



Your Steel Rolling and Fabrication Partner

## What You Need to Know about Steel Rolling and Bending

### How much do you know about Steel Rolling/Bending?

Do you know how does Steel Rolling and Bending works?

Do you know what the smallest diameter you can roll a 220mm Pipe is, and what information to have in your work drawings to ensure your final product is accurate?

These are just some of the common questions that we have received from you throughout the years.

In '**What you need to know about Steel Rolling and Bending**', we hope to answer some of your common questions and make it a wonderful experience in engaging us, Sunlink Engineering for your Steel Works.

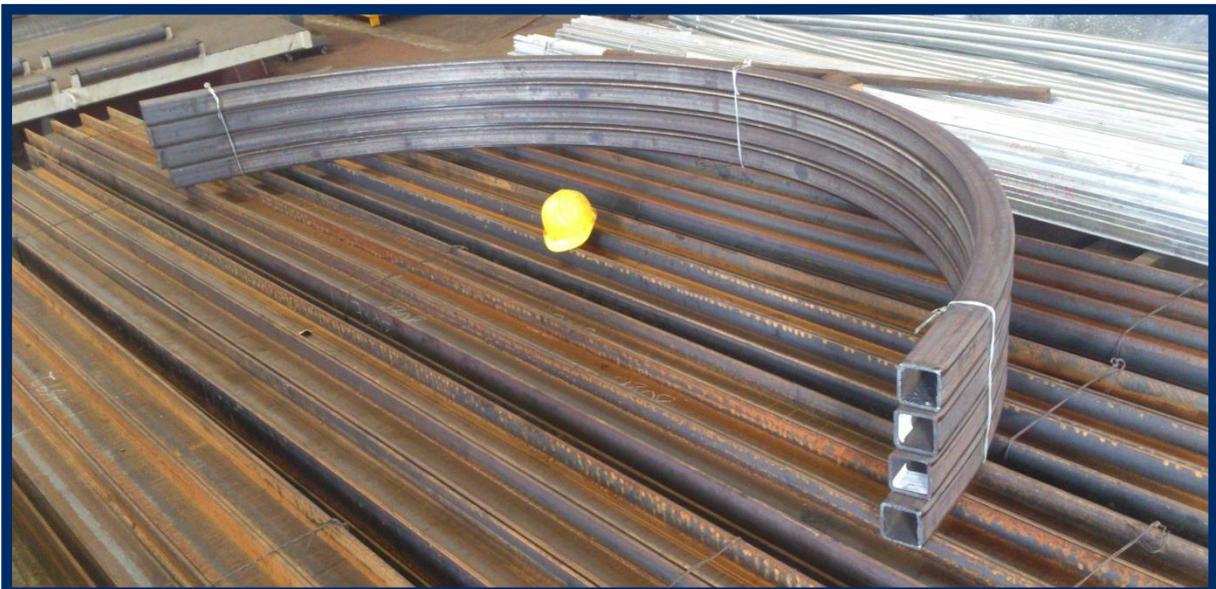


### Introduction to Steel Rolling/Bending

There are 2 main category of Rolling/Bending of Steel, namely Cold and Hot Rolling/Bending. Each category has its own methods of Rolling/Bending, as well as its advantages and disadvantages.

The distinction between Hot Rolling/Bending and Cold Rolling/Bending depends on the processing temperature with respect to the recrystallization temperature of the material. When the processing temperature of the mechanical deformation of steel is above the recrystallization temperature, the process is termed as Hot Rolling/Bending; otherwise, it is Cold Rolling/Bending.

For ease of viewing, we will list out the various types of Rolling/Bending, as well as the Advantages and Disadvantages of Hot vs Cold Rolling/Bending.



## Types of Rolling/Bending

Do you know that between Hot and Cold Rolling/Bending there are 5 different methods?

It is advisable to choose correctly the type of method for your project. Different type of project requires different methods. If unsure, always ask a trusted Rolling/Bending engineer before choosing.



Cold Rolling/Bending	
<b>Cold Rolling</b>	<b>Cold Rolling</b> is the most <b>Common</b> method for the Construction, Marine, Petrochemical and Offshore industry to Roll Steel. It is also the most <b>Economical</b> way for Rolling Plates and Structural Profiles. A Steel Plate or Structural Profile is placed between 3 dies on a machine and is rolled multiple times to form a uniform diameter.
<b>Press Brake Bending</b>	<b>Press Brake Bending</b> is normally used for creating Bends along a Plate. Bending is done by pressing a steel die across a line/plane across the Plate. Various types of dies can be used to form different shapes. If Diameter is too Small for Cold Rolling, Press Brake Bending can also be used to form Cylindrical or Conical shapes through pressing multiple straight lines across a plate.
<b>Rotary Draw Bending</b>	<b>Rotary Draw Bending</b> is a method where a structural profile is clamped into a die and roll/bent by rotating it around the die. The most common type of application for this form of bending are pipes and round bars with a small rolling/bending diameter.
Hot Rolling/Bending	
<b>Induction Rolling/Bending</b>	<b>Induction Rolling/Bending</b> uses an electric coil to heat a short section of a structural profile. That profile is then drawn through a process similar to Rotary-Draw Bending and cooled with water directly after. In some cases, this process can produce a smaller, tighter diameter than Cold Rolling/Bending.
<b>Hot bending</b>	<b>Hot bending</b> is where a structural profile is heated directly and then bent. The heat source could be a direct flame or furnace. This method is used commonly in repair.



## Advantages and Disadvantages of Cold and Hot Rolling/Bending

Not sure of whether to choose Hot or Cold Rolling/Bending?  
Or what type of Rolling/Bending is most suited for your project?

Just refer to the table below for a list of the advantages and disadvantages of both Hot and Cold Rolling.

<b>Cold Rolling/Bending</b>	
<b>Advantages</b>	<b>Disadvantages</b>
<ol style="list-style-type: none"> <li>1. Higher Accuracy of Roll/Bend compared to Hot Rolling/Bending (No Expansion/Contraction of Steel after Roll/Bend)</li> <li>2. Final Products have a Smoother Surface (Better Surface Finishing)</li> <li>3. Increases Yield and Tensile strengths of Final Product, often Eliminating Further Costly Thermal Treatments.</li> <li>4. Lower Cost of Production</li> <li>5. Faster Speed of Production</li> </ol>	<ol style="list-style-type: none"> <li>1. May not be able to make Roll/Bend of Diameters that are too Small.</li> <li>2. Decrease in Ductility of Final Product due to Strain Hardening thus making the Steel more Brittle</li> <li>3. More Spring-back and Residual stress than Hot Rolling/Bending (Can be easily resolved through slight over-roll/bending*)</li> </ol>
<b>Hot Rolling/Bending</b>	
<b>Advantages</b>	<b>Disadvantages</b>
<ol style="list-style-type: none"> <li>1. Can make Roll/Bends with Smaller Diameters as the Steel remains Soft and Ductile during the process</li> <li>2. Less Change in Ductility of Final Product</li> <li>3. Less Spring-back and Residual Stress than Cold Rolling/Bending</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower Accuracy of Roll/Bend compared to Cold Rolling/Bending due to Cooling of Steel after Roll/Bend</li> <li>2. Final Products will experience some Surface Oxidation (or Scaling), resulting in Material Loss (Poorer Surface Finishing)</li> <li>3. Hardness is generally lower than that of Cold Rolling/Bending</li> <li>4. Higher Cost of Production</li> <li>5. Slower Speed of Production</li> </ol>

Due to the many advantages of Cold Rolling/Bending as seen above, Sunlink Engineering choose to specialize in the various forms of Cold Rolling/Bending. With the many complexities in the art and science of Steel Rolling/Bending, it is always advisable to look for a reliable workshop, if not you have find yourself facing frustrating reworks and arguments.

If you are unsure whether to choose Cold or Hot Rolling/Bending for your project, just drop us an e-mail and we will advise you accordingly.

## What about Work drawings?

Have you worked on a steel project that involves steel rolling/bending and had to spend much time conversing with a Steel Rolling/Bending Engineer to make sense of the desired product? Below is Sunlink Engineering's simple guide to dimensions and details needed for a Steel Rolling/Bending project.

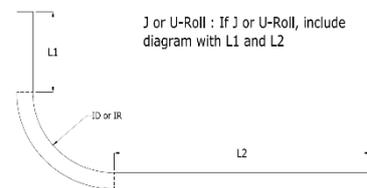
To ensure a hassle and miscommunication free experience for you, please follow our simple 3 step guide to place a work order for Rolling/Bending with us:



### Step 1

Let us know what kind of structural profile(or plate) and orientation you require for rolling/bending as well as the relevant details(H, B, ID, etc) as per below together with your drawing:

<b>1. Angle Bar Leg In</b> 	<b>2. Angle Bar Leg Out</b> 	<b>3. Flat Bar/Plate Ring/Ring</b> 
<b>4. Flat Bar Flange</b> 	<b>5. I-Beam</b> 	<b>6. H-Beam</b> 
<b>7. C-Channel Leg In</b> 	<b>8. C-Channel Leg Out</b> 	<b>9. Pipe/CHS</b> 
<b>10. Round Bar</b> 	<b>11. RHS Ring/Flat</b> 	<b>12. RHS Flange</b> 
<b>13. SHS</b> 	<b>14. Square Bar</b> 	<b>15. Cone</b> 



## Step 2

Please provide us with the following details:

Quantity: \_\_\_\_\_

Material Supplied by: You / Sunlink

Type of Material: Mild Steel / High Tensile Mild Steel / Stainless Steel/ Aluminium / Others: \_\_\_\_\_

Other services to include: Cut(Material Preperation) / Cut(Wastage/Excess) / Bevel / Tack Weld / Full Weld / Drill / Bend / Others: \_\_\_\_\_

Delivery method: Self Collect (Free) / Delivery by Sunlink (Transport Charge)

Other Comments: \_\_\_\_\_

## Step 3

Confirm your order once you have received your quote and we will start production as soon as possible.

## Ask Our Engineers

Unsure of whether your structure can be Roll/Bent?

Have other questions that you cannot find in this article?

Do not fret!

Simply call us up at **6261 6690** or email us at [info@sunlink.com.sg](mailto:info@sunlink.com.sg), and our friendly Engineers will do their best to address your concerns.

For more information, you can download our company profile or visit our website at [www.sunlink.com.sg](http://www.sunlink.com.sg).

