

Building the Nation, Empowering the People



**BUILDING THE NATION,
EMPOWERING THE PEOPLE**

In the development of its commercial operation, KRAKATAU POSCO continues to uphold its commitment to good corporate citizenship. Balancing between its commercial purposes and government's plans and the interests of the community, KRAKATAU POSCO has been heavily involved in many national infrastructure projects, creating over 5,000 job opportunities in the process.

For KRAKATAU POSCO, this is more than just business. This is a lifelong mission to build the nation and empowering the people.

TABLE OF CONTENTS

OUR COMPANY IN BRIEF

- 04 History
- 06 Milestones
- 08 Synergy of Collaboration
- 10 Location, Capacity and Total

OUR BUSINESS

- 14 Key Advantages
- 16 Continuous Workflow
- 18 Slab Product
- 20 Plate Product
- 22 Hot Rolled Coil Product
- 24 Domestic Project Highlight
- 26 Overseas Project Highlight
- 28 Innovative Solution

OUR PEOPLE & OUR SOCIETY

- 32 People for Business
- 36 Improving Life Quality

OUR CATALOGUE

- 40 Slab Product
- 46 Plate Product
- 70 Hot Rolled Coil Product
- 86 Cast Iron & Pig Iron Product

CERTIFICATE

- 92 Product Testing
- 94 Certificate

HISTORY

Our story began in 2010, PT Krakatau Steel (Persero) Tbk., a well-known name in the Southeast Asian steel industry, came to an agreement with Korean steel producer, POSCO to establish a joint venture company, namely KRAKATAU POSCO.

KRAKATAU POSCO combined the strengths of PT Krakatau Steel (Persero) Tbk. - highly skilled workforce and Indonesia's ideal geographical condition - and South Korea's POSCO - strong financial capability and advanced technology. We understand that it needs to be accompanied by real contribution to the local community and the environment. As such, providing a better future for everyone has been our top priority since we first established in Cilegon, Banten.

KRAKATAU POSCO tries to work in synergy with the government and the community. We are committed to be **Agile** in facing the dynamic industry and **Responsive** to all of our stakeholders, while **Aligning** our business plans.

At KRAKATAU POSCO, we aim to generate positive impacts for all by building the nation and empowering the people.

MILESTONES

2009

2010

2013

2014

2022

2024

2025

DECEMBER

OCTOBER

DECEMBER

JANUARY

DECEMBER

NOVEMBER

SEPTEMBER



MoA Signing between KRAKATAU STEEL & POSCO



Groundbreaking Ceremony of KRAKATAU POSCO



Completion Ceremony of KRAKATAU POSCO Integrated Steel Mill



First Delivery of Commercial Steel Plate



In-kind contribution of Hot Rolling Plant



Initiative towards Carbon Neutral with installation of Solar PV 1.2 MWP at Hot Rolling Plant



Completion of HR Coil Warehouse with 70,000 tons capacity on a 16,000 m² area to transform logistics and supply chain efficiency.

KRAKATAU STEEL



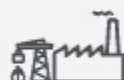
An Indonesian State-owned Enterprise

- The Best BUMN Award 2021.
- Consolidated under Danantara (DAM) with strategic SHL.
- Best Stock Award 2026 for corporate transformation.
- Listed in Fortune Indonesia 100 & Southeast Asia 500 – 2026.



Leading the Indonesian Domestic Market (2009-Present)

- Dominant market leader in national steel industry.
- BUMN Entrepreneurial Marketing Awards 2024 recipient for successful commercial transformation.
- The Most Promising Company in Tactical Marketing and Marketing 5.0.



Strategic location of production facilities

- Convenient access to customers and raw materials.
- Close to port that is operated by PT KBS (a wholly-owned subsidiary), rail, and road transportation.
- Fully integrated supporting facilities including strategic industrial estate, industrial water supply, power plant, and hospital.



Implementing Good Corporate Governance

- Achieved an excellent and sustainable GCG Score of 92.50 (Sangat Baik).
- Green industry award (Level 5-highest). The Ministry of Industry of the Republic of Indonesia – 2018.
- Accelerated Integrated Green Steel Program for national carbon reduction.

- Bring together complementary capabilities and resources to establish a leading equal partnership Joint Venture steel company in Indonesia, KRAKATAU POSCO.
- Foster the market globalization by expanding production capacity through strategic investments and maximizing EV supply chain management performance.

- Increase broad economic and environmental impact by strengthening national steel capacity, deploying low-carbon technologies, and pioneering green steel development.



POSCO



Competitive Steelmaker in the World

- Ranked 1st in the Steelmaker Competitiveness Ranking for Fifteen Consecutive Years World Steel Dynamic (WSD) – 2024.
- Included in DJBIC (formerly DJSI) Asia-Pacific Index for multi-decade, with its battery unit, POSCO Future M, entering the World Index.



Sustainable Global company

- A sustainable growth over 55 years.
- Strong vision to shape future.
- Top 100 World's Most Sustainable Company (World Economic Forum at Davos –2017).
- Named a Sustainability Champion for Five Consecutive Years – 2026.



Advanced technology



Innovative Culture

- Contribute to the global development through endless innovation and developments in technology, corporate and business strategy.
- Named the Top Company in the Steel Industry Leadership Category at the Global Metals Awards – 2020.
- Open Innovation Challenger Award at the CSS Awards by the International Chamber of Commerce (ICC) – 2024.
- Received the Eco-Innovator Award at the 2023 Innovation Awards – 2023.

LOCATION, CAPACITY AND TOTAL EMPLOYEES

PRODUCTION CAPACITY

3.0
Million MT/
year

Slab Production

1.5
Million MT/
year

Plate Production

1.5
Million MT/
year

Hot Rolled Coil
Production

TOTAL EMPLOYEE

± 2,750

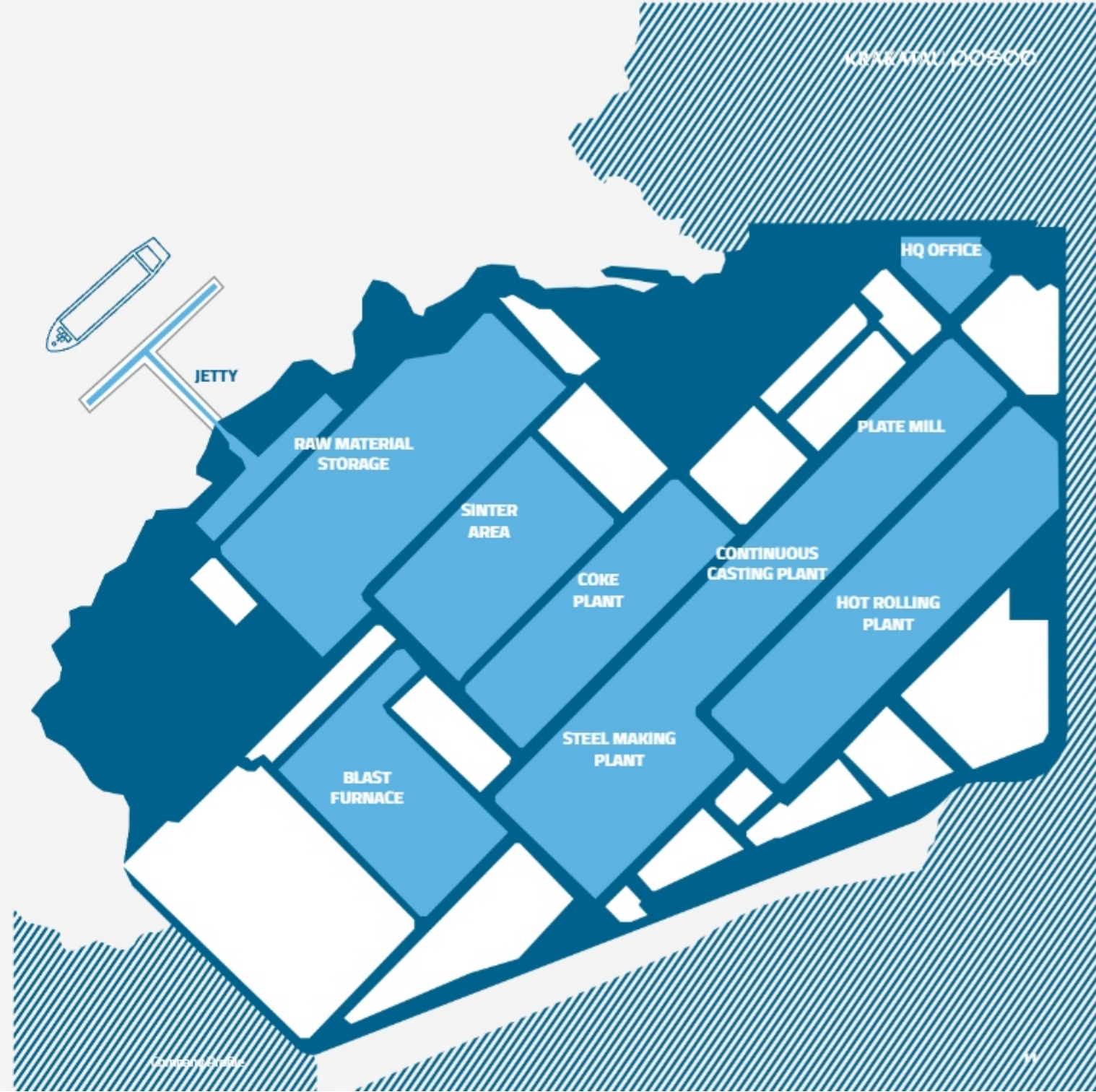
employees

Main Plants (Integrated Steel Mill)

- Coke Plant
- Sinter Plant
- Blast Furnace
- Steelmaking Plant
- Plate Mill
- Hot Rolling Plant

Supporting Facilities

- Waste Treatment
- Water Treatment
- Oxygen Plant
- Power Plant
- Laboratory
- Raw Material Jetty
- Raw Material Yard Closed & Open yard



OUR BUSINESS

- 16 Key Advantages
- 18 Continuous Workflow
- 20 Slab Product
- 22 Plate Product
- 24 Hot Rolled Coil Product
- 31 Innovative Solution



KEY ADVANTAGES

At KRAKATAU POSCO, we maintain a fully integrated production process to ensure consistent quality across all of our products.

From choosing raw materials to customizing our products for different customer needs, our manufacturing process is 100% in-house and digitalized for easier monitoring. Centered in our 388-ha steel mill, every part of our process is monitored 24/7 by our skilled personnel, allowing for thorough quality control.

We conduct our world-class operation in the largest integrated steel mill, supported by the first Blast Furnace technology in Indonesia. Such technology allows us to operate more efficiently while maintaining our zero-waste policy. All of these efforts add up to our commitment to delivering excellent steel products to our valuable customers.

CONTINUOUS WORKFLOW

When it comes to quality, we never compromise.

We uphold this commitment through international grade materials, advanced production plants and facilities, and highly competent human resources.

01. IRON-MAKING

Our production process starts here. Iron ore is processed into sinter in our sintering plant, while coking coal is converted into coke in the coke oven. The two materials are then charged into the blast furnace, oxidizing the raw coke to burn and heat the sinter to later produce molten iron.

02. STEEL-MAKING

This is where we remove impurities. Multi-movers containing the molten iron are transferred from the blast furnace to the steelmaking plant, where the molten iron is poured into a converter. Carbon, phosphor, and silicon are then removed from the molten iron with pure oxygen to produce clean, pure molten steel.

Kanbara Reactor, Converter, & Ruhrstahl Heraeus
Three technologies that we use to produce high-quality clean steel:
•De-S technology on Kanbara Reactor
•Double de-slagging technique and maximum se if-generated Fe-source by-product on converter
•RH-degasser that reduces the hydrogen content in molten steel

03. CONTINUOUS CASTING

Solid steel begins to take shape in this step. Molten steel is placed into a mold and taken through a continuous casting machine where it cools and solidifies into slabs.

04a. PLATE ROLLING

This is where the plates are formed. Slabs are heated to over 1,100°C and sent to large rolling machines where they are rolled into different sizes of plates with 6 to 75 mm thickness and 1,500 to 4,300 mm width.

ACCELERATED COOLING

Some plates are processed in the accelerated cooling where their temperature is quickly decreased by applying low-pressure cooling water to achieve the desired mechanical properties.

04b. COIL ROLLING

At this stage, Slab is sent to be processed at Hot Rolling Plant facility, where it is heated to temperatures above 1,150°C and then further rolled until it reaches the desired final thickness (up to 16 mm) and 600 – 1,500 mm width.

THE SKINPASS

Cold-rolling process to modify the strip material properties and its surface structure to be suited for the post forming operations as deformations, welding and painting.

05. INSPECTION LINE

To maintain the quality of the plates, inspectors are stationed at the inspection line face-to-face to check the quality of each plate moving in front of them.

06. WAREHOUSING AND SHIPPING

Finished steel plates are stockpiled in the designated warehouse, ready to be loaded into trucks to be shipped.



SLAB PRODUCT

KRAKATAU POSCO produces high quality slabs to support the development of steel industry.

KRAKATAU POSCO'S HIGH GRADE STEEL SLABS

Low Inclusions and High Surface Quality

With thorough internal quality control that starts from the ironmaking process up to continuous casting process, KRAKATAU POSCO's slabs are the "cleanest" finished slabs that contain minimum impurities.



Dimensions

Thickness	: 230 mm
Width	: 1,100 mm – 2,300 mm
Length	: 6,000 mm – 12,000 mm

Other Treatments

- Killing Method (Si, Al, or Degassing Treatment)
- Special Control for B, Mo, and N
- Non-Radioactive Test
- Additional Slab Marking

PLATE PRODUCT

KRAKATAU POSCO delivers high quality plates to ensure customer satisfaction

KRAKATAU POSCO'S HIGH GRADE STEEL PLATES

Purity

KRAKATAU POSCO produces clean plates with minimum impurities and tramp elements using virgin iron produced in the blast furnace as material, processed with vacuum degassing for inclusion control (i.e., Dual Type Ruhrstahl Heraeus).

Formability and Machinability

KRAKATAU POSCO's plates are rolled at low temperature with precise rolling control and levelling control to ensure optimal formability, increase scale adhesion, and ensure a bright surface with no residual stress.

Production Time

KRAKATAU POSCO maintains a speedy production process of 3 weeks after order is placed with world-class quality control, inspections and delivery.

Dimensions

Thickness	: 6 - 75 mm
Width	: 1,500 - 4,300 mm
Length	: 3,000 - 25,000 mm
Max Unit Weight	: 10.4 - 15.5 Ton/plate

Steel Plate Application



Infrastructure



Ship
Building



Pipeline



Pressure &
Vessel



Heavy
Equipment

KRAKATAU POSCO'S HIGH GRADE HOT ROLLED COIL

KRAKATAU POSCO is taking a impactful movement in expanding its steel market by producing the high grade Hot Rolled Coil towards realization of the 10 million steel cluster to contribute as leading in ASEAN steel industry.

KRAKATAU POSCO Hot Rolling Plant is established with investment of developed technology and improvement of continuous control process is delivered by the integration of 4 (four) High Rolling Mill and laminar cooling.

Through enhancement of Marketing Solution, KRAKATAU POSCO will continuously dedicate in presenting the most competitive Hot Rolled Coil that meet and exceed customer expectations.

Dimensions

Thickness	: 1.4 – 16 mm
Width	: 600 – 1,650 mm
Max Unit Weight	: ~30 ton

Hot Rolled Coil Application



General
Structure



Automotive

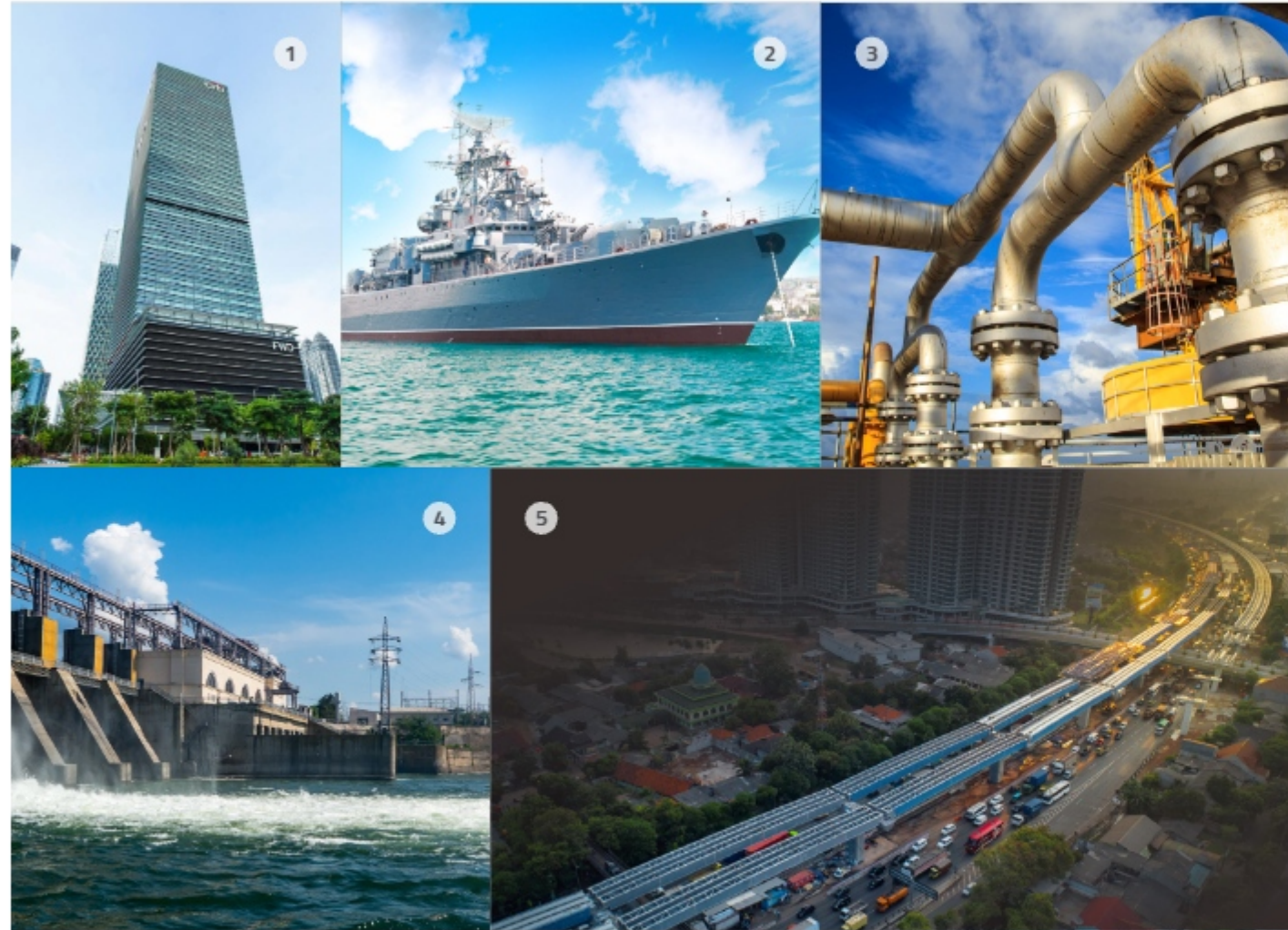


Pipe & Tube



Re-Rolling

HOT ROLLED COIL PRODUCT



DOMESTIC PROJECT HIGHLIGHT

1. Pacific Century Place Building
2. SSV Philipines (PT PAL)

3. Jangkrik Complex Development
4. POSO Hydroenergy PP 615 MW

5. Jakarta-Cikampek 2 - Elevated Toll

PROJECT LIST - DOMESTIC

No	Category	Project Name	Project Owner	Period
1	High Rise Building	Pacific Century Place Building	Takenaka Corporation	2014 – 2015
2	Shipbuilding	SSV Philipines (PT PAL)	Philippines Government	2015 – 2016
3	Pipeline	Jangkrik	ENI	2016 – 2017
4	Power Plant	POSO Hydroenergy PP 615 MW	PT POSO Energy	2016 – 2019
5	Bridge	Jakarta-Cikampek 2 - Elevated Toll	PT Jasa Marga	2017 – 2019
6	Plant Construction	Alumina Refinery Plant	PT Well Harvest Winning Alumina Refinery	2014
7	Train	Train Wagon (INKA)	PT KAI	2014
8	Pipeline	Gresik-Semarang Pipeline	PT PGN	2015
9	Plant Construction	Rembang Cement Plant	PT Semen Indonesia	2015
10	High Rise Building	Astra Tower	PT Astra International	2015
11	Shipbuilding	Container 100 Teus (IKI)	PT PELNI	2015 – 2016
12	Shipbuilding	Proyek Tol Laut	Ministry of Transportation	2016
13	Bridge	Sungai Musi Palembang	PT Waskita Karya	2016
14	Bridge	LRT Palembang	PT Waskita Karya	2016
15	Shipbuilding	Oil Tanker	PT PERTAMINA	2017
16	Wind Tower	Acciona Wind Tower	Acciona	2017
17	Factory	Chandra Asri Expand	PT Chandra Asri	2017 – 2018
18	Pipeline	Gresik-Semarang Gas Pipeline	PT Pertamina	2017 – 2018
19	Power Plant	Tanjung Jati B CFPP	PT PLN	2017 – 2018
20	Storage Tank	Storage Tank Repair	Pertamina RU III	2017 – 2018
21	Power Plant	Tanjung Jati, Central Java, Java 2 Power Plant	PT PLN	2018
22	Offshore Platform	Structural Pipe	PT Pertamina Hulu Mahakam	2018
23	Wind Tower	Gamesa Wind Tower	Gamesa	2018
24	Wind Tower	Siemens Wind Tower	Siemens	2018
25	Storage Tank	Storage Tank Repair	Pertamina RU III	2018
26	Bridge	Kunciran Toll Road	PT Jasa Marga	2018
27	DAM	Bendungan Karolle	PT PLN	2018
28	Power Plant	Sulsel Barru, Cirebon II	PT PLN	2018 – 2019
29	Wind Tower	GE Wind Tower	GE	2018 – 2019
30	High Rise Building	MORI Building	Shimizu Corporation	2018 – 2019
31	Pipeline	Rantau Dedap Geothermal Power Plant	PT PLN	2019
32	Power Plant	Central Java CFPP	PT PLN	2019
33	Refinery	Refinery Development Master Plan	Pertamina RU V	2019
34	Bridge	Alabang Unibridge - Philipines	San Miguel Corporation	2020
35	Power Plant	Matarbari CFPP (2x660MW)	Sumitomo Corporation	2020
36	Bridge	Padang Pekanbaru Elevated Tol	Wijaya Karya	2020
37	Bridge	Seiwampu Project	Waskita	2021
38	Wind Tower	Nordex Wind Tower Project	Nordex	2021
39	High Rise Building	Thamrin 9 Pjt	PT Putra Gaya Wahana	2021
40	Bridge	Belayan Project	PT Bukit Makmur Mandiri Utama	2021
41	Train Station	Kereta Cepat Indonesia China (Halim Station)	PT Kereta Cepat Indonesia China	2022
42	Shipbuilding	BMPP II (Barge Mounted Power Plant) - PT PLN	Ministry of Defense	2022
43	Plant Construction	Freeport Smelter Manyar Pjt	PT Freeport	2022
44	Bridge	Klungkung Bridge (G20 Bali's Culture Center)	Nindya Karya	2022
45	Plant Construction	Lotte Chemical Indonesia New Ethylene (LINE) Project	Lotte Chemical Indonesia	2023



OVERSEAS PROJECT HIGHLIGHT

1. AL Duqm Refinery EPC 2	3. Aframax Tankers C12-C15	5. South Africa RIEPPP Wind Farm
2. ARAMCO Collective	4. Meydan Mall	

PROJECT LIST - OVERSEAS

No	Category	Project Based	Project Name	Project Owner	Period
1	Oil & Gas	South Africa	Burgan Cape Terminals	Burgan Cape Terminals	2016
2	Oil & Gas	Oman	AL Duqm Refinery EPC 2	Samsung Engineering	2019
3	Oil & Gas	Brazil	Aframax Tankers C12-C15	Petrobras	2016-2017
4	Oil & Gas	Saudi Arabia	Jazan Refinery	Saudi Aramco/Petrofac	2016-2017
5	Oil & Gas	Singapore	Liza Project	Exxon Mobil	2017-2018
6	Oil & Gas	Kuwait	Al Zour Refinery	Kuwait Integrated Petroleum Industries Company (KIPIC)	2018-2019
7	Oil & Gas	Saudi Arabia	ARAMCO Collective	Saudi Aramco	2019
8	Others	Philippines	MRT-7	San Miguel Corporation	2018
9	Others	Singapore	Changi Airport T2 Upgrade	Changi Airport Group (CAG)	2018
10	Others	UAE	Meydan Mall	Meydan Group LLC	2018
11	Others	Saudi Arabia	Ihsa'A Water Improvement Project	Saline Water Conversion Corporation (SWCC)	2019
12	Power Plant	Bahrain	GE-Alstom-Alba	GE-Alstom	2016
13	Power Plant	Malaysia	Jimah East Power 2x1000MW CFPP	Jimah East Power Sdn Bhd.	2016
14	Power Plant	Vietnam	Long Phu-Coal Fired Power Plant	PetroVietnam	2016
15	Power Plant	Taiwan	Chai Hui Project	GE	2019
16	Wind Tower	Australia	Silverton PJT	GE	2017
17	Wind Tower	India	"226.8 MW GREENCO (IPP) Project (2.1 MW each machine)"	Telagana electricity board	2017
18	Wind Tower	India	"106 MW Axis Energy group (2.1 MW each machine)"	Andrapradesh electricity board	2017
19	Wind Tower	India	SECI 502 MW (Phase 1 & 2)	SECI (Solar Energy Corporation of India)	2017
20	Wind Tower	Australia	Crudine PJT	GE	2018
21	Wind Tower	India	"SECI 300MW (238unit of S111 140m 2.1MW Each)"	SECI (Solar Energy Corporation of India)	2018
22	Wind Tower	India	100MW in Gujarat State Auction	SITAC and EDF Renewable Energy	2018
23	Wind Tower	Mexico	Vicente Guerrero - 118 MW	Compañía Eólica Vicente Guerrero SA de CV	2018
24	Wind Tower	S.Africa	South Africa RIEPPP Wind Farm	Siemens Gamesa Renewable Energy	2018
25	Wind Tower	Australia	TBD Project	GE	2017-2018
26	Wind Tower	Australia	Cherry Tree PJT	Senvion	2019
27	Wind Tower	India	Bhuj	ReNew Power Ventures	2019
28	Wind Tower	S.Africa	South Africa RIEPPP Wind Farm	SGRE	2019
29	Wind Tower	USA	Milligan Project	SGRE	2019
30	Wind Tower	Australia	Steelhead Empire III	Vestas	2020
31	Wind Tower	S.Africa	Wesley-Ciskei	Vestas	2020
32	Wind Tower	Sweden	Starvo Wind Farm	SGRE	2020
33	Oil & Gas	Egypt	Elsawedy Electric Tower	Elsawedy Electric Tower	2021
34	Oil & Gas	India	SGRE	SGRE	2022
35	Oil & Gas	India	Chowgule	Chowgule	2022
36	Oil & Gas	Poland	Siemens Gamesa Renewable Energy (Shanghai) Co., Ltd.	Siemens Gamesa Renewable Energy (Shanghai) Co., Ltd.	2022



Partnering with
21 Countries



Total of Projects

INNOVATIVE SOLUTION



PRODUCT

Excellent Quality ✓

- Selected Raw Materials
- Excellent Process
- Tight Quality Inspection

High Local Content (TKDN) ✓

72.08%	99%	99%
Slab	Plate	Hot Rolled Coil



TECHNOLOGY

Customized Specs ✓

High-Grade Specs Materials ✓

POSCO R&D Technical Consultancy Provider ✓



COMMERCIAL

Prompt Delivery ✓

Long-Term Contract Agreement ✓

Heart-to-Heart Relationship between Sales Persons and Customers ✓

OUR
**PEOPLE &
OUR SOCIETY**



PEOPLE FOR BUSINESS

At KRAKATAU POSCO, business growth always goes hand in hand with community development.



Together with our supporting companies, we have opened up 5,000 job opportunities for the local community as part of our commitment to local hiring.

We are proud of our success in contributing to community welfare and empowerment, while maintaining an excellent workforce. Every KRAKATAU POSCO's employee has passed a thorough recruitment process to ensure their ability to meet our high standards. We also ensure their continuous growth through various training and development programs. This approach has allowed KRAKATAU POSCO to continue to deliver the best to our customers.



Over the years, KRAKATAU POSCO has made Corporate Citizenship an important part of our business process to optimize our positive long-term impact in the society in relation to social economic empowerment, education, health, and environment.

We have established KPSE SI, a social enterprise that aims to improve local community's welfare.

In addition to opening up employment opportunities, KPSE SI also serves as the social belt for KRAKATAU POSCO's Corporate Citizenship activities, including educational programs for the youth.



IMPROVING LIFE QUALITY

STEEL VILLAGE

In partnership with POSCO and Habitat for Humanity, we built houses, schools, and public facilities for the people in Samangraya, Kubangsari, Tegal Ratu, and Banjarnegara. This program aims to empower communities through the improvement of public infrastructure, Graha POSCO Community Learning Center.

HEALTH IMPROVEMENT

KRAKATAU POSCO contributes to health improvement of the local communities through community health programs. Our employees are also actively participating in city and beach cleaning activities in order to preserve the environment and improve public health.

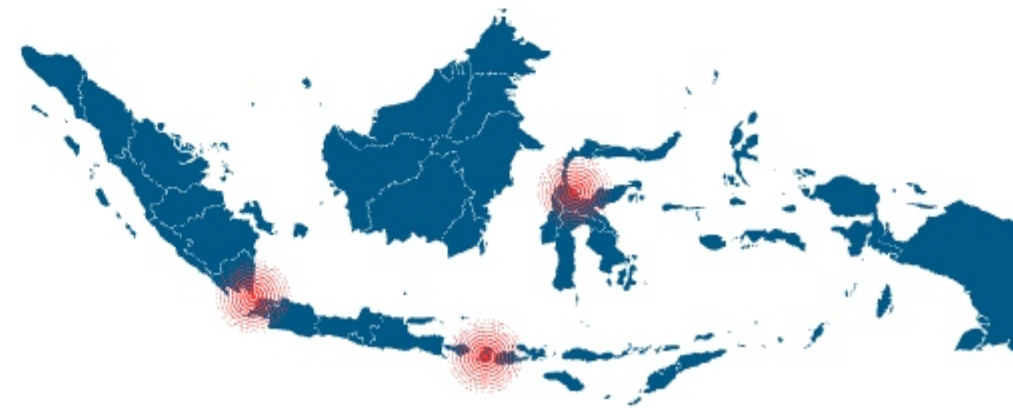
HUMANITARIAN AID

Moved by the series of natural disasters occurring in Indonesia, we together with POSCO and KRAKATAU STEEL helped the victims of natural disasters in Palu and Donggala, the Sunda Strait, Lombok and Cianjur.

HEALTH: CLEAN WATER AND SANITATION SUPPORT

HUMANITARIAN AID: COVID19 MEDICAL EQUIPMENT, OXYGEN SUPPORT, CIANJUR, AND SUMBA DONATION

ENVIRONMENT: SUSTAINABLE MANGROVE AND CORAL REEF ECOSYSTEM CONSERVATION



OUR CATALOGUE

- 42 Slab Product
- 48 Plate Product
- 72 Hot Rolled Coil Product
- 86 Cast Iron & Pig Iron Product



SLAB PRODUCT



AVAILABLE SIZE OF PRODUCT

Length \ Width	6000-6299	6300-6799	6800-7199	7200-7599	7600-8499	8500-9099	9100-9599	9600-10099	10100-10699	10700-11300	11301-11500	11501-12000	
1100-1299	Need to be discussed before confirming order				Available								Need to be discussed before confirming order
1300-1399													
1400-1499													
1500-1599													
1600-1699													
1700-1799													
1800-1899													
1900-1999													
2000-2099													
2100-2199													
2200-2250													
Can not be produced Unit weight is over 35.0 Ton													

Note:

1. Thickness is fixed at 230 mm
2. Maximum slab unit weight is 35.0 tons

AVAILABLE SPECIFICATION

ASTM SPECIFICATION

A36	Carbon Structural Steel
A131	Structural Steel for Ship/High Strength Structural Steel
A283	Low and Intermediate Tensile Strength Carbon Steel Plates
A516/M	Pressure Vessel Plates, Carbon Steel, for Moderate and Lower Temperature Service
A572	High Strength Low Alloy Nb-V Structural Steel

JIS SPECIFICATION

G 3101	Rolled Steel for General Structure
G 3106	Rolled Steel for Welded Structure
G 3131	Hot Rolled Mild Steel Plates, Sheet, and Strip (SPHC)
G 3132	Hot Rolled Carbon Steel Strip for Pipes and Tubes (SPHT)
G 3141	Cold Reduced Carbon Steel Sheet and Strip (SPCC/SPCD)
G 3113	Hot Rolled Steel Plate, Sheet, and Strip for Automobile Structural Use (SAPH)

SNI SPECIFICATION

A/B/D	Rolled Steel for Hull (Mild Steel)
AH/DH	Rolled Steel for Hull (High/Higher Strength Steel)

Note:

- Specifications are referenced for chemical composition only
- Maximum capability is available until 60Kgf

EN SPECIFICATION

EN 10025	Structural Steel
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SNI SPECIFICATION

BjPS	Steel Plates for General Structure
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API SPECIFICATION FOR HOT ROLLED COIL

API 5L	Steel Pipe for Pipeline Transportation System
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CHEMICAL RANGE AND DEVIATION

Main Element

Element	Target Range (%)		Tolerance perGrade (%±)		
	Min	Max	Normal	Special 1	Special 2
C	0.03	0.22	0.02	0.015	0.01
Mn	0.2	1.55	0.15	0.1	0.05
Si	0.15	0.45	0.1	0.05	0.025
P	-	-	0.025 Max	0.02 Max	0.015 Max
S	-	-	0.015 Max	0.01 Max	0.005 Max

Alloying Element

Element	Target Range (%)		Tolerance perGrade (%±)		
	Min	Max	Normal	Special 1	Special 2
Al	0.02	0.04	-	-	-
Nb	0.01	0.055	0.02	0.01	0.005
Ni	0.01	0.25	-	-	-
Cr	0.05	0.25	-	-	-
Ti	0.01	0.05	0.02	0.01	0.005
V	0.01	0.06	0.02	0.01	0.005

Residual Element

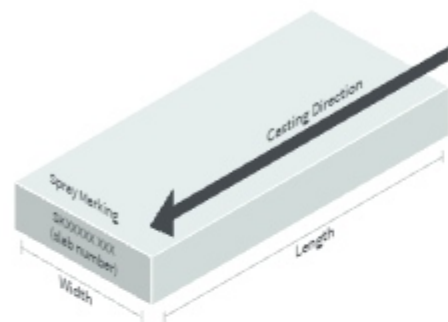
Element	Max Value Grade		
	Normal	Special 1	Special 2
B	10 ppm	8 ppm	5 ppm
Mo	0.08%	0.05%	0.03%
Ca	40 ppm	30 ppm	20 ppm
N	0.007%	0.006%	0.005%
Cu	0.1%	0.05%	-
Nb	0.01%	0.005%	-
Ni	0.1%	0.05%	-
Cr	0.1%	0.05%	-
Ti	0.01%	0.005%	-
V	0.01%	0.006%	-

Note:

- Extra charge is applied for optional methods and treatments such as Killing method (Si, Al, or combined), Calcium (Ca-Si) treatment, and Vacuum degassing treatment.
- Extra charge is applied for "Special" grade (1&2) due to additional control action.
- Any chemical composition exceeding in the table must be confirmed before order confirmation.

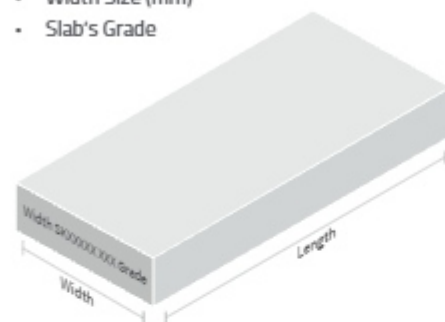
SLAB PRODUCT MARKING

NORMAL TYPE SLAB MARKING



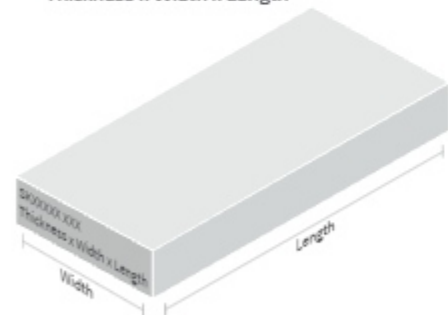
ADDITIONAL TYPE SLAB MARKING

- Width Size (mm)
- Slab's Grade



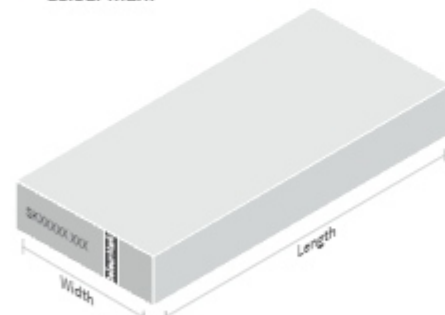
ADDITIONAL TYPE SLAB MARKING

- Thickness x Width x Length



ADDITIONAL TYPE SLAB MARKING

- Colour Mark



SLAB SIZE AND SHAPE CONTROL

Shape Control



Bending
 $B \leq 15\text{mm/M}$



Concave
 $I \leq 15\text{mm}$



Camber
 $C \leq 5\text{mm/M}$



Medium Bending
 $J \leq 15\text{mm}$



Squareness
Surface : $E \leq 5\text{ mm}$
Diagonal : $[-LL12] \leq 60\text{ mm}$



Cutting Margin
 $P \leq 20\text{mm}$



Convex
 $H \leq 15\text{mm}$



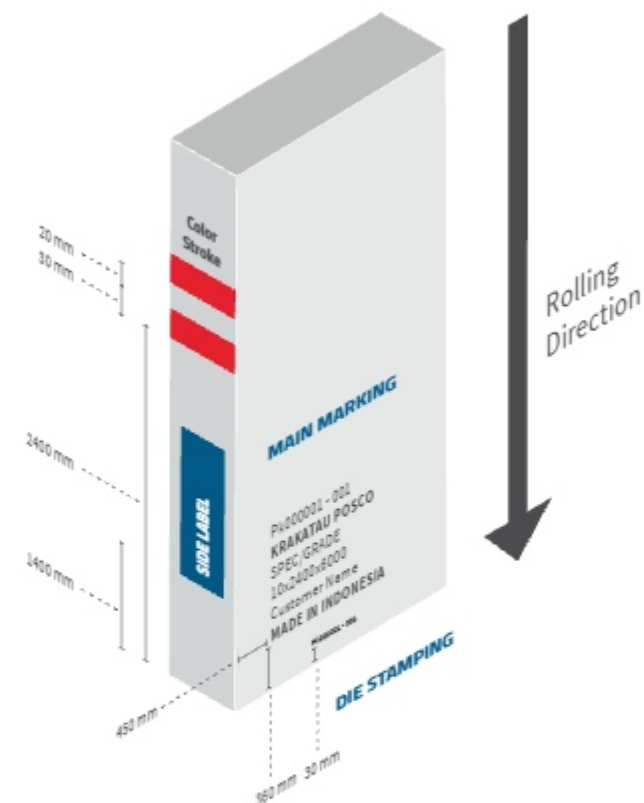
Bulge (F)
15mm

Note:

For smaller control range can be discussed to meet the customer requirement (with extra price).

PLATE PRODUCT

PLATE MARKING STANDARD



Color Stroke

Color	Yellow, White, Red
Line	Max 3 Line

Die Stamping

Normal	Product number Heat Number
Optional (For EN spec)	Grade/Spec
Optional (For Shipbuilding spec)	Association Mark Krakatau Posco Mark

Side Label

Normal	Product number + Order Number Specification + Dimension
Optional	Stock Lot Number PO Number Customer's Code Destination Code Krakatau Posco Mark Heat Number Net Weight

PT KRAKATAU POSCO

Narrow Slab
 Narrow Slab & 2 Layer Design
 Not Available Size
 2 Layer Design
 Should be Discussed Before



STEEL PLATE FOR SHIPBUILDING

Shipbuilding Plate

Spec	Chemical Composition (%)															Applicable Thickness (mm)*	Maximum Applicable Width (mm)*	Supply Condition	Tensile Test				Impact Test			
	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	S.Al	Nb	V	Ti	CEq	De-O				Yield Point (MPa)	Tensile Strength (MPa)	GL=200mm		Elongation (%)	Test Temperature	t≤50	
																					Thickness	Elongation			L	T
A	≤0.21	≤0.50	≥2.5xC	≤0.035	≤0.035	-	-	-	-	-	-	-	-	≤0.40	Full Killed	6-50	4300	As-Rolled	≥235	400-520	6<t≤10	≥16	≥22	20	N/A	N/A
B	≤0.21	≤0.35	≥0.80	≤0.035	≤0.035	-	-	-	-	-	-	-	≤0.40	10<t≤15							≥17	0				
D	≤0.21	≤0.35	≥0.60	≤0.035	≤0.035	-	-	-	-	≥0.015	-	-	≤0.40	15<t≤20							≥18	-20		≥27	≥20	
D-TM	≤0.21	≤0.35	≥0.60	≤0.035	≤0.035	-	-	-	-	≥0.015	-	-	≤0.40	20<t≤25							≥19	-20				
E-TM	≤0.18	≤0.35	≥0.70	≤0.035	≤0.035	-	-	-	-	≥0.015	-	-	≤0.40	25<t≤30							≥20	-20				
AH32	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	-				TMCP	≥315	440-590 440-570 (KR, VL)	30<t≤40	≥21	≥22	-40		
AH32-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.36							40<t≤50	≥22		0		
DH32	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	-							6<t≤10	≥16		≥31	≥22	
DH32-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.36							10<t≤15	≥17		-20		
EH32-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.36							15<t≤20	≥18		-20		
AH36	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	-				As-Rolled	≥355	490-620 490-630 (KR, VL)	20<t≤25	≥19	≥21	0	≥34	≥24
AH36-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.38							25<t≤30	≥20		-20		
DH36	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	-							30<t≤40	≥21		-20		
DH36-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.38							40<t≤50	≥22		-40		
EH36-TM	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.38							6<t≤10	≥15		0		
AH40	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.40				TMCP	≥390	510-650	10<t≤15	≥16	≥20	0	≥39	≥26
DH40	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.40							15<t≤20	≥17		-20		
														20<t≤25							≥18	-20				
														25<t≤30							≥19	-40				
EH40	≤0.18	≤0.50	0.90-1.60	≤0.035	≤0.035	≤0.35	≤0.20	≤0.40	≤0.08	≥0.015	0.02-0.05	0.05-0.10	≤0.02	≤0.40							30<t≤40	≥20		-40		
														40<t≤50				≥21	-40							

(*) Detail applicable thickness and width shall be discussed with PT Krakatau Posco sales representative



STEEL PLATE FOR INFRASTRUCTURE

ASTM Plate

ASTM A36 Carbon Structural Steel											
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties			
		Thickness (mm)	C	Si	Mn	P	S	Yield Point (Mpa)	Tensile Strength (MPa)	Elongation (%)	
										GL = 200mm	GL = 50mm
A36	6-75	6≤t≤20	≤0.25	≤0.40	-						
		20<t≤40	≤0.25	≤0.40	0.8-1.2	≤0.030	≤0.030	≥250	400-550	≥20	≥23
		40<t≤65	≤0.26	0.15-0.40	0.8-1.2						
		65<t≤75	≤0.27	0.15-0.40	0.85-1.2						

ASTM A283 Low and Intermediate Tensile Strength Carbon Steel Plates											
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties			
		C	Si		Mn	P	S	Yield Point (Mpa)	Tensile Strength (MPa)	Elongation (%)	
			t ≤ 40	t > 40						GL = 200mm	GL = 50mm
A283-C	6-75	≤0.24	≤0.40	0.15-0.40	≤0.90	≤0.030	≤0.030	≥205	380-515	≥22	≥25
A283-D	6-75	≤0.27	≤0.40	0.15-0.40	≤0.90	≤0.030	≤0.030	≥230	415-550	≥20	≥23

ASTM A572 High Strength Low-Alloy Nb-V Structural Steel												
Spec	Applicable Thickness (mm)	Chemical Composition (%)							Mechanical Properties			
		Thickness (mm)	C	Si		Mn	P	S	Yield Point (Mpa)	Tensile Strength (MPa)	Elongation (%)	
				t ≤ 40	t > 40						GL = 200mm	GL = 50mm
A572-50	TY1 : 6-75 TY2 : 6-75 TY3 : 6-75	-	≤0.23	≤0.40	0.15-0.40	≤1.35	≤0.03	≤0.03	≥345	≥450	≥18	≥21
A572-60	10-32	-	≤0.26	≤0.40	-	≤1.35	≤0.03	≤0.03	≥415	≥520	≥16	≥18
A572-65	10-32	t≤13 13<t≤32	≤0.26 ≤0.23	≤0.40	-	≤1.35 ≤1.65	≤0.03	≤0.03	≥450	≥550	≥15	≥17

ASTM A573 Structural Carbon Steel Plate of Improved Toughness											
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties			
		Thickness (mm)	C	Si	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)	
										GL = 200mm	GL = 50mm
A573-70	6-40	t≤13	≤0.27								
		13<t≤40	≤0.28	0.15-0.40	0.85-1.20	≤0.030	≤0.030	≥290	480-620	≥18	≥21

ASTM A709 Structural Steel for Bridge											
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties			
		Thickness (mm)	C	Si	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)	
										GL = 200mm	GL = 50mm
A709-36	6-75	t≤20	≤0.25	≤0.40	-						
		20<t≤40	≤0.25	≤0.40	0.8-1.2						
		40<t≤65	≤0.26	0.15-0.40	0.8-1.2	≤0.03	≤0.03	≥250	400-550	≥20	≥23
		65<t≤75	≤0.27	0.15-0.40	0.85-1.2						
A709-50	TY1 : 6-75	6≤t≤40	≤0.23	≤0.40							
	TY3 : 6-75	40<t≤75		0.15-0.40	≤1.35	≤0.03	≤0.03	≥345	≥450	≥18	≥21

JIS Plate

JIS G3101-Rolled Steel for General Structure										
Spec	Applicable Thickness (mm)	Chemical Composition (%)					Mechanical Properties			
		C	Si	Mn	P	S	Thickness (mm)	Yield Point (MPa)	Tensile Strength (MPa)	Bend Test (In Radius)
SS400	6-80	-	-	-	≤0.05	≤0.05	6≤t≤16	≥245		1.5 thickness
							16<t≤40	≥235	400-510	
							40<t≤80	≥215	≥17 ≥21 ≥23	
SS490	6-75	-	-	-	≤0.05	≤0.05	6≤t≤16	≥285		2.0 thickness
							16<t≤40	≥275	490-610	
							40<t≤75	≥255	≥15 ≥19 ≥21	
SS540	6-40	≤0.30	-	≤1.60	≤0.04	≤0.04	6≤t≤16	≥400	≥540	2.0 thickness
							16<t≤40	≥390	≥13 ≥17	

JIS G3106-Rolled Steel for Welded Structure														
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties						
		Thickness (mm)	C	Si	Mn	P	S	Thickness (mm)	Yield Point (Mpa)	Tensile Strength (MPa)	Elongation		Impact Test	
SM400	A 6-75	6≤t≤50	≤0.23	-	≥2.5xC								-	-
		50<t≤75	≤0.25					6≤t≤16	≥245	400-510	6≤t≤16	≥18		
								16<t≤40	≥235		16<t≤50	≥22		
SM490	B 6-75	6≤t≤50	≤0.20	≤0.35	0.6-1.5	≤0.035	≤0.035	16<t≤40	≥215	400-510	16<t≤50	≥24	0	≥27
		50<t≤75	≤0.22					40<t≤75			50<t≤75			
													0	≥47
SM490	C 6-75	6≤t≤75	≤0.18	≤0.35	0.6-1.5								0	≥47
SM490	A 6-75	6≤t≤50	≤0.20										-	-
		50<t≤75	≤0.22					6≤t≤16	≥325	490-610	6≤t≤16	≥17		
								16<t≤40	≥315		16<t≤50	≥21	0	≥27
SM490	B 6-75	6≤t≤50	≤0.18	≤0.55	≤1.65	≤0.035	≤0.035	16<t≤40	≥295	490-610	16<t≤50	≥23		
		50<t≤75	≤0.20					40<t≤75			50<t≤75		0	≥27
SM490	C 6-75	6≤t≤75	≤0.18										0	≥47
SM490	YA 6-75	6≤t≤75	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	6≤t≤16	≥365	490-610	6≤t≤16	≥15	-	-
								16<t≤40	≥355		16<t≤50	≥19		
								40<t≤75	≥335		50<t≤75	≥21	0	≥27
SM520	B 6-75	6≤t≤75	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	6≤t≤16	≥365	520-640	6≤t≤16	≥15	0	≥27
								16<t≤40	≥355		16<t≤50	≥19		
								40<t≤75	≥335		50<t≤75	≥21	0	≥47
SM570TMC*	C 6-75	6≤t≤75	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	6≤t≤16	≥365	520-640	6≤t≤16	≥15		
								16<t≤40	≥355		16<t≤50	≥19		
								40<t≤75	≥335		50<t≤75	≥21	0	≥47
SM570TMC*	10-25	10≤t≤25	≤0.18	≤0.55	≤1.70	≤0.035	≤0.035	10≤t≤16	≥460	520-720	10≤t≤16	≥19	-5	≥47
								16<t≤25	≥450		16<t≤25	≥26		

(*) TMCP Material

JIS G3136-Rolled Steel for Building Structure																
Types	Applicable Thickness (mm)	Chemical Composition (%)								Tensile Test				Impact Test		
		Thickness (mm)	C	Si	Mn	P	S	Ceq	Pcm	Thick (mm)	Yield Point (Mpa)	Tensile Strength (MPa)	Elonga-tion (%)	YR(%)	Temp (°C)	Energy (J)
A	6-75	6≤t≤75	≤0.24	-	-	≤0.05	≤0.05	-	-	6≤t≤12	≥235	400-510	≥17	-	-	-
										12<t≤16			≥17			
										16<t≤40			≥21			
										40<t≤75	≥215		≥23			
SN400	B	6-75	6≤t≤50 50<t≤75	≤0.20 ≤0.22	≤0.35	0.6-1.5	≤0.03	≤0.015	≤0.36	≤0.26	6≤t≤12	235	≥18	≤80	0	≥27
											12<t≤16	235-355	400-510			
											16<t≤40					
											40<t≤75	215-335	≥24			
C	16-75	16≤t≤50 50<t≤75	≤0.20 ≤0.22	0.35	0.6-1.4	≤0.02	≤0.008	≤0.36	≤0.26	t≤16	235-355	400-510	≥18	≤80	0	≥27
										16<t≤40			≥22			
										40<t≤75	215-335		≥24			
SN490	B	6-40	6≤t≤40	≤0.18	0.55	≤1.65	≤0.03	≤0.015	≤0.44	≤0.29	6≤t≤12	≥325	≥17	≤80	0	≥27
											12<t≤16	325-445	490-610			
											16<t≤40		≥21			
											t≤16		≥17			
C	16-40	16≤t≤40	≤0.18	0.55	≤1.65	≤0.02	≤0.008	≤0.44	≤0.29		325-445	490-610	≥21	≤80	0	≥27
											16<t≤40		≥21			

EN Plate

EN 10025-2 Non-Alloy Structural Steel																		
Spec		Applicable Thickness (mm)	Method of de-oxidation	Chemical Composition (%) -Max									Minimum Yield Point (MPa)				Tensile Strength (MPa)	
Accord. EN10027-1 and CR10260	Accord. EN10027-2			C			Si	Mn	P	S	N	Cu	ts16	16<ts40	40<ts63	63<ts75		
				ts16	16<ts40	40<t												
S235JR	1.0038	6-75	FN	0.17	0.17	0.20	-	1.40	0.035	0.035	0.012	0.55	235	225	215	215	360-510	
S235JO	1.0114	6-75	FN	0.17	0.17	0.17	-	1.40	0.030	0.030	0.012	0.55	235	225	215	215	360-510	
S275JR	1.0044	6-75	FN	0.21	0.21	0.22	-	1.50	0.035	0.035	0.012	0.55	275	265	255	245	410-560	
S275JO	1.0143	6-75	FN	0.18	0.18	0.18	-	1.50	0.030	0.030	0.012	0.55	275	265	255	245	410-560	
S275J2	1.0145	6-75	FF	0.18	0.18	0.18	-	1.50	0.025	0.025	-	0.55	275	265	255	245	410-560	
S355JR	1.0045	6-75	FN	0.24	0.24	0.24	0.55	1.60	0.035	0.035	0.012	0.55	355	345	335	325	470-630	
S355JO	1.0553	6-75	FN	0.20	0.20	0.22	0.55	1.60	0.030	0.030	0.012	0.55	355	345	335	325	470-630	
S355J2	1.0577	6-75	FF	0.20	0.20	0.22	0.55	1.60	0.025	0.025	-	0.55	355	345	335	325	470-630	
S355K2	1.0596	6-75	FF	0.20	0.20	0.22	0.55	1.60	0.025	0.025	-	0.55	355	345	335	325	470-630	

EN 10025-2 Non-Alloy Structural Steel							
Spec		Temp (°C)	Min. Energy (J)	Position of test piece	% Elongation after fracture		
Accord. EN10027-1 and CR10260	Accord. EN10027-2		t≤150		L _e =5.65√(S _n) Nominal thickness		
					6≤t≤40	40<t≤63	63< t ≤75
S235JR	1.0038	20	27	L T	≥26 ≥24	≥25 ≥23	≥24 ≥22
S235JO	1.0114	0	27				
S275JR	1.0044	20	27	L T	≥23 ≥21	≥22 ≥20	≥21 ≥19
S275JO	1.0143	0	27				
S275J2	1.0145	-20	27				
S355JR	1.0045	20	27	L T	≥22 ≥20	≥21 ≥19	≥20 ≥18
S355JO	1.0553	0	27				
S355J2	1.0577	-20	27				
S355K2	1.0596	-20	40				

EN 10025-3 Normalized/ Normalized rolled weldable fine grain structural steel																
Spec		Applicable Thickness (mm)	Chemical Composition (%)													
Accord. EN10027-1 and CR10260	Accord. EN10027-2		C	Si	Mn	P	S	Nb	V	Al total	Ti	Cr	Ni	Mo	N	Cu
S275N	1.0490	6-75	≤0.18	≤0.40	0.50-1.50	≤0.030	≤0.025	≤0.05	≤0.05	≥0.02	≤0.05	≤0.30	≤0.30	≤0.10	≤0.015	≤0.55
S275NL	1.0491	6-75	≤0.16	≤0.40	0.50-1.50	≤0.025	≤0.020	≤0.05	≤0.05	≥0.02	≤0.05	≤0.30	≤0.30	≤0.10	≤0.015	≤0.55
S355N	1.0545	6-75	≤0.20	≤0.50	0.90-1.65	≤0.030	≤0.025	≤0.05	≤0.12	≥0.02	≤0.05	≤0.03	≤0.50	≤0.10	≤0.015	≤0.55
S355NL	1.0546	6-75	≤0.18	≤0.50	0.90-1.65	≤0.025	≤0.020	≤0.05	≤0.12	≥0.02	≤0.05	≤0.03	≤0.50	≤0.10	≤0.015	≤0.55

EN 10025-3 Normalized/ Normalized rolled weldable fine grain structural steel																	
Spec		Min Yield Point (MPa)				Tensile Strength (MPa)	Min. % Elongation after fracture L _e =5.65√(S _o) Nominal thickness				Minimum value of impact energy (J) on longitudinal V-notch test pieces at test temperature in °C						
Accord. EN10027-1 and CR10260	Accord. EN10027-2	≤16	16<≤40	40<≤63	63<≤75		≤16	16<≤40	40<≤63	63<≤75	20	0	-10	-20	-30	-40	-50
S275N	1.0490	≥275	≥265	≥255	≥245	370-510	≥24	≥24	≥24	≥23	≥55	≥47	≥43	≥40	-	-	-
S275NL	1.0491	≥275	≥265	≥255	≥245	370-510	≥24	≥24	≥24	≥23	≥63	≥55	≥51	≥47	≥40	≥31	≥27
S355N	1.0545	≥355	≥345	≥335	≥325	470-630	≥22	≥22	≥22	≥21	≥55	≥47	≥43	≥40	-	-	-
S355NL	1.0546	≥355	≥345	≥335	≥325	470-630	≥22	≥22	≥22	≥21	≥63	≥55	≥51	≥47	≥40	≥31	≥27

EN 10025-4 Thermomechanical rolled weldable fine grain structural steel																		
Spec		Applicable Thickness (mm)	Chemical Composition (%)															
Accord. EN10027-1 and CR10260	Accord. EN10027-2		C	Si	Mn	P	S	Nb	V	Al total	Ti	Cr	Ni	Mo	N	Cu		
S275M	1.8818	10-65	≤0.13	≤0.50	≤1.50	≤0.030	≤0.025	≤0.05	≤0.08	≥0.02	≤0.05	≤0.30	≤0.30	≤0.10	≤0.015	≤0.55		
S275ML	1.8819	10-65	≤0.13	≤0.50	≤1.50	≤0.025	≤0.020	≤0.05	≤0.08	≥0.02	≤0.05	≤0.30	≤0.30	≤0.10	≤0.015	≤0.55		
S355M	1.8823	10-65	≤0.14	≤0.50	≤1.60	≤0.030	≤0.025	≤0.05	≤0.10	≥0.02	≤0.05	≤0.30	≤0.50	≤0.10	≤0.015	≤0.55		
S355ML	1.8834	10-65	≤0.14	≤0.50	≤1.60	≤0.025	≤0.020	≤0.05	≤0.10	≥0.02	≤0.05	≤0.30	≤0.50	≤0.10	≤0.015	≤0.55		
S420M*	1.8825	10-65	≤0.16	≤0.50	≤1.70	≤0.030	≤0.025	≤0.05	≤0.12	≥0.02	≤0.05	≤0.30	≤0.80	≤0.20	≤0.025	≤0.55		
S420ML*	1.8836	10-65	≤0.16	≤0.50	≤1.70	≤0.025	≤0.020	≤0.05	≤0.12	≥0.02	≤0.05	≤0.30	≤0.80	≤0.20	≤0.025	≤0.55		
S460M*	1.8827	10-65	≤0.16	≤0.60	≤1.70	≤0.030	≤0.025	≤0.05	≤0.12	≥0.02	≤0.05	≤0.30	≤0.80	≤0.20	≤0.025	≤0.55		
S460ML*	1.8838	10-65	≤0.16	≤0.60	≤1.70	≤0.025	≤0.020	≤0.05	≤0.12	≥0.02	≤0.05	≤0.30	≤0.80	≤0.20	≤0.025	≤0.55		

(*) Need further discussion for thickness above 40mm and below 15mm

EN 10025-4 Thermomechanical rolled weldable fine grain structural steel																
Spec		Yield Point (MPa)				Tensile Strength (MPa)			% Elongation after fracture L _o =5.65√(S _o) Nominal thickness	Minimum value of impact energy (J) on longitudinal V-notch test pieces at test temperature in °C						
Accord. EN10027-1 and CR10260	Accord. EN10027-2	≤16	16<≤40	40<≤63	63<≤65	≤40	40<≤63	63<≤65		+20	0	-10	-20	-30	-40	-50
S275M	1.8818	≥275	≥265	≥255	≥245	370-530	360-520	350-510	≥24	≥55	≥47	≥43	≥40	-	-	-
S275ML	1.8819	≥275	≥265	≥255	≥245	370-530	360-520	350-510	≥24	≥63	≥55	≥51	≥47	≥40	≥31	≥27
S355M	1.8823	≥355	≥345	≥335	≥325	470-630	450-610	440-600	≥22	≥55	≥47	≥43	≥40	-	-	-
S355ML	1.8834	≥355	≥345	≥335	≥325	470-630	450-610	440-600	≥22	≥63	≥55	≥51	≥47	≥40	≥31	≥27
S420M	1.8825	≥420	≥400	≥390	≥380	520-680	450-610	440-600	≥19	≥55	≥47	≥43	≥40	-	-	-
S420ML	1.8836	≥420	≥400	≥390	≥380	520-680	500-660	480-640	≥19	≥63	≥55	≥51	≥47	≥40	≥31	≥27
S460M	1.8827	≥460	≥440	≥430	≥410	540-720	530-710	510-690	≥17	≥55	≥47	≥43	≥40	-	-	-
S460ML	1.8838	≥460	≥440	≥430	≥410	540-720	530-710	510-690	≥17	≥63	≥55	≥51	≥47	≥40	≥31	≥27

EN 10225 Weldable structural steels for fixed offshore structures

Group	Steel Name	Steel Number	Chemical Composition (%)																	Applicable Thickness (mm)	Tensile Strength (MPa)	Yield Point (MPa)				Elongation on gauge length of 5.65√S ₀	Average Charpy V-notch impact energy	
			C	Si	Mn	P	S	Cr	Mo	Ni	Al total ^{a)}	Cu	N	Nb	Ti	V	Cr+Mo+Ni+Cu	Nb+V	Nb+V+Ti			≤16	16<≤25	25<≤40	40<≤60		Temp (°C)	Energy (J)
Cast Analysis ^{b)}																												
1	S355G2+N	1.8801+N	≤0.20	≤0.50	0.90-1.65	≤0.035	≤0.030	≤0.30	≤0.10	≤0.50	≥0.020	≤0.35	≤0.015	≤0.060	≤0.030	≤0.12	-	-	-	6-20	470-630	≥355	≥355	-	-	≥22	-20	-20
1	S355G3+N	1.8802+N	≤0.18	≤0.50	0.90-1.65	≤0.030	≤0.025	≤0.30	≤0.10	≤0.50	≥0.020	≤0.35	≤0.015	≤0.060	≤0.030	≤0.12	-	-	-	6-40	470-630	≥355	≥355	≥345	-	≥22	-40	-40
1	S355G5+M	1.8804+N	≤0.14	≤0.50	≤1.60	≤0.035	≤0.030	-	≤0.20	≤0.30	≥0.020	-	≤0.015	≤0.050	≤0.050	≤0.10	-	-	-	6-20	470-610	≥355	≥355	-	-	≥22	-20	-20
1	S355G6+M	1.8805+N	≤0.14	≤0.50	≤1.60	≤0.030	≤0.025	-	≤0.20	≤0.30	≥0.020	-	≤0.015	≤0.050	≤0.050	≤0.10	-	-	-	6-40	470-610	≥355	≥355	≥345	-	≥22	-40	-40
Cast and product analysis																												
2	S355G7+M ^c	1.8808+N	≤0.14	0.15-0.55	1.00-1.65	≤0.020	≤0.010	≤0.25	≤0.08	≤0.50	0.015-0.055	≤0.30	≤0.010	≤0.040	≤0.025	≤0.060	≤0.090	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
2	S355G7+N ^c	1.8808+N	≤0.14	0.15-0.55	1.00-1.65	≤0.020	≤0.010	≤0.25	≤0.08	≤0.50	0.015-0.055	≤0.30	≤0.010	≤0.040	≤0.025	≤0.060	≤0.090	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
3	S355G8+M ^c	1.8810+N	≤0.14	0.15-0.55	1.00-1.65	≤0.020	≤0.007	≤0.25	≤0.08	≤0.50	0.015-0.055	≤0.30	≤0.010	≤0.040	≤0.025	≤0.060	≤0.090	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
3	S355G8+N ^c	1.8810+N	≤0.14	0.15-0.55	1.00-1.65	≤0.020	≤0.007	≤0.25	≤0.08	≤0.50	0.015-0.055	≤0.30	≤0.010	≤0.040	≤0.025	≤0.060	≤0.090	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
2	S355G9+N ^c	1.8811+N	≤0.12	0.15-0.55	≤1.65	≤0.020	≤0.010	≤0.20	≤0.08 ^d	≤0.70 ^a	0.015-0.055	≤0.30	≤0.010	≤0.030	≤0.025	≤0.060	-	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
2	S355G9+M ^c	1.8811+N	≤0.12	0.15-0.55	≤1.65	≤0.020	≤0.010	≤0.20	≤0.08 ^d	≤0.70 ^a	0.015-0.055	≤0.30	≤0.010	≤0.030	≤0.025	≤0.060	-	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
3	S355G10+N ^c	1.8813+N	≤0.12	0.15-0.55	≤1.65	≤0.015	≤0.005	≤0.20	≤0.08 ^d	≤0.70 ^a	0.015-0.055	≤0.30	≤0.010	≤0.030	≤0.025	≤0.060	-	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40
3	S355G10+M ^c	1.8813+N	≤0.12	0.15-0.55	≤1.65	≤0.015	≤0.005	≤0.20	≤0.08 ^d	≤0.70 ^a	0.015-0.055	≤0.30	≤0.010	≤0.030	≤0.025	≤0.060	-	≤0.06	≤0.08	6-50 ^f	470-630	≥355	≥355	≥355	≥335	≥22	-40	-40

a) For product chemical composition variations see EN10225:2019 Table 17.

b) The total aluminium to nitrogen ratio shall be minimum of 2:1. When other nitrogen binding elements are used, the minimum Al value and Al/N-ratio does not apply.

c) The levels of the residual elements arsenic, antimony, tin, lead, bismuth and calcium shall not exceed 0.03% As, 0.010% Sb, 0.020%, 0.010% Bi, and 0.005% Ca. Boron (B) shall not exceed 0.0005%. These elements shall be checked at least once every 5000 tonnes at each manufacturing location and shall be reported as a cast analysis.

d) For thicknesses greater than 75mm, maximum Mo content of 0.20% shall apply for delivery condition +M.

e) For thicknesses greater than 40mm, the minimum Ni content shall be 0.30%.

f) Charpy V-notch mid-thickness verifications are also required for thicknesses over 40mm.

AS/NZS Plate

AS/NZS 3678:2016 Structural Steel – Hot-rolled plates, floorplates and slabs														
Grade Designation	Applicable Thickness (mm)	Chemical Composition (%)												
		C	Si	Mn	P	S ^b	Cr ^a	Ni ^a	Cu ^a	Mo ^a	Al ^b	Ti	Micro-alloying elements	Ceq ^g
250	6–75	≤0.22	≤0.50	≤1.70	≤0.040	≤0.030	≤0.25	≤0.30	≤0.40	≤0.08	≤0.100	≤0.040	e)	≤0.44
300	6–75	≤0.22	≤0.50	≤1.70	≤0.040	≤0.030	≤0.25	≤0.30	≤0.40	≤0.08	≤0.100	≤0.040	e)	≤0.44
350	6–75	≤0.22	≤0.50	≤1.70	≤0.040	≤0.030	≤0.25	≤0.30	≤0.40	≤0.08	≤0.100	≤0.040	f)	≤0.48
400	6–75	≤0.22	≤0.55	≤1.70	≤0.040	≤0.030	≤0.25	≤0.50	≤0.40	≤0.35	≤0.100	≤0.040	f)	≤0.48
450	6–50	≤0.22	≤0.55	≤1.80	≤0.040	≤0.030	≤0.25	≤0.50	≤0.60	≤0.35	≤0.100	≤0.040	f)	≤0.48

a) Boron shall not be intentionally added to the steel without the agreement of the purchaser.

b) For Z25 grades sulfur 0.008% maximum. Z35 grades sulfur 0.005% maximum.

c) Except for grades 450, 450Lxx, 450Yxx, a Cr + Ni + Cu + Mo = 1.00% maximum applies.

d) Limits specified are both acid soluble and total aluminium. Where grade is ordered as fine grained steelmaking practice the minimum limit T-Al: 0.20 shall be applied

e) Niobium: 0.020% maximum. Vanadium: 0.050% maximum. Nb + V: 0.06% maximum.

f) Vanadium: 0.10% maximum. Niobium: 0.06% maximum. Nb + V + Ti: 0.15% maximum.

g) Carbon equivalent (CE) is calculated from the following equation based on actual cast or product analysis:

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

AS/NZS Plate

AS/NZS 3678:2016 Structural Steel – Hot-rolled plates, floorplates and slabs										
Grade Designation	Yield Stress (MPa)						Tensile Strength (MPa)		% Elongation on a gauge length of 5.65/s ₀	
	6≤t≤8	8<t≤12	12<t≤20	20<t≤32	32<t≤50	50<t≤75	t≤20	20<t≤75	6<t≤20	20<t≤75
250	≥280	≥260	≥250	≥250	≥250	≥240	≥410	≥410	≥22	≥22
300	≥320	≥310	≥300	≥280	≥280	≥270	≥430	≥430	≥21	≥21
350	≥360	≥360	≥350	≥340	≥340	≥340	≥450	≥450	≥20	≥20
400	≥400	≥400	≥380	≥360	≥360	≥360	≥480	≥480	≥18	≥18
450	≥450	≥450	≥450	≥420	≥400	-	≥520	≥500	≥16	≥18

AS/NZS 3678:2016 Structural Steel – Hot-rolled plates, floorplates and slabs											
Grade Designation	Impact Designation	Applicable Thickness (mm)	Test Temp (°C)	Absorbed energy, J						Through Thickness Grade Designation	Reduction area (%)
				10mm x 10mm		10mm x 7.5mm		10mmx5mm			
				Average of 3 tests	Individual test	Average of 3 tests	Individual test	Average of 3 tests	Individual test		
250	L0	6-75 (ex.450: 6-50)	0	≥27	≥20	≥22	≥16	≥18	≥13	Z15 Z25 Z35	≥15 ≥25 ≥35
300	L15		-15								
350	L20		-20								
400	L40		-40								
450	Y20		-20	≥40	≥30	≥32	≥24	≥28	≥21		
	Y40	-40									
	S0	12-50	0	≥70	≥50	-	-	-	-		

IS Plate

IS 2062:2011 Hot Rolled Medium and High Tensile Structural Steel																	
Spec	Applicable Thickness (mm)		Chemical Composition (%) - Max					Ceq	Mechanical Properties					Bending Test		Impact Test	
									Yield Point (MPa)-Min.			Tensile Strength (MPa)	El (%)	Inside Radius			
									t<20	20≤t≤40	t>40			t≤25	t>25		
E250	A	6-75	0.23	0.40	1.50	0.045	0.045	0.42	≥250	≥240	≥230	≥410	≥23	2t	3t	-	-
	BR		0.22				0.41	RT								≥27	
	BO		0.22				0.41	0								≥27	
	C		0.20				0.39	-20								≥27	
E350	A	6-75	0.20	0.45	1.55	0.045	0.045	0.47	≥350	≥330	≥320	≥490	≥22	2t	-	-	-
	BR	0.045					0.47	RT								≥27	
	BO	0.045					0.47	0								≥27	
	C	0.040					0.45	-20								≥27	

SNI Plate

BjPS							
Thickness (mm)	% C	%Mn	% P	% S	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation (%)
6-25	≤0.25	≤1.60	≤0.04	≤0.03	≥245	400-510	≥17



STEEL PLATE FOR PIPELINE

API Plate

API-2W Steel Pipe for Offshore Structure (API-2W 5th Edition)

Spec	Chemical Composition (%) – Max																		
	C	Mn ^b	P	S	Si	Ni	Cr	Mo	Cu	Ti		Nb	N ^c	B	Al total ^d	CE		Pcm	
										N≤0.005	N≥0.005					ts40mm	40<ts60mm	ts40mm	40<ts60mm
												API-2W Grade 50	≤0.16	1.15-1.60	≤0.03	≤0.010	0.05-0.50	≤0.75	≤0.25

a) See API-2W Clause 5 for further detail of chemical requirements

b) Mn up to 1.65% (heat analysis) is permitted at the option of the material manufacturer.

c) Nitrogen may be 0.013% max., if Titanium is 0.01%–0.02%

d) May be substituted with Acid soluble with requirement 0.015%–0.055%.

API-2W Steel Pipe for Offshore Structure (API-2W 5th Edition)

Spec	Applicable Thickness (mm)	Tensile Test					Impact Test	
		Yield Strength (MPa)		Tensile Strength (MPa)	Elongation (%)		Temp (°C)	Avg. Energy (J)
		ts25	25<ts60mm		G=200mm	GL=50mm		
API-2W Grade 50	6–60	345–517	345–483	≥448	≥18	≥23	–40	≥30

Note:

Further discussion is needed prior placing order for thickness above 50mm.

API 5L Steel Pipe for Pipeline Transportation System (API 5L 46th edition) for Non-Sour Application

Spec	Applicable Thickness (mm)	Chemical Composition (%) – Max										Tensile Test			
		C ^a	Si	Mn ^b	P	S	V	Nb	Ti	Other	Ceq	Pcm	Yield Point (MPa)	Tensile Strength (MPa)	Max Yield Ratio
API-B PSL 1	6–50	0.26	–	1.20	0.030	0.030	b	b	b	b	–	–	245	415	–
API-X42 PSL 1	6–50	0.26	–	1.30	0.030	0.030	b	b	b	b	–	–	290	415	–
API-X46 PSL 1	6–50	0.26	–	1.40	0.030	0.030	b	b	b	b	–	–	320	435	–
API-X52 PSL 1	6–50	0.26	–	1.40	0.030	0.030	b	b	b	b	–	–	360	460	–
API-BR PSL 2	6–50	0.24	0.4	1.20	0.025	0.015	b	b	0.04	b	0.43	0.25	245–450	415–655	0.93
API-X42R PSL 2	6–50	0.24	0.4	1.20	0.025	0.015	0.06	0.05	0.04	b	0.43	0.25	290–495	415–655	0.93

$$A1 = C \frac{A_{50}}{U^b}$$

a) Need further discussion for other thickness

b) The chemical composition can be different from the list based on API 5L standard or customer requirement

API 5L Steel Pipe for Pipeline Transportation System (API 5L 46th edition) for Non-Sour Application

Spec	Applicable Thickness (mm)	Chemical Composition (%) – Max										Tensile Test			
		C ^a	Si	Mn ^b	P	S	V	Nb	Ti	Other	Ceq	Pcm	Yield Point (MPa)	Tensile Strength (MPa)	Max Yield Ratio
API-BM PSL 2	6–50	0.22	0.45	1.20	0.025	0.015	0.05	0.05	0.04	b	0.43	0.25	240–450	415–655	0.93
API-X42M PSL 2	6–50	0.22	0.45	1.40	0.025	0.015	0.05	0.05	0.05	b	0.43	0.25	290–495	415–655	0.93
API-X46M PSL 2	6–50	0.22	0.45	1.40	0.025	0.015	0.05	0.05	0.05	b	0.43	0.25	320–525	435–655	0.93
API-X52M PSL 2	6–50	0.22	0.45	1.40	0.025	0.015	b	b	b	b	0.43	0.25	360–530	460–760	0.93
API-X56M PSL 2	6–50	0.22	0.45	1.40	0.025	0.015	b	b	b	b	0.43	0.25	390–545	490–760	0.93
API-X60M PSL 2	10–50	0.12	0.45 ^b	1.60	0.025	0.015	b	b	b	b	0.43	0.25	415–565	520–760	0.93
API-X65M PSL 2	10–35	0.12	0.45 ^b	1.60	0.025	0.015	b	b	b	b	0.43	0.25	450–600	535–760	0.93
API-X70M PSL 2	10–25	0.12	0.45 ^b	1.70	0.025	0.015	b	b	b	b	0.43	0.25	485–635	570–760	0.93

$$A1 = C \frac{A_{50}}{U^b}$$

a) Need further discussion for other thickness

b) The chemical composition can be different from the list based on API 5L standard or customer requirement

API 5L Steel Pipe for Pipeline Transportation System (API 5L 46 th edition Annex J) for Offshore Application																
Spec	Applicable Thickness (mm)	Chemical Composition (%) – Max											Tensile Test			
		C ^a	Si	Mn ^b	P	S	V ^b	Nb ^b	Ti ^b	Other	Ceq	Pcm	Yield Point (MPa)	Tensile Strength (MPa)	Max Yield Ratio	Min. Elongation (%)
API-X42MO PSL 2	6-50	0.12	0.40	1.35	0.020	0.010	0.04	0.04	0.04	b	-	0.19	290-495	415-655	0.93	A1 = C ^A _U ^{2.2}
API-X46MO PSL 2	6-50	0.12	0.45	1.35	0.020	0.010	0.05	0.05	0.04	b	-	0.20	320-520	435-655	0.93	
API-X52MO PSL 2	6-50	0.12	0.45	1.65	0.020	0.010	0.05	0.05	0.04	b	-	0.20	360-525	460-760	0.93	
API-X56MO PSL 2	6-50	0.12	0.45	1.65	0.020	0.010	0.06	0.08	0.04	b	-	0.21	390-540	490-760	0.93	
API-X60MO PSL 2	10-50	0.12	0.45 ^b	1.65	0.020	0.010	0.08	0.08	0.06	b	-	0.21	415-565	520-760	0.93	
API-X65MO PSL 2	10-35	0.12	0.45 ^b	1.65	0.020	0.010	0.10	0.08	0.06	b	-	0.22	450-570	535-760	0.93	
API-X70MO PSL 2	10-25	0.12	0.45 ^b	1.75	0.020	0.010	0.10	0.08	0.06	b	-	0.22	485-605	570-760	0.93	

a) Need further discussion for other thickness

b) The chemical composition can be different from the list based on API 5L standard or customer requirement

$$A1 = C \frac{A}{U}^{0.2}$$



STEEL PLATE FOR PRESSURE VESSEL

ASTM Plate

ASTM A285 Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength									
Spec	Applicable Thickness (mm)	Chemical Composition (%) - Max				Mechanical Properties			
		C	Mn	P	S	Tensile Strength (MPa)	Yield Point (MPa)	Elongation (%)	
								200mm	50mm
A285C	6-50	0.28	0.90	0.025	0.025	380-515	≥205	≥23	≥27

ASTM A515 Pressure Vessel Plates, Carbon Steel, for Intermediate and Higher Temperature Service											
Spec	Applicable Thickness (mm)	Chemical Composition (%) - Max						Mechanical Properties			
		C		Si	Mn	P	S	Tensile Strength (MPa)	Yield Point (MPa)	Elongation (%)	
		≤25	25<≤50							G=200mm	GL=50mm
A515-60	6-50	0.24	0.27	0.15-0.40	0.90	0.025	0.025	415-550	≥220	≥21	≥25
A515-65	6-50	0.28	0.31	0.15-0.40	0.90	0.025	0.025	450-585	≥240	≥19	≥23
A515-70	6-50	0.31	0.33	0.15-0.40	1.20	0.025	0.025	485-620	≥260	≥17	≥21

Note:

Grade 60 with thickness 12.5mm or below, Mn is available in range of 0.85-1.25.

ASTM A516 Pressure Vessel Plates, Carbon Steel, for Moderate and Lower Temperature Service												
Spec	Applicable Thickness (mm)	Chemical Composition (%) - Max							Mechanical Properties			
		C		Si	Mn		P	S	Tensile Strength (MPa)	Yield Point (MPa)	Elongation (%)	
		≤12.5	12.5<≤40		≤12.5	12.5<t					G=200mm	GL=50mm
A516-55	6-40	0.18	0.20	0.15-0.40	0.60-0.90	0.60-1.20	0.025	0.025	380-515	≥205	≥23	≥27
A516-60	6-40	0.21	0.23	0.15-0.40	0.60-0.90	0.85-1.20	0.025	0.025	415-550	≥220	≥21	≥25
A516-65	6-40	0.24	0.26	0.15-0.40	0.85-1.20	0.85-1.20	0.025	0.025	450-585	≥240	≥19	≥23
A516-70	6-40	0.27	0.28	0.15-0.40	0.85-1.20	0.85-1.20	0.025	0.025	485-620	≥260	≥17	≥21

HOT ROLLED COIL PRODUCT

SNI Coil Product

Grade	Thickness (mm)	Width (mm)	% C	% Mn	% P	% S	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation (%)
BjPS			≤0.25	≤1.6	≤0.04	≤0.03	≥245	400-510	t ≥ 4.0 = 17 t < 4.0 = 21
BjPC			≤0.15	≤0.6	≤0.04	≤0.03		≥270	t ≥ 4.0 = 31 3.2 ≤ t < 4 = 31 t < 3.2 = 29
BjPD	1.4 - 16	600 - 1,650	≤0.1	≤0.5	≤0.04	≤0.03		≥270	t ≥ 4.0 = 39 3.2 ≤ t < 4 = 37 2.5 ≤ t < 3.2 = 35 2.0 ≤ t < 2.5 = 33 1.8 ≤ t < 2.0 = 32
BjPE			≤0.1	≤0.5	≤0.02	≤0.02		≥270	t ≥ 4.0 = 41 3.2 ≤ t < 4 = 39 2.5 ≤ t < 3.2 = 37 2.0 ≤ t < 2.5 = 35 1.8 ≤ t < 2.0 = 33

JIS Coil Product

JIS G3101-Rolled Steel for General Structure

Spec	Applicable Thickness (mm)	Chemical Composition (%)				Mechanical Properties				
		C	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)		Bend Test (In Radius)
								ts5	5<ts16	
SS400	1.4-16	-	-	≤0.05	≤0.05	≥245	400-510	≥21	≥17	1.5 thickness
SS490		-	-	≤0.05	≤0.05	≥285	490-610	≥19	≥15	2.0 thickness
SS540		≤0.30	≤1.60	≤0.04	≤0.04	≥400	≥540	≥16	≥13	2.0 thickness

JIS G3106-Rolled Steel for Welded Structure

Spec	Applicable Thickness (mm)	Chemical Composition (%)					Mechanical Properties					
		C	Si	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)		Impact Test	
									Thickness (mm)	%	Temp (°C)	Energy (J)
SM400	A	≤0.23	-	≥2.5xC	≤0.035	≤0.035	≥245	400-510	ts5 5<ts16	≥23 ≥18	-	-
	B	≤0.20	≤0.35	0.6-1.5							0	≥27
SM490	A	≤0.20							ts5 5<ts16	≥22 ≥17	-	-
	B	≤0.18	≤0.55	≤1.65	≤0.035	≤0.035	≥325	490-610			0	≥27
	YA								ts5 5<ts16	≥19 ≥15	-	-
	YB	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	≥365	490-610			0	≥27
SMS20	B								ts5 5<ts16	≥19 ≥15	0	≥27
	C	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	≥365	520-640			0	≥47
SM570		≤0.18	≤0.55	≤1.70	≤0.035	≤0.035	≥460	570-720	ts16	≥19	-5	≥47

JIS G3131-Hot-Rolled Mild Steel Plates, Sheets and Strip

Spec	Applicable Thickness (mm)	Chemical Composition (%)				Mechanical Properties								
		C	Mn	P	S	Tensile Strength (MPa)	Elongation (%)						Bend Test (In Radius)	
							1.2st<1.6	1.6st<2.0	2.0st<2.5	2.5st<3.2	3.2st<4.0	ts4.0	t<3.2	ts3.2
SPHC	1.4-16	≤0.12	≤0.60	≤0.045	≤0.035	≥270	≥27	≥29	≥29	≥29	≥31	≥31	Flat on itself	0.5 thickness
SPHD		≤0.10	≤0.45	≤0.035	≤0.035	≥270	≥30	≥32	≥33	≥35	≥37	≥39	-	-
SPHE		≤0.08	≤0.40	≤0.030	≤0.030	≥270	≥32	≥34	≥35	≥37	≥39	≥41	-	-
SPHF		≤0.08	≤0.35	≤0.025	≤0.025	≥270	≥37	≥38	≥39	≥39	≥40	≥42	-	-

JIS G3136-Rolled Steel for Building Structure

Types	Applicable Thickness (mm)	Chemical Composition (%)						Tensile Test						Impact Test	
		C	Si	Mn	P	Ceq	C	Pcm	Thick. (mm)	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)	YR(%) Max.	Temp (°C)	Energy (J)
SN400	A	≤0.24	-	-	≤0.05	≤0.05	-	-	6≤ts12	≥235	400-510	≥17	-	-	-
									12<ts16						
SN400	B	≤0.20	≤0.35	0.6-1.5	≤0.03	≤0.015	≤0.36	≤0.26	6≤ts12	≥235	400-510	≥18	≤80	0	≥27
									12<ts16						
SN490	B	≤0.18	0.55	≤1.65	≤0.03	≤0.015	≤0.44	≤0.29	6≤ts12	≥325	490-610	≥17	≤80	0	≥27
									12<ts16						

EN Coil Product

EN 10025-2 Non-Alloy Structural Steel													
Spec		Applicable Thickness (mm)	Method of de-oxidation	Chemical Composition (%)-Max							Minimum Yield Point (MPa)	Tensile Strength (MPa)	
Accord. EN10027-1 and CR10260	Accord. EN10027-2			C	Si	Mn	P	S	N	Cu		t < 3	3 ≤ t ≤ 16
S235JR	1.0038	1.4-16	FN	0.17	-	1.40	0.035	0.035	0.012	0.55	235	360-510	360-510
S235JO	1.0114		FN	0.17	-	1.40	0.030	0.030	0.012	0.55	235	360-510	360-510
S235J2	1.0117		FF	0.17	-	1.40	0.025	0.025	-	0.55	235	360-510	360-510
S275JR	1.0044		FN	0.21	-	1.50	0.035	0.035	0.012	0.55	275	430-580	410-560
S275JO	1.0143		FN	0.18	-	1.50	0.030	0.030	0.012	0.55	275	430-580	410-560
S275J2	1.0145		FF	0.18	-	1.50	0.025	0.025	-	0.55	275	430-580	410-560
S355JR	1.0045		FN	0.24	0.55	1.60	0.035	0.035	0.012	0.55	355	510-680	470-630
S355JO	1.0553		FN	0.20	0.55	1.60	0.030	0.030	0.012	0.55	355	510-680	470-630
S355J2	1.0577		FF	0.20	0.55	1.60	0.025	0.025	-	0.55	355	510-680	470-630
S355K2	1.0596		FF	0.20	0.55	1.60	0.025	0.025	-	0.55	355	510-680	470-630

EN 10025-2 Non-Alloy Structural Steel										
Spec		Temp (° C)	Min. Energy (J)	Position of test piece	% Elongation after fracture					
Accord. EN10027-1 and CR10260	Accord. EN10027-2				t≤150	L _o = 80mm				L _o =5.65√(S _o) Nominal thickness
						1.4 < t ≤ 1.5	1.5 < t ≤ 2	2 < t ≤ 2.5	2.5< t < 3	3 ≤ t ≤ 16
S235JR	1.0038	20	27	L T	≥18 ≥16	≥19 ≥17	≥20 ≥18	≥21 ≥19	≥26 ≥24	
S235JO	1.0114	0	27							
S235J2	1.0117	-20	27							
S275JR	1.0044	20	27	L T	≥16 ≥14	≥17 ≥15	≥18 ≥16	≥19 ≥17	≥23 ≥21	
S275JO	1.0143	0	27							
S275J2	1.0145	-20	27							
S355JR	1.0045	20	27	L T	≥15 ≥13	≥16 ≥14	≥17 ≥15	≥18 ≥16	≥22 ≥20	
S355JO	1.0553	0	27							
S355J2	1.0577	-20	27							
S355K2	1.0596	-20	40							

IS Coil Product*

IS 11513:2017 Hot Rolled Carbon Steel Strip for Cold Rolling Purpose						
Spec	Applicable Thickness (mm)	Applicable Width (mm)	Chemical Composition (%) - Max			
			C	Mn	P	S
CR0	1.4-16	600-1,650	0.35	4	0.05	0.045
CR1			0.15	1	0.08	0.04
CR2			0.12	0.5	0.04	0.035
CR3			0.1	0.45	0.03	0.03
CR4			0.08	0.45	0.03	0.03

(*) Certification process is on going

SIRIM Coil Product

MS 1705:2003 Hot Rolled Carbon Steel Strip and Sheet of Commercial and Drawing Quality														
Grade	Thickness (mm)	Width (mm)	% C	%Mn	% P	% S	% CEq	Tensile Strength (MPa)	Elongation (%)					
									1.4≤t<1.6	1.6≤t<2.0	2.0≤t<2.5	2.5≤t<3.2	3.2 ≤ t <4	t ≥ 4.0
SPHC	1.4 - 16	600 – 1,650	≤0.15	≤0.60	≤0.05	≤0.05	≤0.42	≥270	27	29	29	29	29	31
SPHD			≤0.10	≤0.50	≤0.04	≤0.04	≤0.42	≥270	27	30	32	33	35	37
SPHE			≤0.10	≤0.50	≤0.03	≤0.035	≤0.42	≥270	27	31	33	35	37	39

MS 1768:2004 Hot Rolled Carbon Steel Strip for Pipe and Tube															
Grade	Thickness (mm)	Width (mm)	% C	% Si	% Mn	% P	% S	Tensile Strength (MPa)	Elongation (%)				Bondability		
									1.4st<1.6	1.6st<3.0	3.0st<6.0	6.0st<13	Bending angle	Inside Radius	
														3.0 ≥ a	3.0<ts13
SPHT1	1.4 - 16	600 - 1,650	≤0.1	≤0.35	≤0.5	≤0.04	≤0.04	≥270	30	32	35	37	180°	Flat on itself	0.5e
SPHT2			≤0.18	≤0.35	≤0.6	≤0.04	≤0.04	≥340	25	27	30	32		1.0e	1.5e
SPHT3			≤0.25	≤0.35	0.3-0.9	≤0.04	≤0.04	≥410	20	22	25	27		1.5e	2.0e
SPHT4			≤0.3	≤0.35	0.3-1.0	≤0.04	≤0.04	≥490	15	18	20	22			

JIS G3101-Rolled Steel for General Structure										
Spec	Applicable Thickness (mm)	Chemical Composition (%) - Max				Mechanical Properties				
		C	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)		Bend Test (In Radius)
SS400	1.4-16	-	-	≤0.05	≤0.05	≥245	400-510	≥21	≥17	1.5 thickness
SS490		-	-	≤0.05	≤0.05	≥285	490-610	≥19	≥15	2.0 thickness
SS540		≤0.30	≤1.60	≤0.04	≤0.04	≥400	≥540	≥16	≥13	2.0 thickness

MS EN 10025-2 Non-Alloy Structural Steel													
Spec		Applicable Thickness (mm)	Method of de-oxidation	Chemical Composition (%) - Max							Minimum Yield Point (MPa)	Tensile Strength (MPa)	
Accord. EN10027-1 and CR10260	Accord. EN10027-2			C	Si	Mn	P	S	N	Cu		t < 3	3 ≤ t ≤ 16
S235JR	1.0038	1.4-16	FN	0.17	-	1.40	0.035	0.035	0.012	0.55	235	360-510	360-510
S235JO	1.0114		FN	0.17	-	1.40	0.030	0.030	0.012	0.55	235	360-510	360-510
S235J2	1.0117		FF	0.17	-	1.40	0.025	0.025	-	0.55	235	360-510	360-510
S275JR	1.0044		FN	0.21	-	1.50	0.035	0.035	0.012	0.55	275	430-580	410-560
S275JO	1.0143		FN	0.18	-	1.50	0.030	0.030	0.012	0.55	275	430-580	410-560
S275J2	1.0145		FF	0.18	-	1.50	0.025	0.025	-	0.55	275	430-580	410-560
S355JR	1.0045		FN	0.24	0.55	1.60	0.035	0.035	0.012	0.55	355	510-680	470-630
S355JO	1.0553		FN	0.20	0.55	1.60	0.030	0.030	0.012	0.55	355	510-680	470-630
S355J2	1.0577		FF	0.20	0.55	1.60	0.025	0.025	-	0.55	355	510-680	470-630
S355K2	1.0596		FF	0.20	0.55	1.60	0.025	0.025	-	0.55	355	510-680	470-630

MS EN 10025-2 Non-Alloy Structural Steel											
Spec		Temp (°C)	Min. Energy (J)	Position of test piece	% Elongation after fracture						
Accord. EN10027-1 and CR10260	Accord. EN10027-2				t≤150	L ₀ = 80mm				L ₀ =5.65√(S ₀) Nominal thickness	
						1.4 < t ≤ 1.5	1.5 < t ≤ 2	2 < t ≤ 2.5	2.5< t < 3	3 ≤ t ≤ 16	
S235JR	1.0038	20	27	L T	≥18 ≥16	≥19 ≥17	≥20 ≥18	≥21 ≥19	≥26 ≥24		
S235J2	1.0117	-20	27								
S275JR	1.0044	20	27		L T	≥16 ≥14	≥17 ≥15	≥18 ≥16	≥19 ≥17	≥23 ≥21	
S275J2	1.0145	-20	27								
S355JR	1.0045	20	27	L T		≥15 ≥13	≥16 ≥14	≥17 ≥15	≥18 ≥16	≥22 ≥20	
S355J2	1.0577	-20	27								
S355K2	1.0596	-20	40								

JIS G3116-Steel Sheet, Plates And Strip For Gas Cylinders											
Spec	Applicable Thickness (mm)	Chemical Composition (%)					Mechanical Properties				
		C	Si	Mn	P	S	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)	Bend Test (In Radius)	
										Bend Angle	Inside Radius
SG255	1.6 - 6	≤0.20	-	≥0.30	≤0.02	≤0.02	≥255	≥400	≥28	180°	1.0 thickness
SG295		≤0.20	≤0.35	≤1.00	≤0.02	≤0.02	≥295	≥440	≥26	180°	1.5 thickness

JIS G3113-Hot Rolled Steel Sheet For Automobile Structural Use																
Spec	Applicable Thickness (mm)	Chemical Composition (%)		Mechanical Properties												
				Yield Point (MPa)			Tensile Strength (MPa)	Elongation (%)						Bend Test (In Radius)		
		P	S					1.6 ≤ t < 2.0	2.0 ≤ t < 2.5	2.5 ≤ t < 3.15	3.15 ≤ t < 4.0	4.0 ≤ t < 6.3	6.3 ≤ t ≤ 14	Bend Angle	Inside Radius	
		t < 6.0	6.0 ≤ t < 8.0	8.0 ≤ t ≤ 14.0	1.6 ≤ t < 2.0	2.0 ≤ t < 2.5		2.5 ≤ t < 3.15	3.15 ≤ t < 4.0	4.0 ≤ t < 6.3	6.3 ≤ t ≤ 14	Bend Angle	t < 2.0	t ≥ 2.0		
SAPH 370	1.6 - 14	≤0.04	≤0.04	≥225	≥225	≥215	≥370	≥32	≥33	≥35	≥36	≥37	≥38	180°	0.5 thickness	1.0 thickness
SAPH 400		≤0.04	≤0.04	≥255	≥235	≥235	≥400	≥31	≥32	≥34	≥35	≥36	≥37	180°	1.0 thickness	1.0 thickness
SAPH 440		≤0.04	≤0.04	≥305	≥295	≥275	≥440	≥29	≥30	≥32	≥33	≥34	≥35	180°	1.0 thickness	1.5 thickness

ASTM A36 Carbon Structural Steel					
Spec	Applicable Thickness (mm)	Chemical Composition (%)			
		C	Mn	P	S
SAE1006	1.4 - 16	≤0.08	≤0.45	≤0.03	≤0.035
SAE1008		≤0.10	≤0.50	≤0.03	≤0.035
SAE1010		0.08-0.13	0.30-0.60	≤0.03	≤0.035
SAE1012		0.10-0.15	0.30-0.60	≤0.03	≤0.035
SAE1020		0.18-0.23	0.30-0.60	≤0.03	≤0.035

TIS Coil Product

TIS 1479-Rolled Steel for General Structure														
Spec	Applicable Thickness (mm)	Chemical Composition (%) - Max									Mechanical Properties			
		C	Mn	P	S	Cu	Ni	Cr	Mo	B	Yield Point (MPa)	Tensile Strength (MPa)	Elongation (%)	
													ts25	5<ts16
SS400	1.4-16	-	-	≤0.05	≤0.05						≥245	400-510	≥21	≥17
SS490		-	-	≤0.05	≤0.05	≤0.35	≤0.20	≤0.15	≤0.06	≥0.0008	≥285	490-610	≥19	≥15
SS540		≤0.30	≤1.60	≤0.04	≤0.04						≥400	≥540	≥16	≥13

TIS 1499-Rolled Steel for Welded Structure												
Spec	Applicable Thickness (mm)	Chemical Composition (%)					Mechanical Properties					
							Yield Point (MPa)	Tensile Strength (MPa)	Elongation		Impact Test	
		C	Si	Mn	P	S			Thickness (mm)	%	Temp (°C)	Energy (J)
SM400	A	≤0.23	-	≥2.5xC	≤0.035	≤0.035	≥245	400-510	t≤5	≥23	-	-
	B	≤0.20	≤0.35	0.6-1.5					5<t≤16	≥18	0	≥27
SM490	A	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	≥325	490-610	t≤5	≥22	-	-
	B	≤0.18							5<t≤16	≥17	0	≥27
	YA	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	≥365	490-610	t≤5	≥19	-	-
	YB								5<t≤16	≥15	0	≥27
SM520	B	≤0.20	≤0.55	≤1.65	≤0.035	≤0.035	≥365	520-640	t≤5	≥19	0	≥27
	C								5<t≤16	≥15	0	≥47
SM570		≤0.18	≤0.55	≤1.70	≤0.035	≤0.035	≥460	570-720	t≤16	≥19	-5	≥47

ASTM Coil Product

ASTM A36 Carbon Structural Steel											
Spec	Applicable Thickness (mm)	Chemical Composition (%)						Mechanical Properties			
		Thickness (mm)	C	Si	Mn	P	S	Yield Point (Mpa)	Tensile Strength (MPa)	Elongation (%)	
										GL = 200mm	GL = 50mm
A36	1.4-16	t≤16	≤0.25	≤0.40	-	≤0.030	≤0.030	≥250	400-550	≥20	≥23

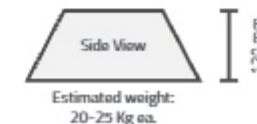
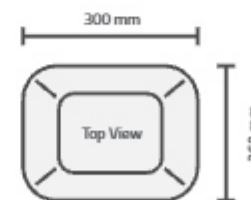
CAST IRON & PIG IRON PRODUCT

CAST IRON & PIG IRON

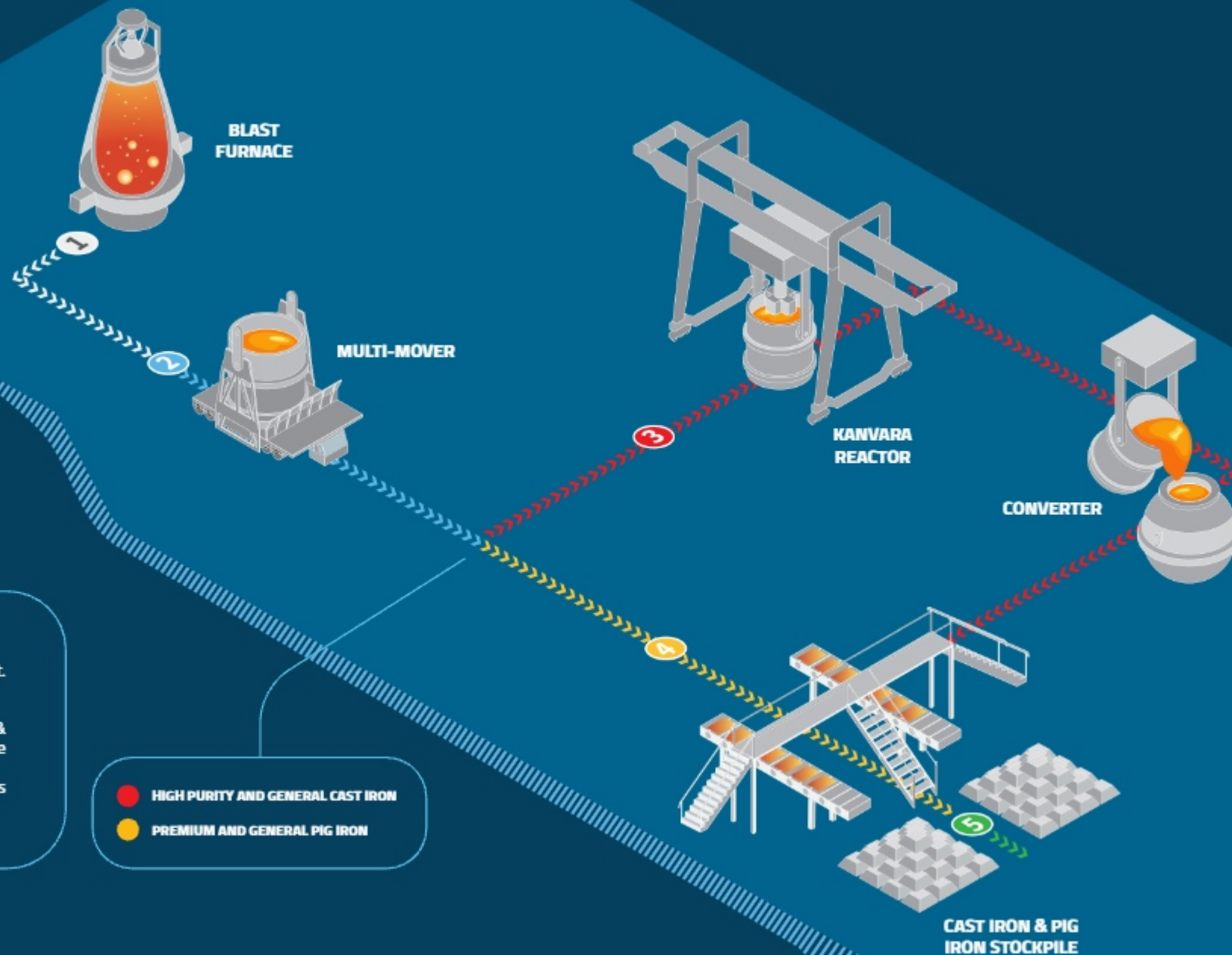
Grade	Specification	%C	%Si	%Mn	%P	%S	%Ti	%V	%Cr	Remark
High Purity Cast Iron	KP-DCC	≥3.50	0.50-1.20	≤0.25	≤0.100	≤0.050	≤0.065	≤0.080	≤0.030	Common Grade
	KP-DCH	≥3.50	0.50-1.20	≤0.15	≤0.050	≤0.030	≤0.020	≤0.020	≤0.030	High Purity Grade
	KP-DCU	≥3.50	0.50-1.20	≤0.06	≤0.030	≤0.020	≤0.020	≤0.020	≤0.030	Ultra Purity Grade
General Cast Iron	KP-F1A	≥3.40	1.40-1.80	0.20-0.90	≤0.200	≤0.050	≤0.100	-	≤0.030	-
	KP-F2A	≥3.40	1.81-2.20	0.30-0.90	≤0.200	≤0.050	≤0.100	-	≤0.030	
	KP-F3A	≥3.40	1.00-1.39	0.30-0.90	≤0.200	≤0.030	≤0.100	-	≤0.030	
	KP-F1B	≥3.40	1.80-2.60	≤0.30	≤0.200	≤0.050	≤0.100	-	≤0.030	
	KP-F2B	≥3.40	1.00-1.80	≤0.30	≤0.200	≤0.050	≤0.100	-	≤0.030	
	KP-F3B	≥3.40	0.50-0.99	≤0.30	≤0.090	≤0.030	≤0.065	-	≤0.030	
	KP-FBI	≥4.00	2.00-2.30	≤0.30	≤0.150	≤0.050	-	-	-	For Domestic market
Pig Iron	KP-PPI	≥4.00	≤1.00	≤0.30	≤0.150	≤0.020	-	-	-	Premium Pig Iron
	KP-GPI	≥4.00	≤1.00	≤0.30	≤0.150	≤0.050	-	-	-	

Note:

1. Size is fixed 300 x 260 x 120 mm
2. Immediate usage is recommended to prevent rust and scale during storage
3. Other chemical composition can be discussed



CAST IRON & PIG IRON PRODUCTION PROCESS



OUR CERTIFICATE

90 Product Testing
94 Certificate



PRODUCT TESTING

To ensure that only conforming products are delivered to customers, KRAKATAU POSCO uses the most advanced technology of steel product testing laboratories. KRAKATAU POSCO Laboratories are also accredited with ISO/IEC 17025:2017.



Management System

KRAKATAU posco



GLOBAL APPROVAL

KRAKATAU POSCO providing world class product quality to dedicate **Pride For Indonesia**

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National Standard Product Certification



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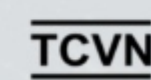
Europe



TIS Thailand



Malaysia



Vietnam



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MANAGEMENT SYSTEM CERTIFICATIONS



ISO 9001: 2015
CERTIFICATE



DOMESTIC COMPONENT
CERTIFICATE (PLATE)



SNI ISO/IEC 17025:2017
CERTIFICATE



AUTHORIZED ECONOMIC
OPERATOR (AEO)
CERTIFICATE



SNI ISO 14001:2015
CERTIFICATE



SNI ISO 45001:2018
CERTIFICATE

NATIONAL STANDARD PRODUCT APPROVALS CERTIFICATIONS



JAPAN STANDARD
(JIS)



MALAYSIAN STANDARD



EUROPEAN STANDARD
(CPR)



EUROPEAN STANDARD
(PED)



SHIPBUILDING
CERTIFICATE BV-FRANCE



SHIPBUILDING
CERTIFICATE KR



SHIPBUILDING
CERTIFICATE RINA



SHIPBUILDING
CERTIFICATE CR - TAIWAN



INDIAN STANDARD



SNI CERTIFICATE



THAILAND STANDARD



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CERTIFICATE ABS



SHIPBUILDING
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CERTIFICATE KR



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Empowering the People**

