

AkzoNobel in the detergents industry

Dishwashing



AkzoNobel

Tomorrow's Answers Today



AkzoNobel in the detergents industry

AkzoNobel is proud to be one of the world's leading industrial companies.

In fact, we are the largest global paints and coatings company and a major producer of specialty chemicals. We supply industries and consumers worldwide with innovative products and quality ingredients for life's essentials. We think about the future, but act in the present. We're passionate about introducing new ideas and developing sustainable answers for our customers.

That's why our 55,000 employees – who are based in more than 80 countries – are committed to excellence and delivering Tomorrow's Answers Today™.

About AkzoNobel:
Looking closer,
Seeing further.

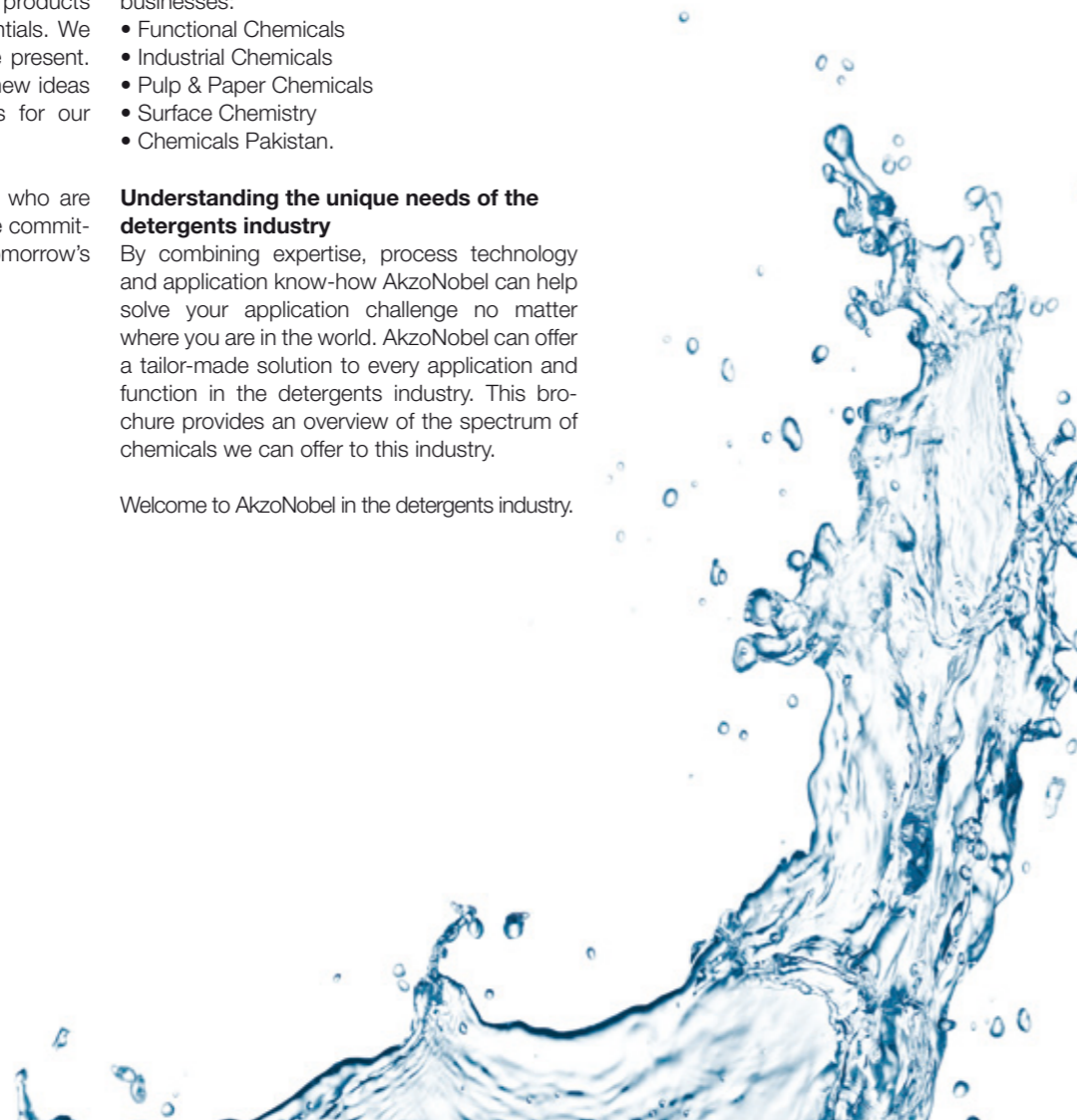
AkzoNobel's chemicals are essential ingredients in everything from ice cream to asphalt, soup to soap, and plastics to paper. We're a global leader in several markets and sectors. Specialty Chemicals is divided into the following businesses:

- Functional Chemicals
- Industrial Chemicals
- Pulp & Paper Chemicals
- Surface Chemistry
- Chemicals Pakistan.

Understanding the unique needs of the detergents industry

By combining expertise, process technology and application know-how AkzoNobel can help solve your application challenge no matter where you are in the world. AkzoNobel can offer a tailor-made solution to every application and function in the detergents industry. This brochure provides an overview of the spectrum of chemicals we can offer to this industry.

Welcome to AkzoNobel in the detergents industry.



For a sustainable future

Protection for human and animal health as well as our environment is embedded in our way of working. Finding new products acceptable in the marketplace and getting them into the market quickly and cost-effectively is vital to our business.

Our sustainability framework focuses on three pillars, to Invent, to Manage and to Improve. As we move forward, we are identifying and managing those issues which provide long-term opportunities for our businesses. By including sustainability in all aspects of the supply chain, we strengthen areas from market research to sales and marketing. Our risk processes integrate environmental, social and governance issues. Backed up by our commitment to Responsible Care®, Product Stewardship, REACH and GHS, we believe that supplying the right chemistry goes beyond just selling products.

AkzoNobel is ranked in the top three of the prestigious Dow Jones Sustainability World Indexes (DJSI) for the fifth year, recognizing the company's ongoing commitment to improving its social responsibility performance.



AkzoNobel Chelates

Dissolvine Chelating agents – performance, safety and sustainability in Automatic and Mechanical dishwashing applications

Dishwashing formulas consist of a variety of components that all work together to obtain a clean and spotless result.

The dishwashing application area can be divided into Automatic dishwashing (ADW) for household use and Mechanical dishwashing (MDW) for industrial use.



At AkzoNobel we have recognized the need of the dishwash industry and developed an excellent alternative to phosphates, phosphonates, EDTA and NTA - Dissolvine® GL. It is a readily biodegradable chelating agent or builder that combines outstanding performance with respect for the environment.

Dissolvine® GL is sustainable, safe and strong. With Dissolvine® GL you can create both an Automatic & Mechanical dishwashing formula that is fit for the future.

Automatic dishwashing formulas have traditionally relied on chemicals like phosphates or phosphonates to obtain the desired cleaning activity. However, it is generally recognized that the use of phosphorous based detergents has a negative impact on the environment. As a result most countries discourage the use of these chemicals and have introduced regulations that promote phosphorous free (P-free) detergents. Clearly, an alternative to phosphates is required.

Mechanical dishwashing formulas are traditionally formed with Chelating agents such as EDTA and NTA. However, the slow biodegradation of EDTA results in restrictions and bans in some countries. Added to which, the use of NTA based detergents is in question due to the possible carcinogen effect. The use of greener alternatives is encouraged. Most countries have now introduced regulations to promote detergents with significantly lower levels of EDTA and/or NTA.

Sustainable

The new generation of detergents has to meet many environmental challenges. Dissolvine® GL has all the properties required to give products a competitive advantage:

- 100% phosphorous free
- NTA free (<0.1%)

- readily biodegradable (according to OECD 301D)
 - smallest eco- footprint in comparison to other frequently used builders (reference SOFW journal10-2009)
 - based on a sustainable source (plant material)
- Dissolvine® GL complies with European eco-labels like Nordic Swan, Euroflower, and Blaue Engel.

Safe

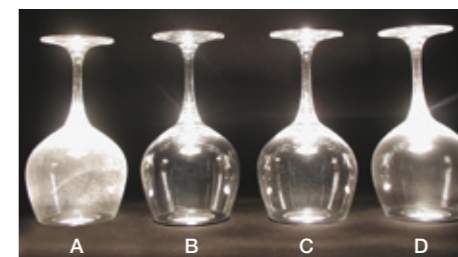
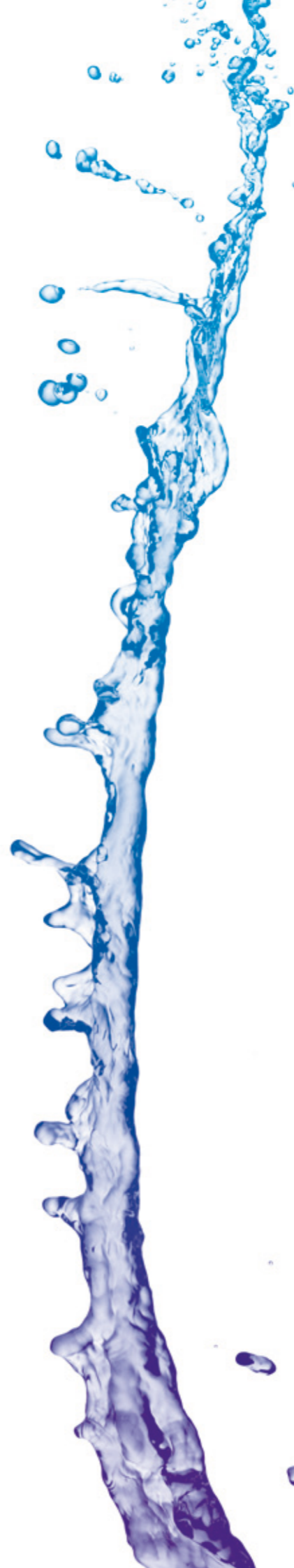
Extended toxicity studies have proven that Dissolvine® GL is safe for man and environment. As a result the product itself is not labeled with environmental hazard symbols and/or risk phrases and there are no restrictions to the amount of Dissolvine® GL in your final product.

Strong

Dissolvine® GL is a powerful chelating agent that fulfills two important tasks in Automatic & Mechanical dishwashing. Firstly, it removes the hard water ions from tap water that otherwise disturb the cleaning action of the formula. Secondly, third party studies show that Dissolvine® GL outperforms phosphates, conventional chelating agents, like EDTA and NTA, and other readily biodegradable chelating agents in the removal of the most common stains (reference patent WO96/22351, WO2007/052064).

The future of Dishwashing

Today we can make a step towards a risk free tomorrow. Replacing phosphates, EDTA and NTA in Automatic and Mechanical dishwashing with Dissolvine® GL will allow your products to comply with the regulations and enable a greener image. Dissolvine® GL hereby successfully combines the improvement of your product performance with a sustainable touch.



Anti-filming test - GLDA based formulation

- A. Without addition of polymers
- B. Alcoguard 4160
- C. AA/MA copolymer
- D. AA/Sulfonate copolymer

Alcoguard®4160 is a co-builder from AkzoNobel Surface Chemistry

Combined strength

A detergent formulation with Dissolvine® GL and co-builder Alcoguard® 4160

AkzoNobel Chelates and AkzoNobel Surface Chemistry have combined their capabilities and expertise in the development of a formulation, specifically aimed at the automatic dishwashing market. This partnership has resulted in a product to offer which:

- is an excellent builder and co-builder, due to scale inhibition, chelating and dispersing properties
- provides excellent anti-filming results in phosphorous free automatic dishwashing formulations
- is stable at high pH, therefore also suitable in industrial and institutional formulations

Contact us:

If you would like further details, please get in touch with us at one of our regional offices.

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As a reference, the anti-filming test with Dissolvine® GL and Alcoguard® 4160 showed significant results.

Products

Our Dissolvine® product line offers a wide range of chelating agents in various salt forms, purities and physical forms. For all dishwashing applications we recommend Dissolvine® GLDA.

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www.dissolvinegl.com / www.dissolvine.com

AkzoNobel Surface Chemistry

Fabric & Cleaning

**Is there a contradiction between clean and green?
We are determined that it shouldn't be.**

As leading supplier of specialty surfactants and synthetic and bio-polymers additives, we can help you enhance the performance of your products. By using chemically efficient solutions we minimize the consumption of energy and raw materials and thereby the impact on the environment.

We are dedicated to make surfaces and fabrics cleaner and brighter with a longer lasting effect.

With production locations in e.g. Mons (Belgium), Herkenbosch (the Netherlands), Stenungsund and Stockvik (Sweden), Chattanooga, Houston and Morris (USA) and Singapore, we are committed to supplying our customers around the globe.

Automatic and mechanical dishwashing products and functions

We offer products and formulation expertise for almost all cleaning segments. We focus on surfactants and specialty polymers suitable for the home and fabric care and Industrial and Institutional (I&I) markets.

Automatic dishwashing (ADW)

We offer a variety of homo- and (sulfonated-) copolymers to control sequestration, crystal-modification and dispersion of almost all types of scales formed in the Automatic dishwashing application. Specialized in the synthesis of water soluble polymer products we use both natural and synthetic sources. Alcoguard 4160-G is the newest anti-filming polymer for phosphate-free based Automatic dishwashing formulations. Reduces filming on dishware, and is particularly suited for use in hard water conditions. Our recently developed hybrid polymer technologies are also suitable for ADW applications, making it possible to do the right thing for the environment while keeping costs and performance where you want them.



Polymers

Our range of rheology modifiers is one of the broadest within the industry and is based on both surfactants and polymers. The Automatic dishwashing polymers prevent scale formation and improve shine on finished goods. We also offer modified starch-based delivery systems for laundry and household products applications.

Our recently launched Alcoguard® H5240 is a unique plant-based alternative to petroleum-chemical polymers, made from over 60 percent renewable resources such as corn, potato and tapioca. In addition to being biodegradable, our hybrid outperforms other green polymers currently on the market. It is designed to prevent scale formation in laundry detergents and automatic dishwashing, as well as other applications where synthetic water-soluble polymers are typically used.

Contact us

If you would like further details, please get in touch with us at one of our regional offices:

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Products

Our products in Cleaning are recognized under the following trade names;

- Alcoguard® (Polymers)
- Alcogum® L (Rheology Modifiers)
- Alcosperse® (Polymers)
- GT 2624 (Surfactant)

Application Areas

Our surfactants and polymers are widely used in various detergent and cleaning applications such as:

- Hard surface cleaning
- Laundry detergents
- Fabric softeners
- Phosphate free Automatic dishwashing (ADW)
- Vehicle cleaning
- CIP / Bottle washing
- Metal cleaning
- Disinfectants / Sanitizers

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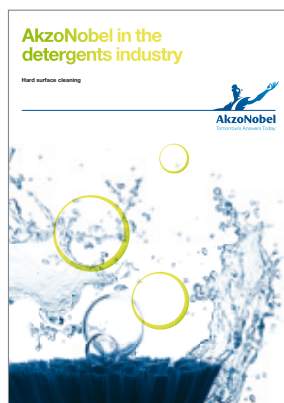
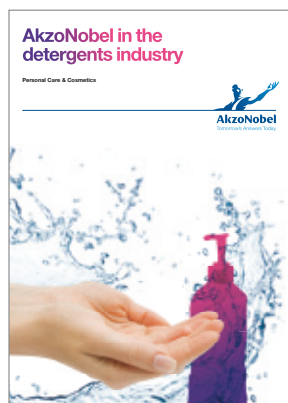
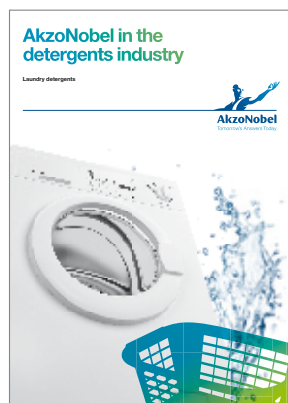
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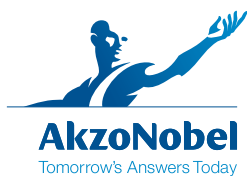
Please also visit our website:
www.akzonobel.com/sc



Our series of brochures, AkzoNobel in the Detergents Industry, covers a complete range of applications. Also available are:



Please contact your local sales representative for more information.



www.akzonobel.com

AkzoNobel is the largest global paints and coatings company and a major producer of specialty chemicals. We supply industries and consumers worldwide with innovative products and are passionate about developing sustainable answers for our customers. Headquartered in Amsterdam, the Netherlands, we are a Global Fortune 500 company and are consistently ranked as one of the leaders on the Dow Jones Sustainability Indexes. With operations in more than 80 countries, our 55,000 people around the world are committed to excellence and delivering Tomorrow's Answers Today™.

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