application needs and metal substrates such as steel, stainless steel, copper, brass, and zinc. With the ability to combine UniClean A101 and UniClean B201 in different ratios and concentrations, these highly concentrated cleaning products offer both flexibility and cost-effectiveness.

Features and benefits

- Medium alkaline cleaner process with emulsifying immersion soak and ultrasonic capabilities
- Safer and eco-friendly cleaning processes, free of undesirable chemicals
- Operate at ultralow temperatures for reduced energy consumption and CO_2 emissions
- Multi-functional cleaner products suitable for diverse cleaning applications
- Superior oil degradation capabilities extend the lifespan of cleaning baths
- Minimized downtime and maintenance costs optimize operational efficiency
- Suitable for various metal substrates like steel, zinc, brass, and copper

Positive environmental impact and cost savings

	Conventional cleaner at 65 °C	UniClean A101/B201 at 35 °C	Difference	Savings
Total power required	2,396 kWh/week	610 kWh/week	1,785 kWh/week	75% energy needed
Cost of heating	527 €/week	134 €/week	393 €/week	75% less cost of heating
Related CO_2 emission	629 kg CO_2/week	160 kg CO_2/week	469 kg CO_2/week	75% less CO_2 emission
Total power/year			85,698 kWh	
Energy cost savings/year			18,853 €	@0.22 €/kWh
Reduced CO_2 emissions/year			22,492 kg	

End markets and industries MKS serves



Automotive



Sanitary



Heavy machinery



Construction



Household appliances



Energy

© Atotech 05/24