



**NSCP® is NIPPON STEEL STAINLESS STEEL PIPE's  
clean pipe for semiconductor manufacturing.**

**NSCP**®  
NIPPON STEEL CLEAN PIPE

**Brand Statement**

NIPPON STEEL STAINLESS STEEL PIPE's clean pipe for semiconductor manufacturing has maintained a high market share for a long time due to its high reliability based on its high performance and high quality.

This clean pipe has been given a new name, "NSCP®", to create new value.

The new brand logo design has been created to promote multi-faced approaches to further improve product recognition in overseas markets.

NIPPON STEEL Group has supported global industrial development through its steel products. By providing the highest quality NSCPs, we will support the semiconductor manufacturing industry, which has grown from being the "core of industry" to the "neurons of society" through the development of digitalization in society, and contribute to making a great leap forward in the future.

Logo design concept: Centering on the appearance of stainless steel (in a silver chrome color), the round shapes (in blue) in the characters express the high-precision internal surfaces of steel pipes. Two different color gradations emerge into a sophisticated logotype.

**NIPPON STEEL STAINLESS STEEL PIPE Co.,Ltd.**

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**Clean Pipe for Semiconductor Manufacturing**

**NSCP**®  
NIPPON STEEL CLEAN PIPE

**NIPPON STEEL STAINLESS STEEL PIPE Co.,Ltd.**



# NSCP<sup>®</sup>

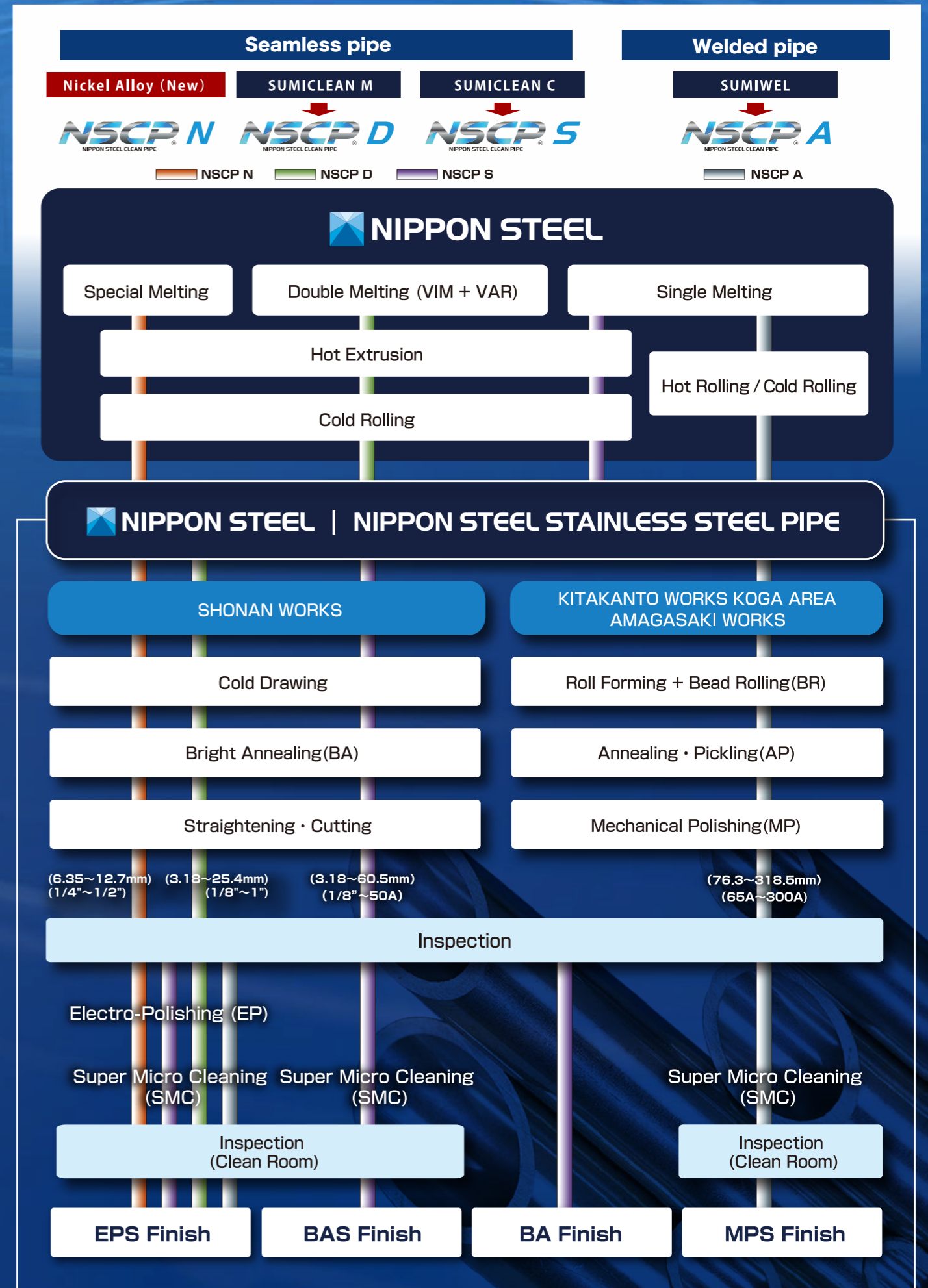
NIPPON STEEL CLEAN PIPE

The clean pipe for semiconductor manufacturing, which has high cleanliness and superior inner-face smoothness, has been given the **new brand name as NSCP<sup>®</sup> to create new value**

(Old) Sumitomo Metal Industries, Ltd. started manufacturing its high quality clean pipes for semiconductor manufacturing in 1993. Using high-cleanliness steel and its original internal processing technique allows the product to boast excellent weldability, inner-face smoothness and cleanliness, and this pipe has been highly evaluated by customers both inside and outside Japan.

We have supplied vast amounts of clean pipes for semiconductor manufacturing so far. These pipes have been given a new brand name, NSCP<sup>®</sup>, to restart them as clean pipes that supports the rapidly advancing semiconductor industry.

# NEXT PHASE



# Products Characteristics

NIPPON STEEL  
CLEAN PIPE

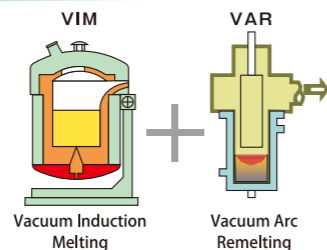
## High Smoothness

Inner surface smoothness is one of the characteristics that a clean pipe is required to have. Dust, moisture and other objects adhere to surface irregularities, contaminate the gasses used in semiconductor manufacturing and lead to a reduction in semiconductor product yield. The products NSCP N, D, and S are processed using our proprietary drawing technique that increases smoothness. After that, they go through one of three different grades of finishing processes that maintain the smoothness: (1) a bright annealing (BA) finish, (2) a BAS finish that removes fine particles and oil to the absolute maximum, and (3) an EPS finish that provides electro-polishing that boasts the highest smoothness in the industry. For NSCP A, our original inner surface bead smoothing technique, which we cultivated for medical piping, is applied at the time of the welding of the pipes, and after that, mechanical polishing (MPS) or additional electro-polishing (EPS) are used for finishing to achieve the high inner surface smoothness that is completely different from that of normal welded pipes.



## High Corrosion Resistance/High Cleanliness

In the semiconductor manufacturing processes, where large volumes of corrosive gasses are used, the corrosion of welded parts directly causes a reduction in the service life of equipment and in the yield of semiconductor products. The NSCP Series offers three types of materials depending on the corrosive environments in question: the high corrosion-resistance Ni-based material (NSCP N), the double-melt high-cleanliness material (NSCP D), and the single-melt material (NSCP S). They are all manufactured under NIPPON STEEL Group's highly sophisticated integrated quality control system to achieve stable corrosion resistance and cleanliness.



Corrosion  
Resistance

## Three Elements of Clean Pipes

The major factors that interfere with clean environment in semiconductor manufacturing are outgassing, adsorption, dust generation, corrosion, and the elution of impurities. For this reason, the inner surface of a clean pipe is required to have not only the material's inherent corrosion resistance but also the pipe itself is required to be smooth and clean, including after the welding process.

Smoothness

Cleanliness

**NSCP**  
NIPPON STEEL CLEAN PIPE

## NSCP Series

(Newly developed product)

**NSCP N**  
NIPPON STEEL CLEAN PIPE

Using a highly corrosion-resistant Ni-based material achieves low contamination and long service lives for piping, even in a highly corrosive gaseous environment that may corrode the conventional 316L.

(Old SUMICLEAN M)

**NSCP D**  
NIPPON STEEL CLEAN PIPE

By using a vacuum double-melt (VIM + VAR) material with impurity elements and non-metal inclusion being reduced as much as possible, high performance is maintained not only for the base material's properties but also for the weldability of processed pipes.

(Old SUMICLEAN C)

**NSCP S**  
NIPPON STEEL CLEAN PIPE

Although it uses a single-melt material, this pipe has lower impurity elements, many variations in steel types and finishing processes, and is applicable to a wide variety of members and uses.

(Old SUMIWEL)

**NSCP A**  
NIPPON STEEL CLEAN PIPE

Bead Rolling on the inner surface of a pipe at the time of making a welded pipe and subsequent mechanical polishing or additional electro-polishing are applied to secure the inner surface smoothness.

## Product name and characteristics

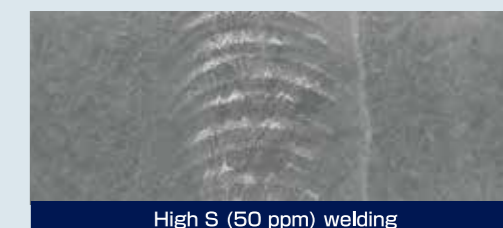
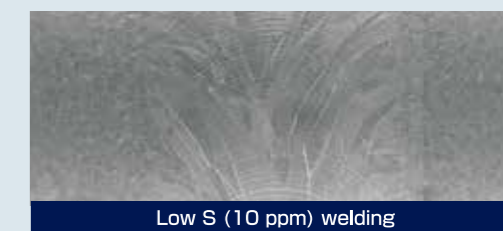
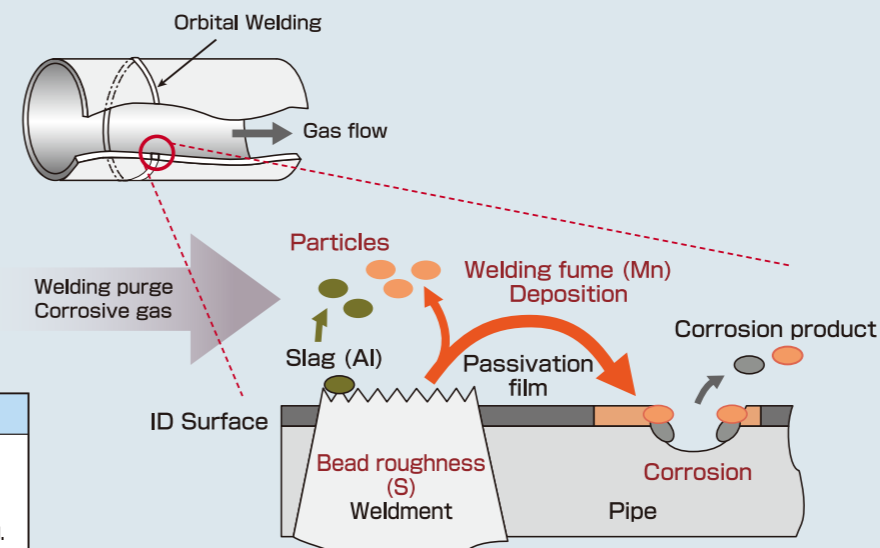
| Method        | Old series name | New series name / Product name |              | Pipe type (UNS No.) | Main components      | Product characteristics |             |
|---------------|-----------------|--------------------------------|--------------|---------------------|----------------------|-------------------------|-------------|
|               |                 | Series name                    | Product name |                     |                      | Corrosion resistance    | Cleanliness |
| Seamless pipe | —               | NSCP N                         | NSCP N22     | (N06022)            | 21Cr-13Mo-3W-Ni base | ★★★★                    | ★★★☆☆       |
|               | SUMICLEAN M     | NSCP D                         | NSCP D316L   | 316LTP              | 18Cr-12Ni-2Mo-Low C  | ★★★★☆                   | ★★★★☆*      |
|               | SUMICLEAN C     | NSCP S                         | NSCP S316L   |                     |                      | ★★★★☆                   | ★★★☆☆*      |
|               |                 |                                | NSCP S316    | 316TP               | 18Cr-12Ni-2Mo        | ★★★☆☆                   | ★★★☆☆       |
| Welded pipe   | SUMIWEL         | NSCP A                         | NSCP S304    | 304TP               | 18Cr-8Ni             | ★★★☆☆                   | ★★★☆☆       |
|               |                 |                                | NSCP A316L   | 316LTP              | 18Cr-12Ni-2Mo-Low C  | ★★★☆☆                   | ★★★☆☆*      |

## Surface finish and inner surface roughness

| Method        | NSCP Series | Surface finish     |           | Inner surface roughness (maximum height) |                               |
|---------------|-------------|--------------------|-----------|--|-------------------------------|
|               |             | Finishing process* |           | 1/8" ≤ OD ≤ 1" (3.18 mm to 20 A)         | 1" < OD ≤ 12" (25 A to 300 A) |
| Seamless pipe | NSCP N      | EPS                | BA+EP+SMC | ≤ 0.7 µm (aim)                           | —                             |
|               | NSCP D      | EPS                | BA+EP+SMC | ≤ 0.7 µm                                 | —                             |
|               | NSCP S      | EPS                | BA+EP+SMC | ≤ 0.7 µm                                 |                               |
|               |             | BAS                | BA+SMC    | ≤ 3.0 µm                                 | ≤ 4.5 µm                      |
| Welded pipe   | NSCP A      | EPS                | MP+EP+SMC | —  | ≤ 0.7 µm                      |
|               |             | MPS                | MP+SMC    | —  | ≤ 4.5 µm                      |

## \* Trace components and cleanliness of 316LTP

|                       | Main components 18Cr-12Ni-2Mo | JIS G3459 | NSCP D        | NSCP S | NSCP A      |
|-----------------------|-------------------------------|-----------|---------------|--------|-------------|
| Trace components      | C                             | ≤ 0.030%  | Extremely low | Low    | As per Std. |
|                       | S                             | ≤ 0.030%  | Low           | Low    |             |
|                       | Mn                            | ≤ 2.00%   | Extremely low | Low    |             |
|                       | Al                            | —         | Low           | Low    |             |
| Welding contamination | Gas components                | —         | Extremely low | —      |             |
|                       | Mn fume                       | Base      | Extremely low | Low    | Base        |
|                       | Slag                          | Base      | Low           | Low    | Base        |



Lower S improves welding bead roughness

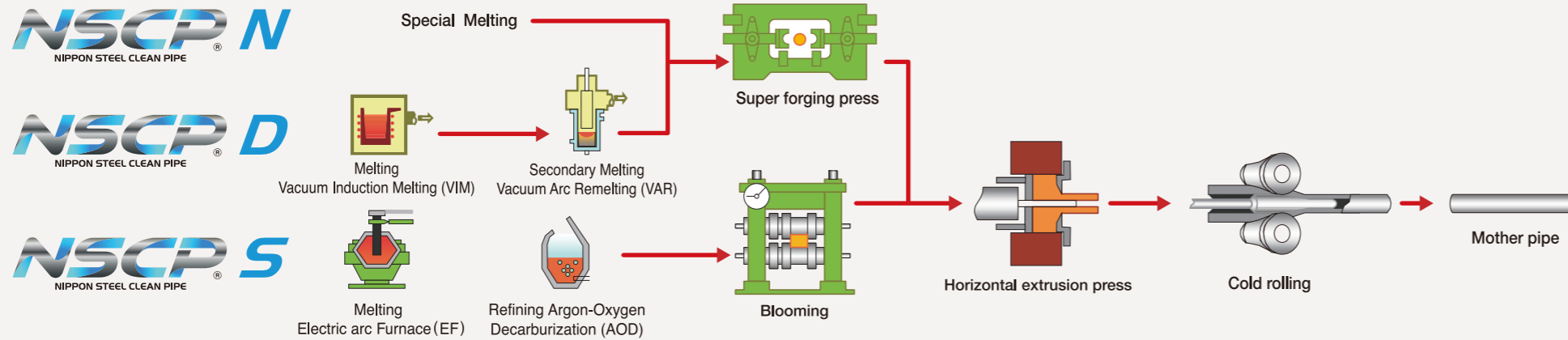
NSCP D316L uses NIPPON STEEL's strictly controlled high-cleanliness steel, which features excellent weldability and low welding contamination.

\*BA: Bright Annealing, EP: Electro-Polishing, SMC: Super Micro Cleaning, MP: Mechanical Polishing

# Manufacturing Process

NIPPON STEEL  
CLEAN PIPE

## Seamless pipe manufacturing process (NIPPON STEEL)



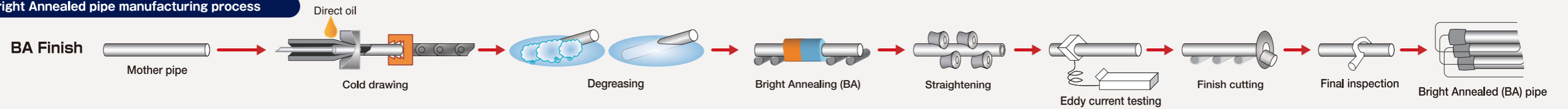
### Dimensions

| Series                     | Outside Diameter |      |       | Wall Thickness |      |              |
|----------------------------|------------------|------|-------|----------------|------|--------------|
|                            | (in.)            | JIS  | (mm)  | (in.)          | JIS  | (mm)         |
| NSCP N<br>NSCP D<br>NSCP S | 1/8              | —    | 3.18  | 0.028          | —    | 0.72         |
|                            | 1/4              | —    | 6.35  | 0.035<br>0.039 | —    | 0.89<br>1.00 |
|                            | 3/8              | —    | 9.53  | 0.035<br>0.039 | —    | 0.89<br>1.00 |
|                            | 1/2              | —    | 12.7  | 0.039<br>0.049 | —    | 1.00<br>1.24 |
|                            | 3/4              | —    | 19.05 | 0.049          | —    | 1.24         |
| 1                          | —                | 25.4 | 0.065 | —              | 1.65 |              |

NSCP N : Please contact us for sizes other than 1/4 (in), 3/8 (in), and 1/2 (in).

| Series | Outside Diameter |     |       | Wall Thickness |       |              |
|--------|------------------|-----|-------|----------------|-------|--------------|
|        | (in.)            | JIS | (mm)  | (in.)          | JIS   | (mm)         |
| NSCP S | 5/8              | —   | 15.88 | 0.039<br>0.049 | —     | 1.00<br>1.24 |
|        | 3/4              | —   | 19.05 | 0.065          | —     | 1.65         |
|        | —                | 15A | 21.7  | —              | Sch5S | 1.65         |
|        | —                | 20A | 27.2  | —              | Sch5S | 1.65         |
|        | —                | 25A | 34.0  | —              | Sch5S | 1.65         |
|        | —                | 32A | 42.7  | —              | Sch5S | 1.65         |
|        | —                | 40A | 48.6  | —              | Sch5S | 1.65         |
|        | —                | 50A | 60.5  | —              | Sch5S | 1.65         |

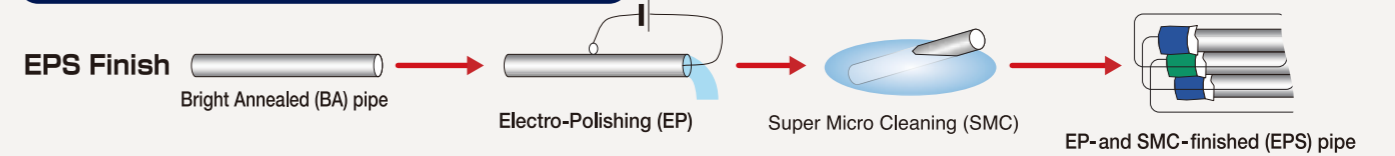
## Bright Annealed pipe manufacturing process



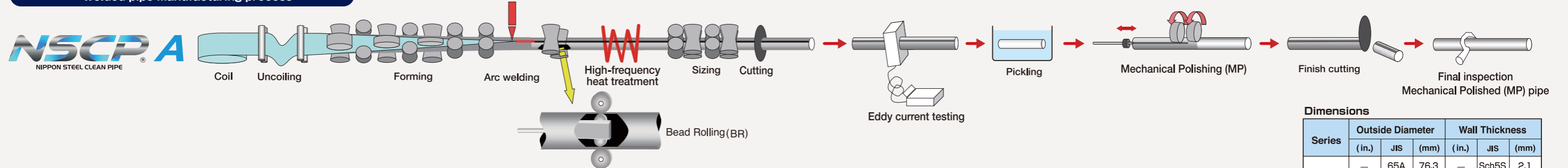
## Surface treatment: Super Micro Cleaning (SMC)



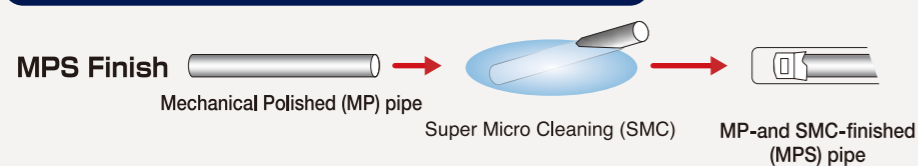
## Surface treatment: Electro-Polishing (EP)



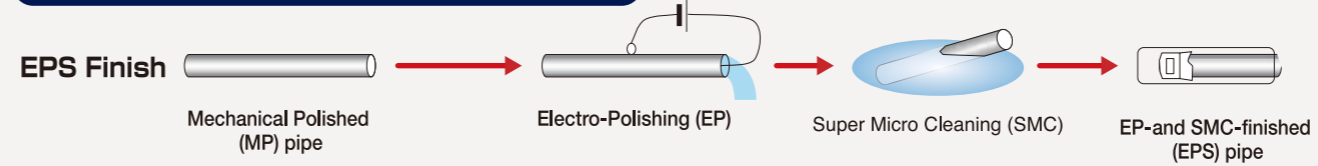
## Welded pipe manufacturing process



## Surface treatment: Super Micro Cleaning (SMC)



## Surface treatment: Electro - Polishing (EP)



### Dimensions

| Series | Outside Diameter |      |       | Wall Thickness |       |      |
|--------|------------------|------|-------|----------------|-------|------|
|        | (in.)            | JIS  | (mm)  | (in.)          | JIS   | (mm) |
| NSCPA  | —                | 65A  | 76.3  | —              | Sch5S | 2.1  |
|        | —                | 80A  | 89.1  | —              | Sch5S | 2.1  |
|        | —                | 100A | 114.3 | —              | Sch5S | 2.1  |
|        | —                | 125A | 139.8 | —              | Sch5S | 2.8  |
|        | —                | 150A | 165.2 | —              | Sch5S | 2.8  |
|        | —                | 200A | 216.3 | —              | Sch5S | 2.8  |
|        | —                | 250A | 267.4 | —              | Sch5S | 3.4  |
|        | —                | 300A | 318.5 | —              | Sch5S | 4.0  |