

NEWS on diagnostics

2021 Special Edition - Sustainability



Working and manufacturing in a 'greener' manner, isn't just about finding alternatives to banned or restricted chemicals. It also refers to sustainability in terms of reduced packaging, waste minimization and inventory management. This volume of News on Diagnostics highlights some of the initiatives that we have available to help you reach your Greener Goals.

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- **Detergents: alternatives to NPE and OPE**
- **Biocides**
- **Filtration**
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Detergents

Detergents, such as sodium dodecyl sulphate (SDS), Triton™ X-100, and CHAPS, are surface acting cleansing agents effective in solubilizing hydrophobic molecules. Generally, these are water-soluble agents comprised of a hydrophobic portion, usually a long alkyl chain, attached to hydrophilic or water solubility enhancing functional groups. These chemicals are periodically monitored for health and environmental effects, which sometimes results in the identification and subsequent phase out of noxious substances.

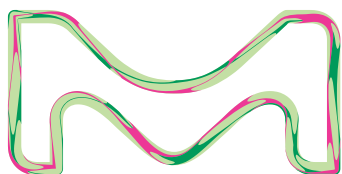
OPE/NPE and REACH Regulation

Many diagnostic assays including lateral flow use OPE/NPE detergents (e.g. Triton™ X-100, etc). OPE and NPE substances were included in REACH Annex XIV on June 14, 2017. The REACH Annex XIV Sunset date was January 4, 2021. After this date, OPE and NPE products cannot be used, unless authorisation was granted by the authorities or the intended use is exempted from authorisation. Important exemptions are the use in scientific research and development, or the use as an intermediate.

While OPE and NPE availability is not affected in the short term, the development of new products using these substances is NOT advisable. Therefore, you are encouraged to evaluate alternative detergents in your development process.

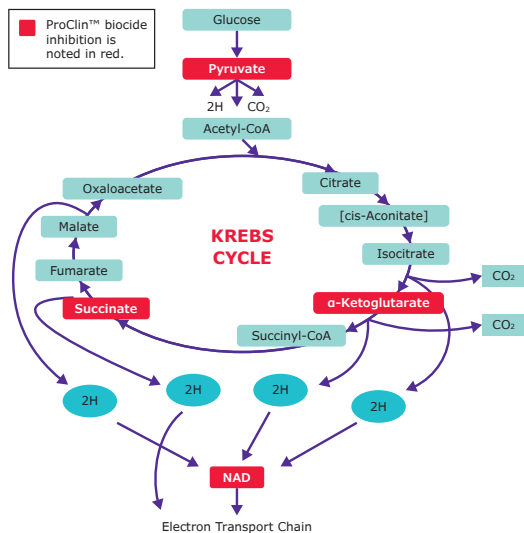
For more information on this important topic, you can visit [SigmaAldrich.com/detergents](https://www.sigmaaldrich.com/detergents), where you will find our application note on OPE/NPE alternatives.

We offer a broad range of biological detergents and surfactants including anionic, cationic, zwitterionic, non-ionic detergents, and anti-foaming agents to meet your research and manufacturing needs with guidance for greener alternatives.



Better Biocide Preservatives

Classic biocide preservatives like thimerosal and sodium azide are being phased out, having been identified as health and environmental hazards. Fortunately, there is an exceptional greener replacement with ProClin™ preservatives. ProClin™ preservatives are among the most effective biocides in the IVD industry, used in over 1,000 FDA registered IVD kits from industry leading diagnostic manufacturers. At low working concentrations, ProClin™ preservatives help extend the shelf life of IVD reagents by effectively and immediately inhibiting a broad spectrum of microbes.



ProClin™ biocides attack the Krebs cycle at four key points: the enzymes pyruvate dehydrogenase, α-ketoglutarate dehydrogenase, succinate dehydrogenase, and NADH dehydrogenase. Because all bacteria and fungi possess at least part of the Krebs cycle, they are broad spectrum in their activity.

Visit our page at SigmaAldrich.com/proclin to download the study from an independent lab which shows equivalent or improved efficacy of ProClin™ preservatives, when compared to top alternatives like thimerosal and sodium azide.

Features of ProClin™ Preservatives

Feature	ProClin™ 150	ProClin™ 200	ProClin™ 300	ProClin™ 950
Active Ingredient (A.I.) %	CMIT/MIT (1.5)	CMIT/MIT (1.5)	CMIT/MIT (3)	MIT (9.5)
Bactericide	++	++	++	++
Fungicide	+	+	+	+/-
Stabilizer	23-25% Mg salts	3% Mg and Cu salts	Alkyl Carboxylate (salt-free)	None
Matrix	Water	Water	Modified glycol	Water
Working pH Range	2.5 - 8.5	2.5 - 8.5	2.5 - 8.5	2 - 12
Temperature Range	< 45 °C	< 45 °C	< 45 °C	< 90 °C
Typical Dosage Levels (W/W) (9 - 15 ppm A.I.)	0.06 - 0.10% (9 - 15 ppm A.I.)	0.06 - 0.10% (9 - 15 ppm A.I.)	0.03 - 0.05% (9 - 15 ppm A.I.)	0.05 - 0.10% (50 - 150 ppm A.I.)
Specific Gravity	1.20	1.02	1.03	1.02
Shelf Life	2 years	18 months	3 years	3 years

If you're unsure which ProClin™ product is best for your application, request a sample at SigmaAldrich.com/proclinsample

Reduced Lab Plastic Waste with Stericup E® Filters

Stericup® E and Steritop® E systems are funnel-less filter products for use in the sterile vacuum filtration of aqueous solutions such as tissue culture media and buffers. The two new formats (38 mm and 45 mm thread-compatible connector) are designed specifically for direct attachment to all commercially-available media and buffer bottles.



Eliminating the funnel greatly reduced the plastic content of the system; beyond improved sustainability, the smaller device results in a significantly reduced footprint both in storage and biohazard waste disposal. All systems contain 0.22 µm Millipore Express® PLUS polyethersulfone (PES) membrane for maximal flow rate with minimal protein loss or denaturation. The Steritop® system has a standard threaded 45 mm connection and does not include a bottle. Stericup® and Steritop® systems are sterile and non-pyrogenic.

Stericup® E and Steritop® E sterile filtration—evolved with an eco-conscience

- Filter design reduces your lab's environmental impact
- Reduction of up to 26% plastic and 20% packaging for Stericup® E sterile filters
- Reduction up to 48% plastic and 69% packaging for Steritop® E sterile filters

To learn more, visit SigmaAldrich.com/Stericup-E

Our video at SigmaAldrich.com/Stericup-E gives more information on this environmentally friendlier alternative for your filtration needs.

	Plastics*	Packaging*
Stericup® E Sterlie filter	Up to 26%	Up to 20%
Eliminates disposable filter funnel		
Steritop® E Sterlie filter	Up to 48%	Up to 69%
Eliminates disposable filter funnel & receiver bottle		

* Plastic and packaging reduction figures derived from comparison to traditional sterile filters

Trilogy™ Pretreatment Solution

Trilogy™ is our patented 3-in-1 EDTA pretreatment solution used in clinical diagnostics labs. This product cuts the pretreatment steps, that can take from 1-2 hours, to only 15 minutes. Trilogy™ solution combines the three pretreatment steps: deparaffinization, rehydration, and unmasking in immunohistochemistry stains.

This solution helps maintain the morphological characteristics of the tissue while preparing

epitopes for specific binding of antibodies within an immunohistochemical reaction. Trilogy™ solution allows for standardisation of the pretreatment procedure, which in turn leads to more consistent and reliable results. Trilogy™ solution is formulated with eco-friendly components to keep this product green – not only saving time but also the environment.

To learn more visit SigmaAldrich.com/Trilogy

Microscopy Reagents

Our Sigma-Aldrich® Stains & Dyes portfolio offers an abundance of greener alternative products specialised for use in daily lab work. We strive to ensure that these safer formulations of routine reagents maintain quality and efficacy so that your results are not compromised. Improve the environmental impacts of clinical testing while reducing time and cost in your lab. Here are some noteworthy reagents:

- 3M™ Novac™ 7000 Engineered Fluid used as a cryofreezing solution. This product is non-corrosive, low toxicity, and non-flammable.
- 3M™ Novac™ 7100 Engineered Fluid serves as a specialty solvent, dispersion media, reaction media, and more. It is used for cleaning and rinsing as well as heat transfer and preservation of biological specimens.
- Neo-Clear® Xylene Substitute. Compared to xylene, this product is less toxic, evaporates at a lower rate, and reduces inhalation risks by being virtually odorless.

To see the full list of greener alternative stains and dyes, visit: cellmarque.com/cms/gogreen/

Safer for you, kinder to the planet.



SMASH Packaging

With our SMASH Packaging initiative we are setting new standards and goals to SHRINK, SECURE, SWITCH, & SAVE packaging while still meeting the required performance requirements and transit safety regulations.

SHRINK – Reduce Amount of Packaging

Our aim is to eliminate the use of packaging that is excessive in size or weight, which unnecessarily consumes more resources, increases energy use and air emissions during transportation. Excess packaging is also undesirable for our customers since there are costs associated with the management and disposal of the packaging.



Our 2022 SHRINK targets are:

- New product packaging aligned with our standards for weight and volume
- 20 key improvement projects for existing packaging
- 20% reduction of air space in distribution boxes

SECURE – Achieve Zero Deforestation

Deforestation is a significant source of global warming and is a threat to biodiversity. Our aim is to ensure that the wood and fiber-based packaging materials that we use do not contribute to deforestation.



Our 2022 SECURE targets are:

- New product packaging aligned with our zero deforestation standards
- 90% of existing packaging aligned with our zero deforestation standards
- 100% of packaging from deforestation-risk countries certified sustainably sourced

SWITCH – Improve Plastic Sustainability

Conventional plastic packaging has several sustainability issues associated with it. Our aim is to improve sustainability of plastic materials used in packaging applications, including increasing the use of materials with lower environmental impacts and reducing the use of plastics produced with chemicals of concern.



Our 2022 SWITCH targets are:

- New product packaging aligned with our plastic sustainability standards
- 20 improvement projects to replace existing plastic packaging by more sustainable solutions
- 20% reduction of Expanded Polystyrene (EPS)

SAVE – Maximize Recycling

Our aim is to maximise recycling of our packaging materials by eliminating the use of packaging materials that are not compatible with recycling and by providing our customers with recycling guidance for all our packaging materials.

Our 2022 SAVE targets are:

- New product packaging aligned with our standards for recyclability
- 100% of fiber-based packaging not compatible with recycling, replaced
- 100% of products with packaging recycling/disposal guidance

You can learn more about these initiatives, including

1. Reading our case studies
2. Downloading our brochure
3. Watching our video

at SigmaAldrich.com/smash

DID YOU KNOW...?

Tomorrow's digital laboratory management...Today IS possible!

The LANEXO™ System is an integrated inventory, safety and compliance management system for chemicals, reagents and other consumables in the laboratory.

Sign up for our next volumes of News on Diagnostics at SigmaAldrich.com/newsondiagnostics for more information.

