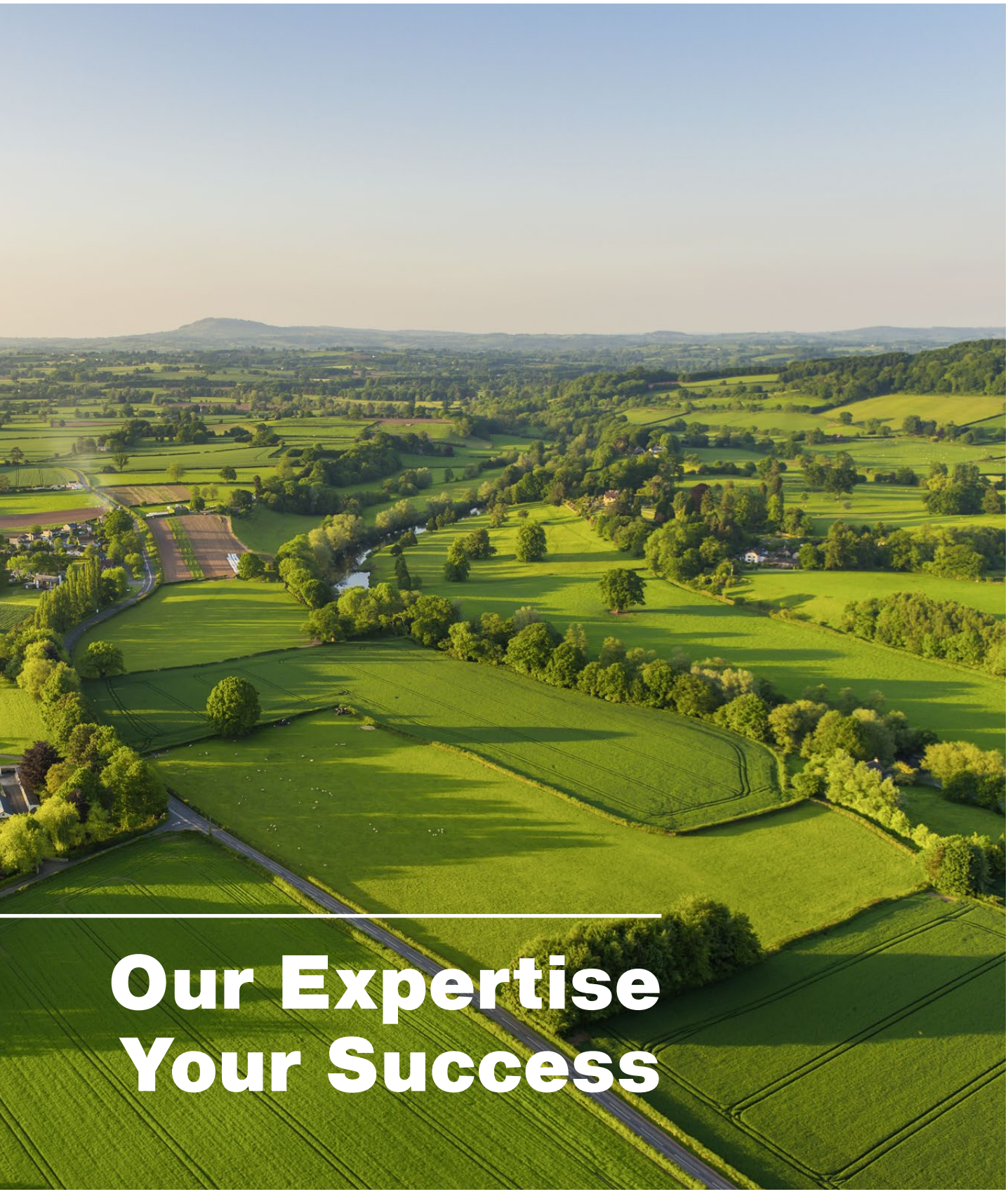
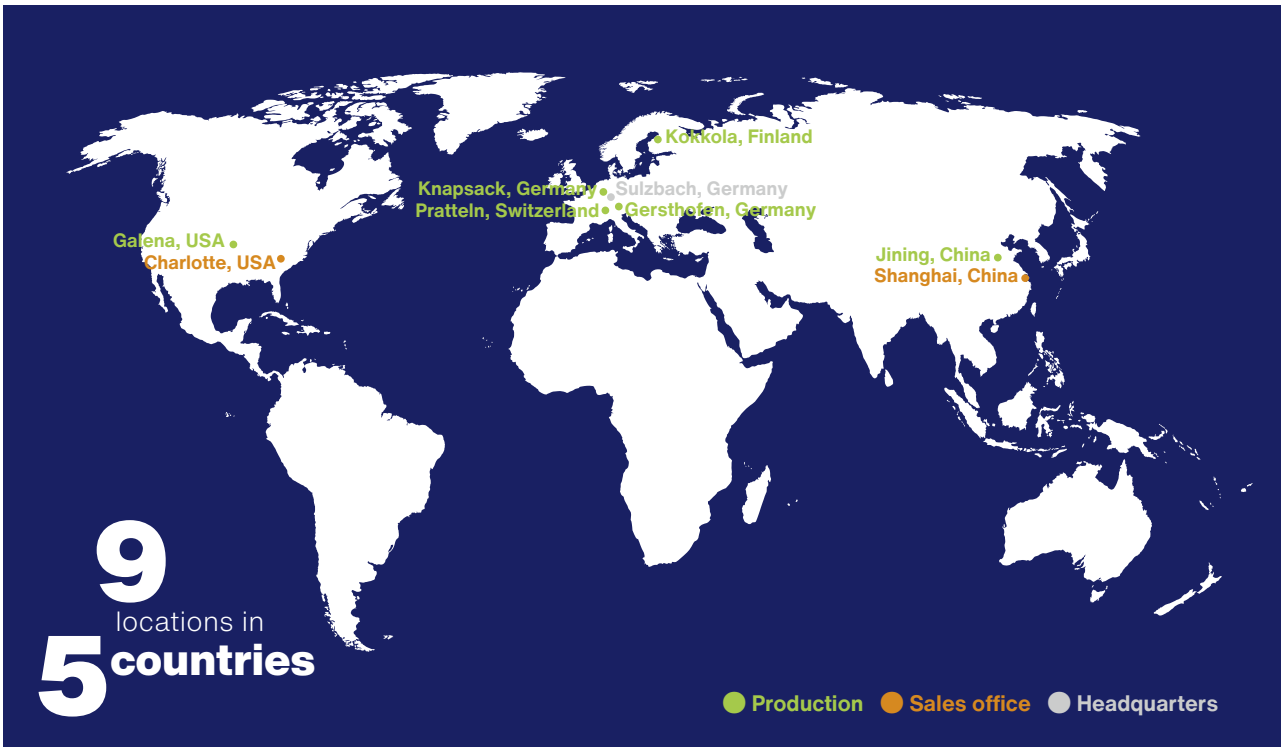


Our Expertise
Your Success

CABB

YOUR PARTNER IN FINE CHEMISTRY



CABB – Your Partner in Fine Chemistry

The CABB Group is a leading provider of contract manufacturing (CDMO) and fine chemicals, specializing in customized active ingredients and high-purity solutions for Crop Science, Life Science, and specialty applications. The CABB Group combines leading-edge technologies with a global large-scale production network to deliver reliable, sustainable, and cost-efficient solutions to provide customized solutions for complex chemistries.

- Custom manufacturing and process optimization
- Scalable, cost-efficient and flexible manufacturing capacities
- End-to-end partnership from development to commercial production
- Leading standards of purity, sustainability and quality

The CABB Group, with its 1,200 employees, c. € 600m revenue and six global production sites, is your partner in Fine Chemistry turning complex chemistry into reliable and cost-efficient solutions.

Leading Contract Development and Manufacturing Company

The CABB Group specializes in complex chemistry and the production of high-purity products through multistep chemical synthesis. With its custom manufacturing services, the CABB Group partners closely with customers to develop and optimize individual steps within their value chains, enabling the synthesis of agrochemicals, pharmaceuticals, and other complex – often patented – chemical products.

Thanks to its unique transatlantic production network with state-of-the-art manufacturing facilities, the CABB Group is an integral part of its customers' value chains. Customers benefit from its proven track record of securing and delivering large-scale growth projects in crop sciences and life sciences – resulting in trusted and long-lasting partnerships.

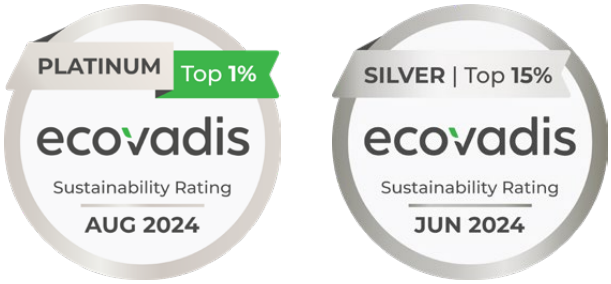
Value-Adding Solutions for Crop Sciences, Life Sciences, and Performance Materials

The CABB Group is a leading global provider of advanced intermediates, specialty chemicals, and active ingredients, serving customers across the Crop Science, Life Science, and Performance Materials industries. With decades of experience and strong, long-term partnerships, the CABB Group is uniquely positioned to deliver value-adding solutions – including advanced intermediates and functional ingredients – for a wide range of applications, from pharmaceuticals, personal care and nutrition to high-tech fields such as electronics, automotive and materials science, helping customers gain a competitive edge.

Committed to Continuous Improvement and Superior ESG Standards

The CABB Group's leading production competence is based on its "Verbund System". These integrated production sites are its platform for providing differentiated, large-scale products based on high process efficiency including the recycling of by-products. The CABB Group has underlined its sustainability commitment by signing the UN Global Compact and the Responsible Care Charter. The CABB Group is also a member of Together for Sustainability (TfS). In addition, we are setting science-based targets through the Science Based Targets initiative (SBTi), aligned with the intent of the Paris Agreement.

EcoVadis Rating



All sites of the CABB Group undergo annual assessments by EcoVadis, the world's largest provider of sustainability ratings. In the latest assessment conducted in April 2024, CABB's site in Pratteln, Switzerland, for the first time awarded the platinum rating, after receiving a gold rating five times in a row. In 2024, the production sites in Germany, USA and China were awarded the silver rating. The production site in Kokkola, Finland, even achieved a platinum rating for its assessment for the third time in a row. Platinum is the highest rating issued by EcoVadis. As part of the assessments, EcoVadis provides valuable input on areas in which the CABB Group can continue to further improve.

Your Benefits

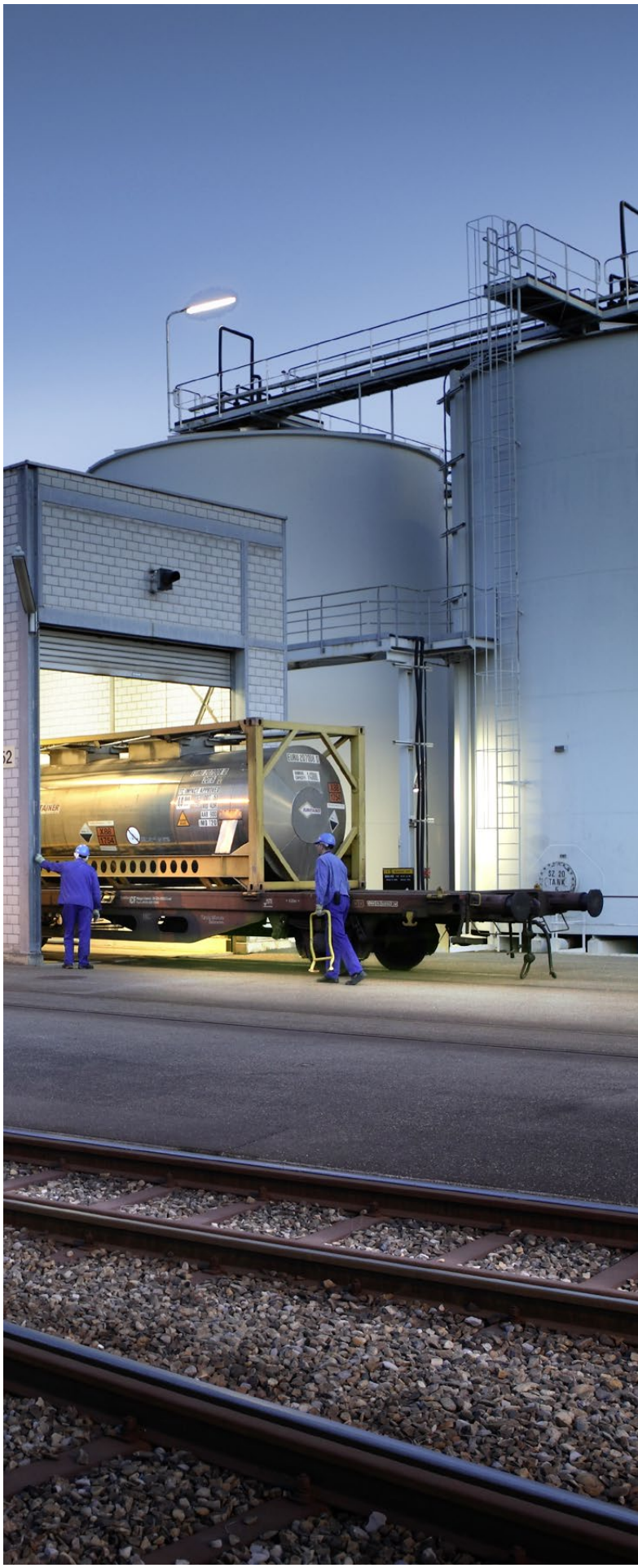
Leader in Complex Chemistry
Focused on complex, multi-step chemical synthesis and high-purity chemical ingredients

Global Footprint
Unique transatlantic production footprint with a strong foothold in Europe

Customer-centric Solutions
End-to-end project management providing customized solutions from development to commercial production

Efficiency and Reliability
Technology leadership and a proven track-record in process optimization offering cost efficiency and reliability

Sustainability
Committed to continuous improvement and superior ESG standards



Our CDMO Expertise

The CABB Group specializes in complex, multi-step chemical syntheses. Our unique expertise in implementing large-scale growth projects and the integration of cutting-edge technology are the basis for our success. Designing, executing, and enhancing safe, cost-efficient and robust production processes is our top priority.

The CABB Group is ideally equipped to perform demanding multistep syntheses of intermediates and active ingredients, and its plants and infrastructure enable efficient and sustainable production. Our capabilities include a vast range of chemical reactions based on our core chemistries to support efficient manufacturing on a large scale.

Commercial Offering

- Custom manufacturing of chemical intermediates and agrochemical active ingredients
- Manufacturing of reagents and intermediates based on chlorination and sulfonation
- Broad in-house development capabilities incl. safety measurements (e.g. RC1, DSC, MoC tests) and scale-up from lab to commercial scale as well as process optimisations throughout product life cycle
- Large-scale commercial production

Assets and Capabilities

- More than 100 reactors group-wide, from 2 m^3 to 35 m^3 (total reactor capacity above 1300 m^3)
- Various materials used in production assets: Hastelloy, glass-lined, stainless steel, etc.
- Several multi-stage distillation columns, solvent recovery capabilities and wastewater treatment
- Solid isolation capabilities with multiple centrifuges, dryers, filters and packing units
- Raw material handling for acetaldehyde, chloroformates, epichlorohydrine, hydrazine hydrate, methyl chloride, solid sodium and others
- Three large-scale manufacturing sites in attractive jurisdictions (Switzerland, USA, Finland) ensure a safe and reliable supply chain for your product.

Technology and Infrastructure

- Leader in chlorination, sulfonation and other technologies for fine chemical production
- Infrastructure for and expertise in alkylation, bromination, lithiation and oxidation on commercial scale
- Backward integration into key reagents and intermediates
- Pipeline supply of hazardous and corrosive reagents and intermediates to multipurpose assets
- Expertise in designing robust and safe processes for hazardous chemicals
- Process technology and expertise in turning batch processes into continuous processes
- Equipment and infrastructure for challenging multistep syntheses
- Infrastructure for waste management
- Process optimization throughout the whole lifecycle of a product

Core Chemistries

Halogenation (Chlorination & Bromination)

Cl_2, Br_2, $SOCl_2$, SO_2Cl_2, HCl, Br_2, HBr,
DBDMH (1,3-Dibromo-5,5-dimethylhydantoin), among others

The CABB Group has various chlorination reagents readily available: chlorine, thionyl chloride, sulfuryl chloride and hydrogen chloride gas. These reagents are produced in our Verbund System in Switzerland and are transported in hermetically sealed pipelines directly from storage tanks to multipurpose and dedicated reactors. Off-gases are fully recycled in our Verbund System in a sustainable, environmentally friendly and cost-efficient way, preventing the formation of large volumes of scrubber waste water.

In addition the CABB Group possesses the infrastructure and expertise to carry out bromination on a large industrial scale. We operate dedicated assets for bromination reactions, including storage facilities, pipelines and safety systems.

Sulfonation

SO_3, HSO_3Cl, H_2SO_4, among others

As part of its Verbund System, CABB Switzerland produces sulfonation reagents such as sulfur trioxide, chlorosulfonic acid and sulfur trioxide amine complexes for its own use and as sales products. This makes it possible to select the right reagent for the specific requirement. The availability of sulfur trioxide from pipeline for use as a reagent in multipurpose plants is unique and a benefit for fine chemical production.

Alkylation

Methylation

Dimethylsulfate, methylchloride

Dimethyl sulfate and methylchloride are the reagents of choice for the methylation of O-, N- and S- functional groups such as alcohols, thiols, carboxylic acids and amines to obtain the corresponding ethers, esters, thioethers and methylated amines.

With all the infrastructure for safe handling in place, the CABB Group is the ideal partner for methylation reactions.

Thioalkylation

The reaction of (aromatic) nitro compounds with alkyl sodium thiolates leads to (aromatic) thioethers in a straightforward synthesis. The CABB Group is well-equipped for this type of reaction and for handling odorous raw materials and products thanks to its inhouse incineration unit for vent gases and waste.

Chloromethylation

CH_2O, $SOCl_2$

Chloromethylation of alcohols and carboxylic acids yields the corresponding chloromethyl ethers and esters. The CABB Group's proprietary technology guarantees a smooth reaction with high yields.

Organometallic Reactions

Lithiation

n-BuLi, LDA, among others

Carrying out large-scale lithiation reactions requires specific and dedicated infrastructure. The CABB Group has this expertise and infrastructure on a commercial scale. We operate a dedicated system for lithiation reactions which includes storage facilities for bulk organic lithium reagents, pipeline supply, safety measures and automated processes.

Grignard reaction

RMgX (R = Alkyl, aryl; X= Cl, Br)

The Grignard reaction is an important method in organic synthesis for the preparation of carbon-carbon single bonds, mainly by combining nucleophilic alkyl- or aryl-magnesium halides with electrophilic compounds such as aldehydes, ketones or esters to yield alcohols. It is also important for the preparation of boron derivatives which are subsequently used as reactants in Suzuki-type cross-coupling reactions.

C-C Cross-coupling

Suzuki, among others

In transition metal-catalysed cross-coupling reactions, carbon-carbon bonds are formed. The Suzuki coupling is the most prominent representative. The reaction of aromatic halides with arylboronic derivatives, for example, yields the corresponding biphenyl derivatives. The CABB Group has many years of expertise in this chemistry including the recycling and reuse of precious catalysts.

Oxidation

Cl_2, H_2O_2, HNO_3, among others

Oxidizing thiols and thioethers with chlorine or hydrogen peroxide is an advantageous and direct method for obtaining sulfonyl chlorides and sulfones. The CABB Group also carries out a variety of other oxidation reactions using air and catalysts. Some of these are performed as continuous processes.

Reduction/Hydrogenation

Pd/H_2, Pt/H_2, $NaBH_4$, among others

Hydrogenation reactions at ambient or elevated pressure, such as the reduction of aromatic nitro compounds or the saturation of double bonds, can be carried out as batch or continuous processes. The CABB Group has the equipment and expertise for both. The safe handling of pyrophoric catalysts and their recycling and reuse are additional benefits.

Specialty and Life Sciences

Expertise, consistency and efficiency – at every scale

The CABB Group, with its Specialty and Life Sciences fields, is a leading supplier of key raw materials, process aids and non-GMP intermediates for the API, cosmetic, industrial detergent, and crop science industries.

In life sciences, the CABB Group's specialties are key to innovative pharmaceutical ingredients, personal care, and nutrition. Produced with advanced technologies and proprietary processes, the CABB Group's fine chemicals ensure consistency, safety, and reliability.

DeTrityl® Ultrapure (Dichloroacetic Acid – DCA)

Premium-grade dichloroacetic acid for oligonucleotide synthesis. Dedicated manufacturing sites in Germany and Switzerland ensure supply security. **CAS: 79-43-6**

Trichloroacetic Acid (TCA)

Strong acid for multiple industrial and pharmaceutical applications. Manufactured in a dedicated facility in Germany. Offered as "Pharma" and "Technical" grade. **CAS: 76-03-9**

GLYCOS® Clear 70

Premium grade glycolic acid for superior skin- and haircare products. Manufactured in a dedicated plant in Germany with absence of CMRs (carcinogenic, mutagenic and reprotoxic) by-product methoxyacetic acid (MAA) which is banned by the European Commission by means of EC1223/2009. **CAS: 79-14-1**

GLYTECH® BASIC 70

Cost-efficient technical grade glycolic acid as reagent for efficient cleaning purposes. Manufactured in a dedicated plant in Germany. Biodegradable. **CAS: 79-14-1**

3-CPA, 2-CPA (Chloropropionic Acid)

Essential key starting materials for the API industry and industrial detergents. Manufactured in Switzerland and Germany. **CAS: 107-94-8 / 598-78-7**

CAN (Chloroacetic Acid Anhydride)

A mild acetylation reagent widely used in chemistry at scale. Very potent acylation reagent like chloroacetyl chloride. (CAC) In contrast to CAC, CAN is a milder acylation reagent since no HCl is going to be released during the process. **CAS 541-88-8**

DCAC (Dichloracetic Acid Chloride)

Used for Agro compounds such as Herbizide Safener but also to build up Active Pharmaceutical Ingredients for human health. Manufactured in a dedicated plant in Germany. **CAS: 79-36-7**

Advanced intermediates and co-products

The CABB Group is the only European company with a multi-site production setup, and holds a leading position in the European market for monochloroacetic acid (MCA) and its derivatives, such as esters and sodium salt. With a unique product portfolio defined by outstanding quality and broad diversity, the CABB Group supplies customers around the world – reliably and efficiently.

- MCA, Technical, high purity and ultra purity with a very low DCA content, available as liquid, flakes and molten
- MCA sodium salt
- MCA ethyl and methyl esters

The CABB Group is also a leading European producer of chlorine- and sulfur-based reagents and building blocks.

- Thionyl chloride
- Sulfuryl chloride
- Chlorosulphonic acid
- Acid chlorides (propionyl chloride, valeryl chloride, chloroacetyl chloride, octanoyl chloride, butyryl chloride, pivaloyl chloride, ethyl hexyl chloride, ...)

The food, flavours and fragrances industry is served with a HACCP-certified range of sodium acetate products – including anhydrous, trihydrate and liquid forms. As well as camphene and isobornyl acetate.

A full portfolio of co-products is manufactured at scale at the CABB Group's sites in Switzerland (Pratteln) and Germany (Gersthofen).

- Caustic soda
- Hydrochloric acid (technical and chemical pure)
- Sulfuric acid
- Bleach
- Acetic acid

Performance Materials

Shaping high-tech applications with the original BTDA®

In the performance materials market, the CABB Group delivers cutting-edge solutions for demanding applications in aerospace and defense, electronics, e-mobility, and automotive.

A key component of this portfolio is the specialty dianhydride JAYHAWK BTDA® – a thermal curative for epoxy resins and co-monomer for polyimide synthesis – ensuring reliability under extreme conditions.

The flagship of the CABB Group's Performance Materials portfolio is JAYHAWK BTDA® (3,3',4,4'-Benzophenone tetracarboxylic dianhydride, CAS 2421-28-5). BTDA is consistently driving exceptional performance in epoxy and polyimide formulations. Today's customers continue to rely upon BTDA as an ideal choice for applications requiring sustained thermal tability under adverse service conditions.

BTDA has proven its superiority over next best alternatives in these applications:

- Standard epoxy resins thermally cured with BTDA achieve glass-transition temperatures >200°C, sustained electrical insulation performance, and improved wear, abrasion and corrosion resistance. Examples include enamels to protect magnet wires in electric motors and transformers; coating powders to insulate industrial busbars, switchgear, fuses, and stators; and potting compounds to encapsulate and protect sensitive electrical components.
- Polyimide resins synthesized with BTDA enable continuous service in high-heat environments >350°C, including sustained dielectric performance in thin films. Examples include flexible copper clad laminates to miniaturize circuitry in smartphones, tablets, and wearables; advanced composites to enable lightweighting of aerospace engines; thermal & acoustic insulation to improve stealth aircraft and marine vessels; bushings and bearings to extend the life of industrial equipment; filters to trap particulates in hot gas filtration processes; coatings to protect medical implants and surgical devices; and blankets to shield spacecraft from radiation.

BTDA is also well-positioned to support customers in these emerging markets:

- Transparent, colorless films for foldable displays
- Varnishes for semiconductor packaging
- Motors for electric vehicle propulsion systems
- Separators for Li-ion batteries
- Membranes for separation technology in chemical processes

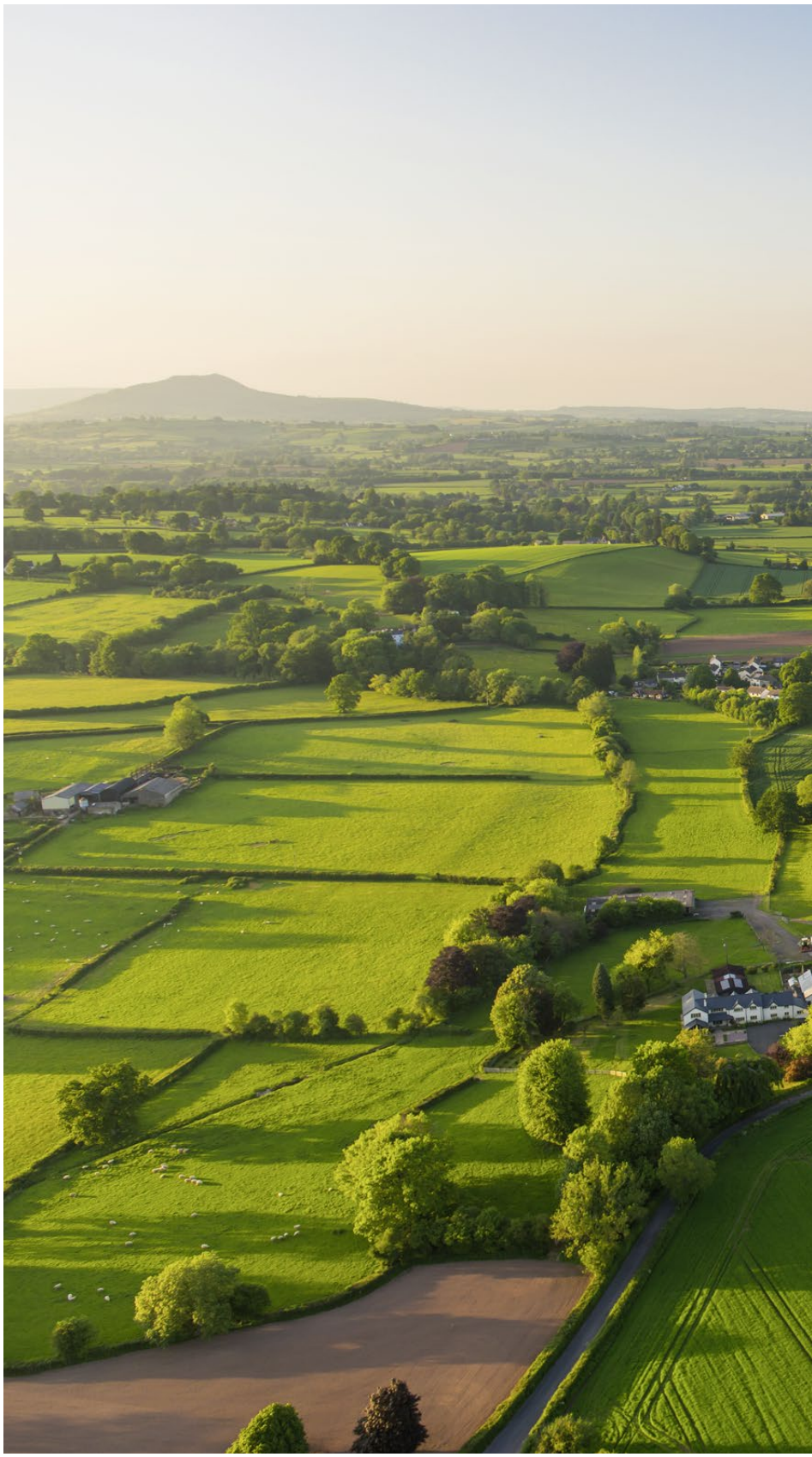
CABB USA is the originator of industrial BTDA and offers a variety of grades tailored to the evolving requirements of today's customers. Products are made in USA using reliable, secure supply chains for consistent quality and performance. Customers and regulatory agencies regularly audit our facilities to endorse our transparency and consistent service. Complementary products include JAYHAWK 6FDA (4,4'-(Hexafluoroisopropylidene)diphthalic anhydride) and JAYHAWK PMDA (Pyromellitic dianhydride).

JAYHAWK BTDA®
CAS: 2421-28-5

JAYHAWK 6FDA
CAS: 1107-00-2

JAYHAWK PMDA
CAS: 89-32-7

YOUR PARTNER IN FINE CHEMISTRY



LEGAL INFORMATION

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Publisher
CABB Group GmbH
Otto-Volger-Strasse 3c
65843 Sulzbach am Taunus
Germany

Tel: +49 6196 9674-0
info@cabb-chemicals.com
www.cabb-chemicals.com

Management
Thomas H. Ahrens, Marcus Mayer
Register court: Frankfurt a. M.
Commercial register no. HRB 98571

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