A NEW CHAPTER
TO THE FUTURE
SeAH CSS is the future of Korea’s special steel industry

As a new member of the SeAH group, SeAH CSS represents the group’s giant step towards Korea’s special steel industry. SeAH CSS is founded upon SeAH’s unique and world-class technology that the group has built in the high-quality special steel sector. Our mission is to create new value of steel in the global steel market.

We aim to raise the level of customer satisfaction and set up the new industry standard by constantly challenging ourselves.
SeAH CSS opens a new chapter in the history of SeAH Group

History of SeAH CSS aligns with the history of Korea’s special steel industry. SeAH CSS was founded in 1966 in the city of Changwon, Gyeongsang South Province of Korea. Since its birth, SeAH CSS has led the growth of the country’s special steel sector by producing high-grade steel products and bringing the optimized steel production process to the next level. Our great product portfolio and sophisticated manufacturing techniques allow us to be responsive to rapidly changing market needs and emerging industry trends. We continue to develop innovative solutions for great customer value based on market demand and industry trend.

SeAH CSS is about to make a giant leap forward with its vast expertise in steel manufacturing and exclusive know-how in special steel making. We plan to focus on investing in exceptionally functional high-grade special steel materials and next generation special alloy steel. Our new products will exemplify the technological innovation and provide a synergy effect. Our commitment and investment in new materials and technology will not only enhance our corporate value, but also help the special steel industry envision its future.

The new era of steel industry starts here with SeAH Group. We are committed to grow with our customers by providing exceptional product quality and service, to eventually become the industry leader in special steel.
Fifty Years of Pioneering Steel Industry and the Challenges

1966
- Founded as Samyang Special Steel Co., Ltd.
- Merged with Korea Special Steel Industry to be Korea General Special Steel Co., Ltd.
- Opened its Central Research Lab
- Opened a special steel production plant in Changwon (for round bars, pipes and plates)
- Recognized for its annual export of USD 100 Mil
- Changed its name to SAMMI General Special Steel
- Opened its second special steel plant (for steelmaking, rolling and processing)

1975
- Re-established as Changwon Special Steel and annexed to POSCO (for round bar and pipe business)
- Certified as ISO 9002 (quality standard) compliant

1976
- Recognized for its annual export of USD 200 Mil

1997
- Certified as KOSHA 18001 compliant
- Completed the 1st phase of its facility rationalization
  - Introduced AOD, HV Mill, RSM, and DST facilities
  - Completed its second acid cleaning plant and an ingot-making plant
- Changed its name to POSCO Specialty Steel Co., Ltd.
- Recognized for its annual export of USD 400 Mil
- Completed the 2nd phase of its facility rationalization
  - A new steelmaking unit: A 60-ton electric furnace, a vertical caster
  - Rolling plant improvement: Continuous heating furnace (90 tons), a large-scale roller (SBM), 3 new 45-ton batch furnaces

2000
- Certified as ISO 14001 (environmental management standard) compliant

2005
- Recognized for its annual export of USD 700 Mil

2006
- Completed offices in China and Thailand

2008
- Opened an office in Japan
- Produced steel of 15 million tons total

2010
- Became the first in Korea to successfully commercialize Ø5 wiring

2011
- Completed the 2nd phase of its facility rationalization
  - A new steelmaking unit: A 60-ton electric furnace, a vertical caster
  - Rolling plant improvement: Continuous heating furnace (90 tons), a large-scale roller (SBM), 3 new 45-ton batch furnaces

2012
- Received the highest rating (AA) in self-regulated fair transactions

2014
- Acquired by SeAH Group and changed its name to SeAH Changwon Special Steel Co., Ltd.
- Made an arrangement with Changwon City to make investment of KRW 100 billion

2015
Business Sites

Seoul Office
Located at the SeAH Tower in Mapo District, Seoul, this office is responsible for planning, sales, exports, and purchases. It overlooks and supervises marketing activities within and outside Korea and manages available raw materials.

Busan Office
This office manages sales activities and marketing strategies for the company’s existing and potential customers, who predominantly reside in Gyeongsang Province.

China Office
This office is responsible for keeping track of special steel market needs in China, which is the largest producer and consumer of steel in the world. This office also carries out market research and creates marketing plans for existing and potential market segments.

Thailand Office
This office is responsible for responding to customer needs and organizing various forms of promotional activities in Thailand, which is the powerhouse of South East Asian automobile and electronics industries.

Japan Office
This office is responsible for responding to the needs of the Japanese market, which emphasizes world-class quality steel production. This office conducts market research to identify new materials for the high-quality special steel industry and keep up with emerging industry trends.

Changwon Plant, the base camp for SeAH CSS to be a leader in global steel manufacturing

Stretching over an area of 670,000 square meters, the Changwon Plant produces 1.2 million tons of crude steel annually. The entire manufacturing process has an integrated system, which takes place at a single factory. Changwon Plant produces a wide variety of high-grade special steel for different applications and offers products and services that target specific customer needs with its customized post-treatment services, such as heat treatment and processing. SeAH CSS is the only seamless stainless steel pipes & tubes manufacturer in Korea that uses the integrated steel manufacturing system. The Changwon Plant produces seamless large diameter steel pipes, and this recent addition of the new plant to the company successfully brings the company a step closer to becoming a leading special steel maker in the world.

Overview

Address
147, Jokhyeon-ro, Seongsan-gu, Changwon City, Gyeongsang South Province

Area
640,000 m²

Capacity
1.2 Million tons of crude steel

Products
Stainless Wire Rods & Bars
Seamless Steel Pipes & Tubes
Tool Steel & Mold Steel
Carbon & Alloy Steel
Special Alloy Steel
Open Die Forged Products

FACILITIES

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PRODUCTS
Stainless Wire Rods & Bars
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Special Alloy Steel
Open Die Forged Products
SeAH CSS is the only company in Korea to produce stainless steel round bars and wire rods. With our integrated production system dedicated to high-grade specialty steel, we are able to maintain market-leading positions in multiple product categories in Korea; including stainless steel, tool steel and special alloy. Our goal is to optimize the products to fulfill customers’ needs and ensure the stable availability of supply by using our innovative technology. Our advanced technology and production are based on over 50 years of experience of innovating high-grade special steel products and developing new materials to ultimately promote customers’ value.
Steelmaking

The steel-making process such as melting consistency, refining and casting critically determines the quality of special steel. The melting facility is capable of 60- or 100-ton electric arc furnace and VIM for the highly clean quality steel production. Refining can take place outside a furnace using LF, VD, VOD and AOD facilities, and Special ESR refining can be applied to highly functional materials. Casting consists of continuous casting and ingot casting, and produces billets, blooms and ingots.

**MELTING**
- EAF (2 units): 100tons, 60tons
- VIM (2 units): 2tons, 8tons

**REFINING**
- LF (2 units): 100tons, 60tons
- VD (1 unit): 100tons
- VOD (1 unit): 60tons
- AOD (1 unit): 100tons
- ESR (4 units): 4tons, 8tons, 8tons, 30tons
- VAR (1 unit): 8tons

**CASTING**
- Billet Caster (Curved Type)
- Bloom Caster (Vertical Type)
- Ingot Casting (1.5~150ton)
Rolling

Wire rods are produced through continuous rolling process, which consists in three facilities: Roughing Mill — Kocks Mill — and Precision Sizing Block. The latest RSM enables texture uniformity and precise dimension control of up to 0.1 mm. Round bars and flat bars are produced through forging and rolling. The latest large scale SBM is used to produce large round bars and wide flat bars. A HV mill allows for horizontal and vertical continuous rolling for the manufacture of products of highly precise dimensions.
Forging

During forging, ingots are heated and pressed into products of various shapes; including vessel shafts, engine parts, plant shells, round bars and flat bars. The forging stage is followed by heat treatment and processing. Final visual and content inspection is conducted before packaging and delivered to the customer.

**FORGING FACILITIES**

- Press (2 units): 9,000tons/2,200tons
- RPM (1 unit): 2,800tons
Seamless Steel Pipes

Seamless steel pipes are produced from round bars cut into cross sections by drilling holes through the sectional center, heating them in an induction heating furnace and then extruding them into pipes of certain inside and outside diameters.

The extruded steel pipes undergo annealing, pickling and inspected to become hot-rolled products and pull out drawing facility or pilger mill to become cold-rolled products. Each of our seamless steel pipes undergoes thorough inspection to check for any defect on the surface or in the interior.
FINISHING

AFTER-TREATMENT FACILITIES

Heat treatment furnace, leveler, processing facility, inspection facility, coil acid pickling

STAINLESS STEEL WIRE RODS

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STAINLESS STEEL BARS

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SEAMLESS STEEL PIPES & TUBES

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TOOL - MOLD STEEL

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CARBON - ALLOY STEEL

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NICKEL ALLOY

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STAINLESS STEEL WIRE RODS

Our stainless steel wire rods are produced through an integrated production system, which involves steelmaking, wire rod rolling and heat treatment to picking. We incorporate world-class technology and offer unmatched quality based on our continued investment in facilities and R&D efforts. Our reducing and sizing mill (RSM) allows for the production of 5 to 34 mm products with dimension control of less than 0.1 mm. We ensure precision and quality by using direct solution treatment (DST) facilities which control the uniformity of grain size and strength, as well as nitric acid-free acid cleaning, an advanced, eco-friendly technology. Our steel grades include Austenitic, Ferritic and Martensitic series as well as high-level duplex.

We are proud to offer products of world-class quality based on continued investment in facilities and R&D efforts as Korea’s sole producer of stainless steel wire rods.

- Applications: Wire ropes, bolts, nuts, springs
- Grades: 304, 316, 304J3, 410, 430, and more
- Industries: Industrial machinery, construction, consumer electronics, automotive, and more

Fasteners
Fasteners are used for cold heading fasteners such as bolts, nuts and screws thanks to improved cold head ability resulting from reduced carbon and sulfur, and addition of copper.

Wire ropes
Used for wire cranes, sea water ropes and wire ropes thanks to higher strength resulting from increased carbon content.

Automotive components
Used for car exhaust systems thanks to improved heat and corrosion resistance resulting from the addition of titanium and niobium.
Our stainless steel bars are produced through an integrated production system, which involves steelmaking, rolling, heat treatment, processing, and inspection. A wide range of steel grades are available, ranging from free-cutting steel, super duplex steel and heat-resistant steel for engine valves in many different dimensions from 5.7 mm to 885 mm and shapes achieved through combination of small scale rolling, large scale rolling and forging.

In addition to an extensive product portfolio, we provide exceptional surface quality based on flawless after-treatment; including heat treatment optimized for product conditions and peeling as thick as 250 mm. Our unparalleled production capacity and manufacturing technologies enable us to supply heat-resistant steel exclusively for many applications including power plants, turbines and vehicle engine valves. With strict quality inspection and a comprehensive QA system covering production to shipping, we provide optimized products and after-sales service trusted by customers.

**Applications**
- Power turbine components, automobile gears, vessel shafts, components of petrochemical plants
- Petrochemicals, automotive, ship building, plant components

**Vacuum gauge or semiconductor parts**
Most widely used for mechanical parts or vacuum gauge parts requiring resistance to corrosion.

**Turbine blades**
Used for components of turbines in thermal and nuclear power plants thanks to its exceptional strength, impact toughness, and heat and abrasion resistance at high temperature.

**Highly stiff shafts Martensitic steel**
Highly stiff shaft Martensite steel, which has high strength and toughness thanks to the hardening heat treatment. Most widely used for high strength shafts, molds and bearing components.
We are the only steel maker in Korea to have an integrated production system ranging from material production to finished goods, including steelmaking, rolling, extrusion, cold-working, and inspection. Diverse dimension products are produced through a hot extrusion of heated material using a 2,000-ton press followed by heat treatment, pull-out, pilger mill and final inspection. We assure our quality by testing and inspection at each stage from production to final shipping. Our products for semiconductors, plants and nuclear fusion generation offer world-class competitiveness. With the adoption of a new 5,000-ton extrusion press in our large diameter pipe and tube plant, we are now capable of making products of 1/8 to 10 inches in outside diameter, which is a big plus for our global operation.

Applications
- Boilers for thermal power generation, piping, heat exchangers, mother pipes for precision steel pipes
- Grades TP304, TP316, TP347H, TP316/316L, S30432, N08904
- Industries Chemical plants, semiconductors, automotive

We are technology-driven: based on an integrated production system capable of self-procurement of materials and supplies, we have the innovative manufacturing technologies and mechanical skills required for a special steel maker.

Boilers and exchangers
Used for waste heat recovery boilers, heat exchanger pipes, condenser pipes, catalyst pipes and heating furnaces in the petrochemical industry thanks to its strength, corrosion resistance and conductivity at high temperature or pressure.

Resistance to heat and corrosion
Used for waste heat recovery boilers and heating furnaces thanks to its high resistance to corrosion and oxidation at high temperature.

Mechanical structures
Used for industrial machines, aircrafts, automotive, and mechanical parts thanks to its high strength as well as good resistance to corrosion, heat, and abrasion.
Blooms and ingots from a 60-ton or 100-ton electric furnace can be fed directly into a rolling facility without an intermediate stage, which allows us to reduce cost and meet delivery schedule. Electro slag re-melting is applied to ensure the cleanliness of steel ingots and close-packed texture in the finished goods. In addition, a wide range of advanced rolling facilities are used to tailor-make products according to customer-specified dimensions and shapes and deliver in timely manner. We use a comprehensive set of facilities intended for the production of tool steel including an SBM producing wide flat steel, an HV mill capable of horizontal and vertical, continuous precise rolling, 2,200- and 9,000-ton free forging units and radial forging machines to offer a full product portfolio of different sizes ranging from small to large; including cold- and hot-rolled tool steel, precision plastic mold steel, flame hardening tool steel and forged rolls.

**TOOL • MOLD STEEL**

With new alloy design and process control, we supply high quality tool and mold steel, which offers improved resistance to abrasion, workability and polish ability.

**Applications**
- Press molds, molds for car bumpers, extrusion molds, molds for high-end consumer electronics

**Grades**
- Hot/cold-rolled tool steel — STD61, STD11, DC1, TDI, SKT4(V)
- Plastic mold steel — TPI, TP4/4M, SMAI, SMATE, SMATF

**Industries**
- Automotive, consumer electronics, industrial machines

**Dies for hot pressing**
Pre-hardened steel is used for this application. It is supplied quenched and tempered so that mold-making customers can commence molding without requiring an additional heat treatment.

**Shear knives**
Cold-worked steel with higher carbon and chrome content is used for this application. Its ability to maintain good hardness after quenching and tempering (QT) provides exceptional resistance to abrasion even in a cold-rolled condition.

**Extrusion molds**
Hot-worked tool steel which offers a higher thermal equilibrium resistance thanks to its lower carbon and higher chrome content is used for this application.
Carbon and alloy steel round bars and wire rods of widely different dimensions for a range of applications are available. Our highly flexible production facility can meet the needs of orders for multiple products in small lots and can fully incorporate special refining and new steel grades. Based on such versatility and flexibility, our products have demonstrated their applicability in automotive and defense industries.

Our quality control scheme is fully compliant with major international standards, incorporating advanced inspection and testing practices including hot-rolled surface defect detection using eddy current testing (ECT), nondestructive testing (NDT) and magnetic particle testing (MPI).

Finally, optimized packaging is applied to each stage of the process from handling through transport to delivery to ensure that flawless products reach our customers.

· Applications: Functional parts of car transmissions and engines, parts of industrial machines, functional materials for defense industry
· Grades: S45C, S48C, SCM420, SCM440
· Industries: Automotive, industrial machines, defense industry
In addition to the production of highly functional and clean materials, we lead the future special steel industry thanks to continued investment in R&D into next generation materials, including nickel and titanium.

Nickel alloy steel caters to the needs of a wide range of applications, including power generation, offshore plants, petrochemicals and even aerospace. This is the material that SeAH CSS considers to be its core source of growth in the future. Our research lab, the base camp for our exploration of next generation materials, has played a pivotal role in the development of our manufacturing technologies and knowledge of highly functional special alloy with exceptional resistance to heat and corrosion and a higher nickel and chrome content. Currently, highly clean special alloy products manufactured using vacuum induction melting (VIM) and electro slag re-melting (ESR) are available. With the recent adoption of vacuum arc re-melting (VAR) and the latest radial forging machine (RFM), we now have a fully integrated production system for special alloy from ingots to finished goods, and this has pushed our expertise in high value-added special materials to a higher level.

- **Applications**
  - Power generation turbines, bolts requiring high resistant to corrosion, piping components, high voltage transmission lines, aircraft parts and more

- **Grades**
  - UNS N07718, N06625, N09925, N08825, MONEL400, CIMA35 and more

- **Industries**
  - Energy, aerospace, defense industry and more

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Cores of high voltage transmission lines
Special alloy containing nickel and capable of withstanding temperature changes is used for this application

Aerospace
Special alloy with very strong fatigue properties is used for this application
Research Lab, the control tower for our efforts to develop next generation materials

Through selection and concentration, SeAH CSS has made intensive investment in R&D for high-grade special steel, developing new highly functional products, improving product properties, enhancing proprietary technologies and developing new processing technologies. Since its opening in 1987, our research lab has led the development of special steel materials, presenting a roadmap for the early excavation of new materials. With a focus on special alloys, it is developing next generation materials and working on new sources for the company’s sustainable growth.

Product research

Our product research center is responsible for the development of new steel grades, substitution of imported items with self-developed ones, as well as improvement of product properties and credibility evaluation. Its focus areas include high alloy stainless steel with good resistance to heat and corrosion, next generation tool and mold steel with long life and special alloys based on elements with ultra-high resistance to corrosion and heat. Key research topics include:

- Development of new stainless steel, tool steel and special alloys
- Improvement of product properties through the optimization of the manufacturing process
- Preceding research into emerging next-generation steel grades

Process research

Our process research center is responsible for the study of emerging process technologies for cost reduction and quality improvement, enhancement of production quality, process technology optimization and inspection systems for better quality assurance, with particular focuses on:

- Development of production technologies for high-quality products through process optimization
- Cost reduction and higher product competitiveness through new process development
- Optimized inspection systems to ensure flawless quality
QM & CERTIFICATION

More than just developing new technologies, SeAH CSS offers customers quality products that meet the expectations by applying a highly sophisticated and robust quality control system. Our customized quality design, quality forecasting and seamless quality assurance coupled with regular improvement and process innovation allow us to offer world-class quality and the highest level of customer satisfaction.

Plan
Customized designing

Do
Quality forecasting and control

Action
Repeated improvement

Check
Seamless quality assurance

SYSTEM CERTIFICATIONS

ISO 9001:2008
ISO/TS 16949:2009
ISO 14001:2004
KOSHA 18001

CLASSIFICATIONS AND CERTIFICATIONS

Korean Register
Nippon Kōji Kyokai
American Bureau of Shipping
Lloyd’s Register

BUREAU VERITAS
DNV-GL
Registro Italiano Navale
China Classification Society

PRODUCT AND OTHER CERTIFICATIONS

Korean Industrial Standards
Japanese Industrial Standards
Japanese Electric Power Industry Code
AD 2000-Merkblatt W0
European Directive 97/23/EC (PED)
DNV-GL M-030 (Duplex STS Tubes & Pipes)
Putting humanity and environment first, SeAH CSS maintains production and recycling systems that allow us to minimize environmental impact throughout the development, production, use and waste of products, by operating highly efficient facility installations. Our rigorous environmental management practices contribute to making our production cleaner and ultimately producing higher quality products.

**Environmental protection**

**Air quality**
- Operation of pulse jet type dust collectors for high capacity electric arc furnaces
- Operation of a tele-monitoring system (Clean SYS)
- Operation of a fugitive dust suppression system at the scrap metal yard

**Water quality**
- Removal of pollutants through mitigation, coagulation, and sedimentation from waste water before its flow into the treatment facility in Deokdong
- Coolant recycling for recirculation
- Recycling of discharged water

**Waste management**
- Recycling of dust from steelmaking
- A facility to use slag as resources

**External activities**
- Participation in activities to keep Masan Bay clean
- Participation in the Council on Sustainable Development of Gyeongsang South Province

<table>
<thead>
<tr>
<th>Environmental management</th>
<th>Statutory standard</th>
<th>Our standard</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUST</strong></td>
<td>20mg/Sm$^3$</td>
<td>14mg/Sm$^3$</td>
<td>6ppm ▼</td>
</tr>
<tr>
<td><strong>COD (Organic substance)</strong></td>
<td>90ppm</td>
<td>63ppm</td>
<td>27ppm ▼</td>
</tr>
<tr>
<td><strong>SS (Suspended substance)</strong></td>
<td>80ppm</td>
<td>56ppm</td>
<td>24ppm ▼</td>
</tr>
</tbody>
</table>

**GREEN PRACTICES**

Through a clean production system, SeAH CSS has adopted environmentally friendly practices, contributing to sustainable development.
Community Reach & Social Contributions

SeAH CSS fulfills its social responsibility through its employees’ volunteer groups that were formed in 2004. Its community-reach activities include sisterhood with social welfare centers and remote villages as well as the donation of funds for those in need every year. At the enterprise level, we ensure that social contribution is part of our corporate culture. We actively fulfill our role as a corporate citizen in many areas, such as social welfare, environmental conservation and support for sports and culture.

<table>
<thead>
<tr>
<th>Sharing on Saturdays</th>
<th>Underwater cleaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our members volunteer for the community on the first and third Saturday of each month.</td>
<td>Members of the company’s skin scuba club conduct underwater cleaning in Masan Bay once every quarter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Themed volunteering</th>
<th>Sisterhood with welfare centers and villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volunteering activities under different themes such as wall painting and the crafting of echo bags are conducted to expand the basis for volunteer activities and create better experiences.</td>
<td>We expand our community reach through sisterhood with welfare centers including Jeongseon-myeon, Pulpyeong-myeon, Inawon, Donggup, Guisandong, and the like.</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Fellowship program</th>
<th>Blood donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>We invite teenagers from low income or single-child families to participate in cultural or sport activities for their better emotional development.</td>
<td>Our entire employees donate blood once every quarter.</td>
</tr>
</tbody>
</table>
More than 40 local and international affiliated companies sharing the SeAH brand pursue innovation based on the group’s core values - honest, passionate, and professional - built up over 50 years of self-driven growth and constant efforts to enhance its world-class technologies and quality competitiveness. Founded in 1960 as a steel pipe maker, SeAH Group has been a leader in steelmaking. Today it supplies special steel, automotive parts, welding materials, industrial machinery, logistics, and IT services, consolidating its position as one of Korea’s leading companies specializing in steel materials.

Based on its history of realizing the value of honesty powered by gratitude and moderation, it now looks to grow into a global player with world-class competitiveness in every area where it operates. By fulfilling its mission and accountability as a major player in the national economy, SeAH Group will contribute to the making of a new history.
SeAH CSS takes another step toward making a better tomorrow and going further into a global world.

Every step we take will add to fuel our march towards being a global leader in special steel.

By creating new value of steel, we will contribute to the co-existence and benefit of all mankind.