# JFE STEEL CORPORATION
# MAJOR BUILDING MATERIALS CATALOG

JFE Steel Corporation

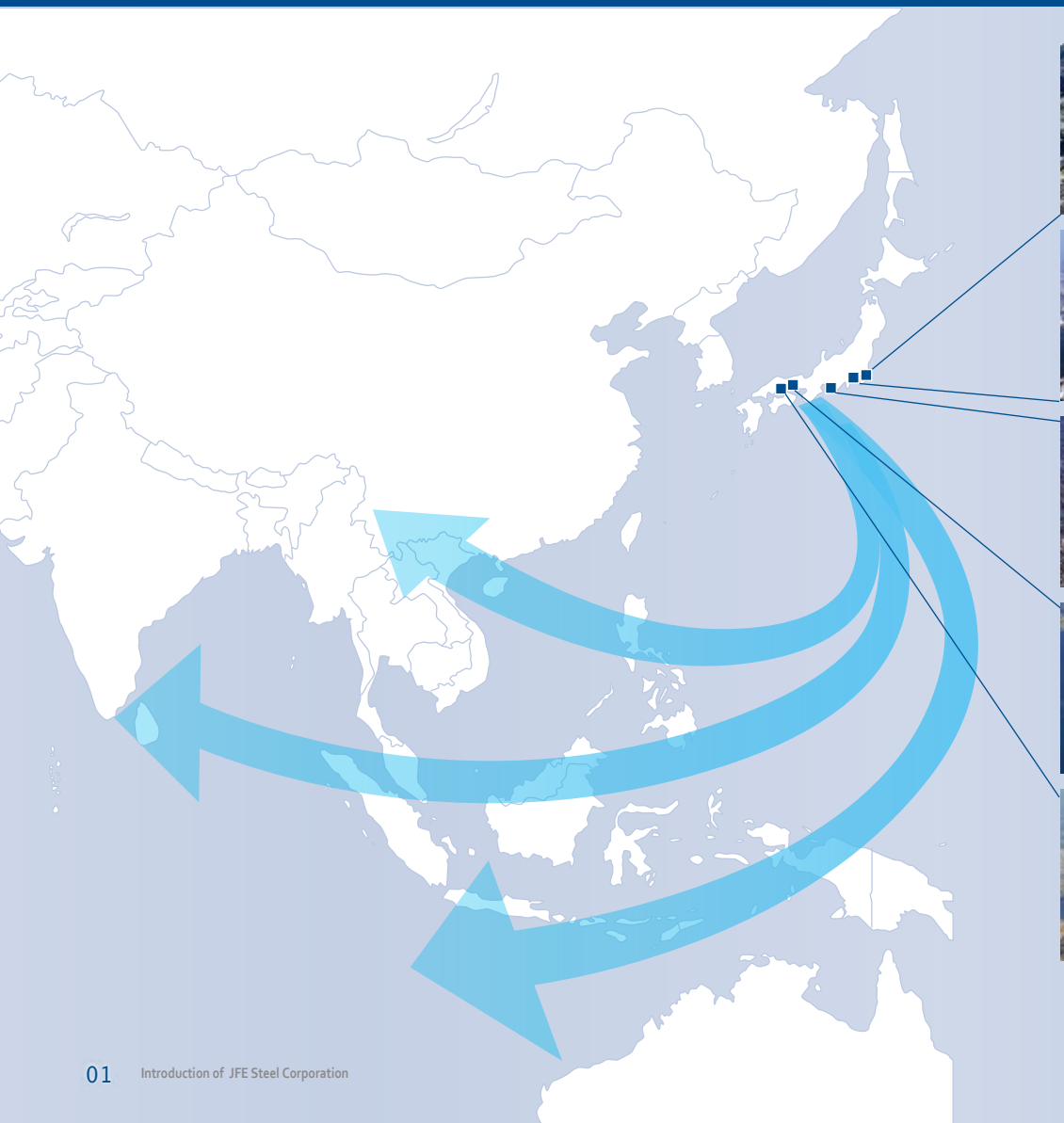
# Introduction of JFE Steel Corporation

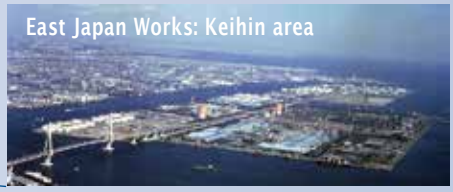
Throughout its history of more than 90 years, we at JFE Steel have done our utmost to meet customers' requirements. We are continuously improving our production equipment, expanding our product types and intensifying our quality control.

We at JFE Steel have established five of the world's most advanced plants in Japan to manufacture various products, meeting demand at home and abroad.

We always maintain the world's highest facility and technology level, and as such are highly trusted by our customers.

We hope that you will continue to choose JFE steels as your preferred products.

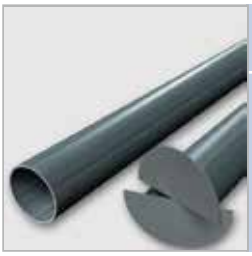





## Steel sheet piles

Steel sheet piles are widely used in river bulkheads, harbor quaywalls, earth retaining walls, and cut-off walls. In addition to U-shaped or one-piece molded corner steel sheet piles, we also manufacture heavy-duty-coated steel sheet piles for a marine environment.



## Steel pipe piles

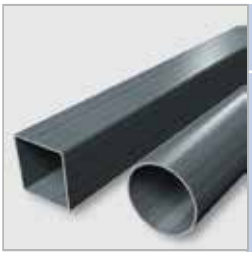
Steel pipe piles employing circular steel pipes and tubes play a valuable role as basic materials for civil engineering and construction due to their high strength and uniform quality. We also provide ingenious original piles.

## Steel pipe sheet piles

Steel pipe sheet piles, in which steel pipe piles are provided with joints, are employed to construct high-rigidity walls. Steel pipe sheet piles are widely used in revetments, breakwaters, and excavation earth retaining walls.

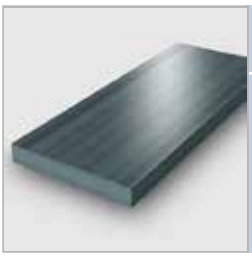
## H-shapes

In addition to a wide selection of geometries, H-shapes, which are widely used in structures from housing to high-rise buildings, long span structures and Steel Road Deck, feature excellent reliability and cost effectiveness.



## Circular/square steel pipes and tubes

In addition to our standard steel tubes and pipes, we also have tubes and pipes that ensure toughness values, low yield ratio, and yield point range and feature excellent aseismicity and weldability.



## Plates

We have worked hard to develop construction materials in response to social needs such as changes in the construction environment, advanced aseismicity requirements, construction cost reductions, and consideration to the environment, thus offering a wide variety of products.

# STEEL SHEET PILES

## 1 Wide variety

In addition to JIS-compliant U-shaped steel sheet piles, we have corner steel sheet piles and heavy-duty-coated steel sheet piles for use in a marine environment (marine coat steel sheet piles) in a wide variety of types and sizes.

## 2 Excellent work efficiency

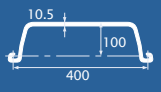
The joints of steel sheet piles have a sufficient margin of flexibility when combined together to ensure excellent interchangeability and workability.

## Product

### 400mm-width

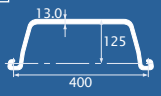
**JFESP-2**

Length
Max : 19m
Min : 2m



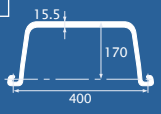

**JFESP-3**

Length
Max : 19m
Min : 2m




**JFESP-4**

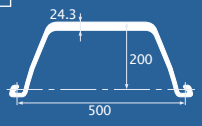
Length
Max : 19m
Min : 2m




### 500mm-width

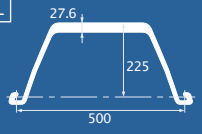
**JFESP-5L**

Length
Max : 19m
Min : 2m




**JFESP-6L**

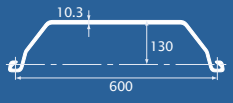
Length
Max : 19m
Min : 2m




### 600mm-width

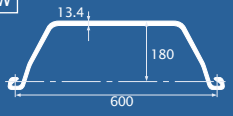
**JFESP-2W**

Length
Max : 16m
Min : 2m



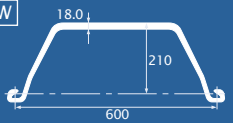

**JFESP-3W**

Length
Max : 19m
Min : 2m




**JFESP-4W**

Length
Max : 19m
Min : 2m




### Marine coat steel sheet pile
(Heavy-duty-coated steel sheet pile)

Heavy-duty-coated steel pipe sheet piles with a urethane elastomer coating that behave extremely well under corrosive conditions such as marine environments.

### J-pocket pile

New steel vertical cut-off walls for use in final disposal sites of controlled waste, featuring a pocket (having a diameter in the order of 10 mm) formed by rolling at the bottom face of the claw.

## Application

**Permanent structures**

- Revetment • Quay wall
- Retaining walls (permanent)
- Breakwater

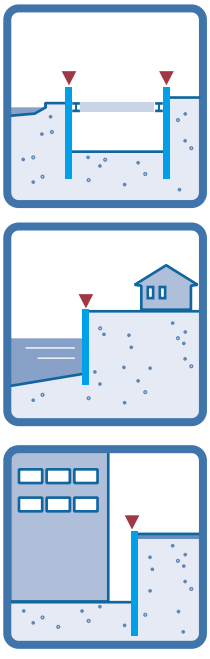
→ Earth retaining

- Scour prevention
- Reinforcement of dikes
- Countermeasures against liquefaction

→ Reinforcing

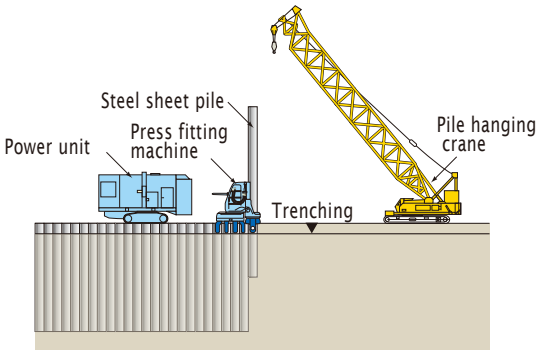
**Temporary structures**

- Retaining walls (temporary)
- Cutoff wall / Closure

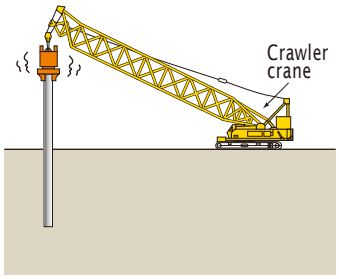


## Construction method

### Press-fit method

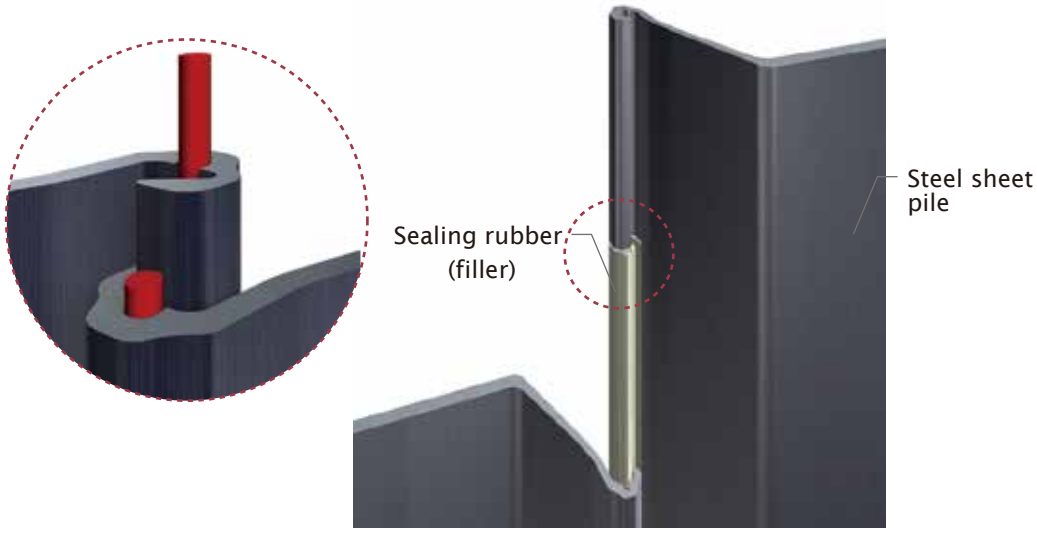



### Vibro method

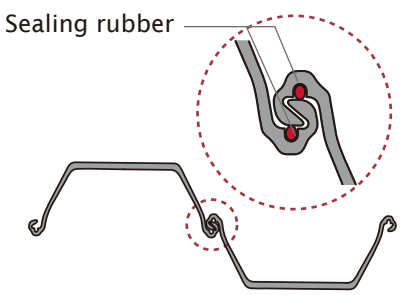



## J-pocket pile

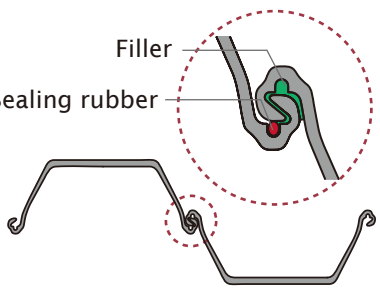
J-pocket piles (JPP) are new steel vertical cut-off walls designed for use in final disposal sites of controlled waste. The piles feature a pocket (having a diameter in the order of 10 mm) formed by rolling at the bottom face of the claw of conventional steel sheet piles. This allows impermeable materials to be installed, filler materials to be injected and monitoring pipes to be set.




### Sealing rubber method



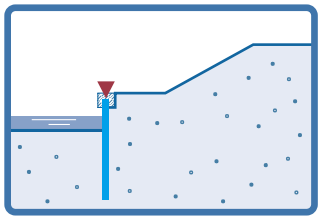

### Filling method



# STEEL SHEET PILES

## Revetment works

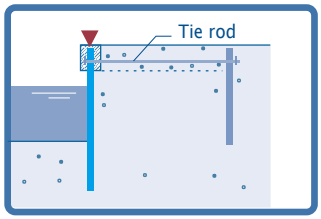
### Self-sustaining type

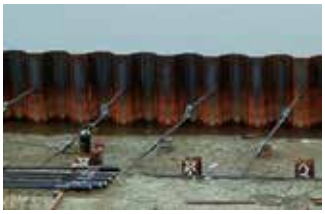


The retaining method using steel sheet piles comes in two types — a self-sustaining type and a tie rod type.

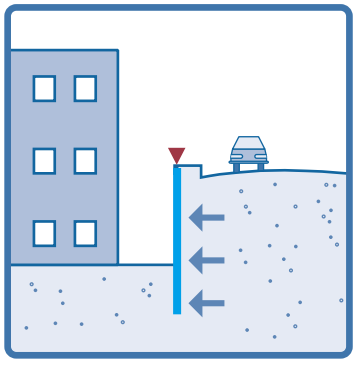
The tie rod type can withstand a larger horizontal force.

### Tie rod type



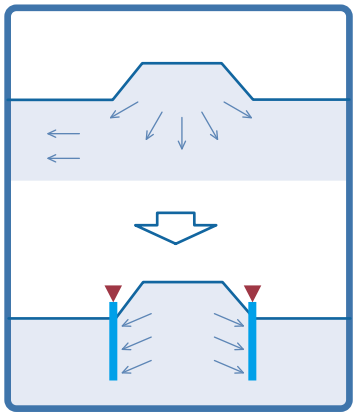



## Walls for road construction



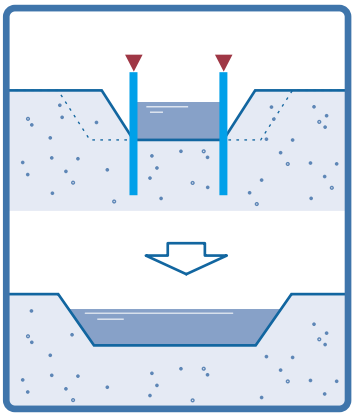
Used when the surrounding ground is lower than the road surface. By placing concrete and finishing the surface after setting steel sheet piles, it is possible to quickly construct walls with an excellent landscape.

## Embankment and reinforcing work



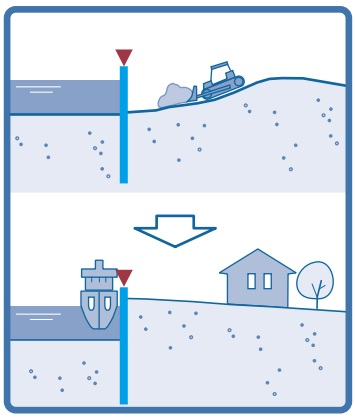
Using steel sheet piles as a countermeasure to the settling of an embankment due to its own weight can provide effective reinforcement.

## River improvement works



Used in river widening works in river improvement works.
It is possible to construct hypothetical cut-off walls with steel sheet piles and remove them after the works are completed.
The steel sheet piles can be reused after disposal.

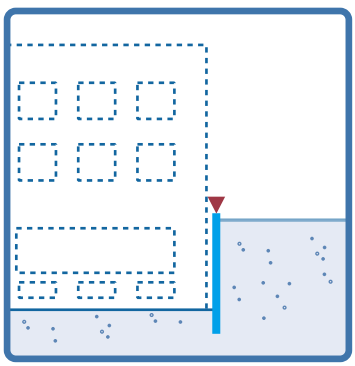
## Cut-off wall



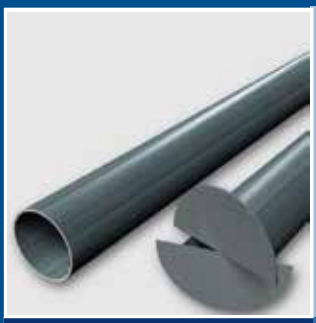
The cut-off walls using steel sheet piles have an embedded structure. As such, they are highly adaptable to flimsy ground and allow for the construction of cut-off walls from an economical standpoint.

## Earth retaining works

Extensive product lineup allows for a wide range of applications depending on the digging depth and ground conditions.



# STEEL PIPE PILES



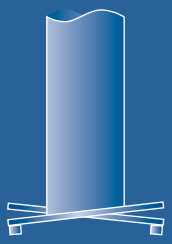
## 1 Large bearing capacity

Capable of withstanding a large striking force and reaching a solid bearing stratum, thus yielding a large bearing capacity.

## 2 Large bending strength

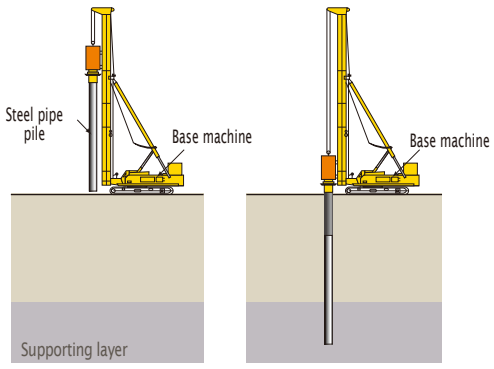
High horizontal resistance can be expected due to large section rigidity and bending strength.
High ductility and deformation performance can properly ensure the safety of a structure during an earthquake.

## Product

| Steel pipe piles | Tsubasa pile | KING construction method pile | Super KING construction method pile | Marine coat steel pipe piles | NF pile/SL pile |
|---|---|---|---|---|---|
|  |  |  |  |  (Heavy-duty-coated steel pipe piles) |  (Measures against negative friction) |
| Pile driving method vibration construction method | Rotation penetration pile method | Inner excavation pile construction method | Steel pipe pile enlarged head foot protection method | Pile driving method vibration construction method | Pile driving method vibration construction method |
| • Good track record in construction. | • Large bearing capacity yielded by end wing (1.5–2.0 times the pile diameter).<br>• No soil is wasted.<br>• Application of enlarged pile head type is possible. | • Low vibration and low noise.<br>• Less displaced soil at construction. | • Large bearing capacity yielded by enlarged foot protection bulb (1.5 times the pile diameter) | • Heavy-duty-coated steel pipe piles with covering of polyethylene or urethane elastomer<br>• Functions extremely well under corrosive conditions such as marine environments | • Steel pipe piles coated with special asphalt on their surface.<br>• Largely decreasing negative friction associated with ground subsidence. |

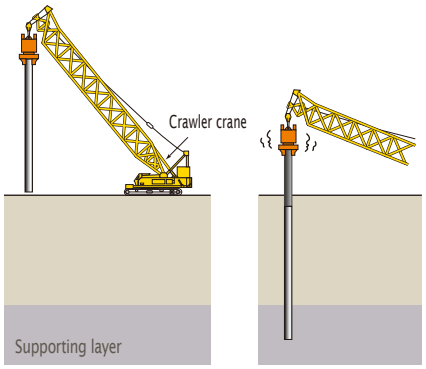
## Construction method

### Steel pipe pile driving method




1 Driving of lower pile
2 Checking pile core for verticality.
3 Driving penetration
4 Penetration into supporting layer

### Steel pipe pile vibration construction method

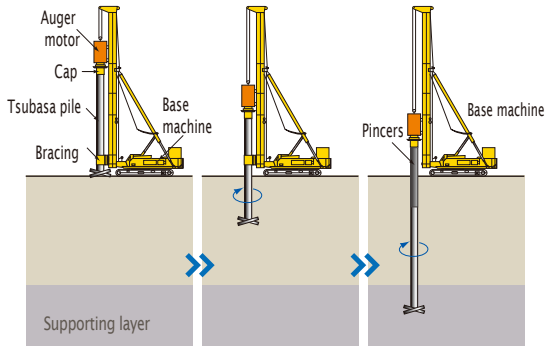



1 Driving of lower pile
2 Checking pile core for verticality.
3 Vibration penetration
4 Penetration into supporting layer

# Construction method

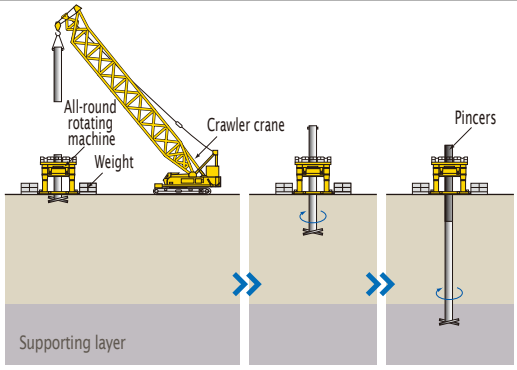
## Tsubasa pile construction method

### Three-point pile driver
(steel tubes and pipes having a diameter of 318.5-600 mm)



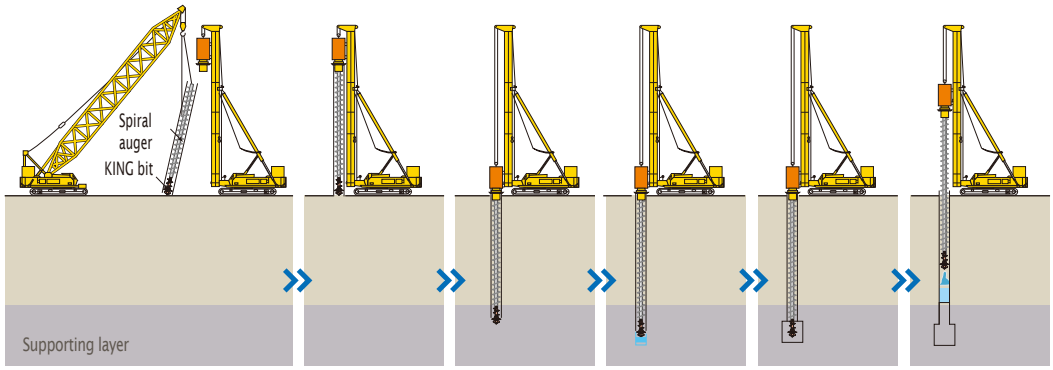

1 Driving of lower pile
2 Checking pile core for verticality.
3 Rotation penetration
4 Penetration into supporting layer

### All-round rotating machine
(steel tubes and pipes having a diameter of 500-1200 mm)



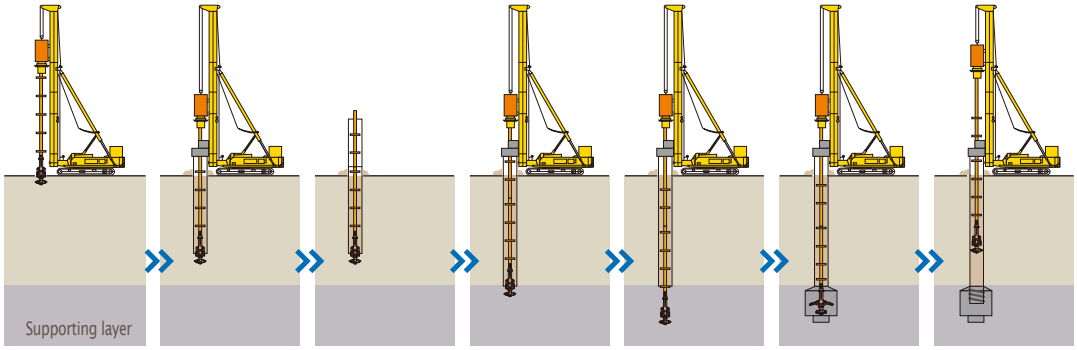

1 Driving of lower pile
2 Checking pile core for verticality.
3 Rotation penetration
4 Penetration into supporting layer

## King construction method




1 Insertion of spiral auger attached with KING bit into pile
2 Connection of spiral auger to running gear and construction of lower pile
3 Drilling down of pile to a predetermined depth while digging and removing soil
4 Changing to water excavation. Prior excavation
5 Excavation and repetitive agitation mixing while spreading the head and injecting cement milk
6 Pulling up spiral auger while pouring water after press fitting pile end to bulb

## Super King construction method

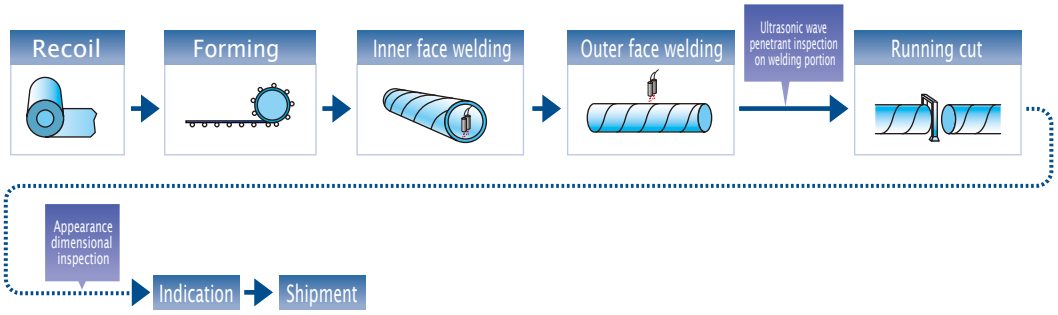



1 Driving lower pile and setting pile core
2 Excavation and agitation. Drilling down lower pile.
3 Driving upper pile. Joint construction
4 Excavation and agitation. Drilling down upper pile
5 Wind spreading
6 Construction of enlarged foot protection bulb
7 Anchoring of pile

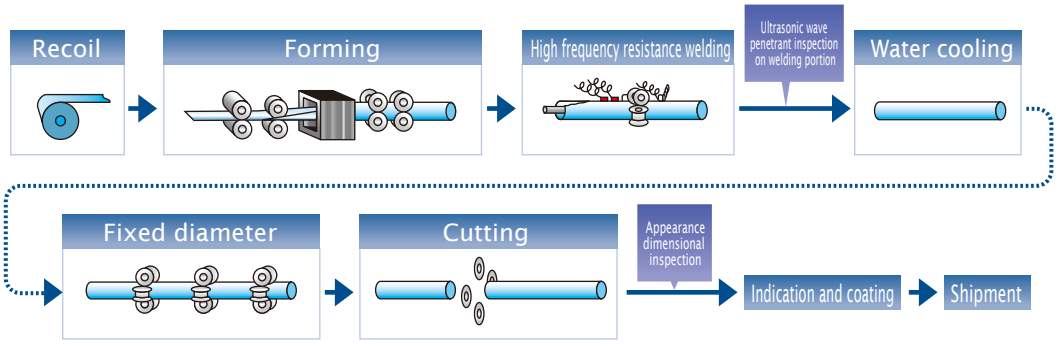
# STEEL PIPE PILES

## Steel tubes and pipes manufacturing method

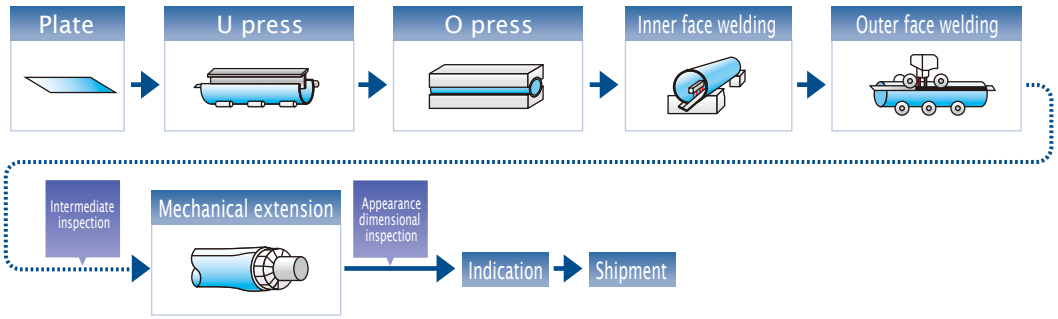
### Spiral steel tubes and pipes



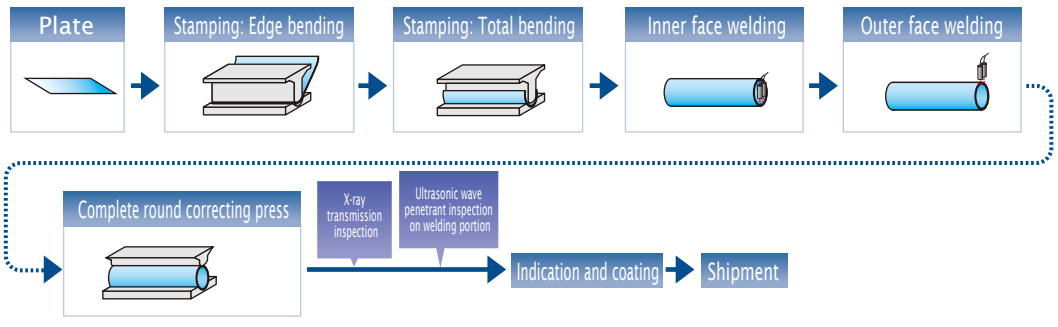

### Medium-diameter seam welded steel tubes and pipes

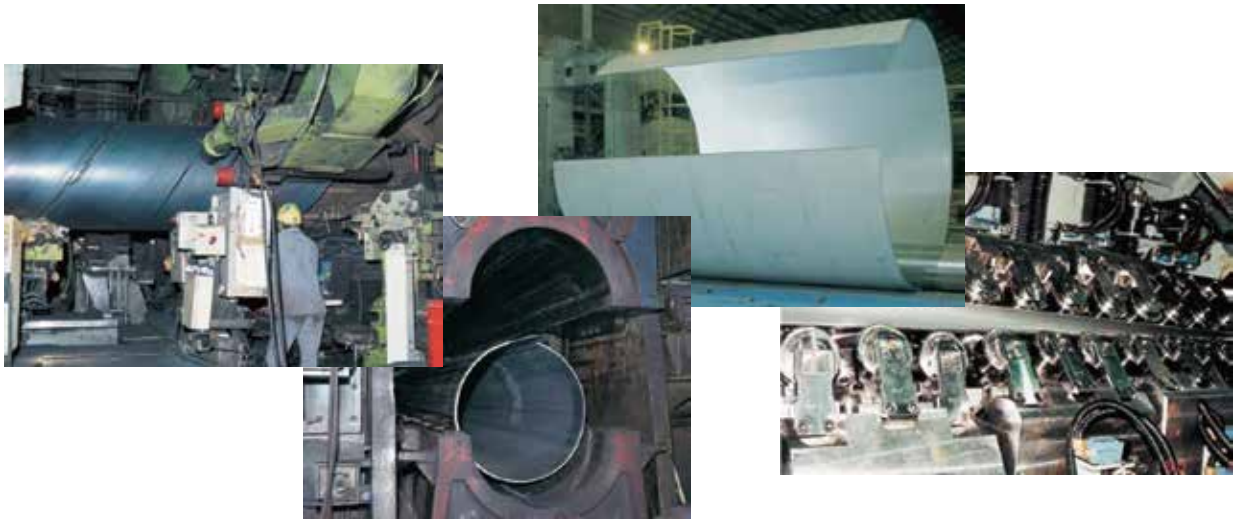



### UOE steel tubes and pipes



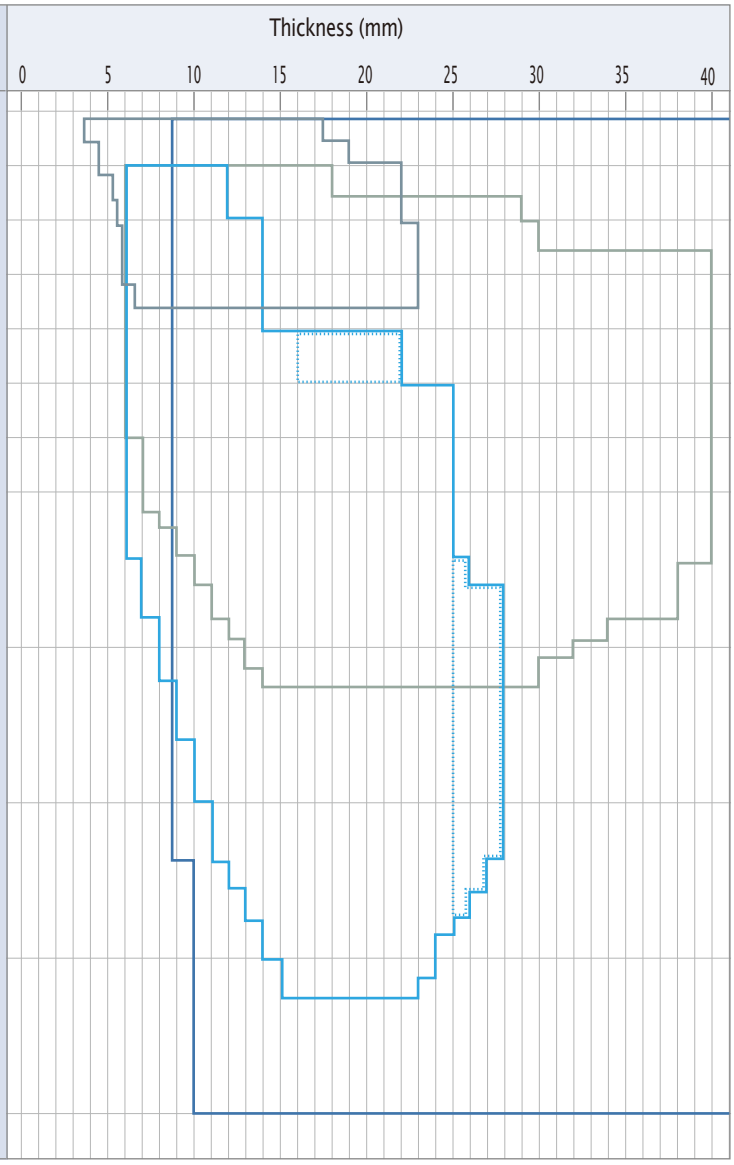

### Large diameter bending steel tubes and pipes





## Manufacturable range of steel tubes and pipes

| Nominal diameter A | Nominal diameter B | Outer diameter (mm) |
|---|---|---|
| 300 – | 12 – | 300 318.5 |
| 350 – | 14 – | 355.6 |
| 400 – | 16 – | 400 406.4 |
| 450 – | 18 – | 450.0 |
| 500 – | 20 – | 457.2 500 508.0 |
| 550 – | 22 – | 550.0 |
| | | 600 609.6 |
| 650 – | 26 – | 660.4 |
| | | 700 |
| 800 – | 32 – | 800 |
| | | 900 |
| 1,000 – | 40 – | 1,000 1050.0 |
| 1,050 – | 42 – | 1100.0 |
| | 48 – | 1200.0 1219.2 |
| | 52 – | 1300.0 |
| | 56 – | 1400.0 1473.2 |
| 1,500 – | 60 – | 1,500 1524.0 1574.8 |
| | 64 – | 1600.0 1625.6 |
| | 70 – | 1800.0 |
| | 80 – | 2,000 |
| | | 2200.0 |
| | | 2300.0 |
| | | 2400.0 1450.0 |
| | | 2,500 2550.0 2600.0 |
| | | 3,000 |




Spiral steel tubes and pipes
Medium-diameter seam welded steel tubes and pipes
UOE steel tubes and pipes
Large diameter bending steel tubes and pipes

※ Contact us in advance for the range of the dotted-line area.

# STEEL PIPE SHEET PILES

## 1 Large rigidity and bearing capacity

Behaving as an integral foundation and thus yielding larger rigidity and bearing capacity compared with a pile foundation.

## 2 Doubling as temporary cofferdam

Doubling as temporary cofferdam with the advantages shown on the right

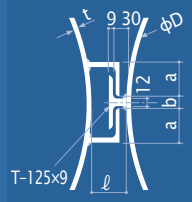
(1) Possible to shorten construction period and reduce construction cost.
(2) Improved safety during construction.
(3) Neighboring construction is possible due to small space occupied

## Product

### L-T type

Steel pipe outer diameter
Max : 1.7m Min : 0.5m

Joint




L-65×65×8 type
a : 65 b : 30
$\ell = 76 + \sqrt{\left(\frac{D}{2}\right)^2 - 80^2} - \frac{D}{2}$

L-75×75×9type
a : 75 b : 30
$\ell = 85.5 + \sqrt{\left(\frac{D}{2}\right)^2 - 90^2} - \frac{D}{2}$

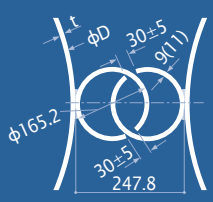
L-100×75×10type
a : 75 b : 35or30※
$\ell = 110 + \sqrt{\left(\frac{D}{2}\right)^2 - 90^2} - \frac{D}{2}$

* Determined with welding specification

### P-P type

Steel pipe outer diameter
Max : 1.7m Min : 0.5m

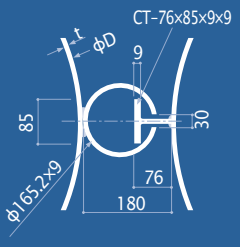
Joint




### P-T type

Steel pipe outer diameter
Max : 1.7m Min : 0.5m

Joint




### Marine coat steel pipe sheet pile
(heavy-duty-coated steel sheet pile)

Heavy-duty-coated steel pipe sheet piles with a urethane elastomer coating that behave extremely well under corrosive conditions such as marine environments.

## Application

Steel pipe sheet piles, in which steel pipe piles are provided with joints, are employed to construct high-rigidity walls.
Widely used in harbor facilities (quaywalls, revetments, breakwaters), urban civil engineering (earthretaining and cofferdams) and bridges (steel pipe sheet pile foundations). Large rigidity and excellent work efficiency allow for rational designing.

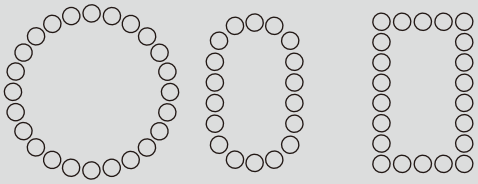
Harbor facilities (quaywalls, revetments, breakwaters)

Bridges (steel pipe sheet pile foundations)

# Steel pipe sheet pile foundation

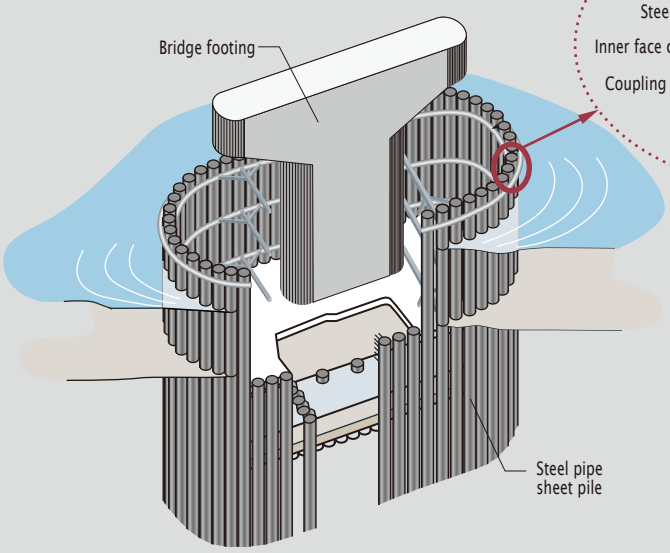
## Steel pipe sheet pile caisson foundation

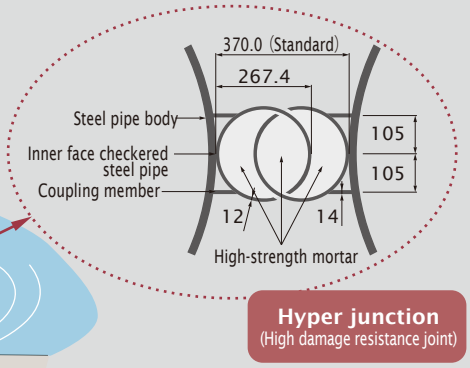
In a steel pipe sheet pile caisson foundation, steel pipe sheet piles having P-P type joints are driven into the supporting layer. They are then arranged in a planar fashion in an enclosed form such as a circular, rectangle, or oval shape. Filling the joint pipes of the steel pipe sheet piles with mortar and providing their heads with rigid connection by means of footing allow a group of steel pipe sheet piles to behave as an integral foundation. This type of foundation is employed with many long-span bridges and large structures.




## Hyper-Well SP

Hyper-Well SP is a construction method developed to meet the needs for greatly reducing costs in constructing large-scale bridge foundations. The conventional steel pipe sheet pile foundation construction method is effectively combined with elemental technologies such as high damage resistance joints (hyper junctions), steel pipe concrete composite members, and cast-in-place piles. This results in improved rigidity and bearing capacity of the foundation.

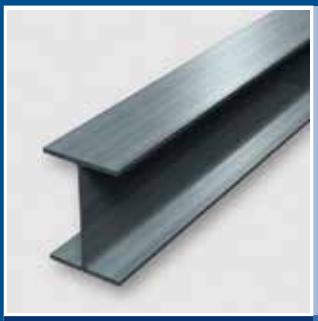



**Hyper junction**
(High damage resistance joint)

This method has been jointly developed by JFE Steel Corporation, Shimizu Corporation, and Obayashi Corporation.

# SECTION SHAPE STEEL



### 1 Structural steels excellent in reliability and cost efficiency

Steels excellent in reliability and cost efficiency backed up by abundant experience and results

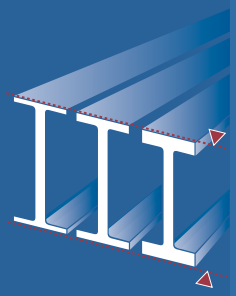
### 2 Wide selection of sizes

We offer many different types and sizes of fixed outer dimension H-shapes, Heavy Wide Flange H-Shapes, highly intensified material: TMCPH-shapes, J-grip H and stripe H as well as standard products.

## Product

**JIS H-shapes**

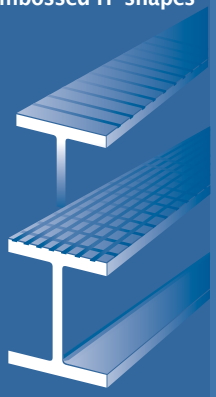
**SUPER HISLEND-H**
(Fixed outer dimension H-shapes)



**Heavy Wide Flange H-Shapes**

**J-grip H**
(H-shapes with inner surface protrusions)

**Stripe H-shapes**
**Embossed H-shapes**



## Application

### Wide Flange Shapes, SUPER HISLEND-H

Structural steels excellent in reliability and cost efficiency
Widely used in applications from housing to heavy-erection constructions including high-rise structures, long span structures, subways, and underpasses. JFE responds to customer needs with products of many different sizes.

### Heavy Wide Flange H-Shapes, J-grip H, Stripe-H, Embossed H-Shapes

- Heavy Wide Flange H-Shapes are employed as pillars or piers for high-rise structures. These shapes have come to be used as walling material in recent years.
- J-grip H and Stripe-H have been developed for steel-concrete composite structures. J-grip H shapes are used in the SC composition diaphragm wall method (see page 17), while Stripe-H shapes are used in the REED method (see page 18).
- Embossed H-Shapes have been developed for Steel Road Deck.

## Standard H

### ASTM

| Type | Yield strength (MPa) min/max | | | | | Tensile strength (MPa) | Yield to Tensile ratio max (%) | Impact test | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tempe-rature (℃) | Minimum energy (J) |
| | ≦16mm | 16mm< ≦40mm | 40mm< ≦63mm | 63mm< ≦80mm | 80mm< ≦100mm | ≦100mm | | | |
| A36 | 250/ | | | | | 400/550 | – | – | – |
| A572 Gr. 50 | 345/ | | | | | 450/ | – | – | – |
| A992 | 345/450 | | | | | 450/ | 85 | – | – |

### BS EN10025-2

| Type | Yield strength (MPa) min/max | | | | | | Tensile strength (MPa) min/max | | Impact test | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tempe-rature (℃) | Minimum energy (J) |
| | ≦16mm | 16mm< ≦40mm | 40mm< ≦63mm | 63mm< ≦80mm | 80mm< ≦100mm | 100mm< ≦150mm | 3mm≦ ≦100mm | 100mm< ≦150mm | | |
| S275JR | 275/ | 265/ | 255/ | 245/ | 235/ | 225/ | 410/560 | 400/540 | 20 | 27 |
| S275JO | 275/ | 265/ | 255/ | 245/ | 235/ | 225/ | 410/560 | 400/540 | 0 | 27 |
| S355JR | 355/ | 345/ | 335/ | 325/ | 315/ | 295/ | 470/630 | 450/600 | 20 | 27 |
| S355JO | 355/ | 345/ | 335/ | 325/ | 315/ | 295/ | 470/630 | 450/600 | 0 | 27 |

### JIS G3101, 3106, 3136

| Type | Yield strength (MPa) min/max | | | | | Tensile strength (MPa) | Yield to Tensile ratio max (%) | Impact test | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tempe-rature (℃) | Minimum energy (J) |
| | 6mm≦ <12mm | 12mm< ≦16mm | 16mm< ≦40mm | 40mm< ≦75mm | 75mm< ≦100mm | ≦100mm | 12≦ | | |
| SS400 | 245/ | 245/ | 235/ | 215/ | 215/ | 400/510 | – | – | – |
| SM400A | 245/ | 245/ | 235/ | 215/ | 215/ | 400/510 | – | – | – |
| SM400B | 245/ | 245/ | 235/ | 215/ | 215/ | 400/510 | – | 0 | 27 |
| SM490A | 325/ | 325/ | 315/ | 295/ | 295/ | 490/610 | – | – | – |
| SM490B | 325/ | 325/ | 315/ | 295/ | 295/ | 490/610 | – | 0 | 27 |
| SM490YA | 365/ | 365/ | 355/ | 335/ | 325/ | 490/610 | – | – | – |
| SM490YB | 365/ | 365/ | 355/ | 335/ | 325/ | 490/610 | – | 0 | 27 |
| SN400A | 235/ | 235/ | 235/ | 215/ | 215/ | 400/510 | – | – | – |
| SN400B | 235/ | 235/355 | 235/355 | 215/335 | 215/335 | 400/510 | 80 | 0 | 27 |
| SN490B | 325/ | 325/445 | 325/445 | 295/415 | 295/415 | 490/610 | 80 | 0 | 27 |

### KS D 3503, 3515, 3866

| Type | Yield strength (MPa) min/max | | | | | Tensile strength (MPa) | Yield to Tensile ratio max (%) | Impact test | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tempe-rature (℃) | Minimum energy (J) |
| | 6mm≦ <12mm | 12mm< ≦16mm | 16mm< ≦40mm | 40mm< ≦75mm | 75mm< ≦100mm | ≦100mm | | | |
| SS275 | 275/ | 275/ | 265/ | 245/ | 245/ | 410/550 | – | – | – |
| SM275A | 275/ | 275/ | 265/ | 255/ | 245/ | 410/550 | – | 20 | 27 |
| SM275B | 275/ | 275/ | 265/ | 255/ | 245/ | 410/550 | – | 0 | 27 |
| SM355A | 355/ | 355/ | 345/ | 335/ | 325/ | 490/630 | – | 20 | 27 |
| SM355B | 355/ | 355/ | 345/ | 335/ | 325/ | 490/630 | – | 0 | 27 |
| SHN355 | 355/475 | 355/475 | 355/475 | 355/475 | – | 490/610 | 85 | 0 | 27 |

See the standards for details of the chemical composition.

# SECTION SHAPE STEEL

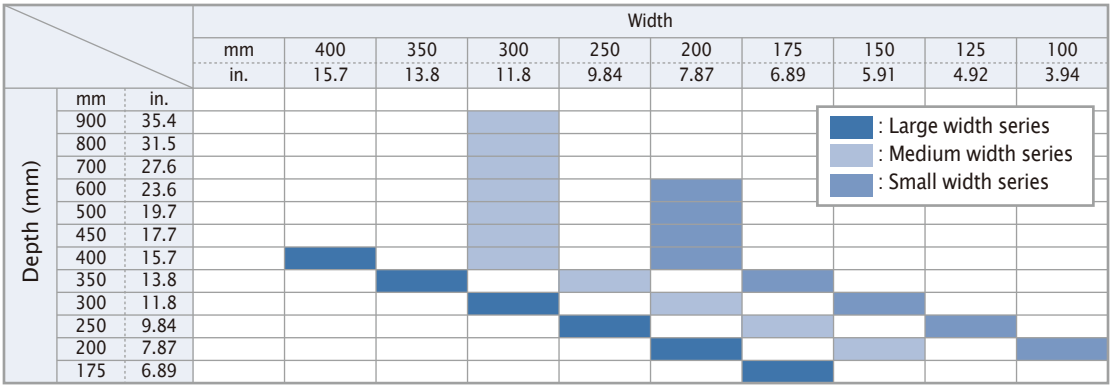
## Standard H

### Manufacturability standard

| Specification | | JIS H JIS G 3192 | Fixed Dimension | Heavy Wide Flange | Special Type | | |
|---|---|---|---|---|---|---|---|
| | | | | | J grip-H | Stripe-H | Embossed H |
| ASTM | A36 | ○ | | | | | |
| | A572 Gr.50 | ○ | | | | | |
| | A992 | ○ | | | | | |
| BS EN10025-2 | S275JR | ○ | △ | | | | |
| | S275JO | ○ | △ | | | | |
| | S355JR | ○ | △ | | | | |
| | S355JO | ○ | △ | | | | |
| JIS G 3101 | SS400 | ○ | ○ | ○ | | | △ |
| JIS G 3106 | SM400A | ○ | ○ | ○ | | △ | |
| | SM400B | ○ | ○ | ○ | | | |
| | SM490A | ○ | ○ | ○ | △ | △ | △ |
| | SM490B | ○ | ○ | ○ | | | △ |
| | SM490YA | ○ | | | | △ | |
| | SM490YB | ○ | | | | | |
| JIS G 3136 | SN400A | ○ | ○ | ○ | | | |
| | SN400B | ○ | ○ | ○ | | | |
| | SN490B | ○ | ○ | ○ | | | |
| KS D 3503 | SS275 | ○ | | ○ | | | |
| KS D 3515 | SM275A | ○ | | ○ | | | |
| | SM275B | ○ | | ○ | | | |
| | SM355A | ○ | | ○ | | | |
| | SM355B | ○ | | ○ | | | |
| KS D 3866 | SHN355 | ○ | | ○ | | | |

Some sizes are not manufacturable; consult us in advance.
Please consult us in advance about the tolerances of the shapes and dimensions marked with a triangle (△).

### Production size of JIS H-shapes (JIS G 3192)




Notes : Some sizes are not manufactured constantly, so please contact us in advance.
Consult us for detailed dimensions.

# Fixed outer dimension H-shapes: SUPER HISLEND-H

## Standard plate thickness with fixed outer dimension (Metric size)

- Web height and flange width are fixed in the same series.
- Web thickness and flange thickness are in accordance with the standard plate thickness system. (Metric size)

## Highly accurate dimensions and shape

- Superior to normal H-shapes in dimensional accuracy.

## Wide selection of sizes

- Manufacturable up to 1000mm of web. Comes in 42 series and 311 sizes.
- Cost-effective design is possible.

## Product size list

(mm)

| Web \ Flange | | 200 | | | | | | 250 | | | | | | | 300 | | | | | | | 350 | | | | | | 400 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12 | 16 | 19 | 22 | 25 | 28 | 16 | 19 | 22 | 25 | 28 | 32 | 36 | 16 | 19 | 22 | 25 | 28 | 32 | 36 | 22 | 25 | 28 | 32 | 36 | 40 | 22 | 25 | 28 | 32 | 36 | 40 |
| 400 | 9 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 450 | 9 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | ● | ● | ● | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| 500 | 9 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | ● | ● | ● | | | | ● | ● | ● | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | |
| 550 | 9 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | ● | ● | ● | | | | ● | ● | ● | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | |
| 600 | 9 | ● | ● | ● | ● | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | ● | ● | ● | | | | | | ● | ● | | | | | | | | | | | | | |
| 650 | 9 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | ● | | | | | ● | ● | ● | ● | | | | | | | | | | | | | |
| 700 | 9 | ● | ● | ● | ● | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | | | ● | ● | ● | | ● | ● | ● | | | | | ● | ● | ● | | | | ● | ● | | | | | | | | | | |
| | 14 | | | | | | | | | ● | ● | ● | | | | | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | | | |
| 750 | 12 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | 14 | | | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | ● | ● | ● | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | ● | ● | ● | | | | ● | ● | ● | | | | | | | |
| 800 | 14 | | | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | ● | ● | | | | | ● | ● | | | |
| | 16 | | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | ● | ● | ● | ● | | | ● | ● | ● | ● | |
| | 19 | | | | | | | | | | | | | | | | | | | | | | ● | ● | ● | ● | ● | | | ● | ● | ● | ● |
| 850 | 14 | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | ● | ● | ● | | | | | ● | ● | ● | ● | | | ● | ● | ● | | | | ● | ● | ● | | |
| | 19 | | | | | | | | | | | | | | | | | | | | | | | ● | ● | ● | ● | | | ● | ● | ● | ● |
| 900 | 16 | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | | ● | ● | ● | | | | ● | ● | ● | | |
| | 19 | | | | | | | | | | | | | | | | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | ● | ● | ● | ● |
| 950 | 16 | | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | ● | ● | ● | | | | ● | ● | ● | | |
| | 19 | | | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | ● | ● | ● | | | | | ● | ● | ● | |
| 1,000 | 16 | | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | ● | ● | ● | | | | ● | ● | ● | | |
| | 19 | | | | | | | | | | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | ● | ● | ● | | | | | ● | ● | ● | |

Fillet curvature = 13 mm

Fillet curvature = 18 mm

Please contact us in advance when ordering H-shapes in the sizes shown in framed rectangles.

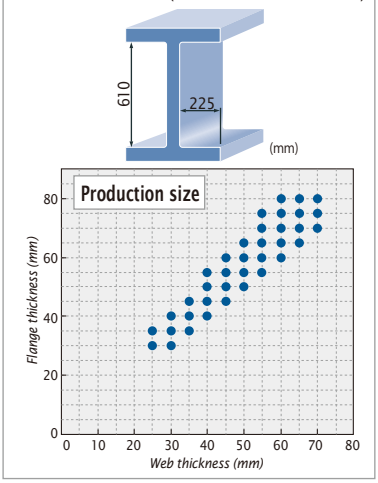
# SECTION SHAPE STEEL

## Heavy Wide Flange H-Shapes

- Heavy wide Flange H-Shapes come in three series: 700×500, 500×500, and 400×400.
- These shapes can be widely applied as pillars and piers of high-rise structures.

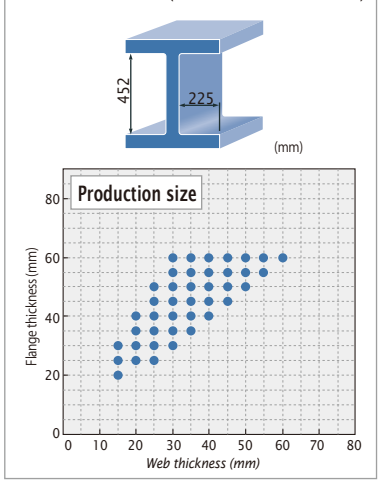
### 700 x 500 series

( Fillet curvature=26mm)



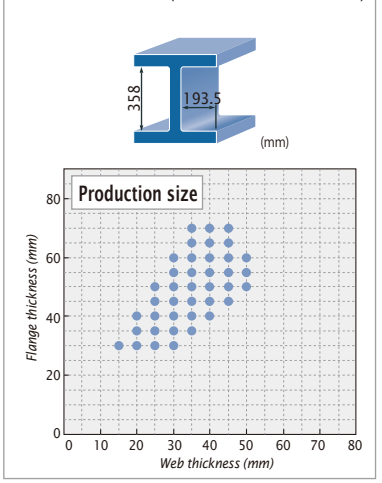

### 500 x 500 series

( Fillet curvature=26mm)

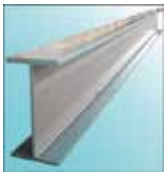



### 400 x 400 series

( Fillet curvature=22mm)




## J-grip H



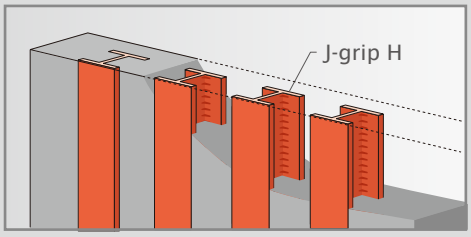
J-grip H (H-shapes with inner surface protrusions) is an H-section steel shape with protrusions formed inside the inner flange.
J-grip H is a new H-section steel shape featuring great adhesion resistance against steel-concrete shearing stress through restraining effects between flanges.

### SC composition diaphragm wall method

This method has been jointly developed by JFE Steel Corporation and Obayashi Corporation.

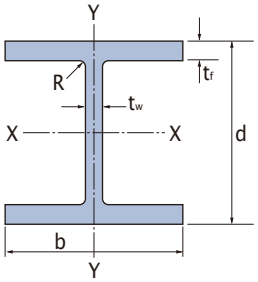
This is a continuous wallwork method in which J-grip H is integrated into a wall with concrete. This method provides high rigidity and high resistance moment with thin walls, thus reducing costs and saving space in excavation work.

This method is effective when there are nearby structures, or the structure has a floor height and a long cut-off wall, or ground movement is large during an earthquake.



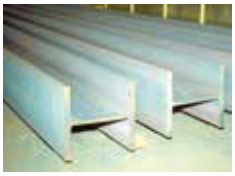

### Production size

| | Nominal Size | Section dimensions (mm) | | | | | Area of Section ($cm^2$) | Mass per Metre (kg/m) |
|---|---|---|---|---|---|---|---|---|
| | d x b | d | b | $t_w$ | $t_f$ | R | | |
| J grip-H | 600 x 300 | 640 | 307 | 19 | 40 | 13 | 353.5 | 555 |
| | | 632 | 307 | 19 | 36 | 13 | 328.9 | 258 |
| | | 624 | 304 | 16 | 32 | 13 | 285.6 | 448 |
| | | 616 | 302 | 14 | 28 | 13 | 249.0 | 195 |
| | | 610 | 300 | 12 | 25 | 13 | 218.7 | 172 |




JIS G 3106 SM490A is used as material.

## Stripe H



### Production size

Comes in three series: 300×300, 200×200, and 150×150.

300×300: 15 sizes of H-350×333×35×40 to H-300×308×10×15
200×200: 5 sizes of H-212×208×12×18 to H-200×204×8×12
150×150: 4 sizes of H-160×159×12×15 to H-150×155×8×10

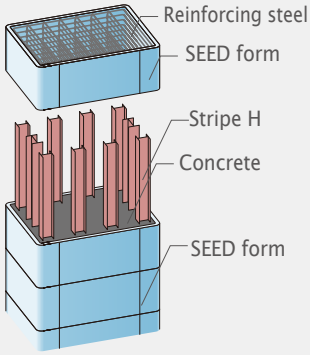
JIS G 3106 SM400A, SM490A, and SM490YA are used as materials.

### REED method

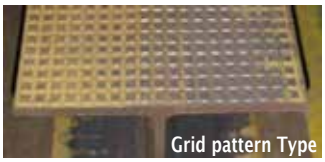
(Rapid construction Earthquake resistance Environment Durability)

This method has been jointly developed by JFE Steel Corporation and Maeda Corporation.

This is a bridge pier construction method that can help reduce the construction period through labor saving by combining stripe H-shapes with precast buried forms (SEED forms).



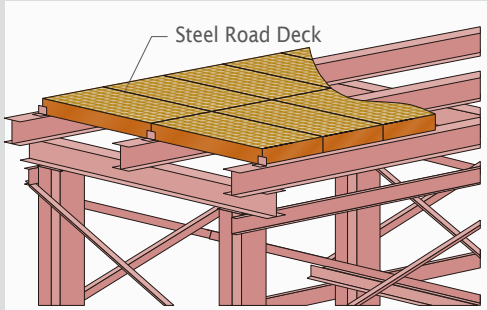

## Embossed H





### Steel Road Deck

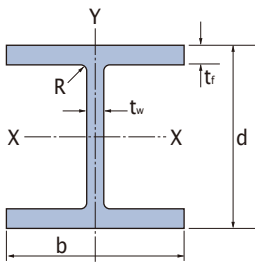
H-shapes with protrusions are structural materials used for temporary working platforms such as covering plates.
These steel surfaces have protrusions that ensure good adhesion with many types of surface coating including asphalt.
In particular, the grid pattern type has specially shaped protrusions that help prevent surface slippage without any surface coating. They also minimize the roaring sound caused by the wind blowing over the material' s surface.
The covering plates that are welded to H-shapes with protrusions are light in weight and can resist large loads and impacts



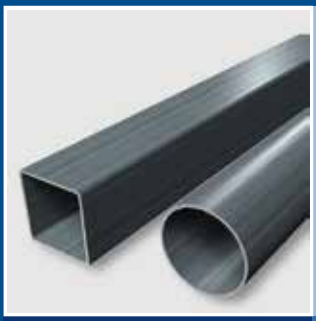

### Production size

| Nominal Size | Section dimensions (mm) | | | | | Area of Section (cm2) | Mass per Metre (kg/m) |
|---|---|---|---|---|---|---|---|
| d x b | d | b | $t_w$ | $t_f$ | R | | |
| Grid Pattern | 190 | 197 | 5.4 | 7.7 | 13 | 41.60 | 34.6 |
| Longitudinal Type | 190 | 197 | 5.4 | 7.7 | 13 | 45.60 | 35.5 |

JIS G 3101 SS400, JIS G 3106 SM490A and SM490B are used as materials.



# PIPES & TUBES



## 1 High performance, high quality, wide selection of types

Backed up by a long history of persistent technological innovation, we can offer high-grade and high-quality steel pipes and tubes in a wide variety of sizes

## 2 Helps reduce weight and offers economical design of structures

The closed cross-section pipes and tubes have excellent cross-section performance against lateral buckling and local buckling. This allows them to have a smaller cross-sectional area, largely contributing to weight reduction and economical design of structures.

## Product

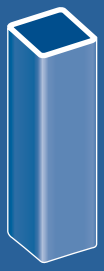
### Circular steel pipes and tubes

**STKN400/490**
Carbon steel pipes and tubes for structures

**P-325,355,SM520,440**
High-strength and thick-wall circular steel pipes and tubes

**STK400/490**
Carbon steel pipes and tubes for general structures

### Square steel pipes and tubes



**BCR295**
Cold-rolled square steel pipes and tubes for structures

**BSH325**
Hot formed seamless square steel pipes and tubes for structures

**STKR400/490**
Square steel pipes and tubes for general structures

## Application

### Circular steel pipes and tubes

These circular cross-section pipes and tubes have no directional properties and provide constant cross-sectional performances. They are used for pillar materials and truss structures.
The round appearance creates stylish structural beauty.

### Square steel pipes and tubes

**[BCR]: Cold rolled square steel pipes and tubes for structures**

Conventional cold rolled square steel pipes and tubes [STKR]
The performance requirements (such as plastic deformation capacity and weldability) peculiar to a structural steel frame are improved in comparison with (JIS G3466). These pipes and tubes are therefore ideal as structural pillar materials.

**[BSH]: Hot formed seamless square steel pipes and tubes**

Having a small-diameter and thick-wall cross section, these pipes and tubes can create a simple space through effective use of space.

**[STKR]: Square steel pipes and tubes for general structures** (JIS G 3466)

These pipes and tubes can be used widely as structural steel pipes and tubes for general-purpose use.

## Square steel pipes and tubes

### Mechanical properties

| designation | Thickness (mm) | Yield strength (Mpa) min/max | Tensile strength (Mpa) min/max | Yield to Tensile ratio max (%) | Impact test | |
|---|---|---|---|---|---|---|
| | | | | | Temperature(℃) | Minimum energy (J) |
| BCR295 | 6≦t<12 | 295/ | 400/550 | — | — | — |
| | 12≦t<22 | 295/445 | | 90 | 0 | 27 |
| BSH325 | 13≦t<16 | 325/ | 490/610 | 80 | 0 | 70 |
| | 16<t≦33 | 325/445 | | | | |
| STKR400 | 6≦t<25 | 245/ | 400/ | — | — | — |
| STKR490 | 6≦t<22 | 325/ | 290/ | — | — | — |

### Production range

| Size(mm) | Thickness (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 9 | 12 | 13 | 16 | 19 | 22 | 25 | 30 | 33 |
| 150×150 | ● | ● | ● | | | | | | | |
| 175×175 | ● | ● | ● | | | | | | | |
| 200×200 | ●●● | ●●● | ●●● | | | | | | | |
| 250×250 | ●●● | ●●● | ●●● | | ●●● | | | | | |
| 300×300 | ●●● | ●●● | ●●● | | ●●● | ●●● | | | | |
| 350×350 | | ●●● | ●●● | | ●●● | ●●● | ●●● | | | |
| 400×400 | | ●●● | ●●● | | ●●● | ●●● | ●●● | ● | | |
| 450×450 | | ●●● | ●●● | | ●●● | ●●● | ●●● | ● | | |
| 500×500 | | | ●●● | | ●●● | ●●● | ●●● | ● | | |
| 550×550 | | | | | ●●● | ●●● | ●●● | ● | | |

● :BCR295 ● :STKR400 ● :STKR490 ■ :BSH325

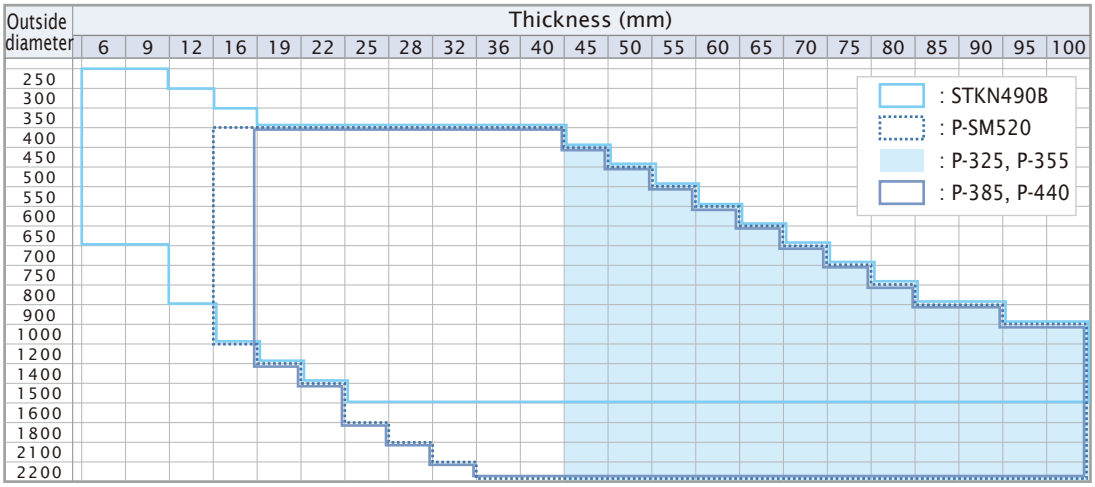
## Circlar steel pipes and tubes

### Mechanical properties

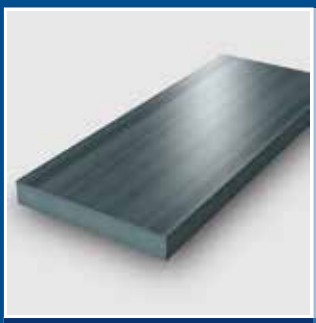
| designation | Yield strength (Mpa) min/max | | | Tensile strength (Mpa) min/max | Yield to Tensile ratio max (%) | Impact test | |
|---|---|---|---|---|---|---|---|
| | 16*mm | 16*mm< ≦40mm | 40mm< ≦100mm | | | Temperature(℃) | Minimum energy (J) |
| P-325 | — | — | 325/475 | 490/610 | 85 | 0 | 27 |
| P-355 | — | — | 355/505 | 520/640 | 85 | 0 | 27 |
| P- SM520 | 365/544 | 355/544 | 335/544 | 520/640 | 85 | 0 | 27 |
| P-385 | — | 385/535(19≦t) | | 550/700 | 85 | 0 | 70 |
| P-440 | 325/ | 440/590(19≦t) | | 590/740 | 85 | 0 | 47 |
| STKN400 | 235/ | 235/385 | 215/365 | 400/540 | 85 | 0 | 27 |
| STKN490 | 325/ | 325/475 | 295/445 | 490/640 | 85 | 0 | 27 |
| STK400(490) | 235(315)/ | | | 400(490)/ | — | — | — |

＊: 19mm for P-385 and P-440, 12mm for STKN and STK

### Production range



# PLATE



**1** Supports rational and economical manufacturing as well as weight reduction and service life extension of structure

Supporting bridges requiring high quality and manufacturing technology with various quality-controlled high-performance steels.

**2** Product lineup in response to social needs

We offer a wide variety of products by working to develop construction materials in response to society' s needs such as meeting highly stringent aseismicity requirements, reducing the cost of construction, and paying consideration to the environment.

## Product

**Plates** Major Japanese standards of steels and JFE original standards

| | |
|---|---|
| SS 400 | Rolled Steel for General Structure (JIS G 3101) |
| SM 400/490/520/570 | Rolled steels for welded structure (JIS G 3106) |
| SN 400/490 | Steels specified in consideration of performance requirements unique to construction steel frames, such as absorption of seismic energy caused by plastic deformation of the frame premised on the current new aseismic design method. |
| HBL 325/355/385:TMCP | Steels having high-strength, low yield ratio, and excellent weldability by applying advanced TMCP (Thermo-Mechanical Control Process) technology developed by JFE Steel for the first time in the world.Reduction of standard strength in thick wall area is not necessary. |
| SA 440 | New steels with a combination of "low yield ratio" and "high welding work efficiency " by continuously working to improve weldability and work efficiency. |
| SMA400/490/570 | Hot-rolled atmospheric corrosion resisting steels for welded structure (JIS G 3114). Can be used without coating at locations where flying salt amount is 0.05 mdd or less (mdd: mg/100cm2/day). |
| JFE-ACL400/490/570 | High resistant steel sheets having excellent weatherbility under severe environments with a flying salt amount exceeding 0.05 mdd. Excellent weldability due to extremely low carbon equivalent. |

## Application

### Bridge

Demand for high tensile strength steel is increasing because bridges are getting bigger.
JFE Steel offers plates having significantly improved weldability by means of optimizing the chemical composition and using the latest plates manufacturing process.

### Architecture

High-strength thick-walled steel sheets (TMCP steels) are excellent in strength, ductility, and weldability.
Best suited for weld assembly H-type beams for long-span structures and weld assembly tetrahedral box pillars for high-rise buildings.

# Standard

## Adaptable standard (Example)

| Type of steel | | | JFE Standard | JIS | ASTM | API | BS | DIN |
|---|---|---|---|---|---|---|---|---|
| Steel Plates for Structural Use | Carbon-Manganese Steel | | | G3101 SS330<br>SS400<br>G3106 SM400<br>G3131 SPHC<br>SPHD<br>SPHE<br>G3136 SN400 | A36<br>A131<br>A283<br>A529<br>A573 Gr.58 | API 2H-42<br>2W-42 | EN10025 S185<br>S235<br>S275<br>EN10113 S275 | |
| | High Tensile Strength Steels | 490N/mm² Class | HBL325 | G3106 SM490<br>SM490Y<br>G3136 SN490 | A572<br>A573<br>A633<br>A709 Gr.50<br>A841 | API 2H-50<br>2W-50 | EN10025 S355<br>E295<br>EN10225 S355<br>EN10113 S355 | |
| | | 540N/mm² Class | JFE-HITEN540S<br>HBL355<br>HBL385 | G3106 SM520 | A572 Gr.60<br>Gr.65 | API 2W-60 | EN10225 S400<br>EN10113 S420<br>EN10225 S460 | |
| | | 590N/mm² Class | JFE-HITEN570U2<br>JFE-HITEN570E<br>JFE-HITEN590S<br>JFE-HITEN590SL<br>JFE-HITEN590AZ<br>JFE-HITEN590<br>JFE-HITEN590U1<br>JFE-HITEN590U2<br>JFE-HITEN590E | G3106 SM570* | A678 Gr.C<br>Gr.D<br>A841 | | EN10025 E335<br>EN10113 S460<br>EN10137 S460 | |
| | | | JFE-HITEN610<br>JFE-HITEN610U1<br>JFE-HITEN610U2<br>JFE-HITEN610E<br>SA440U | | | | EN10137 S500 | |
| Atmospheric Corrosion Resistant Steel Plates | 400N/mm² Class | | | G3114 SMA400 | | | | |
| | 490N/mm² Class | | | G3114 SMA490 | A242Type2<br>A588 | | | |
| | 590N/mm² Class | | | G3114 SMA570* | | | | |
| | Ni Type High Corrosion Resistant Steel | | JFE-ACL400Type1<br>JFE-ACL400Type2<br>JFE-ACL490Type1<br>JFE-ACL490Type2<br>JFE-ACL570Type1<br>JFE-ACL570Type2 | | | | | |

Adaptable to standards other than above. Contact us in advance.

Cat.No.D1E-503-01

# JFE Steel Corporation

https://www.jfe-steel.co.jp/en/

**HEAD OFFICE**
Hibiya Kokusai Building, 2-3 Uchisaiwaicho 2-chome, Chiyodaku, Tokyo 100-0011, Japan Phone: (81)3-3597-3111 Fax: (81)3-3597-4860

## ■ ASIA PACIFIC

**SEOUL**
JFE Steel Korea Corporation
16th Floor, 41, Cheonggyecheon-ro, Jongno-gu, Seoul, 03188, Korea
(Youngpung Building, Seorin-dong)
Phone: (82)2-399-6337 Fax: (82)2-399-6347

**BEIJING**
JFE Steel Corporation Beijing
2018 Beijing Fortune Building, No.5, Dongsanhuan North Road, Chaoyang District, Beijing, 100004, P.R.China
Phone: (86)10-6590-9051 Fax: (86)10-6590-9056

**SHANGHAI**
JFE Consulting (Shanghai) Co., Ltd.
Room 801, Building A, Far East International Plaza, 319 Xianxia Road, Shanghai 200051, P.R.China
Phone: (86)21-6235-1345 Fax: (86)21-6235-1346

**GUANGZHOU**
JFE Consulting (Guangzhou) Co., Ltd.
Room 3901 Citic Plaza, 233 Tian He North Road, Guangzhou, 510613, P.R.China
Phone: (86)20-3891-2467 Fax: (86)20-3891-2469

**MANILA**
JFE Steel Corporation, Manila Office
23rd Floor 6788 Ayala Avenue, Oledan Square, Makati City, Metro Manila, Philippines
Phone: (63)2-8886-7432 Fax: (63)2-8886-7315

**HO CHI MINH CITY**
JFE Steel Vietnam Co., Ltd.
Unit 1704, 17th Floor, MPlaza, 39 Le Duan Street, Dist 1, HCMC, Vietnam
Phone: (84)28-3825-8576 Fax: (84)28-3825-8562

**HANOI**
JFE Steel Vietnam Co., Ltd., Hanoi Branch
Unit 1501, 15th Floor, Cornerstone Building, 16 Phan Chu Trinh Street, Hoan Kiem Dist., Hanoi, Vietnam
Phone: (84)24-3855-2266 Fax: (84)24-3533-1166

**BANGKOK**
JFE Steel (Thailand) Ltd.
22nd Floor, Abdulrahim Place 990, Rama IV Road, Silom, Bangrak, Bangkok 10500, Thailand
Phone: (66)2-636-1886 Fax: (66)2-636-1891

**YANGON**
JFE Steel (Thailand) Ltd., Yangon Office
Unit 05-01, Union Business Center, Nat Mauk Road, Bocho Quarter, Bahan Tsp, Yangon, 11201, Myanmar
Phone: (95)1-860-3352

**SINGAPORE**
JFE Steel Asia Pte. Ltd.
16 Raffles Quay, No.15-03, Hong Leong Building, 048581, Singapore
Phone: (65)6220-1174 Fax: (65)6224-8357

**JAKARTA**
PT. JFE STEEL INDONESIA
6th Floor Summitmas II, JL Jendral Sudirman Kav. 61-62, Jakarta 12190, Indonesia
Phone: (62)21-522-6405 Fax: (62)21-522-6408

**NEW DELHI**
JFE Steel India Private Limited
806, 8th Floor, Tower-B, Unitech Signature Towers, South City-I, NH-8, Gurgaon-122001, Haryana, India
Phone: (91)124-426-4981 Fax: (91)124-426-4982

**MUMBAI**
JFE Steel India Private Limited, Mumbai Office
603-604, A Wing, 215 Atrium Building, Andheri-Kurla Road, Andheri (East), Mumbai-400093, Maharashtra, India
Phone: (91)22-3076-2760 Fax: (91)22-3076-2764

**BRISBANE**
JFE Steel Australia Resources Pty Ltd.
Level28, 12 Creek Street, Brisbane QLD 4000 Australia
Phone: (61)7-3229-3855 Fax: (61)7-3229-4377

## ■ MIDDLE EAST

**DUBAI**
JFE Steel Corporation, Dubai Office
P.O.Box 261791 LOB19-1208, Jebel Ali Free Zone Dubai, U.A.E.
Phone: (971)4-884-1833 Fax: (971)4-884-1472

## ■ NORTH, CENTRAL and SOUTH AMERICA

**HOUSTON**
JFE Steel America, Inc.
750 Town & Country Blvd., Suite 705, Houston, TX 77024, U.S.A.
Phone: (1)713-532-0052 Fax: (1)713-532-0062

**MEXICO CITY**
JFE Steel de Mexico S.A. de C.V.
Ruben Dario #281-1002, Col. Bosque de Chapultepec, C.P. 11580, CDMX. D.F. Mexico
Phone: (52)55-5985-0097

**RIO DE JANEIRO**
JFE Steel do Brasil LTDA
Praia de Botafogo, 228 Setor B, Salas 508 & 509, Botafogo, CEP 22250-040, Rio de Janeiro-RJ, Brazil
Phone: (55)21-2553-1132 Fax: (55)21-2553-3430



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