



2024 Social Responsibility and ESG Report

Qingdao Special Iron & Steel Co.,Ltd



About This Report

Dear Reader:

The '2024 Social Responsibility and ESG Report of Qingdao Special Steel' systematically discloses the management and performance achievements of Qingdao Special Iron & Steel Co.,Ltd in the areas of environment, society, and governance for the year 2024, adhering to the principles of objectivity, standardization, transparency, and comprehensiveness.

Qingdao Special Iron & Steel Co.,Ltd

May 2025

Reporting Period

The reporting period of this report covers from January 1, 2024, to December 31, 2024. In order to enhance the completeness of the report, some content extends beyond the aforementioned period.

Report Scope

This report covers Qingdao Special Iron & Steel Co.,Ltd and its subsidiaries. For ease of expression and reading, 'Qingdao Special Iron & Steel Co.,Ltd' is also referred to as 'Qingdao Special Steel', 'the Company', or 'we' in this report.

Report Data

The information and data disclosed in this report comes from the company's internal formal documents, statistical reports, and public information, including released news and other public documents. The company commits that the report contains no false records or misleading statements and is responsible for the authenticity, accuracy, and completeness of its content.

Unless otherwise specified, the financial data in this report are denominated in RMB.

Compilation Principles

This report is primarily compiled based on the Global Reporting Initiative's 'Sustainability Report Standards' (GRI Standards), China Iron and Steel Association 'Guidelines for Environmental, Social, and Governance (ESG) Special Reports for Steel Enterprises', and 'China Enterprise Sustainability Report Guidelines (CASS-ESG 6.0)', while also referencing the United Nations Sustainable Development Goals (SDGs), Bekaert BEKAERT Social Responsibility Questionnaire, Jiangsu Xingda Steel Cord Co., Ltd. Supplier Sustainability Assessment, Linglong Tire SAQ Questionnaire, Shandong Shengtong Group Co., Ltd. Supplier Social Responsibility Assessment, and other indicator requirements.

Reporting Language

This report is published in both Chinese and English versions. In case of any discrepancies, the Chinese version shall prevail.

Report Access

This report is presented in electronic format for your review. You can read the electronic version of the report by visiting the sustainability section of the company's official website (<https://qdtg.citicsteel.com/>).

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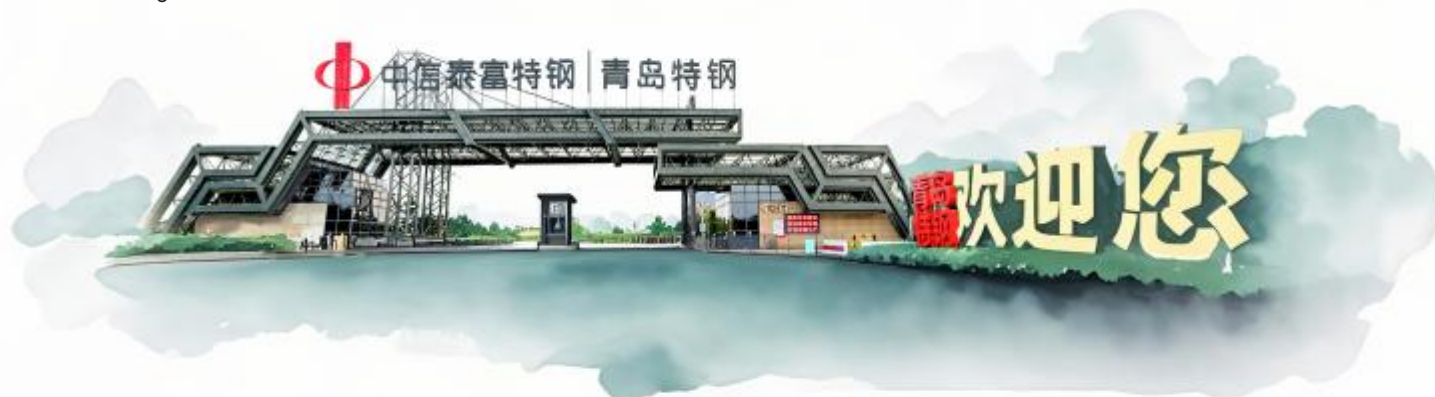
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Message from the General Manager



Sun Guangyi

Party Secretary and General
Manager of Qingdao Special Iron &
Steel Co.,Ltd

As an important member of the CITIC Pacific Special Steel Group Co., Ltd., Qingdao Special Steel has always remembered its historical mission, strived for self-improvement, and unwaveringly marched on the journey of serving the country through steel. From the initial Qingdao Third Steel Plant to the leading enterprise in the Special Steel industry today, we have experienced a rapid development from nothing to excellence. This journey of perseverance embodies the tenacious spirit of generations of Qingdao Special Steel people who are not afraid of difficulties and pursue excellence, demonstrating our firm pursuit of high-end, intelligent, and green development, and inheriting our sincere feelings of caring for our homeland and serving the country.

Party Building Leads to Steady And Far-Reaching Progress

2024 is a critical year for Qingdao Special Steel to deeply implement the 'Party building leads' strategy. We fully leverage the core role of the Party Committee in 'setting the direction, managing the overall situation, and ensuring implementation', resolutely implement the group's work deployment of building a high-resilience enterprise and 'two extremes' (extreme cost, extreme efficiency), and ensure that the enterprise steadily moves forward in the right direction. Closely focusing on the main line of work of 'one center, two pillars', we continuously tap human potential, promote product upgrading and management innovation, and have made new progress, stepping onto a new stage of enterprise development.

Strive for Self-improvement and Steady Governance

Through countless trials, Qingdao Special Steel governs effectively. Qingdao Special Steel upholds the Party's spirit of self-reform, continuously improving its capabilities and strengthening internal management and supervision. We are committed to building a more efficient, collaborative, and focused management system. By optimizing organizational structure, improving performance management, and strengthening supervision and accountability, we continuously enhance Corporate Governance's level and risk prevention capabilities. We know well that good Corporate Governance is an important guarantee for the sustainable and healthy development of an enterprise and is also key to winning market trust and respect.

Green as the Soul, Digital Intelligence Empowerment

There will be times when we ride the wind and break the waves; Qingdao Special Steel takes green development as its core. Qingdao Special Steel takes green as the foundation of development, comprehensively advancing pollution reduction, carbon reduction, and energy conservation and water-saving efforts. We are committed to building an ecologically prioritized, resource-efficient, and green low-carbon development model. By applying digital intelligence to empower production processes, we have pioneered a sustainable and high-efficiency 'low-carbon' production path. From the successful implementation of the Qingdao Special Steel's Environmental Relocation Project, to the selection of the No.5 and No.6 high-speed wire rod production lines as the Ministry of Industry and Information Technology's first batch of excellent smart factories, to our bridge cable steel appearing on CCTV's Made in China by Wisdom, each achievement is a testament to our commitment to green transformation.

Talent Promotes Enterprise and Excellence in Management

Gathering talents to showcase grand plans, Qingdao Special Steel insists on people-oriented. Qingdao Special Steel always adheres to the people-oriented principle and actively fulfills social responsibilities. We advocate a problem-oriented approach, dare to reveal shortcomings, and through management innovation, continuously explore and practice, creating a scientific management system with unique Qingdao Special Steel characteristics. From the practice of structural cost reduction and efficiency improvement across the entire process, to the comprehensive application of scientific management tools to ensure implementation, we continuously stimulate the vitality of enterprises, tap employee potential, and inject strong momentum for the sustainable and healthy development of the enterprise. At the same time, we actively participate in social welfare undertakings, give back to society, and share the fruits of development.

Looking Forward to the Journey, Craftsmanship Leads to Far-reaching Progress

Looking forward to the future, Qingdao Special Steel will continue to embrace the 'two overall situations', care about the 'greatness of the country', and accelerate the cultivation and development of new quality productivity. We will adhere to the development direction of 'high-end, intelligent, and green', focus on 'precision and specialty', and continuously promote 'extreme cost, extreme efficiency'. At the same time, we will further strengthen ESG Management, continuously improve environmental, social, and Corporate Governance levels, continuously inject new momentum into the steel industry's high-quality development, and continuously demonstrate new achievements on the new journey.

About Us

Qingdao Special Iron & Steel Co.,Ltd (referred to as Qingdao Special Steel) is a subsidiary of CITIC Pacific Special Steel Group Co., Ltd. and one of its five major Special Steel manufacturing bases. The company is located in the Dongjiakou Port Industrial Zone, West Coast Economic New Zone, Qingdao City, Shandong Province, covering an area of 9,297 acres, adjacent to the 400,000-tonnes ore terminal of Dongjiakou Port, with the advantages of convenient transportation and rapid logistics.

Qingdao Special Steel is the first batch of 'Green Factory' 'Excellent Level Intelligent Factory' awarded by the Ministry of Industry and Information Technology, selected into the 'Key Water-Using Enterprises and Industrial Parks Water Efficiency Leading Enterprise' list jointly released by the Ministry of Industry and Information Technology, the Ministry of Water Resources, the National Development and Reform Commission, and the State Administration for Market Regulation, rated as an environmental performance A-level enterprise, and is a high-end brand cultivation enterprise, high-tech enterprise, and waste-free factory in Shandong Province. Qingdao Special Steel has won awards such as China's Excellent Steel Enterprise Brand, China Special Steel Enterprise Excellent Brand, China Steel Market Product Quality User Satisfaction First Brand, China Steel Industry Product Development Market Development Award, National Metallurgical Product Physical Quality 'Golden Cup Award', Metallurgical Science and Technology Award First Prize, and Shandong Province Fumin Xinglu Award.

Qingdao Special Steel possesses a national-level enterprise Technical Center, nationally recognized laboratories, postdoctoral workstations, and other R&D platforms. It has undertaken 2 national science and technology support projects, led or participated in the formulation and revision of multiple national and industry technical standards, reaching international advanced levels. Qingdao Special Steel has built 8 world-leading wire rod, bar, and flat steel production lines, introducing internationally advanced process equipment. The production process adopts international advanced technologies, providing multi-specification, multi-variety, and high-quality Special Steel products and comprehensive service solutions to 30 countries and regions worldwide.

Qingdao Special Steel positions its products as 'special steel and premium steel,' forming four major product series: wire rod, flat steel, bar, and continuous casting billet. The main products include high-strength bridge cable galvanized steel wire rod, ultra-high-strength tire cord steel series wire rod, automotive fastener steel wire rod, ultra-high-strength steel strand steel, high-stress long-life spring flat steel, gear steel, bearing steel, non-tempered free-cutting steel, spring steel, anchor chain steel, grinding ball steel, and engineering machinery steel, totaling 22 categories. These are applied in high-end manufacturing industries such as automotive, shipbuilding, aviation, and high-speed rail, as well as key engineering fields like marine and bridge construction. The quality of cord steel, bead wire steel, welding steel, and spring flat steel leads domestically. Among them, welding steel and high-quality high-carbon steel wire rods are known as 'China Famous Brand.' The production and sales of tire cord steel cord have consistently ranked first in China and the world for many years, earning the national 'Manufacturing Single Champion' title.

Qingdao Special Steel adheres to the philosophy of 'integrity, innovation, integration, and excellence,' keeping in mind the mission of providing green and intelligent Special Steel for human civilization. It collaborates with upstream and downstream partners in the industrial chain to build a green industrial chain, striving to become a respected world class Special Steel leading enterprise.

Strategic partners



Tire Cord Steel



Steel for Special Welding



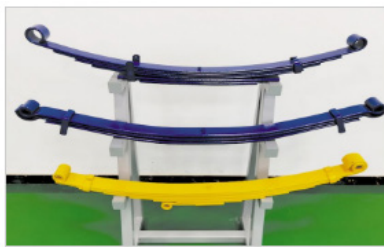
Steel for Bridge Cables



Fastener Series Products



Flat Spring Steel



Suspension Leaf Spring Flat Steel



High-quality Carbon Steel, Aluminum-clad Steel, and Prestressed Steel Strand Steel



High-quality Carbon Structural Steel



Boiler Tube Billet Steel



Corporate Vision

Becoming a respected world special steel leading enterprise

Corporate Mission

Providing green and intelligent special steel for human civilization

Core Values

Integrity Innovation Integration Excellence

Corporate Spirit

Hard work Practical responsibility
Forging ahead Pursuing the Ultimate

Business Philosophy

Extreme cost Extreme efficiency

Market Philosophy

Operations revolve around the market
Production revolves around operations
Other work revolves around production

Quality Philosophy

Quality is the life of the enterprise.
Today's quality is tomorrow's market.
Quality is related to everyone.

Innovation Philosophy

Special steel is forged by technology

Human Resource Management Philosophy

Run a business like running a school

Company History

1958-1984

Serve the country with steel, hard work and entrepreneurship

Qingdao Special Steel came into being under the historical background of 'taking steel as the key link'. Under extremely poor conditions, Qingdao Special Steel people built Qingdao Special Steel into one of the three major steel bases in Shandong.



1985-2006

Reform and opening up, dare to be the first

Facing the Asian financial crisis and the global financial storm, Qingdao Special Steel continuously promoted technological progress and innovation, possessing a process flow integrating coking, sintering, ironmaking, steelmaking, and steel rolling, becoming the enterprise with the highest 'yield per mu' in the Chinese steel industry at that time.



2007-2017

Industrial upgrading, environmental relocation

According to the strategic plan of 'protecting the bay, embracing the bay development' proposed by the Qingdao municipal party committee and government, and the development strategy of industrial upgrading, becoming stronger and bigger, Qingdao Special Steel initiated environmental relocation, focusing on building an efficient and sustainable modern coastal steel enterprise.

2017-2024

Digital intelligence leading, green and low-carbon development

Under the tide of a new round of technological revolution and industrial transformation, Qingdao Special Steel practiced the development model of 'ecological priority, resource conservation, and green low-carbon', and applied digital intelligence to various processes, empowering production links, and creating a sustainable and high-efficiency 'low-carbon' production path.



2017-2024

Transformation and upgrading, phoenix nirvana

In May 2017, Qingdao Special Steel implemented a strategic reorganization, becoming a member of the CITIC Pacific Special Steel Group Co., Ltd. Relying on the business platform of CITIC Pacific Special Steel Group Co., Ltd., the company comprehensively deepened reforms, rapidly entering a new era of significant quality improvement and substantial performance growth.



2022-2024

Management innovation, continuous improvement

Against the backdrop of a complex and ever-changing global economic landscape, the steel industry has experienced numerous challenges and new development opportunities. Qingdao Special Steel adheres to the party's self-revolution spirit, strengthens self-construction, advocates the discovery of problems, pursues continuous improvement, and builds a unique scientific management system.



Honors in 2024



Qingdao Special Steel Technical Center was Recognized by the National Development and Reform Commission and Other Departments National Enterprise Technical Center

★★★★



Qingdao Special Steel's No. 5 and No. 6 High-Speed Wire Rod Intelligent Manufacturing Factory Successfully Selected as the Ministry of Industry and Information Technology's First Batch of Excellent Smart Factories

★★★★



Qingdao Special Steel's 'Online High-End Special Steel Wire Rod Isothermal Heat Treatment Technology and Equipment Independent Innovation Project' Won the First Prize of National Metallurgical Technology of China Iron and Steel Industry Association and China Metal Society

★★★★



Multiple Scientific Research Achievements of Qingdao Special Steel Won the Shandong Provincial Metallurgical Science and Technology Progress Award, including 2 First Prizes

★★★★



Qingdao Special Steel Participated in the Formulation of 'Technical Requirements for Performance Prediction of Special Steel Bar and Wire Rod in the Steel Industry' Intelligent Manufacturing National Standard

★★★★



Qingdao Special Steel Won the Qingdao Mayor's Quality Award

★★★★



Qingdao Special Steel's 'Key Technology Development Project for Lightweight, Fatigue-Resistant Ultra-High and Extra-High Strength Steel Tired Cord Wire Rod' Won the Qingdao the Second Prize of National Science and Technology Progress Award

★★★★



Qingdao Special Steel Passed the IATF 16949 Quality Management System Audit

★★★★



Qingdao Special Steel's Testing Laboratory Passed the CNAS Certification

★★★★



Qingdao Special Steel's 'Hard Wire Rod for Steel Cord' Product Successfully Selected by the Ministry of Industry and Information Technology 'Champion Enterprise in Manufacturing'

★★★★



Qingdao Special Steel Passed Domestic and International Certifications for Welding Wire Steel CCS, Anchor Chain Steel CCS\ABS\LR\NK\DNV\BV, JIS, and SIRIM

★★★★



Qingdao Special Steel H08MnSiTi (ER70S-G) Special Welding Steel Hot Rolling Wire Rod Won the China Iron and Steel Association 2024 'Golden Cup Special Excellent Product' Award, and 3 Products (Special Welding Steel Hot Rolling Wire Rod, High-strength Cold Heading steel Hot Rolling Wire Rod, and Continuous Casting Round Billet for Gas Cylinders) Won the 'Golden Cup High-Quality Product' Award

★★★★



Qingdao Special Steel Wire Rod for Bridge Cable Steel Wire Was Rated as a AAAAA-level Trustworthy Brand of Chinese Steel Products

★★★★



Qingdao Special Steel Spring Flat Steel Selected for the Sixth Batch of 'Langya List' Enterprise Brands in 2023

★★★★



Qingdao Special Steel's 'High-Performance Online Isothermal Heat Treatment(QM) Wire Rod' and 'Spring Flat Steel Quality Improvement' Entered the List of Excellent Brand Creation Cases in the Steel Industry

★★★★



Qingdao Special Steel Won the Ministry of Industry and Information Technology's 'Water Efficiency Leading Enterprise' Honorary Title

★★★★



Qingdao Special Steel's 'Zero-Carbon City Application of Composite Waste Heat Heating System in Steel Enterprises' Project Won the Shandong Circular Economy Science and Technology Award First Prize

★★★★



Qingdao Special Steel Became the First Steel Enterprise in Shandong Province to Pass the EATNS Carbon Management System Certification

★★★★



Qingdao Special Steel Was Recognized as a 'Zero Waste Factory' in Shandong Province

★★★★



Qingdao Special Steel Was Recognized as a 'Resource Recycling Demonstration Unit' in Shandong Province

★★★★



Qingdao Special Steel Passed the ISO 14001 Environmental Management System Certification

★★★★



Qingdao Special Steel Passed the ISO 50001:2018 Energy Management System Certification

★★★★



Qingdao Special Steel Won the 'Most Attractive State-Owned Enterprise for College Graduates' in Shandong Province Top 100

★★★★



'Outstanding Contribution to Employment Promotion Enterprise' Awarded by Qingdao West Coast New District

★★★★



Qingdao Special Steel Passed ISO 45001:2018 Occupational Health and Safety Management System Certification

★★★★



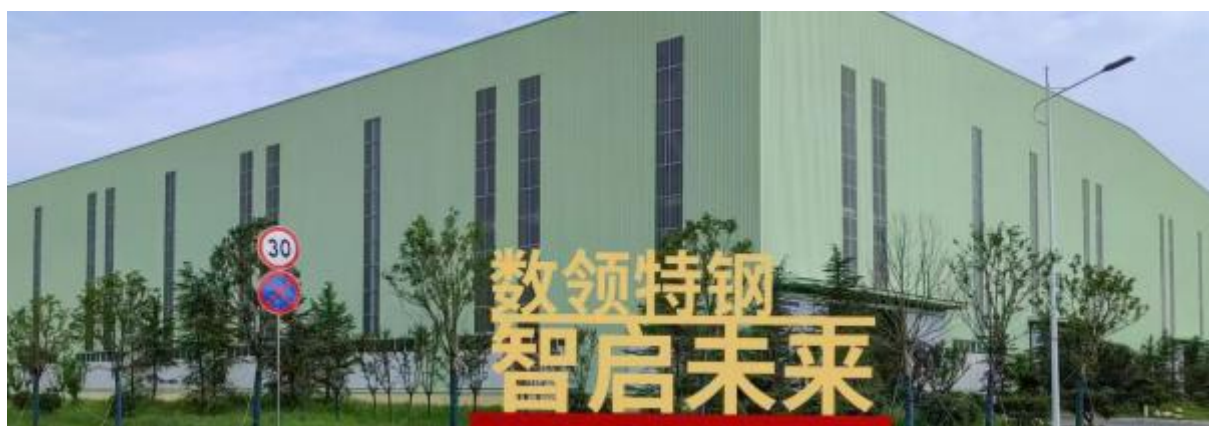
Qingdao Special Steel Passed ISO 27001 Information Security Management System Certification

★★★★



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ESG Governance

Qingdao Special Steel closely follows global ESG development trends and is gradually building an ESG governance system that adapts to the company's development. The company integrates the concept of sustainable development into corporate strategy and daily operations, continuously improving the company's performance in environmental, social, and governance dimensions, and actively responds to the ESG governance requirements of the group and key partners.

➤ Actively Respond to Stakeholder ESG Concerns

On the one hand, the company strictly adheres to the 'Environmental, Social, and Governance Work Management Measures' formulated by CITIC Pacific Special Steel Group Co., Ltd. and the ESG work principles of service strategy, integration into governance, and joint participation. On the other hand, we actively respond to customer concerns regarding the environment, governance, and society, and enhance ESG performance.

Actively respond to partners' sustainable development requirements, pass customer-related assessments and certifications, and improve ESG performance.

Case

Qingdao Special Steel emphasizes the collaboration with key customers and partners in the field of ESG governance, attaches great importance to the sustainable development assessment requirements put forward by key customers, and actively responds to the certification and assessment requirements of customers such as Bekaert, Xingda, and Linglong Tire regarding social responsibility and sustainable development concepts in the environment, governance, and society. For example: the appointment and responsibilities of senior management representatives for sustainable development, the establishment and transmission mode of the company's code of conduct, the characteristics and coverage of the whistleblowing and complaint mechanism, the release and content of Sustainability Report, the acquisition of information security management system certification, and the promotion of responsible supply chain management. In 2024, Qingdao Special Steel received an A-grade rating in Bekaert's social responsibility evaluation system.

Qingdao Special Steel incorporates customer standards into the company's ESG governance system, continuously improves ESG governance levels, and implements a series of measures: such as appointing senior management representatives, the company has clearly appointed senior management representatives for sustainable development, whose responsibilities cover compliance, business ethics, social sustainability (human rights, health, safety), environment and energy, and supervision of sustainable development risks, ensuring high-level attention. The company has established a code of conduct system. The company developed a comprehensive code of conduct, covering aspects such as corporate management, working conditions and human rights, health and safety, business ethics, and the environment, and communicated the code of conduct to all employees and stakeholders through the company portal, bulletin boards, and sufficient training activities. Improving the whistle blowing and complaint mechanism: the company established a distinctive whistle blowing and complaint mechanism that can handle various types of complaints such as human rights complaints, environmental complaints, and unethical business behavior, applicable to internal and external stakeholders, and provides multiple reporting channels. The company has released a corporate social responsibility report, fully disclosing the company's progress and achievements in the field of sustainable development.

➤ Systematically Planning the ESG Management System

Qingdao Special Steel attaches great importance to ESG work, taking it as an important tool to enhance the company's core competitiveness and promote sustainable development. The company strictly follows the 'Environmental, Social, and Governance (ESG) Work Management Measures of CITIC Pacific Special Steel Group Co., Ltd.', systematically plans the construction path of the ESG Management system, aiming to gradually build a comprehensive ESG Management system through 3 years of construction and implementation, continuously improving sustainable development capabilities. To ensure the effective implementation of ESG work, the company established the ESG Management organizational structure and working mechanism. As the Execution Level of the group's ESG work, the company established a two-tier organizational structure of the ESG Leadership Team and the ESG Working Group, formulated and passed the 'Notice on the Establishment of the Company's Environmental, Social, and Governance (ESG) Work Organization' and the 'Implementation Plan for the Construction and Report Compilation of the Qingdao Special Steel ESG Management System' to ensure that all ESG measures can be efficiently executed and implemented in close alignment with the group's ESG strategy.

ESG Leadership Team: The team is led by the company's general manager, who oversees the company's ESG work and serves as the highest authority for the operation of ESG Management and information disclosure. It guides the company's sustainable development and overall ESG work, and supervises the work of the ESG working group.



ESG Working Group: The main department responsible for coordinating, managing, and executing ESG work within the company, led by the head of the Legal and Confidentiality Department. It is responsible for daily coordination and execution, policy implementation and supervision, improvement and feedback, information collection, report preparation, and the fulfillment of daily ESG tasks.



Attaching Importance to Communication with Stakeholders

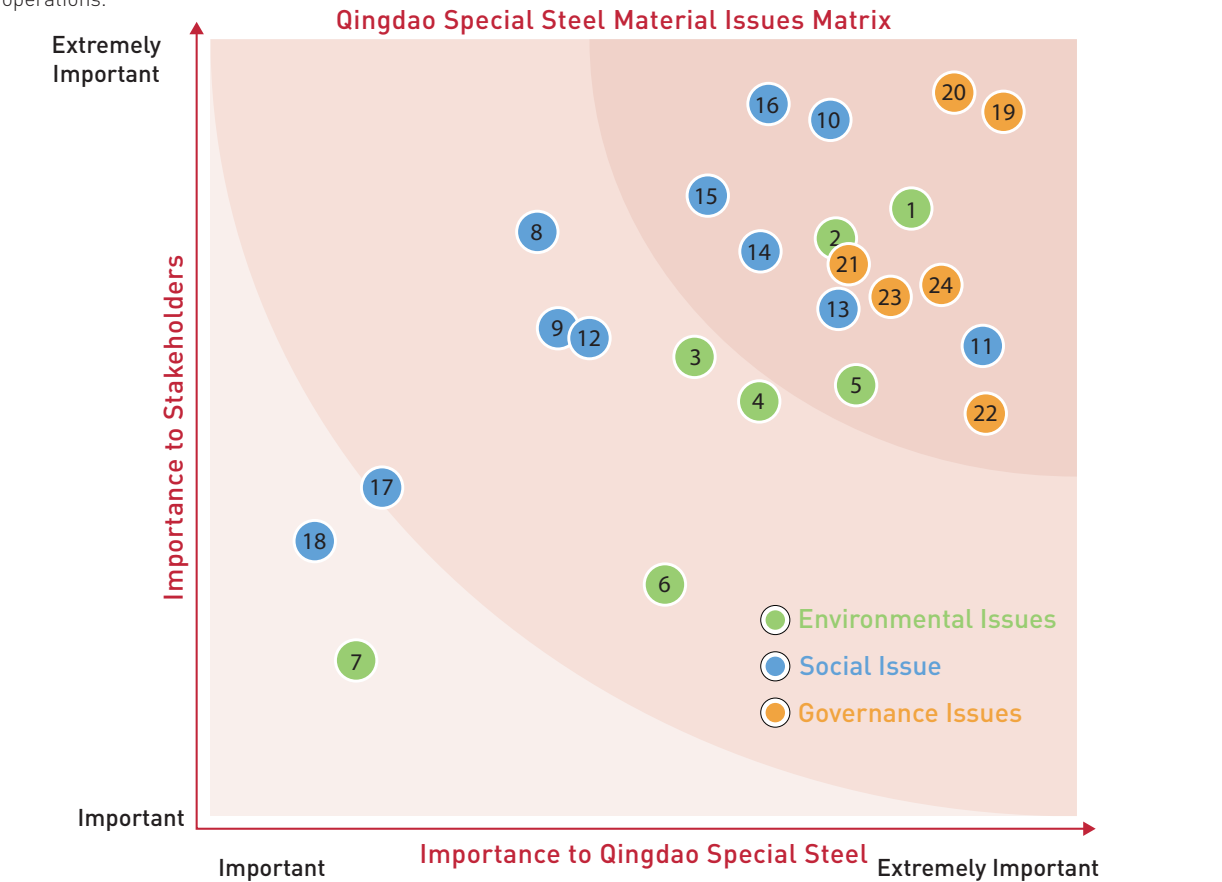
Qingdao Special Steel attaches importance to communication with various stakeholders, actively participates in important investigation and research activities, and enhances corporate social responsibility performance. In 2024, the company received 261 batches of investigation and exchange from government departments at all levels, key clients, cooperative units, and sister companies, and completed the preparation of important materials such as the Dongjiakou Economic Zone Industrial Chain Symposium, Industrial Energy Efficiency Level Research Report, and the Collection of Business Development of CITIC Group in Various Provinces, providing support for effective communication between the company and external stakeholders.

At the same time, the company actively participates in industry exchange activities, such as the Green Manufacturing of China's Wire Products Industry and the Intelligent Manufacturing Promotion Conference, sharing practical experiences in green and low-carbon transformation, Intelligent Manufacturing, and other fields, promoting industry collaborative development, and enhancing the company's influence in the field of sustainable development. The company also actively applied for honors such as 'Qingdao City Integrity Enterprise' and 'Qingdao City Social Responsibility Demonstration Enterprise,' demonstrating the company's commitment and practice in social responsibility.

Stakeholders	Expectations and Demands	Communication Methods	Response Measures
Government / Regulatory Agencies	Compliance management Implement national policies Tax compliance Support local economic development	Special report on policy execution Work meeting information submission Accept supervision and inspection	Strictly comply with laws and regulations Implement policy requirements Pay taxes in full and on time Drive local economic development
Shareholders / Investors	Steady operation and good performance Investor rights protection	Performance briefing session	Improve management level Perfect the corporate governance system Complete group work with high quality
Employees	Rights protection Career development Health and safety	Training and communication for the workers' congress	Improve the salary and welfare system Build a development platform Improve the working environment
Customers	Product quality Service guarantee Business credit	Customer visit Satisfaction survey Customer service hotline	Enhance product quality Optimize the service system Strengthen technological innovation
Suppliers	Fair procurement Integrity performance Mutual benefit and win-Win Long-term cooperation	Supplier conference Business negotiation Cooperation and exchange Evaluation feedback	Fulfill contracts in a timely manner Establish a long-term mechanism Construction of business ethics Reception and exchange with cooperative units
Community / Public	Environmental protection Community development Information disclosure	Community visit Public welfare activities Information disclosure	Strengthening environmental management Supporting community construction Carrying out public welfare projects Maintaining information transparency
Media	Obtaining news materials Safeguarding the public's right to know	Releasing event press releases and operating official websites, Official weibo, and other social media	Establishing corporate publicity departments Timely response to news concerns Release of ESG special reports

Materiality analysis

Qingdao Special Steel insists on combining recognized sustainable development goals and frameworks (such as SDGs, GRI standards), the legal and regulatory requirements of the countries and regions where the business operates, the requirements of regulatory agencies, key customer concerns, excellent management practices of peer companies, and the opinions of external experts, actively identifying and responding to material issues within the three dimensions of environment (E), society (S), and governance (G) that have significant impacts on the company and stakeholders, in line with the ESG impact of the company's own operations.



Dimensions	No.	Issues	Dimensions	No.	Issues
Environment	1	Climate Response	Social	13	Responsible ProcurementIndustry Co-creation and Development
	2	Energy Management		14	Product Quality Assurance
	3	Waste Management		15	Customer Service
	4	Exhaust gas Emission		16	Innovation and Intelligent Creation
	5	Water Resource Management		17	Public Welfare and Charity
	6	Resource Utilization		18	Consumption Assistance
	7	Biodiversity	Governance	19	Corporate Governance
Social	8	Employee Rights Protection		20	Business Ethics
	9	Employee Training and Development		21	Compliance and Risk Control
	10	Occupational Health and Safety Production		22	Intellectual Property Management
	11	Employee Welfare and Care		23	Tax Compliance
	12	Responsible Procurement		24	Information Security

Focus 1

Technology Empowerment
High-end Products Forging Ahead

Qingdao Special Steel thoroughly implements the spirit of important instructions of General Secretary Xi Jinping, accelerates the realization of high-level technological self-reliance, focuses on the development of new steel quality productivity in the main business of Special Steel, and strives to cultivate excellent steel varieties, improve quality, and build the brand, consolidating the core competitiveness of the enterprise over time.

Scientific and Technological Innovation: Leading the Way, Optimizing Product Mix

In 2024, the company's new products development reached 191% of the plan, with substantial increases in output of high-end, key, and mid-range products, and a substantial decrease in output of low-end products. Sales of bridge cables, spring tool steel, cold heading steel for automobiles, and bearing steel wire rods, which have good benefits, all achieved significant growth. The three 'Little Giant' projects—steel for tire wires, high-end automotive spring steel, and steel for automotive fasteners—exceeded the plan. The production efficiency and product quality of salt bath heat treatment products reached an all-time high, and the product applications expanded to various high-end application scenarios. The sales of steel for engineering machinery increased year-on-year, and 206 steel grades were continuously developed over three years, generating benefits of over 200 million yuan from product structure adjustment.

Strengthening Technological Innovation Control, Steadily Improving Quality

The company steadily improved its quality control capabilities, using scientific tools such as SPC control to enhance abnormal management in production process. There were no mixed steel accidents throughout the year, and the cumulative primary inspection qualification rate, the primary inspection qualification rate of inclusions in tire cord steel, and the finishing pass rate of NHK products all improved. The cycle of quality dispute handling was significantly shortened, and customer satisfaction improved. Through process innovation, the surface quality of bearing steel wire rods was greatly improved, meeting customer needs. The annealing-free cold heading steel and bearing steel series products achieved process breakthroughs, creating a win-win situation with customers.



Technological Innovation Building the Brand, Core Value Further Enhanced

The company has been awarded the National High-tech Enterprise, National Manufacturing Single Champion Enterprise, National Enterprise Technical Center, and Qingdao Mayor Quality Award. Throughout the year, 61 patents were authorized. The independent innovation of online isothermal heat treatment technology and equipment for high-end special steel wire rods won the first prize of the National Metallurgical Technology Award. 9 scientific and technological achievements were evaluated by the Shandong Iron and Steel Industry Association, of which 3 are internationally advanced and 6 are domestically leading. The Company won multiple Shandong Provincial Metallurgical Science and Technology Progress Awards, completed multi-national classification society certification for anchor chain steel, and multiple product grades won the Golden Cup Award. The Company passed multiple international certifications, and the market share of wire rods, flat steel, bar steel, and round billets has steadily increased, further enhancing the brand value of the products. The market share of the new 'Three Major Key Products' has significantly increased, and market discourse power has strengthened. The national '14th Five-Year Plan' 2GPa high-strength spring flat steel project was delivered qualified, with the market share of guide arms and high-strength spring flat steel reaching 55%. The round billets for hydrogen and hydrogen-mixed pipelines achieved a breakthrough from zero, and the market share of the 'Little Giant' products exceeded 30%.

National High-Tech Enterprise	National Manufacturing Single Champion Enterprise	National Enterprise Technical Center
Qingdao Mayor Quality Award	61 patents were authorized throughout the year	The independent innovation of online isothermal heat treatment technology and equipment for high-end special steel wire rods won the first prize of the National Metallurgical Technology Award
The 9 scientific and technological achievements were evaluated by the Shandong Iron and Steel Industry Association, of which 3 were internationally advanced and 6 were domestically leading.		
Won many awards of the Shandong Province Metallurgical Science and Technology Progress Awards	Completed multiple classification society certification of the Anchor Chain Steel	Multiple grade products won the Golden Cup Award
The market share of the new 'Three Major Key Products' increased significantly	The '14th Five-Year Plan' national 2GPa high-strength spring flat steel project was delivered qualified	
The market share of guide arms and high-strength spring flat steel reached 55%	The round billets for hydrogen and hydrogen-mixed pipelines achieved a zero breakthrough	The market share of Little Giant products reached over 30%

Focus 2

Lean management

Innovative Engine Opening a Unique New Road

Qingdao Special Steel adheres to the Party's self-revolutionary spirit, continuously strengthens innovation and efficiency, actively advocates problem-oriented approaches, courageously reveals shortcomings, and persistently pursues management improvement and optimization. Through management innovation, continuous exploration, and practice, Qingdao Special Steel has developed a unique scientific management system, achieving continuous efficiency in lean management and injecting strong momentum into the sustainable and healthy development of the enterprise.

Optimizing and Upgrading the Entire Process, Structurally Reducing Costs and Increasing Efficiency

- **Ironmaking Process:** Pioneering application of the 'Structural Cost Reduction Method for Non-Mainstream Raw Materials,' trialing 19 non-mainstream resources; deepening the application of the 'Coal and Ore Blending Model Extension to the Supply Front,' developed high-ash, high-strength coking coal, and medium-sulfur gas-fat coal as substitutes for 1/3 coking coal; No.3 Blast Furnace coal ratio reached the highest level within the group; cost reduction per tonne of coke and per tonne of iron ranks first within the group; ironmaking cost ranked sixth domestically.
- **Steelmaking Process:** Guided by the lean production tool 'Single Minute Exchange of Die,' the campaign to shorten Converter smelting time was conducted in seconds, achieved a smelting cycle of 27.7 minutes per furnace, with a single shift single furnace smelting count reaching 26 furnaces, both setting new historical records; processing costs achieved a historical breakthrough.
- **Steel Rolling Process:** The operational efficiency of the wire rod division set new historical records; the average monthly production of the bar line set a new historical record; the yield rate of medium bars increased from 96.68% to 96.81%.



Actively Learning New Concepts and Promoting the Implementation of Management Tools

- **Comprehensive optimization of safety management:** Integrate resources to reconstruct five safety production subcommittees, learn advanced industry experience, promote and apply 20+ safety management methods and tools, gradually form a leadership-driven safety culture, and implement 31 intrinsic safety transformation and intelligent projects.
- **Production organization becomes more perfect:** Efficiency optimization achieves significant results, successfully breaking through production organization bottlenecks.
- **Organizational structure becomes more reasonable:** Build a more efficient, collaborative, and focused management system.
- **Performance management becomes more focused:** Conduct performance dialogues, effectively leveraging the 'baton' role of performance evaluation.
- **A clean and upright atmosphere is strong:** Strengthen supervision, discipline, and accountability, rotate sensitive positions internally, and continuously enhance confidentiality and risk management.

Cultural Atmosphere

Emphasize on supervision and responsibility to cultivate a positive work environment.

Performance Management

Focus on effective dialogue and evaluation to improve performance.

Safety Management

Integrate resources and advanced methods to enhance safety culture and implement safety projects.

Production Organization

Optimize efficiency and resolve bottlenecks in the production process.

Organizational Transformation

Organizational Structure

Establish an efficient and collaborative management system.

Focus 3

Green leadership

Environmental Model Forging Ahead

Qingdao Special Steel takes green as the development background, comprehensively and deeply promotes pollution reduction and carbon reduction, and water-saving work, achieving remarkable results that have attracted widespread attention, demonstrating the exemplary power of the industry's green transformation.

Forward-looking Governance, Carrying out In-depth Environmental Governance

The company has been adhering to the concept of 'ecological priority and sustainable development', vigorously exploring and implementing the new generation of green manufacturing processes, and striving to build a demonstration base for steel enterprises Circular Economy. The company has implemented the full-process environmental frontier technology and technological transformation from coking, sintering, ironmaking, steelmaking to steel rolling, achieving ultra-low emissions for both organized emissions and unorganized emissions, and has built "Class A Enterprises".

Pollution Reduction and Carbon Reduction, Setting an Industry Benchmark

Qingdao Special Steel actively responds to the national 'Dual carbon' strategy, collaboratively promotes pollution reduction and carbon reduction, and becomes one of the first 'pollution reduction and carbon reduction pilot enterprises' in Shandong Province. By optimizing production processes and improving energy utilization efficiency, the company won the first prize of the Shandong Province Circular Economy Science and Technology Award and the Ministry of Industry and Information Technology 'Water Efficiency Leader' honorary title, demonstrating the strength of green technology innovation.



Utilizing Solid Waste to Build a 'waste-free city'

In the process of Green Cleaner Production, Qingdao Special Steel boldly explores new cooperation models, creates a sustainable solid waste treatment center, utilizes solid waste such as dust, iron oxide scale, desulfurization gypsum, and steel slag as production raw materials, and fully realizes productization. Through coordinated management, resource utilization, and reduction treatment, it achieves collaborative disposal, turning waste into treasure.

Energy Utilization Innovation, Drawing a Map of Urban Clean Heating

Qingdao Special Steel has taken solid steps in optimizing the energy structure, fully putting into use the waste heat zero-carbon urban heating system, with annual heating accounting for more than 55% of the western urban area of Huangdao, significantly reducing coal burning and carbon dioxide emissions. At the same time, the company continues to promote the application of clean energy, having built a 58MW photovoltaic power generation project with an annual power generation of about 65 million kWh, and the third phase of the project is being planned.

Technological Innovation, Improving the Level of Energy Conservation and Consumption Reduction

Qingdao Special Steel takes technological innovation as the core driving force of Energy Conservation and Consumption Reduction, applying 5 advanced energy conservation processes and 2 intelligent energy conservation technologies, significantly reducing energy consumption. At the same time, the company has completed the transformation and commissioning of 56 sets of new energy conservation facilities, with energy conservation rates generally reaching more than 10%.

Low-carbon Management, Addressing Global Climate Change

In order to address the challenges of the EU Carbon Border Adjustment Mechanism and the carbon trading in the steel industry, Qingdao Special Steel took the lead in establishing the EATNS carbon management system, becoming the first steel enterprise in Shandong Province to pass the assessment. In 2024, the company released the Hot Rolling wire rod EPD report, helping downstream users in green and low-carbon development.

In the future, Qingdao Special Steel will continue to adhere to the concept of green development, driven by technological innovation, striving to build a green and low-carbon modern steel enterprise, contributing to the industry's green transformation.

Focus 4

Talent Foundation

Cultivating Talents and Passing Them from Generation to Generation

'Talent is the first resource, innovation is the first driving force' is the key force supporting the achievement of corporate strategy and realizing long-term success. Qingdao Special Steel implements the strategy of 'Strengthening the country with talents, revitalizing the enterprise with talents', activating innovative development, promoting the value-added, increasing benefit, and adding motivation of the cadre and talent team.

Qingdao Special Steel Focus on Talents Cultivation, Training and Empowerment Opening a New Chapter

Focusing on the value-added of human resources, the company has deeply carried out training and empowerment activities, successively dispatching hundreds of employees in batches to study and exchange abroad, collecting thousands of innovative improvement suggestions, many of which have been transformed into actual results, creating significant benefits. By conducting various training classes in a hierarchical and classified manner, such as 'Professional Skills Enhancement' and 'Comprehensive Management Improvement,' we further improve the capabilities and qualities of key employees and young reserve talents. An internal expert team is gradually forming, the number of versatile talents continues to increase, and the rate of all employees being certified for their positions is steadily rising, laying a solid talent foundation for the company's sustainable development.

Talent Cultivation Drives Efficiency in Qingdao Special Steel, Post Optimization Enhances Innovation Strength

Focusing on enhancing human resource increase benefit, the company actively promotes post optimization and all-staff innovation, through measures such as optimizing staff and reducing costs, and improving labor productivity, effectively enhancing organizational efficiency. The vigorous metabolism of key personnel ensures the vitality and competitiveness of the enterprise. The cadres can go up and down, which stimulates the vitality of the cadre team. Continuous improvement by all employees has led to strong innovation capability, with the number of innovative suggestions reaching an all-time high. Representative innovation projects have achieved significant efficiency gains, injecting new momentum into the development of the enterprise.

Strong Incentives for Talents in Qingdao Special Steel, Caring and Warming the Heart

Focusing on enhancing employees' internal drive, we comprehensively strengthen employee incentives and care work. By doing practical things and doing good things for employees through heart and affection,the company enhances employees' sense of gain, happiness, and security. The company especially cared for the growth and development of young employees, we implemented the rotation and competitive post mechanism for college student team leaders, providing more promotion opportunities for young employees. By optimizing and upgrading the employee dormitories in Qingdao Special Steel Town, it improved living conditions; organizing youth social activities, helping young employees build happy families. The turnover rate of young employees has significantly decreased compared to the same period last year. At the same time, the company strengthened incentive measures, cumulatively distributing rewards of millions of yuan, sincerely rewarding employees for their outstanding contributions to the company's development. By tailoring income growth plans for key talents, the company fully stimulates employees' enthusiasm for promoting the company and achieving self-fulfillment. We extensively carry out skill operation competitions, quality team evaluations, and rationalization suggestion collection activities, further mobilizing the wisdom and strength of employees. By formulating relevant implementation measures, employee promotion opportunities have become more diverse. Cultural identity gathers strength, propaganda activities are diversified, and corporate culture consensus is further enhanced.



SDGs Response



Environment Section

Key Issues for Response

- Climate Response
Energy Management
Waste Management
Exhaust Gas Emission
Water Resource Management
Resource Utilization
Biodiversity



Addressing Climate Change and Deepening Carbon Reduction	26
Pollution Control and Environmental Protection	32
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Packaging Material, Quantity Reduction and Weight Reduction	48
Biodiversity and Ecological Conservation	49

2024 Highlights

- Passed the review of Cleaner Production and Environment-friendly Enterprise in China's Iron and Steel Industry
Passed the Environmental Performance A-Class Enterprise Reassessment
Successfully Established a 'Zero Waste Factory'
Environmental Protection Integrity Enterprise
Passed EATNS Carbon Management System Certification
The Ministry of Industry and Information Technology 'Water Efficiency Leader' Enterprise

Qingdao Special Steel adheres to the core concept of green and low-carbon development, practices green production and low-carbon living, actively explores green and low-carbon development paths covering the entire production chain, product chain, and industrial chain, and has pioneered a unique sustainable development path of green manufacturing and manufacturing green, contributing Special Steel strength to building a beautiful China.

Addressing Climate Change and Deepening Carbon Reduction

Climate Governance

Qingdao Special Steel actively responds to the national 'Carbon Peak and Carbon Neutrality' action plan, strictly implements the group's 'Dual carbon' work requirements, and has established a 'Dual carbon' work leading group headed by the general manager, responsible for planning, guiding, and coordinating the development of 'Dual carbon' work, which is the decision-making body for the company's 'Dual carbon' advancement work. The leading group has established the 'Dual carbon' work promotion office, which is set up in the Energy and Environmental Protection Department, with the director of the Energy and Environmental Protection Department serving as the office director. The office is responsible for formulating the 'Dual carbon' work implementation plan and schedule, and for supervising and promoting its implementation. All functional departments and branch plants fully implement the company's 'Dual carbon' work.

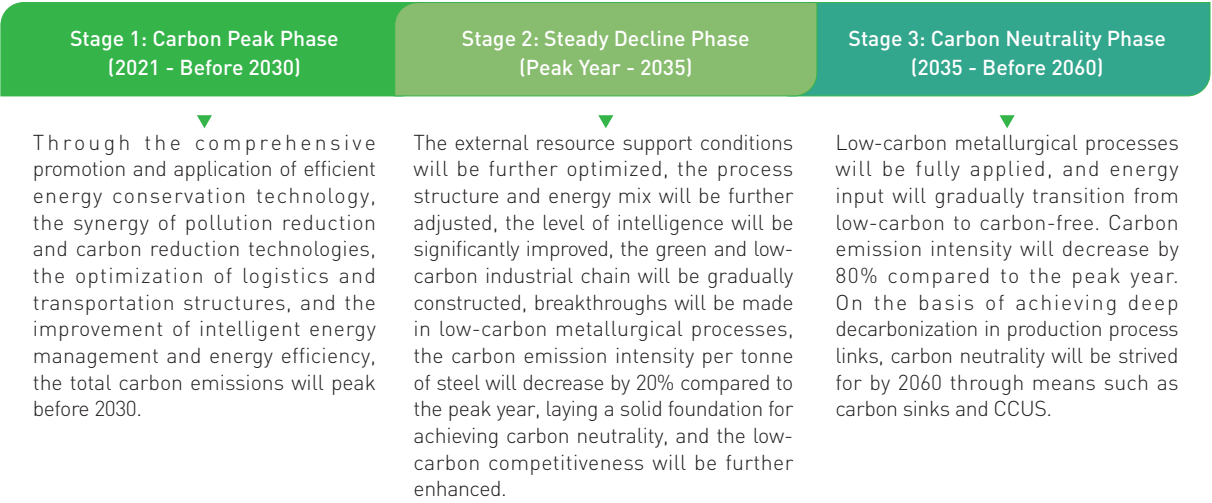
The company adheres to T/CIECCPA 002-2021 'Carbon Management System Requirements and Usage Guidelines,' embracing the concept of lifecycle carbon management. Following the management principle of 'Plan-Do-Check-Act' (PDCA), the company has established a carbon management system encompassing four dimensions: carbon emissions, carbon assets, carbon trading, and carbon neutrality. This system has been awarded the EATNS Carbon Management System Certificate by the Shanghai Environment Exchange, making it the first steel enterprise in Shandong Province to achieve carbon management system certification.

Climate Strategy

Qingdao Special Steel follows the 'CITIC Pacific Special Steel Group Co., Ltd. Low-Carbon Roadmap' and has set the 'Dual carbon' goal of 'achieving carbon peak by 2030 and striving to achieve carbon neutrality by 2060.'



Carbon Management System Certificate



Risk and Opportunity Identification

Climate change is one of the most severe challenges facing humanity in the 21st century. Qingdao Special Steel attaches great importance to the direct or indirect impacts of climate change on production operations and finances. Based on its own operational conditions and in compliance with laws and regulations, the company assesses the risks and opportunities brought by climate change, identifying relevant risks that may have a substantial financial or strategic impact on the company's business.

Risk Type		Financial / Strategic Impact
Physical Risk	Acute Risk	The company is located along the Yellow Sea coast and is prone to typhoon attacks. The increasing frequency of global extreme weather events may lead to impairment or loss of physical assets, as well as other potential economic losses.
	Chronic Risk	Impacts of extreme temperatures, rising sea levels, and changes in temperature and rainfall.
Transformation Risk	Policies and Laws & Regulations	With the continuous advancement of the Ultra-low Emissions policy in the steel industry, environmental, energy, and low-carbon related laws and regulations are becoming increasingly stringent. The company will face rising carbon prices and carbon compliance costs, restrictions on coal use due to energy transition policies, and the suppression of exports by foreign 'carbon tariffs' or other green trade barriers, such as those in the EU, leading to increased investment, operational, and export costs, and reduced profits.
	Technology and Cost	In the process of low-carbon transformation, the company's application of renewable energy, new energy, and other energy conservation environmental technologies, as well as its investment in low-carbon smelting technologies, will lead to increased R&D costs and the risk of value loss in existing fixed assets.
	Market	Under the trend of green and low-carbon development, market demand for green and low-carbon emission steel will significantly increase, and competition will become more intense. If the company's green transformation process is slow, it may result in a reduction in market share.
	Reputation	The concerns of stakeholders and the public regarding the company's Climate Response initiatives may bring reputational risks to the company's operations.

Climate change has a profound impact on the production and operation of enterprises and also brings corresponding opportunities for sustainable development. By analyzing the industry and market environment, combined with its own conditions and strategic layout, the company has identified the following opportunities:

Products and Services: By researching and innovatively developing green and low-carbon products with high performance, lightweight, long lifespan, near-net shape, and recyclability, the company aims to meet the market and customer demand for low-carbon emission products and services.

Resource Efficiency: By optimizing production processes, fully utilizing waste heat and energy, and other measures, the company will continuously improve resource and energy use efficiency, promote energy conservation and emission reduction, and reduce operating costs.

Energy Sources: The company will gradually increase the proportion of clean energy and low-carbon energy such as photovoltaic power generation, research the application of energy storage technologies, purchase green electricity, continuously optimize the energy structure, to build a new green energy landscape, helping the company reduce energy costs and compliance costs, and supporting low-carbon development.

Greenhouse Gas Emissions

In recent years, Qingdao Special Steel has particularly strengthened the management of carbon emission sources and actively implemented energy-conservation and carbon-reduction measures, resulting in a year-on-year decrease in greenhouse gas emissions. In accordance with the guidelines for carbon emission accounting in the steel industry, JJF (Lu) 159-2023 'Specifications for Carbon Emission Measurement Review of Key Emission Units,' and JJF (Lu) 143-2022 'Technical Specifications for the Allocation and Management of Carbon Emission Measurement Instruments in Enterprises,' the company has screened emission sources, accounted for, measured, and managed carbon emissions based on factors. In 2024, the carbon dioxide emissions (Scope 1 + Scope 2) were approximately 7.2077 million tonnes of CO₂ equivalent, with an emission intensity of 1.616 tCO₂ per tonne of product, a decrease of 0.25% compared to 2023.

Metrics	Unit	2022	2023	2024
Greenhouse Gas Emissions (Scope 1)	Tonne of CO ₂ equivalent	6,301,475	6,651,955	6,089,484.45
Greenhouse Gas Emissions (Scope 2)	Tonne of CO ₂ equivalent	1,013,860	1,161,454	1,118,208.79
Greenhouse Gas Emissions (Scope 1 and Scope 2)	Tonne of CO ₂ equivalent	7,074,533	7,160,919	7,207,693.24
Total Greenhouse Gas Emissions per Unit Energy Consumption (Scope 1 and Scope 2)	Tonne of CO ₂ equivalent/ Tonne of product	1.79	1.62	1.616

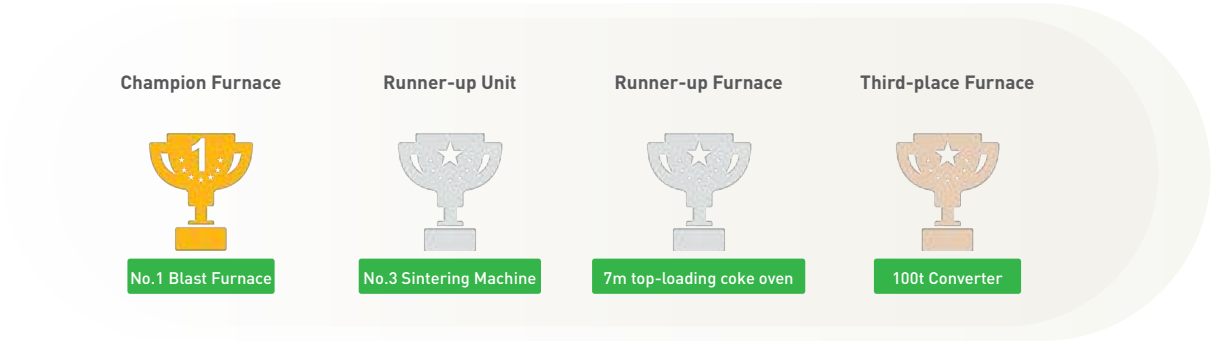
Carbon Reduction Practices

In recent years, Qingdao Special Steel has fully implemented the new development philosophy, actively explored paths and effective models for the coordinated governance of pollution reduction and carbon reduction, and made breakthroughs in collaborative innovation policies, paths, and technologies. During the reporting period, the company was successfully selected as one of the first batch of 'Pilot Projects for Coordinated Innovation in Pollution Reduction and Carbon Reduction' in Shandong Province. A leadership group for the pilot project was established, with the general manager serving as the leader, responsible for supervising, guiding, and coordinating the implementation of the pilot project. A working group was set up under the leadership group to organize and implement the pilot project.

Process Carbon Reduction

Qingdao Special Steel has continuously introduced and applied a series of cutting-edge energy conservation technologies, including the Blast Furnace desalinated water closed-loop circulation system, the Sintering main exhaust fan steam-electric dual-drive upgrading, the smooth operation of the 'ironmaking blast furnace seamlessly connected with the hot metal ladle and converter' technology, the intelligent 'one-key desulfurization operating system' of the desulfurization station, the Converter 'one-key Steelmaking' efficient operation, and the convenient function of 'one-key casting' of continuous casting, etc., to achieve process optimization, while reducing energy consumption and carbon dioxide emissions. In 2024, the company applied 27 energy conservation technologies, and the annual energy conservation benefits exceeded 70 million yuan, reducing carbon dioxide emissions by 130,000 tonnes.

During the reporting period, the company's No.1 Blast Furnace won the title of 'Champion Furnace' in the 2024 Shandong Province Iron and Steel Industry energy conservation emission reduction Green Development Benchmarking Competition, the No.3 Sintering machine won the title of 'Runner-up Unit', the 7m top-loading coke oven and the 100t Converter won the titles of 'Runner-up Furnace' and 'Third-place Furnace' respectively.



Technology for Carbon Reduction

Qingdao Special Steel independently developed high-end special steel wire online salt bath isothermal heat treatment technology and rolling with one heating technology to support carbon reduction across the entire industrial chain, while actively exploring low-carbon smelting technologies such as hydrogen-based shaft furnaces.

High-end special steel wire online salt bath isothermal heat treatment technology. The independently innovated and developed online salt bath isothermal heat treatment technology for steel, combined with optimized design of material chemical composition, achieves precise control of microstructure through meticulous process parameter control. It utilizes heat treatment to realize the ultimate performance of materials, 'tailor-making' the performance of steel materials for customers, and effectively reduces the usage of precious metal elements while achieving high performance of materials, thus realizing the economical production of steel materials. Meanwhile, the project has developed harmless waste gas treatment and saline water recycling technology and equipment based on the characteristics of salt bath heat treatment process, ensuring that the entire production process has no solid, liquid, or gaseous pollutant emissions, truly achieving environmentally friendly production. This technology features a simple and efficient process, stable temperature control, and low CO₂ emissions. Taking ultra-high-strength bridge cables as an example, the entire process reduces CO₂ emissions by 504 kilograms per tonne of steel. The products have been supplied to more than twenty wire deep processing enterprises such as Fasten, Baozelong, and Bekaert, and have been applied in more than ten large-span bridges, the Xiongshang High-speed Railway, and other major projects, as well as in high-end manufacturing fields such as automobiles and high-speed rail locomotives. It has addressed the needs of national major projects, broken through international technological blockades, and achieved a leap-forward from 'following' to 'leading'. This technology won the first prize of the 2024 Metallurgical Science and Technology Award.

The rolling with one heating technology. As the main component of the automobile suspension system, the suspension spring undertakes the important task of supporting the vehicle body, and is required to ensure that the vehicle can maintain a stable height and posture under different load conditions. Therefore, high requirements are put forward for the strength, elasticity, and fatigue resistance of the suspension spring.

The energy conservation type 2000MPa grade suspension spring 55SiCr wire rod key production technologies were independently developed by Qingdao Special Steel. Through the plasticization control technology of inclusions, the optimization of the density of continuous casting billets, the mechanism simulation and industrial control and application of the decarburization layer, and the 'self-breaking' control technology of high-strength steel wire, key production technologies have made key breakthroughs in purity, low magnification of continuous casting billets, and decarburization layer, developed a 2000MPa grade suspension spring 55SiCr Hot Rolling Wire Rod, the steel wire produced from this wire rod has a strength of 1950-2050MPa, a reduction of area $\geq 40\%$, and the fatigue life of the finished spring $\geq 300,000$ times. At the same time, this technological achievement has realized the cancellation of the addition of microalloy elements, reduced the heating and rolling process of the billet, and helped the country's 'Dual carbon' policy to be implemented and the industry's energy conservation and carbon reduction needs. This technology was appraised as 'internationally advanced' by the Shandong Steel Association's scientific and technological achievements.

Collaborative Carbon Reduction,

The company, together with the West Coast Heating Group, jointly promoted the zero-carbon urban heating project of waste heat, relying on the regional urban thermal interconnection pipeline network, and converted the waste heat resources in the plant area into energy transmission sources through energy conservation technology, with an annual heat supply of 3 million GJ, reducing local heating coal consumption by 117,000 tonnes, reducing carbon dioxide emissions by 270,000 tonnes, and helping to improve the urban energy structure and sustainable development.



The application project of zero-carbon city heating system with composite waste heat from steel enterprises has been fully put into use

Case

Qingdao Special Steel and West Coast Public Utilities Group have formed a strong partnership, investing 200 million yuan in implementing a zero-carbon city heating project using waste heat. The project effectively utilizes low-grade waste heat and energy from Qingdao Special Steel to provide heating to the society. The main heat source is the waste heat from power generation condensate water, supplemented by the waste heat from Blast Furnace slag flushing water, Sintering flue gas, and coke oven gas primary cooler. The design process fully adheres to the principle of 'efficient recovery and cascade utilization', heating the city's heating return water to above 60 °C and delivering it to the municipal heating network through the heat exchange station.

After the project is put into use, the annual heat supply can reach 3 million GJ, accounting for more than 55% of the heating supply in the western urban area of Huangdao. It can reduce local coal consumption for heating by 117,000 tonnes annually and reduce carbon dioxide emissions by 270,000 tonnes. The cumulative heat supply in 2024 will be 850,000 GJ.

The successful application of this system in Qingdao Special Steel helps improve the city's energy structure, aligns with the national Circular Economy and sustainable development strategies, and complies with national industrial policy guidance, opening up a new path for comprehensive utilization of thermal energy.



Green Product

Qingdao Special Steel is committed to developing green and low-carbon products with characteristics such as high performance, lightweight, long life, near-net shape, and recyclability. The company actively discloses environmental performance information throughout the product lifecycle and has successfully released an Environmental Product Declaration (EPD) report for hot-rolled wire rods, supporting downstream users in their green and low-carbon development.

Steel cord and tire wire strand: The greater the strength of steel products, the less steel is used by downstream enterprises to manufacture goods of the same strength, especially for tire and automobile manufacturing. Using lightweight steel cord and tire wire strand, the manufactured cars are more energy conservation.

Welding steel: Qingdao Special Steel continues to innovate in the research and production of special welding steel, forming a relatively complete system of special welding steel including high-strength, heat-resistant, corrosion-resistant, and weathering-resistant types. It is widely used in automobiles, high-speed railways, marine engineering, pipelines, pressure vessels, and other fields, with annual sales exceeding 80,000 tonnes and a market share of 50%, ranking first domestically and deeply trusted by domestic and foreign customers. The products have been successfully applied to national key projects such as the Bird's Nest, the Hong Kong-Zhuhai-Macao Bridge, and the West-East Gas Pipeline.

Lightweight, fatigue-resistant ultra-high and extra-high strength steel cord wire rod: The company has successfully developed and mass-produced ultra-high and extra-high strength steel cord wire rods that meet lightweight and fatigue-resistant performance requirements, with tensile strength reaching 4000MPa grade and above.

2200MPa grade and above prestressed steel strand for railways: High-strength prestressed steel strands have the characteristics of safety, lightweight, and economy. The company has successfully developed 2200MPa grade railway prestressed steel strand air-cooled (DP) wire rod, providing strong support for the promotion and application of 2200MPa grade and above prestressed steel strands, accelerating the upgrading of prestressed steel strand products, and helping the steel industry move towards green and high-quality development.

Ultra-high-strength bridge cable wire rods: The company has successfully developed heat-treatment-free ultra-high-strength (1960MPa-2100MPa) bridge cable wire rods. Through precise alloy composition adjustment and innovative optimization of controlled rolling and cooling processes, the wire rods exhibit excellent high-strength plasticity in the hot rolling state, eliminating the need for subsequent heat treatment. This reduces energy consumption and carbon emissions from the source, significantly shortens the production cycle, and improves production efficiency. At the same time, the high strength, fatigue resistance, and good plasticity of the wire rods effectively enhance the fatigue resistance and service life of the cables. The products have been successfully applied to the Nansha Bridge, Yangsigang Yangtze River Bridge, Shanghe-Hangzhou Bridge, Shanghai-Suzhou-Nantong Yangtze River Bridge, Lingdingyang Bridge of the Shenzhen-Zhongshan Link, and the Huajiang Canyon Bridge of Liuzhi-Anlong Expressway.



Shanghai-Suzhou-Nantong Yangtze River Bridge (2000MPa grade)



Ma'anshan Highway-Rail Dual-Purpose Yangtze River Bridge of Chaoma Railway (2100MPa grade)



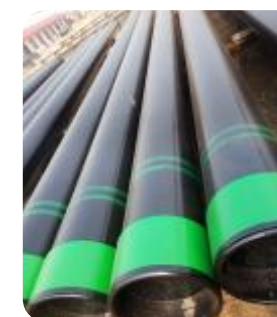
Yanji Yangtze River Bridge (2100MPa grade)



The world's highest bridge — Huajiang Gorge Bridge of Liuzhi-Anlong Expressway

Anti-collapse and anti-hydrogen sulfide corrosion 110-grade high-strength oil casing round billet: A steel for pipes with high strength, high toughness, and excellent anti-hydrogen sulfide corrosion performance, widely used in the extraction of complex oil and gas wells in hydrogen sulfide corrosive environments.

10.9-grade high-strength weathering-resistant bolt hot rolling round steel: Designed for the actual service environment of the Sichuan-Tibet Railway, it is applied to key parts such as tunnels and bridges in special service environments.



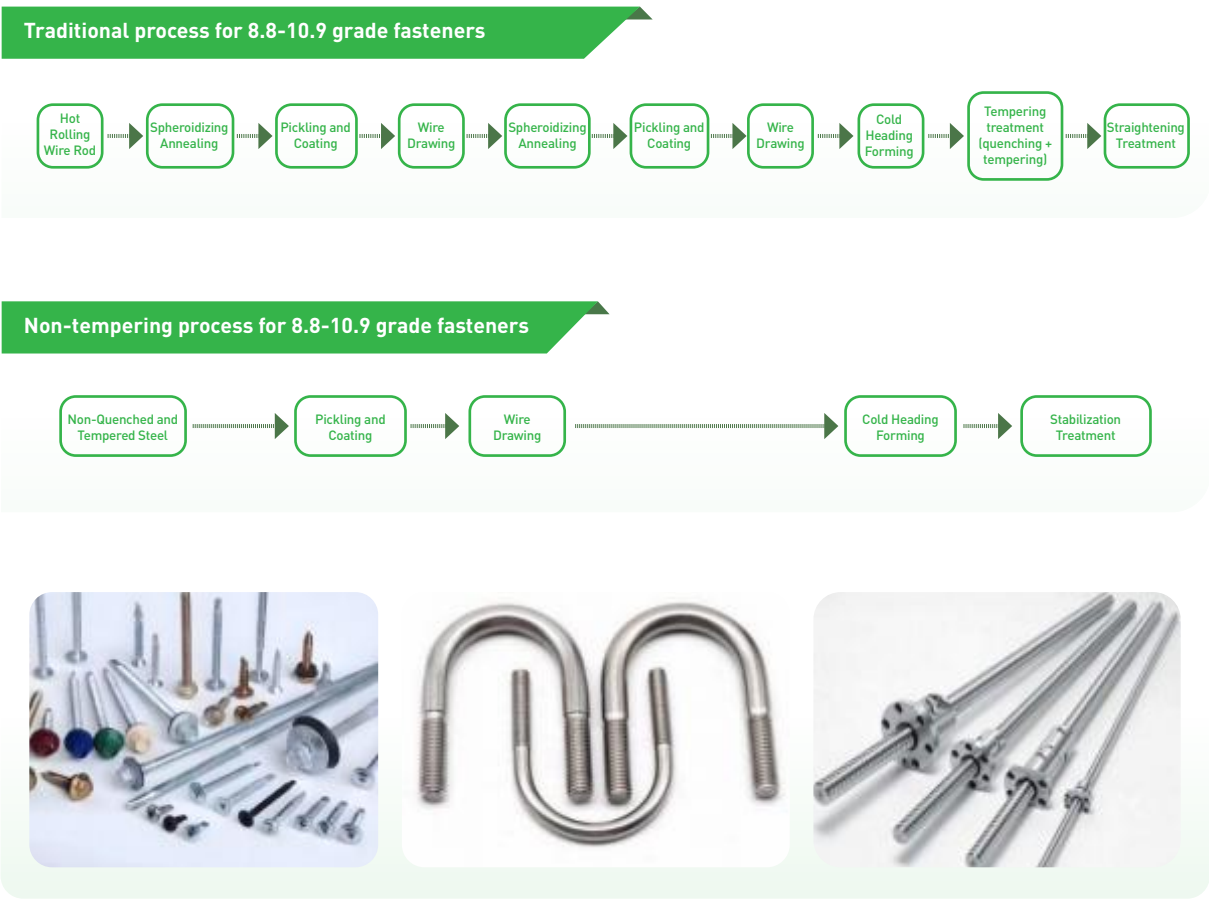
Large-size weathering-resistant bolts: The large-size weathering-resistant bolt steel jointly developed by Qingdao Special Steel and the China Academy of Railway Sciences, designed for the actual service environment of the Sichuan-Tibet Railway, proposes technical routes to improve the hydrogen-induced delayed fracture resistance and corrosion resistance of high-strength bolts, forming the Sichuan-Tibet Railway Suspension Bridge Steel Structure Durability Design Guide and Maintenance Manual, achieving a durability improvement of more than 20% for steel structure bridges.

High-strength spring flat steel: Qingdao Special Steel has innovatively developed new high-strength spring flat steel products with strengths of 1600MPa, 1700MPa, and 1800MPa based on market demand. These products have achieved mass production and are used for processing fewer-leaf spring products, truly realizing vehicle lightweighting. Compared to multi-leaf springs, the weight of fewer-leaf spring products is reduced by 30% to 50%, and carbon emissions are decreased by at least 0.6%.



Non-quenched and tempered steel: By adding trace amounts of alloy elements such as vanadium (V), niobium (Nb), and titanium (Ti) to the steel, non-quenched and tempered steel improves the mechanical properties of the material, replacing quenched and tempered steel. This eliminates the need for downstream customers to perform tempering, reducing carbon emissions by 10% to 15%. It also reduces post-tempering bending, eliminates the straightening process, improves production efficiency, and provides green, low-carbon material support for the steel industry to achieve carbon neutrality and peak carbon emissions.

Bainitic non-quenched and tempered steel: Qingdao Special Steel has developed 8.8-10.9 grade non-quenched and tempered fastener steel using its unique online QM salt bath heat treatment equipment, leveraging the high strength and plasticity of bainitic microstructure. These products are used in truck U-bolts, car seat screws, long rod flange hex bolts, and car ball joint tie rods, and have been successfully applied in major OEMs and well-known component manufacturers.



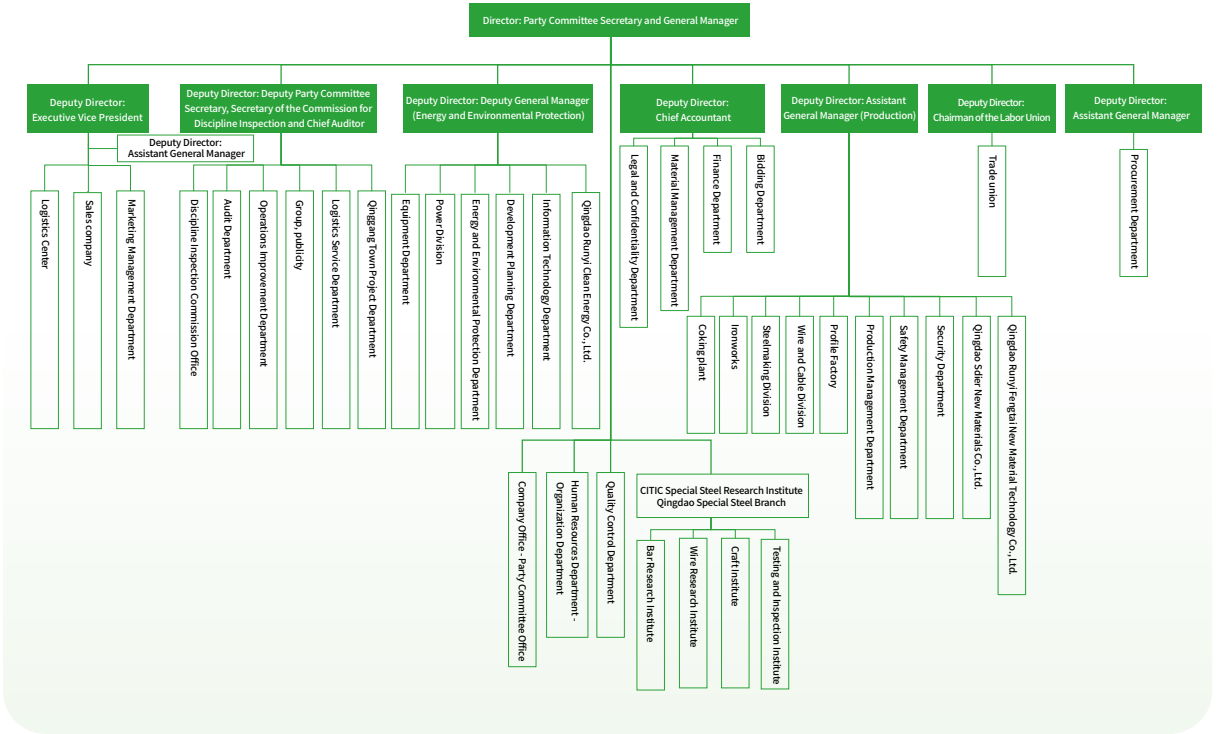
Pollution Control and Environmental Protection

Environmental Management

Qingdao Special Steel strictly adheres to the 'Environmental Protection Law of the People's Republic of China' and the 'Emergency Management Measures for Sudden Environmental Incidents' and other laws and regulations. The company has formulated 21 management measures and systems, including the 'Environmental Protection Responsibility System,' 'Cleaner Production Management System,' 'Environmental Protection Management Regulations for Construction Projects,' 'Supervision and Management Measures for Environmental Protection Facilities,' 'Supervision and Management Measures for Hazardous Waste,' and 'Environmental Supervision Management Measures.' These are revised and improved annually based on their implementation.

Management System

The company has established an Environmental Protection Committee, with the Party Committee Secretary and General Manager serving as the director of the committee, and the Executive Vice President and the Vice President in charge of energy and environmental protection serving as duty directors. The permanent office is the Energy and Environmental Protection Department. The Energy and Environmental Protection Department has an Environmental Management Section responsible for daily environmental management, including the 'Three Simultaneities' of construction projects, in-depth pollution source management, operation of the environmental management system, supervision and inspection of environmental facilities and pollution sources, hazardous waste management, radioactive source management, environmental statistics, and environmental tax accounting and payment. The Energy and Environmental Protection Department also has an Environmental Supervision Section responsible for on-site environmental hidden trouble problems supervision, inspection, and rectification. Each production plant and relevant functional department also has environmental protection personnel responsible for internal environmental protection-related work.



Organizational chart of the Environmental Protection Committee

The company has established and implemented an environmental management system that complies with the 'Environmental Management Systems—Requirements with Guidance for Use' (GB/T 24001-2016) and ISO 14001 environmental management system requirements, and has obtained certification with a certification rate of 100%. Every year, a third party is hired to conduct an external audit of the company's environmental management system to confirm that the environmental management system is correctly and effectively implemented, ensuring continuous improvement and refinement of the organization's environmental management system.



Environmental Management System Certificate

Third-party audit of the environmental management system

Input and Performance

The company continues to deepen environmental governance, investing 800 million yuan in 2024 to implement a series of pollution control projects. The company cumulatively met the on-site inspections and guidance from the ecological environment authorities for 35 times, with no environmental pollution incidents or penalties throughout the year, successfully maintaining the environmental red line, and smoothly passing the annual review of Qingdao Special Steel and lime kiln dual A-level enterprises, being rated as an environmental protection integrity enterprise. The company's pollutant discharge compliance rate, environmental protection facilities and main production equipment synchronization rate, exhaust gas emission qualification rate, solid waste and hazardous waste compliant disposal rate, and emergency plan drill plan implementation completion rate all reached 100%. The total pollutant emissions meet the requirements of the pollutant discharge permit indicators.

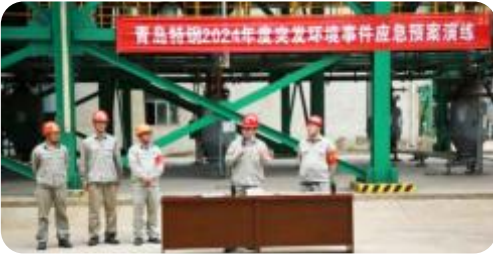


Environmental Risk and Emergency Plan

Qingdao Special Steel follows relevant laws and regulations, regularly conducts environmental risk assessments, and has formulated environmental management systems and methods such as the 'Emergency Management Regulations for Sudden Environmental Events' and the 'Emergency Management System for Sudden Events'. The company annually formulates a comprehensive emergency plan for sudden environmental events and conducts drills according to the plan, continuously strengthening the company's emergency response capability for sudden environmental events and improving emergency response levels.

Environmental Risk	Countermeasures
Ammonia Water Leakage	Reinforced concrete cofferdams are used around the ammonia water storage tank; industrial water spray pipelines and nozzles are installed above and around the storage tank. We formulated an emergency plan for ammonia water leakage risk accidents.
Crude Benzene and Tar Leakage	The oil storage unit in the coke oven gas purification operation area is surrounded by cofferdams, and the effective volume of the tank area cofferdam meets the storage capacity of the largest single storage tank, ensuring that hazardous chemical leakage materials are within the tank area and will not leak out.
Hazardous Waste Leakage	2 hazardous waste temporary storage warehouses have been built, all with anti-leakage floors, equipped with cofferdams, diversion channels, emergency pools, portable fire extinguishers, and cart-type fire extinguishers, and respectively equipped with activated carbon odor control facilities and acid mist purification towers. We formulated an emergency plan for hazardous waste leakage risk accidents.
Failure of Waste Gas Treatment Facilities	The company has developed an emergency plan for the risk of gas leakage, fire, and explosion.
Gas Leakage, Fire, Explosion	The company has developed an emergency plan for the risk of failure of waste gas treatment facilities.
Failure of Wastewater Treatment Facilities	The company has constructed accident pools for wastewater treatment, temporary storage pools for surplus wastewater, accident fire water pools, emergency water pools, etc. The capacity of the emergency pools can ensure that all contaminated initial rainwater, fire water, and leaks are connected to the emergency pools through the drainage system or fully collected, and transported to the wastewater treatment facilities of the contracted unit (Suez) through internal pipelines for treatment. The company developed an emergency plan for the risk of failure of wastewater treatment facilities.

In 2024, the company organized and completed 17 emergency drills, including comprehensive on-site drills for the company-level sudden environmental incident emergency plan, special emergency drills for hazardous waste, radiation accident emergency drills, and heavy pollution weather emergency response drills. These included emergency drills for crude benzene leakage, chemical production area wastewater leakage, heavy pollution weather emergency response, and special emergency drills for hazardous waste. Additionally, 13 emergency drills were conducted at the plant and subsidiary levels.



Actively carry out emergency plan drills for sudden environmental events

Case

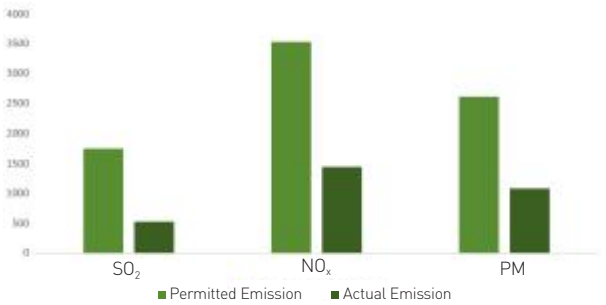
In June 2024, Qingdao Special Steel conducted an on-site emergency drill for environmental incidents, with Vice General Manager Wang Haibo serving as the overall emergency commander. Emergency personnel from the Energy and Environmental Protection Department, Production Control Center, Power Plant, Ironmaking Plant, and environmental facility maintenance contractors participated in the drill. This effectively enhanced the organizational and coordination capabilities of the company's emergency command system, significantly improved the adaptability of emergency rescue personnel in handling unexpected incidents, and promoted the continuous improvement and efficient operation of the company's emergency management system.



Pollution Control

At the beginning of the relocation and construction of Qingdao Special Steel, the design and construction were carried out in accordance with the requirements of the 'Opinions on Promoting the Implementation of Ultra-Low Emissions in the Steel Industry' [Document No.35 (2019) of Air Pollution of Ministry of Ecology and Environment] issued by the Ministry of Ecology and Environment. In the process of relocation and construction, a cumulative investment of 2.8 billion yuan was made in the construction of environmental protection facilities, followed by an additional investment of 1.4 billion yuan, comprehensively carrying out ultra-low emission transformation across all processes from coking, sintering, ironmaking, steelmaking, rolling to clean transportation. In 2021, the company fully met the ultra-low emission requirements, with the pollutant emissions per ton of steel reaching the level of the first-level clean production indicators. The company passed the full-process ultra-low emission acceptance and publicity by the China Iron and Steel Association, and in 2022, we passed the A-level enterprise review of the long-process steel performance rating, and in 2024, we passed the re-evaluation.

In 2024, the emissions of sulfur dioxide, nitrogen oxides and soot (particulate matter) in the steel production process of the company are 529.7 tonnes, 1,440.1 tonnes and 1,083.5 tonnes, respectively, all within the pollutant discharge permit range.



Organized Emissions

The company actively applies Cleaner Production technology to carry out equipment modification and upgrading, and controls the production and discharge of waste gas and pollutants. The coke oven flue gas adopts the integrated activated coke desulfurization and denitrification technology, achieving a denitrification efficiency of $\geq 88\%$ and a desulfurization efficiency of $\geq 90\%$. The Sintering machine head flue gas enters the machine head four-field electrostatic precipitator for dust removal, and is treated through denitrification (SCR), desulfurization (limestone-gypsum method, circulating fluidized bed method), and deep dust removal. In the coke oven gas fine desulfurization project, microcrystalline adsorption technology is applied. The total sulfur content of the purified coke oven gas is $\leq 5 \text{ mg/m}^3$, ensuring that the SO_2 concentration of the flue gas emitted after using the Steel Rolling process is far lower than the Ultra-low Emissions requirements.

During the reporting period, the company completed the Coking plant desulfurization tower upgrading project of the desulfurization tower in the coking plant, which improved the ability to control the source of waste gas emission and further reduced the risk of excessive pollutant emission by coke oven gas users. The No.1 Converter Steelmaking Plant high-span new top suction dust removal environmental protection upgrading project was completed in No.1 Steelmaking Plant, solving the problem of splashing and escaping smoke during iron charging and scrap steel addition, ensuring effective capture of smoke escaping during the Converter blowing process, and effectively reducing adverse impacts on the external environment. We completed the replacement of SCR denitrification catalysts for No.1 and No.2 Sintering machines, ensuring the efficient and stable operation of environmental protection facilities.



Blast Furnace ore tank bag dust removal system



Secondary dust removal system in No.2 Steelmaking Plant



Fine desulfurization system

The Sintering process equipped with desulfurization and denitrification

Case

The sintering process uses low-sulfur raw materials and fuels, is equipped with flue gas desulfurization and denitrification facilities, and employs high chimney emissions to control the concentration and emission of dust, sulfur dioxide, nitrogen dioxide, fluoride, dioxins, and lead compounds in the flue gas. The production process is equipped with 2 limestone-gypsum wet flue gas desulfurization units, 1 circulating fluidized bed desulfurization facility, 3 SCR denitrification systems, 3 electrostatic precipitators, and 10 large bag filter facilities.



Coking plant desulfurization tower upgrading project

Case

The company completed the upgrade and renovation project of the desulfurization tower at the coking plant, adding one desulfurization tower, equipped with two desulfurization liquid circulation pumps, and carried out corresponding modifications to the gas pipelines and valves behind the tower, achieving a series connection of 4 towers, further enhancing the desulfurization effect of coke oven gas. In the case of maintenance and repair of a single desulfurization tower, it ensures the operation of three desulfurization towers together, ensuring the gas index $\text{H}_2\text{S} \leq 20 \text{ mg/Nm}^3$, improving the source control capability of waste gas emissions, and further reducing the risk of excessive pollutant emissions from coke oven gas users.



Unorganized Emissions

The company built 4 fully enclosed raw material sheds, 26 enclosed coal storage silos, and 6 enclosed coke storage silos, achieving 'materials without seeing materials', ensuring that uncontrollable emissions/unorganized emissions control is in place. Simultaneously, the Blast Furnace bunker, Steelmaking workshop, etc., is fully enclosed, and the Steelmaking workshop is equipped with a roof hood and tertiary dust removal facilities; the Blast Furnace tapping platform is enclosed, and the iron trough and slagging channel are covered. The company uses tanker trucks for the transportation of powdered lime, pneumatic ash conveying and tanker trucks for dust transportation, and fully enclosed belt corridors for the transportation of bulk materials. The roads in the plant area are hardened, and measures such as sweeping and watering are taken to maintain cleanliness.



Raw material yard



Coking coal storage silo

The company is building an integrated platform for environmental management, control, and treatment, incorporating all unorganized emission sources across the entire plant area. It is equipped with an eagle-eye fog cannon linkage system to achieve intelligent monitoring and precise dust and pollution control.



Eagle-eye fog cannon linkage system



Ultra-low emissions control platform

Clean Transportation

The bulk materials entering and products leaving the Qingdao Special Steel plant are mainly transported by rail, water, belt, and truck, with the clean transportation ratio maintained above 80%, meeting the clean transportation requirements for bulk materials and products.

Leveraging its port advantage, the company has collaborated with surrounding enterprises to build a 10-kilometer cross-sea unloading belt project, transporting raw materials such as iron ore directly from the port to the enclosed raw material yard in the plant area via a fully enclosed belt corridor.

The company invested 270 million yuan to build a wagon tipper and a fully enclosed coal transportation belt corridor, achieving clean transportation of coal and coke directly into the plant. All vehicles transporting bulk materials, products, and by-products in and out of the factory adopt the China VI emission standard or new energy, with a cumulative purchase of 120 new energy transport vehicles, achieving clean short-distance transportation inside and outside the plant, further reducing fuel consumption, and jointly promoting green and clean development.



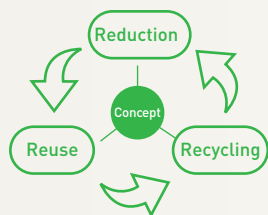
Cross-sea belt corridor



Clean energy vehicles

➤ Solid Waste

Qingdao Special Steel aims at 'no solid waste leaving the factory' and has formulated management measures and systems such as the 'Solid Waste Management Regulations', 'Hazardous Waste Recycling Management Regulations', and 'Hazardous Waste Supervision and Management Measures'. The company adheres to the concept of 'reduce, reuse, recycle', follows the processing principle of 'internal first, external second, short-process cycle', extends the industrial chain, enhances the added value of solid waste, and has been awarded the honorary titles of the first batch of 'Zero Waste Factory' in Qingdao City and 'Zero Waste Factory' in Shandong Province.



'Zero Waste Factory' in Shandong Province.



The first batch of 'Zero Waste Factory' in Qingdao City.



In 2024, the company generated a total of 3.5748 million tonnes of solid waste, with a 100% compliance disposal rate and a recycling rate of 99.99%. The amount of non-hazardous solid waste generated was 3.5698 million tonnes, achieving 100% recycling, of which 1.706 million tonnes were returned to production, accounting for 47.9%.

Generated **3.5748** million tonnes of solid waste
Compliance disposal rate **100%**
Recycling rate **99.99%**

The amount of harmless solid waste generated is **3.5698** million tonnes

Achieve **100%** recycling

The amount returned to production utilization is **1.706** million tonnes

Proportion **47.9%**

Strengthen Whole-Process Management

The company fully implements Cleaner Production, promotes source reduction, adopts advanced production processes and equipment, and achieves a reduction in industrial solid waste generation per unit product. The company practice resource utilization and implement the requirements of harmless disposal. Solid waste that can be recycled within the factory should be fully collected to improve the internal recycling rate. Solid waste that needs to be outsourced must be entrusted to units with corresponding utilization capabilities and qualifications, legally sign contracts, and specify pollution prevention requirements in the contracts to ensure compliant utilization of solid waste, gradually improving the comprehensive utilization rate of solid waste.



Promote Recycling

The general industrial solid waste generated by the company mainly includes Blast Furnace slag, steel slag, dust, iron oxide scale, desulfurization by-products, scrap, waste refractory materials, etc. By optimizing the use of raw materials, energy, and other resources, and improving process technology, we achieve source reduction in industrial solid waste production. At the same time, Qingdao Special Steel strengthen lean management, achieve high-value and efficient utilization of solid waste through resource treatment of Blast Furnace slag, dust, and other bulk solid waste.



Resource return to production process utilization. The company invested 76 million yuan to build a solid slag processing line, processing steel slag through crushing, screening, rod milling, magnetic separation, and other processes into products with high iron content such as granular steel, granular iron, iron concentrate, and scrap iron, which are returned to the Converter as raw materials for utilization. We invested 25 million yuan to build a comprehensive utilization workshop for dust, processing Steelmaking primary fine ash and primary coarse ash, Blast Furnace gravity ash and bag ash, iron oxide scale, and other solid waste into cold-pressed pellets, which are returned to the converter as raw materials.



Steel slag 'turning waste into treasure'. A large amount of steel slag generated daily by the company is screened and recycled within the plant area. The remaining low-grade tailings are processed by Qingdao Shenfei Anda Environmental Materials Co., Ltd., and made into permeable bricks, cement, and other building materials, achieving 100% 'turning waste into treasure' and ensuring the realization of the transformation and disposal on the same day.



Steel slag storage



Solid waste storage

Qingdao Special Steel and Shenfei Anda establish a sustainable solid waste treatment center

Qingdao Special Steel collaborates with Shenfei Anda to establish a sustainable solid waste treatment center, investing 190 million yuan to build a slag powder production line. The center processes Blast Furnace slag and desulfurization by-products into slag powder, and steel slag into steel slag composite powder. The slag powder and steel slag composite powder are used as substitutes for cement in high-grade concrete to improve performance and reduce costs. At the same time, waste refractory materials are processed into grids and tundish covers through grid production lines and tundish cover production lines. The grids and tundish covers are then returned to the Special Steel Steelmaking process for reuse, achieving circular utilization. All materials are transported using new energy vehicles, ensuring effective supervision during transportation and reducing exhaust pollution from fuel vehicles, contributing to carbon reduction.



Case

Hazardous Waste

The hazardous or dangerous waste generated by Qingdao Special Steel mainly includes waste oil, waste paint buckets, waste iron oil drums, and biochemical sludge from the phenol-cyanide wastewater station. The company strictly complies with laws, regulations, and relevant standards for the storage of hazardous waste. For waste that can be returned to production, the company collects as much as possible, while the rest is entrusted to qualified third parties for compliant disposal.

Ensuring risks controlled. The company has installed volatile organic compound treatment facilities in the hazardous waste storage area, completed the video surveillance network connection for the hazardous waste temporary storage, and conducts regular on-site inspections of the disposal process and temporary storage and transfer to ensure that the risks in the hazardous waste disposal process are controlled.

Return to production for reuse. The biochemical sludge from the phenol-cyanide wastewater station, tar residue, regenerator residue, and desulfurization waste liquid are returned to the Coking process for utilization; activated coke powder and waste activated carbon are returned to the Sintering batching process for utilization; waste iron oil drums are returned to the Steelmaking process for utilization after oil control and briquetting. In 2024, 4737.55 tonnes of hazardous waste were returned to production for reuse, accounting for 94.98% of the total hazardous waste generated.

100% compliant disposal. While maximizing the return to production for reuse, other hazardous wastes such as waste iron oil drums, waste oil, waste paint drums, and waste lead-acid batteries are 100% entrusted to qualified third-party units for compliant disposal.

Implementation of the tar slag drying treatment project

The company invested 3.38 million yuan to implement the tar slag drying treatment project, which involves the dry treatment of tar slag generated from the mechanical ammonia water separation tank in the coke oven gas purification and condensation blast section. The process uses a centrifuge to separate dry slag and an oil-water mixture. The dry slag is directly used for coal blending, while the oil-water mixture is returned to the mechanical slag scraping tank for recycling. This achieved deep separation and recovery of tar slag, reduced the moisture content of tar slag to below 20%, decreased the amount of tar slag generated, lowered the environmental risks during transportation, and improved the surrounding environmental quality.



Case

Cleaner Production

Qingdao Special Steel adopts many Cleaner Production technological processes, practicing Cleaner Production throughout the entire lifecycle from raw material procurement, logistics, production organization, process structure, to product services. In 2017, we became one of the first batch of 'Cleaner Production Environmentally Friendly Enterprises'. In 2018, the company was awarded the title of 'Cleaner Production Environmentally Friendly Enterprise' by the China Iron and Steel Association. In 2024, the company was once again awarded the title of 'Cleaner Production Environmentally Friendly Enterprise' by the China Iron and Steel Association.

Since 2019, the company has implemented a full-process Cleaner Production audit, investing 801 million yuan and implementing 80 Cleaner Production projects, saving 684,197,400 tonnes of standard coal annually, saving 1,323,100 tonnes of water annually, and reducing particulate matter emissions by 890.8 tonnes, sulfur dioxide emissions by 341.15 tonnes, and nitrogen oxides emissions by 6,747.82 tonnes annually, achieving significant environmental benefits in energy conservation, energy saving, and pollution reduction.

In 2024, the company's emissions per tonne of steel for sulfur dioxide, nitrogen oxides, and dust (particulate matter) were 0.13 kg, 0.34 kg, and 0.26 kg respectively, reaching the Cleaner Production first-level indicator .

Environmental Training and Promotion

Qingdao Special Steel strengthens employees' environmental protection awareness through daily promotions and online and offline training. In 2024, the company conducted online training using the Zhongte Cloud Course platform and organized 50 offline training sessions, including expert lectures and special seminars, totaling 82.5 training hours with 7,198 participants. At the same time, the company actively participated in external training, including the Ministry of Ecology and Environment's training on emission permit management for the electric power industry, the Qingdao Municipal Bureau of Ecology and Environment's special training on automatic monitoring and operation management of fixed pollution sources, and training on soil pollution prevention for key soil pollution supervision units.

Promotion and training on soil and groundwater pollution prevention laws and regulations

In November 2024, the company invited experts from the Ministry of Ecology and Environment to conduct training on the promotion and interpretation of soil and groundwater pollution prevention laws and regulations for in-production enterprises, enhancing the soil pollution prevention capabilities of company leaders and environmental management personnel.



Case

Energy Utilization, Energy Conservation and Efficiency Improvement

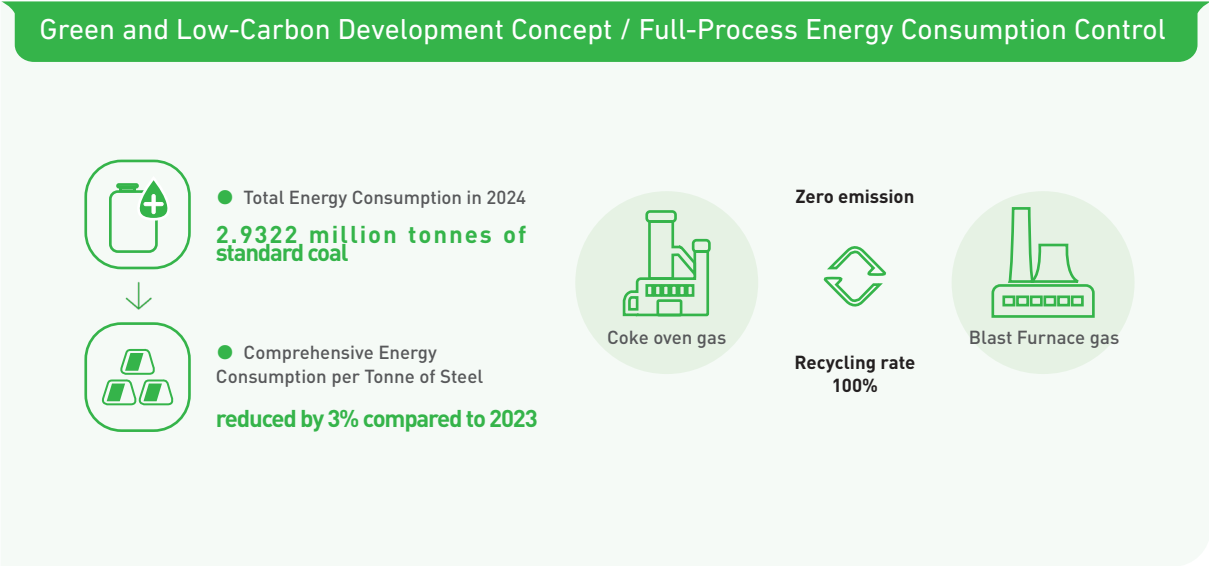
Energy Management

Qingdao Special Steel has established a three-level energy management structure, with the company's vice president overseeing energy management, setting up an energy management department, and assigning dedicated energy management personnel. The company formulates and continuously improves energy management methods and systems in accordance with national laws and regulations to ensure compliance in energy use and continuously enhance management efficiency. During the reporting period, the company has revised the 'energy conservation Management Regulations,' 'Energy Consumption Indicator Management and Assessment System,' 'Water Conservation Management Regulations,' 'Wastewater Pollution Prevention Management Regulations,' 'Solid Waste Management Regulations,' 'Energy Measurement Management System,' 'Measuring Instruments Management System,' and 'Measurement System Management Regulations.'

The company has established an Energy Management System that complies with 'Energy Management System—Requirements and Usage Guidelines' (GB/T 23331-2020) and 'Energy Management System Steel Enterprise Certification Requirements' (RB/T 103-2013), obtaining the Energy Management System certification certificate with a certification ratio of 100%.



In recent years, the company has adhered to the concept of green and low-carbon development, implementing full-process energy consumption control. In 2024, the company's total energy consumption was 2.9322 million tonnes of standard coal, with the comprehensive energy consumption per tonne of steel reduced by 3% compared to 2023. The coke oven gas and Blast Furnace gas have basically achieved zero emissions, with a recovery and utilization rate of 100%, significantly improving resource energy utilization efficiency.



Efficient Energy Utilization

Qingdao Special Steel was constructed according to the principle of 'high-level planning and high-start construction,' adopting advanced and mature energy conservation technology in the industry. Since 2023, in order to continuously tap the potential of energy conservation, improve the efficiency of energy utilization, and achieve green and low-carbon high-quality development, the company has taken 'Best Practice Energy Efficiency Benchmark Demonstration Enterprise for Dual Carbon' as the starting point, focusing on the 'Three-Year Action Plan for Energy Efficiency Benchmarking in the Steel Industry' issued by the China Iron and Steel Association and the 'Extreme Efficiency, Extreme Cost' improvement plan issued by the group. The company compiled the 'Qingdao Special Steel Energy Efficiency Improvement Action Plan,' in order to achieve breakthroughs in four aspects: process energy conservation, equipment energy conservation, intelligent energy conservation, and management energy conservation, and established the 'Extreme Energy Efficiency Promotion Task Force' to comprehensively promote the implementation of 'Extreme Energy Efficiency.'

Management Energy Conservation

Improve the management organization. The company has established an 'Extreme Energy Efficiency' work leadership group with the highest leader as the head, responsible for supervising, guiding, and coordinating the development of 'Extreme Energy Efficiency' work; the leadership group has set up a working group responsible for organizing and implementing the company's 'Extreme Energy Efficiency' work; the working group has established a 'Extreme Energy Efficiency' work promotion office, which set up in the Energy and Environmental Protection Department, with the director of the Energy and Environmental Protection Department serving as the office director, responsible for promoting the comprehensive implementation of the company's 'Extreme Energy Efficiency' related work by various functional departments and branch factories.

Digitalization of energy management. The company is accelerating the application of information technology and digital technology such as AI, big data, cloud computing, 5G technology, Industrial Internet, and the Internet of Things in various production processes, based on the energy and environmental protection control system, coupling energy, low carbon, and environmental protection, exploring the implementation of digital comprehensive energy conservation management to achieve efficient utilization of energy resources.

Process Energy Conservation

In 2024, the company applied 5 advanced energy conservation processes, including coke oven flue gas waste heat utilization, No.3 Sintering workshop steam and electricity dual-drive upgrade, No.2 Blast Furnace slag flushing water waste heat utilization, No.2 and No.3 high-speed wire rod production lines each use a heating furnace, and power boiler desulfurization sodium bicarbonate nozzle modification projects.

No.3 Sintering Workshop main exhaustor of sintering machine steam-electric dual-drive upgrading project

Case

The company utilized the waste heat boiler of the already operational ring cooler of the No.3 Sintering workshop to build a new set of built-in large flue waste heat boiler, producing steam. A new set of main exhaust steam-electric dual-drive unit with reverse power transmission system was built, transforming the existing main exhaust fan from a pure electric drive system to a combined motor + steam turbine drive system. The steam-electric dual-drive power transmission system is a representative project in the Sintering field, utilizing waste heat boilers to recover waste heat from exhaustor gases, producing medium or sub-medium pressure steam, and driving loads with steam turbines. Excess energy can be used for power generation, maximizing the efficiency of waste heat utilization. After the project is officially put into operation, it can save approximately 4,800 tonnes of standard coal annually.



No.2 Blast Furnace slag flushing water waste heat utilization project

Case

The company's No.2 Blast Furnace added three sets of plate heat exchangers for heat exchange in winter, providing urban heating; added a set of hot water-type lithium bromide refrigeration system and a set of surface cooler dehydration system for Blast Furnace dehumidified blast in summer. This has achieved the function of Blast Furnace slag flushing water heat energy for heating in winter and dehumidified blast in summer high-temperature weather. After summer dehumidification, the air humidity is less than 10g/Nm³, and the dehydration amount can reach 16g/Nm³ in three months. In the transition season, the dehydration amount can reach more than 6g/Nm³ in two months. In the first heating season of winter, 75,200 GJ of heat were supplied, saving 2,600 tonnes of standard coal.



Intelligent Energy Conservation

In 2024, the company applied two typical intelligent energy conservation technologies. The coke oven industrial brain project was completed. Through model optimization, gas consumption was reduced by 2m³/t coke, the proportion of high-quality coal was reduced by 0.3%, and the burning loss rate was reduced by 5%. The Sintering denitrification smart environmental protection operation system was put into operation. No. 1 and No. 2 Sintering plant reduced coke oven gas consumption by 1.3m³/t ore, Sintering of No. 3 reduced Blast Furnace gas consumption by 3m³/t ore, and ammonia water consumption was reduced by more than 3%.

Equipment Energy Conservation

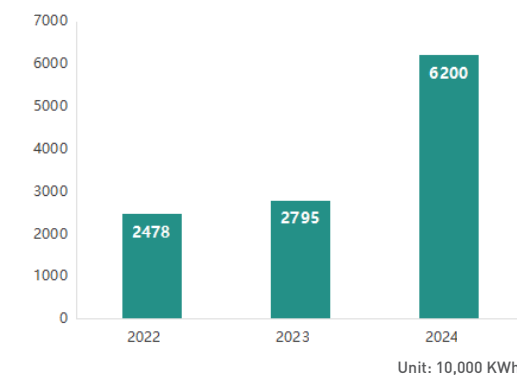
The company actively promotes the improvement of energy-using equipment and vigorously increases the proportion of high-efficiency energy conservation motors, water pumps, fans, transformers, and other products. In 2024, 54 new energy conservation equipment were applied, including: 3 high-efficiency dust removal fan modifications, with an energy conservation rate of more than 20%; 22 high-efficiency circulating water pump modifications, with an energy conservation rate of more than 18%; 8 circulating water pump coating modifications, with an energy conservation rate of more than 10%; 2 permanent magnet speed regulator modifications, with an energy conservation rate of more than 10%; 1 magnetic levitation blower modification, with an energy conservation rate of more than 50%; 1 cooling tower reluctance direct-drive speed motor, with an energy conservation rate of more than 50%; and 4 water-cooled air conditioner modifications, with an energy conservation rate of more than 40%.



Clean Energy

Qingdao Special Steel attaches great importance to energy conservation and low-carbon development. The company analyzes the status, characteristics and problems of energy consumption in steel production, actively develops and applies clean energy such as photovoltaic power generation, and builds a new green energy structure to continuously optimize the energy consumption structure. During the reporting period, the company's photovoltaic power generation installed capacity was 58MW, with an annual power generation of 62 million kWh, which can save 20,000 tonnes of standard coal and reduce approximately 50,000 tonnes of carbon dioxide emissions.

The company's third-phase 21MW photovoltaic power generation project is in the planning stage. In the future, it will continue to increase the proportion of green energy use, while closely monitoring power policies, researching the application of energy storage technology, purchasing green power through the power market, increasing the proportion of green power use, and further optimizing the energy structure.



Significant Increase in Photovoltaic Power Generation in 2024

Second-Phase 35MW photovoltaic power generation project put into operation

Case

Qingdao Special Steel actively promotes the development of green power, building a new green energy structure, and expanding photovoltaic installation areas using factory roofs and seaside open spaces. In June 2024, the company's second phase 35MW photovoltaic power generation project was completed and put into operation, with an annual power generation of 40 million kWh, which can save 12,200 tonnes of standard coal and reduce 29,800 tonnes of carbon dioxide emissions.

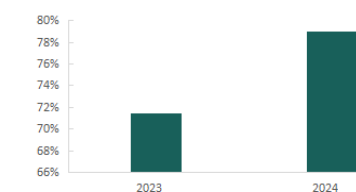


Circular Economy

Qingdao Special Steel strictly follows Circular Economy and green development concepts, always regards comprehensive resource utilization and Energy Conservation and Consumption Reduction as the lifeline of enterprise development, and has achieved good results in Circular Economy and comprehensive resource utilization in recent years. During the reporting period, the company won the title of 'Circular Economy Demonstration Unit' in Shandong Province, and the 'Zero-Carbon City Application of Composite Waste Heat Heating System for Iron and Steel Enterprises' project won the first prize of the Circular Economy Science and Technology Award in Shandong Province.

Qingdao Special Steel makes full use of surplus gas, steam, waste heat, residual pressure, and other waste heat and energy resources in the production process, by improving the deep utilization of waste heat and energy resources and the effective utilization of recovered energy, and strengthens the recovery and comprehensive recycling of waste heat and energy. During the reporting period, the company's self-generation rate reached 79%, an increase of 8.5 percentage points year-on-year.

The company actively integrates into urban construction, signs a comprehensive waste heat utilization agreement with the Dongjiakou District Heating Company, actively develops and efficiently utilizes waste heat resources within the plant, jointly promotes urban central heating, and has produced good economic, environmental, and social benefits, creating a regional 'Circular Economy' development demonstration sample.



The self-generation rate continues to rise

The company won the title of 'Resource Recycling Demonstration Unit' in Shandong Province

Case

In January 2024, the Shandong Circular Economy Association issued the 'Notice on the Announcement of the Shandong Circular Economy Demonstration List', and Qingdao Special Steel successfully passed the review and won the title of 'Circular Economy Demonstration Unit' in Shandong Province.

Efficient recovery and utilization of waste heat and energy. By making full use of waste heat and energy resources, improving the deep utilization of waste heat and energy resources and the effective utilization of recovered energy, the company continuously improves the energy recovery utilization rate. At the same time, the company actively integrates into urban construction and jointly promotes urban central heating with the district heating company.

Multi-channel recycling of solid waste. By improving process technology to reduce the generation of waste at the source, strengthening lean management to reduce resource waste in the production process, and following the treatment principle of 'internal first, then external, short-process recycling', the added value of solid waste is enhanced through the extension of the industrial chain, and the comprehensive utilization rate of solid waste reaches 100%.

Comprehensive utilization of water resources. Adhering to technological and management innovation, the company promotes the construction of water-saving enterprises, applies advanced water-saving processes and technologies, and achieves Zero Wastewater Discharge.



Water Resource Management

Qingdao Special Steel strictly complies with national laws and regulations, industry, and local water-saving policies and standards, establishes a water resource management system, clarifies the water-saving authority, sets up a full-time water-saving administrator, establishes a water-saving management network and job responsibility system, and formulates systems such as the 'Water Consumption Index Assessment Management Measures', 'Water Saving Management Regulations', and 'Water Metering Equipment Management Regulations'. Through strict management processes and increased investment in technological transformation, the company's water resources utilization efficiency has steadily improved. In recent years, Qingdao Special Steel has successively won the titles of 'Water-saving Benchmark Enterprise' in Qingdao City, 'Water-saving Enterprise' and 'Water-saving Benchmark Unit' in Shandong Province, and the national 'Water Efficiency Leader' for key water-using enterprises in 2024.

Strengthen water management. When the company builds, renovates, or expands projects, the company strictly implements the 'three simultaneous' water-saving measures, strictly controls fresh water consumption, and ensures that water consumption is within the planned range. The plan of not exceeding water consumption in the past three years. In accordance with national laws and regulations, the company equips metering devices, with a water metering configuration rate of 100%. It formulates annual water-saving plans, refines water-saving indicators, assesses water use data monthly, strictly controls water consumption in related processes, implements the water resource management system, actively promotes the implementation of water-saving work, and regularly conducts water balance tests.

Strengthen inspection and daily maintenance. The company strengthens the daily inspection, maintenance, and regular maintenance management of water pipe network and water facilities and equipment; special personnel inspect water facilities daily to prevent leaks; and a complete repair feedback process is established to track completion in real time.

Apply water-saving processes. The company's water intake is tap water and desalinated seawater, adopting water-saving processes such as coke dry quenching, Blast Furnace gas dry dust removal, Converter gas electric dust removal, and desalinated water closed-loop cooling. It will continue to increase investment in technological transformation to improve water-saving efficiency and reduce fresh water consumption. In 2024, the company implemented four water-saving renovation projects: Sintering waste heat power generation circulating water discharge to Sintering desulfurization, Steelmaking Converter movable hood water seal overflow water recovery, Blast Furnace continuous use of power generation circulating water and reclaimed water for slag flushing, and reverse osmosis flushing water recovery, saving a total of 800,000 tonnes of fresh water consumption. At the same time, the company strengthened the cascade utilization of circulating water, through differentiated water supply, cascade water use, and water-saving technologies application, the reuse rate of circulating water reaches 98.3%.

In 2024, the company's water consumption was 9.1445 million m³, including 3.6983 million m³ of conventional water resources and 5.4462 million m³ of unconventional water resources. The water intake per unit product was 2.16m³ per tonne of steel, which is better than the leading value of the 'Industrial Water Quota: Steel' issued by the Ministry of Water Resources.

2.16m³ per tonne of steel

98.3%

Recycling water reuse rate



Blast Furnace slag flushing water treatment system



Steel Rolling water treatment system

Blast Furnace continues to use power generation circulating water and reclaimed water for slag flushing

Case

Qingdao Special Steel increases the cascade utilization of circulating water, uses power generation circulating water drainage for blast furnace slag flushing, and by installing online water quality monitoring equipment, realizes the automatic activation of external drainage pumps based on the quality of power generation circulating cooling water, saving about 400,000 tonnes of fresh water per year.



Coking phenol-cyanide wastewater deep treatment

Case

Qingdao Special Steel Coking phenol-cyanide wastewater treatment adopts the domestically leading 'AAO + deep treatment' process, with 1 set of Coking phenol-cyanide wastewater biochemical treatment system and 1 set of deep treatment facilities. The biochemical treatment process is A2/O, with a treatment capacity of 120m³/h. The deep treatment process adopts reverse osmosis technology, using a two-stage reverse osmosis device. The treated water is reused for Coking plant circulating water replenishment, and the concentrated brine is used for Blast Furnace slag flushing.



Enhance water-saving awareness.To enhance the water-saving awareness of all employees and consolidate water-saving efforts, the company continues to carry out water-saving publicity. During the reporting period, the company combines activities such as 'World Water Day', 'China Water Week', and 'Urban Water Saving Publicity Week' to carry out various forms of water-saving publicity. On the line, water-saving training is conducted through the 'Zhongte Cloud Course' APP, and attention is organized to the 'Water Saving and Protection in Action' WeChat public account and the 'Water Saving China' website for water-saving publicity. Offline, water-saving slogans are posted in key water-use areas to create a good atmosphere of water-saving, cherishing water, and being close to water.

Conduct Energy Conservation Publicity and Exchange

Qingdao Special Steel actively organizes energy conservation training, publicity, and exchange, taking opportunities such as 'National energy conservation Publicity Week', 'China Water Week', and 'National Urban Water Saving Publicity Week' to regularly organize themed activities. At the same time, more than 20 internal and external training sessions related to energy conservation carbon reduction and water saving have been conducted for new college students, team leaders, and managers at different levels, effectively promoting the continuous improvement of energy conservation and carbon reduction awareness among all employees.

Conduct Energy Management System certification training

In order to ensure the efficient operation of the Energy Management System, the company invited external experts to conduct re-certification training for more than 30 internal auditors according to Energy Management System certification requirements, and all assessments were passed.



Case



Participate in industry conferences

The company deeply engages in energy conservation exchanges, invites excellent technical manufacturers in the industry to conduct technical exchanges on efficient energy conservation equipment, low-temperature catalysts, and full-oxygen combustion. In 2024, we participated in 7 industry forum conferences and conducted more than 50 energy conservation technical exchanges.

Packaging Material, Quantity Reduction and Weight Reduction

In order to strengthen the overall management of packaging, labeling, and protection by relevant responsible departments involved in the flow of Qingdao Special Steel steel products from production to the customer's designated receiving point, reduce quality issues arising from this, and enhance the responsibilities of various production plants and departments to improve the brand image of the company's products.

The company follows the basic principles of green and circular utilization and has formulated management measures and systems such as the 'Steel Product Packaging and Protection Management Regulations', 'Technical Requirements for Corner Protectors for Coil Packaging', 'Technical Requirements for Packaging Bags for Coils', and 'Management Regulations for the Recycling of Protective Materials for Coils'.

Packaging reducing quantity measures: Full packaging is replaced by half packaging; recycle of packaging bags and corner protectors; optimize packaging bag sizes. Through recycling and optimization of packaging methods, the size of packaging bags has been reduced, leading to a 18% decrease in annual green procurement.

Biodiversity and Ecological Conservation

Qingdao Special Steel fully understands the importance of Biodiversity to the company, continuously pays attention to the harmonious development of the factory environment and the surrounding ecological environment, and while doing a good job in production and operation, considering the suitability and diversity of plant varieties, continuously improves the environment, and is committed to building an environmentally friendly industrial enterprise. In the project design phase, biodiversity protection and land use assessment are carried out in accordance with relevant requirements. In the project operation phase, the surrounding ecological environment is continuously monitored, and biodiversity protection is actively carried out to reduce the impact of production and operation on the ecological environment.

The company continues to improve the greening of the factory area, enhance the level of visual management, and create a garden-style factory. It has been awarded the titles of 'Green Factory' and 'Clean Production Environmentally Friendly Enterprise' among the first batch in the country. In 2024, the company increased the greening area by approximately 65,000 m², planted 13,000 saplings, an increase of 8,000 compared to 2023. The tree species include cedar, black pine, cherry blossom, Japanese maple, red-leaf photinia, large-leaf privet, juniper, holly ball, Hokkaido boxwood, and magnolia. Since 2020, the company has cumulatively planted 99,000 saplings, continuously improving the greening rate of the factory area, forming an ecological picture of shaded trees, interspersed flowers and grass, and egrets flying and birds singing.

Carry out tree planting activities

In March 2024, Qingdao Special Steel Party Committee conducted a tree planting activity with the theme of 'Party Building Activities ' leading 'Ecological Construction ', with more than 60 people participating. The tender green saplings swayed in the spring breeze, adding a touch of vibrant spring color to the factory area. This tree-planting activity not only beautified the ecological environment of the factory area and enhanced the ecological civilization awareness of the majority of party members and league members, but also strengthened the cohesion and cooperative spirit of the party members and league members, demonstrating Qingdao Special Steel's commitment to and practice of the concept of green development.



Case

Qingdao Special Steel is committed to building a resource-saving, environment-friendly, and sustainable modern coastal steel enterprise, achieving synergistic development between the steel plant's sustainable growth and the urban ecological circle. The company aims to contribute more to comprehensively advancing the construction of Beautiful China and accelerating the modernization process of harmonious coexistence between humanity and nature.

SDGs Response



Social Section

Key Issues for Response

- Employee Rights Protection
- Employee Training and Development
- Occupational Health and Safety Production
- Employee Welfare and Care
- Responsible Procurement
- Industry Co-creation and Development
- Product Quality Assurance
- Customer Service
- Innovation and Intelligent Creation
- Public Welfare and Charity
- Consumption Assistance

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2024 Highlights

- National High-Tech Enterprise, National Manufacturing Single Champion Enterprise, Top 50 New Material Leading Enterprises in Shandong Province
- 2024 Qingdao West Coast New District Science and Technology Innovation Leading Enterprise
- The company developed 437 new products, achieved 14 research results, 3 of which were rated as internationally advanced level
- Shandong Province Chief Data Officer System Pilot Enterprise
- Qingdao Technological Innovation Demonstration Enterprise (Artificial Intelligence)
- The company was awarded Qingdao May 1st Labor Medal, Qingdao Craftsman, Worker Pioneer, West Coast New District May 1st Labor Medal, Worker Pioneer, Langya Craftsman

Innovation-driven Transformation and Upgrading

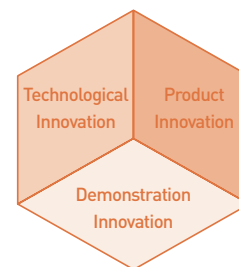
Qingdao Special Steel closely follows the forefront of industrial development, focusing on technological innovation, product innovation, and demonstration innovation. With industry-university-research institute collaboration and the transformation of scientific and technological achievements as key drivers, we participate in collaborative research across the upstream and downstream of the industrial chain, enhance core competitiveness in the field of new materials, actively broaden the application scenarios of new materials, and contribute more new material strength to the construction of a strong advanced manufacturing province.

➤ R&D Management

R&D Management System

Qingdao Special Steel adheres to the innovative concept of 'Special Steel is forged by technology,' continuously optimizing and improving the R&D management system, increasing R&D investment, actively encouraging innovation and R&D, exploring new technologies and solutions, and enhancing the sustainability and efficiency of the supply chain.

Currently, the company has established high-level R&D platforms such as a national-level enterprise Technical Center, a postdoctoral research workstation, and a provincial engineering research center. We have formed a technological innovation system with the characteristics of Qingdao Special Steel, formulated systems such as the 'Technical Project (Technical Evaluation) Management System,' the 'Qingdao Special Steel New Product Development System,' and the 'New Product Development Process Risk Identification and Prevention Management System,' continuously optimizing the R&D project management mechanism to ensure the orderly development of R&D management, intellectual property protection, and technological innovation activities.



2024

R&D Investment

794 million yuan

As a percentage of operating revenue

3.42%

R&D Personnel

642 persons

As a percentage of the total number of employees

14%

Product Technological Innovation

Qingdao Special Steel focuses on technological innovation and product innovation, emphasizing the new technologies, new processes, and the development of resource-saving, green environment-friendly, and human-friendly new products, committed to creating 'special steel, high-quality steel' products, and continuously promoting the transformation and upgrading of the product structure towards higher, superior, and special levels.

Focusing on key projects such as neck-sticking projects and the 6+2 Qingdao Special Steel product special research projects, we carry out technical research, basic process research, and development for different steel series. Our products cover four major series: wire rods, flat steel, bars, and continuous casting commercial billets. We possess a wide range of high-end special steels such as bearing steel and gear steel for automobiles, with complete specifications and excellent quality. These products are applied in high-end manufacturing industries such as automobiles, ships, aviation, and high-speed railways, as well as key engineering fields such as oceans and bridges, and are exported to more than 30 countries and regions worldwide. Among them, our products such as steel cord, bead wire steel wire rods, special welding steel wire rods, bridge cable steel, and spring flat steel hold the top market share.

Exported to **more than 30** countries and regions worldwide

New products developed

437

Cord Steel¹

The self-developed steel cord steel adopts the 'rolling with one heating' process, breaking through the technical bottleneck of central segregation in high-carbon steel, and is applied in the production of car tires, light truck tires, heavy-duty truck tires, construction machinery tires, aircraft tires, and other rubber product skeleton materials. Among them, the 92-grade and 97-grade cord steel can meet the requirements of steel cords above 4000MPa, filling the domestic gap and making outstanding contributions to automobile lightweighting and energy conservationemission reduction.



Wire rods for steel cords



Steel cord products



Welding Steel

We have successfully developed special welding materials such as H08Mn2NiA and FT55-Ni1, filling the domestic gap and meeting the urgent demand for high-performance welding materials in long-distance hydrogen pipelines and carbon capture, utilization, and storage (CCUS) pipelines, providing strong support for reducing the use of fossil fuels and lowering Greenhouse Gas Emissions. We successfully developed welding materials for nuclear reactor steam generators, containment vessels, and offshore platforms such as X598A 【EF3】 , providing a solid guarantee for the safe and reliable operation of nuclear power and marine engineering through optimized material properties and processes.



¹ Cord steel is a representative of ultra-clean steel. Due to the extremely high technical content in producing cord steel, it is known as 'the finest in wire rods' and 'the pearl on the crown of wire rods.'



National High-Tech Enterprise



National Manufacturing Single Champion Enterprise



2024 Qingdao West Coast New District Science and Technology Innovation Leading Enterprise



Shandong Engineering Research Center for Automobile Steel

Top 50 New Material Leading Enterprises in Shandong Province

Shandong Provincial 'Excellent Postdoctoral Research Workstation'



Steel for bridge cables

Qingdao Special Steel independently innovated and built the first offline isothermal heat treatment line (QWTP) and a unique online isothermal heat treatment line (QM) in China, successfully developing wire rods for bridge cables with strength levels of 1960-2200MPa. The products have been applied to major national projects such as the Nansha Bridge (1960MPa), Yangsigang Yangtze River Bridge (1960MPa), Shanghai-Suzhou-Nantong Yangtze River Bridge (2000MPa), Wuhu Bridge of Shanghe-Hangzhou Railway (2000MPa), Lingdingyang Bridge of Shenzhen-Zhongshan Channel (2060MPa), and Yanji Yangtze River Bridge (2100MPa). Among them, the 2200MPa grade steel for bridge cables is the highest tensile strength steel for bridge cables in the world, filling the application gap in this field both domestically and internationally.



Nansha Bridge

Yangsigang Yangtze River Bridge

Shanghai-Suzhou-Nantong Yangtze River Bridge

Non-Quenched and Tempered Steel

The company successfully developed ferrite + pearlite non-quenched and tempered steel and bainite non-quenched and tempered steel, replacing quenched and tempered steels of different strength grades such as 45, 40Cr, and 42CrMo, with strength grades of 750MPa, 850MPa, and 950MPa. The products are used in commercial vehicles, passenger vehicles, high-strength fasteners, engineering machinery, and other fields, and are highly recognized by domestic OEMs and international users.



High-strength non-quenched and tempered steel for shock absorber piston rods

High-strength non-quenched and tempered steel for U-bolts in commercial vehicles

Non-quenched and tempered steel for fracture-split connecting rods

Non-quenched and tempered steel for drive shafts in commercial vehicle chassis transmission systems

Spring Flat Steel

A series of products with strength levels ranging from 1300-1800MPa have been developed. The automotive leaf spring products made from these materials cover micro trucks, light trucks, medium trucks, and heavy trucks, and are applied in major domestic OEMs and overseas markets. Among them, the 1800MPa high-strength product is currently the only spring flat steel product in China that has achieved large-scale mass production with the highest strength. The developed spring flat steel for guide arms has filled a domestic gap, breaking the long-term reliance on imports.



Bearing Steel

The company has carried out 'targeted research' around the key core technical problems that restrict the quality improvement of bearing steel, and formed an independent green and high-quality bearing steel wire rod carbide network control technology, with the product quality reaching the international advanced level. We have successfully developed bearing steel for corrosion-resistant large-load steel balls, which was appraised as 'international advanced' level by the Shandong Iron and Steel Industry Association. The products have been widely used in steel balls, rollers, cones, needles, rings, shafts and other applications.



Round Billets for High-strength Anti-collapse and Anti-H₂S Corrosion Oil Casing

Relying on the full-process clean steel smelting technology, the company successfully developed round billets for 110-grade anti-collapse and anti-H₂S corrosion oil casing. The product has a narrow composition fluctuation range, high purity, low residual element content, and excellent surface quality. The finished pipe's anti-collapse and anti-corrosion performance have reached domestic leading levels, strongly supporting the development of complex oil and gas resources in high-sulfur oil and gas fields such as Tarim and Sichuan.



Steel for Large-scale Weathering Bolts

In response to the actual service environment of the Sichuan-Tibet Railway, a technical route to improve the hydrogen-induced delayed fracture resistance and corrosion resistance of high-strength bolts was proposed, forming the durability design guidelines and maintenance manuals for the steel structures of suspension bridges on the Sichuan-Tibet Railway. This successfully achieved a durability improvement of over 20% for steel structure bridges, providing strong support for the construction of the Sichuan-Tibet Railway.



Steel for Railway Prestressed Steel Strands

The company innovatively developed the energy conservation low-carbon process for ultra-high-strength wire rods, successfully developing 2000MPa—2400MPa grade high-strength prestressed steel strand steel. Among them, the 2200MPa grade product has been applied to the national key project, the Jingxiong-Shang High-Speed Railway. The 2300MPa grade product set a world record for the maximum loading level in the static load test of high-speed railway box girders, providing strong material support for railway construction.



Spring Steel Wire Rod

In line with national low-carbon policies and the energy conservation & cost-reduction needs of downstream industries, we actively develop and promote energy-efficient spring steel wire rod products, achieving stable mass supply of large-specification 2000MPa grade spring steel wires for suspension springs. The key production technology research of energy conservation type 2000MPa grade suspension spring 55SiCr wire rod was appraised by the Shandong Iron and Steel Association as 'internationally advanced'.



Bainite Non-Tempered Cold Heading Steel

Through our unique advantages in online QM salt bath rapid cooling, constant temperature phase transition, and adjustable phase transition time, we have successfully developed high-toughness and plasticity 8.8-10.9 grade non-quenched and tempered fastener steel by utilizing the high strength and plasticity characteristics of bainite microstructure, through the design of non-precious alloying and lower bainite microstructure. This innovation has created a new path for domestic non-quenched steel technology, addressing the issue of balancing strength and plasticity in domestic 8.8 grade non-quenched steel, filling a domestic gap, and achieving global technological leadership. The product is applied in various components including truck U-bolts, car seat screws, long rod flange hex bolts, and car ball joint tie rods, and has been successfully implemented in major OEMs and renowned component manufacturers.



Qingdao Special Steel closely focuses on the key technologies or production bottlenecks in enterprise development, solidly advancing scientific and technological work, and effectively solving production technical difficulties.

Case

Innovatively developed online salt bath isothermal heat treatment technology for high-end special steel wire rods

Qingdao Special Steel independently innovated and developed online salt bath isothermal heat treatment technology for steel, optimized the design of material chemical composition, finely controlled process parameters, achieved precise control of microstructure, and utilized heat treatment to achieve the ultimate performance of materials, customizing the performance of steel materials for customers. At the same time, while achieving high performance of materials, the use of precious metal elements was effectively reduced, realizing the economical production of steel materials.

This technology solved the problem of green, low-carbon, and stable production of high-end special steel wire rods, featuring a simple and efficient process, stable temperature control, and low CO₂ emissions. With independent intellectual property rights, 30 patents have been applied for, including 4 authorized invention patents and 17 utility model patents; presided over the formulation of 2 group standards, and participated in the formulation of 1 international standard, 1 industry standard, and 1 railway standard. In 2024, this technology won the first prize of the Metallurgical Science and Technology Award of China Iron and Steel Association and Chinese Society for Metals.

Currently, the products have been widely used in more than ten large-span bridges, the Xiongshang High-Speed Railway, and other major projects, as well as in high-end manufacturing fields such as automobiles and high-speed rail locomotives. The product not only meets the needs of national major projects, but also successfully breaks through international technological blockades, achieving a leap from 'following' to 'leading'.

R&D Innovation Awards

During the reporting period, Qingdao Special Steel precisely focused on industry frontiers and market demands, anchoring key research projects in high-performance steel material development, green metallurgical process innovation, and Intelligent Manufacturing technology application. The company organized 36 R&D projects and 9 bottleneck projects, laying a solid foundation for the company's core technology breakthroughs and product upgrades.

Qingdao Special Steel actively participated in national scientific research and innovation, joining the '14th Five-Year Plan' national 2GPa high-strength spring flat steel project, demonstrating Qingdao Special Steel's responsibility and contributing its wisdom to major national research tasks, helping to solve common industry challenges; deeply involved in provincial projects, closely aligning with local industrial development needs, conducting targeted technology R&D and achievement transformation, injecting strong momentum into the regional economy high-quality development; actively engaged in external cooperation projects, collaborating with universities, research institutions, and industry leaders to achieve complementary advantages and resource sharing.

Through continuous R&D investment and innovative practices, the company has achieved a series of independent intellectual property rights and research results. During the reporting period, we achieved 14 research results, completed 9 Shandong Provincial Iron and Steel Industry Association scientific and technological achievement evaluations, of which 3 were rated as internationally advanced and 6 as domestically leading. The company won a total of 2 Metallurgical Science and Technology Awards, including 1 first prize; 17 Shandong Provincial Metallurgical Science and Technology Progress Awards, including 2 first prizes.

Achieved 14 Research Results

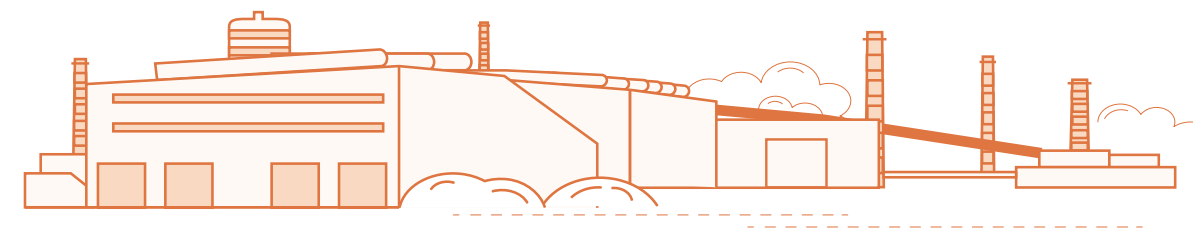
14

Won 2 Metallurgical Science and Technology Awards

2

Won 17 Shandong Provincial Metallurgical Science and Technology Progress Awards

17







'Independent Innovation of Online Isothermal Heat Treatment Technology and Equipment for High-End Special Steel Wire Rods' won the first prize of Metallurgical Science and Technology in 2024.



'Standard Innovation and Internationalization of Wire Rods for Bridge Cable Steel Wire' won the third prize of Metallurgical Science and Technology in 2024.



'Development of Corrosion-Resistant Special Welding Steel Wire Rods for Ships' and 'Key Technologies for the Development of Green and Environmentally Friendly Ultra-High Strength 2100MPa Grade Bridge Cable Steel' won the first prize of Shandong Metallurgical Science and Technology Progress Award. 5 projects including 'Internal Quality Improvement of High-Quality Narrow Band Gear Steel for Automobiles' won the second prize of Shandong Metallurgical Science and Technology Progress Award. 10 projects including 'Development of High-Quality Bearing Steel for Automobiles' won the third prize of Shandong Metallurgical Science and Technology Progress Award.



'Key Technologies for the Development of Lightweight, Fatigue-Resistant Ultra-High and Extra-High Strength Steel Cord Wire Rods' won the second prize of Qingdao Science and Technology Progress Award.

Creating an Innovative Culture

Qingdao Special Steel actively builds innovation mechanisms, establishes diverse platforms, and strengthens incentive measures, opening up a 'track' for employees' technological innovation, fully stimulating employees' innovation potential, and accelerating the transformation of innovation achievements.

The company has formulated a series of management measures such as the 'Innovation Work Management Measures', 'Patent Paper Management Regulations', 'Technical Standards Management Regulations', and 'Annual Project Performance Assessment Management Measures', rewarding innovation achievements, patents, papers, etc., providing institutional guarantees for innovation incentives.

We actively explore more efficient and scientific research incentive mechanisms, regularly hold innovation recognition events such as the 'Top Ten' scientific and technological talents awards, reward innovation and patent winners, mobilize employees' enthusiasm for innovation, and stimulate their innovative talents. We extensively carry out mass innovation activities covering the entire production process, including technological innovation, technical innovation, technical breakthroughs, technical creation, and small inventions, small creations, small innovations, small designs, and small suggestions, fully mobilize the enthusiasm of all employees to participate in innovation, create a strong innovation atmosphere, and promote the innovative development of the enterprise.



'Top Ten' Scientific and Technological Talents Awards

Qingdao Special Steel won the Bronze Award in the 'Jingcai Qianglu' Innovation and Efficiency Special Competition of the 20th Shandong Provincial Youth Vocational Skills Competition



Case

Qingdao Special Steel approved to Establish a Postdoctoral Research Station

In July 2024, Qingdao Special Steel successfully obtained approval to establish a postdoctoral research station, marking a significant breakthrough in the company's scientific research innovation and talent cultivation, highlighting its prominent position in technological innovation and capability.

The postdoctoral research station is a national high-level talent innovation platform approved by the Ministry of Human Resources and Social Security and the National Postdoctoral Management Committee, an organization within enterprises, research and production-oriented institutions, and special regional agencies approved to recruit and train postdoctoral researchers. Currently, the national approval for enterprise postdoctoral research station qualifications is extremely strict. Applying enterprises must not only have specialized R&D institutions and high-level research teams but also be recognized by relevant national departments, demonstrating significant technological innovation status and capability.



Intellectual Property Protection

Qingdao Special Steel regards intellectual property protection as the core guarantee for enterprise innovation and development. The company strictly complies with laws and regulations such as the 'Patent Law of the People's Republic of China', 'Trademark Law of the People's Republic of China', and 'Copyright Law of the People's Republic of China'. In line with the actual situation of the enterprise, the company has formulated the 'Knowledge Management System' and 'Patent Paper Management Regulations', comprehensively improving the intellectual property management system, strengthening the protection of the company's trademarks, patents, copyrights, and other intellectual properties, and achieving a positive interaction between technological innovation and intellectual property. At the same time, the company continuously carries out publicity and training to continuously enhance employees' awareness of intellectual property management and protection, ensuring effective protection of the company's intellectual property. During the reporting period, the company has applied for 286 patents, with 55 patents authorized, including 4 invention patents. By the end of the reporting period, the company owned 139 valid patents, including 21 invention patents.

Patents applied

286

Authorized patents

55

Invention patents

4


Valid patents

139

Invention patents

21

National Intellectual Property Advantageous Enterprise



Deeply carried out intellectual property training

In December 2024, to strengthen the company's intellectual property management and promote the transformation of scientific and technological achievements, the company organized a special intellectual property training for R&D personnel and related management personnel. The training content covered the definition and classification of patents, precautions for patent applications, etc. At the same time, the reward and punishment measures in the company's related systems were also explained in detail. This training effectively enhanced employees' awareness of intellectual property, promoted the transformation of the company's scientific and technological achievements, and provided strong support for the company's innovative development.



Case

Leading the revision of the national standard 'Steel Wire Rods for Welding'

In 2024, Qingdao Special Steel led the revision of the national standard GB/T 3429 'Wire rods for welding'. The standard was reviewed and approved by the Wire Rod and Wire Sub-Technical Committee of the National Steel Standardization Technical Committee (SAC/TC183/SC3), and the compilation level reached international advanced standards.

'Wire rods for welding' is the raw material standard for welding rods, solid wire for gas shielded welding, and submerged arc welding wire products. This revision integrates the grades involved in GB/T 33958-2017 and GB/T 33964-2017, and adjusts and tightens the content range of some grades. The revised standard has a broader scope of application, making it more convenient for upstream and downstream enterprises to apply, and is conducive to further improving the quality of welding materials.

Case

Leading the formulation of the group standard 'Non annealed 30CrMnTi hot rolled wire rods for pin shafts'

The group standard 'Non annealed 30CrMnTi hot rolled wire rods for pin shafts' led by Qingdao Special Steel was successfully approved by the technical review of the Shandong Iron and Steel Industry Association.

The formulation and promotion of the group standard 'Non annealed 30CrMnTi hot rolled wire rods for pin shafts' meets the chain transmission industry's demand for high quality, easy processing, and energy conservation environmental protection, and at the same time, it will play a key role in canceling the annealing process, reducing environmental pollution, reducing carbon emissions, and promoting the rapid and healthy development of the industry, with significant social significance and economic benefits.

Case

Leading the establishment of the High-Performance Prestressed Steel Wire/Strand Technology Joint Innovation Center

In 2024, Qingdao Special Steel led the establishment of the High-Performance Prestressed Steel Wire/Strand Technology Joint Innovation Center. The center aims to serve the high-quality innovative development of the industrial chain, with engineering construction, standard formulation, material research and development, and project promotion as the links, with the collaboration of upstream and downstream of the industrial chain and industry, university, research institute and user combination as the basic form, with resource sharing, win-win cooperation, and building a high-performance steel wire/strand application system as the main goals, and is established according to the principles of equality and mutual benefit, aiming to create an innovation platform for the entire industrial chain of 'R&D - Production - Design - Application - Evaluation', accelerate the market promotion of high-performance prestressed steel wire/strand steel, and promote the close cooperation, high-quality innovative development, and engineering project practical application of the industrial chain.



Case

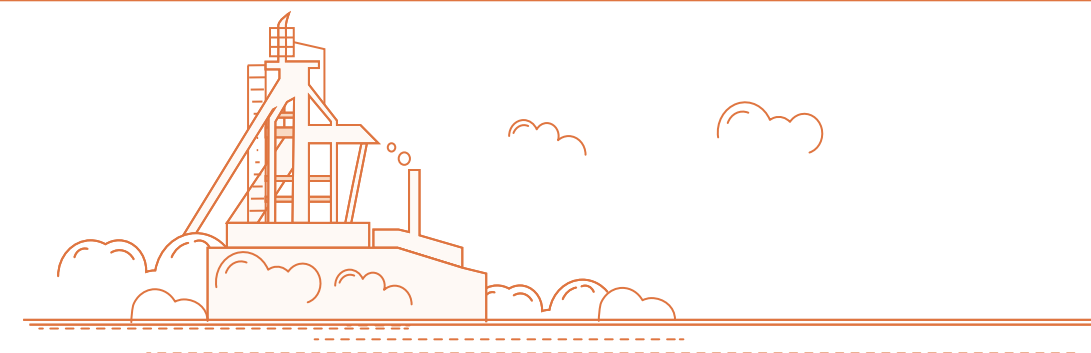
Co-organized the Second Steel Structure and Structural Steel Innovation Development Forum

In August 2024, the 'Second Steel Structure and Structural Steel Innovation Development Forum' with the theme of 'Green Low Carbon-High Quality-Digital Intelligence' hosted by the Chinese Metals Society and co-organized by Qingdao Special Steel was successfully concluded.

The forum brought together experts, scholars, and industry representatives from the metallurgical and steel structure fields at home and abroad, and through the main forum, thematic forums, and roundtable meetings, built a communication bridge for academic exchanges, technological innovation, and enterprise cooperation in the steel and steel structure fields. During the forum, Engineer Li Yang from the company shared the key production technologies of ultra-high-strength bridge cables and prestressed steel strand steel.

The forum deeply discussed the development direction of steel and steel structure scientific research and industrial technology from the perspectives of industrial integration, technological innovation, green development, digital intelligence application, and internationalization, helping the industrial transformation and upgrading and the value enhancement of the entire industrial chain; promoting the deep integration of steel and construction technology, leading the construction of modern industrial technology systems, and promoting the green high-quality development of the steel and steel structure industry.

Case



Industry, University, Research Institute and User Cooperation

Qingdao Special Steel attaches great importance to industry, university, research institute and user cooperation, actively carries out in-depth cooperation with universities, research institutions, and downstream users, and promotes the deep integration of industry, university, research and application. By the end of the reporting period, long-term and stable cooperative relationships had been established with multiple research institutions such as the University of Science and Technology Beijing, Shandong University, Anhui University of Technology, and Northeastern University, carrying out industry-university-research institute cooperation and exchanges, achieving innovation resource sharing and complementary advantages, and strongly promoting product and process innovation and upgrading.

Industry Co-construction

Qingdao Special Steel adheres to the philosophy of open cooperation and innovative development, actively exploring strategic partnerships with suppliers and other industry leaders, leveraging its advantages in technology and innovation. The company places high importance on industry exchange and knowledge sharing, promoting industry progress through participation in industry standard formulating, strategic partnerships, industry, university, research institute and user collaborations, industry forums, and seminars.

Qingdao Special Steel actively participates in the formulation and revision of standards, fully utilizing the company's technical expertise and practical experience in professional fields to drive the updating and iteration of industry standards, strengthening the leading role of standards. During the reporting period, the company participated in the formulation and revision of 8 international, national, and group standards, continuously achieving technology, management, and brand output.

Product Services and Quality Assurance

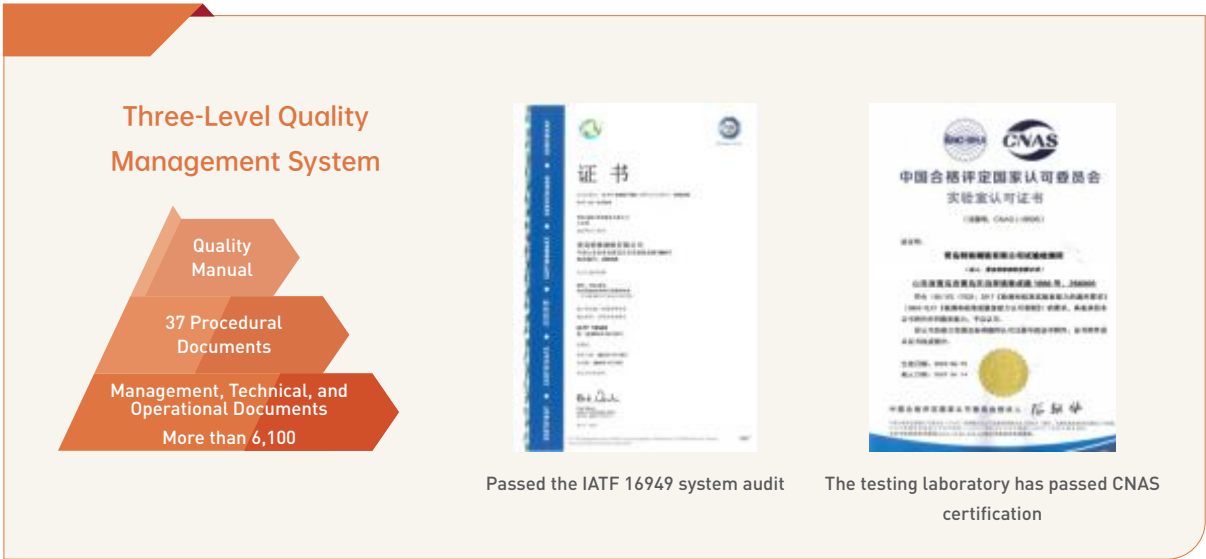
Quality Management

Quality Management System

Qingdao Special Steel strictly complies with the 'Product Quality Law of the People's Republic of China' and other laws and regulations, actively establishing and improving the quality system, continuously enhancing product quality control capabilities. The company establishes a quality management responsibility system, with the company's general manager as the primary responsible person for quality management, taking full leadership responsibility for the quality management system, leading the establishment, implementation, maintenance, and continuous improvement of its effectiveness; all levels of management and quality-related managers sign the 'Quality Responsibility Statement,' strengthening the awareness of quality responsibility.



Based on IATF16949 and ISO9001, we closely integrate with the company's actual operations to meticulously construct a three-tier quality management system: quality manual, procedural documents, and operational documents. The company regularly conducts management reviews and system audits, inviting domestic senior quality system experts and important customers to audit the product quality system, comprehensively reviewing the effectiveness of the quality management system. During the reporting period, the company has not experienced any negative events on product quality and safety.



Quality Process Control

Qingdao Special Steel strictly standardizes production processes, establishes a standardization promotion team, implements standardized operations; systematically organizes key process control indicators, conducts trend tracking and process capability index analysis; introduces big data analysis methods, builds an online control and anomaly detection mechanism for production process parameters, achieving precise control of the production process; and implements full-process quality risk control, real-time tracking and management of changes in major quality risk points, comprehensively ensuring product quality.

Looking Back on Quality

The company establishes a quality review mechanism, reviewing quality objections and various issues monthly to examine improvement effects, ensuring no recurrence of problems.

Quality Assessment Mechanism

The company formulates systems such as the 'Accident Handling Management Regulations' and the 'Product Quality Reward and Punishment Measures,' implementing hierarchical management of quality accidents and strict assessments; establishes a performance evaluation system, clearly defining indicators and responsibilities, conducting monthly rewards and punishments, motivating employees to actively participate in quality management.

Quality Management Extends Upstream

For new suppliers, we conduct on-site audits and qualification reviews to control quality from the source; during cooperation with suppliers, we conduct second-party audits, interviews, and issue improvement reports to ensure suppliers' production always meets the company's quality requirements; we conduct comprehensive evaluations of suppliers annually, implement hierarchical management and elimination systems, and establish a qualified supplier list, strictly selecting suppliers from the list to ensure the stability of raw and auxiliary materials.

Steel for new energy vehicle piston rods enters the mid-to-high-end market

Case

Qingdao Special Steel closely follows market demand, actively promoting quality improvement. We have launched a series of initiatives to address key issues such as subcutaneous inclusions, continuously enhancing the control and quality assurance capabilities of smelting, continuous casting, and rolling processes, providing product support for the rapid development of new energy vehicles. Meanwhile, we have made breakthroughs in the fields of steering system components and hydraulic cylinders for construction machinery.

In terms of piston rod steel products, the qualification rate of water immersion testing samples has rapidly increased from 53.3% to 100% and remains stable, fully meeting product requirements. The physical quality has reached a leading domestic level; the product defect rate is $\leq 3\text{ppm}$, with stable quality, leading the industry.

Product Quality Certification

Qingdao Special Steel has won widespread recognition and numerous industry awards for its products due to their excellent quality and performances. Our various products actively benchmark against advanced domestic and international standards, successfully obtaining multiple domestic and international certification certificates, ensuring that product quality consistently meets industry standards and customer expectations. In 2024, we have passed domestic and international certifications for welding wire steel CCS, anchor chain steel CCS\ABS\LR\NK\DNV\BV, JIS, and SIRIM.



Qingdao Special Steel H08MnSiTi (ER70S-G) special welding steel hot rolling wire rod won the 'Golden Cup Special Excellent Product' in 2024; special welding steel hot rolling wire rod, high-strength cold heading steel hot rolling wire rod, and continuous casting round billet for gas cylinders won the 'Golden Cup High-Quality Product'.



Wire rod for bridge cable steel wire was awarded the AAAAA level certification of China's steel product trustworthy brand

Spring flat steel was selected as the sixth batch of "Langya List" enterprise brands in 2023
'High-performance online isothermal temperature heat treatment (QM) wire rod' and
'Spring flat steel quality improvement' entered the List of Excellent Brand Creation Cases
in the Steel Industry

Quality Culture

Qingdao Special Steel vigorously promotes quality culture construction, enhances the quality awareness of all employees, strengthens the responsibility for quality, and urges all employees to pay attention to quality, attach importance to quality and supervise quality. We regularly organize employees to participate in quality competitions, quality team evaluations, quality model worker selections, quality training, and other activities, providing cash rewards to outstanding organizations and individuals; we carry out the 'Strengthen the Quality Foundation, Sing the Special Steel Brand' Quality Month activities, including the SOP short video competition, quality knowledge competition, and other series of activities to enhance employees' quality awareness and operational skills. In 2024, we organized the second 'Quality Team Competition', with 65 teams awarded as excellent quality management teams.

- Qingdao Special Steel ranks 11th on the 'Product Brand' list
The brand strength is 768 and the brand value is 7.28 billion yuan, a year-on-year increase of 1.472 billion yuan
Awarded '2024 China Excellent Steel Enterprise Brand'
- Awarded the 8th Qingdao Mayor's Quality Award ²



Held Quality Conference

In May 2024, a quality conference with the theme 'Improving Quality, Singing the Brand' was held, attended by company leaders and relevant personnel from the Steelmaking division and other departments. The conference proposed 22 action plans, emphasizing the promotion of a comprehensive quality management system, the application of error prevention measures, and the implementation of quality responsibilities, and set quality goals for May-December 2024, comprehensively improving product quality and brand influence.



Customer Service

Qingdao Special Steel always adheres to the core concept of 'customer-centered,' establishing a comprehensive and efficient customer process technical support and service system, providing customers with high-quality products and excellent service experiences. Through a comprehensive customer service system, advanced technical support, and efficient feedback mechanisms, we ensure that customers receive high-quality service support throughout the product lifecycle.

We have established a customer service system covering pre-sales, in-sales, and after-sales processes, formulated regulations such as 'Customer Relationship Management Measures,' 'Product Quality Dispute Management Regulations,' 'Customer Satisfaction Measurement Management Measures,' 'Customer Complaint Handling Management Measures,' and 'Customer Feedback Information Control Procedures,' ensuring service efficiency and consistency through institutionalized and standardized management.

We have established a rapid response mechanism and service platform for complaint handling, accepting customer complaints through various channels such as phone, email, WeChat, and mobile customer service platforms. The company clearly defined that customer complaint response time does not exceed 24 hours, ensuring that customer issues are promptly addressed. For complaints requiring on-site handling, sales, quality, technical, and production personnel will arrive on-site simultaneously, quickly analyze the problem, and propose solutions.

The company has strengthened the process management of quality dispute handling, established a specialized management process for failure analysis reports, a fast track for dispute handling, and formulated a quality dispute handling investigation and tracking form, submitting daily quality dispute handling reports, shortening the dispute handling cycle, and improving the efficiency of quality dispute handling.

² The Qingdao Mayor's Quality Award is the highest quality award established by the Qingdao Municipal Government.

We attach great importance to in-depth communication with customers. Company executives regularly conduct annual and quarterly return visits and communication with strategic customers to understand customer needs and development trends. Production, technical, and business personnel regularly visit users for key products, applying customer needs to continuous improvement of product development and services. The company regularly organizes technical exchange meetings, customer seminars, and participates in industry exhibitions to shorten the distance of communication and technical docking with customers.

In 2024, the company received letters of thanks from Bekaert, Yantai Dongxing, and other companies.



The company always regards the improvement of customer service quality as the focus of enterprise development. We conduct professional training for the customer service team every month to enhance service awareness and professional skills, and conduct customer satisfaction surveys every year to collect customer opinions and suggestions on product quality, service experience. By analyzing survey results, we identify service shortcomings and formulate improvement measures.



Fair Marketing Training for Marketers

The customer satisfaction survey result is

95.66%

An increase of

2.31 percentage points year-on-year

Attending the Strategic User Seminar on Automotive Steel and Premium Wire Rod

In July 2024, CITIC Pacific Special Steel Group Co., Ltd. held a strategic user seminar on automotive steel and premium wire rod in Datong, Shanxi, engaging in discussions with 160 strategic users from the automotive steel and premium wire rod supply chain on industry trends and development needs. The seminar provided a platform for in-depth communication between Qingdao Special Steel and strategic clients, further solidifying their cooperative relationship.

At the seminar, General Manager Sun Guangyi introduced the production and operation status of Qingdao Special Steel and shared the company's strategies and determination in facing new industry challenges. Qingdao Special Steel always adheres to the service philosophy of 'customer-centered,' committed to providing high-quality Special Steel products and customized solutions to customers. By continuously optimizing production processes, improving technical levels, and enhancing service systems, the company has achieved significant success in the premium wire rod field, earning widespread recognition from customers.



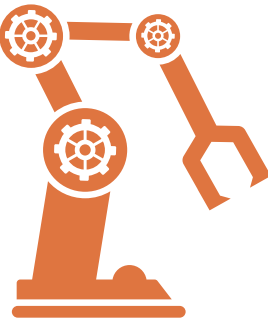
Case

In the future, Qingdao Special Steel will continue to deepen the construction of its customer service system, focus on customer needs, innovate service models, and enhance service value.

Intelligent Manufacturing Empowering Development

Digitalization and intelligence are crucial to enhancing the core competitiveness of enterprises. Qingdao Special Steel has deployed artificial intelligence applications in advance according to the requirements of CITIC Group and CITIC Pacific Special Steel Group's 'Artificial Intelligence+' 3-year action and digital special work, forming the 'Qingdao Special Steel Digital Blueprint Planning (2024 Edition)' and the 'Artificial Intelligence +' 3-year action plan, using informatization and Intelligent Manufacturing to improve production efficiency and product quality.

We have accelerated the deep application of cutting-edge information technologies and digital technologies such as AI big data, cloud computing, artificial intelligence, 5G technology, Industrial Internet, and the Internet of Things in all aspects of steel production, gradually promoting the upgrading of production and manufacturing to 'Intelligent Manufacturing', building intelligent production lines, establishing intelligent Centralized Control Center, and opening a new era of intelligent steel rolling.



Formulate the 'Qingdao Special Steel Digital Blueprint Planning (2024 Edition)'

Based on the development trend of digitalization and intelligence in the steel industry and the actual development of the company, the company aims to 'build a globally leading Special Steel digital navigation enterprise' as the overall goal, by building a comprehensive digital factory and platform including smart logistics, smart material yards, Steelmaking smart factories, high-speed wire rod / bar flat double-line digital production lines, smart energy integrated control and smart operation decision centers, supplemented by organizational, institutional, talent, capital, and technical five-dimensional guarantee mechanisms, systematically promoting the Digital Transformation of the entire production and operation process, leading the industry Intelligent Manufacturing development.

During the reporting period, the company has implemented projects such as the dual-line and dual-intelligent control digital factory for bar and flat steel, intelligent labeling robots, intelligent packaging robots, and a unified R&D data management platform.



Pilot Enterprise for the Chief Data Officer System in Shandong Province
Qingdao Technological Innovation Demonstration Enterprise (Artificial Intelligence)
First Batch of DCMM Pilot Enterprises in 2024



Obtained the Data Management Capability Maturity Level 3 (DCMM) Certificate



AAA Level in the Integration of Informatization and Industrialization Management System

The digitalization rate of production equipment increased by **1.27 percentage points** compared to the planned target, and increased by **3.73 percentage points** year-on-year.

The numerical control rate of key processes increased by **0.67 percentage points** compared to the planned target, and increased by **5.99 percentage points** year-on-year.

The robot ownership rate reached **180 units per 10,000 persons**.



'AI Empowering to Digitize the Whole Process of High-speed Wire Rod of Special Steel' was selected as a key scenario case in the steel industry in 2024 and won the third prize in the 'Kailai Cup' 9th Shandong Province (Industry 4.0) Innovation and Entrepreneurship Competition in 2024.



The company participated in the formulation of the national standard 'Technical Requirements for Performance Prediction of Special Steel Bar and Wire Rod in the Iron and Steel Industry' (T/CISA 396—2024) Intelligent Manufacturing.

Smart Coking

Relying on existing information systems, an industrial big data and industrial intelligence platform based on a digital twin platform was established. The intelligent coking and coke dry quenching optimization application system was deployed, integrating multi-dimensional data and using big data, expert models, and machine learning to train AI algorithm models, achieving production prediction, diagnosis, and cost reduction and efficiency improvement recommendations, reducing resource consumption. The ammonium sulfate process achieved automatic packaging, improved operational efficiency and reduced labor costs; the use of coke oven basement inspection robots reduced personnel exposure to hazardous environments, lowering the risk of casualties.

Reduce resource consumption: The average gas consumption per tonne of coke decreased by 5.21m³/t, the proportion of high-quality coal decreased by 0.38%, and the coke dry quenching burn-off rate decreased by 17% year-on-year, significantly improving coke yield.

Demonstration effect: By building the Coking industrial intelligence brain, it provides technical experience for the intelligent transformation of the Coking industry, accelerating industry digital innovation.

Smart Ironmaking

The company has implemented a cloud ironmaking integrated intelligent control platform based on big data, constructing 6 intelligent application scenarios: production, safety, environmental protection, cost, equipment, and energy. By leveraging industrial mechanism models, big data, artificial intelligence, digital twin and other technologies, we have overcome numerous challenges in green and low-carbon production of high-energy-consuming industries such as steel and coking, and enhanced the value of intelligent manufacturing. We pioneered an intelligent closed-loop automatic water control system for the sintering process, which can stably control the particle size and moisture of the mixture, standardize the operation criteria for four shifts, and effectively reduce energy consumption and costs in the sintering process.

Energy conservation and emission reduction: The average sintering solid fuel consumption per tonne of ore decreased by 0.26kg, and electricity consumption decreased by 0.83kWh.

Process optimization: We achieved data sharing and collaboration in the ore blending—mixing—sintering execution process, improving ore blending efficiency.

Smart Steelmaking

An intelligent scheduling system for the No.1 Steelmaking Plant and an intelligent crane dispatching system are under construction. Using intelligent AI algorithms, they will achieve scientific and efficient dispatching, shorten logistics cycles, reduce waiting times, improve production efficiency, and lower costs. We plan to build the digital steelmaking smart control platform in No.2 Steelmaking Plant in 2025, establishing a Steelmaking production data foundation to achieve centralized data management, precise process control, digitalization of technical know-how, and closed-loop operation management, comprehensively enhancing steelmaking digital intelligence levels.

Efficiency improvement: Through the intelligent production scheduling and crane intelligent dispatching system, we can shorten logistics operation cycles and reduce production costs.

Smart Profiles

We have completed the cold bed sampling robot and coding counting robot application projects, effectively solving the complex identification and discontinuous operation processes caused by multi-variety steel, multi-specifications, and small batches of steel products, and reserved interfaces for subsequent material tracking. The under-construction bar and wire rod dual-line dual-intelligent control digital factory aims to create a dual-line digital demonstration factory. By building a digital platform to collect rolling data and optimize primary programs, it achieves bidirectional transformation between business and digital, enabling full-process material tracking of billets and precise matching of data with material quality, location, and time. We also utilize relevant data to develop automation systems, integrate control panels, and achieve centralized operations.

Robot application: The completed robot project solves the problem of discontinuous workflow and improves operational efficiency.

Digital demonstration factory: The under-construction bar and wire rod and flat steel dual-line dual-intelligent control digital factory will realize full-process material tracking and enhance production efficiency.

Smart High-speed Wire Rod Line

Taking the No.5 and No.6 high-speed wire rod lines as a pilot, we are fully committed to building the Intelligent Manufacturing demonstration factory. Through 'intelligent centralized control—centralized operations,' 'intelligent operation and maintenance—information digitization,' and 'intelligent equipment—equipment intelligence,' we will realize full-line intelligence, informatization, and reduced manpower. Other high-speed wire rod lines will horizontally replicate the successful experience, such as the No.2 and No.3 high-speed wire rod lines completing the construction of a full-process material tracking system, providing material information for finished product batching and intelligent labeling. The newly added intelligent labeling system enhances efficiency and reduces risks. By deepening the high-speed special steel wire rod intelligent manufacturing project, we strengthen big data analysis and three-dimensional warehouse module applications, improve three-dimensional warehouse functions, and increase system utilization, which will assist production and operation, and enhance personnel maintenance capabilities.

Material tracking: Completed the construction of a full-process material tracking system, achieving full-process tracking of billets from reheating furnace entry to offline.

Intelligent labeling: Newly added 2 sets of intelligent labeling systems to improve work efficiency and reduce safety risks.

Deepen applications: Deepening big data analysis and three-dimensional warehouse modules will increase system business utilization.

Smart Inspection and Testing

A temperature measurement and sampling robot for the refining furnace was constructed in the Converter process, and a complete set of testing robot equipment was installed in the front laboratory, improving the efficiency of testing and analysis, reducing the production cycle of the Steelmaking process, and enhancing the stability of product quality.

Efficiency improvement: The inspection and testing process is compressed to within 150s, and the testing time is shortened by 50%.

Smart Equipment Management

In response to the complex working conditions of equipment in the steel industry (variable speed, load, and frequent impact loads), which lead to low accuracy of traditional equipment monitoring, significant human factors in periodic inspections and scheduled repairs, and production disruptions due to emergency repairs, the company has comprehensively built an intelligent equipment diagnosis, operation and maintenance platform, transforming equipment management from 'preventive maintenance' to 'predictive maintenance.' The platform, based on a large amount of equipment data, supported by algorithm models, centered on big data, and governed by an alarm system, can automatically diagnose and issue alarms, optimize the inspection system, shorten sampling cycles, reduce inspection workload, accurately determine fault points and equipment lifespan, and achieve predictive maintenance.

Intelligent equipment diagnosis, operation and maintenance platform: Equipment fault diagnosis accuracy exceeds 95%, with a false negative rate of 0, and equipment failure rate below 0.1%.

First batch selected into the Ministry of Industry and Information Technology Excellent Level Smart Factory

The company explores the Intelligent Manufacturing path for steel enterprises, conducts research and pilot projects on Intelligent Manufacturing key technologies, and promotes the integration of intelligence and manufacturing through artificial intelligence, striving to build a globally leading green, low-carbon, intelligent special steel high-speed wire rod production factory.

The high-speed special steel wire rod smart factory introduces advanced technologies such as private cloud, digital twin, big data analysis, artificial intelligence, and machine learning, deploying intelligent manufacturing equipment, industrial software, and systems to achieve integrated production and operation data, intelligent equipment operation and maintenance, online optimization of production processes, intelligent control of energy utilization, and real-time monitoring of safety risks, building a technologically leading Intelligent Manufacturing demonstration factory.

The intelligent centralized control center integrates the control room, utilizing intelligent means such as digital twin technology, image recognition warning technology, online performance prediction, and full-field temperature measurement of the heating furnace, combined with the company's intelligent equipment operation and maintenance platform and integrated carbon emission and pollutant management, control, and treatment platform, forming an integrated and intensive management model of 'operation, control, and management,' achieving efficient management and intelligent production.

The high-efficiency intelligent wire rod shipment platform, with intelligent three-dimensional warehouses, intelligent unmanned cranes, labeling robots, automatic corner protectors, and logistics execution systems as the main components, pioneered a large-scale three-dimensional warehouse (9600 pallet positions, maximum load capacity of 28,800 tonnes), saving 6,000m² of warehouse space, shortening the logistics dispatch cycle by 1 hour, and improving dispatch efficiency by about 40%.

The company's No. 5 and No. 6 high-speed wire rod smart factories have prominent brand and demonstration effects, with results that are worth promoting, and have been selected as the Ministry of Industry and Information Technology Excellent Level Smart Factory (first batch).

In the future, the company will improve intelligent applications based on the Industrial Internet platform, build the Intelligent Manufacturing ecosystem, and create a full-process, full-process high-quality and efficient Industrial Internet integrated Intelligent Manufacturing wire rod production base, leading a new global model for high-speed Special Steel wire rod production.



Case

Sintering intelligent water control system based on the deep integration of image recognition technology and supervised self-learning algorithms

Case

The project integrates image recognition technology, supervised learning algorithms, sintering expert inference engine, LiDAR scanning, and other cutting-edge technologies to create a series of intelligent models.

Intelligent water distribution model: Using image recognition to make the particle size of sintering mixed materials real-time visible, combined with adaptive control algorithms to achieve precise water distribution.

The project has been appraised as reaching international advanced levels through scientific and technological achievements, being the first of its kind in the industry and possessing independent intellectual property rights. For the first time, a data closed-loop for ore blending - sintering control and management was achieved, pioneering unattended intelligent water distribution based on image recognition technology in the sintering process, enhancing quality stability. A new model for digital talent cultivation and data knowledge collection and learning was established, making team experience and internal knowledge visible through data granularity based on material lists, achieving closed-loop operations in various control links.

In 2024, the 'Sintering Intelligent Water Control System Based on Deep Integration of Image Recognition Technology and Supervised Self-Learning Algorithm' won the second prize of Metallurgical Science and Technology Progress Award from the Shandong Iron and Steel Association and the first prize of Equipment Management Innovation Achievement Award from the Shandong Equipment Management Association. The project has explored a complete and advanced solution for ore blending - sintering closed-loop control intelligent manufacturing for the steel industry, leading the industry's intelligent development.



Using robots to improve work efficiency and reduce safety risks

Case

By implementing the robot application project, key processes such as cold bed sampling, coding counting, and intelligent labeling have been replaced by robots. These robots are equipped with advanced visual recognition systems, enabling precise positioning and efficient operations. For example, the success rate of cold bed sampling robots in cutting and grabbing operations is over 99%, and the intelligent labeling robots can label an average of 18,000 coils per month, greatly improving work efficiency and reducing labor intensity. In addition, the safety benefits are significant, effectively avoiding safety risks in manual operations. For example, the cold bed sampling robots have prevented accidents caused by red steel on the cold bed, significantly reducing the risk of injury and creating a safe and efficient production environment for the company.



Coding Counting Robot



Intelligent Labeling Robot

➤ Digital Talent Cultivation

Qingdao Special Steel attaches great importance to the construction of digital capabilities, focusing on building a team of compound talents who are familiar with both information technology and models, as well as processes, and emphasizing on the enhancement of Management Level's digital thinking. The company innovatively established mechanisms for digital independent development project management, agile development project team collaboration, benefit calculation rules, digital demand review, use case development priority ranking rules, etc., to stimulate team vitality and improve employees' digital capabilities.

The company adopts a combination of weekly training and participation in projects to cultivate digital talents. The training content covers data asset inventory, big data, Java, C#, etc., while practical training is conducted through project-based methods, effectively improving employees' personal skills.

Completed Digital Training

11,830 person-times

In the future, Qingdao Special Steel will continue to take the 'Digital Intelligence Leadership' strategy as the guiding principle, continuously increase investment in digital intelligence, focus on intelligent projects, strengthen digital intelligence collaboration and innovation, promote data governance, drive the digital and intelligent transformation of the enterprise, strive to become an industry model of intelligence, and build a world-class steel demonstration enterprise.

Building a Responsible Supply Chain

Qingdao Special Steel is committed to promoting high-quality development, through close collaboration with partners, not only enhancing its own competitiveness but also making positive contributions to the industry's green transformation and high-quality development.

➤ Supplier Management

Qingdao Special Steel's suppliers are mainly divided into goods, engineering, and service suppliers. The company has established a comprehensive supplier management system, formulating management methods such as the 'Supplier Management System' and the 'Implementation Rules for Second-Party Supplier Audits,' standardizing supplier management from the system process.



The company is committed to becoming a model of transparent cooperation, creating a relaxed, pleasant, and fair cooperation environment, and achieving mutual benefit and win-win results. The company highly values the collaborative development with suppliers, organizing partner exchange meetings, establishing a management community with suppliers, sharing technology, jointly developing, and improving product and material quality, helping suppliers' materials from Qingdao Special Steel go to broader markets.

2024 Partner Conference

In July 2024, the company successfully held the Partner Conference with the theme of 'Walking Together, Win-Win Cooperation, and Creating the Future Together.' Company executives, department heads, and 90 partners attended the conference. At the conference, the leadership of the General Manager's Department awarded the top ten excellent partners.

The company and its partners worked together to face market challenges and share the fruits of success. Looking to the future, in the face of the new market environment, both parties will grasp the forefront of innovation and industry trends, deepen cooperation in technological innovation, product services, etc., improve the efficiency and quality of the enterprise supply chain, and build a community of shared destiny with mutual trust, mutual benefit, and win-win cooperation.



Case

➤ Supply Chain ESG Management

Qingdao Special Steel actively promotes ESG risk management in the supply chain, integrating occupational health, safety production, environmental protection, and other ESG factors into all aspects of supplier access and assessment, continuously improving the level of supply chain ESG Management, and building a responsible and sustainable supply chain system. The company strictly regulates supplier ESG performance based on documents such as the 'Supplier Code of Conduct,' clearly defining requirements for human rights, health and safety, environment, and anti-corruption, while optimizing supplier performance evaluation and audit regulations to ensure that the management of suppliers is more scientific and comprehensive.

Full-process control is implemented for supplier ESG Management and risk assessment. During the access phase, the supplier's occupational health and safety production, environmental management system, and other ESG-related qualifications are meticulously and comprehensively examined to ensure that suppliers prioritize and practice business conduct norms and social responsibility from the source. For auxiliary material suppliers, the 'Environmental Commitment Statement on Not Using Harmful Substances' and the 'Commitment Statement on Not Using Conflict Minerals' are signed, effectively ensuring the green and environmentally friendly production process and preventing potential risks caused by harmful substances and conflict minerals. Regular environmental evaluations are conducted for suppliers to ensure their production and business activities comply with national environmental laws and regulations; suppliers are encouraged to adopt the Circular Economy model to improve resource utilization and reduce environmental pollution.

Sign the 'Supplier Code of Conduct' and the 'Supplier's Commitment to Abide by and Continuously Improve Social Responsibility' with suppliers.

➤ Conflict Minerals Management

The company does not purchase raw materials from conflict-affected and high-risk areas, such as 3TG (tantalum, tin, tungsten, and gold) and other metal minerals. Information on conflict minerals has been included in the supplier access audit, requiring suppliers to sign the 'Commitment Statement on Not Using Conflict Minerals.' If a supplier is involved in conflict mineral disputes, we will not cooperate.

For auxiliary material suppliers, the 'Environmental Commitment Statement on Not Using Harmful Substances' and the 'Commitment Statement on Not Using Conflict Minerals' are signed.

Employee Development and Growing up together

Qingdao Special Steel is committed to building a system that focuses on value creation in talent selection and utilization, sharing achievements with value creators, creating a highland that attracts various professional talents, maximizing employee welfare, meeting employees' aspirations for a better life, and achieving mutual growth of the enterprise and employees.

Employee Rights and Interests

Qingdao Special Steel strictly adheres to relevant laws and regulations such as the 'Labor Law of the People's Republic of China' and the 'Labor Contract Law of the People's Republic of China', formulates and continuously improves management measures such as the 'Labor Contract Management Regulations', 'Attendance Management Regulations', and 'Salary Management System', safeguarding and respecting employees' basic rights, ensuring their rights to work, receive remuneration, and various types of leave, and continuously enhancing employees' sense of gain, happiness, and security.

We insist on equal pay for equal work, legally prohibit forced and compulsory labor, the use of child labor and underage workers, workplace harassment, and any form of punishment, including corporal punishment, intimidation, verbal abuse, fines, and any other mental or physical coercion or verbal insults. We strictly protect employees' personal privacy, respect the customs and habits of ethnic minorities, and oppose all discriminatory acts caused by race, nationality, region or nationality, descent, religious belief, physical disability, gender, age, education, language use and marital status

We widely recruit talents, providing strong support for employment absorption and regional economic development. With its excellent corporate culture, broad development platform, and competitive talent cultivation mechanism, the company has been highly recognized in the field of employee recruitment, winning honors such as the Top 100 'Most Attractive State-Owned Enterprise for College Graduates in Shandong Province in 2023', 'Outstanding Contribution Enterprise for Employment Promotion 2023', and 'Most Popular Enterprise Brand for New Stars in the Workplace in Qingdao West Coast New District'. During the reporting period, a total of 86 college graduates were recruited.

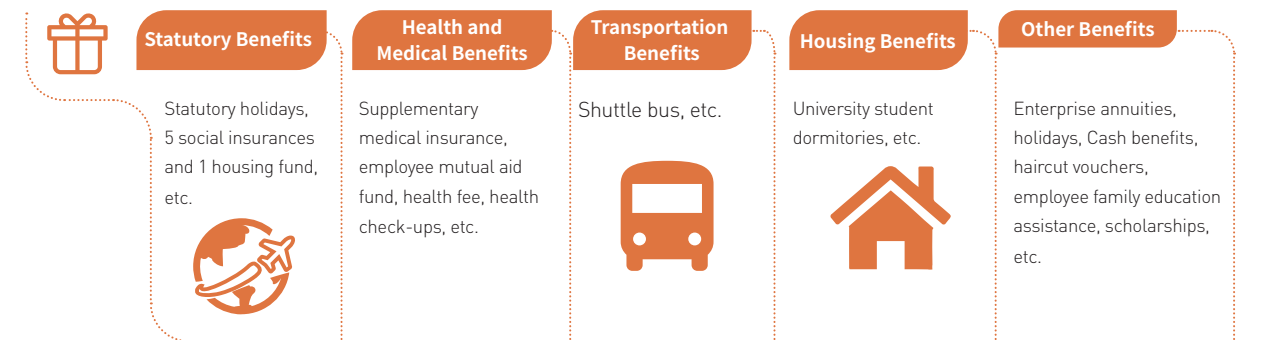


Compensation and Benefits

Qingdao Special Steel continuously improves salary performance appraisal and innovates incentive mechanisms. Following the dynamic management principle of 'salary follows position, capable of moving up and down', we have formulated systems such as the 'Employee Salary Management System', 'Employee Performance Management System', and 'Individual KPI Management Measures', building a differentiated salary system and employee performance management system, achieving full KPI, ensuring that employees' salary levels truly match their abilities and contributions. We establish a diversified incentive system combining material and spiritual incentives, offering equity incentives to core employees, year-end reward incentives to R&D personnel, and conducting various evaluations, awards, innovations, breakthrough competitions, and gold employee evaluations with rewards.

The company has formulated regulations such as the 'Employee Attendance Management Regulations', 'Employee Supplementary Medical Management Measures', 'Shuttle Bus Management System', and 'Dormitory Management System', building a diversified welfare security system, fully enhancing employees' work and life quality. We guarantee employees' right to rest and vacation according to law, implement national standard working hours and overtime policies, and provide employees with paid annual leave, maternity leave, family visit leave, marriage leave, sick leave, etc. We cover all aspects of employees' life scenarios, providing holiday allowances and benefits on important holidays, sending birthday wishes and souvenirs during birthdays, offering summer heat prevention and cooling fees and providing tools and food for heat prevention and cooling in summer, and providing heating subsidies in winter. We focus on the health and safety of employees' career cycles, providing each employee with pre-employment physical examinations, annual health check-ups, occupational disease examinations, and post-employment physical examinations, and offering customized physical examinations for model workers, craftsmen, and advanced employees. During the reporting period, employee physical examination coverage was 100%, work injury insurance payment completion rate was 100%; employee welfare investment was 56.76 million yuan.

100%	Employee physical examination coverage
100%	Work injury insurance payment completion rate
56.76 million yuan	Employee welfare investment



Career Development

Qingdao Special Steel formulated management measures such as the 'Implementation Measures for the Career Development of Professional and Technical and Skilled Operation Positions' and the 'Employee Career Channel Management Measures'. Based on the needs of enterprise development and employee growth, a diversified career development system was established, setting qualification standards and promotion mechanisms for different sequences and levels. By optimizing incentives, assessment mechanisms, and growth paths, employees' enthusiasm, initiative, and creativity were stimulated.

The company categorizes positions into three major categories: management, professional technical, and operational based on job characteristics. On this basis, a comprehensive and flexible career development system is built, providing employees with diversified development paths. Employees can achieve vertical promotion within their job category, cross-job horizontal development through internal transfers and competitions, and flexible interchange between management, technical, and operational positions, breaking job barriers, expanding career development space, assisting employees' career growth, and ensuring job competence, development promotion, and channel compliance.

We attach great importance to the development of young employees, and help them grow in their positions, achieve excellence on the job, and demonstrate personal value through a series of targeted initiatives. We have provided rich and diversified career development paths, allowing each young employee to find a suitable growth direction. We have offered competitive salaries and comfortable living environments to enhance a sense of identity and belonging. The company encourages young employees to participate in PMO projects to accumulate work experience. Qingdao Special Steel organized the '90 Stars' Talent Training Camp, tailoring training courses for post-90s employees to help them grow quickly. We regularly hold young employee growth meetings and university graduate employee exchange forums, building a platform for direct communication between company leaders and employees, listening to demands and providing timely solutions.



'90 Stars' Talent Training Camp

'8 Measures to Promote the Development of Young College Students' Employees

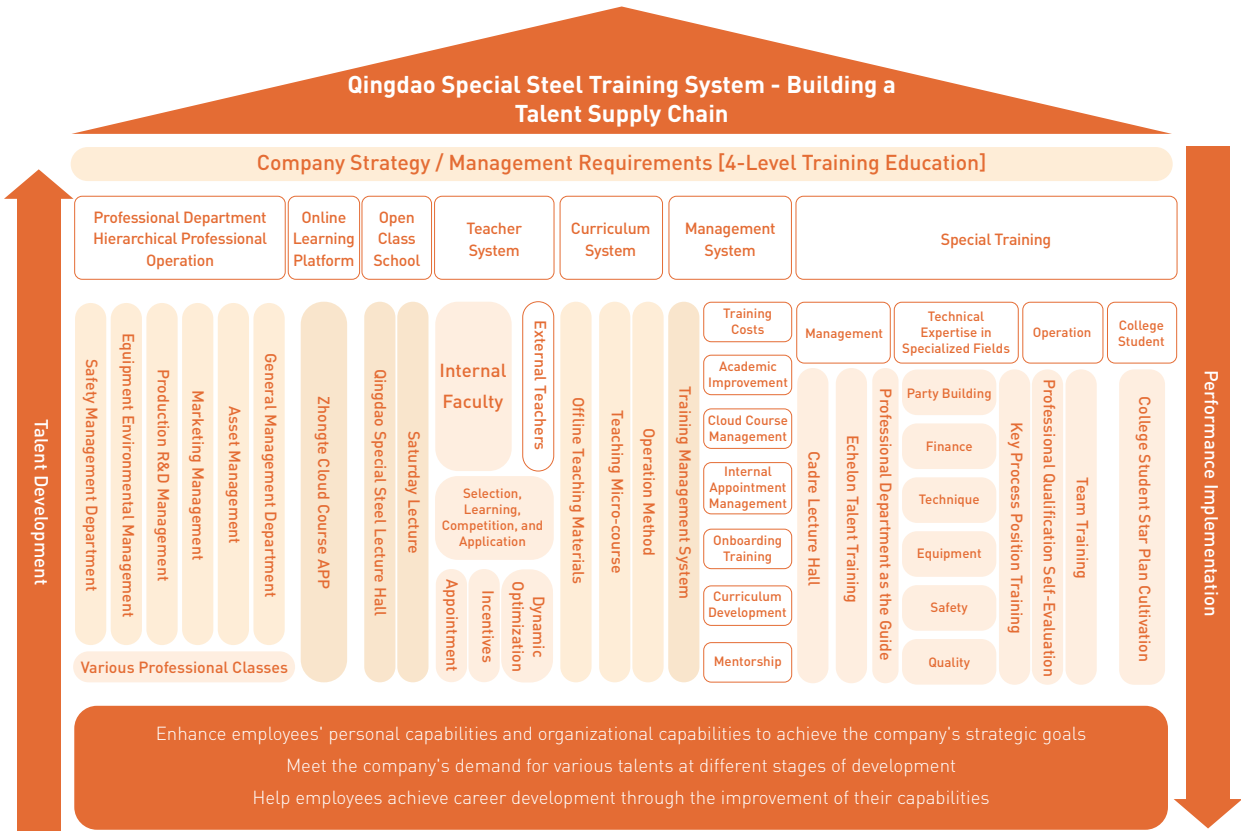
- Refining college students' career development plans
- Key position personnel analysis
- Flexible training models
- Improving timely communication and feedback channels for college students
- Deepening incentive mechanisms, providing competitive learning and growth period salary guarantees
- Offering multi-dimensional, high-level training and learning opportunities
- Actively carry out team-building activities such as sports meets and competitive games
- Actively expand cooperative partnerships with relevant units in Huangdao District



Meeting with leaders of college students

Talent Development

Qingdao Special Steel regards talent cultivation as the core driving force for enterprise development, focusing on the 'refinement' of the employee team and potential tapping, aiming for the succession of management talents, professional leadership of technical talents, excellent skills of operatingtalents, and rapid growth of young talents, and builds a 3+1 talent cultivation system. Relying on the Training Center and upholding the human resources management philosophy of 'running the enterprise like a school', we carry out diversified training activities covering all employees through 7 major modules: Professional Departments, Zhongte Cloud Learning Platform, Open Course Academy, Teaching Staff System, Curriculum System, and Specialized Training. This is based on the 'Internal Lecturer Management Measures' and 'Training Management System', aiming to build a learning organization and promote the common development of employees and the enterprise. The company strengthens practical training methods such as on-site experience in production and operation, job-based skill drills, and master-apprentice mentoring, and organizes vocational skill competitions like the 'Special Steel Cup' to enhance employees' professional skills and business literacy. During the reporting period, a total of more than 1,300 various training sessions have been organized, accumulated training more than 270,000 person-times.



Shandong Province Metallurgical Industry Employee Lean Management Skills Competition

Awarded by Qingdao City

Group Second Prize: 1 group

Individual Second Prize: 1 person

Individual Third Prize: 2 persons

Third Prize in the Shandong Province Skill Xinglu Vocational Skills Competition Employee Group: 3 persons

West Coast New District

May Day Labor Medal

Qingdao Craftsman

Workers' Pioneer

May Day Labor Medal

Workers' Pioneer

Langya Craftsman

Hosted the 4th Echelon Talent Training Program

In 2024, the company hosted a two-year Fourth Echelon Talent Training Program to discover and cultivate young talents with development potential. The courses covered leadership enhancement, efficiency management, AI skills, performance management, etc. Each session adept customized evaluation methods to quantify and visualize learning outcomes.

Through classroom training, corporate study tours, and learning exchanges with sister units, we stimulate the creativity of echelon talents, reserve successors for the company, and provide solid talent support for achieving the company's vision and strategic goals.



Organized professional technical and comprehensive management ability enhancement training courses

In 2024, the company, in collaboration with CITIC Special Steel College, CITIC Special Steel Research Institute, and Ocean University of China, organized a 2-year professional technical and comprehensive management ability enhancement training course. The training targets 80 middle-level cadres and professional technical backbones of the company, conducting precise, comprehensive, and long-term training through classroom teaching, expert lectures, case teaching, experimental practice, inquiry-based learning, and visits. This course aims at cultivating 'umbrella-type' excellent management talents with profound professional knowledge and cross-domain collaboration capabilities, enhancing professional technical and comprehensive management literacy and level, and building a high-level, application-oriented, and compound technical and management talent team.



Hosted the 7th 'Special Steel Cup' Employee Skills Operation Competition with the theme 'Forging Craftsmanship, Enhancing Skills, Selecting Talents'

In 2024, the company hosted the 7th 'Special Steel Cup' Employee Skills Operation Competition with the theme 'Forging Craftsmanship, Enhancing Skills, Selecting Talents', actively leveraging the role of 'mentorship' and 'passing on experience' to enhance employees' professional skill levels, stimulate their learning enthusiasm and technical updates, and cultivate more innovative knowledge-based and skill-based talents.

The competition covers 61 jobs, involving 46 professional jobs such as Coking operators, Sintering operators, Blast Furnace operators, Steelmaking operators, Steel Rolling operators, and crane operators, as well as 15 general jobs, with over 5,000 employees participating. After the competition, 550 employees with outstanding performance were rewarded, with a total reward amount of 350,000 yuan, successfully building a knowledge-based, skilled, and innovative workforce.



Democratic Management

Qingdao Special Steel attaches great importance to employee demands and opinions, establishing comprehensive and smooth communication channels for employees, and continuously improving the employee communication mechanism to listen to employees' voices, understand and solve their difficulties.

The company has effectively strengthened democratic management. It strictly implements the system of employee representative congresses, convenes employee representative congresses, and safeguards employees' rights to know, participate, and supervise. The company actively enhances collective bargaining, focusing on issues of concern to employees such as compensation and labor safety, and signs collective labor contracts to protect employees' legitimate rights and interests. A labor dispute mediation mechanism has been established, and the innovative implementation of the hearing system ensures that decisions are fair, just, and transparent, resolving disputes in a democratic and scientific manner. The company has established a trade union as an effective channel for communication between employees and the company, widely collecting and responding to employee demands through methods such as employee representative proposals, employee representative symposiums, as well as trade union QR codes and email. An annual employee satisfaction survey is conducted to gather employees' views and feelings on the work environment, compensation, career development, and other aspects, enhancing their sense of participation.

In 2024, the company conducted in-depth online and offline discussions on important topics such as the 'Qingdao Special Iron & Steel Co., Ltd Employee Handbook' and 'Attendance Management Regulations', fully leveraging the role of the enterprise democratic management system to ensure that employees' voices are fully heard and responded to, effectively safeguarding employees' legitimate rights and interests. During the reporting period, the company organized 13 employee representative symposiums, collecting and implementing 102 suggestions.



Employee Symposium

Employee Care

Qingdao Special Steel is committed to building a service position brand, creating a warm and home-like atmosphere, and carrying out a series of activities such as 'Spring Warmth, Summer Coolness, Autumn Aid, Winter Care'.

Spring Warmth: During the New Year and Spring Festival, the company leaders express condolences to model workers, employees in difficulty, and frontline employees on duty, with 150 people receiving gifts and a total consolation amount of about 31,000 yuan.

Summer Coolness: The company leaders distribute ice cream, watermelon, drinks, and cooling packages to frontline employees;

Autumn Aid: There are 19 students assisted and awarded by the company, with a total amount of 35,000 yuan.

Winter Care: Precise assistance for employees in difficulty.

Consolation Amount

31,000 yuan

Students Assisted and Awarded

19 students

Amount of aid and scholarship

35,000 yuan



'Send Coolness, Boost Morale' visit activity

Care for women. The company always places the rights and interests of female employees in an important position, actively creating a warm and inclusive working environment, allowing female employees to feel the company's care and respect. The company carefully establishes a 'Mommy Room' to provide a warm and convenient exclusive rest space for female employees during pregnancy and lactation. The company attaches importance to the career development of female employees by organizing special seminars and lectures for female employees, building a platform for communication and knowledge sharing; carrying out the 'Women's Heart to the Party' theme activities, promoting the advanced deeds of female employees, and selecting the most beautiful women to inspire female employees to climb to new heights. The company pays attention to the physical and mental health of female employees, offering training courses on women's health and occupational health, organizing on-site first aid activities, and supervising the biennial health check-ups for female employees to build a strong defense for their health. The company enriches the spiritual and cultural life of female employees by organizing activities such as yoga, tea tasting, hand-painted fans, and movie watching to help female employees relieve work pressure; on International Women's Day and Children's Day, the company carries out family-building activities such as joint learning and construction, family story gatherings, and parent-child reading, extending care to the families of female employees.



Assisting employees in difficulty. The company continues to do practical things for employees, improving the care and concern mechanism for employees in difficulty, establishing a series of 'Warmth Delivery' activities and an employee mutual assistance fund, providing assistance to families of employees who are in difficulty due to serious illness or sudden accidents, and solving problems for employees. We collect the micro-wishes of single-parent female employees in difficulty, and coordinate various forces to help fulfill their dreams. During the reporting period, 'Warmth in the Cold Winter' assisted 43 people, with an assistance amount of 96,000 yuan; the employee mutual assistance fund helped 13 employees, with an assistance amount of 129,000 yuan.

'Warmth in the Cold Winter' assisted	Rescue Amount
43 persons	96,000 yuan
Employee Mutual Assistance Fund helped employees in difficulty	Rescue Amount
13 persons	129,000 yuan

Enriching employee activities. The company actively promotes a healthy lifestyle, satisfying employees' interests and hobbies. The company has established 8 cultural groups such as basketball, football, marathon, and photography, and has carried out nearly 50 diverse activities including football, basketball, table tennis, badminton, marathon, health run, walking, parent-child activities, movie watching, calligraphy, flower arrangement, and tea art, with the participation of 5,000 employees, providing a broad platform for employees to showcase their value and integrate. The company has established an employee cultural and sports activity center, equipped with a gym, library, etc., and offers various courses such as fitness, yoga, basketball, and boxing to help employees strengthen their bodies. The company provides psychological counseling, covering employees and their families both online and offline, offering comprehensive care for employees' mental health.

Caring for the youth. In order to solve the problem of single youth's marriage and love, the company has established a single youth information database, innovating the marriage and love model, mobilizing all employees to participate, and creating an atmosphere of 'everyone helps'. On the basis of stabilizing existing resources, the company actively expands external resources, joining the Qingdao City and West Coast New District Employee Matchmaking Association, to matchmake for single youth employees. During the reporting period, a total of 12 unique youth matchmaking events were organized, attracting 380 single employees, with significant results.





2024
XIN NIAN KUAI LE

Qingdao Special Steel

The 3rd 'Innovation Cup' Table Tennis and Badminton Competitions



The 3rd 'Innovation Cup' Table Tennis and Badminton Competitions



'Parent-Child Hand in Hand, Running Towards the Future' Marathon Series

Case

Hosted the 'Warm Festivals, Special Steel Celebrates Mid-Autumn with You' series of events

In September 2024, the company hosted the 2024 'Warm Festivals, Special Steel Celebrates Mid-Autumn with You' series of events, including City Walk, visits to the Qingdao SCO International Conference Center, and university student forums, allowing employees far from home to feel the warmth of family and experience the cultural charm of Qingdao and the company, promoting mutual development of the enterprise and personal growth of employees.



Case

Conducted the 'Warm Autumn, Scholarship Dream, Job Family Visit' series of events

The company conducted the 'Warm Autumn, Scholarship Dream, Job Family Visit' series of events, actively building a platform for employee families to communicate with the enterprise, promoting deep integration of the 'big family' and 'small family.'

During the event, employee families were organized to visit the high-speed Special Steel wire intelligent factory, experiencing the significant changes brought by intelligent centralized control, intelligent operation and maintenance, and intelligent equipment to the steel industry; forums were held to enhance families' understanding of the enterprise; families were led to visit the Qinggang Town living area, experiencing the living environment of employees. Through these activities, families personally felt the warmth of the enterprise, uniting the strength of families and the enterprise, injecting new vitality into high-quality development.



Occupational Health and Safety

Qingdao Special Steel is committed to establishing a comprehensive Occupational Health and Safety management system, fully building a positive safety culture, and ensuring employees have the necessary safety awareness and skills through enhanced safety training. At the same time, we strictly implement daily inspections, regular maintenance, fundamental site improvement and renovation, and application of advanced management tools and methods, striving to create a safe and healthy working environment. This effectively promotes employees' physical and mental health and minimizes workplace safety risks to the greatest extent.

• Safety Management

Qingdao Special Steel strictly complies with laws and regulations such as the 'Work Safety Law of the People's Republic of China,' the 'Occupational Disease Prevention and Control Law of the People's Republic of China,' and the 'Management Measures for Emergency Plans for Production Safety Accidents,' formulating 98 safety management systems including the 'Management Measures for Work Safety Management Institutions and Personnel' and the 'Work Safety Commitment Management Regulations,' innovatively implementing the participation of all employees in the formulation of safety standards, ensuring the company's production safety with system norms.

The company continuously improves the work safety management system, establishing a Work Safety Committee and five major work safety subcommittees led by the general manager's department, covering 26 professional groups. By implementing a monthly summary and review mechanism, we have effectively integrated resources and precisely focused on key control points. Senior executives lead by example, publicly making safety commitments, deeply engaging in on-site safety activities every week, personally conducting safety training, and strictly formulating and executing personal safety action plans to foster a positive safety culture. We promote the application of scientific management tools such as JSA (Job Safety Analysis), JCC (Job Safety Meeting), 5W (Five Whys) method, and RCFA (Root Cause Failure Analysis). Combined with safety management improvement projects, we proactively benchmark against advanced enterprises, steadily advancing all safety initiatives and effectively enhancing the scientific level of on-site safety management.

The company has set the work safety goal of zero accidents and zero injuries, and during the reporting period, all company work safety goals have been achieved.



Achieving the goals of safety production

- | | |
|---|--|
| ● Number of Production Safety Accidents: 0 | ● Number of Acute Occupational Disease Hazard Accidents: 0 |
| ● Lost Time Injury Rate per Million Man-Hours: 0.15 | ● Effective Safety Education Training Rate: 100% |
| ● Certification Rate for Special Operations (Equipment) Personnel: 100% | ● On-site Hazard Rectification Rate: 100% |
| ● Major Hazard Rate: 0 | ● Safety Behavior Observation Position Coverage Rate: 100% |



Steelmaking Division's No.2 Steelmaking Plant Won the Qingdao City Safety Production Standardization Team Award in 2024



Wire Rod Division's No.1 High Speed Wire Rod Production Line Gao Xian Shi Zhongkun Won the Qingdao City Production Safety Accident Hidden Danger Investigation Outstanding Employee Award in 2024



Steelmaking Division's Ju Guangtong Proposed 'Innovation in Avoiding Mobile Flat Car Injury Interlock' Was Selected for the Qingdao City Safety Production and Occupational Disease Prevention Rationalization Suggestions 'Golden Ideas' List

Safety prevention mechanism. The company implements the dual prevention mechanism for risk hierarchical management and control as well as hidden danger investigation and rectification. It carries out hidden danger investigations in various forms, establishes a list for major accident hazard investigation, refines the investigation content for each position and specialty, and organizes special inspections on electrical safety, major accident hazards, maintenance, and accident analogy, etc.. For violations and hidden dangers found during inspections, we use penalties, work stoppages, interviews, and reflections to rectify them. During the reporting period, a total of 852 issues were discovered, effectively preventing the occurrence of safety accidents.

Safety production responsibility system. The 'Company Safety Production Responsibility System' has been formulated, and the 'Company Position Safety Production Responsibility List' has been customized for the heads of various departments. We refine and improve the safety responsibility content of each work area, team, and position to ensure that each employee is clear about their responsibilities and fulfills them, effectively implementing the 'dual responsibilities of one position', achieving direct and territorial management, and ensuring that safety production responsibilities are assigned to individuals.

Safety informatization construction. The company continues to strengthen safety informatization construction, independently develops a safety production informatization platform, establishes a safety prediction and early warning system, promotes 31 intelligent safety management projects, and significantly improves the intrinsic safety level on site. By utilizing informatization methods ,we develop a safety behavior observation mini-program, encouraging positions including the general manager's department to conduct safety behavior observations. During the reporting period, a total of 65,202 observations have been completed, timely identifying and resolving issues, effectively reducing operational risks.

Safety standardization construction. The company continues to promote safety standardization construction in various processes. We strictly follow the relevant requirements of national safety standardization construction standards, refine the safety management system, improve the on-site working environment, continuously maintain the creation of second-level safety standardization, and move towards the creation of first-class safety standardization; formulate the 'Standardized Safety Team Management Measures', actively promote the construction of national demonstration teams, conduct safety team evaluations and rewards quarterly, and conduct standard safety team evaluations annually, effectively stimulating the enthusiasm of team leaders for autonomous management. During the reporting period, a total of 358 safety standardized teams have been created, including 230 teams from the unit and 128 teams from long-term related parties; a total of 20 teams have been rewarded.

Safety guardian system. The company implements a full-time safety supervisor system, incorporates the performance of supervisors into the company's 6 major prohibitions, and manages them in accordance with the standards for special operation personnel. We establish a mechanism for regular review and certification for the company and long-term related parties, and pre-job territorial training and certification for temporary related parties, certify safety guardians according to the management of special operations personnel, and enhance the capabilities of guardians. The company requires that no operations may be carried out until the safety supervisor arrives on site. Violators will be subject to penalties such as performance salary deductions and a 7-day work suspension. They can only return to work after completing at least 48 hours of safety education training and passing the assessment. During the reporting period, the company organized 13 special safety training sessions for long-term related parties and company safety guardians, with 2,236 participants; conducted 129 computer-based exams, with 1,858 passing, a pass rate of 83.1%; and issued certificates to qualified individuals.



Emergency Management

Qingdao Special Steel attaches great importance to the prevention and response to emergencies, and strives to improve the emergency management system. The company has established a comprehensive emergency plan system and formulated the 'Emergency Management System for Emergencies'. In 2024, the company comprehensively revised and filed the safety production emergency plan, forming a complete plan system including 1 comprehensive plan, 9 special plans, and 145 on-site disposal plans. We prioritize training in real combat conditions and actively innovate drill formats. Through multiple unscripted, scenario-based exercises in diverse forms, we continuously strengthen emergency response team capabilities, enhance frontline personnel's emergency handling and incident management skills, and improve commanders' organizational and coordination competencies. During the reporting period, the company conducted a total of 298 emergency drills.

Conducted emergency drills for major hazard sources in gas holders.

In order to test the rationality and effectiveness of the emergency response plan for major hazard sources in gas holders, and to enhance the emergency response and coordination capabilities of production, power, security, and fire departments, achieving the overall goal of 'unified command, timely response, orderly coordination, and effective handling,' Qingdao Special Steel organized an emergency drill for an 80,000 m³ Converter gas holder leakage and fire incident at the No.2 gas pressurization station.

The drill was divided into 5 stages: accident reporting and initial response, activation of the emergency plan, execution of emergency measures, elimination of the hazard and lifting of the alert, and evaluation by company leadership. It involved exercises such as personnel reporting, use of protective equipment, road closures and traffic diversions, search and rescue, gas holder purging, firefighting, production command, and coordination among various emergency teams. The entire drill process was smooth and orderly, with close cooperation among participating units and personnel, achieving the expected results.



In terms of fire safety, the company established a part-time fire rescue team. Through regular fire safety month activities, fire fighting skill training, fire fighting skill competitions, and emergency evacuation inspections, the company enhanced employees' fire safety skills. The company established and continuously upgraded a smart fire fighting system platform, enabling IoT data collection and application, intelligent fire information application, and big data analysis, effectively addressing management challenges such as dispersed fire information and incompatible communication protocols, and improving fire safety management levels. During the reporting period, 387 unannounced fire alarm signal emergency response linkage tests were conducted, significantly improving the rapid response and handling capabilities of personnel in key fire prevention areas.

Organized a comprehensive fire fighting skills competition

Case

In November 2024, in order to enhance fire emergency rescue capabilities, the company organized a comprehensive fire fighting skills competition, inviting professional firefighters from the Dongjiakou Fire Rescue Station to provide on-site guidance and evaluation. The 27 participants from 11 departments participated in this practical simulation of a comprehensive fire skills competition. The company insists on strengthening daily fire training to improve fire emergency response efficiency, building a solid defense line for fire safety.

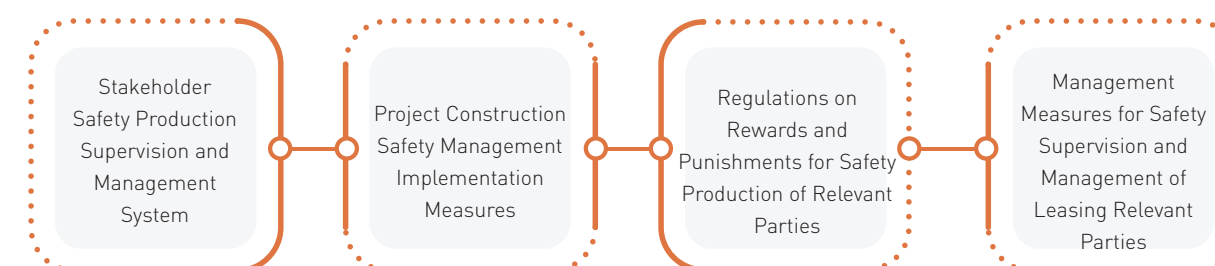


Stakeholder Safety Management

Qingdao Special Steel places high importance on stakeholder safety management, applying uniform safety management requirements and assessment standards to both stakeholders and regular employees to comprehensively improve safety management levels and performance.

Improving systems and refining supervision. The company developed and continuously optimized the 'Stakeholder Safety Production Supervision and Management System,' and implemented detailed management of stakeholders from pre-tendering, during project construction, to exit mechanisms. We established the 'Stakeholder Safety Performance Evaluation System,' regularly conducting comprehensive and accurate safety performance evaluations of stakeholders from multiple dimensions such as accident counts, casualties, near-miss events, inspection issues, major accident hazards, violations, team building, and occupational health. The company developed the 'Safety Production Responsibility Reward and Punishment Regulations' and the 'Stakeholder Safety Production Reward and Punishment Regulations,' a mechanism combining punishment with reward was established to encourage relevant parties to actively participate in safety management.

Stakeholders Safety Management Mechanism



Strictly dealing with violations and strengthening training. The company strictly handles continuous violations of safety bans to reduce the impact of safety risks on the industrial chain. All relevant parties are required to attend company safety meetings and training to enhance their self-safety management capabilities and safety production awareness. During the reporting period, the company organized training for 5,389 personnel from relevant parties.

Selection and commendation, encouraging reporting. Every quarter, we select and reward outstanding relevant parties, safety standardization teams, and safety individuals. The company encourages relevant parties to report hazards, violations, and provide reasonable suggestions, and rewards those who contribute.



Hazardous Work Management

Qingdao Special Steel attaches great importance to the safety management of hazardous work. The company has specifically formulated the 'Hazardous Work Safety Management System', implementing strict approval controls for 11 company-level hazardous work. We insisted on the principles of 'work permit, hierarchical approval, on-site confirmation, and dedicated supervision', ensuring that all hazardous work is only allowed after all levels of review, approval personnel have confirmed safety measures on-site, safety briefings, and dedicated supervisors are in place. The company establishes a company hazardous work improvement team, implements a daily reporting and daily sampling mechanism, and urges the rectification of issues found during inspections.

Qingdao Special Steel continuously optimizes hazardous operation management, meticulously refining the operation plans for various hazardous tasks and integrating and upgrading the JSA (Job Safety Analysis) methodology. Through detailed decomposition of hazardous operation steps, it accurately identifies potential hazards in each step, formulates practical and effective control measures, and ensures the safety of hazardous operations in all aspects.

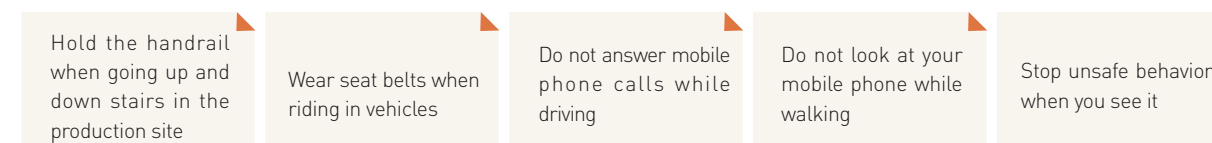
Safety Culture Construction

Qingdao Special Steel has established a Safety Culture Experience Center to comprehensively promote safety culture, improve the company's work safety policy, 10 safety concepts, 6 safety prohibitions, and 5 safety behavior requirements, ensuring that safety culture takes root in the minds, hearts, and actions of employees.

The company has carried out 9 practical activities including leadership safety production commitments, safety pledges, and visible leadership practices. It has organized cultural activities such as Safety Work Day, monthly safety activities, knowledge competitions, debate competitions, and safety essay contests. It encourages all employees to obtain the Certified Safety Engineer qualification, creating a strong safety atmosphere. The company has conducted a retrospective activity on past accident warning education and organized the 'Stakeholders Talk Safety' activity. It has compiled typical industry accident cases for all units to learn from and conduct inspections, enhancing the safety awareness of all employees. The company has utilized the Safety Culture Experience Center for on-site observations. During the reporting period, the company organized 134 sessions with 1,846 participants for learning and visits.



5 Safety Behavior Requirements:



Safety rewards and selections. Monthly and quarterly safety rewards were implemented. In 2024, monthly rewards were given to 746 projects, with monthly and quarterly rewards totaling nearly 1 million yuan, greatly motivating employees to participate in safety management. The company has selected advanced collectives for safe production, safety standardization advanced teams, outstanding safety management individuals, and advanced safety supervisors to promote the concept of 'safety improvement' and enhance the company's intrinsic safety level.

Safety training. The company provides full-cycle safety training for employees. New employees undergo three-level training before entering the factory. All employees are required to complete at least 20 hours of safety education annually. Targeted training is provided for special positions. We innovatively use VR training classrooms and practical training bases to enhance safety training effectiveness, and conduct specialized empowerment training to build a 'Safety Internal Trainer' team. The company has established 285 safety training materials and question banks for various levels, specialties, and positions, and conducts regular exams. During the reporting period, the company conducted 58 specialized training sessions on safety operations, hazardous operations, visible leadership, and contractor management. It has completed 8 company-level and 258 departmental safety training sessions according to the annual training plan, covering hazardous operation management, safety standardization, emergency rescue, and more.

Held the third 'Innovation Cup' 'Debate Safety Principles, Discuss Safety Practices' safety improvement debate competition

In 2024, the company successfully held the third 'Innovation Cup' 'Debate Safety Principles, Discuss Safety Practices' safety improvement debate competition. The 72 employees from 15 divisions/departments including the Iron Front Division and Steelmaking Division formed 18 teams to debate core issues of safety improvement such as safety management principles, safety hazards, and reward and punishment mechanisms.



Through this event, all employees gained a deeper understanding of safety improvement and a clearer direction for safety management. In the future, Qingdao Special Steel will summarize and deepen the views expressed in the debates and apply them in work. It will continue to deepen management concepts, innovate management methods and tools, and achieve the goal of zero accidents and zero injuries.



- Occupational Health

Qingdao Special Steel strictly complies with laws and regulations such as the 'Occupational Disease Prevention and Control Law of the People's Republic of China' and the 'Workplace Occupational Health Supervision and Management Regulations.' It has formulated management measures including the 'Occupational Health Management System,' 'Occupational Health and Safety Goals and Plan Management Regulations,' 'Occupational Disease Prevention and Control Responsibility System,' 'Occupational Health Monitoring and File Management System,' and 'Occupational Hazard Monitoring and Evaluation Management System,' establishing a comprehensive occupational health system. The company ensures employee health and safety from multiple dimensions by adopting diverse measures such as training, health check-ups, occupational hazard check-ups, establishing care population ledgers, installing on-site dust removal equipment to reduce hazard factors, strictly implement notification and warning systems, adequately provide personal protective equipment, improving pre-job, on-job, and post-job health check processes, continuously optimize on-site equipment, reducing environmental risk factors, and preventing occupational diseases.

Case



During the reporting period, 5,132 employees completed health check-ups, and 2,786 completed occupational health check-ups, achieving a 100% occupational health check-up rate. Annual monitoring was conducted on 746 on-site areas involving dust, gas, and noise, comprehensively controlling the work environment.

Complete health check-up	Occupational health check-up
5,132 persons	2,786 persons

Occupational health check-up rate **100%**

Information Security and Privacy Protection

- Information Security

Qingdao Special Steel strictly adheres to the requirements of relevant laws and regulations such as the 'Cybersecurity Law of the People's Republic of China', 'Personal Information Protection Law of the People's Republic of China', and 'Data Security Law of the People's Republic of China', and has formulated management systems such as 'Information Security Management Regulations' and 'Network Management System' to promote compliance and system construction in the field of information security, and to improve the level and protection capabilities of network and information security management.

In order to further strengthen the company's organizational leadership and coordination in information system network security, fully implement the main responsibility of network information security, and improve the protection capabilities of network information security, the company has established a network security leadership group and a working group. The leadership group is headed by the general manager, with leaders from the general manager's department as deputy heads, responsible for the leadership of the company's overall network security management, coordinating, approving, and making decisions on major issues in the construction and implementation of the company's network security; the working group is headed by the company leader in charge of the information technology department, with the head of the information technology department as the deputy head, responsible for the specific work of the network security management leadership group.

During the reporting period, the company has not experienced any network security incidents.



Information Security Risk Management

Attack and defense drill situation. We attach great importance to information technology emergency plans and drills. The IT department organizes company professionals every year to demonstrate the feasibility of improving emergency plans for network, server, database, communication, computer room power distribution failures, and host poisoning, and conducts drills to enhance personnel emergency response capabilities and ensure the normal operation of business systems.

Vulnerability scanning. We set up a vulnerability scanning server independently, conduct monthly scans on different systems, provide repair suggestions and assist in repairing high-risk and above vulnerabilities to ensure that the system is free of such vulnerabilities. In 2024, the company actively responded to the instructions of the Qingdao Network Security Office, completed 68 vulnerability investigation tasks, and investigated and repaired a total of 172 vulnerabilities, effectively improving the system's security protection level. To ensure the security of the newly launched system, vulnerability scanning tests are conducted before system launch. Based on the results, repairs are made followed by re-scanning, and the system is only released externally when no high-risk or above vulnerabilities remain.

Hardware protection. The backbone network adopts a dual-route 10-gigabit backbone and gigabit access networking mode, at the same time, the office, monitoring and energy network are isolated independently to improve network availability and stability. In terms of terminal host protection, EDR (Endpoint Detection and Response), encryption, and access control are deployed. Scheduled antivirus scanning and automatic encryption ensure data and host security. In terms of device access security, direct access to security devices, network equipment, and servers is prohibited; access must be conducted through a bastion host to effectively control access and record the process, comprehensively safeguarding the company's network and data security.

Employee training. We regularly conduct network information security training for all employees to help them keenly detect common risks such as phishing emails and malicious links, reduce the probability of misoperation, and enhance security awareness while improving protection skills.

Customer Privacy Protection

Qingdao Special Steel attaches great importance to customer data and privacy protection, always adheres to professional ethics and laws and regulations, and adopts multiple measures such as data encryption technology, strict identity verification and access control mechanisms, and complete data backup and recovery processes to protect customer privacy.

When customers fill in information, we clearly inform them of privacy protection measures. The company has established a secure isolation zone to securely isolate externally provided service applications, ensuring that external users cannot access core resources and data. We apply encryption protocols such as TLS to prevent customer data from being eavesdropped on or tampered with during transmission. Regular training on data protection and privacy security is conducted for employees to enhance their safety awareness.

Social Contribution and Homeland Building

Rural Revitalization

Qingdao Special Steel actively responds to the national rural revitalization strategy, takes consumption assistance as a powerful starting point to deeply promote rural revitalization practices, lays a solid foundation for local industrial development, and promotes the vigorous development of the rural economy and continuous social progress.

The company focuses on characteristic agricultural products in key rural revitalization areas and actively carries out consumption assistance actions. In 2024, the company purchased 600,000 yuan of high-quality pomegranates from the Guanshi Pomegranate Garden in Yicheng District, Zaozhuang City, Shandong Province, helping local fruit farmers expand sales channels and increase income, further stimulating the development vitality of the pomegranate industry, and contributing to rural revitalization.



Social Welfare

Qingdao Special Steel attaches great importance to the overall development of the community, fully leverages its professional expertise and resource advantages, actively participates in various charitable donations and public welfare activities, and builds a harmonious and symbiotic community environment through close communication and deep cooperation.

The company actively supports community life, education, and environmental construction by providing heating for the West Coast area, establishing internship bases for college students, managing the surrounding environment, donating blood, and engaging in community volunteer work, contributing to the strength of Qingdao Special Steel. By utilizing waste heat to provide heating for the West Coast area, we offer residents clean and efficient heating services, and assist in the transformation of the community's energy structure. The company actively promotes school-enterprise cooperation, establishes internship bases for college students, reserving talents for industry development, and promoting the coordinated development of education and industry. We carry out environmental management actions in the surrounding areas, improving the community environment, and creating a green and livable community atmosphere. We organize employees to engage in volunteer work in the community, helping to solve practical difficulties, and promoting the harmonious and stable development of the community.



Voluntary blood donation

Establishing internship bases for college students

Case

Qingdao Special Steel deepens the integration of education and industry, collaborating with multiple universities such as Chongqing University, Inner Mongolia University of Science and Technology, Xi'an University of Architecture and Technology, Qingdao Harbor Vocational and Technical College, and Hebei Industrial Vocational and Technical University, exploring deep-level school-enterprise cooperation in key areas such as student recruitment, employment internships, and scientific research cooperation.

In 2024, the company organized more than 170 teachers and students from Chongqing University, China University of Petroleum (East China), and Xi'an University of Architecture and Technology to conduct factory internships, providing students with practical platforms, promoting the close integration of theoretical knowledge and practice, reserving a large number of professional talents for industry development, and strongly promoting the coordinated development of education and industry.



China University of Petroleum students engaging in theoretical learning



Chief Engineer Huang Zhen lecturing for students of China University of Petroleum

SDGs Response



Governance Section

Key Issues for Response

- Corporate Governance
- Business Ethics
- Compliance and Risk Control
- Paying Taxes According to Law
- Information Security



2024 Highlights

- Actively respond to ESG requirements from stakeholders and received an A grade in Bekaert's social responsibility evaluation system
- Construct the ESG Management organizational structure and working mechanism
- Employee Risk Management training activity coverage and anti-corruption training coverage both reached 100%
- Employee information security training coverage reached 100%
- Maintain a continuous A-grade tax credit rating

Building an Efficient Governance System	98
Deeply Cultivating Compliance and Risk Control Empowerment	100
Establishing New Business Ethics	102
Improving the Tax Management System	105

Building an Efficient Governance System

Qingdao Special Steel always regards the improvement of corporate governance as a key link in enhancing the core competitiveness of the enterprise, continuously optimizes the governance structure, strengthens internal control, and enhances information transparency, laying a solid foundation for the sustainable development of the enterprise.

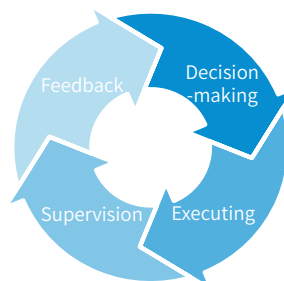
➤ Improving the Modern Corporate Governance Structure

As an important subsidiary of CITIC Pacific Special Steel Group Co., Ltd., Qingdao Special Steel strictly complies with the 'the Company Law of the People's Republic of China' and other relevant laws and regulations, as well as the rules and regulations of CITIC Pacific Special Steel Group Co., Ltd. Group, continuously improves the corporate governance structure, and promotes the establishment and improvement of the internal system. The company adheres to a governance model that deeply integrates the leadership of the Party committee with enterprise management, forming a scientific decision-making, execution, and supervision mechanism. Meanwhile, the company ensures that the pre-study and deliberation procedures of the Party committee for major decisions are effectively implemented.

➤ Building a Standardized and Efficient Decision-making Mechanism

Qingdao Special Steel attaches great importance to the construction of a standardized and efficient decision-making mechanism. On the basis of practicing the Party committee and employees' representatives conference, it has established a general manager's office meeting system, with the core of improving decision-making efficiency, clarifying the principles of meeting convening, topic collection, decision execution, and other key links. In 2024, a total of 9 general manager's office meetings were held, forming a closed-loop management mechanism of 'decision-making-execution-supervision-feedback', ensuring that the effective implementation of the company's various decisions-making and deployments, and strongly promote the realization of the company's strategic goals.

This efficient decision-making mechanism ensures that the scientificity and democracy, and transparency of the company's major decision-making matters, especially for major decisions involving environmental, social and governance (ESG), the company can fully listen to opinions of all parties, ensuring that more efficient and scientific decision-making.



➤ Providing Guarantee for Standardized Operation System

Qingdao Special Steel has established a scientific and complete system system, forming an institutional system based on the company's articles of association, with basic management systems as the backbone, and professional management systems and operating procedures as the support. In 2024, the company has a total of 483 effective management documents, covering all aspects of the company's operation and management, providing solid institutional safeguards for the company's standardized operation.

Qingdao Special Steel attaches importance to the execution and supervision of the system, regularly carries out system publicity training and execution situation inspections, ensures that the implementation of the system, and timely revises and improves it according to the actual situation, maintaining the scientificity and effectiveness of the systems.

Carrying out the 'Hierarchical Optimization, Streamlining and Unification, 100-Day Action' theme activity

Case

In 2024, Qingdao Special Steel carried out the 'Hierarchical Optimization, Streamlining and Unification, 100-Day Action' theme activity, aiming to further standardize system management, effectively distinguish system levels, and improve work efficiency. Through this activity, the company has formulated and revised a total of 13 categories of 100 basic management systems and 261 professional systems, including the 'Bidding Management System', 'Contract Management System', and 'Supplier Management System', involving safety management, energy and environmental protection, and operation management.

During the 100-day action period, Qingdao Special Steel urged relevant departments to carry out promotion and training on the newly revised systems to ensure that managers and employees at all levels fully understand and master the system requirements. By continuously optimizing the system, the company has timely plugged system loopholes, avoided system risks, ensured the simplification and unification of regulations, and enabled the regulations to be implemented seriously and effectively, providing strong support for the company's standardized and standardized operations.

➤ Enhancing Information Transparency and Efficiency

Qingdao Special Steel has established a standardized and efficient information transmission mechanism to ensure timely and accurate transmission of internal and external information, providing strong support for corporate decision-making. In terms of document management, we strictly implement the audit procedures to ensure the accuracy and compliance of information transmission.

At the same time, the company focuses on information security control, timely identifying issues during the document review process, effectively preventing operational risks, and safeguarding the company's legitimate rights and interests. The company continuously improves the information reporting mechanism, follows up on the group's important information feedback and reporting requirements, effectively ensures that the timeliness and effectiveness of major information reporting, continuously improves the information reporting system, ensures that timely reporting of major information, strictly enforces information disclosure requirements, and enhances corporate operational transparency.

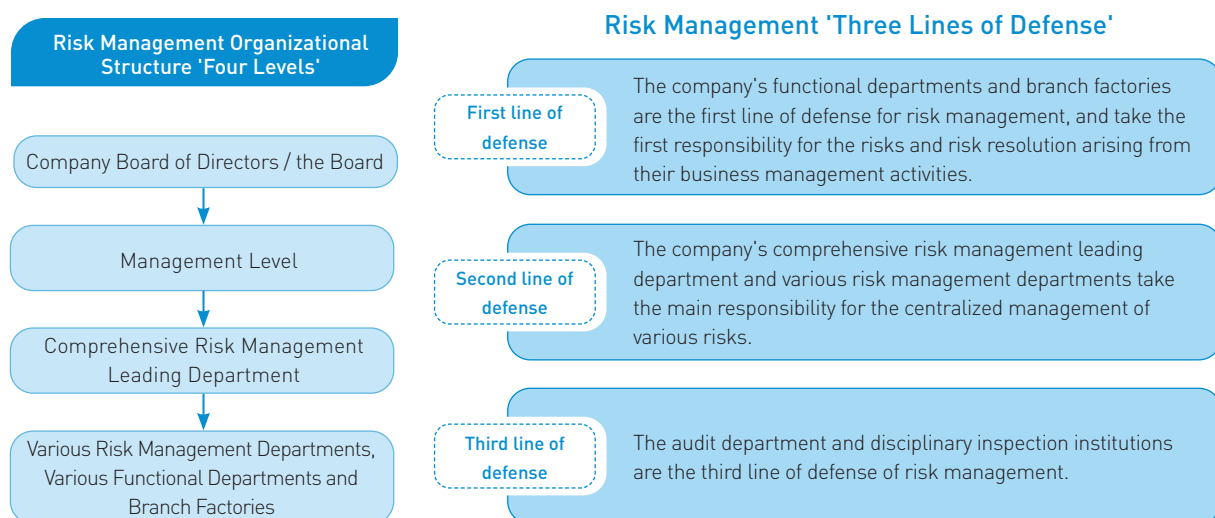


Deeply Cultivating Compliance and Risk Control Empowerment

Qingdao Special Steel attaches great importance to the stable and compliant development of the enterprise, and has built a comprehensive and professional Risk Management and compliance system. In order to standardize and strengthen the comprehensive risk management of Qingdao Special Steel, ensure that the sustained, healthy and stable development of the company's business, and promote the realization of the overall development goals, according to national laws and regulations, regulatory requirements, and the company's relevant regulations, in 2024, the company formulated, improved, and implemented internal management systems such as the 'Confidentiality Management System', 'Contract Management System', 'Legal Case Dispute Management Measures', 'Trademark Management Measures General Principles', 'Comprehensive Risk Management System', and '2024 Risk Management, Compliance Management, and Internal Control Integrated Work Implementation Plan'.

- Comprehensive Risk Management, Integrated Organizational Structure

The company's Party committee plays a leading role in risk management work, and conducts pre-research discussions or decision-making on major matters of risk management in accordance with the 'three major and one big' decision-making system. The organizational structure of the company's risk management is based on the corporate governance structure and control architecture, including 'four levels' and 'three lines of defense'. The management level is responsible for the implementation of comprehensive risk management, and it has a risk management committee, with the general manager as the director, to achieve integrated management of risk management, compliance management, and internal control.



In 2024, the company formulated a detailed implementation plan for risk control management, compliance management, and internal control integration, strictly followed the group's system, and completed the annual internal control self-evaluation by filling out the 'compliance questionnaire'.

- **Dynamic System Evaluation, Hierarchical Precision Practice**

Qingdao Special Steel has established a comprehensive and dynamic risk assessment mechanism. In 2024, the company organized each department to submit risk control management reports and risk assessment forms every six months, ensuring that the continuity and foresight of risk management. The company innovatively constructed a 'risk appetite' indicator monitoring full-scale table, updated the values of 10 core indicators in the table every quarter, accurately controlling key risk areas such as safety management and supplier management.

Safety is the lifeline of enterprise development. The company has built a comprehensive, multi-level safety risk management system. The daily morning meeting has become an important platform for safety management, requiring all departments to share safety cases in turn, covering the entire company, even including departments not directly related to safety, such as the legal department. This innovative approach breaks the limitations of traditional safety management, permeating the concept of safety

into every corner of corporate culture. The company has strictly implemented safety systems, and established a multi-level safety management mechanism including monthly meetings and quarterly safety committees. These systems are not just formalities but concrete manifestations of the corporate safety culture, ensuring comprehensive and continuous control of safety risks.

In supplier management, the company adheres to strict risk control principles. In the supplier access process, the company conducts a comprehensive legal risk and integrity review of each potential partner. This measure effectively screens high-risk suppliers, helping the company avoid potential compliance and reputational risks. The company requires each supplier to sign a commitment document, clarifying the bottom line of cooperation and integrity standards, building a comprehensive supplier risk management system, promoting the establishment of a more transparent and responsible ecosystem in the supply chain.

Introduced the 'Risk Profile View' management tool

In 2024, the company achieved breakthrough innovation in the risk management field. As a pilot unit of the group, Qingdao Special Steel introduced the innovative management tool 'Risk Profile View,' visually presenting the full picture of risk management through PPT, realizing the transformation of risk management from abstract to concrete. This innovative method greatly enhances the transparency and comprehensibility of risk management, enabling management level to more quickly and accurately grasp the enterprise's risk panorama.



- Strengthening the Confidentiality System to Protect Trade Secrets

Strengthening the confidentiality system and protecting trade secrets are the important aspects of a company's integrated risk, compliance, and internal control management. Within the reporting period, the company has continuously improved the institutional system in the field of confidentiality management, revised and added several key documents: revising the 'Confidentiality Management System,' updating the 'Confidentiality and Non-Competition Agreement' and the 'Confidentiality Agreement,' formulating the 'Confidentiality Reward and Punishment Management Regulations,' and compiling the 'Confidentiality Inspection Plan' and the 'Confidentiality Inspection Checklist.'

Qingdao Special Steel has established a multi-dimensional and comprehensive trade secret protection system, classifying trade secrets into three levels, covering both business and technology categories. At the beginning of each year, the level of business secrets is re-evaluated to ensure the scientific and effective management of classification. The departments that possess business secrets have formulated corresponding confidentiality implementation rules, further refined confidentiality requirements and formed a complete confidentiality responsibility system. At the same time, through multi-level and multi-form training mechanisms, the company has deeply promoted a culture of confidentiality and continuously improved confidentiality management capabilities.

Formulating scientific and comprehensive confidentiality management measures to protect the company's core business secrets

Qingdao Special Steel implements strict hierarchical management measures for business secrets, protecting them from multiple dimensions including information classification and physical isolation, technical protection measures, regional control and meeting security, personnel management, legal protection, and continuous supervision and improvement. For example, the company has signed confidentiality agreements with approximately 1,000 personnel involved in confidentiality, established a comprehensive confidentiality salary system, and adopted technical measures such as encryption and watermarking for electronic devices. Confidential areas are equipped with access control systems and strict entry approval systems, with first-level areas requiring approval from senior leadership; meetings are held in secure and enclosed venues, with mobile phones stored at designated locations. Monthly self-inspections of trade secrets are conducted, regularly checking confidential computers, venues, and documents, and promptly tracking and rectifying issues.

In 2024, through scientific and comprehensive confidentiality management measures, the company identified and addressed 18 potential leakage risks, effectively preventing information leakage risks and building a solid security barrier for the innovative development of the enterprise.

Hosted the Group Compliance Annual Meeting, improving compliance management capabilities

Case

In 2024, Qingdao Special Steel hosted the CITIC Pacific Special Steel Group Co., Ltd. Group Compliance Annual Meeting, conducting corporate compliance training for all middle-level cadres and risk control administrators, explaining the value and significance of corporate compliance, localization processes, common issues in corporate compliance practices, and common violation cases and compliance insights. At the same time, the meeting conveyed the group's compliance requirements, made participants deeply aware of the importance and urgency of compliance management. In the process of hosting the annual meeting, Qingdao Special Steel had the opportunity to benchmark and exchange with excellent enterprises, further promoting the implementation of compliance culture within the enterprise and enhancing the enterprise's compliance management capabilities. After the meeting, various departments actively implemented the spirit of the meeting, integrating compliance requirements into daily work, effectively improving the overall compliance management level of the company.



Looking ahead, Qingdao Special Steel will continue to improve the compliance management system, strengthen risk control capabilities, and promote the transformation of compliance management from 'compliance and adherence' to 'compliance empowerment,' turning compliance advantages into new momentum for enterprise development.

Establishing New Business Ethics

Qingdao Special Steel has always regarded the construction of business ethics as an important guarantee for the sustainable development of the enterprise, strictly adhering to relevant laws and regulations and industry standards, upholding the concept of integrity in business, continuously improving the business ethics management system, practicing integrity and self-discipline, and leading the enterprise high-quality development with excellent business ethics.

Qingdao Special Steel strictly complies with the 'Supervision Law of the People's Republic of China,' the 'Anti-Money Laundering Law of the People's Republic of China,' 'Anti-Unfair Competition Law of the People's Republic of China,' and other laws and regulations, formulating and revising the 'Business Ethics Standards Management Measures,' 'Reception Management System,' 'Complaint and Reporting Management Regulations,' and other management systems, stipulating the company's principles and requirements in anti-corruption, anti-bribery, integrity and self-discipline, anti-conflict of interest, and Fair Competition, and maintaining zero tolerance for violations of business ethics. In 2024, the company established a Legal Education Committee in conjunction with excellence performance management to further strengthen business ethics management.

Strengthening Warning Education and Creating a Clean Atmosphere

Qingdao Special Steel attaches great importance to integrity education, deeply carries out party discipline education, and integrates business ethics into learning activities. We organized 101 centralized party discipline learning sessions, with 1,287 participants. The company regularly hold warning education activities to enhance the integrity awareness of all employees. In 2024, the company carried out various forms of warning education activities, including warning education conferences, thematic party lectures, publicity education, integrity talks, etc., tapped educational resources. 16 grassroots party organizations directly under the company visited multiple city and district-level integrity education bases to strengthen the ideological defense line against corruption. Especially for employees in sensitive positions in the material management department, case warning education and interview reminders were conducted. For party members and cadres in the profile factory, case-based warnings were carried out. Integrity training was provided for 83 newly recruited college students, guiding them to fasten the 'first button' and integrate integrity requirements throughout all levels of the enterprise.

Through systematic and multi-level learning and education activities, the discipline awareness and moral level of all employees have been improved, laying a solid foundation for the company's integrity management and high-quality development.

Company warning education conference

Case

On July 18, 2024, the Qingdao Special Steel Party Committee organized 134 representatives of leading cadres and sensitive position personnel to hold the company's warning education conference. Key personnel from sales, procurement, and engineering construction made statements to strengthen the discipline red line for leading cadres and employees at all levels. The company's Party Secretary and General Manager attended the meeting and made deployment requirements. The Deputy Party Secretary presided took the chair of the meeting and put forward requirements for implementing the meeting spirit. The Deputy Secretary of the Discipline Inspection Commission combined typical cases in key areas of the steel industry to promote the spirit of the Central Committee's eight regulations and the relevant requirements of integrity discipline.



All employees deeply studied and understood the spirit of the warning education conference, strengthened self-examination, and achieved rule-abiding and clear bottom lines, knowing what to do and what to stop. Leading cadres at all levels, in conjunction with education on Party discipline, continue to deepen the implementation of the spirit of the Central Committee's eight regulations, strictly fulfill their duties and responsibilities, and ensure that they are responsible for their territories and fulfill their duties, promoting the company's high-quality development with the spirit of entrepreneurship.

Anti-corruption and Anti-bribery, Establishing a Clean and Honest Style

The company continues to improve the institutional system in areas such as bidding, procurement, and engineering, plugging risk loopholes such as corruption and commercial bribery, and strengthening institutional constraints on the use of power, money, and materials. At the same time, the company seriously deals with violations, focusing on promoting reform and governance through cases.

During pre-appointment talks for cadres, the company organizes promoted cadres to sign the 'Integrity Commitment Letter,' further strengthening the guidance for leading cadres to adhere to the bottom line of integrity and set a benchmark for self-discipline. The company requires leading cadres at all levels to take the lead in complying with integrity discipline, driving all party members and cadres to form a conscious thought and action of abiding by rules and discipline.



Through systematic construction of an integrity defense line, Qingdao Special Steel has created a clean and upright business environment, providing strong support for the sustainable development of the enterprise. In the future, the company will continue to deepen the construction of integrity defenses, build a more complete institutional system, and practice higher standards of business ethics.

Sunshine Cooperation Demonstration, Suppliers Are Moderate and Capable

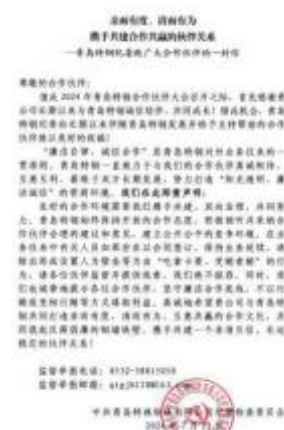
The company attaches great importance to the business ethics management of the supply chain, extending relevant institutional requirements to supplier management. In the supplier access process, the company strictly reviews their legal risks and integrity status, requiring suppliers to sign relevant commitment documents such as the 'Supplier Code of Conduct' and the 'Supplier Commitment to Compliance and Continuous Improvement of Social Responsibility,' ensuring that the compliance and stability of the supply chain.

Integrity Cooperation Promotion: 'A Letter to Supplier Partners'

Case

In partner conference with the theme of 'Walking Together, Win-Win Cooperation, and Creating the Future', the deputy secretary of the Discipline Inspection Commission, with the theme of 'Close but Not Overbearing, Clear but Effective, Building a Win-Win Partnership Together', promoted integrity cooperation in a vivid form through a letter to supplier partners. He stated that it is necessary to deepen understanding, strengthen clarity, focus on long-term cooperation; build together, implement two-way governance, and strengthen integrity prevention; learn from cases, keep the alarm bell ringing, and achieve win-win development; standardize operations, and let regular supervision safeguard each other's sunshine cooperation.

In partner conference with the theme of 'Walking Together, Win-Win Cooperation, and Creating the Future', the convening of this conference not only further deepened the understanding and trust between Qingdao Special Steel and its suppliers but also laid a solid foundation for future win-win development. Both parties will grasp the forefront of innovation and industry trends, improve the efficiency and quality of the enterprise supply chain, and build a community of shared destiny with mutual trust and win-win cooperation.



Improving the Tax Management System

Qingdao Special Steel strictly adheres to national tax regulations, continuously improves the tax management system, standardizes tax behaviors, ensures legal tax payment, and reasonably utilizes tax preferential policies to enhance the enterprise's tax management level.

The company has established a comprehensive tax management system, strictly implements the 'CITIC Pacific Special Steel Group Co., Ltd. Tax Management System,' sets up a professional tax team, and constructs a three-level responsibility mechanism of 'declaration-review-final approval' to ensure tax compliance operations. At the same time, a tax risk warning mechanism has been established, regularly conducting internal tax risk assessments, and using big data comparison technology to promptly identify and resolve potential issues. Additionally, it strengthens communication and exchange with tax authorities, actively participates in policy training, and improves tax compliance levels. Furthermore, the company actively grasps policy opportunities, enjoyed the fire and explosion safety land tax preference for the first time in 2024, effectively reducing the enterprise's tax burden and providing strong support for the company's sustainable development.

Multiple Measures to maintain the A-Level Tax Credit Rating for many years

Case

In 2024, Qingdao Special Steel maintained a good tax credit rating through multiple measures: on the one hand, strictly implemented invoice management norms to ensure the authenticity, legality, and integrity of invoices; on the other hand, regularly checked the tax credit evaluation results, promptly corrected any issues found, and initiated credit repair applications when necessary. By fully cooperating with tax inspections and assessments, the company provided accurate and complete tax information as required. The company actively participated in training activities organized by tax authorities. We will strive to obtain the incentive policies brought by the A-level credit rating for three consecutive years.



Improving the Reporting Mechanism, Protecting Rights and Interests

In 2024, Qingdao Special Steel reviewed and revised 5 disciplinary inspection work systems, including the 'Complaint Reporting Management Regulations', and continued to improve the supervision and discipline enforcement work system and mechanism. The company handled complaint reports and problem clues in accordance with regulations, discipline, and law, and insisted on integrating 'serving production and operation, clarifying the root of problems, plugging risk loopholes, purifying the political ecology, and promoting enterprise development' throughout the entire process of problem clue handling, effectively safeguarding the company's business ethics environment.

In the future, Qingdao Special Steel will continue to focus on responsibility implementation, improve supervision mechanisms, persistently rectify work style and discipline, strengthen the construction of a clean and honest Party conduct, enhance warning education, strictly enforce discipline and accountability, and promote the deepening of business ethics and anti-corruption work to safeguard the enterprise's high-quality development.

Public Reporting Hotline

0532-58815050

Reporting Email

qtgjb110@163.com

GRI Standard Content Index

Statement of use	Qingdao Special Steel has reported in accordance with the GRI Standards for the period January 1st to December 31st, 2024.
GRI 1 used	GRI 1: Foundation 2021
Applicable GRI Sector Standard(s)	Non-use of GRI Sector standards.

Disclosure		Location
GRI 2: General Disclosures 2021	2-1	Organizational details About Us
	2-2	Entities included in the organization’ s sustainability reporting About This Report
	2-3	Reporting period, frequency and contact point About This Report
	2-4	Restatements of information About This Report
	2-5	External assurance —
	2-6	Activities, value chain and other business relationships About Us, Building a Responsible Supply Chain
	2-7	Employees Employee Development and Growing up Together
	2-8	Workers who are not employees Occupational Health and Safety, Building a Responsible Supply Chain
	2-9	Governance structure and composition Building an Efficient Governance System
	2-10	Nomination and selection of the highest governance body Building an Efficient Governance System
	2-11	Chair of the highest governance body Building an Efficient Governance System
	2-12	Role of the highest governance body in overseeing the management of impacts Building an Efficient Governance System, ESG Governance
	2-13	Delegation of responsibility for managing impacts Building an Efficient Governance System
	2-14	Role of the highest governance body in sustainability reporting Building an Efficient Governance System
	2-15	Conflicts of interest Establishing New Business Ethics
	2-16	Communication of critical concerns ESG Governance
	2-17	Collective knowledge of the highest governance body ESG Governance

Disclosure		Location
	2-18	Evaluation of the performance of the highest governance body ESG Governance
	2-19	Remuneration policies Employee Development and Growing up Together
	2-20	Process to determine remuneration Employee Development and Growing up Together
	2-22	Statement on sustainable development strategy Message from the General Manager
	2-23	Policy commitments Establishing New Business Ethics, Each chapter
	2-24	Embedding policy commitments Establishing New Business Ethics, Each chapter
	2-25	Processes to remediate negative impacts Establishing New Business Ethics, Each chapter
	2-26	Mechanisms for seeking advice and raising concerns ESG Governance, Employee Development and Growing up Together
	2-27	Compliance with laws and regulations Each chapter
	2-28	Membership associations Innovation-driven Transformation and Upgrading
GRI 3: Material Topics 2021	2-29	Approach to stakeholder engagement ESG Governance
	2-30	Collective bargaining agreements Employee Development and Growing up Together
	3-1	Process to determine material topics ESG Governance
GRI 201: Economic Performance 2016	3-2	List of material topics ESG Governance
	3-3	Management of material topics ESG Governance
	201-1	Direct economic value generated and distributed ESG Data Indicators
	201-2	Financial implications and other risks and opportunities due to climate change Addressing Climate Change and Deepening Carbon Reduction
GRI 203: Indirect Economic Impacts 2016	201-3	Defined benefit plan obligations and other retirement plans Employee Development and Growing up Together
	201-4	Financial assistance received from government —
GRI 204: Procurement Practices 2016	203-1	Infrastructure investments and services supported About Us, Social Contribution and Homeland Building
	203-2	Significant indirect economic impacts Social Contribution and Homeland Building
GRI 205: Anti-corruption 2016	204-1	Proportion of spending on local suppliers ESG Data Indicators
	205-1	Operations assessed for risks related to corruption Establishing New Business Ethics
	205-2	Communication and training about anti-corruption policies and procedures Establishing New Business Ethics

Disclosure			Location
GRI 206: Anti-competitive Behavior 2016	205-3	Confirmed incidents of corruption and actions taken	Establishing New Business Ethics
	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Establishing New Business Ethics
GRI 207: Tax 2019	207-1	Approach to tax	Deeply Cultivating Compliance and Risk Control Empowerment
	207-2	Tax governance, control, and risk management	Deeply Cultivating Compliance and Risk Control Empowerment
	207-3	Stakeholder engagement and management of concerns related to tax	Deeply Cultivating Compliance and Risk Control Empowerment
	207-4	Country-by-country reporting	—
GRI 301: Materials 2016	301-1	Materials used by weight or volume	Packaging Material, Quantity Reduction and Weight Reduction
	301-2	Recycled input materials used	Packaging Material, Quantity Reduction and Weight Reduction
	301-3	Reclaimed products and their packaging materials	Packaging Material, Quantity Reduction and Weight Reduction
GRI 302: Energy 2016	302-1	Energy consumption within the organization	Energy Utilization, Energy Conservation and Efficiency Improvement
	302-2	Energy consumption outside of the organization	Energy Utilization, Energy Conservation and Efficiency Improvement
	302-3	Energy intensity	ESG Data Indicators
	302-4	Reduction of energy consumption	Energy Utilization, Energy Conservation and Efficiency Improvement
	302-5	Reductions in energy requirements of products and services	Energy Utilization, Energy Conservation and Efficiency Improvement
GRI 303: Water and Effluents 2018	303-1	Interactions with water as a shared resource	Pollution Control and Environmental Protection
	303-2	Management of water discharge-related impacts	Pollution Control and Environmental Protection
	303-3	Water withdrawal	Pollution Control and Environmental Protection
	303-4	Water discharge	Pollution Control and Environmental Protection
	303-5	Water consumption	Pollution Control and Environmental Protection
GRI 304: Biodiversity 2016	304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Biodiversity and Ecological Conservation
	304-2	Significant impacts of activities, products and services on biodiversity	Biodiversity and Ecological Conservation
	304-3	Habitats protected or restored	Biodiversity and Ecological Conservation
GRI 305: Emissions 2016	305-1	Direct (Scope 1) GHG emissions	Addressing Climate Change and Deepening Carbon Reduction
	305-2	Energy indirect (Scope 2) GHG emissions	Addressing Climate Change and Deepening Carbon Reduction

Disclosure			Location
	305-3	Other indirect (Scope 3) GHG emissions	—
	305-4	GHG emissions intensity	Addressing Climate Change and Deepening Carbon Reduction
	305-5	Reduction of GHG emissions	Addressing Climate Change and Deepening Carbon Reduction
	305-6	Emissions of ozone-depleting substances (ODS)	The company's production and operation activities do not generate ODS
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Pollution Control and Environmental Protection
GRI 306: Waste 2020	306-1	Waste generation and significant waste-related impacts	Pollution Control and Environmental Protection
	306-2	Management of significant waste-related impacts	Pollution Control and Environmental Protection
	306-3	Waste generated	Pollution Control and Environmental Protection
	306-4	Waste diverted from disposal	Pollution Control and Environmental Protection
	306-5	Waste directed to disposal	Pollution Control and Environmental Protection
GRI 308: Supplier Environmental Assessment 2016	308-1	New suppliers that were screened using environmental criteria	Building a Responsible Supply Chain
	308-2	Negative environmental impacts in the supply chain and actions taken	Building a Responsible Supply Chain
GRI 401: Employment 2016	401-1	New employee hires and employee turnover	ESG Data Indicators
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Employee Development and Growing up Together
	401-3	Parental leave	Employee Development and Growing up Together, ESG Data Indicators
GRI 402: Labor/Management Relations 2016	402-1	Minimum notice periods regarding operational changes	The company has no material operational changes
	403-1	Occupational health and safety management system	Occupational Health and Safety
	403-2	Hazard identification, risk assessment, and incident investigation	Occupational Health and Safety
GRI 403: Occupational Health and Safety 2018	403-3	Occupational health services	Occupational Health and Safety
	403-4	Worker participation, consultation, and communication on occupational health and safety	Occupational Health and Safety
	403-5	Worker training on occupational health and safety	Occupational Health and Safety
	403-6	Promotion of worker health	Occupational Health and Safety
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Occupational Health and Safety
	403-8	Workers covered by an occupational health and safety management system	Occupational Health and Safety

Disclosure			Location
GRI 404: Training and Education 2016	403-9	Work-related injuries	ESG Data Indicators
	403-10	Work-related ill health	Occupational Health and Safety
	404-1	Average hours of training per year per employee	ESG Data Indicators
	404-2	Programs for upgrading employee skills and transition assistance programs	Employee Development and Growing up Together
	404-3	Percentage of employees receiving regular performance and career development reviews	Employee Development and Growing up Together
	405-1	Diversity of governance bodies and employees	Building an Efficient Governance System, Employee Development and Growing up Together
	406-1	Incidents of discrimination and corrective actions taken	Employee Development and Growing up Together
	407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Employee Development and Growing up Together
	408-1	Operations and suppliers at significant risk for incidents of child labor	Employee Development and Growing up Together
	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	Employee Development and Growing up Together
GRI 405: Diversity and Equal Opportunity 2016	405-1	Diversity of governance bodies and employees	Building an Efficient Governance System, Employee Development and Growing up Together
GRI 406: Non-discrimination 2016	406-1	Incidents of discrimination and corrective actions taken	Employee Development and Growing up Together
GRI 407: Freedom of Association and Collective Bargaining 2016	407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Employee Development and Growing up Together
GRI 408: Child Labor 2016	408-1	Operations and suppliers at significant risk for incidents of child labor	Employee Development and Growing up Together
GRI 409: Forced or Compulsory Labor 2016	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	Employee Development and Growing up Together
GRI 410: Security Practices 2016	410-1	Security personnel trained in human rights policies or procedures	—
GRI 413: Local Communities 2016	413-1	Operations with local community engagement, impact assessments, and development programs	Social Contribution and Homeland Building
	413-2	Operations with significant actual and potential negative impacts on local communities	The company has not identified any operations that have actual or potential significant negative impacts on the local community
GRI 414: Supplier Social Assessment 2016	414-1	New suppliers that were screened using social criteria	Building a Responsible Supply Chain
	414-2	Negative social impacts in the supply chain and actions taken	Building a Responsible Supply Chain
GRI 416: Customer Health and Safety 2016	416-1	Assessment of the health and safety impacts of product and service categories	Product Services and Quality Assurance
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	Product Services and Quality Assurance
GRI 417: Marketing and Labeling 2016	417-1	Requirements for product and service information and labeling	Product Services and Quality Assurance
	417-2	Incidents of non-compliance concerning product and service information and labeling	Product Services and Quality Assurance
	417-3	Incidents of non-compliance concerning marketing communications	Product Services and Quality Assurance
GRI 418: Customer Privacy 2016	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Product Services and Quality Assurance

Explanation of Omitted Disclosed Items for Qingdao Special Steel is as follows:

Omitted Disclosed Items	Explanation
304-4, 411-1, 415-1	The core business of the company has little relevance or importance to this index information, therefore they will not be disclosed
2-21, 202-1, 202-2, 405-2	Due to information confidentiality requirements, they will not be disclosed to the public temporarily

SDGs Content Index

SDGs	Brief introduction	Location
SDG1. No Poverty	End poverty in all its forms everywhere.	Product Services and Quality Assurance
SDG3. Good Health and Well-being	Ensure healthy lives and promote well-being for all at all ages.	Employee Development and Growing up Together
SDG4. Quality Education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	Building a Responsible Supply Chain
SDG5. Gender Equality	Achieve gender equality and empower all women and girls.	Employee Development and Growing up Together
SDG6. Clean Water and Sanitation	Ensure availability and sustainable management of water and sanitation for all.	Pollution Control and Environmental Protection
SDG7. Affordable and Clean Energy	Ensure access to affordable, reliable, sustainable and modern energy for all.	Energy Utilization, Energy Conservation and Efficiency Improvement, Biodiversity and Ecological Conservation
SDG8. Decent Work and Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	Employee Development and Growing up Together
SDG9. Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	Innovation-driven Transformation and Upgrading, Intelligent Manufacturing Empowering Development
SDG10. Reduced Inequalities	Reduce inequality within and among countries.	Employee Development and Growing up Together
SDG11. Sustainable Cities and Communities	Make cities and human settlements inclusive, safe, resilient and sustainable.	Building a Responsible Supply Chain
SDG12. Responsible Consumption and Production	Ensure sustainable consumption and production patterns.	Packaging Material Reducing Quantity and Weight, Product Services and Quality Assurance
SDG13. Climate Action	Take urgent action to combat climate change and its impacts.	Addressing Climate Change and Deepening Carbon Reduction
SDG14. Life Below Water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	Biodiversity and Ecological Conservation
SDG15. Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	Biodiversity and Ecological Conservation
SDG16. Peace, Justice and Strong Institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.	Establishing New Business Ethics
SDG17. Partnerships for the Goals	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.	Building a Responsible Supply Chain

ESG Data Indicators

Environmental Indicators

Indicator	Unit	2024
Total investment in environmental protection	RMB billion	0.8
Environmental pollution incidents	Item	0
Environmental fines during the reporting period	RMB 1,000	0
The proportion of operations certified by the energy management system	%	100
The proportion of operations certified by the environmental management system	%	100
Environment training coverage	%	100
The proportion of sites that have undergone environmental risk assessment to all sites	%	100

Energy

Indicator	Unit	2024
Energy consumption	Tonne standard coal	2,932,246
Steam consumption	Tonne standard coal	135,350
Electricity consumption	kWh	255,431
Self-provided clean energy generation capacity (photovoltaic power generation)	MW	58
Annual generation of self-provided clean energy (photovoltaic power generation)	10,000 kWh	6200
Coal consumption	Tonne	3,076,386
Natural gas consumption	m ³	4,083,900
Residual energy consumption	Tonne standard coal	127,363
Renewable energy consumption	Tonne standard coal	7,621
Proportion of renewable energy consumption	%	0.26
Comprehensive energy consumption per tonne of steel	Kg standard coal/tonne of steel	517.8

Water Resource

Indicator	Unit	2024
Fresh water consumption	m ³	9,144,502
Water recycled	m ³	530,540,000
Water recycling rate	%	98.3
Fresh water consumption per tonne of steel	m ³ /t	2.17

Pollutant Emissions

Indicator	Unit	2024
Nitrogen oxides (NOx) emissions	Tonne	1,440.1
Sulfur dioxides (SO ₂) emissions	Tonne	529.7
Particulate matter (PM) emissions	Tonne	1,083.5

Water Pollutants

Indicator	Unit	2024
Total wastewater discharge	1,000 tonnes	0
Chemical oxygen demand in wastewater discharge	Kg	0
Ammonia nitrogen(NH3-N) in wastewater discharge	Kg	0

Waste

Indicator	Unit	2024
Waste generation	Tonne	3,574,829.99
Hazardous waste generation	Tonne	4,987.88
Non-hazardous waste generation	Tonne	3,569,842.00
Waste Recycled	Tonne	3,574,798.42
Percentage of Waste Recycled	%	99.99

Greenhouse Gas Emissions

Indicator	Unit	2024
Direct emissions (Scope 1)	tCO ₂ e	6,089,484.45
Indirect emissions (Scope 2)	tCO ₂ e	1,118,208.79
GHG emissions (Scope 1 & 2)	tCO ₂ e	7,207,693.24
GHG emissions intensity (Scope 1 & 2)	tCO ₂ e/tonne of product	1.616

Social Indicators

Employee Information

Indicator	Unit	2024
Total number of employees	Person	4,726
Signing rate of labor contracts	%	100
Number of ethnic minority employees	Person	27
Number of disabled person supported in employment	Person	45
Social insurance coverage	%	100
Proportion of employees covered by collective bargaining agreements	%	100
Coverage rate of occupational health check-ups	%	100
By gender	-Male	Person 4,443
	-Female	Person 283
Number of new employees	Person	185
Number of fresh graduates	Person	117
Number of new ethnic minority employees	Person	4
Number of voluntary employee turnover	Person	142

Total employee turnover rate	%	3
Return rate of female employees on parental leave	%	100
Retention rate of female employees on parental leave	%	100

Employee Training

Indicator	Unit	2024
Total number of trainees	Person	4,726
Total training costs	RMB in ten thousand	205.8
Average number of hours of training	Hours/person	105
Percentage of employees who have received regular performance and career development evaluations	%	100
Percentage of employees who have undergone vocational or skills-related training	%	100
Percentage of employees who have received training on prevention of discrimination and human rights violations	%	100
Percentage of workplaces that have undergone human rights review or human rights impact assessment	%	100

Production Safety and Occupational Health

Indicator	Unit	2024
Percentage of workplaces that have undergone employee health and safety risk assessment	%	100
Percentage of Operational Sites Certified to ISO 45001	%	100
Number of work-related fatalities	Case	0
Number of work-related deaths	Person	0
Number of work-related injuries	Person	0
Number of occupational diseases	Person	0
Work time lost due to work-related injuries	Hour	0
Employee lost time injury frequency rate	Per million hours	0
Occurrence rate of work place accidents	Times/Million yuan	0

Indicator		Unit	2024
Total investment in work safety		RMB in ten thousand	7,985
Work Safety Training	Number of work safety training	Session	742
	Number of participants in work safety training	Person-time	18,532
	Total duration of work safety training	Hour	33,678
	Safety training coverage rate	%	100

Products and Customer Service

Indicator		Unit	2024
Product inspection pass rate		%	99.36
Complaint handling rate		%	100
Customer satisfaction		%	95.66
Number of recalls due to product quality issues		Piece	0
Total number of health and safety and labeling violation incidents for provided products and services		Case	0
Percentage of total sold or shipped products subject to recall for safety and health reasons		%	0
Total number of breaches of customer privacy law		Case	0

Supplier Management

Indicator		Unit	2024
Total number of suppliers		Number	2,392
Annual new suppliers		Number	263
Supplier termination/ rejection	Number of suppliers suspended for non-compliance	Number	0
	Number of potential suppliers rejected for non-compliance	Number	0

Innovation and Intellectual Property

Indicator		Unit	2024
Total number of new patents		Piece	61
Accumulated patents		Piece	133
R&D expenditure		RMB	794,335,584
Number of R&D personnel		Person	642
Ratio of R&D personnel		%	14

Public charity and Community Investment

Indicator		Unit	2024
Number of volunteer activity projects		Number	342
Hours spent on voluntary activities		Hour	375
Number of participants in voluntary activities		Person-time	807

Governance Indicators

Indicator		Unit	2024
Employee Anti-corruption Training	Number of anti-corruption training sessions attended	Time	53
	Coverage of employees participating in anti-corruption training	%	100

Reader's Feedback Form

Dear Readers:

Thank you for reading this report. In order to improve the company's ESG work and enhance ESG capabilities and levels, we particularly hope to listen to your opinions and suggestions. We kindly ask you to evaluate our report amidst your busy schedule to help us continuously improve the report. Please assist in completing the relevant questions in the feedback form and provide feedback to us through the following methods. We warmly welcome and sincerely thank you for your valuable opinions!

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1. Which of the following stakeholder categories do you belong to?

- | | | | | |
|---|---|---|-------------------------------------|------------------------------------|
| <input type="checkbox"/> Shareholders and Investors | <input type="checkbox"/> Company Management Level | <input type="checkbox"/> Employees | <input type="checkbox"/> Customers | <input type="checkbox"/> Suppliers |
| <input type="checkbox"/> Government Department | <input type="checkbox"/> Regulatory Agencies | <input type="checkbox"/> Social Organizations | <input type="checkbox"/> News Media | |
| <input type="checkbox"/> Public | <input type="checkbox"/> Others (Please specify) | | | |

2. Your overall evaluation of this report:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

3. Your evaluation of Qingdao Special Steel's practices in environmental protection:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

4. Your evaluation of Qingdao Special Steel's practices in social responsibility:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

5. Your evaluation of Qingdao Special Steel's practices in Corporate Governance:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

6. Please evaluate the clarity, accuracy, and completeness of the information, indicators, and data disclosed in this report:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

7. Please evaluate the readability of this report:

- ☐ Very Good ☐ Good ☐ Average ☐ Poor ☐ Very Poor

Open-ended question

1. What suggestions do you have for Qingdao Special Steel's sustainable development and ESG work?

2. What shortcomings do you think this report has?

3. What additional sustainability and ESG information do you think should be disclosed in this report?
