



Berol[®] LS surfactant

The low-streak degreaser
for high-performance multi-surface
cleaning

Nouryon

Berol[®] LS surfactant



Streak-free shine. Powerful degreasing. Sustainable performance.

The evolving landscape of hard surface cleaning

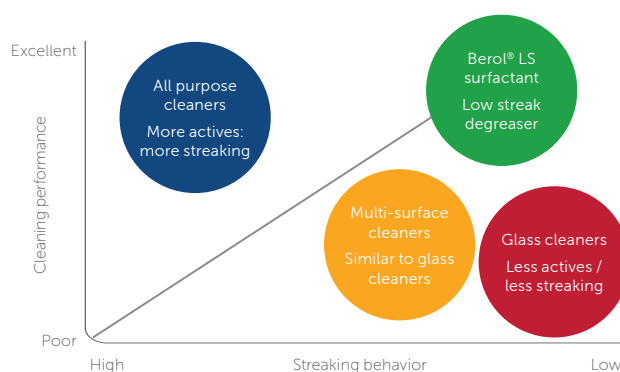
Today's consumers and professional end-users expect more from their cleaning products. They want fewer products that do more, faster results with less effort, and formulations that align with growing sustainability expectations. To meet this growing demand, hard surface cleaning (HSC) formulators must deliver multi-surface cleaners that deliver powerful degreasing and a streak-free finish – without relying on high levels of volatile organic compound (VOC) solvents.

Bridging the performance gap

Most commercially available HSCs are either all-purpose cleaners (APCs) or glass cleaners. APCs typically contain high levels of nonionic surfactants and often rely on VOC solvents such as glycol ethers and alcohols. These products frequently leave visible residues and streaks on glossy surfaces.

To address streaking concerns, glass cleaners rely primarily on solvents and ammonia with only trace amounts of surfactants. The result is minimal streaking but very limited cleaning power.

Multi-surface cleaners were introduced to bridge between the capabilities of APCs and glass cleaners. They use "low-residue" surfactants such as alkyl glucosides, amine oxides, and anionics. However, these products generally provide only moderate cleaning power and streak reduction.



Berol[®] LS surfactant is a single-product solution that combines the degreasing power of an APC with the streak-free clarity of a glass cleaner – without VOC solvents.

This combination simplifies the cleaning process, reduces cleaning frequency, and ultimately reduces cost-in-use for formulators.

	Cleaning	Streaking
Antibacterial APC	■	±
Power cleaner	■	XX
Multisurface cleaner	■	X
Berol [®] LS 2% EDTA / GLDA 0.5% Ethanalamine 0.25% Water q.s.	■	■

Berol[®] LS surfactant delivers both strong cleaning and low streaking at competitive cost-in-use.



Challenges and solutions

Berol® LS surfactant is a concentrated, stable blend of linear alcohol ethoxylate-based nonionic surfactants and colloidal silica (~10 nm), engineered for high-performance hard surface cleaning. Its molecular design optimizes the hydrophilic-lipophilic balance for superior emulsification of hydrophobic soils while maintaining controlled foam and broad pH stability.

The formulation exploits a unique synergy between surfactants and colloidal silica to introduce hydrophilic modification of hard surfaces during the cleaning process. This modification prevents soil deposition and water condensation on the surface, offering a simple way to formulate cleaners that require less effort and less frequent cleaning.

Formulation challenges	Berol® LS surfactant solutions
APCs leave visible streaks and residues on glossy surfaces	Delivers a spotless, streak-free finish without rework – even on glass, stainless steel, and ceramic tiles
Glass cleaners cannot remove greasy soils	Combines the clarity of a glass cleaner with the degreasing power of an APC
VOC solvents face increasing regulatory restrictions	VOC-free, solvent-free formulation that supports EPA Safer Choice*
Multiple products needed for different surfaces and soil types	One versatile ingredient for glass, stainless steel, tiles, mirrors, and more
Fogging issues reduce perceived cleaning quality	Provides temporary anti-fogging properties, keeping surfaces clearer for longer
Food-contact areas require regulatory-compliant cleaning solutions	Complies with FDA 21 CFR 178.3400 for incidental food-contact surfaces when properly rinsed
Repetitive cleaning effort on high-traffic surfaces	Hydrophilic surface modification reduces soil redeposition, lowering effort and frequency for subsequent cleaning

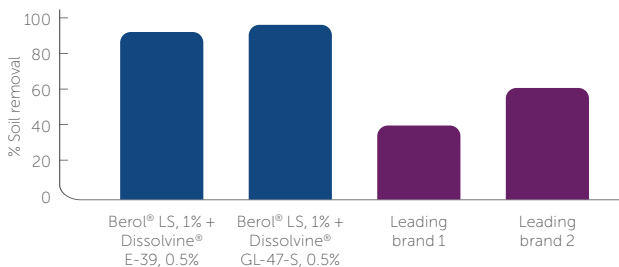
* Regulatory data to support customers' ecolabel assessments is available upon request

Proven performance

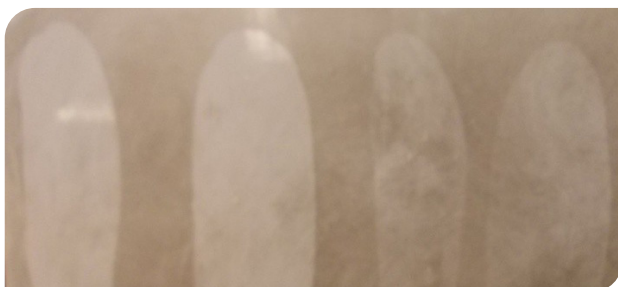
Powerful degreasing

Berol® LS surfactant offers exceptional removal of heavy mineral-based grease at low concentrations, eliminating the need for VOC solvents.

In non-mechanical degreasing tests on mineral soil, a 1% Berol® LS surfactant formulation (combined with Dissolvine® GL-47-S chelating agent) achieved over 90% soil removal – significantly outperforming leading commercial APC brands tested under identical conditions.

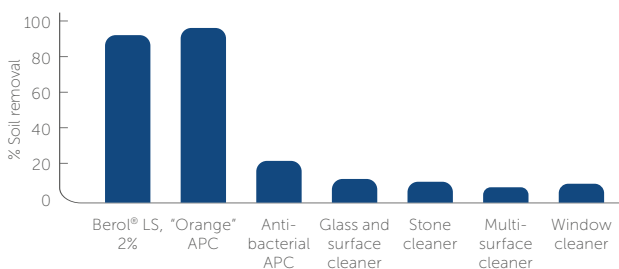


Non-mechanical degreasing performance on mineral soil: Berol® LS surfactant formulation vs commercial products.



Berol® LS surfactant formulation (left) removes mineral grease effectively vs untreated control.

Berol® LS surfactant formulation (left) removes mineral grease effectively vs untreated control.

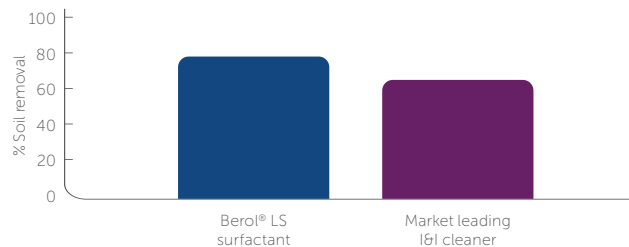


Non-mechanical degreasing performance on mineral soil Berol® LS surfactant cleaner vs commercial products.

Fast wetting

Berol® LS surfactant delivers rapid, uniform wetting and spreading across hydrophobic surfaces, reducing scrubbing effort and improving cleaning efficiency.

Comparative wetting tests demonstrate that Berol® LS surfactant achieves faster surface wetting than conventional industrial cleaners, ensuring even coverage from the moment of application.



Comparative wetting and degreasing performance: Berol® LS surfactant vs industrial cleaner on mineral soil.

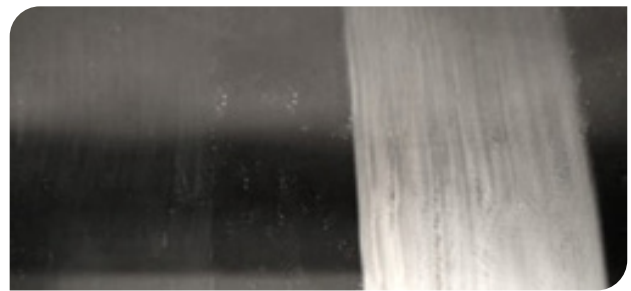


Streak-free performance

Achieve spotless, residue-free finish on glass, mirrors, stainless steel, and other glossy surfaces without the need for additional polishing.

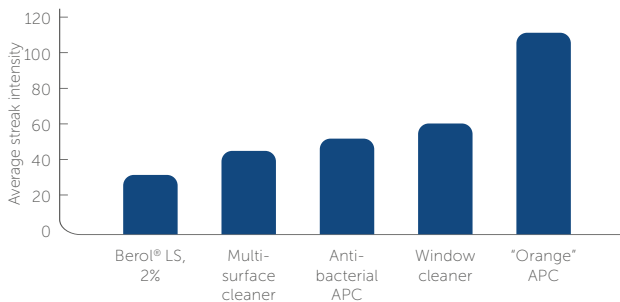
Laboratory testing illustrates BeroL® LS surfactant's superior streaking performance on mirror tiles.

Image-analysis testing of streaking performance on glass shows that a 2% BeroL® LS surfactant formulation achieves streak intensity levels that outperform multi-surface cleaners, anti-bacterial APCs, window cleaners, and heavy-duty APCs.



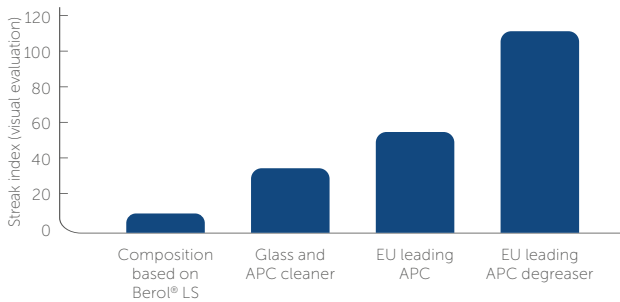
BeroL® LS, 2%
Dissolvine® GL-47-S, 1%

Commercial degreaser



BeroL® LS surfactant

Commercial degreaser
kitchen sink



Streaking performance on glass: BeroL® LS surfactant vs commercial products (measured by image analysis, lower is better).

Surface protection

Berol® LS surfactant's hydrophilic surface modification makes it significantly easier to remove fingerprints, soil, and water marks from stainless steel and other hard surfaces after treatment – reducing effort for subsequent cleaning.

In our testing, a stainless steel tile was treated with a 3% Berol® LS surfactant formulation (with Dissolvine® GL-47-S chelating agent). After applying synthetic sebum fingerprints with equal pressure to both treated and untreated halves, the treated side showed visibly less fingerprint retention and significantly easier removal with a damp cloth.



Stainless steel fingerprint test: untreated surface (left) vs Berol® LS surfactant treated surface (right) after wiping with a damp cloth.

Anti-fogging effect

The temporary anti-fogging properties of Berol® LS surfactant keep bathroom mirrors, shower glass, and stainless steel surfaces clearer for longer, enhancing perceived cleaning quality and user satisfaction.

In a controlled test, window glass was treated with a Berol® LS surfactant formulation (with Dissolvine® GL-47-S chelating agent) on one half and a commercial glass cleaner on the other. When fogged with boiling water, the Berol® LS surfactant side showed demonstrably less fogging, with text behind the glass remaining clearly visible. The anti-fogging and anti-resoiling effect shows no build-up with repeated use.



Berol® LS surfactant

Commercial degreaser



Properties and applications

Chemical and physical data	Typical value
Appearance, 20°C	clear liquid
Clear point, °C	0
Density, kg/m ³	1.103
pH, 1% in water	5.5-8.5
Pour point, °C	-2
Viscosity at 20°C, mPa.s	20

Solubility, 5% Berol® LS surfactant at room temperature

Ethanol	insoluble
Isopropyl alcohol	insoluble
Low aromatic solvent	insoluble
Propylene glycol	soluble
Water	soluble

Surface active characteristics	Typical value
Foam height (Ross-Miles) 0.05% at 25°C	Initial: 40 mm 5 min: 35 mm
Surface tension (Du Noüy) 0.1% at 25°C	29.6 mN/m

Berol® LS surfactant is ideal wherever powerful degreasing and low streaking are required – especially on smooth, shiny surfaces:

- Kitchen cleaners – stainless steel surfaces, ceramic tiles, glass tiles, countertops
- Bathroom cleaners – glass shower enclosures, mirrors, chrome fixtures
- All-purpose and glass cleaners – floors, ceramics, windows, hard shiny surfaces
- Vehicle and marine care – windscreens, painted surfaces, coatings
- Institutional cleaning – food-contact surfaces (FDA 21 CFR 178.3400 compliant when properly rinsed)

Formulation guidelines

Berol® LS surfactant is compatible with a range of complexing agents, co-solvents (such as IPA or ethanol), aesthetic excipients, and preservatives. For optimal degreasing performance, we recommend formulating with a strong complexing agent such as Dissolvine® GL-47-S chelating agent.

The following starting-point formulations are provided as guidelines. You can optimize exact concentrations for your specific applications.

Glass / window cleaner – anti-streak, anti-soil

Ingredient	Concentration, %
Berol® LS	0.5-1.0
Dissolvine® GL-47-S	0.2-0.5
Isopropanol	2.5-5.0
Aesthetics and preservatives	as required
Water	q.s.

All purpose cleaner – anti-streak, anti-soil

Ingredient	Concentration, %
Berol® LS	2.5-5.0
Dissolvine® GL-47-S	1.0-2.5
Aesthetics and preservatives	as required
Water	q.s.

Kitchen cleaner trigger – degreasing, anti-streak, anti-soil

Ingredient	Concentration, %
Berol® LS	5.0
Dissolvine® GL-47-S	2.5
Monoethanolamine (MEA)	0.25
Aesthetics and preservatives	as required
Water	q.s.

Bathroom cleaner – descaler, anti-streak, anti-fog

Ingredient	Concentration, %
Berol® LS	1.0-2.0
Isopropanol	1.0
Lactic acid	2-3
Aesthetics and preservatives	as required
Water	q.s.

Partner with us

We partner with formulators worldwide to develop cleaning solutions that meet the highest standards of performance and sustainability. Our technical experts are ready to support you in optimizing Berol® LS surfactant formulations for your specific applications and markets.

Contact us directly for detailed product information and sample request
website | nouryon.com/markets/cleaning
email | cleaning@nouryon.com



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Nouryon

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