Westlake
Vinnolit

ENVIRONMENT & SAFETY REPORT 2021

WESTLAKE VINNOLIT GMBH & CO. KG

ACTING RESPONSIBLY

As a company, we combine economic success with social and environmental responsibility: safety, health and environmental protection are among our foremost corporate objectives. We adhere to high safety and environmental standards, operate our production facilities efficiently and conserve resources and sell products in whose safety and environmental compatibility we firmly believe. As an energy-intensive company, we focus in particular on improving energy efficiency. Westlake Vinnolit (before May 2022 "Vinnolit") has made significant investments and achieved enormous success in this respect. Regular audits conducted by independent experts confirm our strict compliance with international management standards´ in the areas of quality, Occupational safety, environmental and energy management.

Some sustainability challenges can only be effectively solved by the PVC or plastics industry as a whole. This is why we are actively involved in a variety of associations and initiatives and work together with other companies in the plastics industry, and in particular the PVC value chain, to achieve further improvements for the environment. Westlake Vinnolit is actively involved in VinylPlus, the voluntary commitment of the European PVC industry towards sustainable development, in EuroChlor´s sustainability program and the global Responsible Care initiative of the chemical industry. The industry has achieved tremendous success in recent years, especially in PVC recycling, the more sustainable use of PVC additives, and the conversion to the more environmentally-friendly membrane cell process for the production of chlorine and caustic soda.

The social megatopics of climate neutrality and circular economy concern us all. Help us to acknowledge plastics as a valuable resource that is consistently managed in a closed loop and does not become waste.

Dr. Karl-Martin Schellerer
Managing Director

CONTENT

THE COMPANY

As a leading manufacturer for PVC and reliable partner for caustic soda, Westlake Vinnolit offers individual solutions for customers from a wide range of industries, such as the construction sector, the automotive industry or medical technology. As a manufacturer of high-quality PVC specialties, Vinnolit is a global market leader. Westlake Vinnolit is a subsidiary of Westlake Corporation, a leading international producer of petrochemicals, polymers and downstream building products.

www.westlake.com

Westlake Vinnolit produces and markets a wide range of PVC products covering all kinds of PVC applications, e.g. in the building and construction sector, in the automobile industry and in the medical sector. Whether the PVC is for flooring, wall covering, window profiles, pipes, rigid film, technical coatings, automotive sealants, cable sheathing or medical applications, Vinnolit is able to offer a suitable solution.

Additionally Westlake Vinnolit produces and markets intermediates such as caustic soda, vinyl chloride and tin tetrachloride, which are used in the chemical industry as well as in many other industries.

Westlake Vinnolit´s production sites are located in Burghausen, Gendorf, Knapsack and Cologne. The company´s headquarters is in Ismaning near Munich. With 1,400 staff, Westlake Vinnolit had a turnover of around 1,2 billion euro in 2021.

The company is upstream integrated from chlorine/caustic soda to PVC and is a technology supplier for the entire vinyl chain from EDC to PVC.

Westlake Vinnolit operates several sales or representation offices in Europe and works together with numerous sales partners worldwide.

RESPONSIBILITY FOR PEOPLE AND ENVIRONMENT

Safety, health and environmental protection are key corporate goals and firmly anchored in the company's vision and values.

Through effective environmental management, we ensure that statutory regulations and the voluntary self-commitments of the industry are met, and we work continuously to achieve further improvements.

Integrated management system

An integrated management system for quality, safety, environmental protection and energy management ensures the constant development and improvement of products and processes in the company. Westlake Vinnolit is certified in accordance with ISO 9001 (quality management), 14001 (environmental management) and 50001 (energy management); and according to BS OHSAS 18001 and OHRIS (both occupational safety). Regular audits conducted by independent auditors confirm compliance with relevant standard requirements. Current certificates are available at *www.westlakevinnolit.com*.

Organization

Responsibilities relating to quality, safety, environmental and health protection and energy are clearly defined at Westlake Vinnolit and laid down in the company procedures. Regular training ensures that these instructions are familiar to and observed by all employees.

According to Section 52 b of the German Federal Emissions Control Act (BImSchG), a member of top management performs the duties and obligations as the operator of plants which are subject to goverment regulations. Immediate responsibility for environmental protection lies in the delegation chain including the Operations Director and the respective production area and plant managers.

Idea management

Through the employee suggestion system, the company collects ideas from employees for ongoing improvement of our processes, occupational safety, environmental protection and energy management.

Emergency management

Vinnolit is integrated into the emergency management systems at each of the sites. Primary contact in case of an emergency is the factory fire department, which is manned around the clock. At the Cologne location, responsibility for fire safety lies with the municipal Cologne Fire Brigade, which is supported by personnel, technical and organizational measures at the plant.

In addition to the fire brigade, various standby services at the plants are also provided if necessary as part of a graduated plan. On-site teams are capable of detecting possible immissions outside the plant perimeter.

Channels for reporting to the authorities and informing the public are precisely defined. Possible emergency scenarios are discussed regularly and simulated in practice-oriented exercises with emergency services from outside the plant and the involvement of representatives of the authorities.

Any deviations from normal operation are documented and investigated in order to avoid similar events in the future.

Incidents

Incidents as defined in the German Incident Reporting Ordinance (12. BImSchV) are events associated with serious danger inside or outside the operating area or serious damage to material assets. No incident occurred at Westlake Vinnolit during the reporting period.

Major emergency exercise at Gendorf Chemical Park (Photo: Heiner Heine)

THE GLOBAL GOALS
For Sustainable Development

Sustainable Development Goals

With its environmental activities Westlake Vinnolit contributes to many of the United Nations' goals for sustainable development. Here is a selection:

We operate all plants safely and environmentally consciously and avoid pollution and contamination of air, water and soil by chemicals. The protection of the health of our employees and our neighbours is our top priority.

PVC is one of the most important plastics in medicine.

Through various water-saving programs, we reduce our water consumption as much as possible, for example by recycling process water. Wastewater is purified.

Durable and safe PVC pipes make a valuable contribution to the supply with clean drinking water and wastewater disposal.

We operate our plants in an energy-efficient manner and are constantly looking for further optimization possibilities. Westlake Vinnolit's energy management system is certified according to ISO 50001.

In all production processes we ensure environmentally compatible handling of chemicals and waste, minimize emissions and waste and use natural resources responsibly. We report on our activities in our annual environmental report.

We make an active contribution to climate protection through a variety of measures that increase energy efficiency and protect the environment.

Energy-efficient PVC window systems reduce energy consumption.

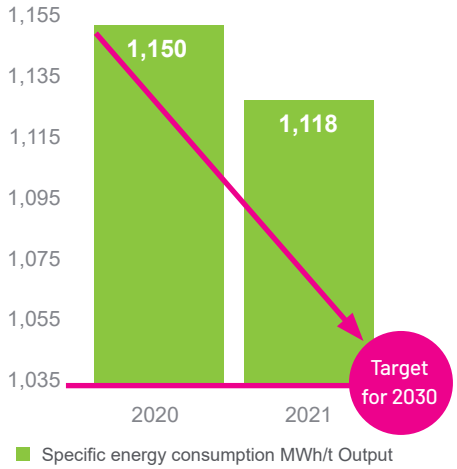
We participate in the „Operation Clean Sweep" initiative to prevent the release of PVC particles into the environment through closed handling and clean work. To this end, we regularly train our employees.

We are a member of the `Naturnahe Alz´ association, which supports the Bavarian government in the renaturation of the Alz. The aim is to sustainably strengthen the river's ecosystem.

ENVIRONMENTAL TARGETS

Target	Measures	Involvement	Target	Completion status [1]
Reduction of energy consumption; climate protection	Saving energy according to the ‘VinSavE’ method	all sites	annually	continuously
	Reduction of specific natural gas consumption by 30% and electricity consumption by 3% in VC production	Gendorf	2021 [2]	80%
	Reduction of fuel gas consumption by about 3% in VC production	Knapsack	2021	100%
	Use new advanced membranes in electrolyzers 1 and 9 to reduce power consumption	Knapsack	2022	20%
	Savings of 2,000 MWh/a steam and electricity	Gendorf	2021	100%
	Reduction of specific CO_2 emissions by 20% in VC production (based on 2016)	Gendorf	2021	100%
	Optimization of steam consumption in the SET plant, saving of 3.136t steam per year	Gendorf	2021	100%
	Thermal interconnection of the dryer systems to save 8,000 MWh/a HP steam (dryers IV, III, II)	Gendorf	2024	planned
	Electricity savings through conversion to frequency converters of the water ring compressors of 529 MWh/a	Gendorf	2024	planned
	Waste heat recovery from direct chlorination reactors Savings 120 GWh/a	Gendorf	2024	planned
	Optimization of steam generation at the cracking furnaces, savings of 4,500 MWh/a of low-pressure steam	Gendorf	2022	planned

Our energy savings target for 2030:
10% less energy consumption than in 2020



[1] as at 12/2021

[2] Specific natural gas consumption was reduced by 23% and specific electricity consumption by 14%. Only 80% of the planned savings in specific natural gas consumption were achieved because, contrary to the original plan, one cracking furnace is not operated with hydrogen.

Target	Measures	Involvement	Target	Completion status [1]
Reduction of energy consumption; climate protection	Reduction of natural gas consumption through optimizations in the bagging plant	Cologne	2023 [2]	planned
	Reduction of steam consumption through installation of trace heating and insulation	Cologne	2021	100%
	Reduction of product-related natural gas consumption by approx. 4000 MWh/a through optimization of recipes	Burghausen	2023	50%
	Saving of compressed air by retrofit PVC filter DT 1 with Micropul controller	Burghausen	2022	planned
	Reduction of compressed air consumption by the equivalent of approx. 4,000 MWh/a in E-PVC production	Burghausen	2023 [3]	80%
Improvement of wastewater quality	Reduction of the AOX-value in waste water by at least 50%	Gendorf	2021	100%
Reduction in the use of raw materials	Reduction of the specific oxygen consumption by 2%	Gendorf	2021	100%
	Reduction of the specific ethylene consumption by approx. 1%	Gendorf	2021	100%
	Reduction of nitrogen consumption by 350 Nm^3/h with a running time of 8000h/a	Gendorf	2022	planned
Reduction of water consumption	Reduction of fresh water consumption by 2 m^3/h at 7,000h/a	Gendorf	2022	planned
	Reduction of deionized water consumption through use of steam condensate	Knapsack	2022	20%
	Reduction of domestic water consumption by installing a perforated disc	Cologne	2022	planned
Reduction of emissions	Reduction of emissions through closed sampling points (at 50 sampling points)	Gendorf	2021	100%

[1] as at 12/2021

[2] The goal is extended to 2023 because the building permit was not in place by the 2022 annual deadline.

[3] The target is extended to 2023; to allow further optimization during commissioning.

Target	Measures	Involvement	Target	Completion status [1]
Reduction of emissions	Optimization of monitoring of recooling water with regard to hydrocarbon input	Gendorf	2024	40%
	Saving of truck transports, every 2 weeks a suction truck for special disposal of sludge	Gendorf	2023 [2]	40%
	Reduction of hydrochloric acid transports by rail: approx. 8-9 rail tank cars per week	Gendorf	2024	planned
	Development of measures to reduce noise emissions	Burghausen	2021	100%
Launch of CO_2-saving products	Market launch of GreenVin® caustic soda (50%) with reduced carbon footprint	Ismaning, Gendorf, Knapsack	2021	100%
	Market launch of GreenVin® PVC with reduced carbon footprint	all sites	2021	100%
	Market launch of GreenVin® bio-attributed PVC with reduced carbon footprint	all sites	2022	planned

Vinnolit GreenVin®

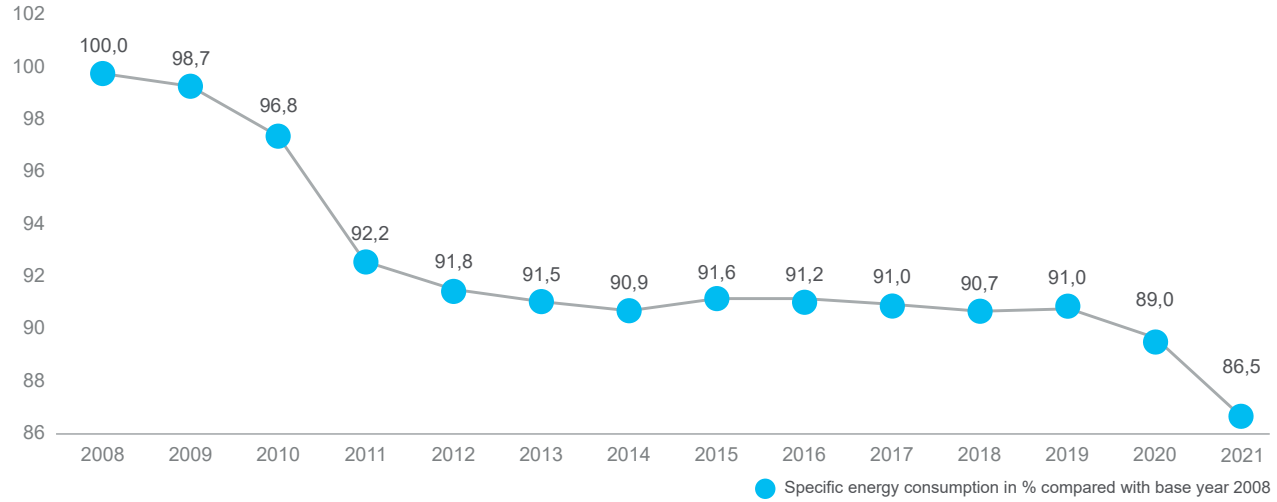
[1] Stand 12/2021

[2] The target is extended to 2023. Due to the capacity expansion, the technical framework conditions have changed. Technical adjustments to be made by 2023 will create the conditions for sludge to be disposed of via another disposal route.

Since 2008, specific energy consumption has been significantly reduced and, consequently, energy efficiency has been significantly increased.

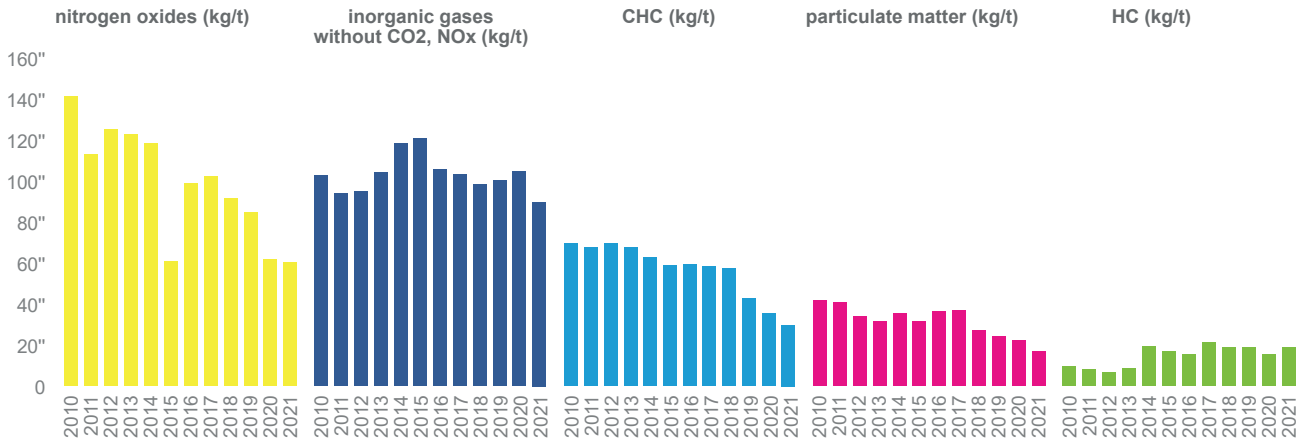
All large-scale consumers are state-of-the-art. Plants and processes are continuously reviewed for further energy-saving opportunities. 2021, energy was saved, among other things, by optimizing the cracking furnaces in Gendorf and Knapsack (with hydrogen utilization in Gendorf) and by the product transfer from Schkopau to Gendorf.

Energy efficiency (steam, electricity, natural gas) 2008 – 2021 in GJ pro t Output



A very high level has already been achieved in reducing emissions. All limit values were well observed.

Environmentally relevant emissions 2010 – 2021



PRODUCTS

PVC

Over 100 years ago, the German chemist Fritz Klatte received the first patent for the production of PVC. Today, PVC is a modern and innovative material which is constantly being developed.

Thanks to its quality and versatility, PVC is an ideal material for use in numerous applications. PVC flooring is particularly easy to maintain and available in many designs, decorative vinyl wallpapers are used to individualize rooms and PVC window profiles are ideal for energy-saving window systems. PVC is also used in the construction sector for long-life pipes, cable sheathing and robust tarpaulins. This versatile material is familiar to us in everyday life in forms ranging from credit cards, artificial leather, durable rainwear, automotive interiors and many other areas from blister packaging for tablets to intensive care medicine.

PVC performs well both economically and ecologically when compared to alternative materials:

- PVC consists of approximately 57% chlorine obtained through electrolysis from domestic rock salt. This means that PVC consumes comparatively less non-renewable fossil fuel raw materials than other polymers during production.
- Approximately 70% of the products manufactured from PVC (e.g. windows, flooring, pipes, etc.) are durable products with a life span of more than ten and in some cases up to 100 years.
- Products made of PVC are generally easy to clean and require less maintenance.
- Most PVC products are recyclable.
- Important ecological criteria (e.g. energy consumption or greenhouse gas emissions) can be quantified through life cycle assessments. PVC products tend to perform well in this respect, as a comparative EU eco-balance study published in 2004 has shown.
- PVC products are frequently more cost-effective than alternatives. The money saved can be used for other ecological or social improvements.

PVC is a well-researched and safe plastic which, having proven itself over many years, is used in medical technology, food packaging and drinking water pipes.

PVC is shipped to the customer in silo tankers, as palletized sacks or in big bags.

In 2021, Westlake Vinnolit launched the new, more climate-friendly "GreenVin®" product line for lower carbon products. Depending on the PVC type, CO_2 savings with GreenVin® PVC are around 25% - compared to conventionally produced ®Vinnolit PVC. Guarantees of origin for renewable electricity (HKNs) with quality labels are used for this purpose. The respective carbon footprint for the entire product portfolio was calculated by Sustainable AG according to the ISO 14067:2019 standard. The verification and certification is carried out by TÜV Rheinland.

Vinnolit GreenVin®

Caustic Soda

Caustic soda is a co-product of the production of chlorine, the raw material for PVC. It is an important basic chemical and used among other things in the production of paper, glass and ceramics, aluminum, detergents, cleaning agents and viscose. Caustic soda is also used as a neutralizing agent, a precipitant, a cleaning agent and as a food additive.

The product is delivered to customers in tank wagons, tankers, ships and via pipelines.

Since 2021, Westlake Vinnolit has also offered caustic soda as a climate-friendly GreenVin® product. The use of renewable electricity (HKNs) saves more than 30% CO2 compared to conventionally produced Vinnolit caustic soda.

Hydrogen

Hydrogen, also a co-product of chlor-alkali electrolysis, is used primarily as an CO_2 saving energy source replacing natural gas, but is also utilized in chemical processes or as an energy source for hydrogen stations.

Tin tetrachloride

Tin tetrachloride is produced from chlorine and tin and is the base product for tin-based special chemicals, especially tin stabilizers used in the processing of PVC. In addition, it is used for coating glass surfaces or as a hardener for polyurethane systems. Tin tetrachloride is shipped mostly in railroad tank cars.

Research and development

Westlake Vinnolit regularly invests in research, development, and application technology. We work on the continuous improvement of our production technologies and are developing PVC materials to meet the demands of tomorrow's markets. We cooperate with customers and universities across international boundaries in this respect.

Westlake Vinnolit is one of the most innovative companies in our industry. The Research & Development department is located in Gendorf. Our employees develop new products for our customers in the laboratory and pilot plant.

The Westlake Vinnolit Application Technology Center in Burghausen can simulate all important PVC processing techniques. In close cooperation with Research & Development in Gendorf and with customers, we continuously work on the optimization of processing methods and products and develop solutions for special customer requirements.

In the application technology center in Burghausen all important PVC processing methods can be reproduced. Picture: Quality inspection for PVC film products.

PROCESSES

Production and technology

Vinnolit plants are subject to the German Federal Emissions Control Act (BImSchG) and further obligations of the Hazardous Incident Ordinance (12. BImSchV) which include compilation of a comprehensive safety report. All plants are subject to operating authorizations issued by the competent regulating authority.

All plants are regularly tested and maintained to ensure trouble-free operation. We operate our production facilities to high safety standards and continually develop them to further increase safety for employees, neighbors and the environment. Compliance with legal regulations, the lowest-possible environmental impact and best-possible state-of-the-art energy efficiency are a matter of course for us.

Emissions

In the production of chlorine, dichloroethane and, ultimately, vinyl chloride as the raw material for PVC, technically unavoidable emissions occur in the air. Westlake Vinnolit uses cleaning and filtering systems to reduce such emissions. Process wastewater is purified in central biological sewage treatment plants at the sites. Emissions to air and water are monitored continuously to ensure observance of the permissible limits prescribed by statutory regulations, permits or self-commitments.

Production processes are largely realized in closed systems. Unreacted monomer is recycled to the manufacturing process to achieve high raw material efficiency. Correspondingly, these containers and pipelines must meet high requirements with regard to material and load-bearing capacity. The respective units are only freely ventilated during drying and reprocessing.

Low dust emissions occur on dedusting filters and cannot be completely avoided through any technical measures. New filter systems have enabled us to achieve significant reductions in these emissions. The actual emissions are regularly reported to government authorities in emissions statements and in the European pollutant register E-PRTR.

Westlake Vinnolit participates in the `Operation Clean Sweep´ initiative to prevent the release of PVC particles into the environment through closed handling and clean working. We regularly train our employees to the topic.

Raw materials

The most important raw materials are supplied to Westlake Vinnolit plants via closed pipeline systems. Salt is delivered as bulk material by rail. This reduces the consumption of packaging material. Plastic packaging and plastics are recycled in cooperation with RIGK GmbH.

Raw materials are stored exclusively in containers or rooms approved for this purpose. Westlake Vinnolit assesses the environmental compatibility of raw materials and auxiliary substances during product development and regularly checks for more environmentally-compatible alternatives.

Waste

The manufacture of PVC is a very low-waste process when compared to the amount of raw material used. All processes are optimized for raw material efficiency and waste prevention. Waste is recycled where possible, and process-related PVC waste is recovered.

Water and wastewater

Water consumption is reduced as much as possible through various water conservation programs. At the Knapsack site, Westlake Vinnolit operates PVClean, the world's first large-scale system for recycling the process wastewater of a suspension PVC plant. Ultrafiltration and water recycling have reduced water consumption by 200,000 cubic meters per annum.

Wastewater generated during the polymerization process and cleaning of plants is collected in in-plant sewer systems and purified in sewage treatment plants.

Noise and odors

All plants have sound insulation procedures. The noise level in workplaces is monitored using an operational noise register. We continually strive to reduce noise emissions. Sound insulation is an essential criteria when it comes to purchasing new systems.

Westlake Vinnolit plants generally do not emit any odors.

Soil

In cases of suspected contaminated sites, special soil or groundwater sampling is conducted and, if necessary, appropriate monitoring, containment or clean-up procedures are agreed to with the authorities. Checks for soil contamination are conducted during all excavation work.

All relevant filling/transfer facilities are equipped with liquid-tight floor trays, collecting pits, etc. Special floor coatings and collecting trays in the production facilities serve as protection against possible soil contamination.

Energy efficiency

Continuous modernization and optimization of plant equipment has considerably reduced the consumption of electricity, steam and cooling water in recent years. Especially the conversion of electrolysis systems from mercury to membrane technology significantly reduced specific energy consumption since 2009. Westlake Vinnolit therefore makes a significant contribution to increasing energy efficiency and reducing CO_2 emissions.

The further enhancement of energy efficiency remains an important corporate objective, which is why Westlake Vinnolit continuously invests in the modernization of its plants and improvement of processes. Employees developed ideas for saving energy in the company-wide VinSavE project which has reduced energy consumption in the enterprise by more than 10 percent. Many of the measures demonstrated have already been implemented, and others will follow in the coming years.

Westlake Vinnolit performs well with regard to energy consumption when judged against industry benchmarks. Shifts in the product mix can result in minor fluctuations in energy consumption.

Shipping and transportation

By using rail, ship and pipeline as much as possible for transportation, Westlake Vinnolit deliberately relies on more environmentally friendly logistics, both for the procurement of raw materials and shipping of its products. In order to minimize the environmental impact during transportation to the customer, the following principles are followed:

Westlake Vinnolit uses exclusively the energy-efficient membrane process for the production of chlorine and caustic soda.

- Avoidance of packaging through use of silo vehicles, whenever the customers' facilities permit.
- Return transport of unsuitable rock salt to the mine by the same train.
- Use of railway silos and railway silo containers, whenever the customers' facilities permit.
- Use of recyclable paper for sacking and participation in the Repasack model.
- Shrinking of sacks with recyclable shrinking hoods.
- Stacking of sacks on standardized pallets for which a circulating and repair system exists.

Environmental aspects are also taken into account during selection of forwarding agents.

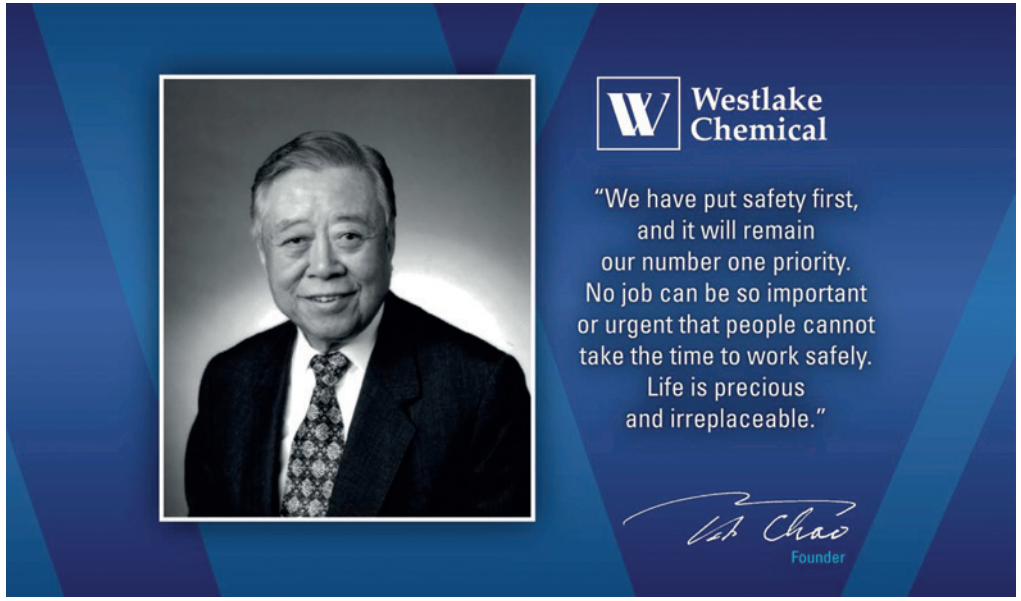
Environmentally relevant facilities

The Westlake Vinnolit plants make use of the extensive environmental protection equipment at the production sites, ensuring an environmentally friendly on-site treatment and disposal of waste water and waste that for the most part does not require any transport. In addition, Westlake Vinnolit operates its own facilities for this purpose.

		Burghausen	Gendorf	Knapsack	Cologne
Residue incineration	Incineration of solid, liquid, and gaseous waste	■	■	■	
Waste water stripper	Cleaning of process water containing VCM	■	■	■	■
Flocculation	Separation of solids from process water	■	■	■	■
Waste water cleaning	Mechanical, chemical, and/or biological cleaning of plant waste water with analytical testing	■	■	■	■
Water retention	Emergency basin for incidents/water for fighting fires	■	■	■	■
Dumps	Storage of construction rubble and similar waste, in some cases also industrial special waste (depending on class)	■	■	■	
HCl recycling/central exhaust gas recycling	Thermal recycling of exhaust gases	■	■	■	
Recycling facilities	Utilization/recycling of by-products from VCM/PVC production, HCL recovery		■	■	
Exhaust gas cleaning plant	Recycling of VCM from exhaust gases	■	■	■	■
Rain water utilization	Utilization of collected and cleaned rain water as cooling water				■
Ultrafiltration facilities	Concentration of PVC latex and conservation of steam; Recycling of water		■	■	■

■ Facilities at the plant sites ■ Westlake Vinnolit facilities

SAFETY



Occupational safety

Westlake Vinnolit takes the necessary measures for occupational safety on the basis of extensive risk assessments pursuant to the Occupational Safety Act and the Hazardous Substances and Industrial Safety Regulations. Working resources and equipment are checked regularly to ensure they are in proper condition and safe to use. Employees receive operating instructions and directives, and observance of these is monitored by managers. Regular training is also provided. Where required, employees wear appropriate personal protective equipment.

Measurements are regularly conducted and options for optimization are sought to ensure observance of limits for hazardous substances and noise in the workplaces. In accordance with the Regulations for Occupational Health Screening, employees are regularly examined by the company doctor.

Through the STOP™ (Behavioral Hazards Component) program, supervisors and employees are in regular contact to reduce or prevent unsafe conditions and behaviors..

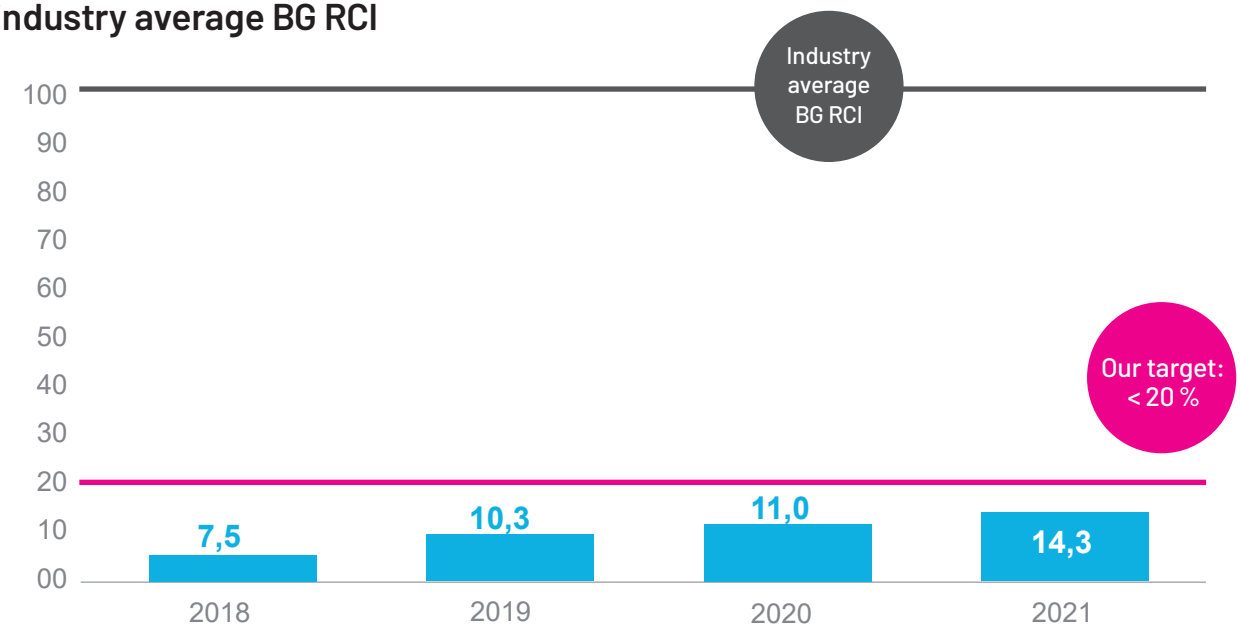
In accordance with Westlake Vinnolit's motto „Drive to Zero" (aim: no accidents), Westlake Vinnolit systematically and consistently processes all accidents and exchanges experiences in all units. The proportion of technical and organizational causes for accidents is very low. Westlake Vinnolit is constantly working on improvements in the area of „human factors" and has started to introduce the "SafeStart™" program, which enables employees to recognize unsafe behavior at an early stage through training.

In the Corona pandemic, we succeeded in ensuring a high level of protection for our employees.

SafeStart™ flyer for Westlake Vinnolit

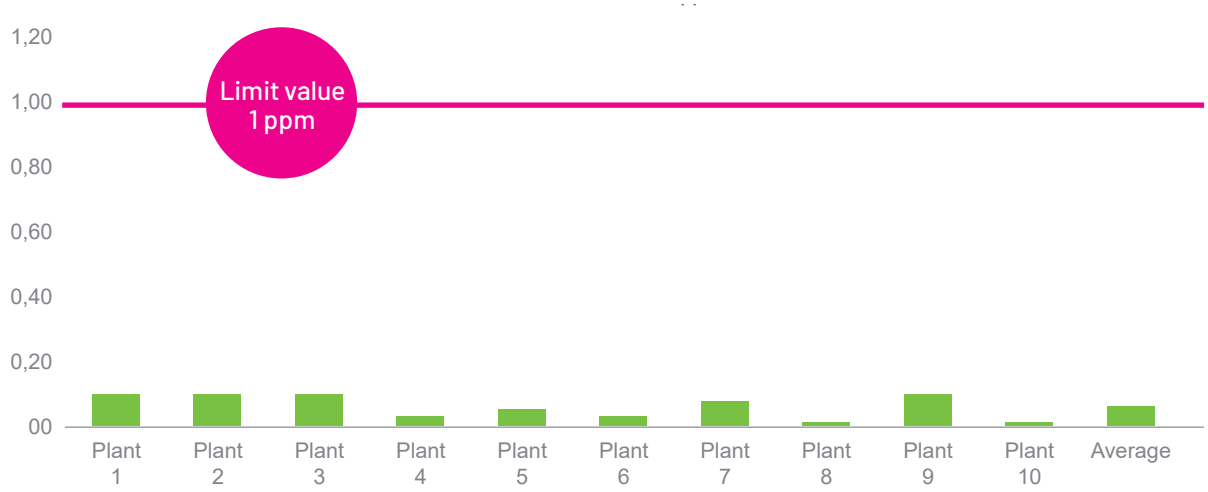
Westlake Vinnolit has a sustainably low accident rate of at least 80 percent below the industry average of the German Employers' Liability Insurance Association for Raw Materials and the Chemical Industry (BG RCI, Germany).

Reportable occupational accidents at Westlake Vinnolit compared to industry average BG RCI



We are well below the maximum permissible workstation concentration of vinyl chloride (VCM).

Workplace concentration VCM (in ppm) in the Westlake Vinnolit plants 2021



ASSOCIATIONS AND INITIATIVES

VinylPlus

As an „Official Partner", Westlake Vinnolit supports VinylPlus, the voluntary commitment of the European PVC industry to sustainable development financially, through commitment to its principles, and through active participation.

With the new 10-year VinylPlus 2030 program, the European PVC industry commits to proactively contribute to addressing global sustainability challenges:

- Pathway 1: Increasing circularity in the PVC value chain (900,000 t PVC recycling by 2025, 1 million t by 2030; supporting innovative recycling technologies; safe and sustainable use of additives).
- Pathway 2: Progress towards climate neutrality and minimization of environmental footprint.
- Pathway 3: Build global coalitions and partnerships for sustainability goals.

The progress is documented in an annual report. In 2021, despite the economic downturn caused by the COVID-19 pandemic, 810,775 tons of PVC waste were recycled within the framework of VinylPlus, of which 63.6% was pre-use waste and 36.4% was post-consumer waste.

Responsible Care

Westlake Vinnolit participates in the Responsible Care program of the chemical industry for continuous improvement of safety, health and environmental protection.

PlasticsEurope

Westlake Vinnolit is involved in „Operation Clean Sweep" of PlasticsEurope, the association of European plastics manufacturers. The aim is to avoid the entry of plastic powders or pellets into flowing watercourses, lakes or seas („Zero pellet loss"). Operation Clean Sweep is part of the global „Marine Litter Solutions" project.

ECVM

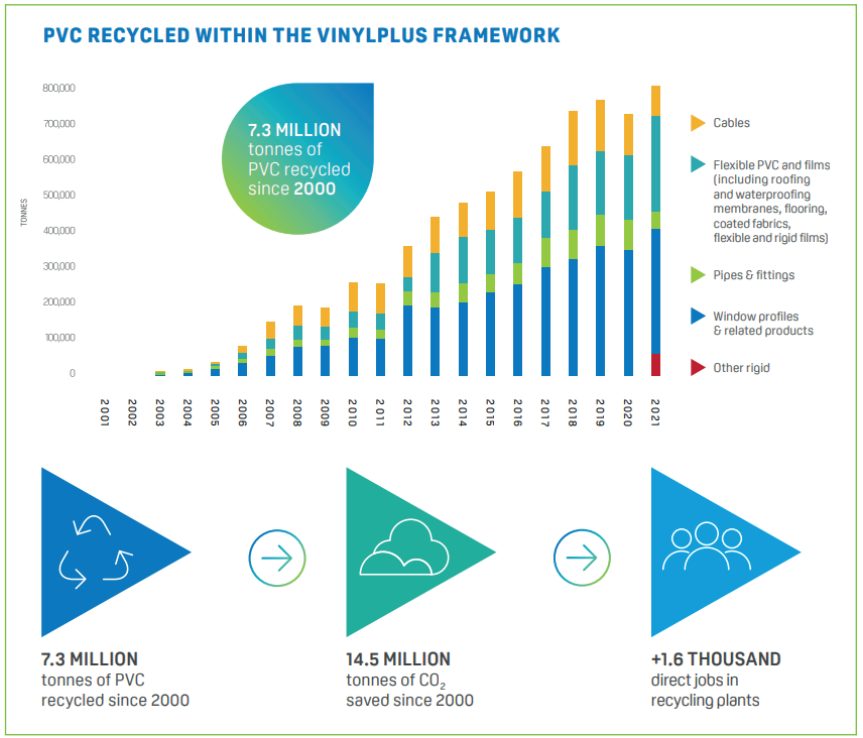
Westlake Vinnolit is a member of the European Council of Vinyl Manufacturers (ECVM). An important focus of the assosiation is sharing experiences related to environmental and safety issues.

Euro Chlor

Westlake Vinnolit is a member of Euro Chlor, the association of European chlorine producers, and supports the Euro Chlor sustainability program. Westlake Vinnolit exceeded the voluntary commitment of Euro Chlor members by converting its chlorine production from the mercury process to the environmentally friendly membrane process in 2009 - ahead of the Euro Chlor target of 2020.

Umweltpakt Bayern

Westlake Vinnolit is a founding member of the Umweltpakt Bayern (Bavarian Environmental Pact) for the continuous improvement of operational environmental protection.



Since 2000, VinylPlus has recycled 7,3 million tons of PVC.

FIGURES

Core indicators according to EMAS III (EG) No. 1221/2009

The values are subject to inevitable fluctuations owing to changes in the utilization of plant capacities or the product mix, technological modifications, and fluctuations in weather conditions. t = metric ton of total output from production. The output is the sum of the production volumes of each production plant (chlorine, caustic soda 100%, hydrogen, sodium hypochlorite, tin tetrachloride, vinyl chloride monomer, PVC).

Westlake Vinnolit	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**
Energy efficiency (GJ/t)	4,02 [1,2]	4,14 [3,4]	4,23	4,22	4,23	4,24	4,26	4,23	4,25	4,27
Water consumption (m^3/t)	1,00 [2]	1,04 [4,5]	1,17	1,25 [6]	1,17 [7]	1,16 [8]	1,12	1,10	1,11	1,18
Biological diversity (m^2/t)	0,0588 [2]	0,0657 [4]	0,0718 [9]	0,0646	0,0648	0,0664	0,0658	0,0627	0,0587	0,0597
Emissions										
Particulate matter (kg/t)	0,0088 [2]	0,0125 [4]	0,0134	0,014 [10]	0,0177 [11]	0,0172	0,0157	0,0170	0,0151	0,0162
Nitrogen oxides (kg/t)	0,0293	0,0312 [4]	0,043	0,0452	0,0505	0,0485	0,0295 [12]	0,0583	0,0615	0,0630
Sulfur dioxide (kg/t)	0,000101 [13]	0,000302 [14]	0,000298 [15]	0,000188	0,000199	0,000195	0,000171	0,000191	0,000141	0,000081
Carbon dioxide equivalents (kg/t)	52,2 [2]	57,4 [4]	62,7	63,5 [16]	67,5	71,9 [17]	62,4 [18]	68,2	66,0	63,8
Inorganic gases without CO2, NOx (kg/t)	0,0392 [2]	0,0519 [19]	0,0499	0,0486	0,0530	0,0533	0,0601	0,0595	0,0536	0,0465
CHC/HC (kg/t)	0,0216 [2]	0,0245 [4]	0,0309 [20]	0,0369	0,0400	0,0368	0,0369	0,0410	0,0388	0,0386
Waste (kg/t)	18,75 [2]	6,20 [21]	9,86 [21]	8,93 [21]	9,92	9,93	9,31	9,45	8,49	8,28
Waste water (m^3/t)	0,87 [2]	0,91 [22]	1,03	1,06	1,03	1,05 [23]	0,98	1,00	1,00	1,05

[1] Commissioning of Gendorf cracking furnace with hydrogen utilization, optimization of Knapsack cracking furnace firing profiles

[2] Product transfer Schkopau Gendorf

[3] Optimization of cracking furnace operation, product flow control, dryer temperatures

[4] Product transfer Hillhouse Burghausen

[5] Optimization of waste water plant in Schkopau

[6] long hot summer; new production processes

[7] Takeover of a subsystem of a service provider

[8] Special cleaning work

[9] Increase in built-up areas in Burghausen and Schkopau

[10] Filter renewal in Hillhouse

[11] Filter runtime approaching end of lifetime

[12] Gas turbine shutdown and maintenance

[13] Lower quantity of fuels with sulfur for residue incineration Knapsack

[14] higher sulfur dioxide levels in the fuel for the residue incineration plant

[15] Fluctuations in sulfur content in district gas and fuels

[16] Low load gas turbine

[17] Normal operation gas turbine after shutdown and maintenance in 2015

[18] Gas turbine shutdown and maintenance

[19] Burghausen plant expansion, additional dryer

[20] Optimization of latex degassing in Schkopau; Hillhouse production shutdown

[21] Values vary due to construction activities

[22] Optimization chamber filter press in Schkopau

[23] Restructuring waste water treatment and special cleaning works

CONTACT

If you have any questions about this report, please contact us:

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In case of any incident you will receive information via the **community helpline**:

Burghausen site: +49 8677 83-6111
Gendorf site: +49 8679 7-6111
Cologne site: +49 221 31086-226
Knapsack site: +49 2233 48-6001

Brochures containing information for the general public required pursuant to Section 11 Incident Reporting Ordinance were prepared at all production sites and distributed to all households in the vicinity. They have been prepared in consultation with the relevant government authorities and contain information about proper conduct in the event of the occurrence of incidents.

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