

# BJCHI BJC HEAVY INDUSTRIES PCL.



GALVANIZING



GRATING



BUILT-UP BEAM



# BJC HEAVY INDUSTRIES PUBLIC COMPANY LIMITED

Embracing the corporate motto "New Force in Heavy Industries," BJCHI is unreservedly dedicated to shouldering the responsibility inherent in this declaration, aspiring to evolve into a world-class integrated engineering, procurement, fabrication, and modularization (SMP E&I) service provider.

Since its inception in 1994, BJCHI has exceeded global expectations and performed with excellence to every client's need. BJCHI's value has grown exponentially and has been recognized as an experienced and reliable manufacturer in various fields including pre-cast concrete services, galvanizing, grating, built-up beams and in many other fields.





## HISTORY



**1994**

Founded as BJC Industrial Company Limited, at Maptaphut, Rayong.



**2001**

Relocated to Nikompattana, Rayong and expanded capacity.

Began working with major overseas customers, including ITT S.p.A.



**2003**

Registered with BOI.

Certified ASME Stamp Holder - S, U, U2, and R.

**RIO TINTO**



**2006**

Commenced the Alcan Gove Calcinator Project in Australia about Fabrication and Modularization work.



**2008**

Commenced the Tenke Fungurume Mining Project in DR Congo for Large-Scale Site Erection services.



**2009**

Expanded business line to Pre - cast Concrete services.

Delivered the Air Liquide H<sub>2</sub> Plant Project at site in Singapore for site Erection Service.



**2011**

Certified ISO 14001:2004 (Environment Mgmt System).

Certified OHSAS 18001:2007 (Occupational Health and Safety Mgmt System).

**ORIGIN ENERGY**



**2012**

Commenced the APLNG Pre - Assembly Unit & Wellhead Separator Projects in Australia due to exceptional products and services widely recognized.



**2013**

Listed on the Stock Exchange of Thailand

Established the Galvanizing Shop and the Grating Shop to enhance production efficiency.



**2014**

Included in SET100 and MSCI Global Small Cap Indexes.

Commenced the Petrobras FPSO P75/P77 Modules Project in Brazil.

Certified ISO 14001 : 2004 for Galvanizing Shop.

Received the CSR Award for Excellence in Supporting the Disabled.

Established the Built-up Beam Shop for fabricating steel products.

**PETROBRAS**



**2015**

Commenced the FPSO Compression Modules Project (01B and 02B) with TUPI (Petrobras & Partners).

Enter into a service agreement with Bangkok Dock for using areas nearby Sattathip's deep sea port for modularization work.

**PETROBRAS**



**2016**

- Commenced the FPSO Compression Modules Project (03B) after successfully delivered The FPSO Compression Modules (01B and 02B) with excellent quality.
- Received ESG100 certificate from Thaipat Institute for its contribution to society, environment under good corporate governance framework.



**2017**

- Receive Best IR award for the group of listed companies with market capitalization between 3,000 - 10,000 million baht.
- Entered into Memorandum of Understanding (MOU) with SunSHIFT to execute Solar panel demonstration project in Australia.

**PETROBRAS**



**2018**

- Successfully delivered The FPSO Compression Modules ( 03B ) with TUPI BV.
- Commenced the UPGN Comperj of Kerui Método Construção e Montagem S.A in the oil and natural gas industry in Brazil.
- Successfully certified as a member of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC).

**OPHIR**



**2019**

- Successfully delivered Phase 4B BLWPC and Decks Fabrication and Transportation of Ophir Thailand (Bualuang) Limited.
- Commenced the CRISP' project largely engaging in Steel Fabrication and Modules Construction work in Oil and Petrochemical industry in Singapore.

**PETROBRAS**



**2020**

- Successfully delivered UPGN Comperj of Kerui Método Construção e Montagem S.A in the oil and natural gas industry in Brazil.
- Successfully delivered LINDE project in the gas industry in United States.
- Received 2020 Outstanding IR Award from SET Award 2020 in the group of listed companies with market capitalization between 3,000 - 10,000 million baht.

**RIO TINTO**



**2021**

- Successfully delivered Koodaideri project relating to steel fabrication and modularization in mining industry, located in Australia
- Successfully deliver OWMAN and MARLIM AZUL M501JAC Modular Package Skid project relating to steel fabrication in power plant industry, located in United States and Brazil
- Received Santos project relating to supply and fabrication of Wellhead Separator in gas industry, located in Australia

**EXXON MOBIL**



**2022 - 2023**

- Successfully resumed CRISP, the large-scale project in petrochemical industry, located in Singapore
- Successfully deliver GENESEE M501JAC Modular Package skid relating to steel fabrication in power plant industry located in Canada
- Continued receiving Santos project relating to supply and fabrication of Wellhead Separator in gas industry located in Australia



# INTERNATIONAL CERTIFICATIONS

BJCHI has certificates from well-known international institutions which are a testament to the Company's commitment and capabilities to deliver products and services of the highest quality.

## ISO AND OHSAS CERTIFICATES ACCREDITED BY TÜV NORD

- ISO 9001 :2015 (Quality Management System)
- ISO 14001:2015 (Environmental Management System)
- ISO 45001:2018 (Occupational Health and Safety Management System)



## CERTIFICATES FROM AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- Standards for "S", "U" and "U2" (boiler and pressure vessel)



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# 01

## **GALVANIZING SHOP**

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GALVANIZING STANDARD  
BENEFITS OF GALVANIZING  
GALVANIZING PROCESS  
MAJOR CLIENTS

# GALVANIZING SHOP

BJCHI has established a galvanizing facility distinguished as one of the largest in Thailand.

The strategic objective behind this initiative was to address the escalating demands for galvanizing services, both internally and externally. Since the facility's completion in 2013, BJCHI has adeptly fulfilled these demands.

In adherence to BJCHI's commitment to prioritizing the safety of its workforce and the surrounding environment, the Galvanizing Shop is equipped with an advanced air ventilation system designed to ensure optimal conditions for employees. Additionally, the facility strictly adheres to meticulous procedures for waste disposal, aiming to minimize adverse impacts on the surrounding ecosystem



## CAPACITY FACILITY AND ENVIRONMENT



### CAPACITY

**Capacity:**  
3,500 Tons / Month

**Kettle Size:**  
13(L) x 2(W) x 2.7(D) Meters

**Automatic Winch System:**  
6 units with control room

**Overhead cranes:**  
Crane : 10 Ton (2x)  
Crane : 6 Ton (2x)  
Crane : 3 Ton (1x)



### FACILITY

**Facility Area:**  
28,000 Square Meters

**Factory Area:**  
3,500 Square Meters

**Stockyard Area:**  
24,500 Square Meters



### ENVIRONMENT

**Bag filter system:**  
Fume zinc

**Wet scrubber:**  
3 Sets of fume scrubbers

**Waste storage tank:**  
240 cubic meters



# THE BENEFITS OF HOT DIP GALVANIZING

## Top 10 Benefits of Galvanized Steel:

### 1. Cost efficiency:

Galvanizing has a lower initial cost compared to other protective coatings, making it a cost-effective choice.

### 2. Minimal maintenance:

Galvanized steel requires less maintenance over time, resulting in the lowest long-term cost.

### 3. Longevity:

With a life expectancy exceeding 50 years in rural environments, galvanized coatings endure well in various conditions.

### 4. Reliability:

Galvanizing adheres to strict standards, ensuring predictable coating life and performance.

### 5. Durable coating:

The metallurgical structure of a galvanized coating provides exceptional resistance to mechanical damage.

### 6. Automatic protection for damage:

Galvanized coatings offer sacrificial protection to exposed steel, eliminating the need for touch-ups.

### 7. Comprehensive protection:

Galvanizing covers every part of an article, including recesses and sharp corners, providing unmatched protection.

### 8. Easy inspection:

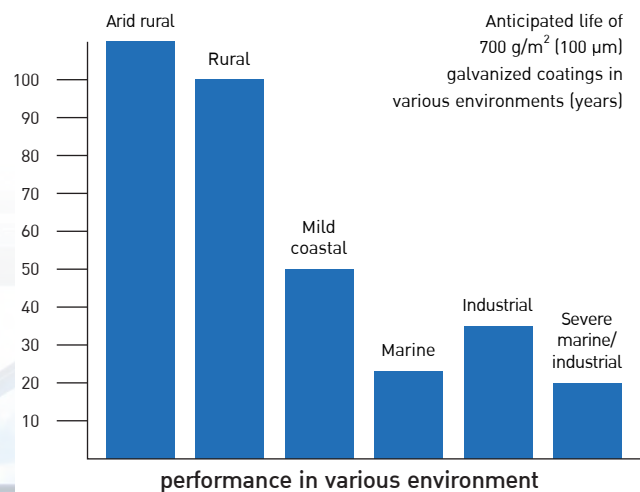
Galvanized coatings are easily assessed visually, and non-destructive testing methods can confirm their integrity.

### 9. Time efficiency:

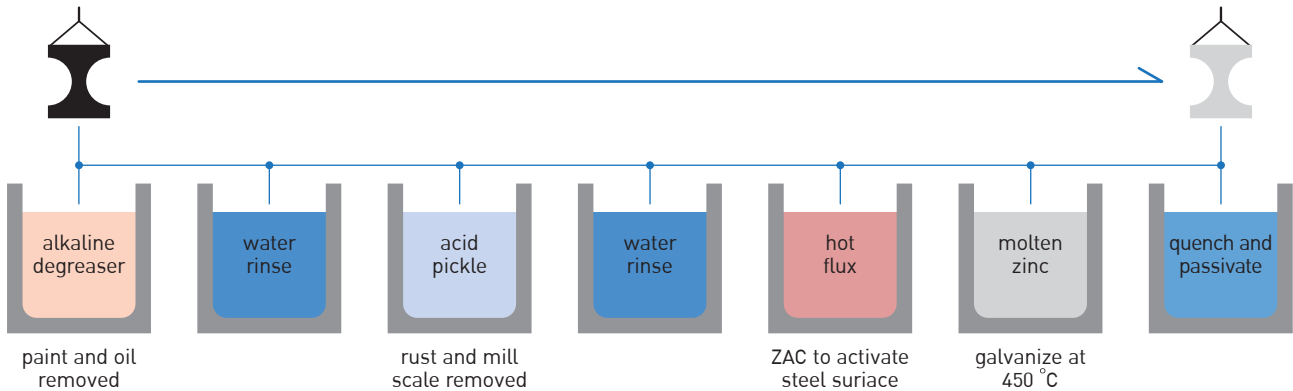
Galvanized steel is ready for use upon receipt, eliminating on-site surface preparation and inspection time.

### 10. Quick application:

A full protective coating can be applied in minutes, independent of weather conditions.



# HOT DIP GALVANIZING - PROCESS



Surface preparation is a pivotal phase in the hot-dip galvanizing process, as the metallurgical reaction between the molten zinc and clean steel surfaces is fundamental.

Proper preparation is imperative, as insufficient or inadequate measures can lead to uncoated areas. The process involves the following steps:

### DEGREASING:

Immersing steel in a hot alkaline cleaner solution at around 60°C, removing contaminants like dirt, oil, and grease.

Note: Certain coatings may require specialized removal methods like sand/grit blasting or solvents.

### WATER RINSE:

Thorough water rinsing after degreasing before entering the pickling acid stage

### PICKLING:

Using hydrochloric acid solutions to eliminate surface rust and mill scale, ensuring a clean metallic surface.

Note: Residence time in pickling acid varies based on steel condition.

### WATER RINSE:

Water rinsing after pickling to prevent acid carryover into prefluxing and remove any adherent iron salts.

### PREFLUXING:

Immersing acid-cleaned steel in a flux solution at 50-70°C to eliminate oxide film, preparing for galvanizing.

### GALVANIZING:

Immersing prepared items in molten zinc, forming zinc-iron alloy layers influenced by steel mass.

Standard minimum coating thickness is automatically applied, regardless of operator control.

Work remains in the bath until its temperature aligns with molten zinc, then withdrawn at a controlled rate to form the outer zinc coating.

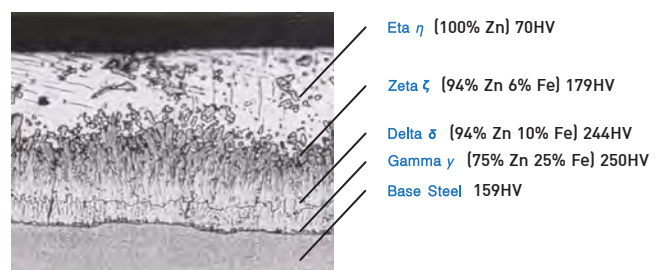
### FINISHING:

Withdrawing the galvanized item at a controlled rate and draining excess zinc.

Optional centrifuging or spinning for smaller items.

Quenching in a sodium dichromate solution to prevent zinc corrosion and remove ash particles, facilitating handling and finishing.

### METALLURGY OF GALVANIZING





# GALVANIZING STANDARD

we execute the orders to the relevant standards and specification :

American Standards	ASTM A 123/A 123M, A 153/A 153M
British Standards	BS 729
International Standards	BS EN ISO 1461
Australian Standards	AS1214, AS/NZS 4680
Japanese Standards	JIS H8641

## Coating Requirements

**Table 1.** Requirement for coating thickness conform to ASTM A 123M - 17

Steel Category (Not Centrifuged)	Minimum Average Coating Thickness (Micron)					
	Steel Thickness Under 1.60 mm.	Steel Thickness > 1.60 mm.	Steel Thickness 1.60 mm. To Under 3.20 mm.	Steel Thickness 3.20 mm. To 4.80 mm.	Steel Thickness > 4.80 mm.To Under 6.40 mm.	Steel Thickness 6.40 mm. To Under 16.00 mm.
Structural	45	65	75	75	100	100
Strip and Bar	45	65	75	75	75	100
Plate	45	65	75	75	75	100
Pipe and Tubing	45	45	75	75	75	75
Wire	35	50	60	65	80	80
Reinforcing Bar	-	-	-	-	100	100
Remark	The Table Value For Specimen Test					

**Table 2.** coating thickness GradeA

Coating Grade	mils	oz/ft <sup>2</sup>	um	g/m <sup>2</sup>
35	1.4	0.8	35	245
45	1.8	1.0	45	320
50	2.0	1.2	50	355
55	2.2	1.3	55	390
60	2.4	1.4	60	425
65	2.6	1.5	65	460
75	3.0	1.7	75	530
80	3.1	1.9	80	565
85	3.3	2.0	85	600
100	3.9	2.3	100	705

**Table 3.** Requirement for coating thickness on sample that are not centrifuged conform to BS EN ISO 1461

Article and its thickness	Local coating thickness (minimum) um (g/m <sup>2</sup> )	Mean coating thickness (minimum) um (g/m <sup>2</sup> )
Steel > 6 mm	70 (505)	85 (610)
Steel > 3 mm to ≤ 6 mm	55 (395)	70 (505)
Steel ≥ 1.5 mm to ≤ 3 mm	45 (325)	55 (395)
Steel < 1.5 mm	35 (250)	45 (325)
Casting ≥ 6 mm	70 (505)	80 (575)
Casting < 6 mm	60 (430)	70 (505)

Equivalent coating mass using a nominal coating density of 7.2 g/cm<sup>3</sup>

**Table 4.** Requirement for coating thickness conform to BS 729

Category	Minimum Average Coating Weight For Any Individual Test Area, g/m <sup>2</sup> (um)
Steel article which are not centrifuged	
5 mm. Thick and over	610 (85)
2 mm. To under 5 mm.	460 (64)
1 mm. To under 2 mm.	335 (47)
Grey and malleable iron casting	610 (85)
Thread work and other article which are centrifuged	305 (43)

Remark :

1 g/m<sup>2</sup> = 0.14 um (305 g/m<sup>2</sup> = 1 oz/ft<sup>2</sup> = 43 um)



# INSPECTION OF GALVANIZED PRODUCTS

## Appearance

Variations in appearance of galvanized coatings listed below and their influence on coating quality.

### Dull grey coating

General comment: Acceptable

A dull grey appearance is caused by usually occur on steels with relatively high silicon content which are highly reactive to molten zinc and thicker than the normal bright coatings and therefore give longer life.



### Rust stains

General comment: Acceptable when present as a surface stain.

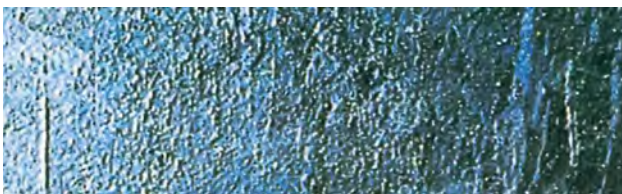
Rust staining on the surface of galvanized coatings is usually due to contact with or drainage from other corroded steel surfaces. Steel fillings or saw-chips produced during erection and fabrication



### General roughness

General comment: Acceptable unless otherwise agreed.

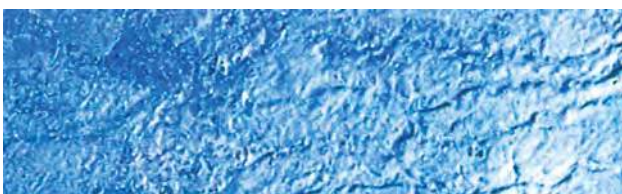
General roughness may also be caused by over-pickling, prolonged immersion in the galvanizing bath, or excessive bath temperature and may be beyond the control of the galvanizing.



### Lumpiness and runs

General comment: Acceptable unless otherwise specified.

Lumps and runs arising from uneven drainage and not detrimental to coating life.



### Pimples

General comment: May be grounds for rejection depending on size and extent.

Pimples are caused by inclusions of dross in the galvanized coating, Gross dross inclusions may be grounds for rejection as they tend to embrittle the coating.

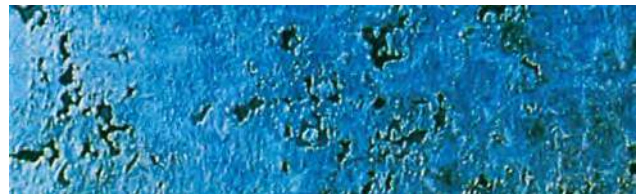


### Bare spots

General comment: Acceptable if small in area and suitably repaired, depending on the nature of the product.

Small localized flaws up to about 3mm. wide in a galvanized coating are usually self-healing

Bare spots may be caused by under-preparation including the presence of residual welding slags, rolling defects such as laps, folds and laminations in the steel, and non-metallic impurities rolled into the steel surface.



### Wet storage stain or bulky white deposit

General comment: Acceptable if non-adherent deposit is removed and the coating meets coating mass requirements.

A bulky white or grey deposit, known as wet storage stain may form on the surface of closely stacked freshly galvanized articles which become damp under poorly ventilated conditions during storage or transit



### Dark spots/Flux staining

General comments: Acceptable if flux residues have been removed.

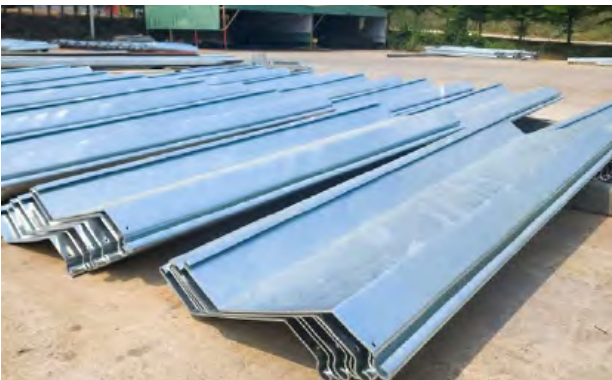
Dirt may form on the surface of the zinc coating, or from contact with other things. These stains are washed away immediately to reveal the coating and are intact.











## MAJOR CLIENTS





**GRATING SHOP**

02

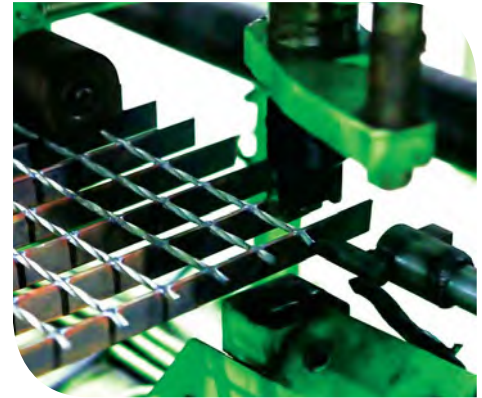
## GRATING SHOP

MATERIAL TYPE / GRADE  
STEEL GRATING PATTERNS  
SURFACE TYPES  
TYPE OF STAIR TREADS  
TREATMENT AND COLORS



## GRATING SHOP

BJCHI operates a highly reliable grating factory in Thailand, equipped with a complete set of forge welding and accessory tools. The annual capacity of 5,000 tons ensures the fulfillment of both internal and external grating demands. Ongoing investments have enhanced automation and expanded fabrication capabilities to accommodate a broader range of specifications.

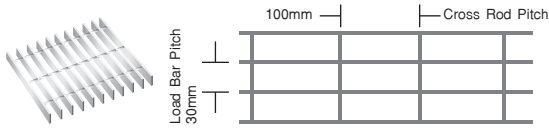


## MATERIAL TYPE / GRADE

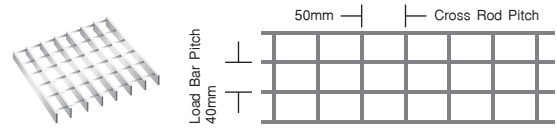
- ① **Mild Steel**  
Material grades ASTM A36 and Grade 250 or equivalent
- ② **Stainless Steel**  
ASTM A240-304, 316



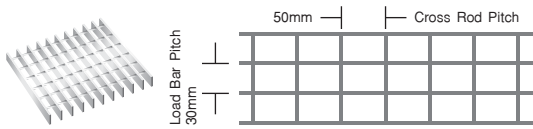
# STEEL GRATING PATTERNS



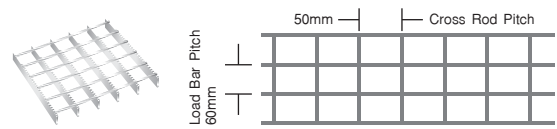
PATTERN A.



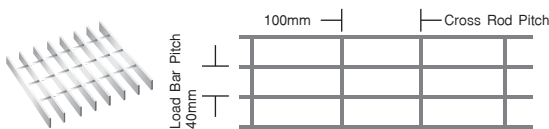
PATTERN D.



PATTERN B.

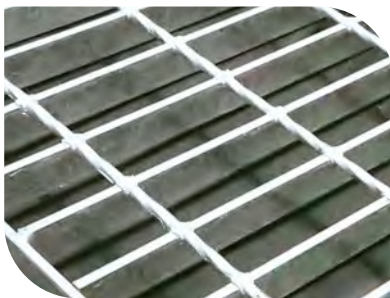


PATTERN E.

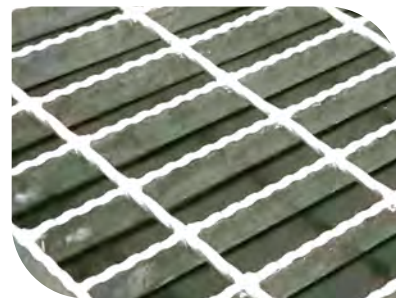


PATTERN C.

# SURFACE TYPES



Plain Surface



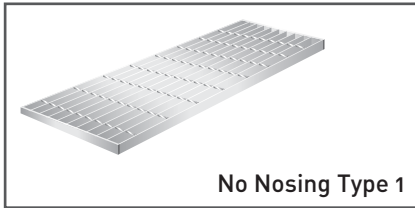
Serrated Surface

## Recommended Max. Span (mm)

Bearing Bar Size	25 x 5	32 x 5	40 x 5
A & B Pattern	900	1300	1600
C & D Pattern	750	1200	1500
E Pattern	500	800	-

## TYPE OF STAIR TREADS

BJCHI offers customizable stair tread gratings with the ability to manufacture various lengths and widths to meet specific requirements. Additionally, floor plate nosing and yellow abrasive nosing for extra grip can be produced as per customer specifications.



No Nosing Type 1

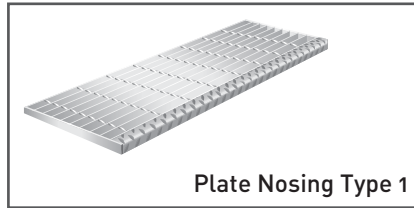
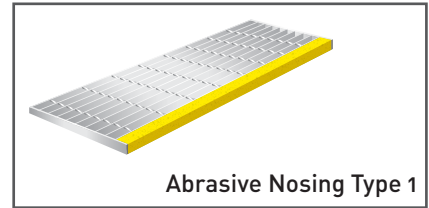
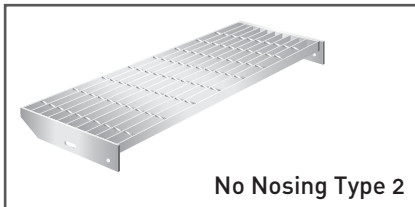


Plate Nosing Type 1



Abrasive Nosing Type 1



No Nosing Type 2

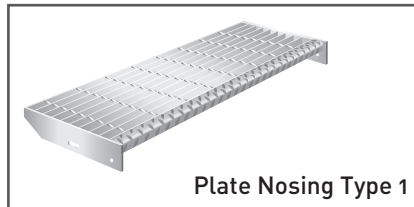
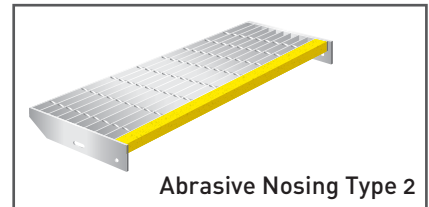
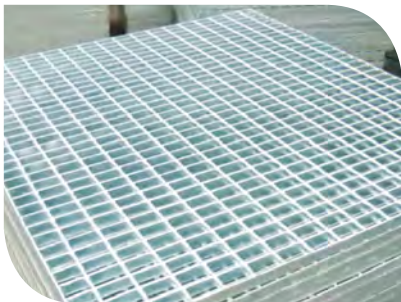


Plate Nosing Type 1



Abrasive Nosing Type 2

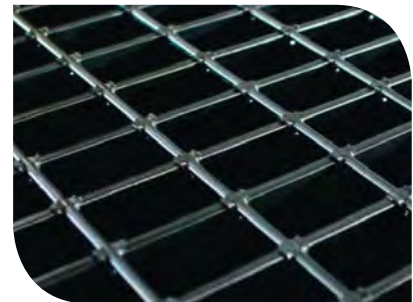
## TREATMENT AND COLORS



Galvanized



Painted



Black (Untreated)







# 03

## BUILT-UP BEAM SHOP

H-BEAM STANDARDS

MACHINERIES

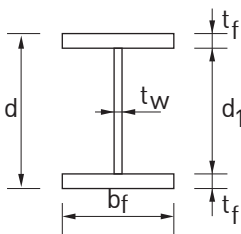
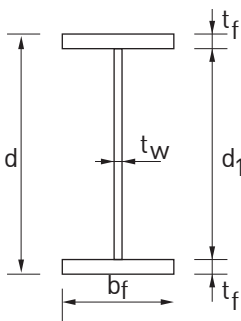
H-BEAM PRODUCTION PROCESS

# BUILT-UP BEAM SHOP

In 2014, BJCHI established a built-up beam shop to meet the growing demand for beams. The production line has an annual capacity of 25,000 tons and is equipped with highly automated machinery for plate cutting, T-Shape, and H-Shape assembly. The advanced technical capabilities of the built-up beam shop allow BJCHI to fabricate nearly all beam specifications required by clients.



## DIMENSIONS



Welded Beams									
Designation	Depth of Section	Flange		Web thickness	Dep Between flanges	Weld Size	Design Capacity Joint		
		Width	Thickness				300 PLUS	400 Grade	
	d	bf	tf	tw	d1	s	Øvwj	Øvwj	
	kg/m	mm	mm	mm	mm	mm	kN/mm	kN/mm	
1200WB	455	1200	500	40	16	1120	8	5.50	6.14
	423	1192	500	36	16	1120	8	5.50	6.14
	392	1184	500	32	16	1120	8	5.50	6.14
	342	1184	400	32	16	1120	8	5.50	6.14
	317	1176	400	28	16	1120	8	5.50	6.14
	278	1170	350	25	16	1120	8	5.50	6.14
1000WB	249	1170	275	25	16	1120	8	5.50	6.14
	322	1024	400	32	16	960	8	5.50	6.14
	296	1016	400	28	16	960	8	5.50	6.14
	258	1010	350	25	16	960	8	5.50	6.14
900WB	215	1000	300	20	16	960	8	5.50	6.14
	282	924	400	32	12	860	6	4.13	4.61
	257	916	400	28	12	860	6	4.13	4.61
	218	910	350	25	12	860	6	4.13	4.61
800WB	175	900	300	20	12	860	6	4.13	4.61
	192	816	300	28	10	760	6	3.44	3.84
	168	810	275	25	10	760	6	3.44	3.84
	146	800	275	20	10	760	6	3.44	3.84
700WB	122	792	250	16	10	760	6	3.44	3.84
	173	716	275	28	10	660	6	3.44	3.84
	150	710	250	25	10	660	6	3.44	3.84
	130	700	250	20	10	660	6	3.44	3.84
	115	692	250	16	10	660	6	3.44	3.84

Welded Columns									
Designation	Depth of Section	Flange		Web thickness	Dep Between flanges	Weld Size	Design Capacity Joint		
		Width	Thickness				300 PLUS	400 Grade	
	d	bf	tf	tw	d1	s	Øvwj	Øvwj	
	kg/m	mm	mm	mm	mm	mm	kN/mm	kN/mm	
500WC	440	480	500	40	40	400	8	5.50	6.14
	414	480	500	40	32	400	8	5.50	6.14
	383	472	500	36	32	400	8	5.50	6.14
	340	514	500	32	25	450	8	5.50	6.14
	290	506	500	28	20	450	8	5.50	6.14
	267	500	500	25	20	450	8	5.50	6.14
400WC	228	490	500	20	20	450	8	5.50	6.14
	361	430	400	40	40	350	8	5.50	6.14
	328	430	400	40	28	350	8	5.50	6.14
	303	422	400	36	28	350	8	5.50	6.14
	270	414	400	32	25	350	8	5.50	6.14
	212	400	400	25	20	350	8	5.5	6.14
300WC	181	390	400	20	20	350	8	5.5	6.14
	144	382	400	16	16	350	8	5.5	6.14
	280	355	350	40	28	275	8	5.50	6.14
	258	347	350	36	28	275	8	5.50	6.14
	230	339	350	32	25	275	8	5.50	6.14
	197	331	350	28	20	275	8	5.50	6.14



# MACHINERIES



Rounding Machine



Assembly Machine



Centering Machine



Turning Machine / Lifting Machine



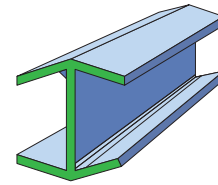
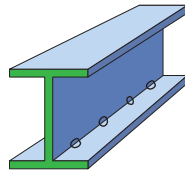
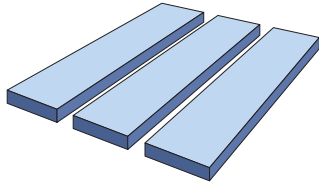
Mobile Turning Machine



Straightener



# H-BEAM PRODUCTION PROCESS



## Plate cutting

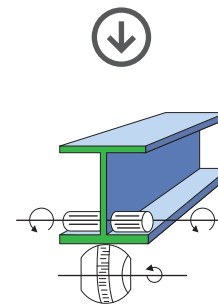
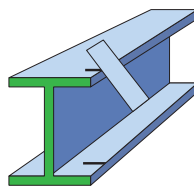
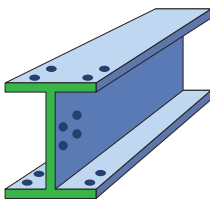
The steel plates are cut to weld 3 pieces before forming an H shape

## H-beam Assemble

Assembling and welding 3 plates to form an H shape

## H-Beam Welding

Turning the pre-welded H-beam to weld it completely around



## Hole Drilling

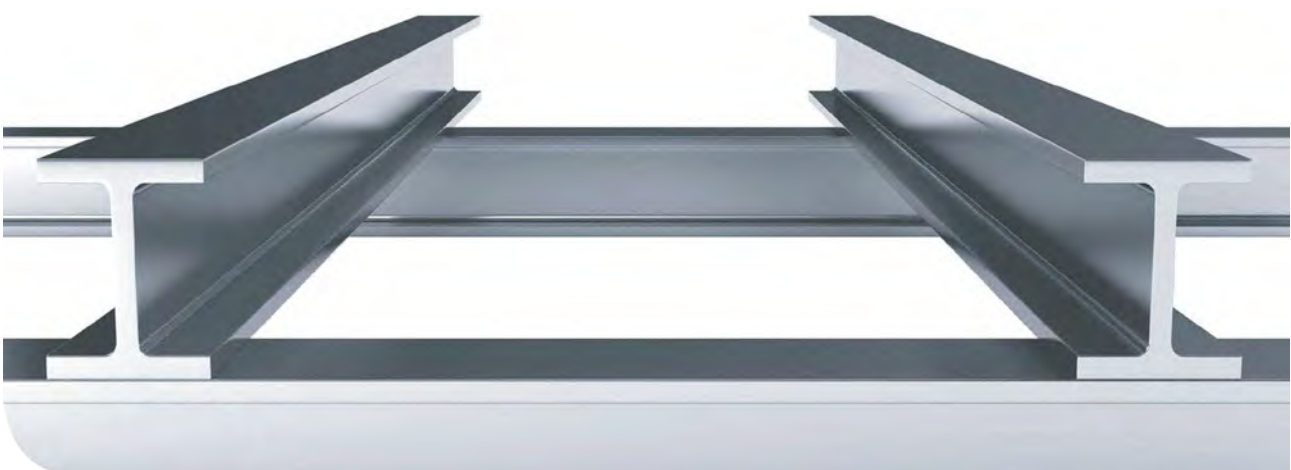
Drilling the holes into the H-beam.

## Edge Processing

Trimming off the excess edges of the H-beam.

## Straightening

Straightening the beam to verify alignment with specified material requirements





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