Grupa Azoty

Oxoplast™
flexible opportunities

Flexible solutions for your business

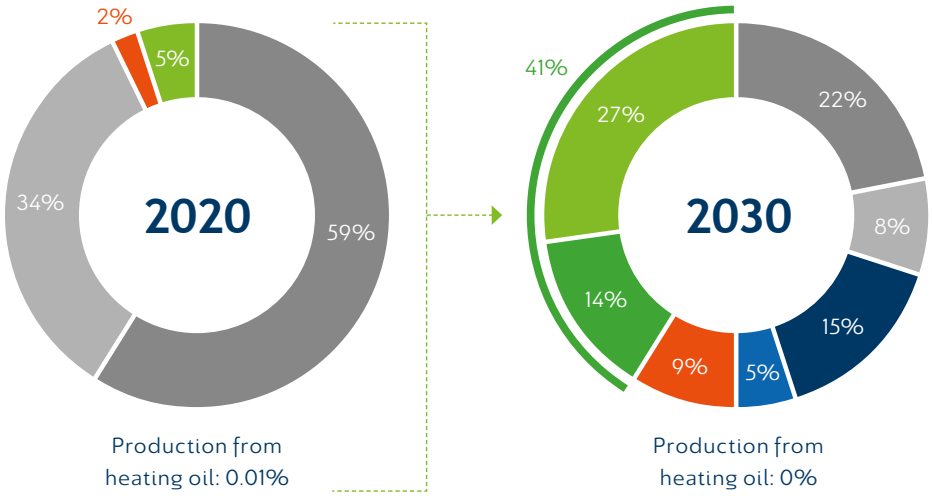
2024

Grupa Azoty S.A.

With the strategy we have developed for 2021-2030, we are responding to the most pressing challenges of today's industry from the perspective of one of the leaders in the European fertilizer and chemical industry. For us, the issue of sustainability and socially responsible business is of strategic importance. We address the challenges posed to the modern industry by **European Green Deal**, being proactively involved in projects covering the areas of green energy, emissions reduction or decarbonization. For smooth functioning, we have launched **'Green Azoty' project** that is based on 3 pillars: **green products, green technologies and green organization**. By 2030, we will continue to actively seek opportunities to implement technological solutions for carbon-free and renewable energy sources, resulting in an **average share of renewable energy sources** in the group energy mix of **at least 40 percent**. Meanwhile, the implementation of the planned decarbonization projects is expected to **reduce the CO_2 emissions** in Grupa Azoty in 2030 by over 800,000 tons compared to 2021. **As Poland's leading hydrogen producer**, we will continue our efforts to develop the hydrogen market and implement the European Union's Hydrogen Strategy.

We understand the gravity of climate and environmental changes, which present a major threat to Europe and the whole world. The chemical industry, which is a source of large amounts of greenhouse gas emissions for reasons inherently related to the technologies employed, must take its share of responsibility for slowing down the pace of these changes by striving to achieve carbon neutrality and by investing in green energy and green products. Pro-environmental activities will be carried out within the organization, but we also responsibly select suppliers of raw materials.

Grupa Azoty energy production structure breakdown by source



Grupa Azoty's goal is to reduce the share of electricity from coal to less than 50% of the total energy consumed in 2030

Key objectives of the 'Green Azoty' project

Diversification of feedstocks towards greensources

Delivery of the ESG Strategy and its reporting to the market

Implementation of technological solutions involving renewables as **alternative green energy sources**

Striving towards **decarbonisation and reduction of harmful environmental emissions**

R&D projects corresponding to the objectives of the **European Green Deal**

'GreenHydrogen' and **Green Ammonia** projects Depending on the regulatory direction taken by the EU and EU funding obtained, Grupa Azoty – as Poland's largest producer of hydrogen – intends to keep track of and actively participate in the development of the green hydrogen market. The Grupa Azoty Group will actively seek technological, investment and acquisition solutions in the field of obtaining green ammonia

The 'GREEN AZOTY' strategic corporate project stands primarily for: **Green products** | **Green technologies** | **Green organisation**

Grupa Azoty
at a glance

Grupa Azoty, Poland's largest chemical group and a significant chemical industry player in the EU offering a diversified product portfolio – from mineral fertilizers and engineering plastics through OXO products to melamine.

5
main production sites

over
50
companies in the capital group

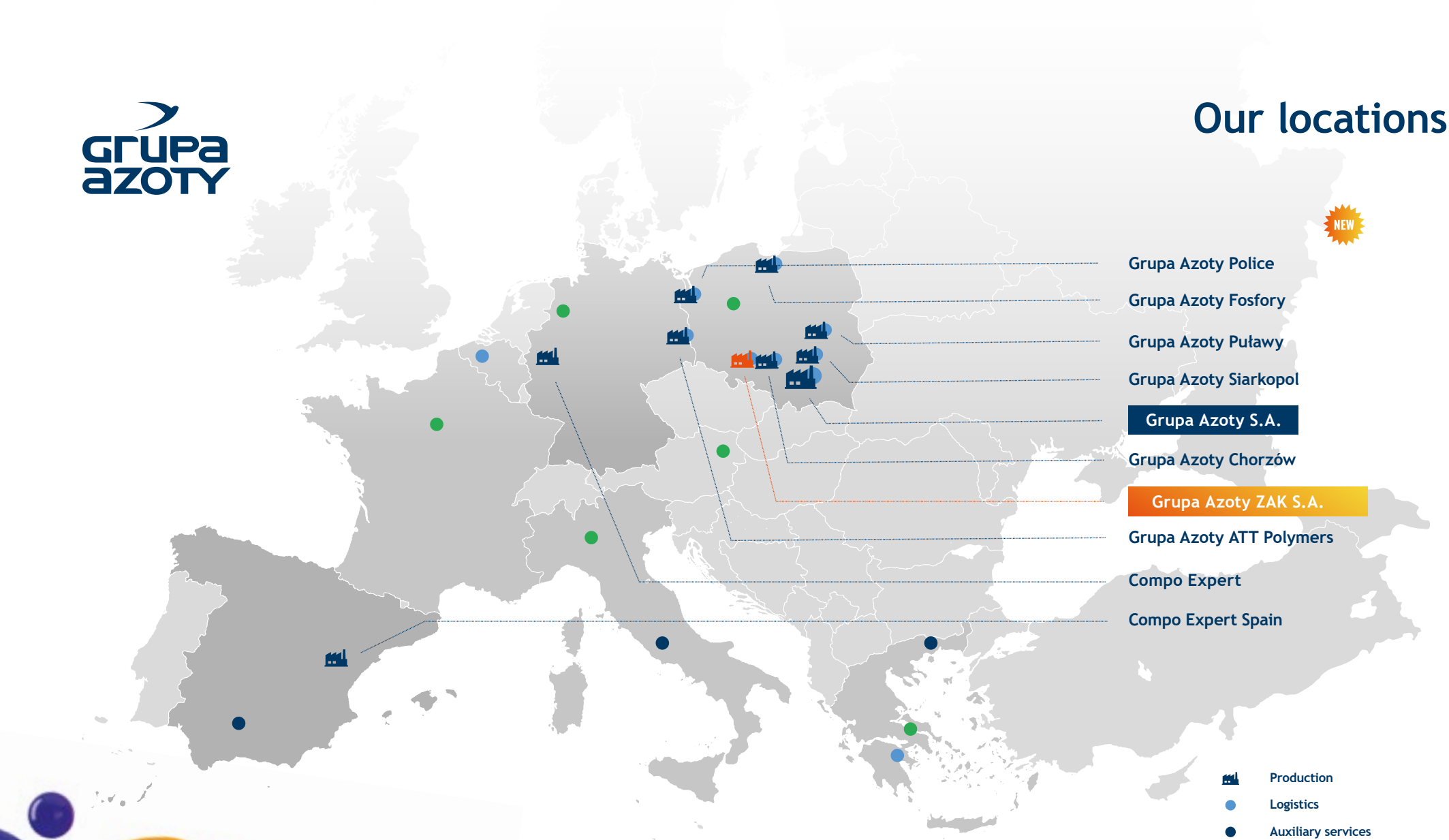
approximately
~15 000
employees

Business areas	AGRO	PLASTICS		CHEMICALS			Strategic Business Area - Energy
Business Segments	AGRO	Plastics - Polyamides	Polyolefins	Pigments	Tech Grade Urea	Oxoplast™	

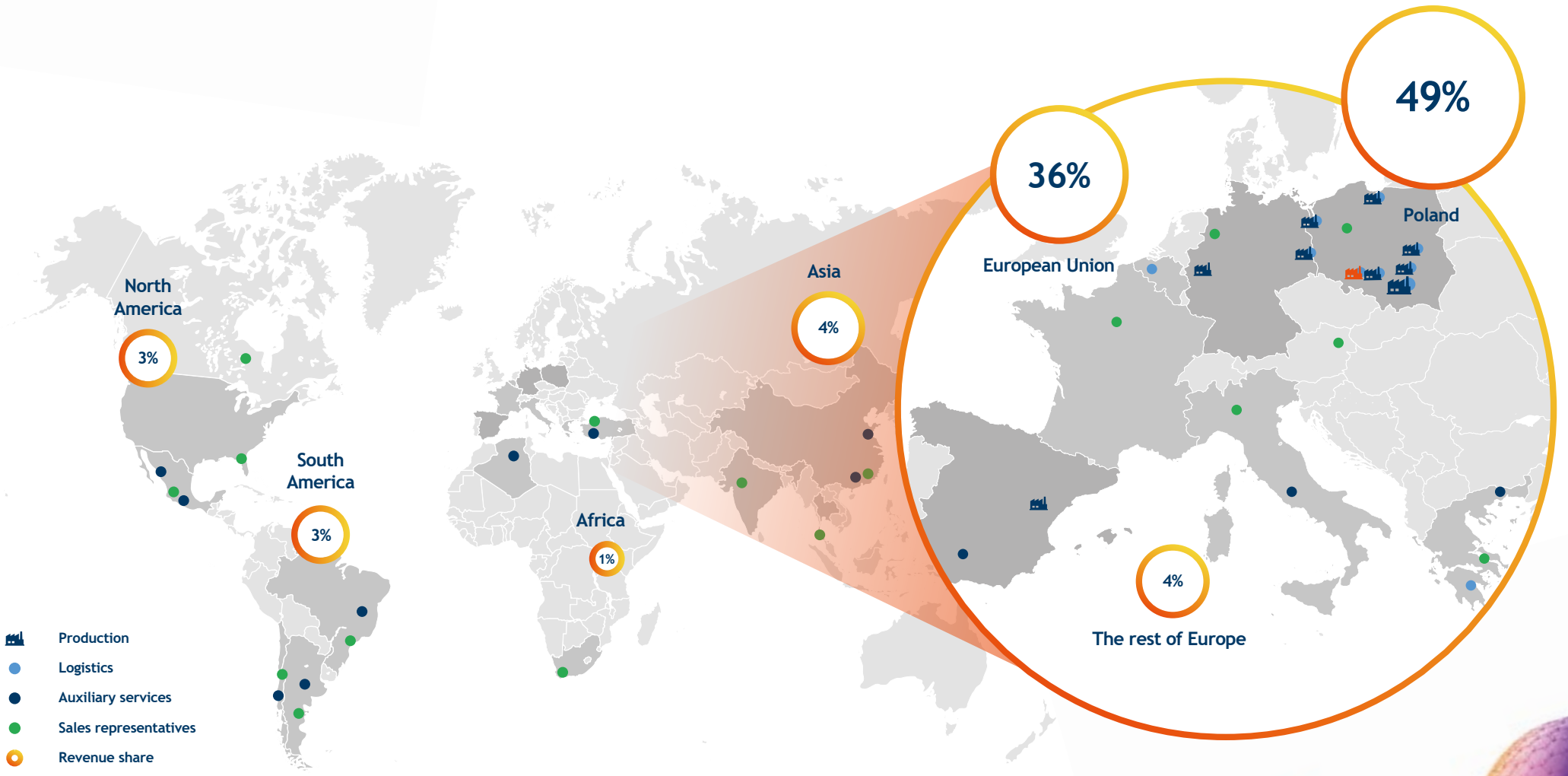
Business Segments Details

Business Segments				
	Fertilizers	**Chemicals**	**Plastics**	**Other**
Grupa Azoty S.A. (parent company, capital group)	AN, CAN, ASN, AS		PA6, POM, Compounds, Caprolactam	
Grupa Azoty ZAK S.A. (capital group)	AN, CAN, UAN, CAN+S, urea	OXO alcohols, Plasticizers, Aldehydes		
Grupa Azoty Puławy (capital group)	AN, UAN, urea, NPK, AS	Melamine	Caprolactam	
Grupa Azoty Police (capital group)	NPK, NP, NS, urea	Titanium Dioxide		
Grupa Azoty Polyolefins S.A.			Polypropylene NEW	
Grupa Azoty ATT Polymers			PA6, Compounds	
Compo Expert	Specialty fertilizers, biostimulants			
Grupa Azoty Koltar				logistics
Grupa Azoty Siarkopol		Sulphur based producsts		mining
Grupa Azoty Polskie Konsorcjum Chemiczne				designing and engineering services, repairs, maintenance, chemical rescue

Our locations



Core Business



Environmental investments in Grupa Azoty ZAK S.A.

We are leading green projects to be able to produce heat, electricity, hydrogen and green chemicals. Also, we are implementing a very ambitious plan to convert to green energy and green hydrogen. The environmental investments we are making at Grupa Azoty ZAK S.A. fit perfectly into this scheme. Being committed to the idea of a clean Poland and having taken tangible steps to this end, we have become leaders in the green transformation. Our projects are implemented following assumptions such as safety, price stability, with the balance of benefits outweighing costs.

- Our new project named **New Energy Concept** features eco-friendly changes within the production facilities that will provide Business Unit Oxoplast™ **with the availability of energy utilities** produced with a significantly reduced, and periodically even **zero carbon footprint**, thereby helping to **curb CO_2 emissions**.
- **Hydrogen is our green technology**, and in response we are building **the first alternative fuel laboratory** in this part of Europe. The laboratory will facilitate an end-to-end analysis of hydrogen purity for the automotive industry.
- On October 14, 2021, a sectoral agreement for the development of the hydrogen economy was concluded, which involves 200 entities, including Grupa Azoty.
- On November 2, 2021, a strategy for the development of the hydrogen economy until 2030 with foresight until 2040 was adopted. According to the National Reconstruction Plan, **Poland is expected to develop at least 5 hydrogen valleys**.

Grupa Azoty's hydrogen strategy until 2030 seeks to **decarbonize the hydrogen used**. As part of the planned projects, we start making **investments** in both **renewable energy sources and electrolyzers** allowing the production of green hydrogen. We are also exploring solutions to decarbonize our existing steam reforming plants and to manage the CO_2 resulting from them.

- We are looking for opportunities to implement technical solutions within the scope of renewable energy sources, such as solar **photovoltaics, wind power, biomass energy production and waste heat from production facilities**. The implementation of the above investment and modernization measures will enable us to obtain the status of a renewable energy generator. **We are already implementing a pilot** renewable energy sources project **based on solar photovoltaics, which marks the beginning of our journey toward a substantial reduction in CO_2 emissions**.

Oxoplast™
flexible opportunities

Key challenges of the modern world and our responsibility

In **Business Unit Oxoplast™**, we produce high-performance plasticizers, OXO alcohols and aldehydes. As the market leader in OXO, we are constantly expanding our presence with our products distributed in Europe, North and South America, Asia and the Middle East. Importantly, all Oxoplast™ products are prepared in line with the REACH regulation requirements. In 2021, we launched **new specialty plasticizers, with the entire product line under the Oxofine™ brand**. The portfolio of specialty products features **Oxofine™ TOTM, Oxofine™ DOA and Oxofine™ Poly2K polymeric plasticizer**.

We are continuously working on the synthesis of new products, including bioplasticizers. Our pride is in combining and developing the key aspects of operating and managing an innovative business- competent and committed employees with modern technologies that give us a winning edge over our competitors. But our number one priority project is **the climate and energy transition**.

Our products and technologies contribute to attaining our customers' environmental goals. By enhancing people's life standards, we favorably impact the climate and the environment. Our R&D projects are carried out in line with the European Green Deal. Innovation and collaboration make an indispensable pairing toward **the sustainable growth of the chemical industry**.

Our responsibility is the future

We are unceasingly working to make Business Unit Oxoplast™ operations more and more sustainable. Our environmental impact is being reduced, and we are putting sustainable operations into practice. Our expansion enables the manufacturer to reuse and recycle the product, aiming to support a closed-loop economy, minimize raw material consumption, and cut down on waste.

The ongoing activities related to **the project on thermal modernization of production facilities at Oxoplast™** will allow us to generate savings in thermal energy consumption as early as 2022, with **the scale of savings** reaching **9,910 GJ/year**, compared to 2019. Subsequent thermal modernization work will enable us to achieve our goal of **maximizing the energy-saving effect and reducing the environmental footprint of our products!**

At **the Laboratory of the Research and Innovation Department**, we are constantly conducting research and development work to synthesize new products including renewable-based ones, which will be a compelling alternative to the petrochemical-derived products. Products based on renewable raw materials are marked by low toxicity and high biodegradability, plus they do not adversely affect the environment and are neither toxic, carcinogenic, nor mutagenic.

Bioproducts are used as **plasticizers for plastics.** In the nearest future, **our first bioplasticizer** will be featured in the Oxoplast™ product range. We are a game-changer for the circular future!

Our goals:

Diversification of the product portfolio through the roll-out of new products extending the value chain of aldehydes and OXO alcohols

Increasing production flexibility by balancing the output of aldehyde derivatives

Expansion of the Oxoplast™ presence and market exposure in non-European markets

Ongoing assessment of the competitive position and customer perception in relation to both products and market operations in order to facilitate swift response to any identified changes

Our commitments:

We establish long-term partnerships with our customers and uphold our reputation as a reliable business partner.

Our position of a dependable product supplier is maintained thanks to a top-notch level of service, competent employees, on-time delivery and excellent product quality.

We expand our product portfolio by extending the value chain of aldehydes and OXO alcohols.

To accommodate regulatory changes and environmental protection, **we provide our customers with access to innovative products** that meet market requirements.

Oxoplast™ History

1954
Our experience in OXO products dates back to 1954. This is when we started production of our first PVC plasticizer.

1963
In 1963 we have started to produce diethylhexyl phthalate – DEHP.

1986
We have started-up a modern OXO alcohols plant (2-Ethylhexanol, n-Butanol, Isobutanol) as well as hydrogen and synthesis gas facilities. The investment had been started in 1982 and employed Davy Process technology.

1996
In co-operation with Davy Process we commenced OXO plant modernization aimed at increasing its capacity. The process ended in November 1998.

1999
We began production of diisobutyl phthalate – DIBP.

2002
We changed our internal structure and a dedicated Oxoplast Business Unit was created.

2010
Observing trends and dynamic changes in the market we have introduced a high molecular weight phthalate plasticizer – DPHP.

2011

As one of the first in Europe we developed a non-pthalate, PTA based plasticizer and put it to small scale production.

2014

We have introduced a new product brand – Oxoplast Medica™, a plasticizer for medical purposes.

2016

We have started putting up our Research and Development Centre.

2018

Decision to increase Oxoviflex™ capacity by 15 kT up to 65 kT/year.

2013

We decided to build a large scale plant for Oxoviflex™ a non-pthalate plasticizer (50 kT /year).

2015

We have started-up a large scale plant for a non-pthalate, PTA based plasticizer (50 kT /year).

The product has been introduced under Oxoviflex™ brand.

We signed a letter of intent on the establishment of the OXO and polymer Application Center.

2017

We have launched SEP (Specialty Esters Project) pilot plant.

2019

We have startedup a new plant and introduced new specialty plasticizers.

2020

Return to the historical name Oxoplast™.

2021

We introduced into our portfolio high quality specialty plasticizers Oxofine™ TOTM and Oxofine™ Poly2K. Oxofine™ has become the umbrella brand for all specialty plasticizers.

Segment Oxoplast™

flexible opportunities

Grupy Azoty ZAK S.A. is a part of Grupa Azoty. Oxoplast™ is a Business Unit of Grupa Azoty ZAK S.A. focused on OXO alcohols, plasticizers and aldehydes.

We respond to customers' needs and challenges of a changing world with our **specialty products.**

Innovation has permanently entered our DNA. We believe that the future lies in better understanding of our partners' needs and working together to create the best solutions.

We develop our products according to sustainable development principles and **environmental care**. Our goal is to provide solutions that enable the production of products that are environment-friendly and safe for human health.

We are proud of Oxoplast™ **heritage**. We have been producing plasticizers continuously since 1954, and OXO alcohols since 1986. ZAK Quality is our trademark - quality recognized all over the world!

Oxoplast™ over the years

Plasticizers

- **1954** start of production of the first PVC plasticizers
- **1963** Oxoplast™ O (DEHP)
- **1999** Oxoplast™ IB (DIBP)
- **2010** Oxoplast™ PH (DPHP)
- **2014** Oxoplast Medica™
- **2015** Oxoviflex™ - start up of 50 kT/year plant
- **2018** phase out of phthalate plasticizers and decision to increase of Oxoviflex™ production capacity by an additional 15 kT / year
- **2019** Start-up of 10 kT/year specialty plasticizers plant
- **2021** Oxofine™ TOTM - high quality specialty plasticizers and first polymeric plasticizer Oxofine™ Poly2K

OXO Alcohols

- **1986** Start-up of OXO alcohols plant (2-Ethylhexanol, n-Butanol, Isobutanol)
- **1998** OXO plant revamp aimed at increasingits capacity up to 225 kT/year

Capacities

Plasticizers

Our experience in the production of plasticizers dates back to **1954**

- We are the largest European producer of **DOTP**
- We look boldly into the future - **we have increased capacity of Oxoviflex™ and launched specialty esters plant**
- We introduced into our portfolio high quality specialty plasticizers, **Oxofine™ TOTM**, **Oxofine™ DOA** and polymeric plasticizer **Oxofine™ Poly2K**

no. 1 in EU's DOTP capacity

General Purpose
Plasticizers

Oxoviflex™

65 kT/year

Specialty
Plasticizers

Oxofine™ Poly2K **Oxofine™ TOTM**
Oxofine™ DOA

10 kT/year

2,4 million tons of plasticizers produced since 1954

OXO alcohols

We have been producing OXO alcohols since **1986**

- In 1998 our OXO plant was modernized, **now it is one of the most modern in Europe.**
- On our plant, apart from OXO alcohols we supply their precursors i.e. n-Butyraldehyde and Isobutyraldehyde.
- Geographical barriers do not exist for us, we serve our clients globally

no. 2 in EU's 2-EH capacity

n-Butanol
Isobutanol
Octyl alcohol F

55 kT/year

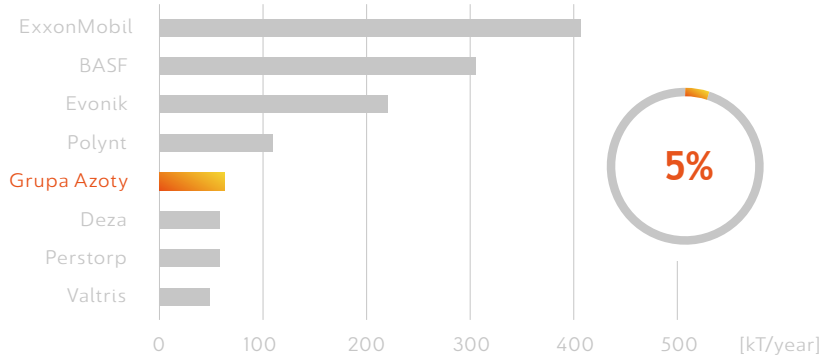
2-Ethylhexanol

170 kT/year

5 million tons
of OXO alcohols
produced since 1986

Market share in European Union

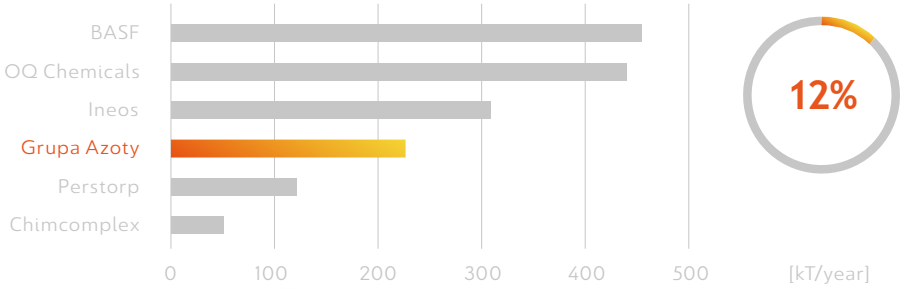
Plasticizers



with reference to DEHT, DINCH, DINP, DPHP

no. 1 in EU's DOTP capacity

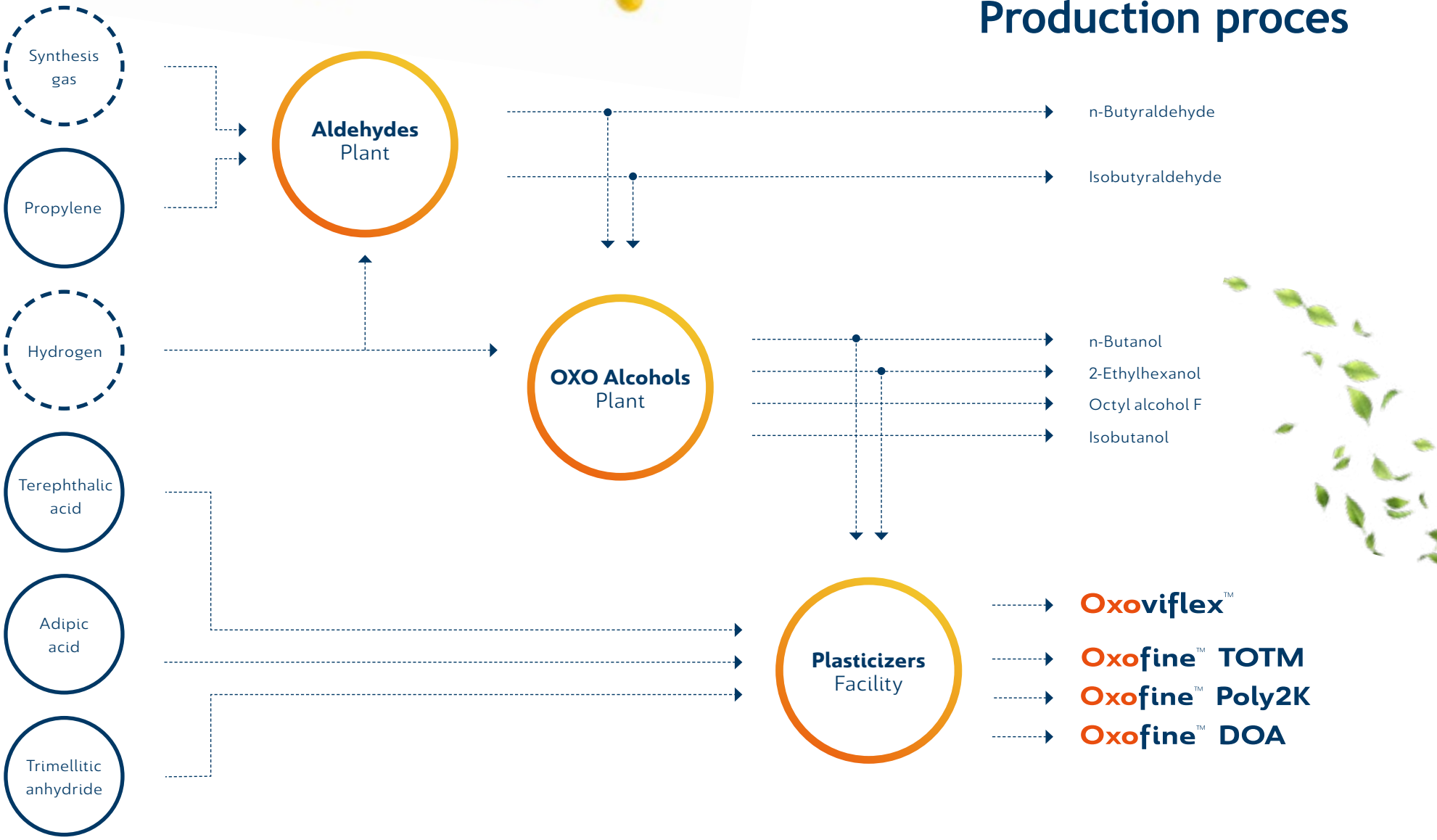
OXO alcohols



with reference to 2-EH and butanols

no. 2 in EU's 2-EH capacity

Production proces



Market share in EU
Production proces

Logistics options

Efficient logistics

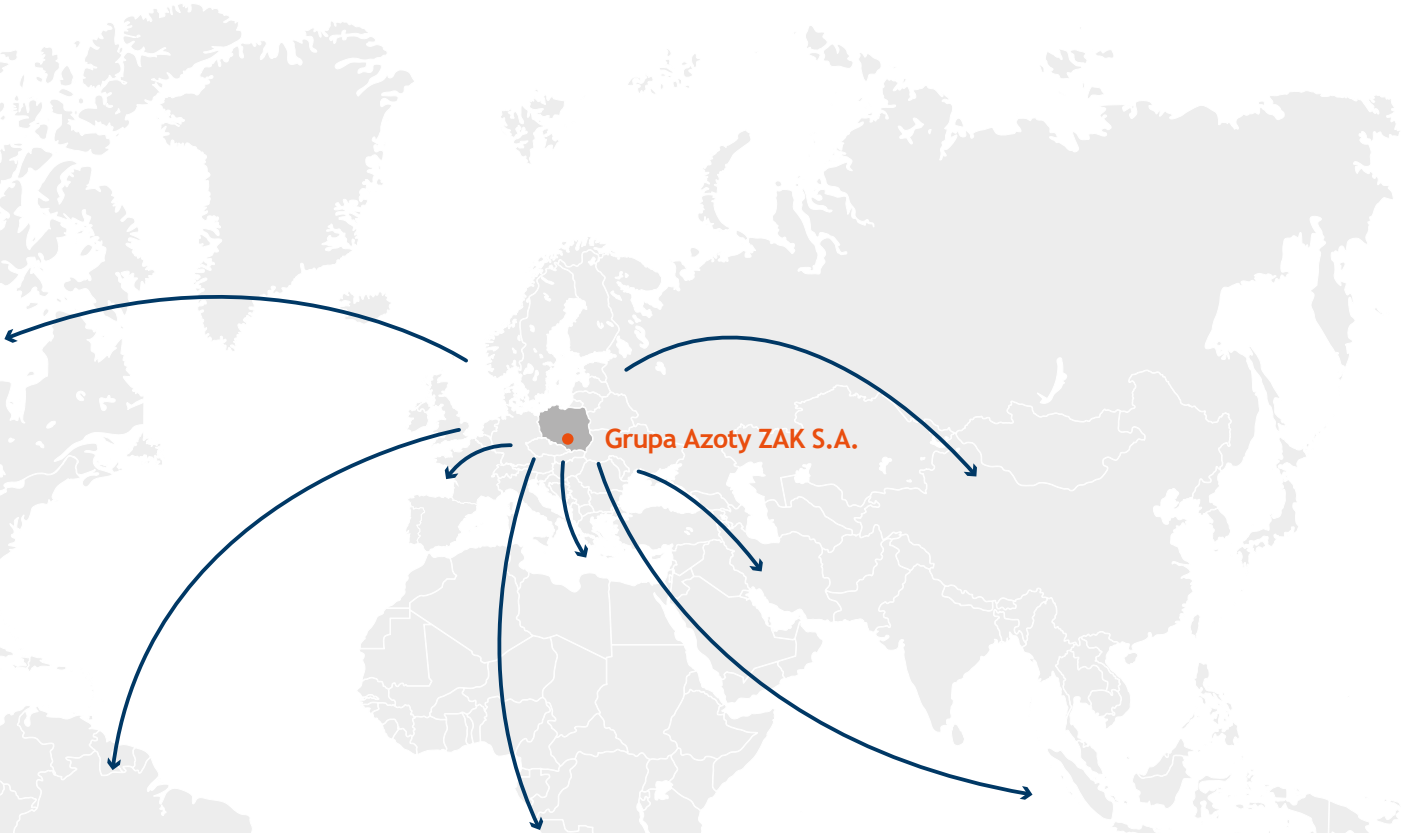
Geographical barriers do not exist for us, we operate globally. We provide our clients with comprehensive service and in-time deliveries. We adapt to the most demanding needs and use innovative logistics solutions.

IN-TIME deliveries in:

- IBC's
- drums
- road tankers
- ISO tanks
- flexitanks
- rail tankers

Proven logistics:

- land
- maritime
- intermodal



Oxoplast™ Products

		Trade name	Chemical name	CN	CAS	PKWiU	REACH Status
General Purpose Plasticizers	Oxoviflex™	Oxoviflex™	bis(2-ethylhexyl) terephthalate	2917.39.35	6422-86-2	20.14.34.0	DEHT registered 06/09/2012
Specialty Plasticizers	Oxofine™ TOTM	Oxofine™ TOTM	tris(2-ethylhexyl) benzene-1,2,4-tricarboxylate	2917.39.95	3319-31-1	20.14.34.0	TOTM registered 2/12/2020
	Oxofine™ Poly2K	Oxofine™ Poly2K	n/a	3812.20.90	—	20.59.56.0	Polymeric substance - exempt from REACH registration
	Oxofine™ DOA	Oxofine™ DOA	bis(2-ethylhexyl) adipate	2917.12.00.90	103-23-1	20.14.33.0	DOA, DEHA zarejestrowany 11/12/2018
OXO Alcohols	2-Ethylhexanol	2-Ethylhexanol, 2-EH	2-Ethylhexan-1-ol	2905.16.85	104-76-7	20.14.22.9	2-Ethylhexanol registered 28/09/2010
	n-Butanol	n-Butanol	Butan-1-ol, n-Butanol	2905.13.00	71-36-3	20.14.22.9	N-Butanol registered 02/11/2010
	Isobutanol	Isobutanol	2-Metylopropan-1-ol, Isobutanol	2905.14.90	78-83-1	20.14.22.9	Isobutanol registered 04/11/2010
	Octyl alcohol F	Octyl alcohol F	1-Hexanol, 2-ethyl-, manuf. of, by-products from, distn. residues	3824.99.92	68609-68-7	20.59.59.9	Octyl alcohol F registered 12/01/2012
Aldehydes	n-Butyraldehyde	n-Butyraldehyde	n-Butyraldehyde; Butanal	2912.19.00	123-72-8	20.14.61.0	N-Butyraldehyde registered 07/10/2010
	Isobutyraldehyde	Isobutyraldehyde	2-methylpropanal	2912.19.00	78-84-2	20.14.61.0	Isobutyraldehyde registered 11/08/2010

Plasticizers

Oxoplast™

Identifieds use

Cables, films, PVC flooring, paints, hoses and profiles, wallpapers, shoe soles, upholstery, food contact materials, toys and other (seals, roofing, ink).

General Purpose Plasticizer

Oxoviflex™
(DOTP, DEHT)

- >99,5% DOTP Superior Purity
- Phthalate Free
- Food Contact Certified
- Pharmacopoeia Approved
- Quality Monomeric

Specialty Plasticizers

Oxofine™ TOTM

- Phthalate Free
- Quality Monomeric

Oxofine™ Poly2K

- Phthalate Free
- Quality Polymeric

Oxofine™ DOA

- >99,5% DOA Superior Purity
- Phthalate Free
- Food Contact Certified
- Quality Monomeric

Plasticizers applications

	medical devices	wires & cables	wallpapers	garden hoses	fabrics	paints and varnishes	toys	footwear	automotive	cosmetics	pvc flooring	food contact materials
Oxoviflex™	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔
Oxofine™ TOTM	✔	✔							✔			
Oxofine™ Poly2K	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔
Oxofine™ DOA	✔	✔	✔	✔	✔	✔		✔		✔		✔

General Purpose Plasticizers

Oxoviflex™

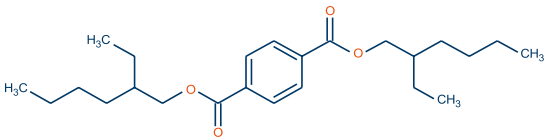
Trade name: Oxoviflex™

Chemical name: Bis(2-ethylhexyl) terephthalate

CAS: 6422-86-2

REACH Status: DEHT

registered 06/09/2012



Make it flex!

Oxoviflex™ is high-quality bis(2-ethylhexyl) terephthalate used in PVC and polymers processing as well as in paint and varnish industry. It features particularly good physical and chemical properties and serves as general purpose plasticizer for vast array of flexible PVC products. Oxoviflex™ is environmentally safe and is not subjected to any legal restrictions. Oxoviflex™ makes things flexible, functional and friendly in everyday use. Due to superior purity Oxoviflex™ can be successfully applied to sensitive applications as toys and food contact materials.

Oxoviflex™ is REACH registered according to EC regulation No. 1907/2006.

>99,5% DOTP Superior Purity

Phthalate Free

Food Contact Certified

Pharmacopoeia Approved

Quality Monomeric

No. 1
in DOTP production
in the European Union

- Dedicated production plant
- No phthalate impurities
- Stable and repeatable product quality

General
Purpose
Plasticizer

Specialty Plasticizer

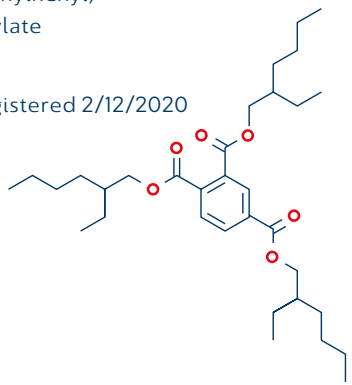
Oxofine™ TOTM

Trade name: Oxofine™ TOTM

Chemical name: Tris(2-ethylhexyl) benzene-1,2,4-tricarboxylate

CAS: 3319-31-1

REACH Status: TOTM registered 2/12/2020



Oxofine™ TOTM is produced using our high high quality 2-EH and trimellitic anhydride. It is manufactured according to a proven technology which guarantees its highest quality and production stability.

Oxofine™ TOTM can be used as primary or functional plasticizer in combination with other plasticizers. It has a positive effect on finished product properties and its manufacturing process.

Oxofine™ TOTM has been registered in accordance with Regulation (EC) No. 1907/2006 (REACH).

Phthalate Free

Quality Monomeric

Specialty Plasticizer

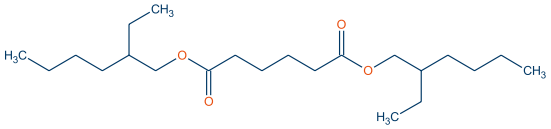
Oxofine™ DOA

Trade name: Oxofine™ DOA

Chemical name: bis(2-ethylhexyl) adipate

CAS: 103-23-1

REACH Status: DOA, DEHA registered 11/12/2018



True professional!

Oxofine™ DOA is high-quality bis(2-ethylhexyl)adipate. Due to its particularly good plasticizing properties, especially in low-temperature applications and a safe toxicological profile,it is recommended for food contact materials (in particular in the production of PVC food films). In addition, Oxofine™ DOA is applied in the production of garden hoses, cables and coated fabrics. Depending on the application, it can be used as a main or functional plasticizer with Oxoviflex™. In addition to the processing of PVC, Oxofine™ DOA is recommended as a solvent in the cosmetics industry, plasticization of nitrocellulose, synthetic rubber and production of varnishes. Oxofine™ DOA is an oily liquid, colourless, with no mechanical impurities

Oxofine™ DOA is REACH registered according to EC regulation No. 1907/2006.

>99,5% DOA Superior Purity

Phthalate Free

Food Contact Certified

Quality Monomeric

Specialty Plasticizer

Oxofine™ Poly2K

Trade name: Oxofine™ Poly2K

Chemical name: n/a

CAS: —

REACH Status: Polymeric substance - exempt from REACH registration

Oxofine™ Poly2K is the first polymeric plasticizer in Oxoplast™ portfolio. **Oxofine™ Poly2K** is a result of intensive research and development works in our Company. We produce it with the use of adipic acid. It is manufactured according to a proven technology which guarantees its highest quality and production stability.

As the polymer substance, **Oxofine™ Poly2K** is excluded from mandatory REACH registration under Regulation (EC) No. 1907/2006.

Phthalate Free

Quality Polymeric

OXO Alcohols and Aldehydes

Oxoplast™


OXO

OXO Alcohols

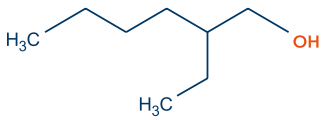
2-Etyloheksanol

Trade name: 2-Ethylhexanol

Chemical name: 2-Ethylhexan-1-ol

CAS: 104-76-7

REACH Status: 2-Ethylhexanol registered 28/09/2010



Identifieds use

Paints and varnishes

Pharmaceutics & Cosmetics

Automotive

Chemical Synthesis

Other

It is produced according to strict process regime derived from our experience. We put an extra emphasis on its quality which is transferred to further processed products: plasticizers, acrylates, fuel additives (2-EHN) and other chemical products.

2-EH is REACH registered according to EC regulation No. 1907/2006.

n-Butanol

Trade name: n-Butanol

Chemical name: Butan-1-ol, n-Butanol

CAS: 71-36-3

REACH Status: n-Butanol registered 02/11/2010

Identifieds use

Paints and varnishes

Pharmaceutics & Cosmetics

Chemical Synthesis

Other

It is manufactured according to highest quality standards which guarantees our customers that all requirements concerning its further processing to acrylates, acetates and solvents and other chemical substances are met.

n-Butanol is REACH registered according to EC regulation No. 1907/2006.

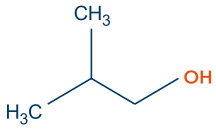
Isobutanol

Trade name: Isobutanol

Chemical name: 2-Metylopropan-1-ol, isobutanol

CAS: 78-83-1

REACH Status: Isobutanol registered 04/11/2010



Identifieds use

Automotive

Chemical Synthesis

Our product is mailny used as solvent in many appreciated brands of paints, varnishes and resins.

Isobutanol is REACH registered according to EC regulation No. 1907/2006.

Octyl alcohol F

Trade name: Octyl alcohol F

Chemical name: 1-Hexanol, 2-ethyl-, manuf. of, by-products from, distn. residues

CAS: 68609-68-7

REACH Status: Octyl alcohol F registered 12/01/2012

Identifieds use

Other

Octyl alcohol F is a liquid with various colourations: from yellow through yellow-brown to greenish and with the specific odour.

Octyl alcohol F is REACH registered according to EC regulation No. 1907/2006.

Aldehydes

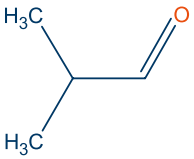
Isobutyraldehyde

Trade name: Isobutyraldehyde

Chemical name: Isobutanal; 2-methylpropanal

CAS: 78-84-2

REACH Status: Isobutyraldehyde registered 11/08/2010



Identifieds use

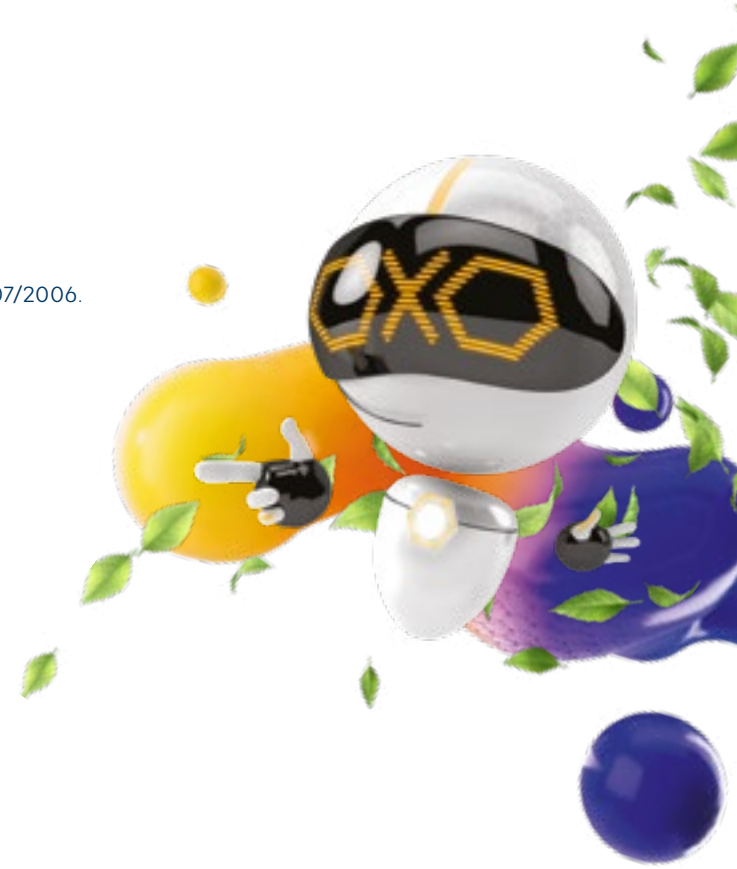
Pharmaceutics & Cosmetics

Chemical Synthesis

Other

Isobutyraldehyde is the second of the intermediates in the synthesis of OXO alcohols. We process it to isobutanol. With its specific proprieties isobutrylaldehyde is also used by our customers for production of resins, amines and specialty esters.

Isobutyraldehyde is REACH registered according to EC regulation No. 1907/2006.



n-Butyraldehyde

Trade name: n-Butyraldehyde

Chemical name: n-Butyraldehyde; Butanal

CAS: 123-72-8

REACH Status: n-Butyraldehyde registered 07/10/2010

Identifieds use

Pharmaceutics & Cosmetics

Chemical Synthesis

Other

n-Butyraldehyde is the basic intermediate in the production of our OXO alcohols (2-EH and n-butanol). Our customers process it and produce solvents, esters, acids, resins, etc.

n-Butyraldehyde is REACH registered according to EC regulation No. 1907/2006.


azot
oxovitex

Business support

Research and Development Center

The main purpose of our **experimental installation, known as quarter-technical installation is to develop the synthesis of new plasticizers obtained through the esterification and transesterification methods.** Efforts have also been undertaken to continually optimize the current plasticizer manufacturing technology and research new technologies. With the possibility of changing the parameters for running the process, we are able to select such conditions for conducting the synthesis to obtain a product with specific properties, tailored to the customers' specifications. The technology for manufacturing plasticizers is verified at the Research and Development Center of Grupa Azoty ZAK S.A.

The Research and Development Center (Polish: CBR) is a significant boost to our company's research and development capabilities. As such, it allows us to replicate on a laboratory scale the manufacturing process, produce test materials and conduct advanced application research. With extensive equipment facilities at our disposal, we are able to offer our customers tailor-made products.

The Research and Development Center features 10 research laboratories divided into condensation, pressure, polymer and physicochemical research laboratories, providing facilities for organic synthesis, application testing of plastics, as well as analytical and physicochemical research. The amenities of the processing section are supplied with a range of equipment and devices used in processing and research into the physicochemical properties of plastics. The equipment used in the processing includes a set of mixers, a granulation line with a twin-screw extruder and a granulator, a planetary extruder, a laboratory injection molding machine and a hydraulic press. Equipment for testing the physicochemical properties of plastics includes a plasticization time tester, a testing machine and a thermal stability test machine.

The processing of plastics starts with the preparation of dry-blend mixtures. The data obtained at this stage provide an opportunity to compare the processing conditions of PVC blends using different plasticizers. The next step involves producing pellets from the previously prepared blends. With extrusion parameters, we are able to determine the optimal processing parameters. The next stages include the preparation of plastic samples for testing the physical and chemical properties of the plastic (pressing and injection molding). Samples prepared in this way are then tested for migration, plasticization time and thermal stability, and are subjected to strength tests (tensile strength, elongation at break).

Condensation laboratories at CBR (Eng. RDC) are equipped with sets of glass reactors with capacities ranging from 0.2 to 5 liters. The laboratory equipment facilitates research and development work in the formulation of new esters- bio esters- which can serve as plasticizers. The reactors provide the opportunity to carry out syntheses under complete control of reaction time parameters. Physicochemical research laboratories feature five laboratory rooms. The laboratory equipment supports advanced work in chemical analytics, structural analysis, thermogravimetry, as well as basic studies of physico-chemical properties that are essential in the course of research and development.

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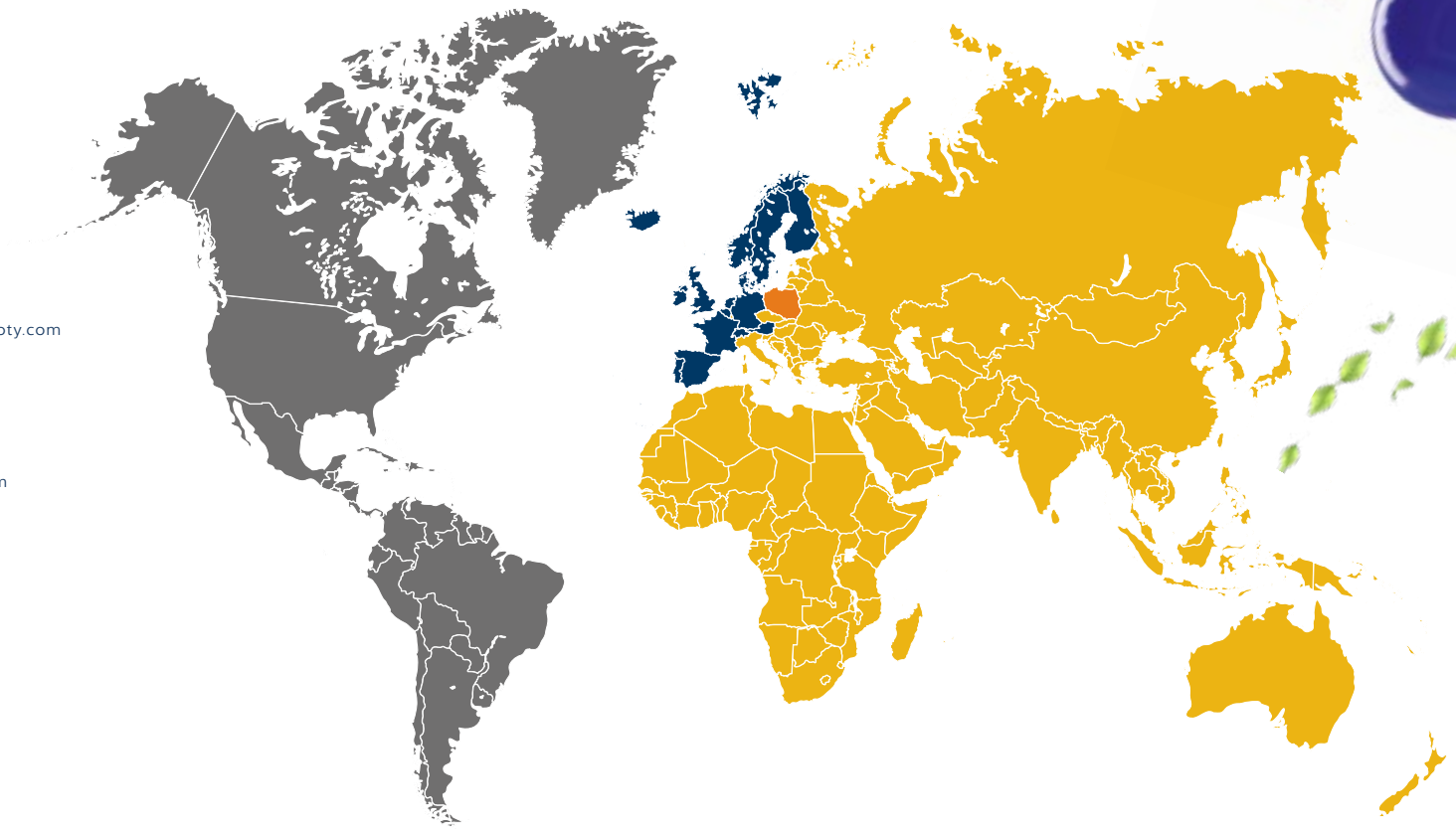

Oxoviflex™

oxoplast.com/en/plasticizers/oxoviflex-dotp-deht/

Oxofine™ TOTM

oxoplast.com/en/plasticizers/oxofine-TOTM

Oxofine™ Poly2K

oxoplast.com/en/plasticizers/oxofine-Poly2K

Oxofine™ DOA

oxoplast.com/en/plasticizers/oxofine-doa

oxoplast.com/en/download/

OXO Alcohols

2-Ethylhexanol

oxoplast.com/en/oxo-alcohols/2-ethylhexanol/

n-Butanol

oxoplast.com/en/oxo-alcohols/n-butanol/

Isobutanol

oxoplast.com/en/oxo-alcohols/isobutanol/

Octyl alcohol F

oxoplast.com/en/oxo-alcoholst/oktanol-f/

Aldehydes

n-Butyraldehyd

oxoplast.com/en/aldehydes/n-butyraldehyde/

Isobutyraldehyd

oxoplast.com/en/aldehydes/isobutyraldehyde/

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07/2024