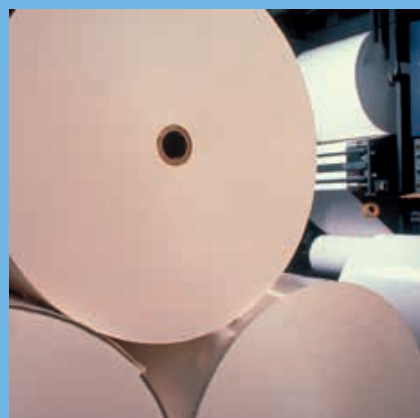
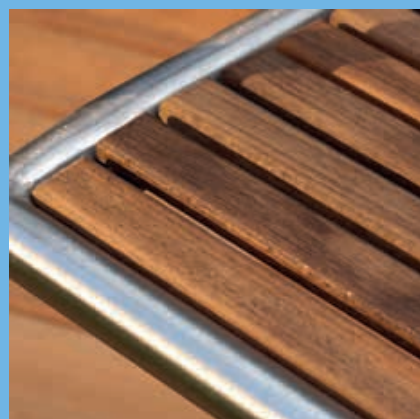


Intermediates

# Glyoxal

More Sustainable Solutions  
for Your Business



# BASF

## We create chemistry

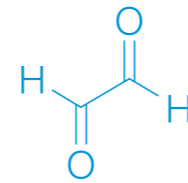
At BASF, we create chemistry. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future.

### Top intermediates supplier

The BASF Group's Intermediates division develops, produces and markets a comprehensive portfolio of about 700 intermediates around the world. Its most important product groups include amines, diols, polyalcohols, acids and specialties. Intermediates are for example used as starting materials for coatings, plastics, pharmaceuticals, textiles, detergents and crop protectants. Innovative intermediates from BASF help to improve both the properties of final products and the efficiency of production processes. The ISO 9001 certified Intermediates division operates plants at production sites in Europe, Asia and North America.



## Glyoxal – the All-Rounder



Since its discovery in 1856, glyoxal has been an important component in chemical applications. BASF has over 60 years of R&D experience with glyoxal and has developed a vast number of applications ever since. The R&D team of our "know-how Verbund" makes sure that there is more to come.

Due to its diverse properties, glyoxal can be used in a wide range of innovative applications. To discover new fields of use, we are working closely together with our customers. As their partner, we are highly interested in supporting our customers with our expertise to maximize their innovative outcome.

### Applications

Application	Characteristic	Benefit
Textiles	<ul style="list-style-type: none"> <li>■ Crosslinking agent or building block for crosslinker</li> </ul>	<ul style="list-style-type: none"> <li>■ Softer and less wrinkled textiles</li> </ul>
Paper	<ul style="list-style-type: none"> <li>■ Crosslinking agent or building block for crosslinker</li> </ul>	<ul style="list-style-type: none"> <li>■ Increases paper wet strength (e.g. toilet paper)</li> <li>■ Increases paper dry strength (e.g. recycled paper)</li> <li>■ Efficient paper coating additive for high-quality papers</li> </ul>
Oil & Gas	<ul style="list-style-type: none"> <li>■ H<sub>2</sub>S scavenger</li> <li>■ Crosslinking polymers (hydrocolloids)</li> </ul>	<ul style="list-style-type: none"> <li>■ Anti-corrosive</li> <li>■ Biodegradable</li> <li>■ Supports safety at work</li> <li>■ Improves viscosity in oil-drilling fluids</li> </ul>
Disinfection	<ul style="list-style-type: none"> <li>■ Biocidal active ingredient for disinfection formulations</li> </ul>	<ul style="list-style-type: none"> <li>■ Co-biocide for disinfectants used in the health industry and in veterinary hygiene</li> <li>■ Effective when formulated together with e.g. glutaraldehyde</li> </ul>
Leather	<ul style="list-style-type: none"> <li>■ Crosslinking in tanning process</li> </ul>	<ul style="list-style-type: none"> <li>■ Preservation of leather quality</li> </ul>
Cosmetics	<ul style="list-style-type: none"> <li>■ Crosslinking polymers (hydrocolloids)</li> </ul>	<ul style="list-style-type: none"> <li>■ Increases viscosity in emulsions</li> </ul>
Epoxy	<ul style="list-style-type: none"> <li>■ Building block for specific epoxy applications</li> </ul>	<ul style="list-style-type: none"> <li>■ Higher epoxy stability &amp; performance</li> </ul>
Wood Hardening	<ul style="list-style-type: none"> <li>■ Crosslinking agent or building block for crosslinker</li> </ul>	<ul style="list-style-type: none"> <li>■ Wood curing</li> <li>■ Protection from moisture</li> </ul>
Glyoxylic Acid	<ul style="list-style-type: none"> <li>■ Raw material</li> </ul>	<ul style="list-style-type: none"> <li>■ Serves as an intermediate for vanillin, agricultural chemicals, antibiotics, allantoin, complexing agents</li> </ul>
Imidazoles	<ul style="list-style-type: none"> <li>■ Raw material</li> </ul>	<ul style="list-style-type: none"> <li>■ Versatile intermediates with a variety of applications, ranging from building blocks in pharmaceuticals and pesticides to catalysts in polyurethanes and epoxy systems</li> </ul>

## The More Sustainable Solution for Your Business

### Glyoxal from BASF is a solution for your needs. Thus we offer you more than just a product:

#### Sustainability:

Glyoxal is readily biodegradable by showing more than 90% decrease of dissolved organic carbon according to OECD guidelines 301 C-E and 303 A.

#### Accreditation for food packaging:

Glyoxal is listed as an accredited chemical substance for the production of paper for food packaging by the Federal Institute for Risk Assessment (BfR) in Germany, and by the Food and Drug Administration (FDA) in the U.S.

#### Substitution of aldehydes:

Glyoxal shows high potential in the substitution of aldehydes, e.g. for formaldehyde or glutaraldehyde. Additionally, in disinfection it can be used as a co-biocide formulated together with glutaraldehyde from BASF.

#### Reliability:

With 60,000 metric tons annual world-scale production in Ludwigshafen we are a leading player in the glyoxal industry. Our backward-integrated production of glyoxal guarantees efficient and reliable supply wherever you are.

#### Services:

Whether you need bulk or packaged material, we ensure efficient solutions. Our advice on packaging and dedicated storage facilities guarantee reliable supply to allow you to run your business steadily.

#### Application expertise:

At BASF, we make our expertise available to our partners. Working together with our customers in successful partnerships will offer mutual benefits.

#### Registration support:

We registered glyoxal in the EU under REACH, and together with BASF's specialist biocide group in our Care Chemicals division we support customers who want to obtain registrations for their biocidal products according to the EU Biocidal Products Directive. We also offer to advise you with respect to these legal requirements.

## Product Specification

Nomenclature	Name:	glyoxal, 40% aqueous solution
	Chemical name:	ethanedial, oxalaldehyde
	CAS No.:	107-22-2
Chemical structure		
Chemical properties	Form:	liquid
	Color:	colorless to pale yellow
	Odor:	almost odorless
	Solubility:	miscible with water and with all water-miscible organic solvents
8,5 mm	Melting point:	-14 °C
	Boiling point:	104 °C
	Density at 20 °C:	1.27 g/cm <sup>3</sup>
	Vapor pressure at 20 °C	24 mbar
	Ignition temperature:	285 °C (DIN 51794)
Product Specification	Assay	39.5% - 40.5%
	Formaldehyde	max. 0.01%
	Acid number	max. 1.50 mg KOH/g
	ph value	2.00-3.50
	Color	max. 20 APHA

#### Backward-integrated production process of glyoxal

Ethylene ► Ethylene glycol ► Glyoxal 40%

- Textile resins
- Paper resins
- Oilfield
- Imidazoles



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# Glyoxal - More Sustainable Solutions for Your Business

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## Your benefits:

- ▶ Reliable supply
- ▶ Biodegradability
- ▶ Accreditation for food packaging
- ▶ Substitution of aldehydes
- ▶ Logistics services
- ▶ Application expertise
- ▶ Registration support



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[www.intermediates.basf.com/chemicals/glyoxal](http://www.intermediates.basf.com/chemicals/glyoxal)

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