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## NIPPON STEEL

# **Hot Extruded Steel Shapes**

The Tools of Free Design





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Hot Extruded Steel Shapes The Tools of Free Design P104en\_03\_202312f © 2019, 2023 NIPPON STEEL CORPORATION



富山県美術師

Toyama Prefectural Museum ©Ogawa Shigeo

### Introduction

Since 1941, the first successful of making steel shapes with hot extrusion using glass lubricants in France, the number of applications for hot extrusion steel shapes has shown remarkable growth in such fields as structural members and machine parts.

NIPPON STEEL installed the hot extrusion plant at its Hikari Works in 1960. Based on the many years of research and development, we have established a sophisticated hot extrusion production system with high-quality steel shapes. Currently, these shapes are highly evaluated by our customers.

Hot extruded shapes possess diverse features that cannot be obtained with other production processes. We strongly recommend these quality shapes to improve machinery performance, reduce processes, enhance labor savings, and cut costs.

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### Features of Hot Extrusion Process

Hot extruded shapes are produced by means of the hot extrusion method. In this method, round billets are heated to around 1,200°C, and then hot extruded through dies mechanically processed into diverse configurations. The hot extruded shapes thus obtained are then subjected to tensile straightening and other finishing processes to produce the final product.

Accordingly, the hot extrusion process is suitable for producing shapes of complex configuration, multiple-grade/small-lot shapes, and difficult-to-process materials.

Manufacturing Process



Extrusion direction





 Image: straightening

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### Merit of Hot Extruded Shapes

#### Freedom of Design

In contrast to standard specified shapes by rolling process, hot extruded shapes combine both decorative and structural functions that allow the design of structural members that permit optimal originality and freedom in building design.

#### Save the Machining Process

In contrast to the conventional method by machining (lathe, milling) from material block, the hot extrusion process forms shapes by passing the material through die calibers, thereby greatly saving the machining process.



### Save the Welding Process

Because hot extruded shapes are produced by means of solid forming, the welding processes can be saved. Further, stress relief can be saved, whereby thermal deformation during welding, thereby contributing greatly to cost cutting. In addition, the quality deterioration of weld portion can be prevented and the reliability of end products can be improved.



#### Suitable for Small-lot Production and Model Changes of Shapes

The cost of hot extrusion tools is much lower than that of rolling mill tools (rolls): Accordingly, the hot extrusion process allows not only the minor dimensions changes of each product to be altered simply by changing tools, but also the production of small lots starting at one-ton units that otherwise are economically untenable for rolling processes.









Naito Architects & Associates Shirayama Co.,Ltd.

#### NIPPON STEEL CORPORATION

Bashamichi station (Minatomirai Line)



### Configurations and Application Examples







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### Configurations and Application Examples

Unit: mm (inches)

Steel grade SM490A

#### Civil engineering member

#### Shield tunnel segment





#### 2 Clamping bar



#### 3 Pipe roof









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When inquiries are made

### **NIPPON STEEL recommend the extensive** application of hot extruded shapes!

Specific (Order-made) configuration shapes can save the cost.

Make inquiries by drawing your imagination within the 215mm diameter circle shown below. Our technical staff will examine inquires one by one to accurately meet your needs.

### **Ø215mm** Actual Size

**Example** 

Available Dimension

Circumscri

Minimur

Corne

Minim (S mir

Le

Maxim

### In Placing Orders

Available steel grades:

- of a repeat order
- When steel is tapped after order receipt: 100 days after initial order receipt, 50~75 days after receipt of a repeat order

#### Minimum lot available for order receipt (standard):

[Export]

All material

\* When you need lower amout, to be discussed.

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oed circle Dia.	φ215 mm
n thickness	8 mm
er (r) (R)	r:2 mm
	R:5 mm
um area ı)(S max)	S min: 300 mm <sup>2</sup>
	S max:8,000 mm <sup>2</sup>
ength	1 m~11 m
um weight	260 kg

Carbon steel, low alloy steel, stainless steel and titanium

#### Delivery Terms after Order Receipt:

• When stocked billets are used: 75 days after initial order receipt, 50~75 days after receipt

- When hot extrusion is commissioned:
- 50~75 days after arrival of the hot extruding material

Total 15 MT / 1 time (34,000 lbs / 1 time)