ChiroBlock®

STATUS REPORT HSE MEASURES

[Health-Safety-Environment]

2021

ChiroBlock®

Our Vision:

„In the gap between basic chemical research and industrial manufacturing: We develop the material basis for new, molecule based products of our customers.“

Our Mission:

"We are a leading, renowned, private provider of both high-class applied synthetic R&D and exclusive fine and special chemicals."

Sectors of Activities

Providing cutting-edge chemistry solutions - ChiroBlock has been serving the product development of matter based industries for more than 20 years.

Our 4 business fields are:

MoleculeFactory

high-value, applied synthetic research on – and the actual synthesis of – sophisticated new compounds.

ReDesignFactory

route scouting and route design + optimization towards more efficient, less toxic, more environmentally friendly or simply faster syntheses of already commercially available molecules and compounds.

IP-Factory

Generating proprietary IP by in-house research on new, low molecular, sophisticated compounds – such as „non-natural“ building blocks of natural molecules and functional specialty chemicals

SupplyChain-Factory

manufacturing selected results of the other three business fields for the supply chain of our customers:
- exclusive syntheses on scales between a few mg to 100 kg per year
- under strict quality management regulations

Model of Environmental Sustainability

An approach to sustainability based on all possible instruments to address this issue — as disciplined management systems, strategically focused projects, research and innovation,— is the path to follow if a leading role is to be played in the chemical industry. To achieve such a complex and dynamic balance, ChiroBlock conforms to the following guidelines:

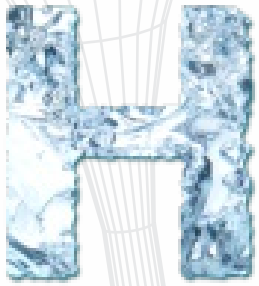
- encouraging corporate action and growth strictly in compliance with the Code of Conduct and the rules of governance;
- protecting environment — air, water, soil — from potentially irreversible impacts
- precautionary principle;
- intergenerational equity;
- rational use of non-renewable resources;
- accounting to and communication with employees and customers on environmental performances and safety issues.

ChiroBlock is committed to providing its customers with an integrated vision of its activities, whichever may be the areas of special interest. Communication and dialogue are the basis for progress toward sustainability.

Through a careful assessment of HSE issues, ChiroBlock has been able to pinpoint and analyze the sustainability agenda on an ongoing basis.

HSE POLICIES

When carrying out its activities, the aim of ChiroBlock is to guarantee the health and safety of its employees, local communities, contractors and customers, to protect the environment and ensure public safety on the basis of the following principles:



- industrial and commercial activities must be managed in strict compliance with regulations and operating procedures established for the sectors of activity;
- the adoption of principles, standards and solutions that constitute international best practices in business for the protection of health, safety, the environment and public safety; to this end the companies must implement systematic benchmarking processes;
- operational management must be based on state-of-the-art criteria in terms of environmental protection and energy efficiency and the objective must be pursued of improving health and safety conditions according to practices and procedures;
- operational management must be subject to constant auditing;
- research and technological innovation must aim at promoting products and processes which are increasingly compatible with the environment and whose content reflects the constant attention paid to the health and safety of customers and employees;
- personnel training and the exchange of experience and information must be considered fundamental tools in order to achieve HSE objectives, with a view to the continuous improvement of prevention and protection standards;
- employees, when carrying out their duties, must be actively involved in the process of HSE safeguards; this, in the interests of their colleagues and the public at large, as well as in their own interests;
- employees, authorities and the general public must be informed periodically about the results achieved in terms of environmental protection, health and safety;
- an active part must be played in scientific-technical circles and business associations to promote scientific and technological developments aimed at protecting the environment and safeguarding resources;
- when requested, cooperation must be ensured with competent authorities regarding the preparation of technical regulations and guidelines concerning HSE issues;

The foregoing principles must be reviewed constantly and their application monitored periodically. Besides considering the protection of health, safety and the environment as a priority corporate objective, ChiroBlock is actively engaged in contributing, with its respective technological know-how and professional skills, to the well-being and improvement of the quality of life of the communities in which it operates.

The HSE policy, its revision and its daily implementation in ChiroBlock's activities is being monitored and supervised by the "LDAr" department (refer to the company structure).

Commitments, Achievements & Goals

- Preventing health risks in the workplace and in the surrounding areas
- Contributing to the fight against endemic and epidemic diseases entailing serious social consequences
- Drawing up schemes for the management of health emergencies
- Offering and supporting employees health promoting programs and activities

- Preventing workplace injuries
- Maintaining standards of excellence in the safety management
- Preventing chemicals spills in transport and distribution

- Implemetantion of the main aspects of an environmental management system into ChiroBlock's quality management system
- Minimizing and mitigating atmospheric greenhouse gas emissions
- Limiting the environmental footprint of activities
- Avoidance of extremely hazardous and environmentally dangerous chemicals and solvents
- Developing synthesis routes with a low environmental impact

Health/ Working Environment

HEALTH

Goals	Achievements
Education of management and staff	Revision of the HSE policy & communication to the employees General instruction of all employees about precaution measures regarding HSE risks of machines and hazardous compounds. Medical aid training of three employees.
Evaluation of potential health risks & their prevention	Revised risk assessments of all working places. New/first-time risk assessment for the work in the kg-lab. Four reported accident (cut wounds). New evaluation of suitable protecting gloves with respect to different working activities. Preventive medical check-up regarding skin status.
Improvement of the working conditions	Further reduction of health risks: o investments in air-conditioning of the kg-lab o extension of the lab-space per lab worker o further separation of documentation working places from the experimental work in the labs Improved ventilation system in the “medium scale lab / kg - lab”.
Improving the status of employee’s illness	The status of employee’s illness rose to the level of 9% (compared to a 3.2% in 2020 and to 5.3% average in Saxony Anhalt).
Health supporting measures	Offer of in-house vaccination against flu and COVID19. One company sponsored “healthy lunch day” per month. Determining the health status of employees and offering regular measures to avoid work-related health issues. Extended hygiene plans as to prevent infections by the Corona virus: no reported infection! Extension of the home-office options for office workers.
Medical status	Inspection of the facilities by a specialized medical practitioner identifying potential health risks.

SAFETY

Goals	Achievements
Training of the staff	Accomplishment of the annual safety training. Repetition of the operating instructions for potentially dangerous machines and operations. Additional safety instruction for operations in the kg-lab. Fire protection instruction of the staff. Training of the two fire protecting assistants. Fire test alarm and evacuation training.
Precaution measures aiming at the avoidance of safety deficits	o General maintenance of all hoods, safety instruments and devices. o Risk assessment according to ArbSchG §5 o Explosives safety document according BetrSchV §5 o Substitution check for hazardous chemicals acc. ArbSchG §5 and GefStoffV §7 o Repository audits (overall storage conditions, stock items, labels, safety measures) o Check of all safety gadgets (fire extinguisher, electronic sensors, safety showers) o New lab coats, safety glasses and safety shoes. o Safety risk assessment of all new projects already in the initiating phase. o Appointment of an external safety advisor / supervisor. o Additional appointment of an internal safety officer. o Internal safety meeting (Arbeitsschutzausschuss) with physician, safety officer, safety supervisor and management.
Avoidance of accidents	• New equipment, staff and adjusted processes for the disposal of chemical waste. • Improved earthing of synthesis reactors • General fire protection inspection and implementation of improvement measures: removal of combustible material from the labs, connection of most electrical devices to lightning protected plug sockets • Implementation of the revised ASR A2.2 (fire protection regulations) • Preparation of safety regulations and documents for the “kg-lab”, including an explosion preventing document • Introduction of an extentsive COVID-19 hygiene scheme resulting in a zero infection rate during work.
Minimizing transport safety risks	Optimizing internal transport procedures by re-organizing repository facilities. Investment in new solvent pumps for safer re-filling of transport barrels. New selection guide for choosing the most appropriate, the safest flasks for product shipments.
Safe shipment	Introduction of new stoppers and caps for shipping containers for liquid goods. Training regarding the shipment of “Dangerous Goods”.

ENVIRONMENT I

ENVIRONMENT

Goals	Achievements
Minimizing energy consumption	19% increase of the specific energy consumption (compared to 2020): 31 kWh per 1000 € turnover. (2020: 26 kWh, 2019: 28 kWh, 2018: 29 kWh, 2017: 27 kWh, 2016: 30 kWh, 2015: 28 kWh, 2012: 33 kWh, 2005: ~48 kWh). 100% electrical energy from renewable sources (wind, water, sun). Use of timer triggered heating valves aiming at the reduction of heating energy for the labs.
Reduction of the water consumption	100% closed water circulation for cooling purposes.
Reduction of the chemicals consumption	Recycling of 5% solvents Preference of atom efficient syntheses Strict avoidance of one-way drums for solvents. Introduction of 'just-in-time' management for ordering of starting materials resulting in lower stock volume and less waste.
Minimizing emissions Avoidance of waste	Extension of the 'ban-list' of ozone layer destructible chemicals. Up-dating of a catalogue of "chemicals not to be used" (including 2 additional hazardous chenmicals). No disposal of waste via the waste water system (waste management for chemical waste and polluted media & agents) Re-use of noble metal catalysts whenever possible. Separated collection of noble metal waste. Recycling of all 250l- and 25l metal drums.
Environmental protection by design	Implementation of infrastructure for central supply of media (water, gases). Intermediary storage of the weakly contaminated waste water & its chemical analysis before releasing it to the public sewage system. Implementation of trapping pans under the waste containers and in the storage rooms. General switch from product glass bottles to plastic flasks if possible. Installation of a "solvent-tight" floor and solvent pipes in the new kg-lab.

Environment II

ENVIRONMENT

Goals

Waste management

Restriction of travelling

Environmentally benign shipment

Achievements

Separation of waste & disposal by authorised, certified waste management. providers:

- o Potentially dangerous:
- o Free of halogens
- o Containing halogens
- o Watery waste solutions (new category as to minimize more hazardous waste types)

- o Not dangerous, not contaminated:
- o Paper
- o Organic waste
- o Plastics & metals
- o Others

Policy of a low consumption of halogene containing solvents:
2012: 5.0 kg per 1000 € turnover
2013: 4.2 kg per 1000 € turnover
2014: 4.4 kg per 1000 € turnover
2015: 8.1 kg per 1000 € turnover
2016: 7.2 kg per 1000 € turnover
2017: 3.4 kg per 1000 € turnover
2018: 3.7 kg per 1000 € turnover
2019: 10.0 kg per 1000 € turnover*
2020: 11.0 kg per 1000 € turnover*
2021: 7.1 kg per 1000 € turnover*
*incl. new kg-lab facility

Extended use of video conferences whenever possible.
Investment in three new video conferencing stations.
Reduction of business travelling to nearly “zero” due to the Corona restrictions.

Offer of CO2 neutral shipment.
Collective shipments whenever possible.

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Measures related to single steps of the value creating chain

Goals	Achievements
Suppliers	
Sourcing from reliable and responsible vendors.	Preference of certified vendors (at least ISO 9001) Preference of local (European) vendors (avoidance of long transportation) Preference of vendors who offer the recycling of the barrels/flasks
Synthesis	
General safety	- No serious accident - individual risk assessment documents - new risk assessment approaches for the kg-lab
Complete ban of halogenated ethers	Keeping of the low level consumption (only after substitution check)
Ban of thallium and organic mercury reagents	Accomplished
Renunciation of tin organyls	Not used
implementation of a strict ‘order on demand’ oder ‘just in time’ policy	Accomplished
As far as possible: avoidance of halogenated solvents and ozone layer destructing agents	Not used
Renewal of the risk assessments of all working places	Done 11/ 21
introduction of a general substitution check of hazardous chemicals	Implemented

Measures related to single steps of the value creating chain

Goals	Achievements
Shipment	
Selection of freight carrier companies with proven experiences/ services in the shipment of chemicals and hazardous goods	Confirmation of the preferred main product carrier: FedEx due to their outstanding / improved HSE policy
Appropriate packaging of products avoiding any damage & leakage Reducing damages during shipment	No report of damaged flasks: Result of the replacement of the flasks by safer ones. Introduction of outer packaging.
Staff Education	
Annual general safety instructions	Done in 12/21
Implementation of environmental and safety aspects into the weekly continuous education scheme	For chemists implemented in 11-06, continued 2007, 2008,2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021 & included in monthly assessment New education scheme (added discussion of safety issues, sensitisation towards environmental issues, quality management, opportunities for health protection)

This HSE report was prepared in Febuary 2022 by the head of LDAr (HSE – manager):

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and authorized by the management:

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