Essential Ingredients for Industrial and Household Cleaning

Nouryon

Contents

Products in Alphabetical Order

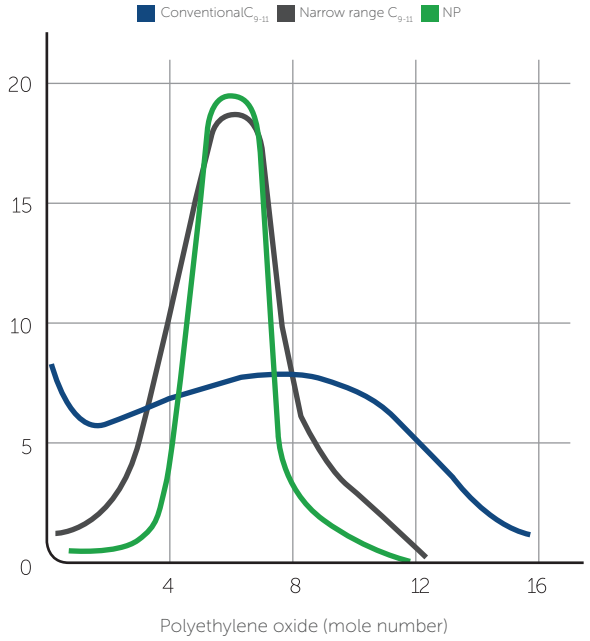
Nonionic Surfactants

Narrow Range Alcohol Ethoxylates

Nouryon (formerly known as AkzoNobel Specialty Chemicals) offers a series of alcohol ethoxylate products for cleaning applications. Narrow range alcohol ethoxylates is our main specialty product line. Compared with nonylphenol alcohol ethers, standard alcohol ethoxylates has a fairly broad range of mole numbers of EO, by using special catalysts, a narrow range ethoxylate similar to nonylphenol alcohol ethers can also be obtained on alcohol ethoxylates.

A narrow range ethoxylated alcohol has a distribution curve that is narrower than the equivalent standard alcohol ethoxylate with a considerably lower content of unreacted alcohol. The lower unreacted residual alcohol results in low odor products even if they are based on short chain alcohol.

Nonionic surfactants based on short carbon alcohols have the highly penetrative properties, which makes it perfectly suitable for hard surface cleaning with short contact time. In general, the lower the degree of ethoxylation, the more free alcohol in the product. However, the average free alcohol contents in Berol® 260, Berol® 266 and Berol® 840 are less than 1%, enabling formulators to prepare highly effective low odor cleaners.



Product Name	Chemical Name	Appearance (20°C)	Cloud Point /°C	HLB Value	Active Matter Percentage (%)	Characteristics	Main Usage
Berol® 260	Alcohol Ethoxylate	Liquid	22-59 (1)	10.5	100	Degreasing, emulsifying, wetting, low content of unreacted alcohol, low foaming, low odour	Water-based alkaline detergent Automobile and engine cleaning Hard surface and all purpose cleaning Food industry pipeline cleaning, etc.
Berol® 266	Alcohol Ethoxylate	Liquid	24-29 (2) &54-59 (2)	12.1	100	Dispersing, emulsifying, wetting, relatively low foaming	Water-based alkaline detergent Vehicle cleaning /Car wash Multi-purpose cleaning Laundry detergent, etc.
Berol® 840	Alcohol Ethoxylate	Liquid	49-54 (1)	11.5	100	Defoaming, extremely low foaming	Industry pipeline CIP cleaning Low-foaming detergent Automatic dishwasher detergent Water-based alkaline cleaner, etc.
Ethylan® 1005	Alcohol Ethoxylate	Liquid	47-53 (1)	11.6	100	Emulsifying, extremely high wetting, extremely low foaming	Hard-surface cleaning Micro-emulsion-type detergent Vehicle cleaning /Car wash
Ethylan® 1003	Alcohol Ethoxylate	Liquid	31-34 (1)	9.8	100	Emulsifying, extremely high wetting, extremely low foaming, defoaming, low aquatic biotoxicity	Hard-surface cleaning Microemulsion Multi-purpose cleaning Low-foaming detergent Vehicle cleaning Rinse aids

(1) 5g product dissolved in 25ml diethylene glycol monobutyl ether; (2) 1% aqueous solution.

Nonionic Surfactants

Other Alcohol Ethoxylate/Alkoxylate

Product Name	Chemical Name	Appearance (20°C)	Cloud Point /°C	HLB Value	Active Matter Percentage (%)	Characteristics	Main Usage
Berol® 508	Alcohol Ethoxylate	Liquid	60-68 [1]	15	100	Dispersing, emulsifying, medium foaming, wetting	Hard-surface cleaning Micro-emulsion-type detergent Vehicle cleaning /Car wash Laundry detergent
Ethylan® DA-4	Isodecyl Alcohol Ethoxylate	Liquid	N/A	10.5	100	Dispersing, medium foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® NS-500 LQ	Butanol alkoxylate	Liquid	N/A	N/A	100	Dispersing, medium foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® SN-90	C10-14 Alcohol ethoxylate	Liquid	58-60	12.9	100	Emulsifying, dispersing, medium foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® TD-60	Tridecanol ethoxylate	Liquid	36-40 [2]	11.4	100	Emulsifying, dispersing, low foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® TD-100	Tridecanol ethoxylate	Liquid	67-68	13.7	100	Emulsifying, dispersing, medium foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® TD-1407	Tridecanol ethoxylate	Liquid	77-83	N/A	75-76	Dispersing, medium foaming	Acidic or alkaline water-based degreaser Hard-surface cleaning Multi-purpose cleaning
Ethylan® CPG7545	Alcohol alkoxylate	Liquid	35~38 [2]	10.8	99	Emulsifying,degreasing, low foaming, medium and high-temperature defoaming, readily biodegradable	Hard-surface detergent CIP cleaning Glass bottle cleaning Multi-purpose cleaning Low-foaming detergent Vehicle cleaning Rinse aids
Berol® 185	Alcohol alkoxylate	Liquid	64~70 [2]	13.5	90	Wetting, degreasing, emulsifying, readily biodegradable, Eco-friendly	Hard-surface cleaning Hand wash Metal cleaning Vehicle cleaning

[1] 1% aqueous solution; [2] 2% aqueous solution.

Anionic Surfactants

Sodium Alkyl Naphthalene Sulfonates

Product Name	Appearance (20°C)	Active Matter Percentage (%)	Draves Wetting [1]	Ross Miles Foam Height[2] Ross Miles	Surface Tension [3]	Characteristics and Usage
Petro® 22 N LIQUID/POWDER	Liquid/ powder	50/95	20-30	60	30	Solubilizing, rinse aides, carpet cleaning, textiles detergent, etc.
Petro® AA POWDER	Liquid/ powder	50/95	20-30	106	43	Solubilizing, acid and alkaline stability, degreaser, carpet cleaning, textiles cleaning, etc.
Petro® AGS LIQUID/POWDER	Liquid/ powder	50/95	>300	10	34	Solubilizing, acid and alkaline stability, degreaser, carpet cleaning, textiles cleaning, etc.
Petro® BA LIQUID/POWDER	Liquid/ powder	50/95	20-30	113	43	Solubilizing, acid and alkaline stability, degreaser, carpet cleaning, textiles cleaning, etc.
Petro® BAF LIQUID/POWDER	Liquid/ powder	50/95	5-10	175	35	Solubilizing, alkaline stability, degreaser, carpet cleaning, etc.
Petro® LBA LIQUID	Liquid	50	>300	11	33	Solubilizing, acid and alkaline stability, degreaser, carpet cleaning, textiles cleaning, etc.
Petro® LBAF LIQUID	Liquid	50	5-10	185	34	Solubilizing, alkaline stability, degreaser, carpet cleaning, etc.

[1] DeNouy, Dynes/cm, 0.1%@25°C; [2] 0.25%@25°C; [3] 1.0% aqueous solution@25°C.

Other Anionic Surfactants

Product Name	Chemical Name	Appearance (20°C)	Active Matter Percentage (%)	Characteristics	Main Usage
Lankropol™ 4500	Sodium dioctyl sulfosuccinate	Transparent to slightly turbid liquid	70	Dispersing, washing, decontamination, wetting	Excellent acid and alkaline stability, laundry detergent, textile cleaning, etc.
Witconate® AOS	Sodium C14-16 olefin sulfonate	Transparent yellow liquid	38-40	Dispersing, washing, decontamination, wetting	Laundry detergent, metal cleaning, hard-surface cleaning, carpet and furniture upholstery cleaning
Witconate® NAS-88	Sodium octane sulfonate	Transparent to slightly turbid liquid	≥36	Low foaming, solubilizing, protein stain removal, corrosion inhibition	Alkaline liquid detergent, metal cleaning, hard-surface cleaning, carpet and furniture upholstery cleaning
Lankropol™ OPA	Fatty acid sulfonate	Liquid	50-55	Low foaming, wetting, degreasing, high alkali resistance, solubilizing	Alkaline metal cleaning, corrosion inhibitor, electroplating, wax remover, heavy oil industrial cleaning, food equipment cleaning, oven cleaning

Nitrogen Derivatives

Quaternary Ammonium Compounds

Product Name	Chemical Name	Appearance	Active Matter Percentage (%)	Characteristics	Main Usage
Armosoft® L	Dialkyl dimethyl quaternary ammonium compounds	Transparent to slightly turbid liquid (25°C)	48-52	Antistatic	Softener, water-proofing agent/water repellent, etc
Arquad® MC 210	Quaternary ammonium compounds	Yellow liquid	79-81	Sterilizing, Antimicrobial	Sterilizing agent, preservative, etc
Arquad® MCB-50/80	Coco(fractionated) benzyldimethylammonium chloride	Colorless liquid	49-52/80-81	Sterilizing, Antimicrobial	Sterilizing agent, algicide, etc
Arquad® 16-29/16-50	Hexadecyltrimethylammonium chloride	Light yellow liquid	28-30/ 49-52	Thickening	Household cleaning (realizing the thickening of systems containing strong acid or hydrogen peroxide)
Arquad® 2.8-50	Dioctyldimethylammonium chloride	Light yellow liquid	49-51	Sterilizing, Antimicrobial	Sterilizing agent, algicide, etc.
Arquad® 2.10-50/2.10-80	Didecyldimethylammonium chloride	Light yellow liquid	49-51/79-81	Sterilizing, Antimicrobial	Sterilizing agent, algicide, etc.
Arquad® 2C-75	Dicocoalkyldimethylammonium chloride	Yellow liquid	74-77	Emulsifier	Oil emulsion, softener, water-proofing agent/water repellent, etc.
Arquad® 2HT-75	Di(hydrogenated tallowalkyl) dimethylammonium chloride	Paste	74-76	Antistatic	Automobile flushing/rinsing agent, softener, water-proofing agent/water repellent, etc
Arquad® 2HT-75 E	Di(hydrogenated tallowalkyl) dimethylammonium chloride	Paste	74-76	Antistatic	Automobile flushing/rinsing agent, softener, water-proofing agent/water repellent, etc
Arquad® 2HT-75 PG	Di(hydrogenated tallowalkyl) dimethylammonium chloride	Paste	74-77	Antistatic, high flash point	Automobile flushing/rinsing agent, softener, water-proofing agent/water repellent, etc
Arquad® 2HT-82 E	Di(hydrogenated tallowalkyl) dimethylammonium chloride	Paste	82-85	Antistatic, high flash point	Automobile flushing/rinsing agent, softener, water-proofing agent/water repellent, etc
Arquad® DE-T	Esterquats	Paste	75~85	Excellent formula stability, antistatic, softening	Softener, and water-proofing agent
Arquad® T-50	Tallowalkyltrimethylammoniun chloride	Liquid	49-52	Solubilizing	Acid cleaning, thickener, etc.
Arquad® HTL8-MS	Hydrogenated tallowalkyl(2-ethylhexyl) dimethyl ammonium methylsulfate	Liquid	81.5-84.5	Antistatic, emulsifying, dispersing, corrosion mitigation, etc.	Softener, water-proofing agent/water repellent, etc.

Amines, Diamines, Polyamines (salts)

Product Name	Chemical Name	Appearance	Active Matter Percentage (%)	Characteristics	Main Usage
Armeen® CD	Cocoamine, distilled	Light yellow liquid	100	Corrosion inhibition/corrosion mitigation	Intermediate, neutralizer, etc.
Duomeen® C	Cocopropylene diamine	Yellow liquid or paste	100	Emulsifying, hydrophobic	Industrial and institutional cleaning, intermediate, etc.
Duomeen® CD	Cocopropylene diamine, distilled	Yellow liquid or paste	100	Emulsifying, hydrophobic	Industrial and institutional cleaning, intermediate, etc.
Duomeen® O	Oleylpropylene diamine	Yellow liquid or paste	100	Corrosion inhibition/ corrosion mitigation, emulsifying	Metal cleaning, chain lubes, lubricants, etc.
Duomeen® OL	Oleylpropylene diamine (low cloud point)	Liquid	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Metal cleaning, chain lubes, lubricants, etc.
Duomeen® SV	N-soya-1,3-diaminopropane	Yellow liquid or paste	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Metal cleaning, etc.
Duomeen® T	Tallowpropylene diamine	Solid	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Metal cleaning, etc.
Duomeen® TDO	N-(Tallow alkyl)-1,3-proanediamine oleates	Brown paste	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Metal cleaning, etc.
Triameen® T	Tallowdipropylene triamine	White paste	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Dispersant, intermediate, chain lubes, etc.
Triameen® YT	Tallowdipropylene triamine	Amber liquid or paste	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Dispersant, intermediate, chain lubes, etc.
Triameen® Y12D	Dodecyl dipropylene triamine	Yellow liquid	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Dispersant, intermediate, chain lubes, etc.
Tetrameen® T	Tallow tripropylene tetramine	Light yellow paste	100	Corrosion inhibition/ corrosion mitigation, dispersing, emulsifying, hydrophobic	Dispersant, intermediate, metal working lubricant additives, etc.

Nitrogen Derivatives

Amine Oxides

Product Name	Chemical Name	Appearance	Active Matter Percentage (%)	Characteristics	Main Usage
Aromox® 14D-W970	Tetradecyl dimethylamine oxide	Liquid	24-26	Foaming, high foaming, oxidant resistance, thickening	Alkaline cleaner, hypochlorite based cleaner, etc.
Aromox® C/12	Cocobis(2-hydroxyethyl)amine oxide	Liquid	49-53	Foaming, high foaming, solubilizing	Foaming agent, car cleaners and transportation cleaners, cleaner concentrate, etc.
Aromox® C/12-W	Cocobis(2-hydroxyethyl)amine oxide	Liquid	30-32	Foaming, high foaming, solubilizing	Foaming agent, car cleaners and transportation cleaners, cleaner concentrate, etc.
Aromox® MCD-W	Cocoalkyl dimethylamine oxide	Liquid	30-32	Foaming, high foaming, oxidant resistance, thickening	Alkaline cleaner, hypochlorite based cleaner, acidic detergent, hydrogen peroxide cleaner, etc.
Aromox® T/12	Tallowbis(2-hydroxyethyl)amine oxide	Paste	49-51	High flash point, solubilizing, thickening	Acid cleaner, alkaline cleaner, neutral cleaner, etc.
Aromox® T/12 HFP	Tallowbis(2-hydroxyethyl)amine oxide	Paste/Slightly turbid liquid	39-41	High flash point, solubilizing, thickening	Acid cleaner, alkaline cleaner, neutral cleaner, etc.

Polymers

Acrylic Acid Homopolymers

Product Name	Appearance	Solid Content/%	Average Molecular Weght	pH	Characteristics	Main Usage
Alcosperse® 149	Amber liquid	39-41	2,500	7.5-9	Anti-redeposition agents, corrosion resistance, chlorine resistance, fouling particulate dispersion, scale control, water hardness control, etc.	Multipurpose cleaner, bottle washing, I&I dishwasher detergent, etc.
Alcosperse® 149 DRY	White powder	≥95	2,500	7.5-9.5[1]	Anti-redeposition agents, corrosion resistance, chlorine resistance, fouling particulate dispersion, scale control, water hardness control, etc.	Multipurpose cleaner, bottle washing, I&I dishwasher detergent, etc.
Alcosperse® 602N	Colorless to light amber liquid	44-46	5,000	7.0-8.0	Anti-redeposition agents, corrosion resistance, chlorine resistance, fouling particulate dispersion, scale control, water hardness control, etc	Multipurpose cleaner, bottle washing, food & beverage industry cleaning, I&I, dishwasher detergent, etc.
Alcosperse® 602ND	White or off-white powder	>95	5,000	7.0-7.5[1]	Anti-redeposition agents, corrosion resistance, chlorine resistance, fouling particulate dispersion, scale control, water hardness control, etc.	Multipurpose cleaner, bottle washing, food & beverage industry cleaning, I&I dishwasher detergent, water softening agent, etc.

Acrylic/Maleic Copolymer

Product Name	Appearance	Solid Content/%	Average Molecular Weght	pH	Characteristics	Main Usage
Alcosperse® 175	Light amber liquid	39-41	20,000	7-8	Anti-redeposition additives, chelating calcium, calcium carbonate encrustation	Automatic dishwasher washing tablet, laundry tablet washing powder, water softening agent, etc.
Alcosperse® 175 DRY	White or off-white powder	>95	20,000	6.5[1]	Anti-redeposition additives, chelating calcium, calcium carbonate encrustation	Automatic dishwasher washing tablet, laundry tablet washing powder, water softening agent, etc.
Alcosperse® 408	Light amber liquid	42-44	3,000	5.0-6.0	Anti-redeposition additives, calcium carbonate encrustation, electrolyte resistance, water hardness control, etc	Multipurpose cleaner, bottle washing, I&I dishwasher detergent, etc.
Alcosperse® 408 DRY	Yellow or dark brown powder	>95	3,000	5.5[1]	Anti-redeposition additives, calcium carbonate encrustation, electrolyte resistance, water hardness control, etc	Multipurpose cleaner, car wash, bottle washing detergent, food & beverage industry cleaner, etc.
Alcosperse® 412	Colorless to amber liquid	40-42	3,000	10.0-11.0	Anti-redeposition additives, calcium carbonate encrustation, electrolyte resistance, water hardness control, etc	Multipurpose cleaner, car wash, bottle washing detergent, food & beverage industry cleaner, etc.

Polymers

Acrylic/Styrene Copolymer

Product Name	Appearance	Solid Content/%	Average Molecular Weght	pH	Characteristics	Main Usage
Alcosperse® 747	Yellow to amber clear liquid	39-41	3,000	8.0-10.0	Aluminum corrision protection, anti-redeposition, anti-spot, solubilizing, suspension of oily and particulate soils, surface energy modification	Laundry detergent, multipurpose cleaner, liquid detergent for automatic dishwasher, car wash, concentrate detergent, dish washing detergent, bathroom cleanner, etc.
Alcosperse® 747 D	White or off-white powder	37-39	3,000	7.0-9.0[1]	Aluminum corrision protection, anti-redeposition, anti-spot, solubilizing, suspension of oily and particulate soils, surface energy modification	Tablet detergent for automatic dishwater, washing tablet/ wahing powder, water softening agent, etc.
Alcoguard® 7100	White emulsion		n/a	6.0-8.0	Opacifying/ emulsifying, anti-redeposition	Chlorine bleaching solution, laundry detergent formulation, etc.

[1] 1% aqueous solution.

Natural-Based Polymer

Product Name	Appearance	Solid Content/%	Average Molecular Weght	pH	Characteristics	Main Usage
Alcosperse® H5941	Starch modifying polymer	Yellow liquid	39~41	4-6	Anti-redeposition additives, calcium carbonate encrustation, water hardness control	Washing powder, laundry detergent, automatic dishwasher detergent, etc
Alcoguard® H5240	Waterborne hybrid bio-polymer	Clear amber liquid	44-46	5-6	Anti-redeposition additives, calcium carbonate encrustation, electrolyte resistance, water hardness control	Powder or tablet detergent for automatic dishwater, washing power, laundry detergent, etc.
Alcoguard® H5240L	Waterborne hybrid bio-polymer (light color)	Clear amber liquid	44-46	5-6	Anti-redeposition additives, calcium carbonate encrustation, electrolyte resistance, water hardness control	Powder or tablet detergent for automatic dishwater, washing power, laundry detergent, etc.

[1] 25% aqueous solution.

Sulfonated Copolymers

Product Name	Appearance	Solid Content/%	Average Molecular Weght	pH	Characteristics	Main Usage
Alcosperse® 4000	Colorless to light amber liquid	40-42	12,000	6-8	Film formation resistance, dispersion of oily and particulate soil, phosphate scale control, soap scale inhibition, etc	Multipurpose cleaner, liquid detergent for automatic dishwater, tableware rinsing aid, bathroom detergent, laundry detergent, etc.
Alcosperse® 4000 DRY	White or off-white powder	>95	12,000	7-8[1]	Film formation resistance, dispersion of oily and particulate soil, phosphate scale control, soap scale inhibition, etc.	Multipurpose cleaner, liquid detergent for automatic dishwater, tableware rinsing aid, bathroom detergent, laundry detergent, etc
Alcosperse® 4100 G	White or off-white particulate	>92	8,000	4.0-6.5[2]	Film formation resistance, Anti-redeposition, electrolyte resistance, dispersion of oily and particulate soil, phosphate scale control, soap scale inhibition, etc	Tablet detergent for automatic dishwasher, washing tablet/washing powder, etc.
Alcosperse® 4160	Colorless to light amber liquid	39-41	3,800	4.0-5.0	Film formation resistance, water hardness control, dispersion of oily and particulate soil, phosphate scale control, soap scale inhibition, very strong co-builder, etc.	Combined with GLDA green chelating agent as a substitute for NTA, liquid detergent for automatic dishwater, I&I dishwasher detergent, laundry products, non-phosphorus formula, etc.
Alcosperse® 4160 DRY	Brown powder	>92	3,800	6-7[1]	Film formation resistance, water hardness control, dispersion of oily and particulate soil , phosphate scale control, soap scale inhibition, very strong co-builder, etc.	Combined with GLDA green chelating agent as a substitute for NTA, liquid detergent for automatic dishwater, washing tablet/washing powder, non-phosphorus formula, water softening agent, etc
Alcosperse® 4160 G	Off-white particulate	>92	3,800	4-5[1]	Film formation resistance, water hardness control, dispersion of oily and particulate soil, phosphate scale control, soap scale inhibition, very strong co-builder, etc.	Combined with GLDA green chelating agent as a substitute for NTA, liquid detergent for automatic dishwater, washing tablet/washing powder, non-phosphorus formula, water softening agent, etc.

[1] 1% aqueous solution; [2] 25% aqueous solution.

Polymers

Sulfonated Polystyrenes

Product Name	Chemical Name	Appearance	Solid Content/%	pH	Characteristics	Main Usage
Versa-TI® 3 DRY	Sulfonated styrene/maleic acid copolymer	White to light amber powder	>90	5-9[1]	Antistatic, rust removal, scale inhibition, surface energy modifier, etc.	Furniture polishing, glass cleaner, shower cubicle cleaner, toilet cleaner/ bathroom cleaner, etc.
Versa-TL® 4	Sulfonated styrene/maleic acid copolymer	Amber liquid	24-26	6.5-8	Antistatic, rust removal, scale inhibition, surface energy modifier, etc.	Furniture polishing, glass cleaner, shower cubicle cleaner, toilet cleaner/ bathroom cleaner, etc.
Versa-TL® 70	Sulfonated polystyrene, sodium salt	Solid	100	3.5-9.5[2]	Antistatic, surface energy modifier, etc.	Glass cleaner, shower cubicle cleaner, hard surface cleaner, etc.
Versa-TL® 71	Sulfonated polystyrene	Amber liquid	29-31	<1	Antistatic, surface energy modifier, etc.	Glass cleaner, shower cubicle cleaner, hard surface cleaner, etc.
Versa-TL® 125	Sulfonated polystyrene, ammonium salt	Liquid	28-32	3-5	Antistatic, surface energy modifier, etc.	Glass cleaner, shower cubicle cleaner, hard surface cleaner, etc.
Versa-TL® 130	Sulfonated polystyrene	Amber liquid	28-32	5-9	Antistatic, surface energy modifier, etc.	Furniture polishing, glass cleaner, shower cubicle cleaner, toilet cleaner/ bathroom cleaner, etc.
Versa-TL® 501	Sulfonated polystyrene	Amber liquid	24-26.5	4-9[3]	Antistatic	Glass cleaner, shower cubicle cleaner, film formation, etc.
Versa-TL® 502	Sulfonated polystyrene	Dark brown solid	>90	6-10[3]	Antistatic	Glass cleaner, shower cubicle cleaner, film formation, etc.

[1] 25% aqueous solution; [2] 20% aqueous solution; (3) 10% aqueous solution.

Functional polymer

Product Name	Chemical Name	Solid Content/%	Characteristics	Main Usage
Narlex PPE1189	Hydrophobically modified acrylic copolymer	30%	Excellent alkali resistance, emulsification, anti-redeposition, compatible with high-concentration surfactants	Commercial laundry products, concentrated laundry detergent, automatic dishwashers, etc.
Balance Extra	Acrylic copolymer	45%	Excellent film-forming performances	Anti-wrinkle agent for clothes

Dissolvine® Chelating Agent

General Solution for Metal Ion Control

Metal ions have a huge impact on chemical processes and the properties of many products. A variety of problems related to metal ions, from household cleaning to industrial cleaning, can be solved with Dissolvine® chelating agent, improving the stability and cleaning power of formulas.

Chelating Agent

Product Name	Chemical Name	Appearance	Contents	Characteristics	Main Usage
Dissolvine® Z	EDTA-H_4	White crystals	≥99%	High purity acid	Industrial process cleaning
Dissolvine® NA2	EDTA-Na_2H_2 Dihydrate	White crystals	≥99%	Slightly acidic without inorganic salt	Metal ion shielding, soften water, stable formula, washing aid
Dissolvine® NA2-S	EDTA-Na_2H_2 Dihydrate	White crystals	≥99.3%	High purity	Metal ion shielding, soften water, stable formula, washing aid
Dissolvine® NA2-P	EDTA-Na_2H_2 Dihydrate	White crystals	99-101%	Food/pharmaceutical grade	Personal care, pharmaceutical, food cleaning
Dissolvine® NA	EDTA-Na_4	Beige granules	≥86%	Most widely used solid chelating agent	Industrial/household, scale cleaning
Dissolvine® NA-X	EDTA-Na_4 Tetrahydrate	White crystals	≥83%	High purity	Industrial/household, scale cleaning
Dissolvine® NA-E	EDTA-Na_4	Beige granules	≥91%	High purity	Industrial/household, scale cleaning
Dissolvine® 220-S	EDTA-Na_4 Tetrahydrate	White crystals	≥99%	High purity	Industrial/household, scale cleaning
Dissolvine® E-39	EDTA-Na_4	Clear liquid	≥39%	Most widely used liquid chelating agent	Industrial/household, scale cleaning
Dissolvine® 105E	EDTA-Na_4	Colourless to light straw-coloured liquid	≥39%	High purity	Industrial/household, scale cleaning
Dissolvine® 115E	EDTA-Na_4	Colourless to light straw-coloured liquid	41.5-42.5%	High purity and high concentration	Industrial/household, scale cleaning
Dissolvine® 100-S	EDTA-Na_4	Clear liquid	≥38.2%	High purity	Industrial/household, scale cleaning
Dissolvine® D-40	DTPA-Na_5	Clear, light yellow liquid	≥40%	DTPA	Bleach stabilizer, scale remover
Dissolvine® D-50	DTPA-Na_5	Clear, light yellow liquid	≥50%	DTPA	Bleach stabilizer, scale remover
Dissolvine® H-88-S	HEDTA-Na_3	Beige crystals	≥87.8%	Chelating agent for iron at low alkalinity	Iron scale removal
Dissolvine® H-40	HEDTA-Na_3	Clear amber liquid	≥42.5%	Chelating agent for iron at low alkalinity	Iron scale removal

Green Chelating Agent

Product Name	Chemical Name	Appearance	Contents	Characteristics	Main Usage
Dissolvine® GL-47-S	Glutamic acid, N,N-EDTA tetrasodium salt	Clear liquid	≥47.4%	High-purity and highly-bio-degradable chelating agent, mainly derived from natural raw materials	Widely used for descaling, water softening and formula stabilizer in household and industrial cleaning
Dissolvine® M-40	N,N-bis(carboxymethyl) alanine trisodium salt	Colorless to Light yellow clear liquid	39-41%	High-purity and highly-bio-degradable chelating agent, mainly derived from natural raw materials	Widely used for descaling, water softening and formula stabilizer in household and industrial cleaning. Replace NTA
Dissolvine® CSA	Sodium glucoheptonate	Clear light brown liquid	≥30%	Rapid biodegradation, natural source, excellent iron chelating properties	Chelating and dispersing agent, excellent iron, aluminum ion chelating performance
Dissolvine® EDG	N-Hydroxyethyliminodiacetic acid disodium salt	Clear liquid	≥27.5%	Readily biodegradable, also called as HEIDA	Readily degradable chelating agent

For more information and the latest address, please visit our website:
www.dissolvine.com
chelates.nouryon.com
micronutrients.nouryon.com

Functional Specialty Chemical

Specialty Surfactant Blends for Cleaning

Product Name	Chemical Name	Appearance	Solid Content %	pH	Characteristics	Main Usage
Berol® 1250 SAS	SAS Proprietary surfactants blend	Yellow liquid	n/a	8-11[1]	Effective acid thickening agent, fine wall-clinging property, rich foam, auxiliary cleaning and corrosion inhibition	Toilet cleaner thickener, applicable to formula system containing high-concentration hydrochloric acid and other acids
Berol® 226 SA Berol® 226	Proprietary nonionic/cationic surfactants blend	Light yellow liquid	100	5-8[2]	Efficient degreasing and decontamination, dispersing, emulsifying, wetting	Acidic or alkaline water-based degreaser, multipurpose cleaner, automotive and transportation cleaner
Berol® 611	Proprietary nonionic surfactants blend	Colorless liquid	90	5-9[2]	Degreasing and decontamination, dispersing, emulsifying; able to serve as a direct equivalent substitute for nonylphenol ethoxylate (NPE) NP9/NP10 at the same dosage, equivalent cloud point and HLB value, lower pour point and viscosity, more superior water solubility, readily biodegradable	Water-based degreaser, hard surface cleaners (such as cleaners for motorized means of transportation), multifunctional detergent, ready-to-use detergent, strong detergent and so forth; particularly suitable as a substitute for the NP9/NP10 in the original cleaning formula (1:1, without having to adjust the formula), able to acquire equivalent cleaning efficiency and excellent environment-friendliness
Berol® DGR 81	Proprietary alcohol-EO /alkyglucoside blend	Brown liquid	95	6-8[3]	High alkali resistance, emulsifying, medium foaming, wetting agent	High-alkali system detergent, offshore operation cleaner, automobile film-removing cleaner (contactless auto wash), detergent for automobiles, trains and other means of motorized transportation, water-based detergent, etc.
Berol® EZ-1	Proprietary surfactants blend	Brownish yellow liquid	n/a	6-8[2]	Emulsifying, medium foaming, wetting	Detergent for automobiles, trains and other means of motorized transportation, water-based detergent, etc.
Berol® LFG 61	Proprietary alcohol-EO/ alkyglucoside blend	Brown liquid	95	6-8[3]	High alkali resistance, low foaming	Industry pipeline CIP detergent, food industry cleaner, water-based high-alkali cleaner, automatic dishwasher detergent, etc.
Berol® LS	Proprietary surfactants blend	Light yellow liquid	n/a	5.5-8.5[2]	Degreasing and decontamination, low (anti) streaking, anti-fog, anti-resoiling properties	Multipurpose cleaner for kitchen, bathroom and other household reflective hard surfaces (such as stainless steel, ceramic tiles, glass surface and floor), cleaners for inner sides of windshields on automobiles and ships
Berol® EVN226 Plus	Proprietary surfactants blend	Yellow liquid	55	5-8	Efficient degreasing and decontamination, dispersing, emulsifying, wetting, readily biodegradable, comform to EU green label standard	Acidic or alkaline water-based degreaser, multipurpose cleaner, detergent for automobiles, trains and other means of transportation

[1] 5% product dissolved in the mixed solvent of water and isopropanol (1:1);
[2] 1% aqueous solution;
[3] 2% aqueous solution.

Functional Speriality Chemicals

Rheology Modifiers/Thickeners

Product Name	Chemical Name	Appearance	Solid Content %	pH	Characteristics	Main Usage
Ethomeen® C/12	Bis(2-hydroxyethyl) cocoalkylamine	Light yellow liquid	100	9-11 [1]	Thickening, emulsifying, natural plant origin	Acid thickening, polar solvent thickening
Ethomeen® O/12	Bis(2-hydroxyethyl) oleylamine	Yellow liquid	100	11-12	Thickening, emulsifying, natural plant origin	Metal cleaner, acid cleaner, thickner, solvent-type detergent formula, etc.
Ethomeen® O/12 LC	Bis(2-hydroxyethyl) oleylamine	Light yellow liquid	100	n/a	Thickening, emulsifying, natural plant origin	Metal cleaner, acid cleaner, thickner, solvent-type detergent formula, etc.
Ethomeen® SV/12	Bis(2-hydroxylethyl) soyaalkylamine	Amber liquid	100	12	Thickening, emulsifying, natural plant origin	Metal cleaner, acid cleaner, thickner, solvent-type detergent formula, etc.
Ethomeen® T/12	Bis(2-hydroxyethyl) tallowalkylamine	White to light yellow paste	100	n/a	Thickening, emulsifying	Metal cleaner, acid cleaner, thickner, solvent-type detergent formula, etc
Ethomeen® 18/12	Bis(2-hydroxyethy) octadecylamine	White solid	100	n/a	Thickening, emulsifying, natural plant origin	Metal cleaner, acid cleaner, thickner, solvent-type detergent formula, etc.
Aromox® 14D-W970	Tetradecyldimethyl-amine oxide	Colorless liquid	24-26	7-8 [2]	Thickening, high foaming,wetting, natural plant origin	Alkaline cleaner, hypochlorite based detergent, etc.
Aromox® T/12	Tallowbis(2-hydroxyethyl)am-ine oxide	Light yellow liquid	49-51	6-9 [3]	Thickening, low foaming	Acidic, alkaline, neutral detergent
Aromox® T/12 HFP	Tallowbis(2-hydroxyethyl)am-ine oxide	Light yellow paste or slightly turbid liquid	39-41	6-9 [3]	Thickening, low foaming	Acidic, alkaline, neutral detergent
Arquad® T-50	Tallowtrimeth-ylammonium chloride	Yellow liquid	49-5	6-9 [5]	Thickening, corrosion inhibition, dispersing, emulsifying, lubricating, wetting, antistatic, etc	Acidic cleaner, hydrogen peroxide-based detergent formula, etc.
Arquad® T-50 HFP	Tallowtrimethylam-monium chloride	Yellow liquid	49-52	6-9	Thickening, corrosion inhibition, dispersing, emulsifying, lubricating, wetting, antistatic, etc	Acidic cleaner, hydrogen peroxide-based detergent formula, etc.
Arquad® 16-29	Hexadecyltrimeth-ylammonium chloride	Light yellow liquid	28-30	6-9 [4]	Thickening, dispersing, emulsifying, antistatic, etc.	Acidic cleaner, hydrogen peroxide-based detergent formula, household hard surface detergent, etc.
Arquad® 16-50	Hexadecyltrimeth-ylammonium chloride	Colorless to light yellow liquid	49-52	6-9 [5]	Thickening, dispersing,emulsifying, antistatic, etc.	Acidic cleaner, hydrogen peroxide-based detergent formula, household hard surface detergent, etc.
Alcoguad® 5800	Hydrophobically modified alkali swellable emulsion (HASE)	White emulsion	29-31	2.5-3.5	High-concentration resistance electrolyte, Rheology modifier alkaline thickener	Alkali formula, food & beverage industry cleaner, formula system containing high-concentration surfactant, etc.
Alcogum® L 520	Hydrophobically modified acid swellable emulsion (HH+SE)	White emulsion	20-22	8-9	Rheology modifier acid thickener	Acidic formula, fabric softener, toilet cleaner thickener, etc.
Alcogum® SL 70	Hydrophobically modified alkali swellable emulsion (HASE)	White emulsion	29-31	2.2-3.5	Rheology modifier alkaline thickener, high efficient thickening	Alkali formula, bathroom/shower cubicle cleaner, hard surface detergent, industrial and institutional facility cleaner, etc.
Alcogum® SL 117	Hydrophobically modified alkali swellable emulsion (HASE)	White emulsion	29-31	2.2-3.5	Rheology modifier alkaline thickener	Alkali formula, bathroom/shower cubicle cleaner, hard surface detergent, industrial and institutional facility cleaner, etc.
Alcogum® RM515	Proprietary polymer	Liquid			Rheology modifier acid thickener	Acidic formula, bathroom/shower cubicle cleaner, industry detergent, softener thickening, etc.

[1] 1% aqueous solution; [2] 5% aqueous solution; [3] 10% product dissolved in 30% ethanol water;
[4] 10% aqueous solution; [5] 5% product dissolved in the mixed sovent of isopropanol and water (50:50).

Hydrotropes/Solubilizers

Product Name	Chemical Name	Appearance	Solid Content %	pH	Characteristics	Main Usage
AG 6202	C8 glucoside	Dark brown liquid	65	6-8[1]	Thickening, low foaming, wetting, high alkali resistance, readily biodegradable	Multipurpose cleaner, alkali cleaners, detergent for automatic dishwasher, detergent for offshore operation, etc.
AG 6206	C6 glucoside	Dark brown liquid	75	6-8[2]	Thickening, low foaming, high alkali resistance (50% sodium hydroxide), readily biodegradable	Multipurpose cleaner, alkali cleaners, detergent for automatic dishwasher, detergent for offshore operation, etc.
AG 6210	C8-10 glucoside	Light yellow liquid	61	4-7[1]	Dispersing, high foaming, wetting, high alkali resistance	Multipurpose cleaner, alkaline cleaners, cleaning concentrate/dish-washing liquid, etc.
Ampholak YJH-40	Amphoteric surfactant	Yellow liquid	38-40	8.5-9.5[3]	Alkali resistance, solubilizing, low foaming	Alkali cleaner, household hard surface cleaner, etc.
Berol® 561	Proprietary quaternary ammonium salts	Amber liquid	>95	6-8	Solubilizing, washing aid	Multipurpose cleaner, acidic or alkali water-based degreaser, etc
Berol® R648	Proprietary quaternary ammonium salts	Yellow liquid	60%	5-8	Solubilizing, washing aid, readily biodegradable, conforming to the Green Label standard of the EU	Multipurpose cleaner, acidic or alkali water-based degreaser, etc.

[1] 1% aqueous solution; [2] 2% aqueous solution; [3]20% aqueous solution.

Other Functional Chemicals

Product Name	Chemical Name	Appearance	Solid Content %	pH	Characteristics	Main Usage
Armohib® CI-31	Proprietary amine blend	Amber liquid	100	5.5	Corrosion inhibition/corrosion mitigation	Rust cleaner, industry pipeline CIP cleaner, specially applicable to the corrosion inhibition/corrosion mitigation of systems containing sulfuric acid, citric acid (or phosphoric acid) and other strong acids
Berol® 79	Oleylamine ethoxylate	Liquid	100	7[2]	O/W emulsifier	Stable O/W emulsion formula
Berol® 797	Proprietary surfactant blend	Dark brown liquid	100	5-7[2]	Self-separating emulsifier	Cold degreasing cleaner
Ethylan® HB4	Aromatic phenol ethoxylate	Colorless clear liquid	100	7[3]	Permeation, solubilizing	Vehicle and transportation cleaning, drilling equipment cleaning, micro-emulsion, fragrance solubilizer etc.
OMA 4	Alkyl monoethanol-amide ethoxylate	Brown liquid	100	6-8[3]	O/W emulsifier, low foaming	Stable O/W emulsion formula, water-based alkali detergent, etc.

[1] 1% product dissolved in the mixed solvent of isopropanol and wate (50:50);
[2] 1% product dissolved in the mixed solvent of ethanol and water (50:50);
[3] 1% aqueous solution.

Berol® LS

Low Streak Innovative Cleaning Technology

The excellent degreasing and decontamination performance of conventional multi-purpose cleaners comes from the effective degreasing ingredients contained in them, and more active ingredients tend to result in residual streaking on surfaces. With the advent of Berol® LS, the combination of excellent cleaning power and low streak is no longer a magical concept. Berol® LS is a concentrated blend of various surfactants and special materials, which is featured by solvent-free degreasinglow (non) streaking, anti-soiling, anti-fogging, etc., and suitable for hard surface cleaning in household, industrial and institutional facilities.

Product features

- Excellent cleaning performance, low streaking on the surface after washing, with especially significant effects on shiny surfaces such as glass, metal, ceramic tiles, etc.
- Good anti fogging effect on glass surface
- The treated glass and ceramic surfaces are resistant to recon-tamination.
- It is easy to rinse, making the next-time cleaning easier and simpler.
- Stable performance

Product performance test comparison

Cleaning performance

Berol® LS cleaning formula
Berol® LS 5%
Dissolvine GL-47-S 1%
pH 11

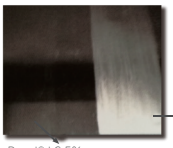
EU leading brand kitchen cleaner
Nonionic surfactant <5%
Carbonate < 5%
pH 11.4

EU leading brand kitchen cleaner
Nonionic surfactant <5%
Polycarboxylate < 5%
pH 11

EU leading brand kitchen cleaner
Nonionic surfactant <5%
pH 10.8

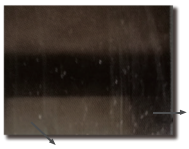
Oil stains for test:
Nouryon standard internal kitchen soil: 50% corn oil, 30% water and 20% Lambert particulate soil

Streaks after cleaning



Commercially available heavy duty cleaner (serious streak traces)

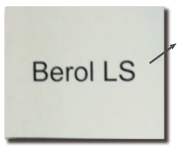
Berol® LS 5%
Dissolvine GL-47-S 1%
No streaks



Commercially available glass cleaner

Berol® LS 5%
Dissolvine GL-47-S 1%

Antifogging



Clear typeface - no fogging

Berol® LS 5%
Dissolvine GL-47-S 1%

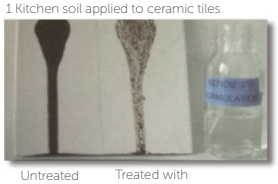
Vague typeface - fogged

Commercially available glass cleaner

Test method: Glass panels treated by different cleaners are set over boiling water for fogging. White papers printed with typeface are then placed over the glass panels and visually evaluated for degree of fogging.

Anti-soil resistance

1 Kitchen soil applied to ceramic tiles



Untreated — Treated with Berol® LS detergent

2 Rinse with water carefully.

Untreated — Treated with Berol® LS detergent

Recommended applications

- Kitchen detergent (stainless steel surface,ceramic tiles, glass panel, kitchen worktop, etc.)
- Shower cubicle detergent (shower cubicle,mirror, etc.)
- All-purpose cleaner and glass cleaner (floor,ceramic tiles, glass window, metal and other hard shiny surfaces)
- Car and marine cleaning (windscreens, coating, etc.)

Formula guide

- To achieve the best low streaking and anti-fogging performance, it is not recommended to use Berol® LS with other surfactants – which may affect the dispersion stability of the surfactant blend.
- Berol® LS is compatible with additives such as: chelating agent, organic solvents in a certain amount (such as isopropanol and ethanol), preservatives
- Extreme pH conditions or excessive organic solvents may give rise separation issues in the solution
- To achieve the best degreasing and cleaning effects, formulation with strong complexing agent (such as Dissolvine GL-47-S 1%) is recommended

Glass cleaner - low streaking, degreasing	
Berol® LS	0.5-1%
Dissolvine GL-47S	0.2 - 0.5%
Isopropanol	2.5-5%
Pigments and preservatives	Appropriate amount
Water	Up to 100%

Multi-purpose cleaner - degreasing,low streaking, ant	
Berol® LS	5%
Dissolvine GL-47-S	2.5%
Alcoguard H 5941	0.2-0.5%
Pigments and preservatives	Appropriate amount
Water	Up to 100%

Kitchen cleaner - degreasing,low streaking, anti-soiling	
Berol® LS	5%
Dissolvine GL-47-S	2.5%
Isopropanol	2%
Alcoguard H 5941	0.2-0.5%
Pigments and preservatives	Appropriate amount
Water	Up to 100%

Sanitary cleaner: scale control,low streaking, antifogging	
Berol® LS	1-2%
Isopropanol	1%
Lactic acid/citric acid	2-3%
Pigments and preservatives	Appropriate amount
Water	Up to 100%

Berol®611

Environmentally Friendly Nonionic Compound

As a new generation of substitute for nonylphenol ethoxylate (NPE), Berol® 611, launched by Nouryon (formerly known as AkzoNobel Specialty Chemicals), is used as a direct substitute for NP9 and NP10, and its cleaning performance exceeds that of the other current leading NPE substitutes.

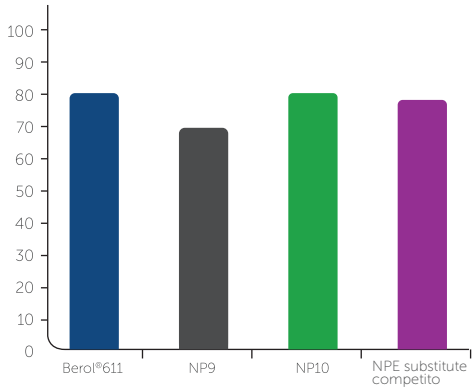
What is Berol® 611?

- Berol® 611 is an alcohol ethoxylate surfactant mixture, whose key features and performances are fully consistent with NP9 or NP10.
- Berol® 611 exceeds the cleaning and degreasing performance of other leading NPE replacements (as shown in Fig. 1).
- Berol® 611 is completely water soluble - no need for solubilizers, easy to biodegrade, and environmentally friendly
- TSCA and DSL registered.

Why using Berol® 611?

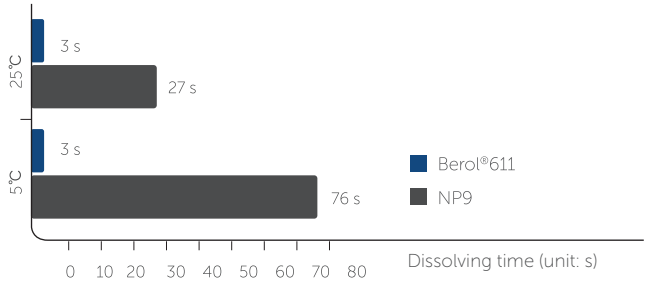
- Berol® 611 can serve as a direct substitute for NP9 or NP10 (1:1).
  - -Similar surface activities (basically equivalent cloud point and HLB value with those of NP9)
  - -Easy to handle and process
  - -(lower pour point and viscosity, faster dissolution in cold water, as shown in Fig. 2)
  - -No further changes are needed to maintain performance of existing NPE based formulations.
- It is customized for efficient water-based detergents
- Berol® 611 has excellent cleaning performance, and can completely replace other declared NP9 and NP10 substitutes when used at the same dosage.

Fig. 1 Comparative Performance for Mineral Oil Cleaning Test (no mechanical scraping)



Test formula: 0.1% surfactant, 0.2% EDTA, water

Fig. 2 Berol® 611 dissolves much faster than NP9 in water, especially in low temperature water



Test method (deionized water as medium; stirring rate, 100rpm): In each test, one drop of surfactant is added into an equal volume of water, and the time taken for the stirring solution to turn clear was recorded. Test was repeated 4 times and the average value reported.

Main physical and chemical parameters of Berol® 611

Cloud point (1% aqueous solution)	54°C
pH (1% aqueous solution)	5-9
Pour point	<6°C
Brookfield viscosity (25°C)	100cPs
Draves wetting (0.1% aqueous solution, 25°C)	7.4S
HLB value	12.9
Biodegradability rate (OECD 301E)	>60% (28d)

Recommended applications

- Direct replacement of NP9 or NP10 in the original formula (1:1)
- Water-based industrial hard surface detergent (such as vehicle and engine cleaning)
- Home care products
- Laundry detergent, etc

Berol® 561

High-performance Cosurfactant

Providing the ideal solution for your cleaning formulations
Berol®561 is a high-performance multi-functional cosurfactant that will upgrade the cleaning performance of your formulations.
Berol® 561 multi-functional cosurfactant enables it to function as an excellent hydrotrope, a degreasing booster, effective at very low concentrations.
Ranging from household cleaners to the most demanding industrial degreasers, Berol® 561's unique chemistry upgrades your cleaning formulations in many ways.

Application field

- Household cleaners - kitchens, floor, bathrooms, etc.
- Industrial & Institutional cleaners - hospitals, hotels, dining places, utilities, etc.
- Industrial cleaners - metal degreasing, engine cleaning, vehicle cleaning, etc.
- Other water-based multifunctional hard surface detergents

Performance advantagest

- Berol® 561 is suitable for alkaline formulations and can be compatible with 2-4% NaOH or KOH.
- It can also work well with hydrochloric acid, phosphoric acid, methanesulfonic acid and other acidic systems.
- It is highly compatible with all kinds of chelating agents used in cleaning applications.
- It is compatible with nonionic and cationic surfactants and is selectively compatible with certain anionic surfactants.
- It is a medium-foaming surfactant.

Comparative degreasing performance with a typical market all-purpose cleaner (APC)

Market APC | Berol® 561 formulation

Commercially available multifunctional detergent formulas (% w/w active matter content)	Berol® 561-based APS formula (% w/w active matter content)
3.0% LAS	1.0% ethoxylated alcohol ether (narrow range)
1.0% 6501 (1:1)	1.0% Berol® 561
2.0% triethanolamine	2.0% triethanolamine
3.0% Diethylene Glycol Butyl Ether (DGBE)	0.2% Na_4EDTA
0.2% Na_4EDTA	95.8% water
90.8% water	

Compared with the multi-purpose cleaners on the market, the formula system of Berol®561 and ethoxylated alcohol ether (narrow range) shows obvious advantages in the removal of heavy oil stains. Furthermore, in the case of dilution, it can still maintain a good cleaning and degreasing effect.

SXS | SCS | Berol 561

Test formula (% w/w active matter content)
3.0% ethoxylated alcohol ether (narrow range)
1.0% Na_4EDTA
4.0% solubilizer
92% water
Diluted by a ratio of 1:10

Conventional hydrotropes such as SCS or SCS show no cleaning performance in this test. Berol® 561 provides superior performance in addition to excellent solubilisation power. It also gives the desired cloud point at lower concentrations compared to conventional hydrotropes.

Recommended formulas

Water-based multifunctional hard surface detergents		Household detergents - kitchens, floor and bathroom		Household detergents - kitchens, floor and bathroom	
Alkaline formula	Alkaline formula	Multifunctional detergent	Hard surface disinfectant and detergent	Heavy oil stain degreaser	Acid pickling formula
5.0% Berol® 260	5.0% Berol® 260	2.0% Berol® 266	3.0% MEA	5.0 % Berol® 260	1-3% Berol®260 or Ethylan 1005
3.5% Berol® 561	4.0% Berol® 561	1.0% Berol® 561	1.5% Na_4EDTA	5.0% Berol®561	1-3% Berol® 561
1.0 % Na_4EDTA	1.0 % Na_4EDTA	0.4% Na_4EDTA	7.0% LAE-7EO	2.0% NaOH	5-40% citric acid, phosphoric acid, hydrochloric acid or
0.5 % NaOH	2.0% sodium silicate	96.6% water	1.0% Berol® 561	1.0% Na_4EDTA	5-15% Sulfamic acid
90.0% water	88.0% water	Direct application (spray)	0.7% Arquad MCB-80	87% water	Water
Application dilution 1:20 to 1:60	Application dilution 1:20 to 1:60		86.8% water		
			Application dilution 1:10 to 1:40		

Ampholak YJH-40

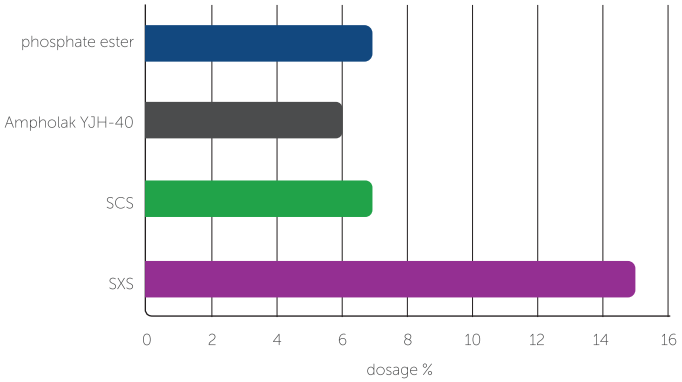
Low-foaming High-efficiency Non-phosphorus Solubilizer

Ampholak YJH-40 is a new-generation low-foaming high-efficiency non-phosphorus solubilizer. As an amphoteric surfactant, it is compatible with various types of surfactants, chelating agents and salts. In addition, Ampholak YJH-40 is stable in NaOH solution (up to 27%) and nitric acid solution (up to 40%). Characterized by extremely low foaming, Ampholak YJH-40 can be extensively used in all kinds of cleaning products, especially low-foaming cleaning products.

Recommended applications

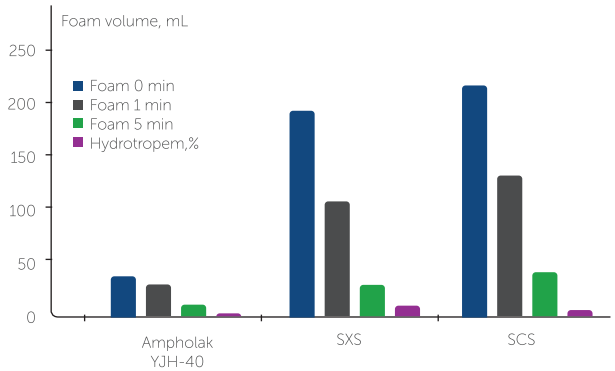
- Able to effectively replace traditional solubilizers, such as sodium xylene sulfonate, sodium cumenesulfonate, sulfuric ester-type solubilizers and organic acid-type solubilizers
- Able to effectively improve the stability of surfactants in high-alkali and high-acid solutions, and increase the cloud point of a formula
- Hard surface cleaning
- Automatic dishwashing
- CIP (clean-in-place)
- Spray detergent
- Heavy soil cleaning
- Glass bottle cleaners
- High-alkali/high-acid cleaners, etc.

Ampholak YJH-40 has a relatively high solubilizing efficiency



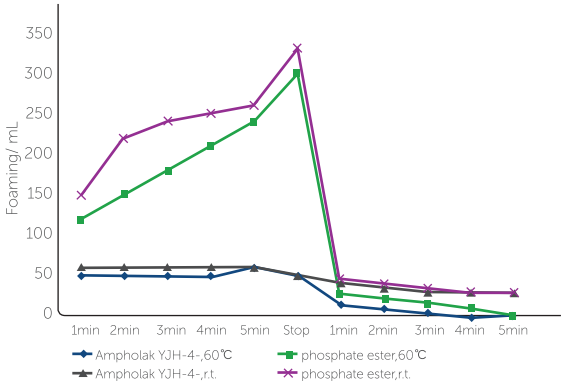
Formula: 6% Berol® 260, x% solubilier, 6% TKPP, 4% sodium metasilicate pentahydrate, topped up by water; cloud point: 40°C

Ampholak YJH-40 is extremely low-foaming.



Formula: 5% GT 2624, x% solubilier, 6% TKPP, 4% sodium metasilicate pentahydrate, topped up by water; cloud point: >40°C; solution ratio: 1:10

Spray foaming of Ampholak YJH-40



Test conditions: spray pressure, 0.5mPa; test concentration, 1%; test temperature, room temperature (r.t.) & 60°C

Ethylan® CPG 7545

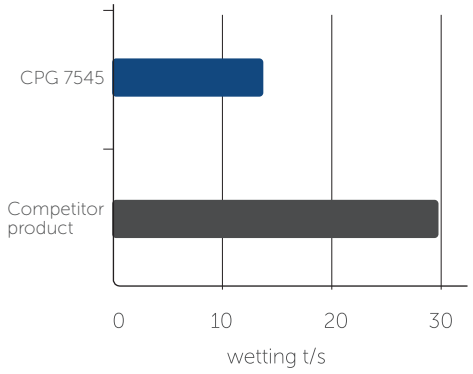
Ethylan® CPG 7545 is polyoxypropylene polyoxyethylene aliphatic alcohol ether, which has extremely low foam at medium/high temperatures and has some defoaming function. At the same time, the product has excellent wetting and degreasing ability.

Basic properties

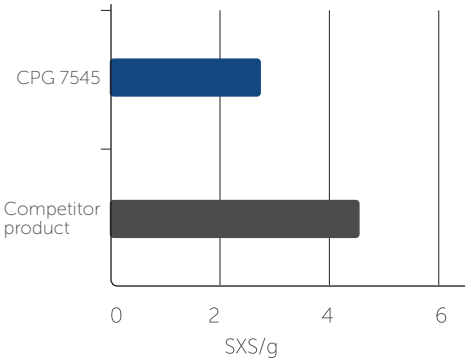
- Soluble in water at room temperature
- Low smell, low VOC
- Low foam/defoaming
- Excellent wetting
- Excellent detergency
- Readily biodegradable

Product parameters

Active matter content/%	99
Wetting power (Draves, 25°C, 0.1%)	14s
Surface tension, 25°C, 0.1%	31 mN/cm
Cloud point (Water, 1%)	35~37°C
Foam (50°C, 0.1%)	0min 5ml；5min0 ml



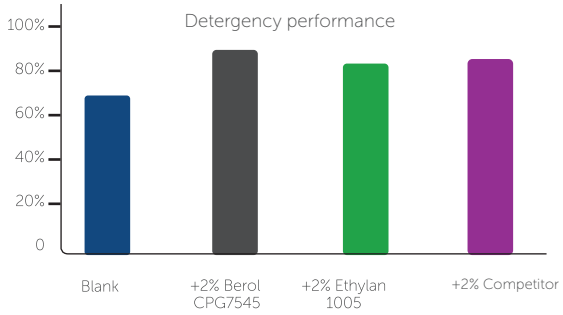
The wetting rate of Ethylan CPG 7545 is twice as fast compared to the competitor product



At the cloud point of 45°C of 10% aqueous surfactant solution, the amount of hydrotrope required by Ethylan CPG 7545 is 60% of that is reuiqred by the competitor product

Recommended applications

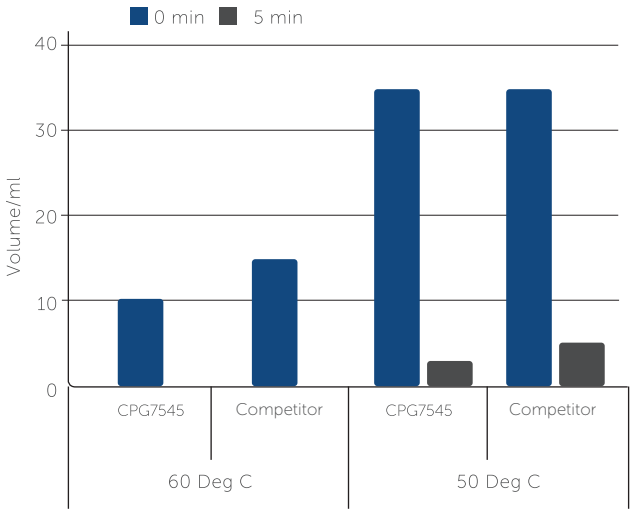
- Automatic dishwasher detergent
- Automatic dishwasher rinse aid
- CIP
- Metal cleaning detergent
- Glass bottle detergent
- Multi-purpose detergents, etc.



Ingredient	Percent
Sodium silicate	3%
EDTA-4Na	0.5%
Surfactant	2%
Hydrotrope (Amphotak YJH-40)	X%
Water	Balance

Test method: GB/T 2117-96
Test concentration: 3%
Temperature: 60°C

Foam height of 0.1% surfactant solution at 50°C and 60°C



Dissolvine® M-40
An Essential and Environmentally Friendly Ingredient

MGDA is a biologically sourced, fast working strong builder with excellent ecological properties, which is readily biodegradable and labeled non-hazardous. MGDA has become an ideal substitute for traditional builders in automatic dishwashing (ADW) and laundry under greater pressures from laws and regulations, such as phosphates (banned in various countries and regions since it causes eutrophication of water bodies). It is also a direct substitute for NTA in industrial and institutional cleaners. In cleaning applications, the strong binding between Dissolvine® M-40 and hard water ions will outperform the widely used builders such as phosphates, citrates, gluconates and zeolites. The IUPAC name of MGDA is 2-aminopropionic acid N, N-dicarboxymethyl-trisodium salt. MGDA is also known as N,N-bis(carboxymethyl)alanine trisodium salt.

Dissolvine® chelate products cover all applications, and meet the demands for the sustainable development in the future.

MGDA has three carboxyl groups, which provide multiple bonds to bind tightly with divalent and trivalent metal ions together with the central nitrogen atom. With a small molecular weight, it can act quickly at low temperature and short contact time.

Dissolvine® M-40 has completed REACH formal registration. Its low toxicity and low ecotoxicological properties endow it with superior safety performance, and may not be labeled hazardous. MGDA-Na has been listed on the US EPA's "Safer Chemical Ingredients" list.

Dissolvine® M-40 is a strong chelate of hard water and transition metal ions. MGDA can improve descaling and cleaning ability when acting as an ingredient in cleaning formulas; it also helps with whitening and color protection in laundry and dirt-removing power in automatic dishwashing (ADW). Since MGDA is also a strong chelating agent of heavy metal ions (such as Fe and Cu), it can enhance product stability and prevent the negative effects of transition metals.

Dissolvine® GL-47-S Green Chelating Agent Provides Unusual Performances

Dissolvine® GL witnesses our continuous efforts to develop new and improved products. GLDA is made from the natural biobased amino acid monosodium glutamate (MSG), which is readily biodegradable and has high solubility over a wide pH range. It is non-sensitizing to human skin, and can enhance the bactericidal ability and biodegradability of the product. Compared with phosphate, GLDA is a more effective chelating agent and will not cause eutrophication of water bodies

Dissolvine® GL is a kind of tetrasodium glutamate diacetate salt (GLDA-Na_4). GLDA has four carboxylic acid groups, which can bind the nitrogen atom in the center of the molecular structure to divalent and trivalent metal ions through strong multiple bonds.

Dissolvine® GL is a typical sustainable innovative material, which enhances the value of your products both economically and ecologically, and is therefore considered a more cost-effective, safer and greener chelating product.

Dissolvine® GL is based on sodium L-glutamic acid (MSG), a food-grade natural amino acid salt. This biomass feedstock is used to produce GLDA products containing more than half of the bio-based carbon atoms. We believe that this natural amino acid structure in the GLDA molecule makes it easy to be recognized as food for bacteria, thereby making GLDA more readily biodegradable. Dissolvine® GL has low toxicity and low ecotoxicity, and may not be labeled hazardous. More importantly, Dissolvine® GL-47-S meets EPA requirements as a safer chemical ingredient. Consumer and industrial products using Dissolvine GL-47-S will be labeled "Safe Choice" on the package. Dissolvine® GL has strong chelating properties for hard water metal ions such as Ca^{2+} Mg^{2+} ions, etc., which is more effective to water softening, improving cleaning effect and formulation stability.

Application field

Household cleaning

- Automatic dishwashing
- Laundry detergent
- Hand Dishwash
- Surface cleaning

Industrial and institutional cleaning

- Automatic Dish Wash
- Cleaning in place
- Transport cleaning
- Hard surface cleaning
- Laundry detergent
- Disinfectant and bactericide
- Metal cleaning

Alcosperse® 747

Best Polymer Choice for Concentrated Laundry Detergents

Product description

Alcosperse® 747 is a hydrophobically modified copolymer that combines the advantages of common polymers with some unique properties

As a hydrophobically modified copolymer specially customized for laundry detergents, Alcosperse® 747 has superior compatibility in formulations, and is stable and compatible even highly concentrated laundry detergent with 50% surfactant content.

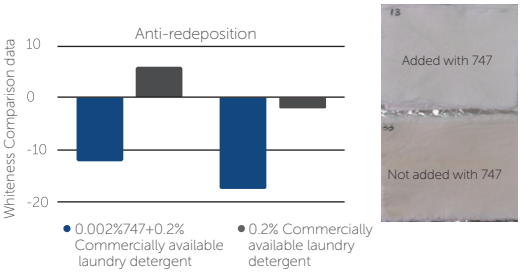
Excellent formula compatibility

2% polymer	Ordinary laundry detergent (18% surfactant content)			Super concentrated laundry detergent (50% surfactant content)		
	Room temperature	50°C	2°C	Room temperature	50°C	2°C
Alcosperse® 747	•	•	•	•	•	•
Sodium polyacrylate	•	•	•	•	•	•
Competitor product	•	•	•	•	•	•

• Clear and transparent • Turbid • Layered

Anti-redeposition, dirt suspension

Alcosperse® 747 has a strong dispersing effect on oil stains and particulate dirt. The laundry detergent formula added with polymer has a very outstanding anti-redeposition effect, which can make clothes bright white as new, and reach the best cleaning effect.



Test conditions: temperature: 30°C; revolving speed: 160rpm; cycle washing: 5 times, 60m each time; rinse twice with tap water; dry at 70°C for 1h

Corrosion inhibition

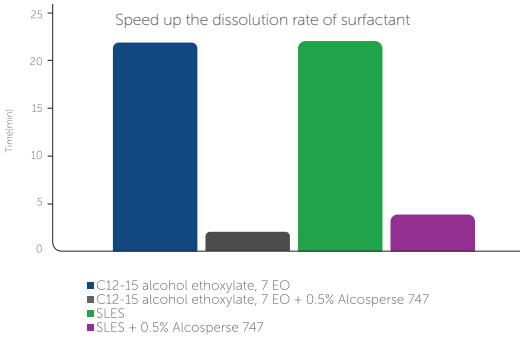
Aluminum and copper are very common in industrial cleaning. Alcosperse® 747 can also protect metals, and slow down the corrosion of alkaline substances on metals.

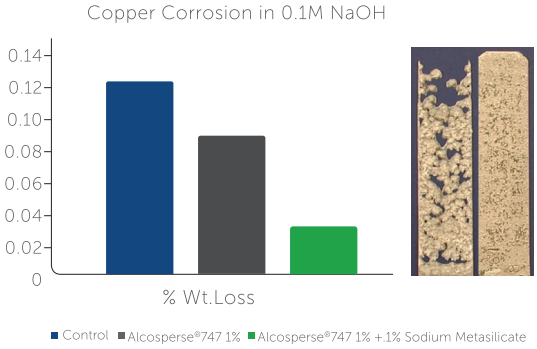
Application range:

- Laundry detergent (better concentration)
- Dishwashing
- Hard surface cleaning, etc.

Hydrotropy (speed up the dissolution rate of surfactant)

Alcosperse® 747 can speed up the dissolution rate of surfactant.





Arquad® 2C-75

Excellent Emulsifier/Hydrophobic Modifier

About the productt

Arquad® 2C-75 is a coconut oil-based dialkyl quaternary ammonium salt, which has excellent emulsifying and surface modification performances, as well as certain antibacterial performances. This product is widely used in rinse-aid for car washing, O/W emulsifier, plant-based fabric softener and antistatic agent, etc.

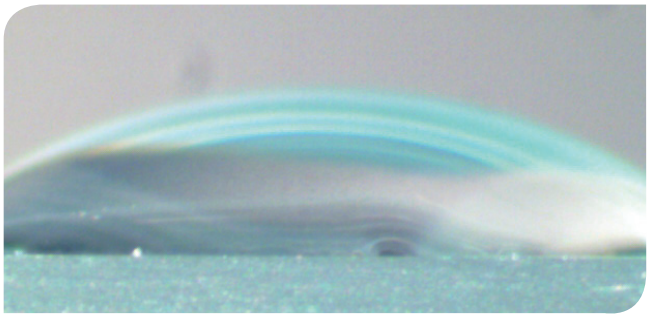
Excellent formula compatibility

Appearance	Light yellow liquid
pH	6-9
Solid content	74-77%
Free amine	<1.5%
Color	1~3 Gardner

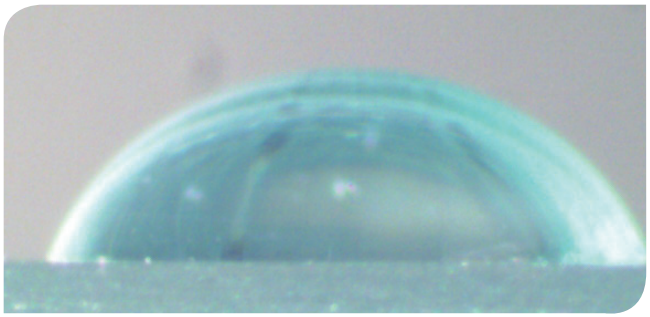
Car Rinse Aid

Test formula

Raw material	%Weight
White mineral oil	25
Arquad® 2C-75	18
Ethomeen® T/15	2.3
Ethomeen® T/25	0.7
diethylene glycol monobutyl ether	5
Water	49



The state of water droplets on the untreated glass surface



The state of water droplets on the glass surface treated with car rinse aid

Recommended formula

Glass bottle brightener		Baby softener	
White oil	3%	Arquad 2C-75	9%
Ethyan CPG7545	4%	Calcium chloride	0.02%
Arquad® 2C-75	5%	Perfume (optionally added)	Appropriate amount
Diethylene glycol monobutyl ether	3%	Water	Balance
Water	Balance		

Antistatic spray	
Arquad® 2C-75	2%
Berol®561	0.3%
Berol® 611	0.1%
Ethanol	1%
Perfume	Appropriate amount
Water	Balance

Product features

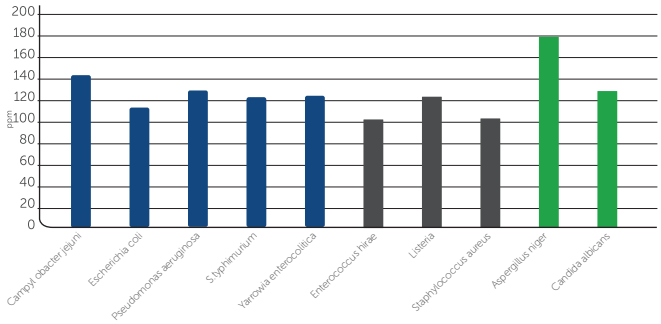
- Short drying time for car surface
- Enhance the brightness of the car surface
- Helps bead water from the vehicle surface (once formulated), allowing droplets to be blown free
- Low streaking, no water spots
- Vegetable-based, naturally derived ingredient

Triameen® Y12D/Y12D-30

High Performing, Non-Sensitizing Biocide / Bactericidal Synergist

About the product

Triameen® Y12D is a new type of green and high-efficiency biocide. Containing 67% plant ingredients, the product has broad-spectrum bactericidal power, and strong killing capacity against various bacteria and enveloped viruses (H1N1, HIV, etc.), as well as mycobacterium tuberculosis that cannot be killed by quaternary ammonium salts. When used in combination with other biocides (such as Arquad 2.10-80, MIT, alcohol, etc.), it can greatly improve the bactericidal performance of compound products, and can kill germs that cannot be killed by a single product, such as some spores and non-enveloped viruses. This product is not a quat and has no photosensitivity; therefore, it can be used in combination with a variety of surfactants and has high stability. The product is specifically suitable for disinfection of food contact surfaces , and there is no MRL (maximum residue limit) level on non-food direct contact surfaces; it is listed in the biocides / preservatives of technical products as it is free of aldehydes and halogens, it is not a sensitizer and it is on the BfR (German Federal Institute for Risk Assessment) recommendations for Food Contact Materials



Concentration required for TriameenY12D to pass sterilization requirements (LRV >5 for bacteria, >4 for fungi)

■ Gram-negative bacteria ■ Gram-positive bacteria ■ Fungus

When used in combination with green chelating agent, Triameen® Y12D can further enhance the bactericidal efficiency, and maintain high bactericidal performance in the presence of high-content organic pollutants (such as blood, protein).

Test strain (EN1276)	Contact time	Test result (LRV)
Escherichia coli	5 min	>5
Enterococcus hirae	5 min	>5
Staphylococcus aureus	5 min	>5
Pseudomonas aeruginosa	5 min	>5

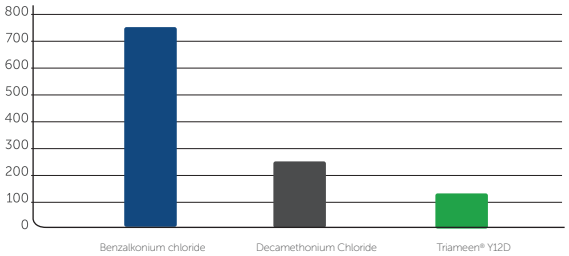
Test strain (EN1650)	Contact time	Test result (LRV)
Candida albicans	15 min	>4

Test formula: Triameen® Y12D 3%, Dissolvine GL-47-S 8%, topped up by water

Conditions: formula concentration 0.3%, BSA 0.03%, water hardness 17°dH, suspension method, 20 Deg C

This product can be used for cleaning and disinfection of food contact interfaces:

- It is very safe when used in normal concentrations on indirect food contact surfaces;
- The product is listed in the "positive list" of raw materials usable for food contact surfaces in France;
- No maximum residue level (MRL)



Concentration required for Triameen® Y12D to kill pseudomonas aeruginosa LRV >5 (EN1276)

Inactivation of virus

Triameen® Y12D has a strong killing capacity against enveloped viruses. According to EN14476 (0.03% BSA), Triameen® Y12D can effectively inactivate H1N1 viruses at an active concentration of 300ppm in 10 minutes. Theoretically, Triameen® Y12D has good inactivation performance against all enveloped viruses (lipophilic viruses).

Preservation

Triameen® Y12D is specially used for preservation systems.

- Without aldehydes, halogens;
- No photosensitivity;
- BfR, German Federal Institute for Risk Assessment recommends it as preservative for the following areas:

XIV: Coating dispersants for food packaging

XXXIV: Paper and cardboard

For more product information and samples, please contact:

Petro LBAF/ Petro 22N

Petro Alkyl Naphthalene Sulfonates

About the product

Petro alkyl naphthalene sulfonates has excellent wetting, decontamination, solubilization and coupling performances. This series of products have excellent solubility, compatibility with strong acids and alkalis, high resistance to electrolyte and hard water, and excellent high and low temperature stability, and are specially designed for cleaning formulas under extreme conditions.

Petro Products can lock dirt and form hard brittle crystalline residue after drying, capturing the soil, which can be easily removed by vacuuming, thereby avoiding redeposition of soil caused by sticky substances formed after used of standard high foaming surfactants. Petro powder products can enhance the anti-caking performance and flowability of powder formulas.

Petro 22 N

Petro 22N produces low foam and defoams extremely fast; it has excellent solubilization, wetting, and penetration performances, and can resist up to 5000ppm hard water, strong acid and alkali; it can be used in low-foam cleaning fields such as steam cleaning and high-pressure spray cleaning without bringing the risk of blocking the nozzle.

Main parameters

Ross Miles foam height (0.25%, 25°C, mm)	30
Wetting time (1%, 25°C, s)	9
Surface tension (0.1%, 25°C, dynes/cm)	51

Recommended applications

- Low foam carpet cleaning machine
- Steam cleaning
- High-pressure spray cleaning
- Low foam rinse aid, etc.

Petro LBAF

Petro LBAF has rich foam, as well as excellent wetting, solubilizing and cleaning performances. This product is compatible with strong acid and alkali and high-concentration electrolyte solutions. Unlike traditional anionic surfactants, this product does not gel at high concentrations, making it suitable for highly-concentrated formulas.

Main parameters

Ross Miles foam height (0.25%, 25°C, mm)	30
Wetting time (1%, 25°C, s)	9
Surface tension (0.1%, 25°C, dynes/cm)	51

Recommended applications

- High foam / dry foam carpet cleaning machine
- Vehicle (automobile, high-speed rail) cleaning agent
- Highly-concentrated cleaning agent
- Metal cleaner
- Oven cleaner, etc.
- High pressure spray cleaning, etc.

Reference formula

Low foam / dry foam carpet cleaning agent	
Petro 22N	10%
Dissolvine E-39	8%
Perfume	q.s
Water	Balance

Foam alkaline cleaning spray for metal	
Petro LBAF	5%
Dissolvine E-39	8%
NaOH	10%
Water	Balance

Dry foam carpet cleaning agent	
Petro LBAF	3.8%
K12	6.6%
Preservative	q.s
Water	Balance
Diethylene glycol monobutyl ether	2%

Super concentrated car washing fluid	
Petro LBAF	16%
K12	12%
Alkyl sulfonic acid	20%
Alcosperse 747	2%
Propylene glycol	6%
Dissolvin GL-47-S	2%
Alkaline agent	pH~9
Water	Balance

Foam cleaning fluid for cars (non-contact)	
Petro LBAF	3%
Alkyl sulfonic acid	5%
AES	42%
NaOH	0.8%
Perfume preservative	q.s
Water	Balance

Aromox 14D-W970

Excellent Foaming Agent / Thickener for Alkaline Oxidative Systems

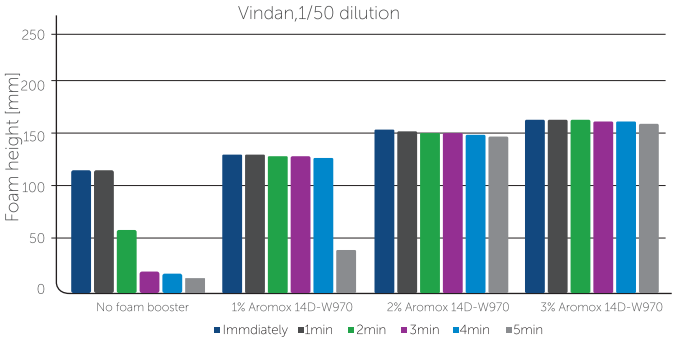
About the product

Aromox 14D-W970 is a plant-based amine oxide surfactant, which has excellent foaming and foam stabilizing property, as well as excellent wetting and solubilizing performances; it plays a certain role in synergistic cleaning performance and foam stabilization together with anionic and nonionic surfactants. With excellent electrolyte compatibility, it can be used in strong acid and alkali formulas; it is stable in oxidative formulas, and can be used for thickening of sodium hypochlorite and sodium hydroxide systems.

Performances and features

- Excellent foaming and foam stabilizing property
- Excellent electrolyte compatibility, can be used in strong acid and alkali formulations
- Stability in sodium hypochlorite solution
- Strong wetting performance, synergistic detergency with anionic and nonionic surfactants
- Excellent thickening agent for sodium hypochlorite, sodium hydroxide, etc.

Foam stability



Test formulation: 10% Berol® EZ-1, 10% Dissolvine GL-47-S, x% foaming agent, topped up by water

High-efficiency foam cleaning agent for automobiles / trains

Berol® 226SA	9%
Aromox 14D-W970	4%
Berol® 561	2.0%
Berol® Surfboost AD2M	2.0%
Dissolvine E-39	10%
NaOH	1.5%
Water	Balance

Main indicators

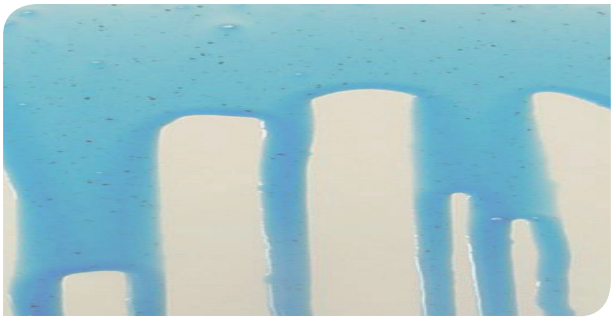
Appearance	Colorless transparent liquid
Solid content	24%~26%
Tertiary amine content	< 0.5%
pH (25 ℃, 5%)	7~8
Hydrogen peroxide	0.1%
Foam height (rm, 0.1%, 25 ℃)	167 mm
Wetting (0.1%, 25 ℃)	19.5 s

Alkaline thickening

Aromox 14D-W970	4.0%
Sodium Xylene Sulphonate	1.0%
NaOH (100%)	5.0%
Viscosity ~ 300 cps	

Thickening of sodium hypochlorite solution

Aromox 14D-W970	4.0%
NaOCl (10%)	70.0%
Na2CO3	4.0%
NaOH (100%)	0.5%
Water	Balance
Viscosity ~ 450	



Alcoguard® 7100

Polymer Opacifying Agent

About the product

ALCOGUARD® 7100 is a polymeric brightener suitable for acidic, alkaline and oxidizing systems, including sodium hypochlorite systems and low surfactant systems.

Performances and features

- The product is low viscosity milky white liquid, and is easy to handle
- Stable in sodium hypochlorite
- Good compatibility, can be used in acidic, alkaline and hypochlorous acid formula systems
- Excellent shading performances, bringing products a pearly white appearance
- Excellent anti-redeposition performance

Main indicators

Appearance	Uniform white emulsion
Color	Milky white
pH	6-8
Solid content	37 - 39%

Recommended applications

This product can be used in chlorine-containing disinfectants, hand sanitizers, cleaning products, heavy oil cleaning agents, toilet cleaners and other corresponding product formulas that need to adjust the opacity .

Recommended dosage

The recommended addition amount is 0.05% ~ 0.4% active content, that is, 0.13% ~ 1% product content.

Recommended formula

Universal cleaning agent (emulsion type)		Toilet cleaning emulsion		Cleaning and disinfecting emulsiont	
Berol® 226SA	2%	Citric acid	5%	NaClO (10%)	60%
Dissovline GL-47-S	1%	Methanesulfonic acid	2%	Na_2CO_3	2%
Alcoguard® 7100	0.5%	NaCl	5%	Sodium metasilicate	0.8%
Diethylene glycol monobutyl ether	1.5%	Berol® 226SA	0.5%	Arorrox 14D-W970	1.5%
Perfume, dye	Appropriate amount	Alcoguard® 7100	1%	Alcoguard 7100	1%
Preservative	Appropriate amount	Perfume	Appropriate amount	Water	Balance
Water	Balance	Water	Balance		

Laundry emulsion		Heavy oil cleaning emulsion	
LAS	4%	Berol® 226SA	4%
AES	7%	Isopropanolamine	5%
Berol® 611	7%	Dissolvine® GL-47-S	0.8%
Berol® 260	3%	Alcoguard® 7100	1.0%
AEO 9	6%	Citric acid	pH~10
Alcoguard 7100	0.2%	Perfume	Appropriate amount
Citric acid	0.5%	Water	Balance
EDTA 4Na	1.3%		
Alcogum® 5800	1.5%		
Perfume preservative dye	Appropriate amount		
Water	Balance		

Alcoguard® 5800

Rheology Modifier for Electrolyte / Surfactant Systems

About the product

Alcoguard® 5800 is a hydrophobically modified alkali swellable rheology modifier emulsion that can be used in formula systems (e.g., electrolyte solutions, surfactants, etc.) that adversely affect other thickeners. When the pH value of the system is greater than 7, Alcoguard 5800 can effectively thicken and stabilize most water-based formulas. For some special formula systems, when the formula design is reasonable and the pH is below 7, the formula can also be effectively thickened.

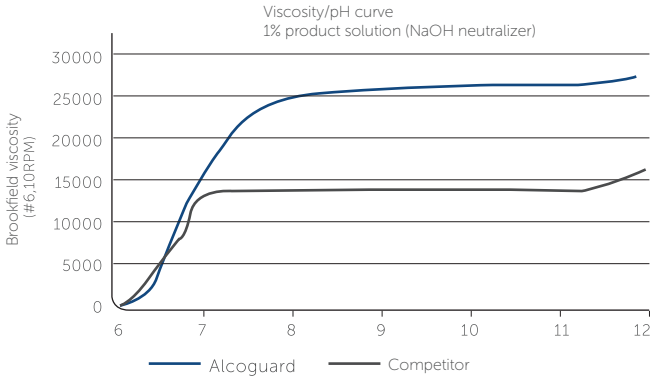
Performances and features

- Effectively improve the viscosity of formulas
- The product itself is low-viscosity emulsion, and is easy to handle
- Nonionic and anionic surfactants with low HLB value
- Synergetic thickening with anionic and nonionic surfactants
- Endow the product with pseudoplastic fluid performances
- Can be used in a variety of cleaning formula systems, and also in latex paint and coating systems
- Effectively thickening when pH>7.0

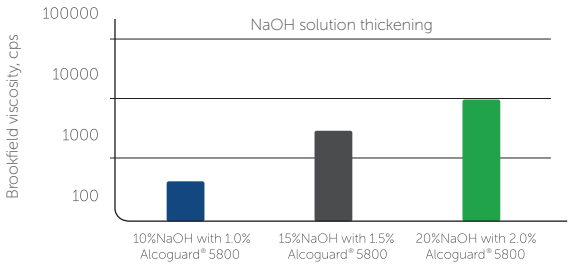
Alcoguard® 5800 can be used for thickening of various neutral and alkaline systems. When the pH is above 7, the viscosity of the system increases rapidly, as shown in the figure on the right; inorganic metal bases such as NaOH, KOH, etc., or amines such as ammonia water, etc. can serve as the neutralizing agent, and the thickening effect of NaOH is slightly higher than that of amine alkaline substances. Alcoguard® 5800 can also be used in surfactant systems, and it plays a role of synergistic thickening in anionic surfactants and low HLB nonionics.

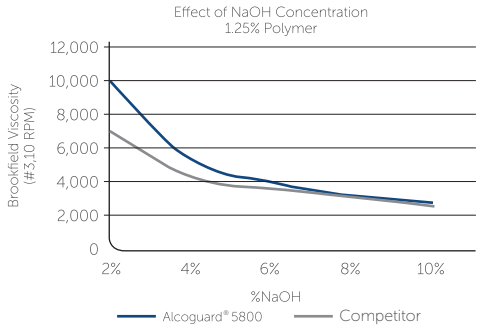
Main indicators

Appearance	White emulsion
Viscosity cps (mPa.s)	< 100 cPs
Solid content (wt%)	29.0-31.0 %
pH (25 ℃)	2.5-3.5
Viscosity, 1% (active content)	2,500 - 22,500 cPs (pH 9, NH_4OH,25 ℃, 10rpm，sp # 6



Alcoguard® 5800 can be used to thicken medium- and high-concentration electrolyte systems, such as NaOH-based formula systems. Compared to competitors, this product has excellent electrolyte tolerance and can tolerate up to 20% NaOH solution.





Berol® LGF 61 and Berol® DGR 81

High Alkali-Resistant Low Foam Surfactants

Berol®LFG 61

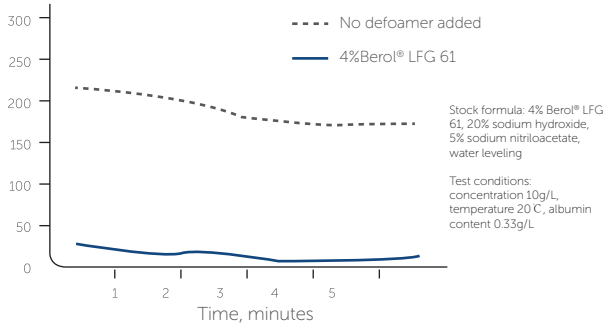
Berol® LFG 61 a very low foaming blend of alkylglucoside and alcohol ethoxylate, optimized for water-based cleaning with good biodegradability.

Berol®LFG 61 has good wetting performances, and defoaming properties on protein foam under high alkali conditions (as shown in Fig. 1); it does not require additional defoaming agent, and it can be readily used in cyclic cleaning processes in the food industry such as CIP (clean-in-place), washing and rinse-drying by automatic dishwasher.

Berol® LFG 61 can be easily combined with chelating agents, alkalis and other cleaning aids to make alkaline cleaning formulas, and with excellent compatibility with high-concentration electrolytes without solubilizers. Berol® LFG 61 is soluble and stable in system of 40% NaOH if the surfactant concentration is above 1%.

Berol® LFG 61 can also be used in weak/strong acid cleaning products, when low foam performance is required.

Fig. l The foaming-inhibiting effect of Berol® LFG 61 on protein solution (circulation method)



Recommended applications

- CIP (clean-in-place) cleaning
- Brewery and dairy plant cleaning
- Detergents and rinse aids for automatic dishwashers, etc.

Formula guide

Rinse aids for automatic dishwashers

15%	Berol®LFG 61
10%	Ethanol or isopropanol
10%	Citric acid
Balance	Water

Low- (non-) foaming acid detergent

4%	Berol®LFG 61
20%	Phosphoric acid, citric acid or hydrochloric acid
Balance	Water

Working concentration: use directly, or can be diluted to a ratio of 1:100

High-alkali low-foaming detergent

≥2%	Berol®LFG 61	≥4%	Berol®LFG 61
40%	Sodium hydroxide	20%	NTA (92%)
3%	Sodium gluconate	5%	Sodium hydroxide
Balance	Water	Balance	Water
Working concentration: 10g/L		Working concentration: 10g/L	

Berol®DGR 81

Berol® DGR 81 is a optimized blend of alkyl glycoside and alcohol ethoxylate, best suited for water-based cleaning, which has excellent degreasing power and medium (low) high foaming (Figures 2 and 3)

Berol® DGR 81 has good wetting and cleaning performances. The water-based alkaline detergent formula based on Berol® DGR 81, if matched with a suitable chelating agent, can effectively replace solvent-based detergents in many applications with its excellent degreasing performance, bringing excellent environmental benefits.

The solubility of Berol® DGR 81 in water increases as the electrolyte concentration increases, so Berol® DGR 81 can be used to prepare concentrated detergent products. Berol® DGR 81 is resistant to sodium hydroxide with concentrations up to 40%, which is unavailable to most other surfactants.

The water solubility of Berol® DGR 81 decreases at low concentrations, which results in a "quick-drying" effect when rinsed with water. When used at low concentrations, it will show a unique oil-water separation capability, which is effective in waste water treatment.

Berol® DGR 81 is also suitable for weakly acidic, weakly alkaline or strongly acidic cleaning formulation.

Fig. 2 "Black Box" non-mechanical degreasing experiment

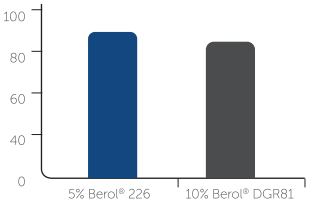
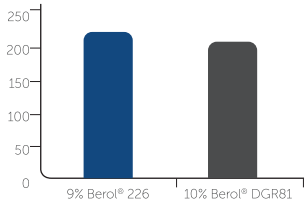


Fig. 3 Foam experiment



Stock formula for degreasing and foam test: 9% Berol® 226 or 10% Berol® DGR81, 6% potassium pyrophosphate, 4% sodium metasilicate pentahydrate, water leveling

Experimental conditions: the concentration is 50L, and the temperature is 20 C

Recommended applications

- Vehicle Cleaning
- Industrial cleaning
- Food industry cleaning
- Water-based multifunctional detergent, etc

Formula guide

Acid cleaner

4%	Berol® DGR 81
20%	Phosphoric acid, citric acid or hydrochloric acid
Balance	Water

Working concentration: use directly, or can be diluted to a ratio of 1:100

Strong alkaline cleaner

≥3%	Berol®DGR81	≥25%	Berol®DGR 81
40%	Sodium hydroxide	20%	NTA (92%)
Balance	Water	5%	Sodium carbonate
		Balance	Water

Working concentration: 1:100 Working concentration: 1:500 or above

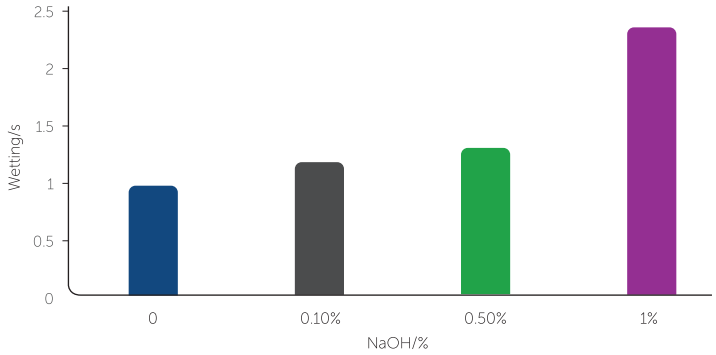
Berol® 840

Low-foaming High-efficiency Wetting Agent

Berol ®840 is a fatty alcohol ethoxylate (narrow range) with extremely low foaming and excellent wetting properties.

Main properties

- Low odour, low VOC
- Extremely low foaming, able to inhibit foaming
- Excellent wetting
- Acid and alkali resistance
- Low aquatic biotoxicity



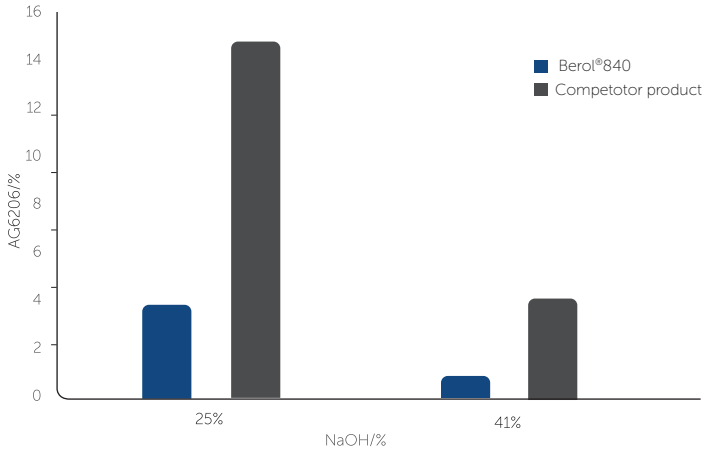
Wetting time of Berol® 840 at different NaOH concentrations (0.5%, r.t.)

Excellent alkali resistance

Under high-temperature and strong-alkali conditions, conventional polyethers experience ether bond rupture which affect the low-foaming/foaming-inhibiting behaviour. Berol® 840's unique chemistry is resistant to the impact of high temperature and strong alkali conditions.

	Foam height	
Storage time	0 s	30 s
1D	<1 ml	0
2D	<1 ml	0
3D	<1 ml	0
4D	<1 ml	0
5D	<1 ml	0
6D	<1 ml	0
7D	<1 ml	0

Storage conditions: 3% NaOH, 80°C, D: Day;
Foam test conditions: Berol 840 2g/L, 60 ℃



Amount of solvent needed to dissolve Berol® 840 at different alkali concentrations
Test conditions：NaOH 25%，Berol® 840：4% NaOH 41%，Berol® 840 1%

Under alkaline condition, the amount of solvent needed to dissolve Berol®840 is much lower than that needed to dissolve conventional polyether systems.

Recommended applications

- CIP cleaners
- Low foaming cleaners
- Metal cleaners
- Glass cleaners
- Electronic device cleaners
- Refining aids
- Glass bottle cleaners

Biocides

Biocides are widely used in various fields to control or inhibit the growth of harmful microorganisms that survive in a humid environment with suitable nutrient sources.

Nouryon (formerly known as AkzoNobel Specialty Chemicals) produces and offers an extensive range of fatty amine derivatives with antimicrobial properties. The outstanding features of fatty amine or quaternary ammonium compounds as disinfectants are high efficient against a broad spectrum of micro-organisms and relatively low toxicity when used at recommended doses. These bactericides are very stable at a wide pH range

It is well known that organic soiling on surfaces to be disinfected not only provide nutrients but also a natural barrier for micro-organisms, which blocks the contact between biocides and micro-organisms, and prevents it from playing a role of killing and inhibiting bacteria. The recommended formula we provide gives optimal wetting of the surface to achieve intimate contact between the biocide and the micro-organisms to be controlled..

Product features

Arquad® MCB

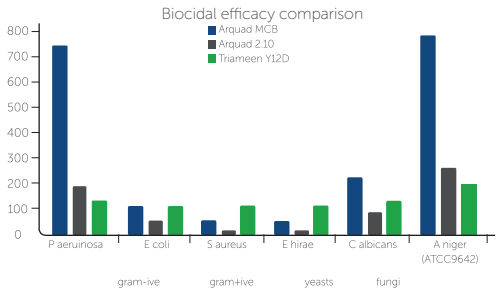
- Solubilises high concentration of salts
- Easy foaming
- Incompatible with anionic surfactants

Arquad® 2.10

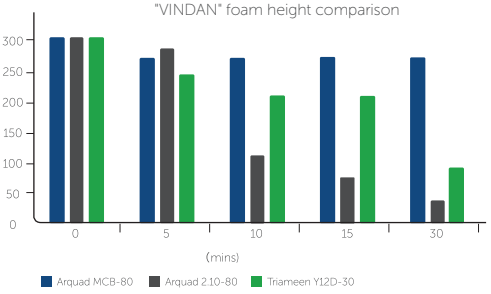
- Stronger biocidal power than that of Arquad® MCB
- Good wetting agent
- Easy foaming
- Incompatible with anionic surfactants

Triameen® Y12D

- High solubility, compatible with most anionic surfactants
- Broad-spectrum activity for tubercle bacillus, gram-positive bacteria and gram-negative bacteria, and effective for enveloped viruses (such as hepatitis B virus) as well
- Maintains high efficacy in the presence of heavy organic soiling
- Corrosion inhibition (non-corrosive for metals)



Test conditions: water hardness 17ºdH, 0.03% bovine serum albumin



Test conditions: 1,000ppm active content of aqueous biocide solution

Product information and recommended applications

Applications requiring bactericidal/bacteriostatic properties, such as hospital cleaning, food processing, veterinary hygiene, water treatment, chain lubrication, etc.

Product name	Chemical Name	Appearance (20°C)	Solids content %	Main applications
Arquad® MCB-50/80	Cocoalkyl (fractionized) benzyl dimethyl ammonium chloride	Liquid	50/80	Biocide/Bacteriostatic agent for algae, bacteria, and fungi, preservative
Arquad® 2.10-50/80	Didecyl dimethyl ammonium chloride	Liquid	50/80	Biocide/Bacteriostatic agent for algae, bacteria, and fungi, preservative
Triameen® Y12D	Dodecyl diallyl triamine, distilled	Liquid	100	Highly effective biocide/bacteriostatic agent for algae, bacteria, and fungi,preservative
Arquad® MC210	Optimized formula	Liquid	80	Broader spectrum, biocide/bacteriostatic agent for algae, bacteria, and fungi,preservative

Formula guide

15%	Arquad®MCB-50
3%	Berol®175
9%	NA4EDTA
Balance	Water

Working concentration: when water hardness is relatively high (17ºdH), it can be diluted to 1:100; when water hardness is relatively low (5ºdH), it can be diluted to a ratio of 1:300.

7.5%	Arquad® 2.10-50
Balance	Water

Working concentration: when water hardness is relatively high (17°dH), it can be diluted to 1:200; when water hardness is relatively low (5ºdH), it can be diluted to a ratio of 1:500

10%	Triameen®Y12D
1%	NA3HEDTA
Balance	Water

Working concentration: when the water hardness is relatively high (17°dH), it can be diluted to 1:200.

Contact us directly for detailed product information and sample request at cleaning @ nouryon.com

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We are a global specialty chemicals leader. Markets worldwide rely on our essential chemistry in the manufacture of everyday products such as paper, plastics, building materials, food, pharmaceuticals, and personal care items. Building on our nearly 400-year history, the dedication of our 10,000 employees, and our shared commitment to business growth, strong financial performance, safety, sustainability, and innovation, we have established a worldclass business and built strong partnerships with our customers. We operate in over 80 countries around the world and our portfolio of industry-leading brands includes Armeen, Berol, Atrac, Lilaflot and Tecflote.

For more information visit https://www.nouryon.com/markets/cleaning/

Nouryon