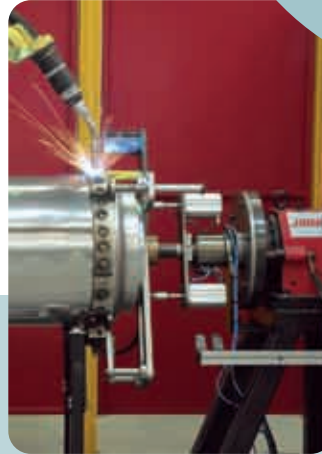


# Stainless Steel Sheet, Coil and Plate



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# Stainless steel sheet, coil, strip and plate



## Specification

**ASTM A240M.** Chromium and chromium-nickel stainless steel plate, sheet and strip for pressure vessels and for general applications.

**ASTM 480M.** General requirements for flat rolled stainless and heat-resisting steel plate, sheet and strip.

## Production

Stainless steel coil and plate consumed by the Australian and New Zealand market is supplied from mills throughout the world in hot rolled and cold rolled conditions.

Product	Production process	Description	Abbreviation
Hot rolled	Hot rolled, annealed and pickled.	Condition and finish preferred for corrosion-resisting and heat-resisting applications. Typically available in thickness 5mm and above.	No.1 or HRAP
Cold rolled	Hot rolled, annealed, descaled, cold rolled, annealed, pickled, final skin pass rolled.	Smooth finish achieved by cold rolling, then annealing and pickling, followed by skin pass rolling. Typically available in thickness up to 8mm.	2B

## Stainless steel flat products from coil

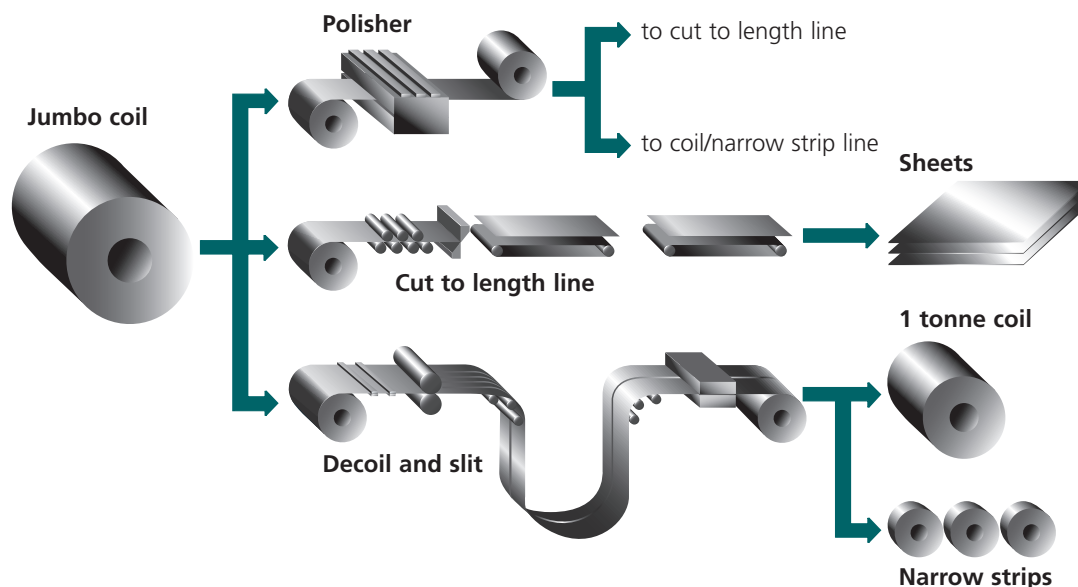
The internationally recognised crossover thickness between what is referred to as sheet and plate is 5.0mm. This is specified in ASTM A480M.

Therefore, **sheet** is thickness less than 5.0mm and **plate** is 5.0mm and over.

It is common practice for large stainless steel coils to be brought into Australia and processed by a specialty metals service centre into smaller coils, sheet, strip and plate. Product over 12mm is brought into Australia as plate only.

The range of stock of stainless steel flat products produced from large coil is limited to mill production constraints in thickness, width and grade and the processing equipment at the coil service centre.

## Flat products processing line



## Surface finishes

The following stainless steel finishes are commonly used in the Australian and New Zealand market.

Finish	Description
2B	The general-purpose, cold rolled, smooth finish obtained as a result of a final light pass through polished rolls at the mill.
BA	Bright annealed finish is a bright, cold rolled, highly reflective finish retained by final annealing in a controlled atmosphere furnace. The finish has large application in the appliance and automotive industry and as a decorative finish in architecture. The brightness and reflectivity is a function of thickness and grade. Consultation is recommended prior to specification in architectural applications. BA finish is usually supplied with a PE or PVC coating as a surface protection.
No.4	Produced from 2B finish often by a service centre rather than the production mill. It is a general-purpose ground polished finish used widely for kitchen equipment and applications requiring a decorative finished finish. No.4 finish is usually supplied with a PE or PVC coating as a surface protection.
No.8	Highly reflective 'mirror' finish. Produced from 2B finish by polishing with successive finer abrasives followed by extensive buffing. Mainly used in architectural applications.
Customer-specific	A service centre with polishing equipment can produce special finishes for specific applications.



# The Atlas Steels bulk coil stocking program

## Stainless steel sheet, coil and strip 0.45mm to less than 5mm thick – ASTM A240M

From many years of experience Atlas Steels has determined the popular range of grades, widths and thicknesses to be held in its coil program to service customer demand.

The standard range is as follows.

Coil and strip					Sheet	
Grade	Thickness (mm)	Coil width (mm)	Finish	Coating	*Length (mm) Imperial	Metric
304 316	0.45 0.55 0.70 0.90	914 1219	2B No.4 BA	PE	1829 2438 3048 3658	1800 2400 3000 6000
304 316	1.20 1.50 1.60 2.00	914 1219 1500	2B No.4 BA	PE		
304 316	2.50 3.00	914 1219 1500	2B No.4	PE		
304 316	1.50 1.60 2.00 3.00	2000	2B	PE		
304/304L 316/316L	4.00	1500 2000	2B No.1	PE		
430	0.70 0.90	914 1219	2B BA No.4	PE		
AtlasCR12 AtlasCR12Ti	1.20 1.60 2.00 3.00	1250 1500	2B			
	4.00	1250 1500	No.1			
AtlasF20S	0.70 0.90 1.20 1.50 2.00	1219	2B No. 4	PE		
Atlas444	0.70 0.90 1.20 1.50 2.00	1219 1500	2B No. 4	PE		

Other grades and widths available, but not always ex-stock.

Grades: 301L, 310, 321, 2205, 253MA.

Widths (mm): 600, 750, 900, 1050, 1200, 1524.

Product outside the standard range can be indented from overseas mills or stocked by special arrangement.

\*Through our processing facilities any length up to 15000mm can be produced (refer table p8/S2).

## Stainless steel coil plate – ASTM A240M

The most efficient route for a stainless steel production mill to produce plate (5mm and over) is in coil form. The coil is then further downstream processed by the mill or through a service centre with equipment to flatten (often called 'levelling') and cut to length.

The maximum plate width produced by mills from coil is 2000mm and the maximum thickness is 13mm for hot rolled and 8mm for cold rolled.

Atlas, through the AMP coil service centre, has the capability to process large stainless steel coils in thickness up to 6mm (8mm for aluminium) and in widths to 2000mm. This enables an extensive range of cold and hot rolled coils to be held with the flexibility to convert into small coils, sheet, strip and plate in standard and customised lengths.

Grade	Thickness (mm)	Coil width (mm)	Finish
304/304L 316/316L	5.0 6.0	1500 2000	2B No.1
304/304L 316/316L	8.0 10.0 12.0	1500 2000	No.1
AtlasCR12 AtlasCR12Ti	5.0 6.0	1250 1500	No.1

Other grades available, but not always ex-stock.

Grades: 301L, 310, 321, 2205, 253MA.

Coil plate is commonly stocked in dual certified grade, i.e. 304/304L and 316/316L.

## Stainless steel quarto plate products – ASTM A240M

Another method of producing stainless steel plate within and beyond the thickness range of coil production is from a slab of steel that is rolled in the flat condition to a specified length, width and thickness. The product of this process is commonly referred to as quarto plate and is available from mills in thickness from 5mm and above and widths to 4000mm in some thicknesses.

The standard grades and thickness for quarto plate are as follows:

<b>Grades</b>	304/304L, 316/316L, AtlasCR12, 321, 321H, 2205, 253MA
<b>Thickness (mm)</b>	5.0, 6.0, 8.0, 10.0, 12.0, 16.0, 20.0, 25.0, 32.0, 40.0, 50.0
<b>Width (mm)</b>	1500, 2000, 2500
<b>Length (mm)</b>	6000, 7500, 8000
<b>Finish</b>	No.1

Non-standard grades, widths and lengths can be obtained to individual customer-specific requirements.

Quarto plate is commonly stocked as a dual certified grade, i.e. 304/304L and 316/316L.



### **Stainless steel chequer (floor) plate**

<b>Grades</b>	304
<b>Thickness (mm)</b>	3.18, 4.76, 6.00
<b>Width (mm)</b>	1219, 1250 (6mm only)
<b>Length (mm)</b>	2438, 3048, 2500 (6mm only)

### **Plasma cut processing for plate**

Atlas Steels warehouses have modern plasma equipment for the precision profiling of plate shapes.

Processing thickness range is from 3mm to 65mm. Maximum width is 3000mm and length is 12000mm.

Plasma equipment is supported by modern CAD/CAM control and production programming facilities.

The Atlas warehouse in Kalgoorlie has modern oxy profile equipment for the precision profiling of steel plate shapes.

Please contact your sales representative for individual State processing capabilities and service parameters.

# Processing of stainless steel sheet, coil, strip and plate



Atlas Steels holds an extensive stock of bulk coils at its coil service centre, Atlas Metal Processors (AMP), located at Warragamba, NSW and offers a service to provide stainless steel sheet, coil and strip in a range of combinations of thickness, length, width and finish.

The following presents a guide to the capabilities of this service centre.

## The service centre

The AMP service centre is a 6500 square metre warehouse with modern processing equipment to convert large coils of stainless and aluminium into:

- small coils;
- sheet and plate;
- slit strip;
- polished finishes; and
- scotchbrite finishes.

The latest technology has been incorporated in materials handling equipment and information and communications systems. These complement the state-of-the-art processing equipment and provide efficient process management and customer service.

## Sheet cut to length line

A high speed line optimised for accurate cutting of standard or special length sheets.

The line's capabilities and features are:

- 0.3-2mm thickness;
- 200-1580mm width;
- Side trimming unit (minimum 5mm to 40mm maximum per side trim);
- Length validation and feedback system to maintain consistency;
- Stacker automatically sets to order requirement;
- Herr Voss leveller enables automatic set-up feature, which can be activated by gauge or coil identification number. This feature saves time and material on partly processed coils held in stock, as the leveller will set up the same parameters previously used;
- Six high Herr Voss leveller enables the bottom surface to be treated with the same loving care as the top surface (most lines are only four high and a few are five high). Back up transfer marks are a thing of the past;
- High speed (up to 76m per minute);
- All rolls in contact with the strip are coated to reduce the possibility of scratching;
- Double-sided PE application;
- Paper interleaving;
- 12.5 tonne maximum input coil weight.



## Plate cut to length line

This is a complete processing line that features shears, leveller and stacker.

The line's capabilities and features are:

- 500-2000mm processing width;
- 1.6-6mm stainless steel thickness and to 8mm for aluminium;
- 700-15000mm length;
- in-line double sided PE applicator; and
- 1-14.5 tonne input coil weights.

## Polishing line

This line is an Imeas coupled polishing/brushing unit which provides polished and brushed finishes including, No. 4, Scotchbrite, Duplo and custom finishes to meet most needs.

Polishing belts are formulated to provide a uniform polished surface. A roughness gauge is used to measure every coil to verify consistency of finish from coil to coil.

The line's capabilities and features are:

- 300-1580mm processing width;
- 0.3-2mm thickness up to 1580mm wide and up to 1220mm wide to 3mm;
- 7.5 tonne back tension coupled with a control system to optimise polishing conditions;
- rolls in contact with steel are coated to minimise the possibility of surface scratching;
- in-line double-sided PE applicator and paper interleaving; and
- 1-12.5 tonne input coil weights.

## Slitting line

This line has been designed to provide maximum flexibility in producing high quality slit, narrow width material.

The line's capabilities and features are:

- 200-1580mm processing width;
- 0.3-3mm thickness for stainless steel and 5mm maximum for aluminium;
- minimum 25mm slit width;
- computer-aided shimless slitting process to maintain accuracy of width;
- unique slit coil down-layer to minimise bore scoring;
- rolls in contact with steel or aluminium are coated to minimise the possibility of surface scratching;

- in-line double sided PE applicator and paper interleaving;
- conventional drag, tension rolls, bridle or combination of tension control;
- pull, loop, driven and combination slitting techniques; and
- 1-12.5 tonne input coil weights.

## Materials handling and packaging

Materials handling and packaging for stainless steel sheet, coil and strip are critical to minimising product damage. A range of innovative solutions has been installed such as coil-lifting devices that do not damage product, high-speed coil cars for transporting coils to the processing line and a down-layer for slit coil to minimise bore scratches.

One tonne coils are vertically packed with strong top and bottom pallets and a protective wrap of heavy corex around the coil.

Sheet and plate are packed on strong wooden pallets and with secure strapping to withstand extensive handling and transportation.

Customised packing is provided subject to enquiry.

## Processing parameters

Sheet and plate size limits						
Thickness (mm)	Width (mm)		Length (mm)		Input coil mass (tonne)	Outside diameter
	Min.	Max.	Min.	Max.	Max.	Max.
0.30 - 2.00	200	1580	200	6000	12.5	1650
2.00 - 6.00	500	2000	700	15000	14.5	1650

Sheet and plate length tolerance		
Thickness (mm)	Length (mm)	Tolerance (mm)
0.30 - 2.00	Up to 5000	+3.0, -0.0
2.01 - 3.00	Up to 3000	+4.0, -0.0
	Up to 6000	+6.0, -0.0
	Up to 10000	+10.0, -0.0
	Up to 15000	+15.0, -0.0
3.01 - 6.00	Up to 3000	+4.0, -0.0
	Up to 6000	+6.0, -0.0
	Up to 10000	+10.0, -0.0
	Up to 15000	+16.0, -0.0

Note: Length tolerances on double sided plastic coating +7, -nil

Sheet and plate squareness tolerance		
Width (mm)	Length (mm)	Squareness (mm)
Up to 914	Up to 3000	4
	Up to 6000	5
	Up to 10000	6
915 to 1500	Up to 3000	4
	Up to 6000	6
	Up to 10000	8
1501 to 2000	Up to 3000	5
	Up to 6000	7
	Up to 10000	10

**Side trim:** Available up to 3.0mm thick and 1580mm wide. Side trim allowance is a minimum 5mm per side from 3mm to 0.7mm and 10mm per side below 0.7mm to a maximum of 40mm per side (allowance is the same for slitting).

Sheet and plate flatness tolerance		
Thickness (mm)	Width (mm)	Amplitude* (mm)
0.3 - 1.50	900	10
	1200 / 1500	10
1.51 - 5.00	900 / 1200	10
	1500	10
	2000	12
5.01 - 6.00	900 / 1200	10
	1500	12
	2000	12

**\*Note:** Deviation from a straight-edge.

Slit strip size limits								
Thickness (mm)	Width (mm)		Input coil (mm)		Input coil mass (tonne)		Outside diameter	Slit width tolerance
	Min.	Max.	Min.	Max.	Min.	Max.	Max.	
0.3 - 3 (stainless) 0.3 - 5 (aluminium)	200	1580	300	1580	0.5	12.5	1650	±0.2mm

Polishing					
Thickness (mm)	Width (mm)		Input coil mass (kg)		Outside diameter
	Min.	Max.	Min.	Max.	Max.
0.30 - 2.00	300	1580	500	12500	1650
2.01 - 3.00	500	1250	500	12500	1650

Polishing roughness values	
Finish	Ra (µm)
No.4	0.15 - 0.50
Duplo	0.10 - 0.40
Scotchbrite	0.05 - 0.17

Recoiling					
Thickness (mm)	Width (mm)		Input coil mass (kg)		Outside diameter
	Min.	Max.	Min.	Max.	Max.
0.30 - 3.00	200	1580	500	12500	1650

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