Asymchem Labs.



2022

Environmental, Social and Governance Report

www.asymchem.com

Stock Code: 002821.SZ / 6821.HK

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Chairman's Message:

Company ***mission***: Collaboration for Innovation.

Company ***vision***: To be the partner of choice to global pharmaceutical companies of all sizes providing R&D and manufacture solutions throughout the full lifecycle of innovative drug development.



Dr. Hao Hong
Asymchem Chairman of the Board and Chief Executive Officer

Staying true the operational philosophy of "being prepared for danger in times of peace, treading on thin ice, and rising abruptly based on its accumulated strength", we have been fighting for the cause of human health over the past two decades. That means striving to create value for society, our customers and employees and give back to all walks of life for their concern. This is how we are dedicating ourselves to the cause of environmental protection for a better world while promoting business development.

Taking technological innovation as its very core driver, Asymchem, on the back of the accumulated technical advantages, quality control operation management systems and platform advantages, has been extending its service chain and service fields to transmit competitive advantages, which has ensured our steady presence in the emerging business. We have created a one-stop GXP service and PM management platform of "GMP-GLP-GCP", covering small molecule APIs, chemical macromolecules, biologics, drug products, pharmacological toxicology, clinical research, registration and declaration/drug administration and analysis, and invested more in research and development, aiming to seek changes through innovation, improve quality and reduce costs.

The faded 2022 was a year marked by great efforts that have taken Asymchem's business further. Over the past year, we have proactively delivered the largest order in the history of the CDMO industry despite hardships. Following the "two-wheel drive" strategy, the Group has made great strides in the results of the small molecule business and the emerging business. This has maintained our leadership as one of the top innovative drug CDMO companies in the world. Thanks to the teamwork of all our colleagues, our unremitted pursuit of quality control and our unswerving protection of customer privacy and intellectual property, we have won the long-term trust and support of customers and met the diversified needs of customers with high-quality products and professional services, and given back to the cause of human health with honest cooperation.

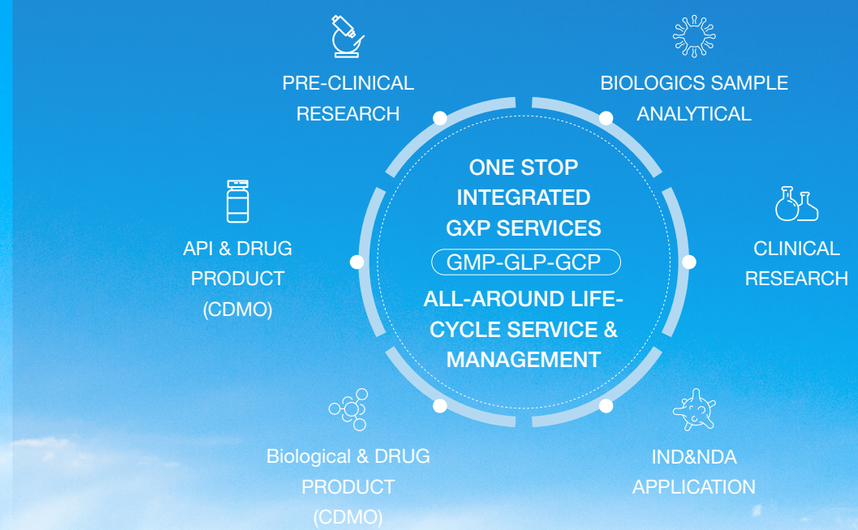
Asymchem has further embedded the ESG concept into our strategies and operations in all respects while maintaining the steady growth of the business. That is how we have realized the synchronous improvement in the Group's core competitiveness and ESG management ability and fulfilled our commitments to all parties in the community in compliance operation, customer service, employee care, environmental protection and social responsibility. We have included the management responsibilities of ESG in the responsibilities of the Strategy Committee and promoted the improvement in ESG management capacity by improving the policy system and strengthening the transparent operation. We have continued to promote green technology research and development such as continuous reaction and biotransformation; participated in the formulation of national industry standards such as Typical Scenarios of Intelligent Manufacturing in Pharmaceutical Enterprises; built an industry cooperation and exchange platform; improved the management and service system of the Company and its stakeholders; completed the transformation from green manufacturing to green development; carried out health care, public welfare donations and other actions for good and actively built a multi-party community with a shared future. All in all, we have achieved our intended goals as planned steadily and rapidly.

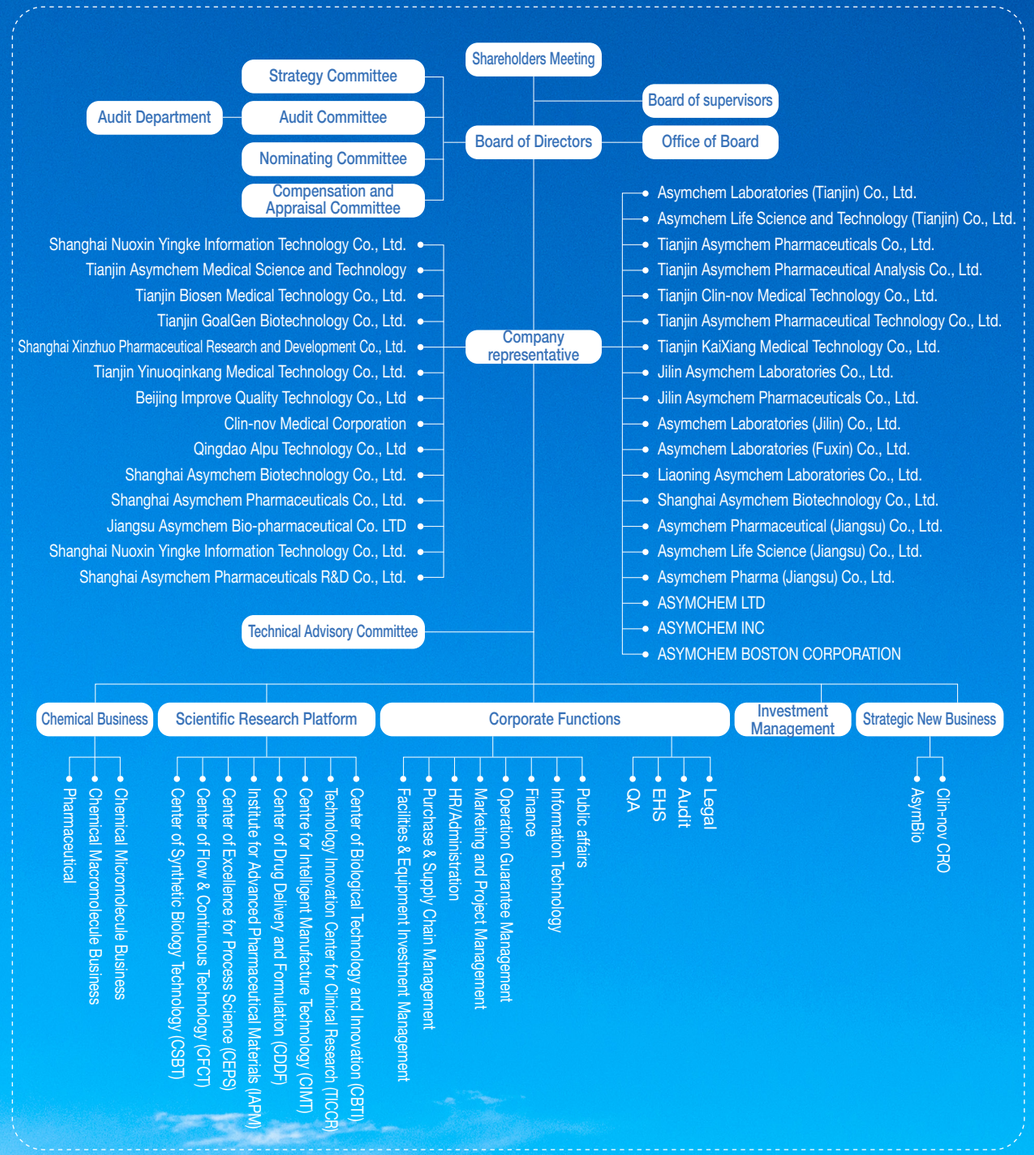
Looking ahead, Asymchem will strategically seek its presence in new technology areas and transition to the broader CDMO business, further consolidating the sustainable development concept of the Group. We, joined by stakeholders, will promote the co-development and co-existence of economic, social and environmental values and pursue the vision of global drug research and development and manufacturing partners to fight for the cause of human health.

About us:

Company Profile

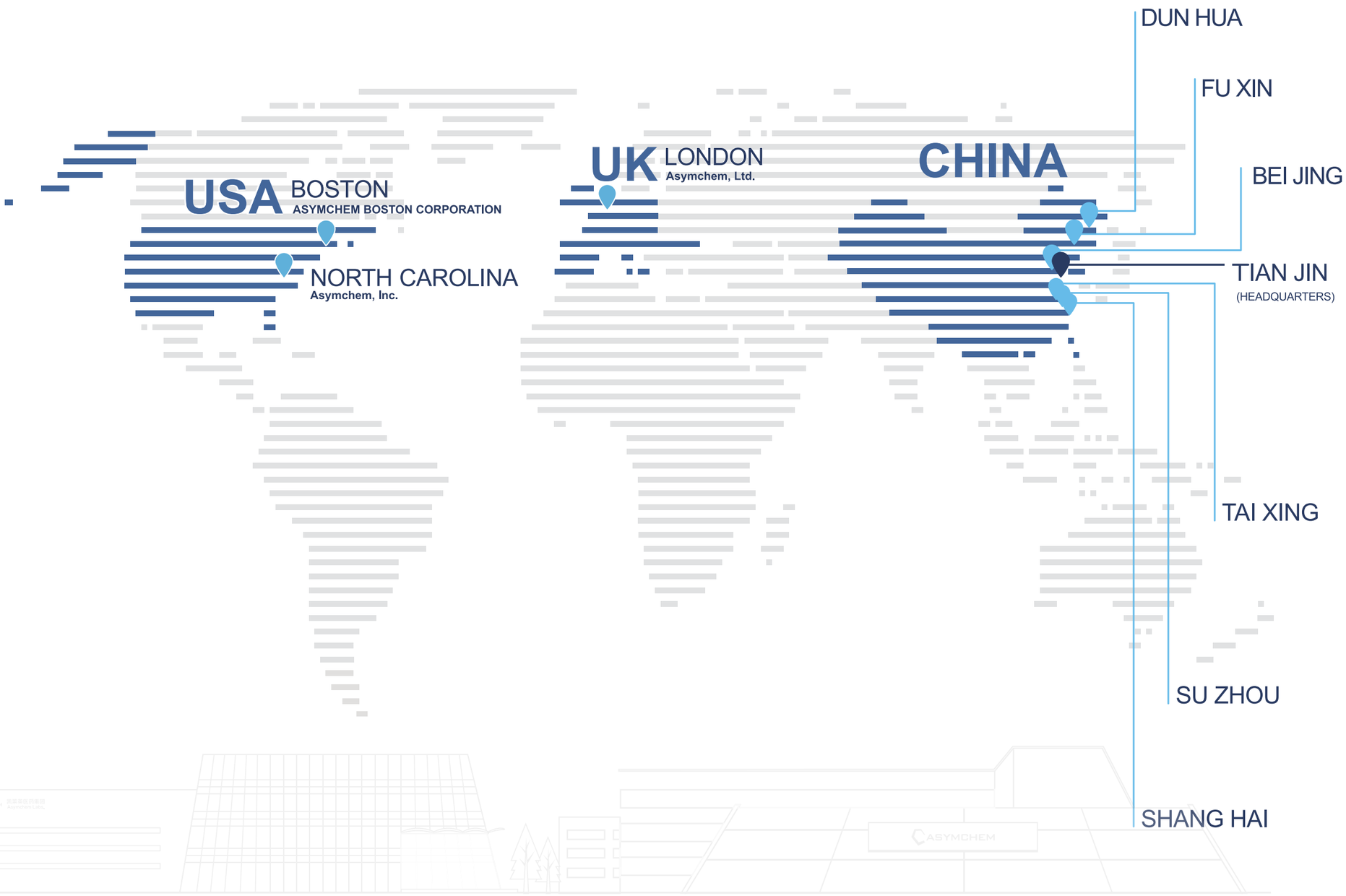
DEVOTED to making technological innovation and commercialized application of global pharmaceutical process, Asymchem (stock code: 002821.SZ/06821.HK) is a CDMO one-stop integrated service provider for new drug research & development and production, and it accelerates clinical research and commercialized application of innovative drugs by providing domestic and foreign pharmaceutical companies and biological technology companies with full-life-cycle one-stop CMC services of drugs, as well as efficient and high-quality research & development and production services. Over the years, the Company has always been following the operation and development concept of "International Standards, China Advantages, Technology-driven and Green-oriented", serving the field of innovative drugs and blockbuster drugs, making continuous research & development of multiple internationally leading patent technologies, and enabling the research & development capacity, equipment and facilities, environment protection standards and patent protection to be geared to international standards; its service items involve multiple major disease treatment fields such as tumor, virus, infection, heart and blood vessels, nervous system and diabetes, etc., and some drugs have become or are expected to become break-through blockbuster drugs in the globe.





Organizational structure of Asymchem





Asymchem Global layout

Manufacturing Sites
8

Successful Inspections From USFDA/NMPA/ TGA/MFDS/PDMA
35

Employees
9700+

Scientists
4600+

Global Clients
1000+

On-going Commercial Projects
40

2019

Recognized as Tianjin Green Factory by Industrial and Information Technology Bureau in 2019

2021

The Most Beautiful Low-carbon Plant in Tianjin Economic Technological Development Area

06 2022

The "CMO Excellence in Green Chemistry Award of the first ACS GCI"

Tianjin Economic Technological Development Area Administrative Commission awarded Asymchem Life Science (Tianjin) Co., Ltd. the title of 2021 Top 100 Enterprises in Tianjin Development Zone

07 2022

The Ministry of Industry and Information Technology awarded Asymchem Laboratories (Tianjin) Co., Ltd.the title of Specialized and Innovative "Little Giant" Enterprises (July 1, 2022 to June 30, 2025)

2021 TOP 20 CRO Enterprises (including CDMO) in China

09 2022

Global Health Drug Development Center ("GHDDI") awarded Asymchem Laboratories (Tianjin) Co., Ltd.the title of Excellent Partner

12 2022

TOP 10 Chinese Pharmaceutical Listed Companies in ESG Investment Value

Top 20 Chinese CDMO Enterprises in 2022

2022 Top Brands of Chinese Life Science Service Enterprises

2021 Most Influential List of China's Pharmaceutical Industry - 2021 Top 100 Pharmaceutical Manufacturers in China

2021 Most Influential List of China's Pharmaceutical Industry - 2021 Top 50 Growth Enterprises in Chinese Pharmaceutical Industry

2021 Most Influential List of China's Pharmaceutical Industry - 2021 Top 50 R&D Enterprises in Chinese Pharmaceutical Industry

The Fifth Made-in-China Hidden Champions



Representative Awards of Asymchem in 2022

01

Governance for Sustainable Development

Attaching great importance to the sustainable development goal of “What's taken from the people is used for the people”, Asymchem is committed to creating sustainable value system. We actively follow the goals of SDGs, maintain effective interaction and communication with stakeholders, seriously practice the concept of sustainable development, and identify important issues through a variety of research methods.

- Management Structure for Sustainable Development
- Strategic planning and mechanism construction



Asymchem Labs

Management Structure for Sustainable Development

A good governance structure is a foundation to promote the integration of ESG into operation philosophy, improving management and enriching practice. Asymchem has established an ESG governance architecture with a complete structure, clear hierarchy, clear rights and responsibilities, and efficient collaboration, which is composed of a three-level structure of "governance team, management team and execution team". The Board of Directors is the governance team, the Strategy Committee reports to the Board of Director as the management team, and the ESG working group, subsidiaries and functional guarantee departments jointly form the execution team to carry out the daily ESG works. In 2022, to meet the needs of strategic development and standardize the ESG management of the Company, we formally incorporated the responsibility of ESG management into the scope of responsibility of the Strategy Committee, further elevating ESG to the level of long-term strategic development.



ESG governance architecture of Asymchem

Board of directors	As the supreme decision-making body of ESG management, the Board of Directors is responsible for the Company's ESG management. It shall pinpoint the Company's ESG management policies and strategies, including guiding and supervising the Company's ESG risk management, ESG goal setting and achieving conditions, ESG information disclosure condition, etc.
Strategy committee	• To research the ESG development strategy, vision and goal setting of the Company and make corresponding suggestions • To propose opinions and suggestions on the Company's sustainable development and the formulation and implementation of the ESG management work plan • To monitor the implementation and improvement of the sustainable development and the management of ESG, ensure that the management and decision-making mechanisms of relevant issues meet the requirements of relevant laws and regulations, and improve the performance of relevant issues
ESG Working Group	Consisting of persons in charges of various departments of the Company, the ESG Working Group is responsible for assisting with ESG Management Committee in jointly promoting the implementation and execution of various ESG daily work of the Company.

ESG governance architecture setup of Asymchem

Strategic planning and mechanism construction

Sustainable development goal of Asymchem

The 17 Sustainable Development Goals (SDGs) launched by the United Nations are a blueprint for achieving a future that everyone looks forward to. Which have covered many challenges faced by human society, including no poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. While ensuring its own steady development, Asymchem is also committed to making due contributions to human well-being. After more than 20 years of development, the Company has been working tirelessly for the cause of human health by constantly enabling global innovative drugs production technology, providing customers with advanced CDMO solutions, actively promoting a fair and just employment environment, exploring green production technology, and promoting the early launch of innovative drugs in a low-carbon, efficient and sustainable way. To this end, the Company has taken a comprehensive look at SDGs, determined nine sustainable development goals based on their relevance with corporate responsibility practices, and incorporated them into daily production and operation, so that the responsibility can run through the daily work and be performed naturally.

Two subsidiaries of Asymchem, Asymchem Life Science (Tianjin) Co., Ltd and Tianjin Asymchem Pharmaceuticals Co., Ltd applied for membership of the United Nations Global Compact in 2022. To support the ten principles of the UN Global Compact in the areas of human rights, labor, environment and anti-corruption, we incorporated them into our strategy, operations and culture, integrated the United Nations Global Compact and its principles into the decision-making process of top management, and actively engaged in partnerships to promote the achievement of the broader SDGs.



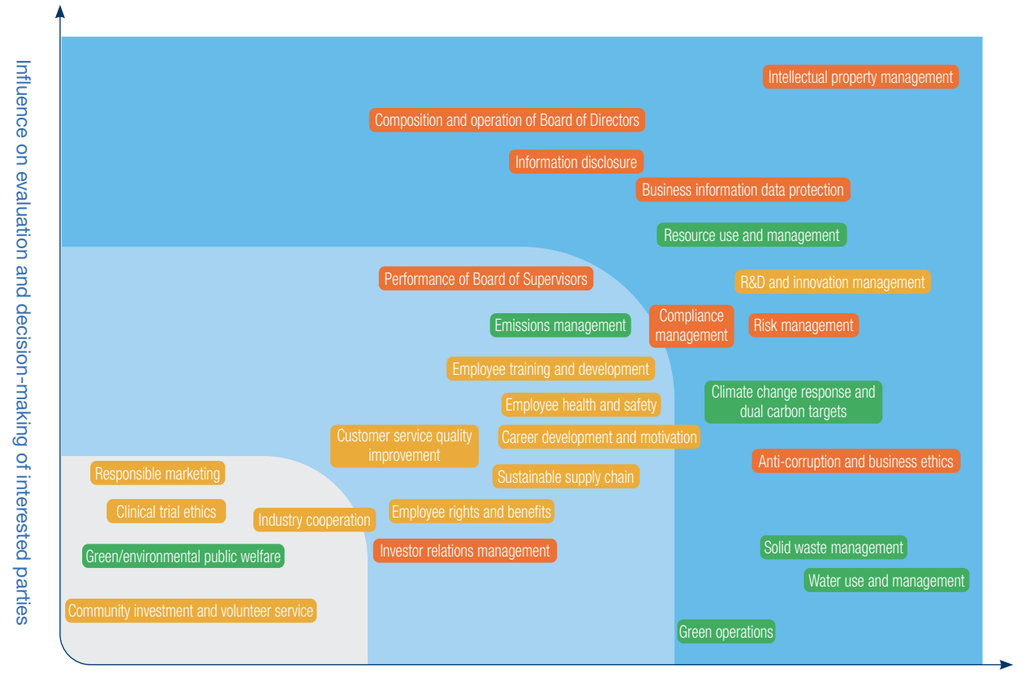
Construction of stakeholders' engagement mechanism

Stakeholder expectations are an important consideration for Asymchem to develop ESG strategy and optimize ESG management. The Company uses a variety of methods to identify areas of focus for stakeholders. Key stakeholders, including members of the Board of Directors, shareholders and investors, governments and regulators, customers, partners, suppliers, employees, communities and the public, are identified based on our own business characteristics and the experience and practice of global peers.

Identification of stakeholders	Key stakeholders	Issue of interest	Communication and response
Shareholders/ investors	Investors and investment institutions that invest in equity and creditor's rights of the Company	• Controlling shareholders and general meetings • Investor relation management • Board composition and operation • Performance of Supervisory Committee • Risk Management • Internal control • Information disclosure • R&D Innovation • Business information and data protection • Intellectual property management • Emission management • Resource use management	• General meeting • Information disclosure • Roadshows
Governments/ regulators	National ministries and commissions, local governments, CSRC, market regulation authorities, emergency management authorities, ecological environment authorities, taxation authorities, customs authorities of China; overseas local government departments, market regulation authorities, ecological environment authorities, taxation authorities, etc.	• Emission management • Environment and Natural Resources Management • Climate change management • Labor standards management • Product liability management • Anti-corruption • Participation in community welfare • Company information disclosure • Risk Management • Internal control	• Investigation into institutions • Official documents exchange • Policy implementation • Information disclosure
Customers	Medical and health industry enterprises, research institutions, scientists, schools, hospitals and doctors	• Product liability management • R&D Innovation • Industry exchanges and cooperation • Anti-corruption • Intellectual property management	• Customer survey • Technical seminar • Customer service hotline • Customer satisfaction surveys
Partners	Pharmaceutical industry association (chamber of commerce organization), cooperative institutions (public welfare organizations, scientific research institutions), distributors, etc.	• Supply Chain Management • Product liability management • R&D Innovation • Industry exchanges and cooperation • Anti-corruption • Business information and data protection • Intellectual property management	• Exchange and reciprocal visits • Industry forum
Suppliers	Suppliers of raw materials, equipment and services	• Employee Health and Safety • Labor standards management • Supply Chain Management • R&D Innovation • Industry exchanges and cooperation	• Supplier evaluation • Supplier exchange and training
Employees	Company employees	• Rights and interests protection • Remuneration and benefits • Career development • Occupational health and safety	• Staff activities • Employees' benefits • Information announcement • Democratic communication • Development and promotion channels
Community and the public	Community residents, non-governmental organizations, social groups, media, etc., around where the Company operates	• Emission management • Resource use management • Environment and Natural Resources Management • Climate change management • Employment management • Anti-corruption • Participation in community welfare	• Volunteer service • Community activities • Exchange and interview

Identification of substantive issues

Based on HKEX's Environmental, Social and Governance Reporting Guidelines, the Global Reporting Initiative's Sustainability Reporting Guidelines, internal and external shareholder assessments of the issues in the list of potential issues, and the nature of our business, Asymchem identified 27 substantive issues of social responsibility related to the Company. In addition, we ranked the issues based on their importance and established a matrix of substantive issues through peer evaluation, expert consultation and management feedback.



Matrix of substantive issues

Material issues

- Green/environmental public welfare
- Community investment and volunteer service
- Responsible marketing
- Industry cooperation
- Clinical trial ethics

More material issues

- Resource use and management
- Water use and management
- Green operations
- Customer service quality improvement
- Sustainable supply chain
- Employee rights and benefits
- Employee training and development
- Employee health and safety
- Career development and motivation
- Performance of Board of Supervisors
- Composition and operation of Board of Directors

Most material issues

- Emissions management
- Solid waste management
- Climate change response and dual carbon targets
- R&D and innovation management
- Information disclosure
- Investor relations management
- Anti-corruption and business ethics
- Compliance management
- Risk management
- Business information data protection
- Intellectual property management

02

Responsibilities to shareholders

In strict accordance with Company Law, Securities Law, Listing Rules of Shenzhen Stock Exchange, the Corporate Governance Code in Appendix 14 to the Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited and overseas local laws and regulations, as well as the Rules of Procedures of General Meeting, Asymchem convenes and holds general meetings to ensure that shareholders have the right to know about and participate in major issues of the Company stipulated by laws, administrative regulations and the articles of association.

- Corporate Governance
- Information disclosure and investor relation management
- Compliance management
- Risk Management



Asymchem Labs.

Corporate Governance

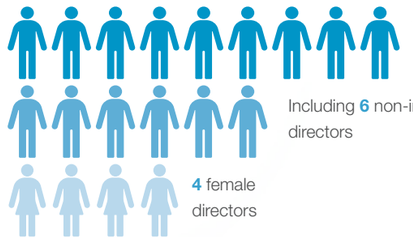
Asymchem is committed to protecting the rights and enhancing corporate value by developing business interests of shareholders and enhancing corporate value by developing business strategies and policies, and enhancing operational transparency and accountability. The Company continuously improves the corporate governance structure, effectively supervises its operation and management, and protects shareholders' rights and interests from a long-term perspective.

Board Diversity

Asymchem actively implements the Diversity Policy for Board of Directors. The composition of the Board is based on merit and diversity, with best candidates selected, taking into account gender, race, ethnicity, geography, culture and experience (business, government, education, healthcare, science, technology and other areas related to the Company's activities). The Company has properly balanced the diversity of skills, experience and perspectives of board members to improve the effectiveness of the board.

Composition of the board of directors and supervisory committee:

Board of Directors:



There are **9** members

Including **6** non-independent directors

4 female directors

Supervisory committee:

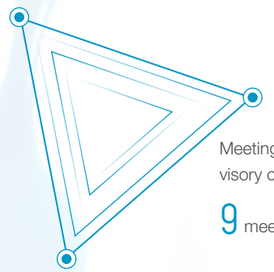


There are 3 members, all of whom are women, including **1** employee representative supervisor.

General meetings, board meetings and meetings of supervisory committee in 2022

General meeting:

6 meetings were held



Meeting of supervisory committee:

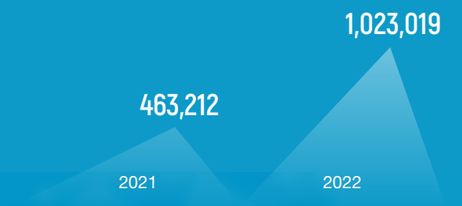
9 meetings were held

Board meeting:

15 meetings were held

Key performance indicators for 2022

Economic indicators



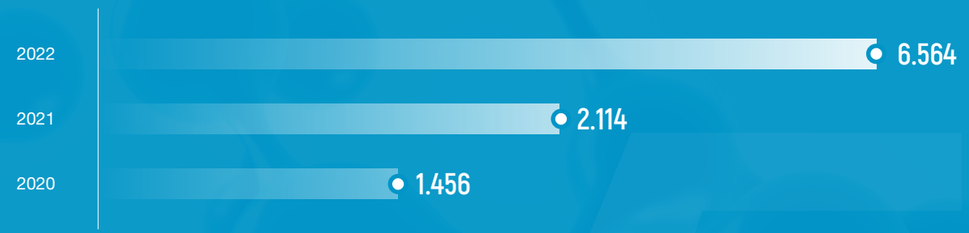
Revenue (Unit: RMB ten thousand Yuan)



Net profit attributable to shareholders of list company (Unit: RMB ten thousand Yuan)

* The above data are from the Company's results announcement for the year ended December 31, 2022

Cash dividends



Unit: RMB 100 million yuan (tax included)

Share repurchase

TheThe A-shares repurchase was completed in November, and a total of **5,229,266** shares were repurchased

Total transaction amount of RMB **799** million

ESOP

At the fifth extraordinary general meeting in 2022, the shareholders reviewed and approved the Proposal on the Management Measures of Employee Stock Ownership Plan in 2022, which covers more than 600 key technical/ business personnel.



Information disclosure and investor relation management

In 2022, in accordance with relevant requirements of the Company Law, the Securities Law, the Measures for the Management of Information Disclosure of Listed Companies and other laws and regulations, as well as the Articles of Association, the Information Disclosure Management System and other rules and regulations, the Company strictly fulfilled the obligation of information disclosure, and disclosed a total of 192 public announcement documents, totaling about 1,380,300 words.

The Company earnestly implements the requirements of protecting investors' interests, attaches great importance to investor relationship management, and carries out multi-dimensional investor relationship management and maintenance according to the Company's Investor Relationship Management System. We actively interact and communicate with investors through performance presentations, institutional research meetings, investor hotlines, interactive platforms and other channels and ways to convey our operating situation and other relevant information.



Performance exchange teleconference held in 2022

Investor relations activities in 2022:

The Company's performance presentation for the first three quarters was held in November 2022, with

135 participants

In September 2022, we participated in the semi-annual performance presentation of listed companies under Tianjin jurisdiction and the investor online collective reception day activity, attracting about

3000 page views

The Company's performance presentation for the first half of the year was held in August 2022, with

375 participants

In April 2022, an online performance presentation was held, with about

28000 page views

The Company's annual performance presentation was held in March 2022, with more than

600 participants

Compliance management

Compliance management is an important cornerstone of Asymchem's sustainable and healthy development. In 2022, Asymchem always adhered to the concept of compliance, complied with the principles of honest management and ethics, and abided by the bottom line of compliance and the red line of business ethics in the actual daily production and operation. In 2022, all the senior executives of the Company signed the "Letter of Commitment on Honesty and Self-discipline, Anti-corruption and Anti-Bribery", and middle-level and below employees signed the "Employee Integrity and Self-discipline Agreement of Asymchem".

Reporting channels for compliance-related issues

Asymchem maintains an atmosphere of openness, trust and respect, accepting anonymous reports and making sure everyone feels comfortable raising concerns. The Company has developed a whistleblower protection mechanism, clearly stipulating the reporting requirements, reporting scope, investigation process, whistleblower protection and other measures. Once a report is received, the management will take timely measures to ensure that any whistleblower will not be subject to discrimination, unfair treatment and other retaliation, so as to protect whistleblowers to the greatest extent. In addition, the Company has issued the "Regulations on Employee Opinion Collection Management", in order to further improve the employee opinion feedback system.

Comment and feedback content

The contents include but are not limited to: management efficiency improvement, quality management improvement, safety management improvement, employee relations, living services, rationalization suggestions, training needs, service awareness improvement and work process improvement.

Comment and feedback channel

Staff seminar, opinion mailbox, opinion collection platform

Handling department and method

The HR shall be responsible for the organization, implementation and information entry of discussion with employees. The Audit Department shall be responsible for information entry and routine maintenance of opinion mailbox. The Audit Department shall be responsible for information collection, fact investigation, feedback and tracking of opinion collection platform.

Employees can check the progress of issue handling on the platform at any time, or directly contact the handling department for details.

Whistleblower protection mechanism

- The Company has improved and updated the Internal Control Management System on Business Ethics;
- It is strictly prohibited to disclose the name, department, company and other information of the whistleblower;
- In the course of investigation and verification, it is not allowed to present the reporting materials or identify the handwriting;
- It is strictly prohibited to retaliate against employees who report. If any violation is found, the personnel involved in the retaliation will be removed from their posts and the labor contract will be terminated, and those who violate the law will be transferred to the judicial organs for handling according to law.



Business ethics and compliance training

The Company strictly abides by business ethics and conducts self-audit from top to bottom. The Audit Department holds at least one business ethics training lecture for all employees of the Company every year. In 2022, the Company improved and updated the anti-corruption, anti-money laundering, confidentiality regulations and other relevant contents, further clarified the relevant requirements of legal risk management; and updated the Sunshine Cooperation Agreement to further strengthen the business ethical risk control of suppliers.

In addition, the Company updates and improves the training content related to business ethics in a timely manner every year, focuses on clean working standards training, prohibits employees from participating in all kinds of bribery activities, and prohibits employees from accepting any form of kickbacks and bribes provided by the counterparties. At the same time, our board of directors, supervisory committee, and senior executives actively participate in the training of "critical few" by the regulators and the trade associations of listed companies, with the concept of protecting small and medium investors rooted in the heart. During the reporting period, the Company and the related personnel were not subject to any corruption related litigation.



In July, all directors, supervisors and officers shared the compliance trading practices for directors, supervisors and officers of A-share listed companies, and accepted the continuous compulsory training for the Company and its directors, supervisors and senior officers.

Business ethics and compliance training for directors, supervisors and officers in 2022

In December, anti-money laundering and anti-corruption training (for H shares) was conducted, and the executive directors of the Company participated in relevant training such as “Explanation of Key Points of Listed Company Rule Governance" organized by China Association of Listed Companies.

Normal compliance operation mechanism

The Company has established a normal compliance operation mechanism, which mainly includes three major measures.

01

Establishment of Legal Department: The Legal Department is fully responsible for the legal affairs related to the Group. Besides, it shall conduct daily supervision on the relevant departments, pay close attention to the new laws and regulations every month, monitor the newly promulgated or revised laws and regulations, analyze the possible impact of new laws and regulations on the Company's operation, and timely report to the business department and management.

02

Engagement of legal counsel for long-term cooperation to deal with daily legal advice and litigation dispute cases.

03

Capital market compliance management: Engagement specialized Law Offices as legal counsels professional in listing compliance for A-share and H-share issues respectively. In addition, the Company engages flexibly external legal counsel specializing in projects according to different business needs.



Risk Management

Asymchem has established and improved the risk management system and internal control mechanism, and strengthened the major risk early warning system and emergency handling mechanism on the basis of identifying and managing daily operational risks.

Risk Management System

The Company has formulated a series of internal control policies, including Risk Management System, and established relevant internal control procedures to have the risk management system cover all levels of the Company. The Company classifies risks according to different operational objectives, including strategic risk, operational risk, financial risk and legal risk.

In addition, focusing on establishing standardized works, the Company has created a management pattern that the first-level legal department leads and goes forward hand in hand the external legal counsel, so that the responsibility of legal risk prevention and control is implemented to all departments and positions of the Company. The Company has formed a long-term control mechanism of joint force in legal risk management, striving to achieve 100% legal review rate of corporate rules and regulations, economic contracts and important decisions, and eliminate major legal disputes.

In 2022, the Company updated the Contract Review Management System, further clarifying the responsibilities of the contract review department, the scope of contract review, the contract approval process and the specific requirements for contract signing, and strengthening the risk management ability related to contract affairs.

Strategic risk

The Company did not make any incorrect strategic decisions, and there are no negative factors affecting the realization of strategic objectives;

Operational risk

The Company has no improper operation decisions, and there are no factors that hinder or affect the realization of operation objectives;

Financial risk

There is no risk of distortion in financial report, no threat to asset safety and fraud risk;

Legal risk

The Company comprehensively and conscientiously implements national laws, regulations and policies, and there are no factors affecting the realization of compliance goals.

Major risk early warning system and emergency handling mechanism

For major risks or emergencies that may occur, the Company has formulated emergency plans, specified responsible personnel and standardized disposal procedures to ensure timely and proper handling of emergencies. At present, the Company has developed emergency plans for fire, chemicals, dangerous goods, flammable and explosive products, safety production accidents, personnel mutations, information crisis, public relations crisis and natural disasters and other emergencies.

Internal Control and Assessment System

Asymchem has established an internal control and assessment system for our organizational structure, development strategy, asset management, capital activities, procurement business contract management and IT construction. The Audit Department is responsible for the inspection and evaluation of the Company's overall internal control. It shall carry out internal control audit through on-site visits, sampling inspection, fact checking and other means, report risks detected in inspection to the relevant business departments, and follow up with the relevant departments to implement remedial measures.

03

Responsibilities to Customer

As a partner of choice for global pharmaceutical R&D and manufacture, Asymchem has always strictly controlled product quality and safety, actively promoted scientific and technological innovation and development and digital intelligence construction, and constantly improved service quality to provide customers with the top quality solutions. In addition, we have insisted on creating a fair and transparent business environment, strictly controlled sensitive information and intellectual property rights, and protected the rights and interests of customers in all aspects of our operations.

- Strict control of product quality is our business foundation
- Speeding up research and development and the construction of digital intelligence simultaneously
- Improving service system based on customer first principle
- Privacy Protection and Data Security



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Asymchem Quality Management System Training

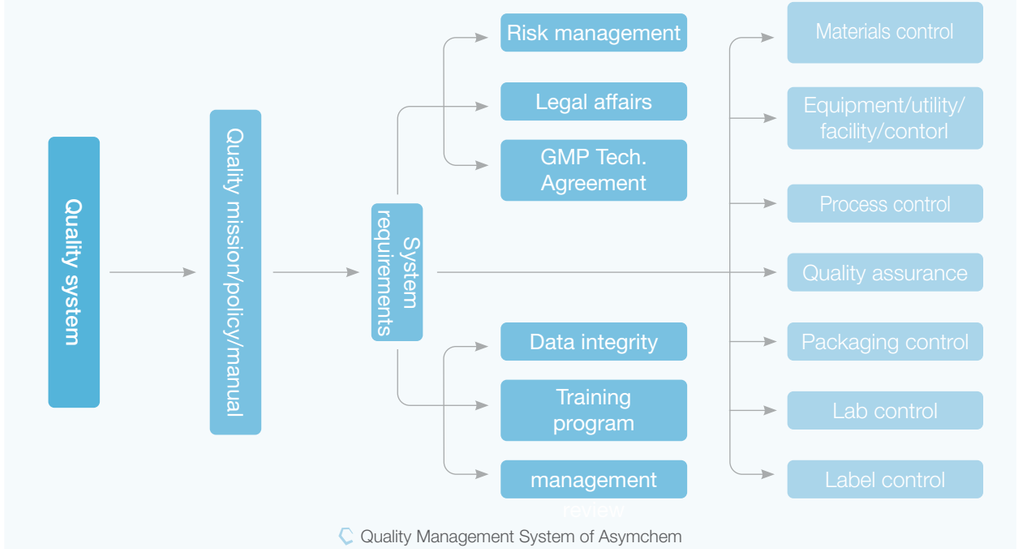
Strict control of product quality is our business foundation

Quality Management System

Asymchem's quality policy is to develop and produce APIs and drug products that meet worldwide regulatory requirements and the high quality standards of pharmaceutical products for human use set out in CGMP and ICHQ7, Q8, Q9, Q10, Q11 and EMA, USFDA and NMPA regulatory requirements. The Company strictly abides by the Guidance on Good Data and Record Management Practices of the World Health Organization, the Pharmaceutical Administration Law, Chinese Good Manufacturing Practice (GMP) and other laws and regulations, and maintains a quality management system in accordance with Chinese GMP, the United States' cGMP regulations, and the European Union's GMP standards. The system is designed for the life cycle management of products under research and development, technology transfer, clinical stage and commercial stage. It covers clinical research, production of APIs, production of drug products (solid oral drug products and injections), biosynthesis, mRNA R&D and production, ensuring that the products consistently meet the expected requirements and quality specifications.

In addition, the Company has set up an independent quality assurance department and established a quality system management model based on GMP activities. The model covers data integrity management, risk management, training program, management review and other processes across all aspects of GMP from materials control, equipment/utility/facilities/control to laboratory control. Asymchem benefits patients by ensuring the quality of its products and services through a comprehensive quality control system.

In 2022, Tianjin Clin-nov Medical Technology Co., Ltd, subsidiary of the Company, successfully passed ISO9001 international quality management system certification.



Quality Management System of Asymchem

Quality supervision and inspection

Asymchem has built a cGMP workshop in compliance with international standards, always maintaining high standards of quality supervision requirements, and constantly practicing quality culture in the work. Therefore, we can accept regulatory inspection at any time. Since 2020, according to EMA, USFDA and TGA remote audit guidelines, Asymchem has taken the lead in achieving full coverage of WIFI signals in GMP production areas in China, and gradually established a comprehensive remote audit system with advanced hardware and software.

In April 2022, Asymchem completed a remote audit by Therapeutic Goods Administration (TGA) in 4 working days in strict accordance with GMP guidelines issued by the Pharmaceutical Inspection Co-operation Scheme, and was rated A1, the highest GMP compliance level in the current TGA system.

By the end of 2022, Asymchem has successfully passed **35** regulatory inspections (including FDA, PMDA, TGA, MFDS and NMPA).

In 2022, Asymchem host customers for **464** times

QA audit for **111** times

With the regulatory inspections rate of **100** %

Product quality review measures

- Review of critical process control and key testing results to the products;
- Review of all non-conforming product batches;
- Review of all critical deviations and related investigations;
- Review of stability testing results;
- Review of all quality related returns, complaints and recalls;

Product recall mechanism

- Written product recall procedures: to specify the recall notice, recall methods, recalled product evaluation, disposal of recalled products, implementation of corrective sactions;
- The QA is responsible for the specific assessment and reporting the recall to the relevant authorities;
- Perform annual mock recall

Product quality review and recall mechanism

By the end of 2022, Asymchem had no product recalls

"Rock Plan", the quality system improvement plan

The Rock Plan is an important link in the long-term development strategy and a quality system improvement plan of Clin-nov, our subsidiary. This plan is designed to constantly improve quality management on the basis of ISO9001 certification. With the business process of Clin-nov's projects as the main line, it covers the work of each module of clinical operation to ensure the project delivery with quality and quantity guaranteed.

- **Near-term target:** To establish a set of complete and unified quality system documents of Clin-nov, so that all departments can skillfully use them to ensure the quality of drug clinical development.
- **Long-term target:** To promote the quality system of Clin-nov to high standards to lead the industry with quality

Target

Results

- The new quality management system was launched by the end of 2022,
- Covering 120 SOPs and WIs, and more than 250 supported forms and templates,
- Covering all business segments of Clin-nov, guiding all the employees in the business departments under the quality system to implement projects in accordance with unified standards and compliance procedures to ensure the quality of clinical trials.

Target and results of Rock Plan

Speeding up research and development and the construction of digital intelligence simultaneously

R&D innovation system

"Independent innovation" and "core technology" are the source of Asymchem's continuous progress. Committed to technological innovation and research and development, we have built a platform for researchers to access the progress and latest technologies in the biomedical industry and stimulate innovation potential through industrial R&D exchanges and independent innovation, and boast a large number of proprietary intellectual property rights in synthetic technologies.

The Company has set up a scientific advisory board composed of famous scholars around the world and a development strategy expert committee composed of experts in various fields to give full play to the advantages of experts and scholars in the industry, who will form intellectual forces with Asymchem, jointly promote the progress of our green pharmaceutical technology, and improve the professional and scientific level of strategic decision-making, while guiding the relevant technical personnel to carry out technical research.

Science Advisory Board

It aims to provide world-class technical guidance for the development of the Company, participate in the project approval, evaluation and acceptance of the Company's research and development projects, put forward suggestions on research, development, promotion and application of advanced technologies, and organize and guide the relevant technical personnel to carry out technical breakthroughs.

1 2 3

Three R&D support systems

Committee of Experts on Development Strategy

It aims to develop the domestic market for the Company, give full play to the advantages of experts and scholars in the industry, form intellectual forces, and actively promote the progress of green pharmaceutical technology of Asymchem, improve the professional and scientific level of strategic decision-making.

International Joint Laboratory for Green Pharmaceutical Technology

The laboratory aims to jointly develop research topics with commercial application value based on green pharmaceutical technology, and focuses on the international cutting-edge green pharmaceutical technology through further cooperative development, process optimization and extension to scale-up research, so as to replace or innovate the existing backward production process and technology, and greatly reduce the production cost

Three R&D support systems

Moreover, Asymchem has teamed up with a number of industry experts, including Nobel Prize winners, to build an international joint laboratory for green pharmaceutical technology. Under the guidance of many professors, the research and development projects of the joint laboratory have been carried out smoothly and phased results have been achieved in several research and development directions.



International Joint Laboratory for Green Pharmaceutical Technology

As a world-leading, technology-driven one-stop integrated CDMO service provider, the Company focuses on strengthening the capability of "D" (Development) and continuously improves it. We can quickly solve the new and complex process problems and technical challenges faced by customers, and quickly realize the transformation from small laboratory trials to large-scale production.

In 2022, the Company continued to improve the construction of the R&D platform. Following the Center of Excellence for Process Science (CEPS), Center of Flow & Continuous Technology (CFCT), Center of Synthetic Biology Technology (CSBT), and Centre for Intelligent Manufacture Technology (CIMT), the Company has formally established the Institute for Advanced Pharmaceutical Materials (IAPM), Center of Drug Delivery and Formulation (CDDF), Center of Biological Technology and Innovation (CBTI) and Technology Innovation Center for Clinical Research (TICCR). The eight technology centers complement each other while striving to develop cutting-edge and future-critical technologies in different directions. We reserve forward-looking technology and lead technical innovation to provide strong technical support for the Company's new layout and direction, and to create a new engine of GXP one-stop service of "GMP-GLP-GCP" in Asymchem.

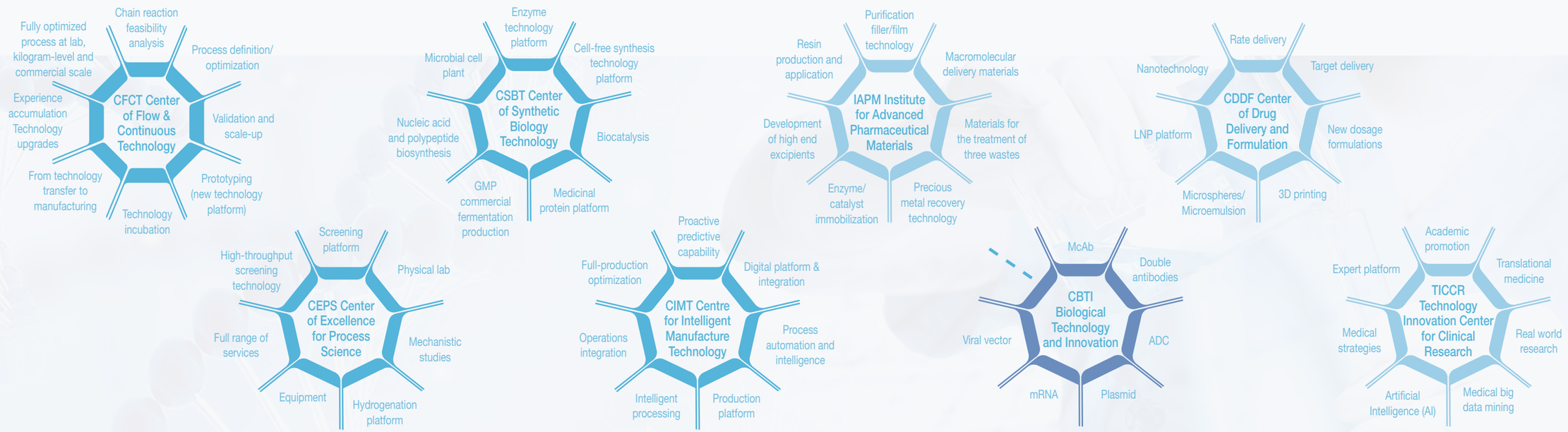
Summary of scientific research achievements of the joint laboratory in recent three years

In 2020, one paper was published on Journal of American Chemical Society (JACS, impact factor 14.612), and one patent was derived from the results.

In 2021, one paper was published on Nature Chemistry (impact factor 24.427).

In 2022, one paper was published on Science (impact factor 47.73).

As of the end of 2022, the joint laboratory had published a total of 20 papers.



8 technology centers of Asymchem







Continuous reaction research and development platform







Chemical macromolecular CMC one-stop service platform



DOE (Design of Experiment) platform

Asymchem was granted the first "CMO Green Chemistry Excellence Award" in the world by ACS GCI's Green Chemistry and Engineering Conference

In 2022, Asymchem was granted the Inaugural CMO Excellence in Green Chemistry Award by ACS GCI's Green Chemistry and Engineering Conference. This is the first time for ACS GCI to honor a global outstanding green chemistry CMO. Asymchem Leveraged innovative manufacturing technologies to deliver sustainable processes: A production-scale continuous [2+2] photocycloaddition to prepare a key raw material. This innovative technological achievement broke the scale limitation of the traditional [2+2] photocycloaddition, solved the long-term technical problem that production could not be scaled up for such reactions, and established the kg-level scale production system. Thanks to this, we have become one of the pioneers who successfully realized industrial production of [2+2] photocycloaddition in the world. The perfect combination of photochemistry and flow & continuous technology is not only the change and innovation of pharmaceutical industry technology, but also a leapfrog development that allows photochemistry to be successfully applied to industrial production out of the laboratory, which is of great significance and value to the innovation and development of the pharmaceutical industry.

Data-based performance of R&D platform construction:

As of the end of 2022, the Company had more than **4600** scientific researchers, and RMB **709** pre-million was invested in research and development

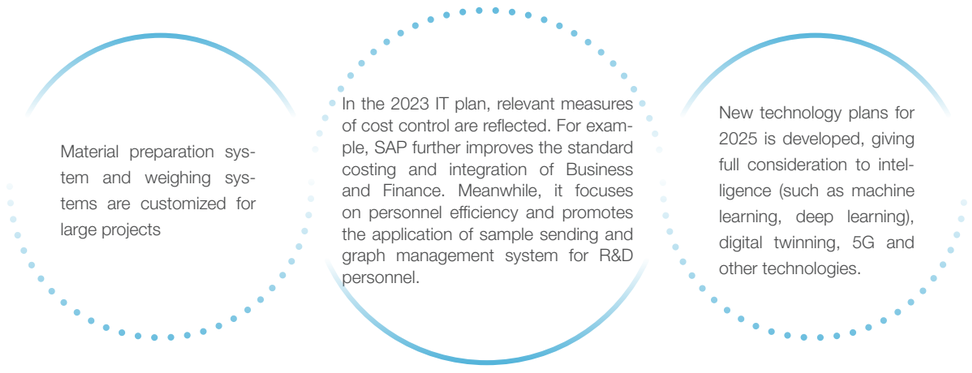
In 2022, we had **57** new patent applications and **48** authorized patents, including **16** patents for continuous reaction and **15** patents for synthetic biotechnology; and published **6** articles in international mainstream journals.

Digital and intelligent construction

The development of information technology and artificial intelligence technology has significantly propelled the digitalization of pharmaceutical and chemical industry. Empowering innovation with digital technology is thekey for the pharmaceutical industry . As a one-stop service platform for “APIs + formulations + clinical study”, Asymchem leverages its own digital transformation to empower innovation and continuously improves the efficiency of R&D and operation. Through diverse approaches such as independent R&D, collaborative research and the adoption of advanced technology tools in the industry, Asymchem enables innovation of the whole process of drug research and development, production and clinical studies.

With more than 20 years of innovation technology and service experience, Asymchem has set up the Centre for Intelligent Manufacture Technology (CIMT). Through digital strategy, artificial intelligence (AI) and data science, it enables intelligent management and manufacturing, to replace manual operation, and helps the Group continue to lead the development trend of CDMO industry in the era of industry 4.0, and continue to improve our leading position in the global CDMO market.

From 2020 to 2021, the Company launched a variety of independently developed production system and support systems, such as production Kanban, production scheduling, intelligent project Kanban, etc., successfully meeting the management goal of expanding production capacity and improving project delivery.



Implementation and planning of IT development strategy





We participated in the formulation of the White Paper on Intelligent Manufacturing in China's Pharmaceutical Industry (2020 Edition) and Typical Scenarios of Intelligent Manufacturing in Pharmaceutical Enterprises (2022)

Implementing QMS system to improve quality management

Previously, the company used paper documents to manually carry out deviation management, change management, laboratory investigation management, supplier management, customer audit management, risk management and CAPA management related to commercial/validation projects. In September 2021, the Company held the kick-off meeting of Veeva QMS project. By establishing the electronic QMS system, the Company adopted the online way to accelerate the speed of work flow and ensure the integrity of electronic data. The system has three functions (intelligent prompts, reports and database) to reduce the manual drafting, transfer and archiving time, and facilitate data statistics and analysis, which is conducive to improving quality management. In September 2022, the system was successfully launched, **and the Company became the first CDMO service provider to deploy Veeva QMS system in China.**

Adopting factory logistics management system to improve the efficiency of material formulation and feeding

Collecting logistics documents and arranging transportation according to the production planis a challenge in the logistics scheduling process. In January 2022, the production plant put forward the demand to solve this problem, and the IT department acted immediately to set up a logistics management system. The system was put into use in May,simplified the process of material application , providing data reference for logistics performance, and greatly improving the transportation efficiency and distribution rationality.

Operation process

- The workshop staff can propose logistics requirements at any time according to the production plan.
- The Supply Department receives the stock-up information and the system informs the logistics personnel to pick up the goods and deliver them to the designated place.
- At the end of the operation, the system will collect the statistics of the logistics list delivered by the logistics personnel.

Results achieved

- The workshop personnel can submit the material application according to the project requirements. The warehouse personnel and logistics personnel can also check the latest real-time material application, which simplifies thetedious process of material application.
- The system supports the whole process of the application from submission, formulation and delivery in real time, automatically calculates the monthly delivery quantity of the logistics personnel to provide data support for the performance of logistics, and greatly improves the efficiency of transportation and the rationality of distribution formulation.

Factory logistics management system operation process and results



Screenshot of Material distribution system page

Improving service system based on customer first principle

Based on the customer first principle, and starting with every single person, product and service, Asymchem is always committed to "becoming the most creative escort and participant in the global development and supply of new drugs, and becoming a partner of global drug R&D and production".

Service quality management system

Formulation asymchem has established a complete set of customer service management system, including customer communication and management, product complaint handling, customer satisfaction management and other aspects, and constantly updates the service quality management systems (such as "Customer Management and Communication Management System of the Group", "Customer Complaints", "Requirements On Non-Quality Complaints Management", etc.) according to the actual business development, so as to ensure that customers enjoy the best quality API + formulation + clinical research one-stop service.

Customer compliant handling mechanism

The Company accepts customer complaints, and the QA department is responsible for the registration, classification, coordination, investigation and handling of customer's quality-related complaints, and the establishment of corresponding corrective and preventive measures against the root causes to continuously improve product quality. In 2022, Asymchem handled all the customers' quality and non-quality complaints promptly and effectively through self-inspection and investigation in accordance with the corresponding management mechanism, reached agreements with customers through communication, and reduced and eliminated the subsequent impact of customer complaints through various measures.

For customer quality complaints

Complaints will be received by the QA over the phone or in writing, and a Complaint Log will be formed.	Investigation will be conducted according to Deviation Investigation, and notice will be provided to the complainant within two working days after receiving the complaint that the investigation has been commenced.	Upon completion of the investigation, the QA personnel or the responsible person of the relevant department will provide the investigation report.	The investigation report will be reviewed and signed and then sent to the customer by the QA.
For any product recall/ withdrawal/return, we will act strictly according to the relevant procedures.	The validity of the complaint will be determined according to the investigation results.	The progress of corrective and preventive actions will be tracked according to the Corrective and Preventive Action Tracking.	The corrective and preventive actions will be reviewed in the Annual Product Review Report.

For non-quality complaints

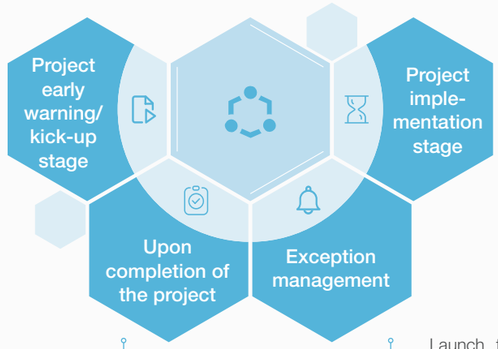
Any department receiving customer complaints must report relevant information to the Project Coordination Office (PCO) within 24h.	Within 4h upon receipt of the information, the PCO shall complete validation with corresponding project VP/ED, and make final report of the causes and solutions for customer complaints.	Any department and project VP/ ED receiving customer complaints must make response to customer complaints as soon as possible, and make feedback of solution or give reply within 24h.

Customer compliant handling measures

Customer satisfaction management

In order to comprehensively and timely understand customer needs, optimize products and improve service quality, the Company has set up corresponding customer communication management requirements and mechanisms in accordance with the Formulation of the Company's Customer Management and Communication Management System during the three stages of project initiation, project progress and project completion, so as to maintain timely, sufficient and efficient communication and exchange with customer. In 2022, we got a full score in the customer satisfaction questionnaire survey (API & Pharmaceutical-01 production order).

Start the project within one week after receiving the project/warning. The project leader should fully communicate with the customer about the needs.



Strengthen the quality of customer communication during the project, and formulate standardized service standards for personnel quality requirements and customer feedback in the process of customer communication.

After the completion of the project, we shall send and collect customer satisfaction questionnaires, respond to customers' comments and suggestions and make internal rectification in the first time.

Launch the internal delay warning mechanism according to the requirement of project delivery on schedule, and respond to customer complaints in time during the project implementation process.

Customer satisfaction management process





Service quality management result

As a global industry-leading provider of integrated one-stop CDMO solutions, the Company has been implementing all standards with high requirements, high standards and high-quality work specifications, and adhering to the cGMP quality management system and EHS management system with first-class international standards, and improving the production management and project management capabilities. The Company has also established a “customer-centric” business orientation. These efforts have contributed to the Company’s position as a “trusted and reliable CDMO partner” in the industry, enabling it to meet the diversified needs of customers, provide efficient and high-quality R&D and production services, and form deep embedded cooperative relations with international manufacturing giants and emerging pharmaceutical companies, and become a long-term strategic partner of many multinational pharmaceutical companies.

Since its establishment, Asymchem has been awarded "Tier 1 Supplier" and "Most Valuable Partner" by leading pharmaceutical companies such as Pfizer, Merck, Roche, etc. During the Reporting Period, the Company had more than 561 order customers and more than 1,000 active customers. The key drugs it serves cover virus, infection, tumor, cardiovascular, nervous system, diabetes and other major disease treatment fields, including several breakthrough blockbuster drugs with annual sales or predicted sales peak of more than US$1 billion.



Supplier Diversity Tier 1 Award granted by MERCK

Top Intermediates CMO granted by Pfizer



Most Valuable Partner Award granted by Roche

Asymchem was granted the honor of “Excellent Partner” by ZLAB

In early 2023, Zai Lab (Shanghai) Co., Ltd. (“ZLAB”) awarded Asymchem the honor of “Excellent Partner of 2022" again after 2018, and expressed full recognition and gratitude to Asymchem for its support in the commercial manufacturing process of Zeller® (Nylapalil toluene sulfonate) and Newzeller® (Omacycline toluene sulfonate).

Since the first cooperation in 2015, Asymchem has been providing stable and high-quality services for ZLAB. Our research and development, production, analysis, QC, PCO and RA teams worked closely together, and provided precise control and efficient collaboration from material formulation to production, packaging and other links, leaving a deep impression on the customer. The award of "Excellent Partner of the Year 2022" is a recognition of Asymchem's strong technical strength, rigorous quality control, flexible and strong execution of service capabilities. In the future, Asymchem will further improve the GXP one-stop service capabilities, and as always, provide efficient and high-quality extreme services based on the technology-driven and customer-centered principle.

2015

Asymchem cooperated with ZLAB for the first time

2016-2017

Asymchem provided long-term stable R&D and productions services for ZLAB

2018

Asymchem was awarded the "Best Partner" honor by ZLAB

2019

Asymchem helped its Category 1 drug, the PARP inhibitor Zerol ® (Nilapalil toluesulfonate) obtain approval for marketing

2021

Once again, Asymchem helped its Category 1 new drug Newzylor® (Omacycline toluene sulfonate) to be launched in China

2022

Asymchem was awarded the honor of "Excellent Partner" by ZLAB

Cooperation between Asymchem and ZLAB

Privacy Protection and Data Security

Privacy Protection Management

Asymchem attaches great importance to protecting customers' trade secrets, data and personal privacy. Through strict internal control procedures, the Company has realized safe and controllable information collection, transmission and processing. All the employees have signed the Confidentiality and Non-competition Agreement, new employees in important positions are subject to background checks, core managers are subject to off-office auditing and need to sign non-competition agreements, so as to minimize the risk of information disclosure.

In addition, when it comes to the protection of subjects' privacy, Asymchem strictly complies with the Good Clinical Practice and the Personal Information Protection Law. Subjects must read and sign the Informed Consent Form before participating in the study. All study reports or process documents shall use initials or code to indicate the subjects. In 2022, the Company updated its SOP for informed consent writing, specifying a series of process requirements from the writer's ICF writing, line manager/medical staff/project manager review, to sponsor review and finalization. During the reporting period, there was no incidents of leakage of customers' or subjects' private information.

Institutional level

We have formulated the Reiteration of Requirements on IP Protection System, which requires the management personnel of all departments to properly manage all kinds of data and document information of the department, and prohibit the internal management of important data and documents to be transmitted without encryption.

Internal audit

We conduct quarterly internal spot checks and audits on the privacy protection of all departments. If any problems are found, the corresponding management personnel will be held accountable.

Information control

We have formulated the System for the Use and Control of Mobile Storage Devices. Employees' work computers are not allowed to connect to external mobile storage devices, and forwarding to personal cloud mailbox/web disk and other third-party cloud services is prohibited.

Privacy protection measures

Data security management

Ensuring information security is an important guarantee to maintain the steady operation of Asymchem. The Company strictly abides by the Network Security Law and other relevant regulations, and has established various data security management systems, which cover production, document management, information security management, business continuity management and other aspects of the Company. In 2022, the Company passed the annual supervision and audit of China Quality Certification Center and successfully obtained ISO27000 information security management system certification. During the reporting period, no information security-related accidents occurred in the Company.

Dealing with data breaches

- We conduct professional security penetration testing and vulnerability scanning on our PMF system, SDMS system and Yonyou U9 system.
- We perform vulnerability scans on Intranet and extranet servers.

Network security training

- We hold annual information security training for all staff,
- Information security training is included in the mandatory orientation course for new employees
- We carry out phishing email test for all staff.

Handling of common IT problems

- Daily operation maintenance personnel build and update the knowledge base, provide frequently asked questions and solutions.
- When a failure or security incident occurs, the IT department assesses the risk and initiates a deviation process as well as a CAPA based on the risk level. All corrective actions are reviewed by the QA and retraining will be completed.

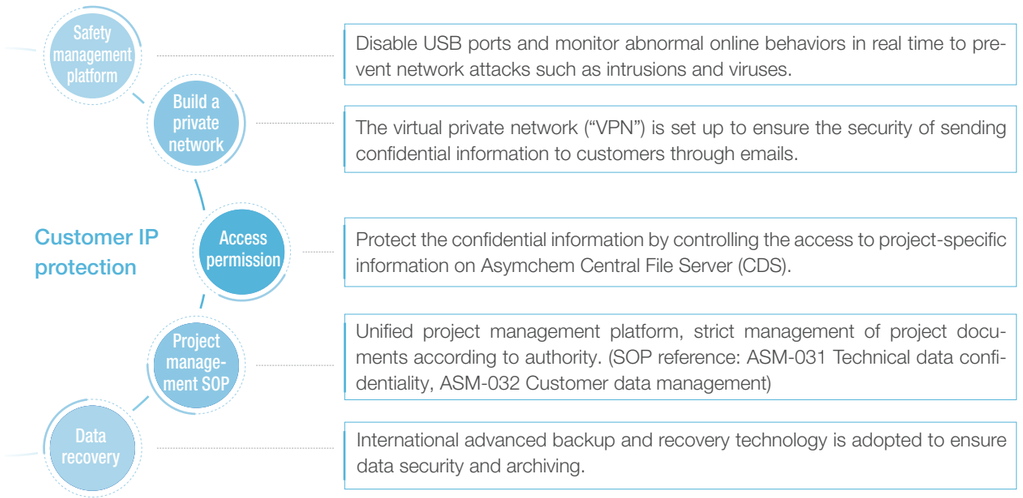
Information Security Management Measures



ISO27001 certificate, information security internal training courseware

Intellectual property management

Ensuring the security of customers' intellectual property is an important code of conduct and core value of Asymchem. During the reporting period, there were no major litigation cases related to intellectual property. Under the framework of the Confidential Disclosure Agreement (CDA) and the Master Service Agreement (MSA), any intellectual property developed by the Company for the customer service is owned by the customer. The confidentiality obligation of employees is not limited to the employment contract. The intellectual property rights of customers and Asymchem are protected by both the laws of the country where they are located and the Company's agreement.

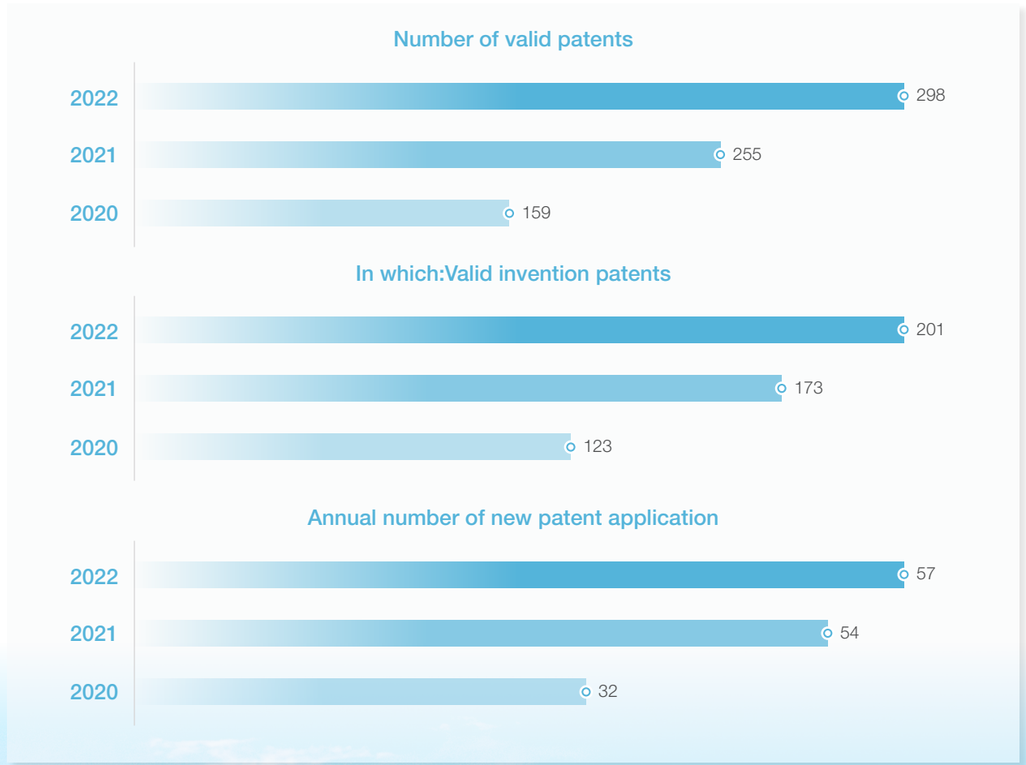


Customer's intellectual property protection measures

IP protection special audit specification workflow

In 2022, the Audit Department took the lead and coordinated the Information Management Department, Project Coordination Management Department and other departments to carry out special IP protection audit for the Group's subsidiaries, in order to identify the management risks related to IP protection, and put forward targeted suggestions for improvement. At the same time, the relevant process standards and rules and regulations were improved, all the employees were trained, and the "Outsourcing Printing System of Clin-nov" was developed to promote the construction of intellectual property compliance management.

For the management of our internal intellectual property rights, Asymchem has formulated the Patent, Software Copyright and Article Publication Management System to prevent external infringement risks according to the requirements of the Patent Law, the Implementation Rules of the Patent Law and other laws and regulations. For patentable technologies and achievements, patent directives will be formed after approval by the Office of the Co-chief Executive Officer, and all technical departments and public business units will complete patent applications according to the patent directives to establish intellectual property protection for the Company's technologies and achievements. During the reporting period, there were no litigation cases related to intellectual property.





04

Responsibilities to partner

As an A-share and H-share listed enterprise, Asymchem bears the responsibility of the industry and has the obligation to lead the entire CDMO industry to carry out technology research and development and promote industry exchanges and cooperation, so as to make contribution to building the green and sustainable CDMO industry chain.

- Leading the industry change as a pioneer
- Promoting industry development through industry-university cooperation
- Building a green sustainable supply chain



Asymchem Labs.

In 2022, the Company was honored by several industry associations:



"TOP10 Listed Chinese Pharmaceutical Companies with Most ESG Investment Value in 2022"

2022 CHSESI



"Top 100 Chinese Life Science Service Enterprise Brands in 2022"

2022 CHSESI



Top 20 Chinese Pharmaceutical CDMO Enterprises in 2022

2022 High Quality Development Conference of Massive Health Industry and the 7th China Pharmaceutical R&D Innovation Summit (PDI)

Leading the industry change **as a pioneer**

As one of the leading companies with influence in the industry, Asymchem actively organizes and participates in industry discussions and exchange, and effectively promotes the maximization of the comprehensive benefits of industry resources through the coordinated development of upstream and downstream in the industrial chain. Recognized by all parties, we are contributing to the progress of the industry.

Name of Institution	Role Name	Joining time
The United Nations Global Compact		2022
China Pharmaceutical Association of Plant Engineering	Director	2021
China Chemical Safety Association	Member	2021
ACS GCI's Green Chemistry and Engineering Conference	Member	
China Pharmaceutical Innovation and Research Development Association	Member	2018
China Pharmaceutical Industry Association	Managing director	2017
All-China Federation Of Industry & Commerce, Medical & Pharmaceutical Chamber	Member	2017
China Chamber of Commerce for Import & Export of Medicines & Health Products	Member	2017
China Pharmaceutical Enterprise Association	Member	
Healthcare Executive	Gold Services Provider Alliance	

Promoting industry development through industry-university cooperation

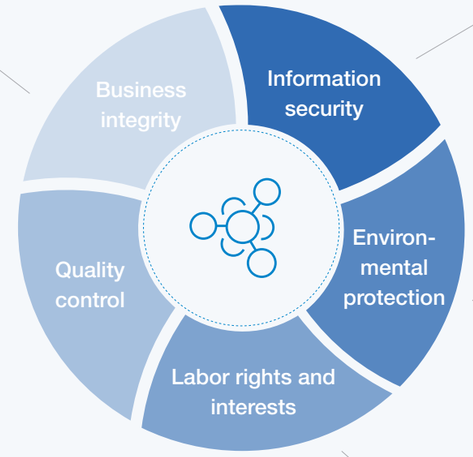
Industry-university-research cooperation is a key link of innovation-driven development and an effective way to promote new development drivers of the industry. Giving full play to the advantages of enterprise post-doctoral workstation, Asymchem actively carries out in-depth cooperation with domestic well-known universities to explore green pharmaceutical related technologies, and promote the development of the industry. In 2022, the Company cooperated with Nankai University to jointly train two post-doctoral students. The cooperation project is designed to effectively reduce the use of chemical reagents with high energy consumption, high risk and low atomic economy in traditional process reactions, reduce the consumption of precious metal resources and realize the innovation of green pharmaceutical key technologies and processes through the pioneering research of photochemistry and catalysis of precious metals.

Building a green sustainable supply chain

The Company continued to standardize supplier management, construct a supply chain collaborative cooperation mechanism, integrate ESG into supply chain management, give full play to the market role, promote more upstream partners to practice the concept of sustainable development, so as to jointly create a stable, green, and sustainable supply chain, and achieve green upgrading and sustainable development of the overall industry.

Avoid bribery and corruption of any kind. No offer or acceptance of bribes or other forms of undue advantage.

Respect intellectual property rights, fair trade, protect customer information security and business secret.



Procure products and services that meet quality requirements.

Give priority to the purchase of green environmental protection, energy saving and emission reduction products and services

Comply with the labor law, protect the rights and interests of employees, and protect the health and safety of employees.

Main topics of supply chain management



Supplier Management System

In 2022, the Company revised the relevant system of green procurement, updated the procurement system documents and improved the procurement process to achieve honesty, self-discipline and fairness.

The new chapter of supplier management strategy is added to the supplier management system, which systematically includes the quality management supply chain (QMS) into the supplier management mode. Meanwhile, the Company divided the management of supplier list into three parts: project-specific Qualified Supplier List, the annually updated Group-level Qualified Supplier List and the quarterly maintained Supplier Quarterly Update Form. In this way, it is more convenient for the Company to manage suppliers, improve the standardization and process, and ensure the efficiency and quality of procurement.

New supplier access

For new suppliers, the Company has a complete and strict review and evaluation process, and early review will be conducted on new suppliers.



Supplier access process

New shortlisted supplier access materials:

- Three certificates in one (Business license, organization code certificate / tax registration certificate);
- Industrial and commercial information, safety data, credit information, etc.;
- Suppliers within the scope of quality control shall fill in questionnaires and declaration documents;
- Materials within the scope of state control shall be provided with qualification certificates.

Before the first raw material release of the newly accepted supplier, the Purchasing Department shall lead or assist the QA to collect the qualification documents and credit evaluation of the supplier, and complete the approval and confirmation of the corresponding documents before the material release. For the supplier requiring on-site audit and the execution of the quality agreement, the relevant procedures shall be completed before the product release.

Supplier evaluation

Every year, the Purchasing Department and the QA will evaluate the supply status of existing suppliers and generate the Supplier Annual Supplier Evaluation Form. For suppliers of commercial projects, the Company will evaluate their qualifications every 1-2 years according to the level of suppliers, and provide a review report. If the supplier qualification does not meet the requirements, the QA organization shall submit the Deviation Investigation Report to assess the impact on product quality and develop the necessary CAPA (Corrective and Preventive Action).

Total number of suppliers:
5,084
including
4834
from Mainland China
250
from Hong Kong, Macao, Taiwan and overseas;

Number of new suppliers:
1,110
Number of suppliers participating in safety and environmental training:
1,251

When delivering products to customers, under the premise of ensuring product quality and compliance with regulatory requirements, the Company tries to use environmentally friendly materials and use the least resources for packaging, so as to reduce the impact on the environment and practice sustainable development.

Using green packaging materials to reduce hazardous waste emissions

Asymchem actively uses green and sustainable materials as packaging materials. The inner packaging of the chemical compound used in the project was plastic products. After feeding, the plastic products used in packaging were uniformly disposed of as hazardous waste. In recent 2 years, the Company has negotiated with several suppliers to update the inner packaging of materials into fusible materials, which can be fed directly to avoid dangerous waste and be more friendly to the environment.

05

Responsibilities to employees

As an enterprise that values technological innovation and focuses on customers, Asymchem keeps attracting and retaining experienced experts and outstanding talents in the industry, and constantly introduces high-end external talents. Based on the employment principle of "making the best possible use of the talents and assigning jobs to whoever has talent", the Company continuously optimizes the talent reserve, and strengthens the institutionalization and normalization of talent training, with an aim to create a diverse team and a fair, equal, healthy and safe working environment. In addition, the Company provides employees with a positive growth platform, communication platform and smooth career development opportunities, provides salaries and benefits that match the performance of employees, and protects the legitimate rights and interests of employees, enabling the employees to grow together with the Company, and constantly enhancing the sense of belonging of employees.

- Standardizing employment and creating an equal workplace
- Ensuring equal communication and Enhancing democratic management
- Protecting Employee Right and Benefit, enabling them to enjoy their fruits of labor
- Upholding People-Oriented Philosophy and improving the overall quality of the team
- Enhancing occupational health and safety based on the principle of life first



Asymchem Labs.

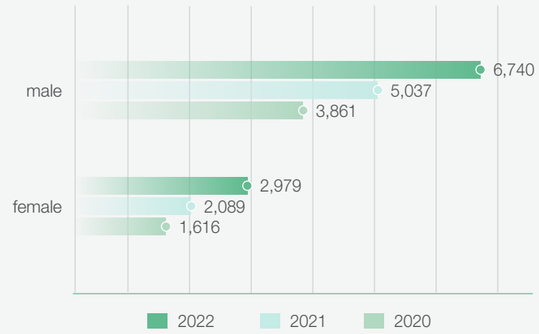
Standardizing employment **and creating an equal workplace**

The Company has established a diverse, standardized and transparent recruitment process and employs a variety of recruitment channels to attract talents of different nationalities, races, genders and social experiences. We focus on the capabilities, experience, soft skills, potential of the talents in the recruitment, and actively strengthen the introduction of domestic and foreign talents, so as to improve the Company's high-quality innovative talent reserve.

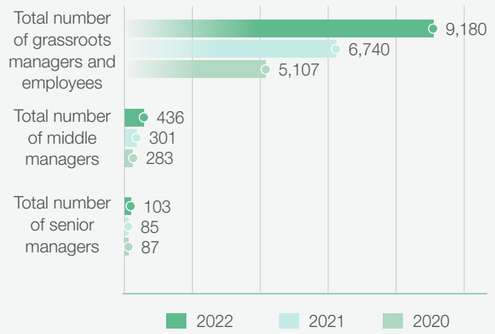
Total number of employees with disabilities hired in 2022:

23

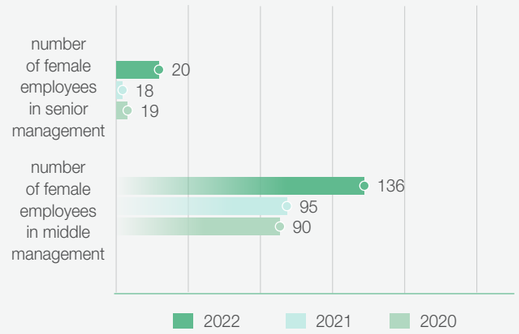
Gender distribution



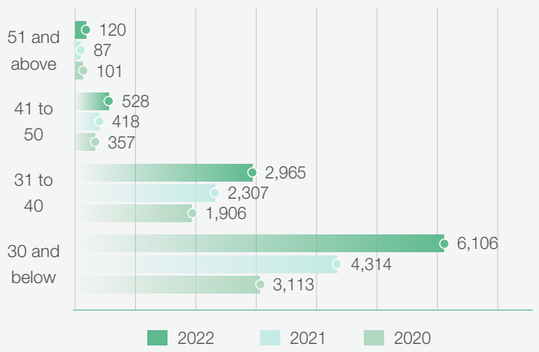
Employee distribution



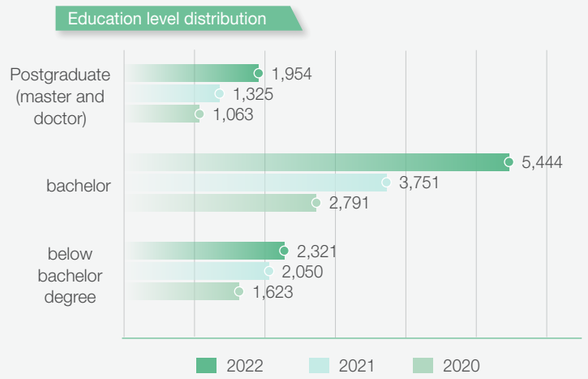
Number of female officers



Age distribution



Education level distribution



The Company undertakes to abide by and protect the basic rights and interests of its employees. The Company adheres to the principle of putting people first, ensuring that employees are free to choose their jobs, and neither forced labor nor guaranteed employment is used. The Company has established a standard human resource management system, covering recruitment and change, working hours and leave, compensation and benefits, etc., to ensure that no one suffers discrimination due to race, religion, gender, age, marital status, disability, nationality and other factors. We adhere to the legal use of labor and there is no child labor or forced labor.

Asymchem advocates diversity in employment. The Company employs employees from six countries, including the United States, Germany, and India, in laboratories and branches around the world. In addition, the Company's domestic employees covers 23 ethnic minorities, including Bai, Buyi, Tibetan, and Korean.

Prohibition of child labor

- Recruitment: The company adheres to the principles of legality and compliance, equality and fairness.
- The Company is prohibited from employing employees under 18 years old.

Emphasis on employee welfare

- The Company guarantees that working hours and welfare of the employees comply with local laws and regulations.

Respect human rights

- The Company respects human rights and insists on being people-oriented.
- The Company shall not implement any cruel or inhuman treatment toward the employees, including any harassment, abuse, corporal punishment, mental or physical coercion, verbal abuse or threat.

Insisting on diversity

- The employees would not be discriminated employment and work such as promotion, reward and training rights, etc. for their ethnic group, skin color, belief, gender, age, nationality, disability, sexual orientation, race, political faction, society membership or marital status, etc.
- The Company respects and supports protection of women's rights and interests.

Ensuring equal communication **and Enhancing democratic management**

Asymchem actively advocates open communication and has established a standard, smooth and systematic communication mechanism. Asymchem uses “Three Ones” working method preliminarily, focusing on three aspects i.e. employee health service, employee dormitory environment improvement and employee comprehensive services. Employees can appeal to managers or human resources department through email, phone and other channels. The Company will hold staff communication meetings from time to time, through which the positive energy of the Company will be spread continuously, and the bridge between employees and the Company will be built to promote the improvement of our operation process.

The Company has developed an employee feedback and appeal management system, established employee appeal and feedback channels, and encouraged employees to actively offer suggestions, put forward reasonable suggestions for the development of the Company, and report the acts against laws or regulations or against the interests of the Company in the work. The Company will arrange specially-assigned personnel to sort out and classify the opinions, suggestions and appeals received on a regular basis. For the frequently reported issues or major concerns, it is required that feedback on the progress shall be provided within one week after receiving the comments, suggestions and appeals.

Employee symposium

The company will organize new and old employees to hold symposiums from time to time to solicit employees’ opinions and suggestions on work and life, and the relevant opinions and suggestions will be sent to the Audit Department for follow-up.

Opinion mailbox

The company has set up a special mailbox for employee complaints. Employees can send their opinions and suggestions anonymously through their personal mailboxes. Specially assigned persons in the Audit Department will be responsible for checking the emails and giving feedback on the implementation.

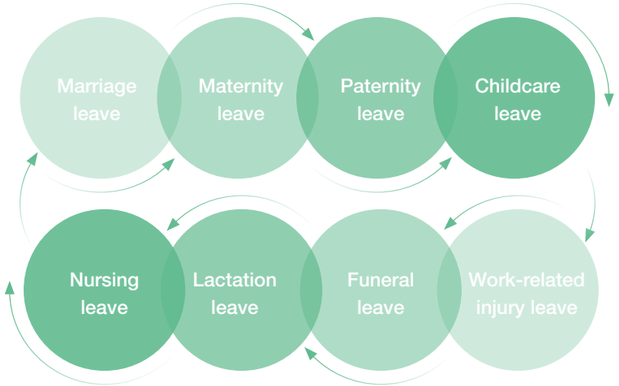
Opinion Collection Platform

The company’s OA platform has specially set up a workflow for “employee opinion and suggestion collection”. Employees can write their opinions and suggestions into the work flow and inquire the progress of the solution on the disclosure page (the information of the opinion provider is kept confidential).

Protecting Employee Right and Benefit, enabling them to enjoy their fruits of labor

Asymchem keeps optimizing its internal appraisal system. According to the strategic development needs of the Company, we have established a set of performance management system and operation standards that are in line with the long-term development of the Company, and use scientific and fair assessment methods to evaluate and measure the performance of employees on their posts.

The Company actively protects the legitimate rights and interests of employees and implements labor insurance, provident fund, medical insurance and other systems for employees. In the performance management, the Company attaches great importance to broadening the assessment dimension and listening to the voice of employees, continuously improving the performance-oriented compensation, and constantly upgrading the assessment with incentive as the orientation, so as to motivate employees to work actively, and build a high performance team. The Company will set flexible and differentiated working hours (Variable working hours, calculating working hours comprehensively, standard working hours, etc.) for different employee groups according to the different working places and work nature of different regions and departments, and implement flexible working hours, and provide allowances and compensation for night shift or middle shift.



Diversified vacation system

Fixed salary

Determine the fixed salary standard according to corporate qualifications, experience and job responsibilities, etc.

Performance bonus

Short-term bonus: production project bonus, R&D project bonus, sales bonus, functional bonus, project performance bonus, annual bonus, etc.
Long-term bonus: long-term incentive funds for front-line employees, stock option for middle and senior managers and core technicians.

Cash allowance

Subsidy for meal, communication, housing renting, transportation, babysitting, night shift, travel, cold/heatstroke protection, etc.

Security benefits

Social insurance, house fund, supplementary medical insurance, accident insurance

Personalized benefits

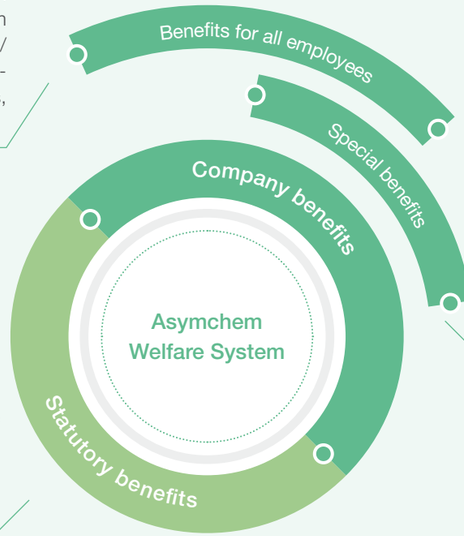
Room and board benefits, free shuttle bus, employee travel, family day, alumni association, marriage/maternity benefits, annual physical examination, annual awards, annual salary adjustment, etc.

Flexible benefit system

Employee welfare system

In order to promote the healthy development of the Company and increase the sense of belonging of employees, the Company has formulated the Employee Welfare Policy, which covers housing, house purchase support, communication, transportation and business trips and other subsidies and offers employees with comprehensive benefit plans.

Work meal benefits, housing benefits, communication/transportation benefits, family visit benefits, team building benefits, condolences/birthday/marriage/holiday benefits, tourism development benefits, alumni association/club



Delivery subsidy benefits, child support benefits, health benefits, interest-free loan benefits for house purchasing, further education and training benefits

Social insurance and house fund, middle/night shift allowance, heatstroke and cold protection allowance, statutory holidays

Offering a helping hand and caring for employees in need

The Company continues to increase efforts to assist employees in difficulties. Focusing on the needs and demands of employees in difficulties, it takes practical actions to address their worries. In response to employees' illness, the Company will respond as soon as it receives the information and proactively coordinate hospital resources for them, to help employees seek medical attention as soon as possible. For employees in difficulties, the Company conducts regular holiday condolences, and on the basis of fully respecting the personal wishes of employees, initiates fundraising for employees in difficulties; At the same time, it actively assists them in applying for assistance from the government and other relevant agencies to help needy employees obtain livelihood security.



Fellowship activity titled “with flowers blossoming, we are coming for you”

In order to help young employees solve marriage and dating problems and maintain the harmony and stability of the workforce, the Company has organized several online and offline fellowship activities for single employees for many times to promote communication and interaction between male and female young employees.





Celebrating the International Women's Day: No compromise on health and beauty

In order to inherit the corporate culture of care, enhance the sense of belonging of female employees, and let female employees show their workplace quality in the best attitude, the Company prepared three gifts according to the previous practice on the International Women's Day: ① Healthy beauty/easy office theme lecture; ② All female employees have half a day off; ③ A fine gift; to send warmth and love to female employees.

In addition, the Company also provides baby care room which is equipped with refrigerators, lockers, sofas and other facilities and daily necessities, to help female workers solve the practical difficulties during lactation. The Company actively builds the "female workers' health and safety island" to protect the physical and mental health of female workers and build harmonious labor relations.





Recreational and sports activities for employees

Cultivating employees' sense of belonging is an important part of Asymchem's corporate culture construction. By organizing a variety of cultural and sports activities, the Company enhances the communication among employees, builds a harmonious and cooperative working relationship, promotes the work-life balance of employees and improves their personal physical and mental health.

Joining hands to create a bright future for employees and Asymchem

In order to enrich the cultural life of employees, cultivate their interests, and create a united, harmonious, healthy working and living atmosphere, Asymchem has set up a total of 10 employee interest clubs (football, basketball, badminton, table tennis, swimming, photography, art, sports, outdoor, car lovers, martial arts). We provide our staff with a variety of fun and cultural activities to keep fit and relax on a regular basis.









Retaining talents through culture: Gathering talents in Asymchem to create future together

In order to promote new employees to integrate into the Company as soon as possible, get familiar with the work content and environment, accelerate the integration of the old and the new employees, and help the Company and employees explore each other's bright points, we organize club recruitment, Discovering the Most Beautiful Asymchem, all kinds of sports events and other activities, to help new employees transform into a member of the Asymchem family.









Employees' families Open Day activity

In order to better care for employees and their families, create a "home" culture, so that everyone can relax after the busy work and return to work with more enthusiasm, the Company organized diverse employees' families open day activities such as Little Artists, the most beautiful family photo, Halloween carnival and Dr. Eagle fitness program to further enhance the emotional communication between employees and their families.







Upholding People-Oriented Philosophy and **improving the overall quality of the team**

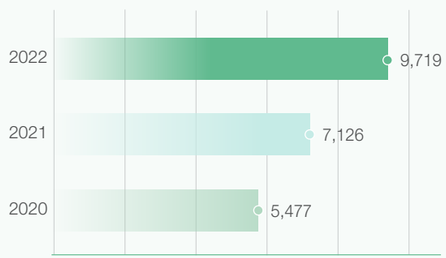
Talent is the core competitiveness and important assets of Asymchem. Staff development has always been one of the most important responsibilities of the Company. We strive to provide better career development opportunities and a better working environment for our employees. The Company will constantly strengthen the construction of talent team supporting business development, promote team integration, and jointly create value and share development with the team.

Employee training system

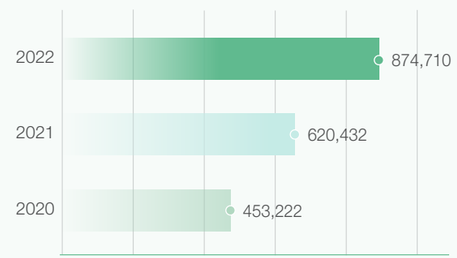
Asymchem attaches great importance to creating high-quality talents and teams. We have established an effective training system, and developed Asymchem Training Management Systems to ensure that employees have a harmonious working and growth environment. Facing the needs of employees at different levels and positions, the Company carried out a series of targeted and diversified training, so as to guide the employees to stimulate their personal potential, and help them grow rapidly. In order to support the Company's sustainable development strategy, "Asymchem Learning Center" was officially opened on June 24, 2022.

As an important carrier for Asymchem to carry out talent training, Asymchem Learning Center relying on Asymchem's accumulation and precipitation of more than 20 years in corporate culture, management philosophy, professional technology and other fields, and has set up a talent training system with Asymchem characteristics. Asymchem Learning Center has the management branch, technical branch, academic education branch, academic exchange branch to meet the development needs of employees at different levels in different stages, and achieve the goal of all-round and multi-dimensional talent cultivation.

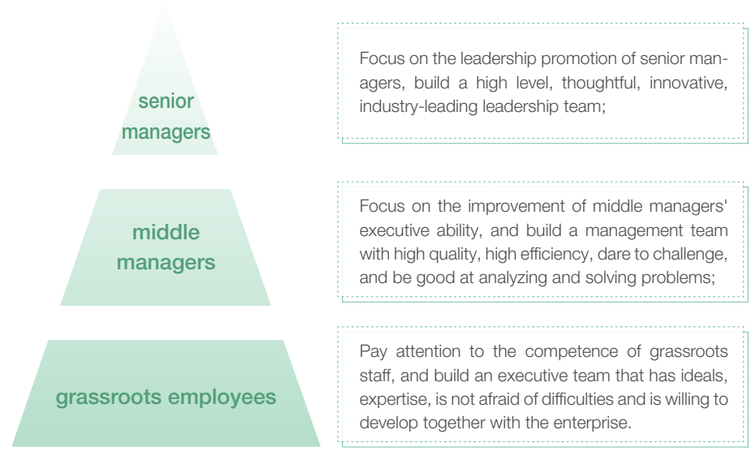
Total number of employees receiving training



Total duration of training for employees



In a hierarchical and classified mode, the Company has carried out a series of vocational training programs for employees, including preparing specialized courses for different positions to help employees perform their duties smoothly and continuously improve their professional skills. In order to improve the comprehensive management ability of officers, the Company also provides diversified management ability improvement training programs for different managers, covering manager role cognition, management skills, leadership and management cases. In addition, the Company actively cooperates with external institutions to carry out joint training programs, and regularly hires external experts to share experience and provide opportunities for employees to broaden their horizons.



Top-level Design of Training Model

Asymchem has established a comprehensive talent development system, based on which we promote talent development through selection system, and develop talents in practice. We aim to provide employees with multi-channel development path, establish a learning organization with scientific and systematic training system and build harmonious labor relations. The Company will provide management development channels and technology development channels respectively for employees according to the quality and personal will of the employees. The managers and the technical personnel of the same level enjoy the same welfare policies.

Management promotion pathway

- Based on departmental needs and recommendations, the candidates are evaluated comprehensively according to the work performance, work experience, historical promotion, training participation and completion, zero regulation violation record, and reporting results.

Technical promotion pathway

- Give recognition to the employees with excellent performance and strong business ability through technical ranking promotion. According to the technical promotion conditions such as work performance, educational background, service years in the department, duration at current ranking, work experience, completion of training and participation, zero discipline violation record etc., the recommended personnel who meet the conditions shall take the technical promotion exam, and can have their technical ranking promoted only after passing the exam.

Dual promotion path

The Company has implemented the equity incentive plan for 5 consecutive years since its listing on the capital market in 2016. In 2022, in order to fully mobilize the working enthusiasm of managers at all levels and core backbone employees of the Company, attract and retain outstanding talents, the Company intended to implement an employee stock ownership plan on the basis of the implementation of the equity incentive plan, covering more than 600 directors (excluding independent directors), senior officers and core technical personnel of the Company.

Enhancing occupational health and safety based on the principle of life first

Asymchem is committed to ensuring the health and safety of our employees, visitors and communities, and devotes itself to environmental sustainability. Therefore, the Company strictly complies with the applicable laws and regulations on occupational health and safety covering different business sectors. We have established a sound occupational health and safety management system to provide a healthy and safe working environment for employees.

In 2022, the Company invested a total of RMB

37,699,600

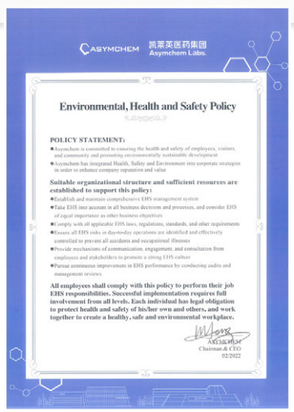
in occupational health and safety production.

Occupational health and safety management system

Good EHS management is the foundation for the survival and development of the Company. The Company has integrated health, safety and environmental protection philosophy into its corporate strategy, established and improved the EHS management systems. In our business decisions and processes, we take EHS into full consideration and place it in the same priority as other business objectives. In accordance with all applicable EHS laws, regulations, standards and other requirements, the Company makes best efforts to ensure that all EHS risks during operations are identified and effectively managed to prevent accidents and occupational diseases. We have established the EHS communication, participation and consultation mechanisms for employees and stakeholders to promote a strong EHS culture.

Company commitment:

All employees shall abide by the Company's ESG management policy and fulfill the EHS responsibility. The successful implementation of the management policy requires the full commitment of employees at all levels. Each employee has the legal obligation to take responsibility for the health and safety of himself/herself and others, and jointly create a healthy, safe and environmentally friendly workplace.


ASYMCHEM 药明英医药集团 Asymchem Labs.

Environmental, Health and Safety Policy

POLICY STATEMENT:

- Asymchem is committed to ensuring the health and safety of employees, visitors, and communities and promoting environmentally sustainable development
- Asymchem has integrated Health, Safety and Environment into corporate strategies in order to enhance company reputation and value

Suitable organizational structure and sufficient resources are established to support this policy:

- Establish and maintain comprehensive EHS management system
- Take EHS into account in all business decisions and processes, and consider EHS of equal importance as other business objectives
- Comply with all applicable EHS laws, regulations, standards, and other requirements
- Ensure all EHS risks in day-to-day operations are identified and effectively controlled to prevent all accidents and occupational illnesses
- Provide mechanisms of communication, engagement, and consultation from employees and stakeholders to promote a strong EHS culture
- Pursue continuous improvement in EHS performance by conducting audits and management reviews

All employees shall comply with this policy to perform their job EHS responsibilities. Successful implementation requires full involvement from all levels. Each individual has legal obligation to protect health and safety of his/her own and others, and work together to create a healthy, safe and environmental workplace.

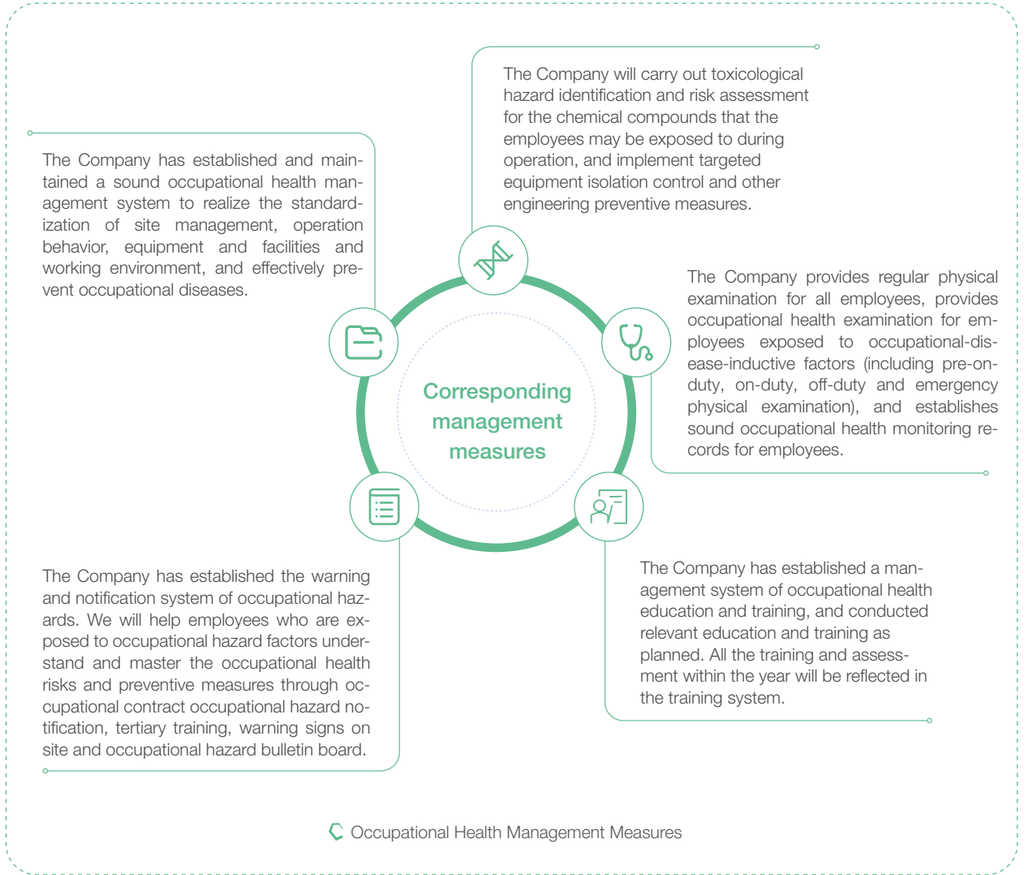
Chairman & CEO
02/2022

Occupational health and safety management measures and performance

Protecting the health and safety of employees is an important task of the Company. Asymchem actively implements the entity responsibility of enterprise for ensuring occupational health and safety, and complies with the national requirements in the daily supervision of occupational health risk warning and employee personal protection, in order to realize the closed-loop management of employee occupational health and safety. The Company has formulated management systems such as Occupational Health Management, Process Safety Management, Special Operation Management and Safety Risk Investigation, Prevention and Rectification Management, and realized the safety management idea of "hierarchical management and line responsibility". We constantly improve the construction of the management system and operation procedures of production equipment and processes, launch the safety production responsibility system for all staff, implement safety prevention and control measures, in order to ensure the realization of production safety objectives.

In 2020-2022, the number of work-related deaths of employees was

0



Occupational Health Management Measures



Safety training

According to the actual situation and characteristics of each department, the Company organizes employees to participate in a variety of safety and occupational health training, including three-level education and training for new employees, onboarding safety training for contractors, annual safety training for posts, fire facilities use training, emergency drill training, occupational health education and training, covering all production line employees of the Company, enabling the employees to receive a full range of safety and occupational health education training, and meet the requirements of the safety training hours. In addition, the Company also actively carries out safety training and safety assessment for employees and contractors. In 2022, Tianjin Asymchem Pharmaceuticals, subsidiary of the Group, was awarded the title of "Demonstration Unit of Safety Culture Construction in Development Zone of the Year ".

In 2022, more than **150** drills including chemical leakage, emergency evacuation, fire and explosion, anti-terrorism and anti-riot, power outage and other on-site disposal were organized in all regions according to the comprehensive emergency plan of the plant.

Safety training

- Fire emergency and practice training
- Safety training for externally-hired personnel
- Contractor training
- Safety training in annual plan
- Accident case warning education and training
- Special operation training
- Legal and regulatory training
- Occupational health training

Safety assessment

- EHS quarterly safety assessment
- Contractor safety assessment
- Safety assessment on externally-hired personnel
- Assessment of production safety responsibility system
- Safe production month assessment
- Safety practice assessment of regular staff in production department

Types of safety training and safety assessment carried out by Asymchem



Tianjin Asymchem Pharmaceuticals was awarded the title of "Demonstration Unit of Safety Culture Construction in Development Zone of the 2022 Year".



Safe production month commendation



Fire drills





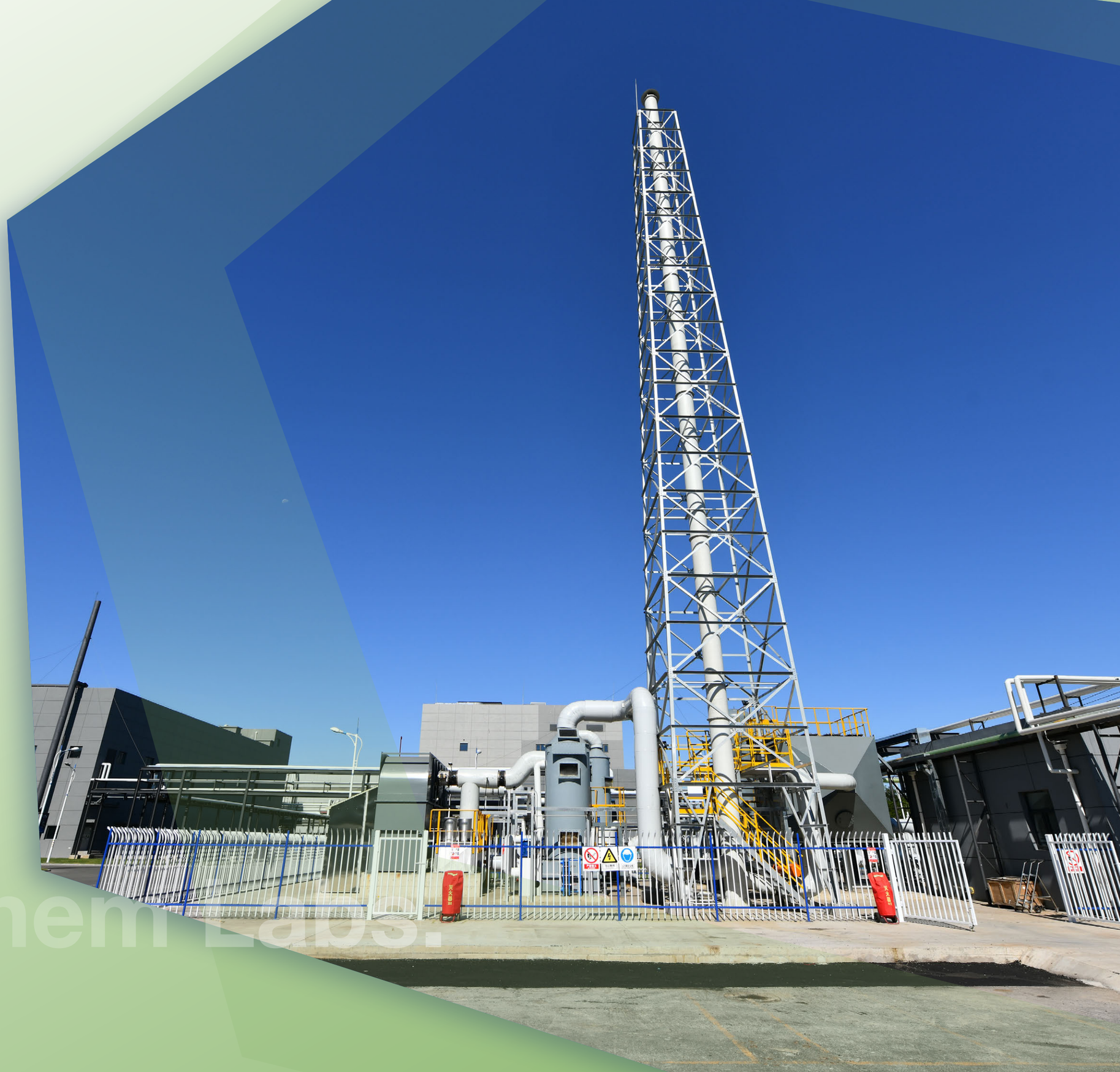
Safe production training

06

Environmental Responsibility

Guided by the development strategy of “International Standards, China Advantages, Technology-driven and Green-oriented”, Asymchem deeply implements the concept of green manufacturing, and controls the environmental impact from the production source. We invest capital and resources to replace the traditional process with the green, environment-friendly and low-carbon production process, and practice the concept of friendly coexistence with environment.

- Special topic: Forward-looking deployment, green technology innovation
- Building environmental protection systems to ensure green and low-carbon operation
- Energy use and tackling climate change
- Reducing the discharge of three wastes to protect the clear water and green mountains
- Enhancing green operation as daily routines



Asymchem Labs.

Special topic

Forward-looking deployment, green technology innovation



Driven by innovation, Asymchem actively practices green operation and environmental protection through green technology research and development. The Company constantly promotes technological innovation and the comprehensive application of green technology to boost industrial efficiency, cost reduction and low carbon environmental protection, and supports global new drug research and development and supply with sustainable innovative technologies to accelerate the launch of innovative drugs. Up to now, the Company has made great breakthroughs in the research and development of green pharmaceutical technology and its commercial application. During the reporting period, the Company applied green pharmaceutical technologies such as flow & continuous technology and biological enzyme technology in more than 40% of the mid and late clinical projects.

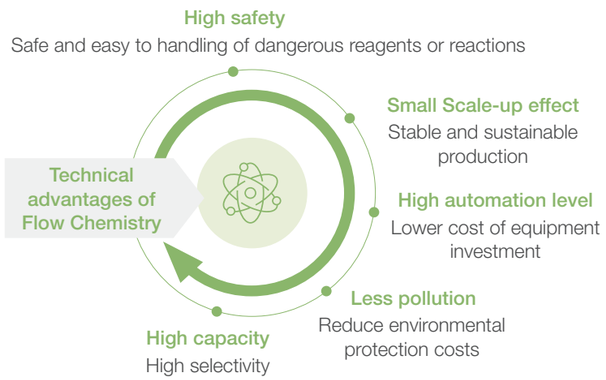
In addition, the International Joint Laboratory of Green Pharmaceutical Technology, jointly established by Asymchem and American professors, is actively developing research topics with commercial application value related to green pharmaceutical technology, with an aim to replace the existing backward production process and technology with the international cutting-edge green pharmaceutical technology through process optimization and scale-up research.

By the end of 2022, the joint laboratory had published

20 papers.

Development and application of flow & continuous technology

Continuous production refers to the whole process in which raw materials, reagents/catalysts, etc. are continuously transported to the reactor, where they receive light, electricity or heat energy input from the reactor during the rotation of the material, and then the product is quenched into a continuous or intermittent post-treatment unit. Flow & Continuous Technology Team of Asymchem has been committed to Flow & Continuous Technology innovation and application. Thanks to timely control and rapid assessment of the trend of Flow & Continuous Technology, and 13 years of active investment and technical breakthroughs, they have accumulated rich experience in the development and production of more than 400 Flow Chemistry projects. By far, the team has independently designed and developed a series of continuous reaction devices, successfully realized the large-scale application of Flow & Continuous Technology in the field of photoelectric chemistry, low temperature lithium, high temperature and high pressure, hydrogenation, ozonation, nitrification and high energy reagents (TMSN3, NaN3, H2O2, TBHP, diazomethane) and other medical fine chemical industry.



Data-based performance of Flow & Continuous Technology

Applying flow & continuous technology in commercial scale can reduce production costs



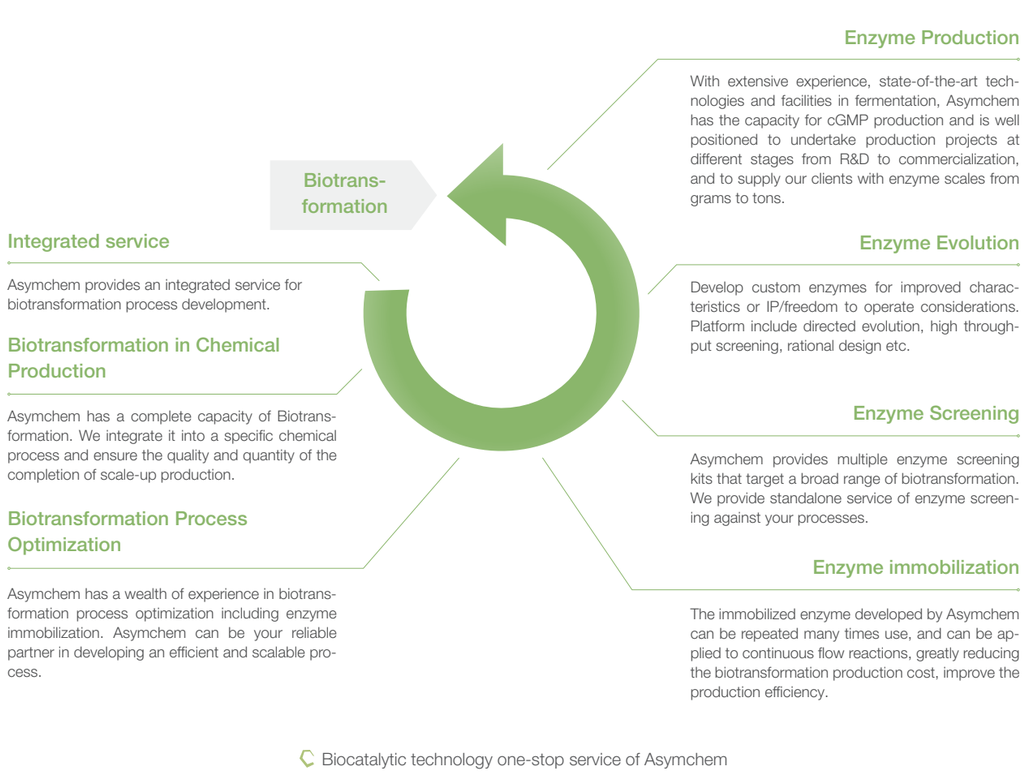
Application of Flow Chemistry in the R&D and production of anticoagulant drugs

In 2022, Asymchem undertook the production project of anticoagulant drug clinical phase II API of a large pharmaceutical company. The original process of the project had some defects, such as intense heat release, short reaction time, unstable racemization of products, high safety risk, and difficult for mass production. Using Flow & Continuous Technology and the self-developed micro-channel reaction equipment, Asymchem solved the technical difficulties of short reaction time and intense heat release of the project, avoided the problem of temporary storage of dangerous material intermediates, reduced the risk of deterioration of the reaction material, and solved the technical bottleneck of large-scale production of the API. In the production process, we adopted online PAT technology to achieve real-time online tracking of the reaction process, providing the customer with more safe, stable, reliable and environment-friendly production process solutions. Thanks to the application of this technology, the production yield of a single unit was increased by 40%, the equipment consumption was reduced by 80%, the labor required was reduced by 80%, and the power consumption was reduced by 78%.

R&D and application of enzyme catalysis technology

As efficient biocatalysts, enzymes can achieve specific complex chemical reactions. Compared with conventional chemical reactions, enzyme catalysis is cheaper and more environmentally friendly. As a global leader in the development and commercialization of engineered enzymes, Asymchem keeps enhancing the capacity and efficiency of R&D and scale-up production platforms. The Center of Synthetic Biology Technology (CSBT) has built eight technology platforms to fundamentally solve the shortcomings such as insufficient efficiency of enzyme through rational/semi-rational design and directed evolution technology as well as a variety of evolutionary strategies. In addition, the highly activity and multi-variety engineered enzymes have been successfully used in the commercial production of statins, gliazones, penan and other blockbuster drugs, so that they can better meet the needs of large-scale industrial production. In recent years, the Company has been authorized more than 30 patents related to enzyme evolution, which helps Asymchem build a comprehensive technical barrier and continuously improve the core competitiveness.





Biocatalytic technology one-stop service of Asymchem

Promoting the development of migraine drug intermediates with enzyme catalyzed synthesis

Rimegepant is an oral CGRP receptor antagonist approved by the FDA in 2020 to treat acute migraine headaches. The metal catalyst used in the production of the key chiral intermediate 1 of this drug is costly and involves a two-step reductive amination under high-pressure reaction with a yield of only 55%.

The project team of the Center of Synthetic Biology Technology (CSBT) obtained an Transaminase mutant that could efficiently synthesize the intermediate through enzyme evolution, and used the new mutant to achieve kilogram formulation of key chiral intermediate of Rimegepant. Compared with the existing process, the enzymatic process can greatly increase the yield, reduce the production cost and industrial waste, and is more safe and environmentally friendly.


ORGANIC PROCESS RESEARCH & DEVELOPMENT

OPR&D

pubs.acs.org/OPRD Article

Engineering a Transaminase for the Efficient Synthesis of a Key Intermediate for Rimegepant

Yulei Ma, Xuecheng Jiao,* Zujian Wang, Huiyan Mu, Kaihua Sun, Xiang Li, Tong Zhao, Xufeng Liu, and Na Zhang

Cite This: https://doi.org/10.1021/acs.oprd.1c00376 Read Online

Research paper of Asymchem "Engineeringa Transaminase for the Efficient Synthesis of a Key Intermediate of Rimegepant"

Application performance of enzymatic process:

Yield: improved by 30 %,

Use of noble metal catalyst: none

API production cost: reduced by 30 %,

Waste discharge: The reaction is carried out in aqueous phase without organic solvent formulation.

Building environmental protection systems to ensure green and low-carbon operation

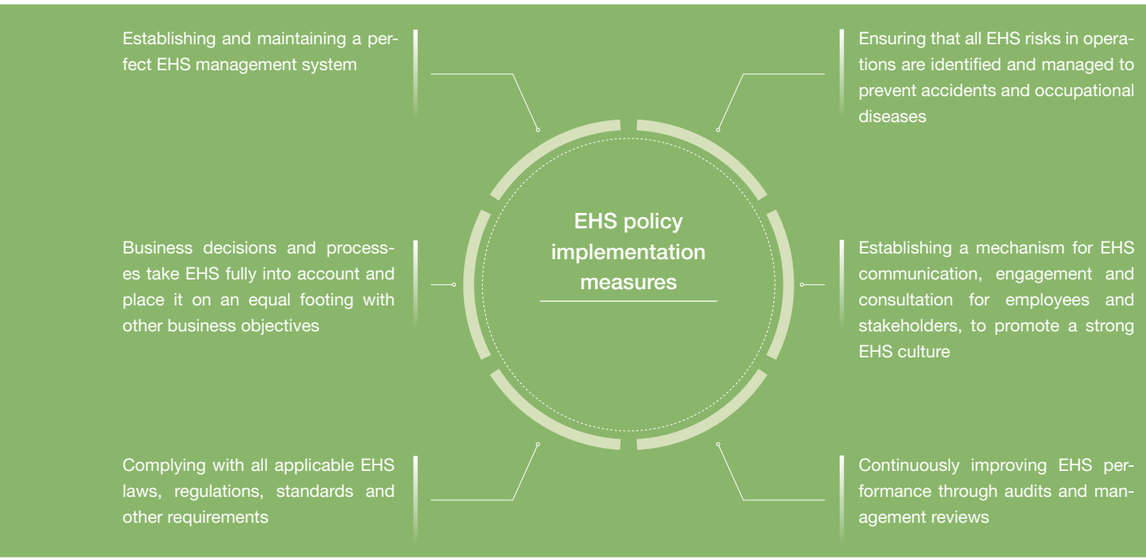
Asymchem complies with the Environmental Protection Law, Environmental Impact Assessment Law and other laws and regulations, and implements environmental management according to ISO14001:2015 environmental management system requirements and guidelines. The Company regularly releases environmental information disclosure, such as the Corporate Environmental Information Disclosure Report, annually and accepts public supervision. During the reporting period, the Company did not violate the environmental protection laws and regulations, and was not subject to any pollution accident disputes or administrative penalties.

Total investment in environmental protection in 2022: RMB

290.3165 million

The Company has developed an environmental management system and the corresponding SOP consisting of Environmental Testing Management Process, Environmental Pollution Accident Management Process, Emergency Plan for Sudden Environmental Incidents and other documents, and constantly improves the environmental management system to minimize the harm to the environment, focusing on pollutant discharge control and management, pollution accident management, environmental impact assessment and management of new projects, and environmental protection education and training management.

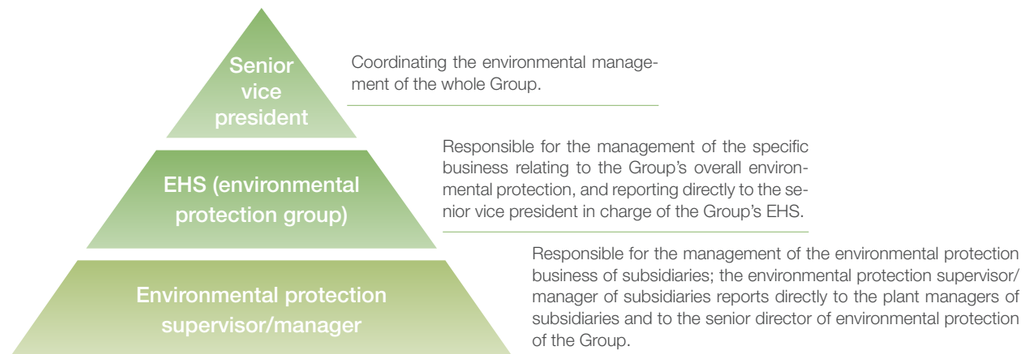
The Company has integrated the concept of health, safety and environmental protection into its corporate strategy, and established the EHS department led by the senior vice president, which is responsible for coordinating and guiding our EHS policy, formulating policies, carrying out performance management and resource scheduling. The Company organizes an internal audit of EHS management every half a year. The audit team is composed of EHS experts, who will audit each plant area. In addition, the EHS department of the Company and each factory have assigned special personnel to take charge of the identification, acquisition, communication, compliance evaluation and management of EHS related laws and regulations and other requirements, and update and maintain the list of EHS requirements. The existing list of EHS regulations is divided into eight professional categories, including “Environmental Safety”, “Environmental Management”, “Special Equipment” and “Hazardous Chemicals”. During the reporting period, the Company updated the corresponding EHS management system documents according to the requirements of Safety Code for Special Operations in Hazardous Chemical Enterprises (GB 30871-2022).



In 2022, to improve the efficiency of EHS management and reduce management costs, the Company launched the pilot project of optimizing and reorganizing the EHS management system within a controllable range. In this pilot project, we selected some plant areas as the representative, developed EHS management system documents suitable for the plant area according to local conditions, unified the file format, introduced the management matrix. The EHS management system was optimized from five aspects of compliance, suitability, flexibility, readability and talent cultivation, effectively reducing communication costs and enhancing management flexibility.

Conformity	1. The documents are territorial, reflecting the fulfillment of the legal responsibility of the main responsible person of the enterprise to establish and perfect the production safety management system. 2. Some of the documents are revised according to the latest regulations, reflecting the compliance of the documents.
Adaptability	Tailor-made system documents are prepared in light of the particular conditions of plants, with stronger suitability.
Flexibility	Previously, the revision of management documents required extensive consultation. After optimization, documents can be released only through internal reviews of plants and the Group’s professional reviews, making the management strategy more flexible.
Readability	Previously, the subjects of certain documents were not defined and the processes were not clear. This time, the documents are adjusted according to the requirements of 5W1H, and the management matrix is introduced to achieve list-based management. This makes the documents more readable.
Talent development	Personnel at all levels are widely involved in document revision. This process is also one of reviewing and sorting out the management, which improves the management of the participants.

EHS management optimization measures



Three-level EHS management architecture



Environmental emergency management and environmental protection training

To deal with potential environmental risks, the Company has formulated the Environmental Emergency Response Plan. We hold annual environmental emergency training and emergency exercises, and prepare exercise reports to improve our ability to respond to environmental emergencies. In 2022, the Company organized more than 10 environmental emergency drills and training, covering all the employees. In addition, the Company attaches great importance to the popularization of environmental protection knowledge and strives to improve employees' environmental awareness. The EHS department leads the development of environmental protection training courseware and carries out a series of environmental protection theme training. During the reporting period, the Company conducted more than 30 environmental protection trainings, covering all the employees.



Hazardous chemical spill emergency drill and training

Energy use and tackling climate change

Tackling climate change

Climate change is a great challenge facing the world. It is the responsibility and obligation of the Company to take measures to reduce greenhouse gas emissions. The greenhouse gas emissions in the production and operation of Asymchem mainly sourced from the Scope 1 greenhouse gas emissions caused by the combustion of coal, natural gas, gasoline and diesel, as well as the Scope 2 greenhouse gas emissions caused by the purchased power and hot water heating. In order to better implement the 2030 Agenda for Sustainable Development, the Company has made tackling climate change a priority in EHS management, and set climate management goals. Starting from the two dimensions of improving energy efficiency and reducing energy consumption, We will make practical contributions to the realization of "carbon neutrality and carbon peaking".

Commitments for addressing climate change:

Asymchem will constantly improve energy efficiency, reduce energy intensity, actively carry out climate action, and make best efforts to achieve "carbon peaking" by 2030 and "carbon neutrality" by 2060.

Implications of transformation	The economic society as a whole is moving toward green transformation as the "dual carbon" (i.e. "carbon peaking" and "carbon neutrality") drive is initiated. Asymchem will make greater efforts in low-carbon programs to enhance investors' confidence. This is how we can manage the possibly growing operating costs coming with high energy consumption.	The Company, taking into full consideration its operations, will systematically identify the sources of greenhouse gases. Meanwhile, we will work out gas emission objectives and roll out pushes catering to local realities for reduced energy consumption. To be specific, we will seek green office by upgrading technical equipment to improve the use of power-consuming devices and purchasing clean energy. All in all, we will contribute to the dual carbon goals.
Impacts on entities	Extreme weather events and natural disasters may damage the equipment and infrastructure in parks where we operate and put the staff at risk. This in turn will take its heavy toll on the operations of the Group.	To better address unexpected extreme weather events, we will closely follow the development of climate. Meanwhile, we will lay out emergency response plans for extremely low and high temperatures, rainstorms and typhoons. Furthermore, we will conduct routine inspections and emergency drills to prevent and control relevant risks.

CLIMATE CHANGE RISK EVALUATION AND RESPONSE

Improving the efficiency of energy and resource utilization

The energy consumption of Asymchem includes raw coal, diesel, natural gas, steam, electricity, and hot water heating, among which electricity is the most important energy consumption. The EHS department carries out energy use statistics and abnormal consumption management for each plant, according to the changes of customer orders every year. The Company strives to reduce energy consumption and improve energy efficiency through trade-in, technological improvement, scientific energy use and other measures.

Indicators	Unit	2021	2022
Natural gas	m^3	4,199,118	4,592,471
Steam	Ton	70,711	110,139
Raw coal	Ton	12,784	34,829
Diesel	Liter	145,668	23,000
Purchased electricity	kWh	135,437,210	232,037,625
Total integrated energy consumption	Tons of standard coal	34,047	65,785
Integrated energy consumption per RMB10000 income	Tons of standard coal/ RMB10,000 income	0.073	0.064

Major energy consumption of Asymchem

Renovation of outdated facilities

The replacement of outdated water towers improves the efficiency of the unit cooler of air conditioning, which promises to save 238,100 Kwh.

Recycling of condensed water

This aims to reduce relevant losses by topping up boilers with softened water.

Frequency conversion renovation of power facilities

The large power equipment designed with FC control operation model consumes power 40% less annually.

Photovoltaic power generation

We prioritized street lamps with PV power generation for newly-built factories considering the location of lamps and illumination.

Enhancing efficiency of VAV system

All the newly-built labs are well equipped with the VAV variable air rate + FC system, which enhances the operation frequency, halving power consumption.

Key energy saving measures of Asymchem

Adopting condensate recycling to promote energy conservation and emission reduction

The steam condensate water in a Dunhua factory of Asymchem was not collected and reused, and the energy utilization efficiency was low. In September 2022, the factory started the transformation of condensate recovery system, collected the steam condensate of each plant and transferred it to the boiler softening tank for secondary use. The project was put into use by the end of 2022. About 54,000 tons of softened water is saved annually, and 260,000 m^3 of natural gas consumption is reduced, greatly reducing the water consumption and natural gas consumption of the factory.



Condensate water recovery equipment in Dunhua factory

Replacing water tower to improve energy efficiency

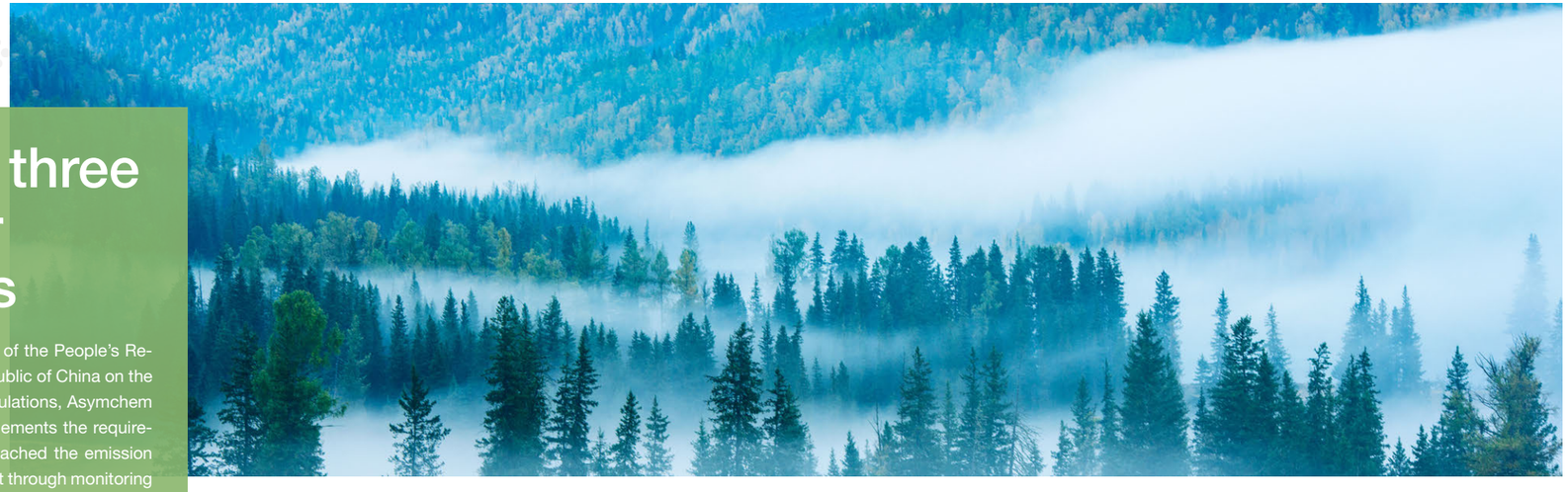
Three cooling water towers in the air conditioning system of a factory of Asymchem in Tianjin were in poor working condition. They could not effectively reduce the water temperature, resulting in a large amount of water and electricity waste. In 2022, the Company replaced the three water towers, which improved the cooling effect and improved the energy efficiency of air conditioning. Compared with the previous year, the consumption of tap water was reduced by about 12,000 tons, and about 240,000 KWH of electricity was saved, greatly improving the efficiency of energy utilization.



Energy-saving water tower in Tianjin factory

Reducing the discharge of three wastes to protect the clear water and green mountains

In strict compliance with the Comprehensive Discharge Standards of Air Pollutants, Law of the People's Republic of China on the Prevention and Control of Water Pollution, Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste and other laws and regulations, Asymchem has developed systems and procedures for the treatment of three wastes, and fully implements the requirements to ensure the normal operation of environmental protection facilities. We have reached the emission standards for all pollutants, and constantly improve the level of environmental management through monitoring and auditing, so as to ensure that the Company's construction, production and operation process meets the requirements of relevant environmental laws and regulations, and minimize environmental pollution.



Waste gas management

The main exhaust gas emitted by the Company in the process of production and operation includes volatile organic compounds (VOCs), nitrogen oxides, sulfur oxides, etc. By establishing Tail Gas Equipment (Environmental Protection) Operation Management procedures and Operation and Management of Online Monitoring System of Air Pollution Sources procedures, we have established three waste gas treatment processes: treatment, monitoring and disclosure , that is, making regular testing of the exhaust emission condition so as to guarantee that the exhaust emission conforms to standards, making regular disclosure of pollutant discharge information for supervision; and investing in new technologies to lower emissions.

Indicators	Unit	2021	2022
NOx	Kg	26,199	97,357
NOx emission intensity	kg/RMB10,000	0.057	0.095
Sulphur oxides	Kg	11,002	50,763
SOx emission intensity	kg/RMB10,000	0.024	0.050
VOC emission	Kg	39,020	38,519
VOC emission intensity	kg/RMB10,000	0.084	0.038

Emission of major gas pollutants

Note:

(1) The emission intensity reflects the emission of gas pollutants per RMB 10,000 of output value, and a smaller emission of gas pollutants per unit of output value represents a lower emission of gas pollutants.
(2) The annual revenue data (in RMB 10,000) of Asymchem are from 2021 H-share annual report and 2022 annual performance announcement.
(3) The data only includes the factories of Asymchem and its main domestic branches and subsidiaries, and the nitrogen oxides and sulfur oxides mainly came from the self-built incinerator in the factory.

Applying activated carbon adsorption to reduce exhaust emissions

In order to reduce VOC emissions, a factory of Asymchem in Tianjin installed the activated carbon adsorption and desorption equipment to treat the VOC waste gas generated by the process. The recycling of activated carbon material greatly reduced the production of hazardous waste. After the equipment is put into operation, it met the national standard.



Activated carbon adsorption and desorption transformation of a factory in Tianjin

Water resources use and waste water treatment

The water resources used by the Company for production and operation mainly come from municipal tap water. A cost accounting mechanism is established for water consumption, the consumption is recorded and analyzed on a monthly basis, and water-saving control measures are taken. In addition, by means of advising the employees and posting water-saving slogan, etc., the Company tries to enhance the employees' consciousness of water-saving.

Indicators	Unit	2021	2022
Water consumption	Ton	1,219,691	1,749,056
Water resource consumption intensity	Tons/RMB10,000 of revenue	2.630	1.710
Water resource efficiency	RMB10,000 of revenue/ton	0.38	0.58

Note:

(1) The water resource consumption intensity reflects the water resource consumed per RMB10,000 of output value, and a lower water resource consumption per unit of output value represents a lower water resource consumption intensity.
(2) The water resource efficiency reflects the revenue generated per ton of water resource, and a larger output value per unit of water resource represents a higher water resource efficiency.
(3) The annual revenue data (in RMB 10,000) of Asymchem are from 2021 H-share annual report and 2022 annual performance announcement.
(4) The data only includes the factories of Asymchem and its main domestic branches and subsidiaries.

Waste water treatment is an important part in the treatment of three wastes of Asymchem. The waste water produced in the operation of the Company mainly includes domestic wastewater, research and development and production wastewater, and circulating cooling water. The Company has revised procedures such as Operation Management of Sewage Station, Operation Management of Online Monitoring System of Water Pollution Source and Environmental Monitoring Management, and clarified the requirements for classified collection and disposal of wastewater. The Company's wastewater treatment facilities are under regular maintenance of professional departments, and we have commissioned experts to develop appropriate treatment technology and operating procedures. At present, we have achieved the daily monitoring of wastewater treatment operation data indicators, and we can adjust the operating parameters timely according to the monitoring data. The monitoring department will monitor production bases with daily wastewater discharge of more than 100 tons online and share them with the local environmental management department.

Indicators	Unit	2021	2022
Total wastewater discharge	m^3	679,636	882,389
Wastewater discharge intensity	m^3/RMB10,000 of revenue	1.47	0.86
Chemical oxygen demand (COD)	Kg	62,237	101,836
Chemical oxygen demand (COD) emission intensity	kg/RMB10,000 of Revenue	0.134	0.100
Ammonia nitrogen	Kg	3,691	8,452
Ammonia nitrogen emission intensity	kg/RMB10,000 of Revenue	0.008	0.008
pH value	-	6-9	6-9

Note:

(1) The emission intensity reflects the emission of pollutants generated per RMB10,000 of output value, and a smaller emission of pollutants per unit of output value represents a lower consumption intensity.
(2) The annual revenue data (in RMB 10,000) of Asymchem are from 2021 H-share annual report and 2022 annual performance announcement.
(3) The data only includes the factories of Asymchem and its main domestic branches and subsidiaries.

Building a new sewage station to improve the efficiency of wastewater treatment

A new sewage treatment project was built in July 2022 at a plant of Asymchem in Tianjin, which is designed to meet the increased demand for sewage treatment due to the new capacity. At present, the installation of sewage station equipment has come to the end, and the daily wastewater treatment volume is 650t/d, which effectively meets the Company's expanding production needs and improves the efficiency of sewage treatment.



A new sewage treatment station for a factory in Tianjin

WASTE MANAGEMENT

The solid waste of Asymchem is divided into four categories: domestic waste, general industrial solid waste, hazardous waste (including solid and liquid hazardous waste) and construction waste. The Company has formulated procedures such as Solid Waste Management Procedures and Measures for Hazardous Waste Management to clarify the operating procedures of solid waste generation, collection, storage and disposal, and prepared emergency plans to avoid environmental pollution by solid waste. In addition, the Company organizes a comprehensive emergency drill covering all departments and employees of the whole plant every half a year, which is organized and carried out by all the departments involved in risk, including hazardous waste leakage drill, chemical leakage drill, sewage station emergency drill, tank farm emergency drill, workshop fire drill, etc.





Hazardous waste leakage drill and chemical leakage drill

1. The domestic wastes will be cleaned up by the sanitation department on a regular basis after collection.
2. Hazardous wastes will be collected and transported to the temporary storage site of hazardous wastes by special personnel, and then handed over to the organization qualified for hazardous waste disposal for compliant disposal.
3. General industrial solid wastes are stored in the designated location of the factory area, and are disposed by local qualified organization.

Waste disposal measures

Indicators	Unit	2021	2022
Total amount of general solid waste	Ton	4,694	12,678
Total amount of general solid wastes recycled	Ton	41	844
Density of general solid waste	Tons/RMB10,000 of revenue	0.010	0.012
Total amount of hazardous wastes	Ton	46,748	87,423
Total amount of hazardous wastes recycled	Ton	2,327	1,839
Density of hazardous waste	Tons/RMB10,000 of revenue	0.101	0.085

Waste discharge in 2022 (The data only includes the factories of Asymchem and its main domestic branches and subsidiaries)

Enhancing green operation as daily routines

Asymchem not only focuses on environmental protection in the process of production and operation, but also actively advocates green and low-carbon office methods, guiding and driving all employees to form good habits of energy saving and consumption reduction. The Company actively organizes publicity and training on energy conservation and environmental protection, and guides and encourages employees to carry out environmental protection actions. Asymchem is also committed to creating an environmentally sustainable work environment. In the engineering design and construction, we give priority to the selection of energy-saving and green environmental protection materials, such as thermal insulation decorative integrated plate, ALC board light partition, thermal insulation sandwich color steel plate, glass curtain wall, aluminum curtain wall, so as to achieve the purpose of low carbon and energy saving.

Green Operation Performance:

In 2021, Asymchem won the title of "the Most Beautiful Low-carbon Factory" in Tianjin Economic Development Zone. In 2022, Asymchem won the title of "TOP10 Listed Chinese Pharmaceutical Companies with Most ESG Investment Value" issued by Healthcare Executive.

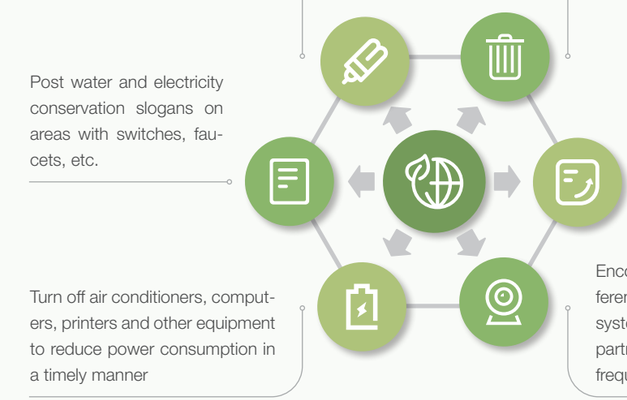


Certificate of the Most Beautiful Low-carbon Factory, Certificate of TOP10 Listed Chinese Pharmaceutical Companies with Most ESG Investment Value





The Company carried out internal promotion of green operation



Green office initiatives of the Company

07

Responsibilities to community

Asymchem advocates paying close attention to and having deep integration with the community, and regards meeting the needs of the community and seeking common development with the community as an important aspect of fulfilling its social responsibilities. In addition, we carry out a number of public welfare activities in the areas of health care, and charity donation, in order to give back to the community.

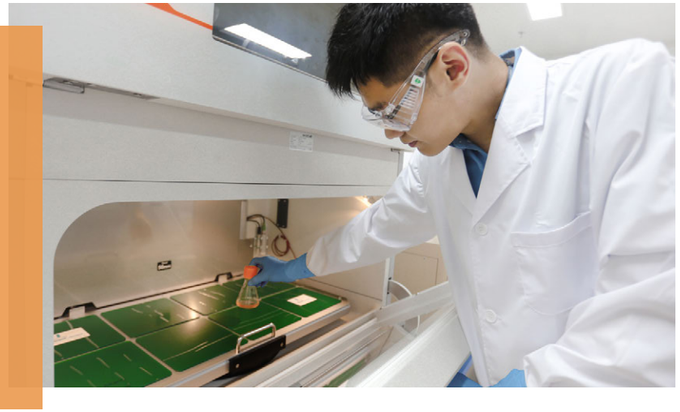
- Caring for health and improving public health safety
- Actively participating in community building to show gratitude for the source of benefit



Asymchem Labs.

Aring for health and **improving public health safety**

As a member of the pharmaceutical industry, the Company has always been concerned about public health safety. The Company has never stopped acting for love and shared social responsibilities.



Fulfilling our duty as an enterprise to cope with the difficulties of our country"

Asymchem paid close attention to developments of the public health security issue. Jilin Asymchem Laboratories Co., Ltd, our subsidiary, donated large number of medical supplies, including alcohol, aseptic isolation suits and gloves, to the municipal government of Dunhua, Jilin Province, solving the problem of material shortage faced by the local government and providing more protection for local front-line medical workers.





To tide over the difficulties together through charity donation

On March 16, 2022, Jilin Asymchem Laboratories Co., Ltd, our subsidiary, donated a total of RMB 3 million to the Red Cross Society of Jilin Province and the Red Cross Society of Yanbian Korean Autonomous Prefecture, in order to improve the level of public health protection in Jilin Province and Yanbian Prefecture.

Actively participating in community building to show gratitude for the source of benefit

Asymchem always believes that social welfare is not only the obligatory social responsibility, but also the belief support of the healthy and sustainable development of the Company. For a long time, Asymchem has always been committed to the development of public welfare undertakings, making best efforts to practice social responsibility. We are willing to open the "door to good" for social welfare undertakings and work together to build a healthy and bright future.

In 2022, Asymchem donated a total of RMB **3,840,000** to the society



Asymchem won the "2022 Annual Social Responsibility Award" issued by the CPC Committee of Tianjin Economic and Technological Development Zone

Data-based performance of our support to public welfare



On May 20, 2022, we donated RMB20,000 to the Red Cross Society of Binhai New Area of Tianjin to promote high-quality cooperation and support between East and West.



In October 2022, we donated RMB200,000 to the New Innovation Foundation of the University of Science and Technology of China in Beijing. The scholarship will be used for the "Yang Chengzong Education Fund".



In September 2022, Liaoning Asymchem donated RMB100,000 to the charity organization of Fuxin Mongolian Autonomous County.

On November 25, 2022, we donated RMB100,000 to Tianjin Development Area Charity Association.



Donating office supplies to Aimin Community



Donating rice to the Sanitation Department of Dunhua City

Appendix

About this Report

Reporting Period

This report is the second ESG report of Asymchem for the stakeholders. The text information and performance of the report are mainly for the period from January 1, 2022 to December 31, 2022, but some information may relate to policies and practices of previous years.

Report Boundary

This report discloses the information on the fulfillment of economic, social and environmental responsibilities by Asymchem Laboratories (Tianjin) Co., Ltd. ("Asymchem" or "the Company") and its subsidiaries and branches. The relevant typical cases come from the affiliates of the Company.

Source

The information and data disclosed in this report are derived from the internal official documents, statistical reports and annual reports of Asymchem Laboratories (Tianjin) Co., Ltd. The Board of Directors and all directors of the Company guarantee that there are no false records, misleading statements or major omissions in the report, and bear individual and joint responsibility for the truthfulness, accuracy and completeness of the contents. The financial data in this report is denominated in RMB. In case of any inconsistency with the financial report, the financial report shall prevail.

Reporting Principles

Materiality: This report follows the materiality principle of Hong Kong Stock Exchange, and discloses the consideration of ESG matters by the Board of Directors and ESG working group, stakeholder communication, substantive issues identification process and substantive issues matrix;

Quantification: The statistical criteria, methodology, assumptions and/or calculation tools for the quantitative key performance indicators in this report, as well as the sources of conversion factors, are described in the notes of each data sheet in the report;

Consistency: The statistical methods used to disclose data in this report are consistent.

Reference standards

This report was prepared in accordance with the Core Programmes and Standards of Global Reporting Initiative ("GRI") ("GRI Standards"), Guidelines for the Formulation of Corporate Social Responsibility Reports in China (CASS5.0), Environmental, Social and Governance Disclosure Guide of the Hong Kong Stock Exchange, Guideline No. 1 on Self-discipline Supervision of Listed Companies – Standard Operation of Main Board Listed Companies of the Shenzhen Stock Exchange, the United Nations Sustainable Development Goals (SDGs) and other international and domestic standards.

Process of Formulation

Based on the ESG practice of the Company, this report was prepared in accordance with the process of "project approval -- material collection -- compilation and revision -- review by the senior management -- review by the board of directors -- disclosure". In addition, we actively communicated with the relevant stakeholders in the stages of project approval, compilation and revision to study the framework structure and content of the demonstration report.

Report Form

This report is available in electronic format for your reading. You may access this report on the websites of Shenzhen Stock Exchange (http: //www.szse.cn/disclosure), Hong Kong Stock Exchange Disclosure (https: //www.hkexnews.hk) and the official website of the Company (http://www.asymchem.com.cn/).

Key Performance Table

Economic performance

	Indicator	Unit	2020	2021	2022
Economic indicators	Revenue	10,000 yuan	313,672	463,212	1,023,019
	Total assets	10,000 yuan	718,265	1,515,629	1,823,927
	Net profit attributable to shareholders of list company	10,000 yuan	71,974	106,927	330,164
	R&D expenses	10,000 yuan	25,893	38,748	70,889
	Number of R&D technical personnel	Person	2,607	3,381	4,656
	Proportion of Number of R&D technical personnel	%	47.60%	47.45%	47.91%
	Total of cash dividends (tax inclusive)	10,000 yuan	14,558	21,142	65,644
	Cash dividends per 10 shares	RMB	6	8	18

The above data of Asymchem are from 2021 H-share annual report and 2022 annual performance announcement.

Employee training

	Indicator		Unit	2020	2021	2022
Employee training	Total number of employees trained		Person	5,477	7,126	9,719
	Total training hours of employees		Hour	453,222	620,432	874,710
	Average training hours of employees		Hour	83	87	90
	By gender	Total training hours of male employees	Hour	319,498	438,551	606,600
		Total training hours of female employees	Hour	133,724	181,881	268,110
	By employee type	Total training hours of grass-roots employees	Hour	101,865	145,667	226,200
		Total training hours of middle management employees	Hour	23,418	26,207	39,240
		Total training hours of senior management employees	Hour	7,199	7,401	9,270

Employee compliance training

Indicator	Unit	2020	2021	2022
Number of employees trained on compliance	Person	5,477	7,126	9,719
Training hours of employees on compliance	Hour	2	2	4

Employee compliance training

Indicator	Unit	2020	2021	2022
Average training hours of employees on anti-corruption	Hour	1	1.5	2
Number of employees trained on anti-corruption	Person	5,477	7,126	9,719
Number of directors trained on anti-corruption	Person	9	9	9
Average training hours of directors on anti-corruption	Hour	1	1	2
Lawsuit regarding anti-corruption	Hour	0	0	0

Employee equity

Indicator	Unit	2020	2021	2022
Proportion of employees signing labor contracts	%	100	100	100

Employee employment

Indicator		Unit	2020	2021	2022
Total number of employees		Person	5,477	7,126	9,719
By gender	Male	Person	3,861	5,037	6,740
	Female	Person	1,616	2,089	2,979
By employment type	Labor contract	Person	5,436	7,115	9,650
	Labor dispatch	Person	-	-	-
	Others	Person	41	11	69
By age	51 and above	Person	101	87	120
	41-50	Person	357	418	528
	31-40	Person	1,906	2,307	2,965
	30 and below	Person	3,113	4,314	6,106
By region	Employees serving in the Chinese mainland	Person	5,442	7,086	9,652
By region	Employees serving in Hong Kong, Macau, and Taiwan	Person	-	-	-
	Other countries and regions	Person	35	40	67
By education	Bachelor degree and above	Person	3,854	5,076	7,398
	Of which, doctor	Person	146	187	272
	Master	Person	917	1,138	1,682
	Bachelor	Person	2,791	3,751	5,444

Employee employment

Indicator		Unit	2020	2021	2022
By education	Junior college	Person	673	974	1,104
	Technical secondary school or below	Person	950	1,076	1,217
By employee type	Total number of grass-roots employees	Person	5,107	6,740	9,180
	Total number of middle management employees	Person	283	301	436
	Number of female middle management employees	Person	90	95	136
	Total number of senior management employees	Person	87	85	103
	Number of female senior management employee	Person	19	18	20
By profession type	Production	Person	1,747	2,427	3,314
	Sales	Person	59	61	92
	R&D and analysis	Person	2,607	3,381	4,656
	Supply and procurement	Person	152	177	282
	Infrastructure and equipment	Person	426	494	566
	Finance and administration	Person	486	586	809

Employee turnover rate

Indicator		Unit	2020	2021	2022
Employee turnover rate		%	14.5	14	13
By gender	Number of male employees leaving office	Person	784	875	1,076
	Number of female employees leaving office	Person	143	311	406
By age	Number of employees aged 51 and above leaving office	Person	7	9	6
	Number of employees aged 41-50 leaving office	Person	39	42	42
	Number of employees aged 31-40 leaving offic	Person	266	323	358
	Number of employees aged 30 and below leaving office	Person	615	812	1,076
By region	Number of employees leaving office in the Chinese mainland	Person	919	1,178	1,479
	Number of employees leaving office in Hong Kong, Macau, and Taiwan resigned	Person	0	0	0
	Number of employees leaving office in other countries and regions	Person	8	8	3
By employment type	Labor contract	Person	926	1,186	1,482
	Labor dispatch	Person	0	0	0
	Others	Person	1	0	0

Supply chain management

Indicator		Unit	2020	2021	2022
Total number of suppliers		Supplier	3,324	3,981	5,084
By region	Suppliers from the Chinese mainland	Supplier	3,143	3,769	4,834
	Suppliers from Hong Kong and Macau and overseas suppliers	Supplier	181	212	250
Total number of new suppliers		Supplier	419	797	1,110
Proportion of suppliers signing the Sunshine Cooperation Agreement		%	100	100	100
Proportion of suppliers signing the agreement containing provisions on requirements for environment and labor		%	100	100	100
Number of suppliers having conducted social impact assessments		Supplier	950	1,024	1,251
Number of suppliers having conducted environmental impact assessments		Supplier	950	1,024	1,251
Number of suppliers identified as having real and potentially significant negative social impacts		Supplier	146	159	142
Number of suppliers identified as having real and potentially significant negative environmental impacts		Supplier			
By assessment type	Proportion of new suppliers selected using environmental standards	%	30	27	26
	Proportion of suppliers selected using social standards	%	94	87	91
Number of suppliers participating in training on safety and environmental protection		Supplier	950	1,024	1,251

Social welfare

Indicator	Unit	2020	2021	2022
Amount of investment in social welfare	10,000 yuan	221	80	384
Number of persons participating in voluntary activities	Person	143	217	476

Product quality and service

Indicator	Unit	2020	2021	2022
Number of major complaints about product and service	Case	0	0	0
Number of recalled products	Case	0	0	0
Customer complaint handling rate	%	100	100	100

Occupational health and safety

Indicator		Unit	2020	2021	2022
Safety and health of employees	Number of employees working at posts with occupational disease risks	Person	1,681	2,105	3,440
	Number of employees having taken the physical examination of occupational diseases	Person	1,681	2,105	3,440
	Number of employees having occupational diseases	Person	0	0	0
Investments in health and safety	Investments in employee occupational health and workplace safety	10,000 yuan	-	-	3,770
Data of lost working hours due to work-related injury	Number of workdays lost due to work-related injury	Day	-	605	879

Major energy consumption of Asymchem

Indicators	Unit	2021	2022
Natural gas	m^3	4,199,118	4,592,471
Steam	Ton	70,711	110,139
Raw coal	Ton	12,784	34,829
Diesel	Liter	145,668	23,000
Purchased electricity	kWh	135,437,210	232,037,625
Total integrated energy consumption	Tons of standard coal	34,047	65,785
Integrated energy consumption per RMB10000 income	Tons of standard coal/RMB10,000 income	0.073	0.064

Emission of major gas pollutants

Indicators	Unit	2021	2022
NOx	Kg	26,199	97,357
NOx emission intensity	kg/RMB10,000	0.057	0.095
Sulphur oxides	Kg	11,002	50,763
SOx emission intensity	kg/RMB10,000	0.024	0.050
VOC emission	Kg	39,020	38,519
VOC emission intensity	kg/RMB10,000	0.084	0.038

Water Consumption

Indicators	Unit	2021	2022
Water consumption	Ton	1,219,691	1,749,056
Water resource consumption intensity	Tons/RMB10,000 of revenue	2.630	1.710
Water resource efficiency	RMB10,000 of revenue/Ton	0.38	0.58

Main wastewater discharge

Indicators	Unit	2021	2022
Total wastewater discharge	m^3	679,636	882,389
Wastewater discharge intensity	m^3/RMB10,000 of revenue	1.47	0.86
Chemical oxygen demand (COD)	Kg	62,237	101,836
Chemical oxygen demand (COD) emission intensity	kg/RMB10,000 of Revenue	0.134	0.100
Ammonia nitrogen	Kg	3,691	8,452
Ammonia nitrogen emission intensity	kg/RMB10,000 of Revenue	0.008	0.008
pH value	-	6-9	6-9

Waste discharge			
Indicators	Unit	2021	2022
Total amount of general solid waste	Ton	4,694	12,678
Total amount of general solid wastes recycled	Ton	41	844
Density of general solid waste	Tons/RMB10,000 of revenue	0.010	0.012
Total amount of hazardous wastes	Ton	46,748	87,423
Total amount of hazardous wastes recycled	Ton	2,327	1,839
Density of hazardous wastes	Tons/RMB10,000 of revenue	0.101	0.085

Packaging Materia			
Indicators	Unit	2021	2022
Total amount of packaging material used for finished product	Kg	-	106,216
Intensity of packaging material used for finished product	kg/RMB10,000 of Revenue	-	0.104

Greenhouse gas emissions			
Indicators	Unit	2021	2022
Direct emissions (category 1)	Tons of carbon dioxide equivalent	9,104	9,998
Indirect emissions (category 2)		101,572	170,456
Total greenhouse gas emissions		110,677	180,457
Greenhouse gas emission intensity	Tons of carbon dioxide equivalent / 10,000 yuan of revenue	0.240	0.170

Energy accounting specification:

1. The statistical scope of the total direct/indirect energy consumption data covered Asymchem and its domestic production entities and subsidiaries. The energy consumption was calculated according to the General Principles for the Calculation of Comprehensive Energy Consumption (GB/T 2589-2020) of the National Technical Committee for Standardization of Energy Fundamentals and Management.

Coefficient for translating into standard coal:
Electricity: 0.0001229 (ton standard coal/KWH)
Natural gas: 0.0011 (ton standard coal/m^3)
Diesel: 1.4571 (ton standard coal/ton)
Steam: 0.1071 (ton standard coal/ton)
Raw coal: 0.7143 (ton standard coal/ton)

2. Emissions were calculated in accordance with the Appendix II of the Environmental, Social and Governance Reporting Guide: Reporting Guidelines on Environmental Key Performance Indicators issued by Hong Kong Stock Exchange in May 2021. The nitrogen oxide emission coefficient was 0.885g/km (less than or equal to the 2.5-ton light vehicle), the sulfur oxide emission coefficient was 0.0147g/liter (gasoline), the PM emission coefficient was 0.0848g/km (less than or equal to the 2.5-ton light vehicle).

3. Hazardous waste was classified and calculated based on the National Hazardous Waste List (2021 Edition), and the discharge density of hazardous waste was calculated as ton / RMB10,000 revenue.

4. Harmless waste mainly included daily office and household waste and general industrial solid waste generated in production and operation. The discharge density of harmless waste was calculated as ton / RMB10,000 revenue.

5. Packaging materials mainly included medical or food grade packaging bags, cardboard buckets, medical glass bottles, PVC and other packaging. In 2022, the Group used packaging that is more environmentally friendly, lightweight and has a high recycling rate to avoid waste.

6. GHS emissions were calculated in accordance with the Appendix II of the Environmental, Social and Governance Reporting Guide: Reporting Guidelines on Environmental Key Performance Indicators issued by Hong Kong Stock Exchange in May 2021. The gasoline emission coefficient was 2.36 kg/l. In 2021, the electricity emission coefficient was 0.6101 kg CO2 equivalent/KWH. In 2022, the electricity emission coefficient was 0.5810 kg CO2 equivalent/KWH (the latest value in the “Guidelines on Accounting and Reporting of Greenhouse Gas Emissions for Enterprises: Power Generation Facilities” (2022 Revision).

Index of indicators

Environmental, Social and Governance Disclosure Guide of the Hong Kong Stock Exchange

Content of Indicators			Relevant sections
A. Environmental			
A1: Emissions	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
	A1.1	The types of emissions and respective emissions data.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
	A1.2	Greenhouse gas emissions in total and intensity.	6.2 Energy use and tackling climate change
	A1.3	Total hazardous waste produced and intensity.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
	A1.4	Total non-hazardous waste produced and intensity.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
	A1.5	Description of measures to mitigate emissions and results achieved.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
	A1.6	Description of how hazardous and nonhazardous wastes are handled, reduction initiatives and results achieved.	6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
A2: Use of Resources	General Disclosure	Policies on the efficient use of resources, including energy, water and other raw materials.	6.2 Energy use and tackling climate change
	A2.1	Direct and/or indirect energy consumption by type (e.g., electricity, gas or oil) in total and intensity.	6.2 Energy use and tackling climate change
	A2.2	Water consumption in total and intensity.	6.2 Energy use and tackling climate change
	A2.3	Description of energy use efficiency initiatives and results achieved.	6.2 Energy use and tackling climate change
	A2.4	Description of whether there is any issue in sourcing water that fit for purpose, water efficiency initiatives and results achieved.	6.2 Energy use and tackling climate change
	A2.5	Total packaging material used for finished products and with reference to per unit produced.	6.2 Energy use and tackling climate change
A3: Environment and Natural Resources	General Disclosure	Policies on minimizing the issuer’s significant impact on the environment and natural resources.	6.2 Energy use and tackling climate change
	A3.1	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	6.2 Energy use and tackling climate change
A4: Climate Change	General Disclosure	Identification of policies on the significant climate-related issues which have impacted, and those which may impact, the issuer	6.2 Energy use and tackling climate change
	A4.1	Description of the significant climate-related issues which have impacted, and those which may impact, the issuer and the actions taken to manage them.	6.2 Energy use and tackling climate change
B. Society			
B1: Employment	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare.	5.1 Standardizing employment and creating an equal workplace
	B1.1	Total workforce by gender, employment type, age group and geographical region.	5.1 Standardizing employment and creating an equal workplace
	B1.2	Employee turnover rate by gender, age group and geographical region.	5.1 Standardizing employment and creating an equal workplace
B2: Health and Safety	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to providing a safe working environment and protecting employees from occupational hazards.	5.5 Enhancing occupational health and safety based on the principle of life first
	B2.1	Number and rate of work-related fatalities.	5.5 Enhancing occupational health and safety based on the principle of life first
	B2.2	Lost days due to work injury.	5.5 Enhancing occupational health and safety based on the principle of life first

Content of Indicators			Relevant sections
B2: Health and Safety	B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored.	5.5 Enhancing occupational health and safety based on the principle of life first
B2: Health and Safety	General Disclosure	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.
	B3.1	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.
	B3.2	The average training hours completed per employee by gender and employee category.	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.
B4: Labour Standards	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labor.	5.2 Ensuring equal communication and Enhancing democratic management
	B4.1	Description of measures to review employment practices to avoid child and forced labor.	5.2 Ensuring equal communication and Enhancing democratic management
	B4.2	Description of steps taken to eliminate such practices when discovered.	5.2 Ensuring equal communication and Enhancing democratic management
B5: Supply Chain Management	General Disclosure	Policies on managing environmental and social risks of the supply chain.	4.3 Building a green sustainable supply chain
	B5.1	Number of suppliers by geographical region.	4.3 Building a green sustainable supply chain
	B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	4.3 Building a green sustainable supply chain
	B5.3	Description of practices relating to identifying environmental and social risks at each link of the supply chain where the practices are being implemented, how they are implemented and monitored.	4.3 Building a green sustainable supply chain
	B5.4	Description of practices relating to selecting suppliers to promote the use of green products and services where the practices are being implemented, how they are implemented and monitored	4.3 Building a green sustainable supply chain
B6: Product Responsibility	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	3.3 Improving service system based on customer first principle
	B6.1	Percentage of total products sold or shipped subject to recalls for safety and health reasons.	3.3 Improving service system based on customer first principle
	B6.2	Number of products and service related complaints received and how they are dealt with.	3.3 Improving service system based on customer first principle
	B6.3	Description of practices relating to observing and protecting intellectual property rights.	3.4 Privacy protection and data Security
	B6.4	Description of quality assurance process and recall procedures.	3.1 Strict control of product quality is our business foundation
	B6.5	Description of consumer data protection and privacy policies, how they are implemented and monitored.	3.4 Privacy protection and data Security
B7: Anti-corruption	General Disclosure	Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to bribery, extortion, fraud and money laundering.	2.3 Compliance management
	B7.1	Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases.	2.3 Compliance management
	B7.2	Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored.	2.3 Compliance management
	B7.3	Description of anti-corruption trainings provided to directors and employees	2.3 Compliance management
B8: Community Investment	General Disclosure	Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure its activities take into consideration the communities' interests.	7.2 Actively participating in community building to show gratitude for the source of benefit
	B8.1	Focus areas of contribution (e.g. education, environmental concerns, labor needs, health, culture, sport).	7.2 Actively participating in community building to show gratitude for the source of benefit
	B8.2	Resources contributed to the focus area	7.2 Actively participating in community building to show gratitude for the source of benefit

Index of GRI and CASS 5.0 Indicators

Contents		GRI Standards	CASS-5.0
About this Report		GRI 2 (general disclosure 2021)	P1.2 P1.3
Chairman's Address		/	/
Who We Are	Company profile	GRI 2 (general disclosure 2021)	P4.3, P4.4, G1.2
	Strategic planning and mechanism construction	GRI 2 (general disclosure 2021)	P4.1, P2.3, P2.4
	Operation philosophy	/	P1.2
	Key enterprise honors in 2022	/	P1.2
Responsibilities to shareholder	Corporate Governance	GRI 2 (general disclosure 2021)	G1
	Management Structure for Sustainable Development	GRI 302 GRI 305 GRI 201 GRI 416 GRI 304	G2
Responsibilities to shareholder/ Responsibilities to customer	Compliance management	GRI 306	G1.3, G1.4
	Information disclosure and investor relation management	GRI 201 GRI 202 GRI 203 GRI 204	G3.6
	Business ethics and compliance training	GRI 205	G1.7, G1.8
	Intellectual property management	GRI 201	V2.2, V2.3, V2.4
Environmental Responsibility	Building environmental protection systems to ensure green and low-carbon operation	GRI 308	E1
	Energy use and tackling climate change	GRI 306	E1
	Reducing the discharge of three wastes to protect the clear water and green mountains	GRI 305	E3
Responsibilities to Customer	Speeding up research and development and the construction of digital intelligence simultaneously	/	M2.4, M2.7, M3.5
	Strict control of product quality is our business foundation	GRI 202	M2.1 – M2.3, M2.8 – M2.18
	Improving service system based on customer first principle	GRI 415	S4
Responsibilities to partner/Responsibilities to employee/ Responsibilities to community	Promoting industry development through industry-university cooperation	GRI 405	M3.4, M3.6
	Standardizing employment and creating an equal workplace; Ensuring equal communication and Enhancing democratic management	GRI 403 GRI 404	S2.1 – S2.19
	Actively participating in community building to jointly tide over difficulties and show gratitude for the source of benefit	GRI 405	S4.1, S4.6, S4.8-S4.11

Contribution to UN's Sustainable Development Goals (SDGs)

3 GOOD HEALTH AND WELL-BEING	5.5 Enhancing occupational health and safety based on the principle of life first 7.1 Caring for health and improving public health safety
4 QUALITY EDUCATION	4.2 Promoting industry development through industry-university cooperation
5 GENDER EQUALITY	5.1 Standardizing employment and creating an equal workplace
6 CLEAN WATER AND SANITATION	6.2 Energy use and tackling climate change
8 DECENT WORK AND ECONOMIC GROWTH	7.2 Actively participating in community building to show gratitude for the source of benefit 5.3 Protecting Employee Right and Benefit, enabling them to enjoy their fruits of labor
10 REDUCED INEQUALITIES	7.2 Actively participating in community building to show gratitude for the source of benefit
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	3.1 Strict control of product quality is our business foundation Forward-looking deployment, green products innovation
13 CLIMATE ACTION	6.2 Energy use and tackling climate change 6.3 Reducing the discharge of three wastes to protect the clear water and green mountains
17 PARTNERSHIPS FOR THE GOALS	4.3 Building a green sustainable supply chain 7.2 Actively participating in community building to show gratitude for the source of benefit

Feedback

Dear readers:

Hello!

Thank you very much for reading the 2022 Environment, Society and Governance Report of Asymchem Laboratories (Tianjin) Co., Ltd despite busy schedule. In order to provide you and other interested parties with more valuable information, and effectively promote the Company to enhance its corporate social responsibility performance ability and level, we sincerely look forward to your opinions and suggestions.

Multiple-choice questions (please check in the corresponding position)

1. Your overall assessment on this report is:
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

2. The report's response and disclosure to the issues with which the interested parties are concerned?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

3. What do you think of Asymchem's performance in economic responsibility?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

4. What do you think of Asymchem's performance in environmental responsibility?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

5. What do you think of Asymchem's performance in safety management?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

6. What do you think of Asymchem's performance in employee responsibility?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

7. What do you think of Asymchem's performance in community responsibility?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

8. Are the information, indicators and data disclosed in the report clear, accurate and complete?
☐Very Good ☐Good ☐Ordinary ☐Substandard ☐Poor

9. Do you think the content arrangement and layout design of this report are easy to read?
☐Yes ☐No

10. Open-ended question

Do you have any comments and suggestions on Asymchem's performance of social responsibility and this report?