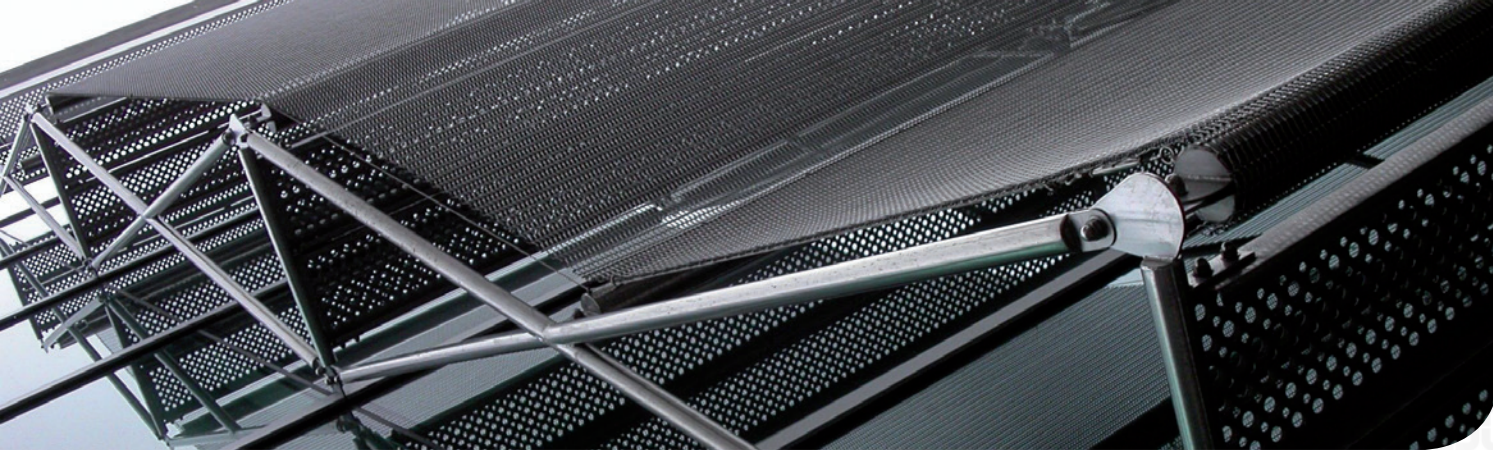


STAINLESS STEEL





GENERAL INFORMATION

Steel & Tube is a leading distributor of stainless steel, operating from locations nationwide. We have extensive experience in providing ongoing maintenance support to major corporations, supplying large scale projects, and of course catering to the day-to-day requirements of New Zealand's stainless steel fabricators.

Major end-use industries include:

- Dairy
- Wine and beverage
- Pulp and paper
- Catering equipment
- Architectural/construction
- Meat and food processing
- Water treatment
- Petrochemical

Our extensive range includes the following products, with 304 and 316 austenitic grades available ex-stock, while other grades and products are available on an indent basis:

- Flat products, such as stainless steel coil, sheet and plate
- Bars in round, square, flat, angle and channel
- Square and rectangular tube
- Schedule pipe and fittings
- Hygienic tube and fittings
- Architectural balustrades and fittings
- Mesh and perforated sheet
- Pipe and tube valves
- Coloured, patterned and textured architectural stainless steel sheet
- Fasteners
- Tig stainless steel welding wires
- Protective films
- Food grade lubricants
- Anti-galling compounds

We also stock a comprehensive range of sundry items.

STAINLESS STEEL FINISHES

Common finishes held in stock are No.1, 2B, BA, No.4, however other finishes can be sourced.

FINISHES

No.1

Hot-rolled, annealed and pickled. Generally used where smoothness of finish is not a design consideration.

2D

A cold-rolled finish obtained from a final annealing and pickling, or a final light cold-roll pass on dull rollers, which may be polished after fabrication.

2B

A bright, moderately reflective cold-rolled finish with the annealed and de-scaled coil receiving a final light roll pass through polished rolls. This is the general purpose cold-rolled finish that can be used as is, or as a preliminary step to polishing. 2B is the most commonly used surface finish in the food and beverage sector.

BA (Bright Annealed) A mirror-like appearance, it is produced by cold-rolling, then annealing in a controlled atmosphere furnace. Grinding of the surface is then undertaken while the product is at an intermediate gauge, before the product is given a light skin pass through a cold mill over highly polished rolls. The bright finish is often used for architectural applications or uses including appliance trim, cookware, benches and food processing equipment.

No.4

A 'brushed' or 'satin' finish obtained from mechanical polishing with 120-240 grit. Used in dairy and kitchen equipment. Meets international 3A Hygiene Standards.

No.8

A mirror finish for high reflectiveness. Can be used as mirrors or reflectors.

HL (Hairline)

A finish obtained by mechanical polishing with 120-320 grit.

CF (Cold-formed)

A smooth flat reflective finish.

BP (Buff-polished)

Mechanically polished tube using 220-240 grit.

AW (As welded)

Receives no further treatment after forming and welding.

SPECIAL NOTES

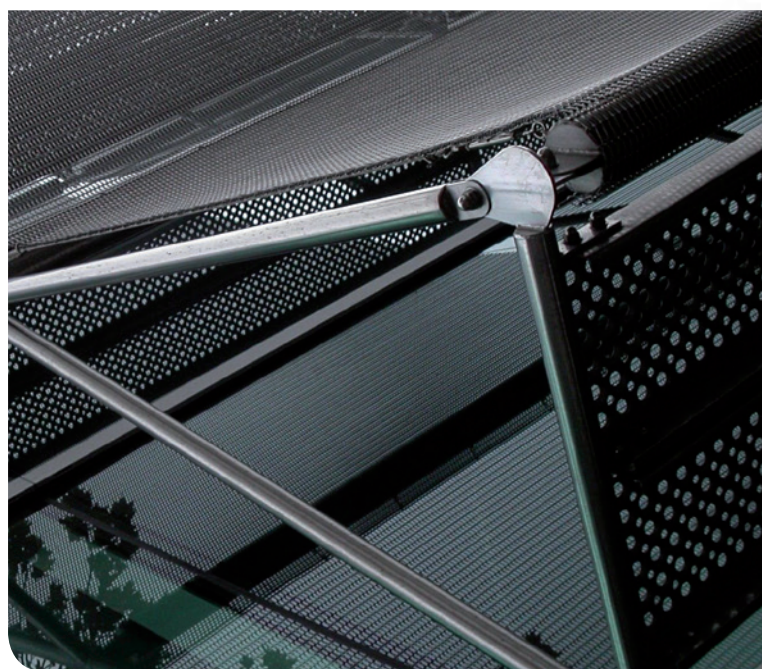
Although every endeavour has been made to have all detail contained in the catalogue correct at the time of printing, we suggest product specification be confirmed with your Steel & Tube representative when placing orders.

For an up-to-date version of this catalogue please refer to our website. Items identified in this catalogue as 'stocked items' are defined as goods normally held in stock, and are subject to prior sales.

Steel & Tube terms of trade are supplied at the time of opening a trading account and are available upon request. A copy of this appears on the reverse of all invoices issued. A minimum order charge may apply.

All weights and dimensions provided in this catalogue are theoretical.

Mill tolerances will affect actual weights (+/-). All weights in this catalogue are based on a density of stainless steel being 8000kgs/m³.



TYPES OF STAINLESS STEEL

Stainless Steel is a name given to a group of steel alloys that contain more than 10.5% Chromium. Chromium has a high affinity for oxygen and forms a stable oxide film on the surface of stainless steel.

The film is called the "passive oxide layer" and forms instantaneously in ordinary atmospheres. The film is self-healing and rebuilds when it has been removed. It is this film that gives stainless steel its corrosion resistance.

AUSTENITIC GRADES

When nickel (Ni) is added to stainless steel in sufficient quantities the crystal structure is changed from ferrite to austenite, hence the term austenitic stainless steel. The basic composition of austenitic stainless steel is 18% chromium (Cr) and 8% nickel (Ni). This is called 304 grade, sometimes referred to as 18/8 or 18/10. If additional corrosion resistance is required 2% molybdenum (Mo) is added to form grade 316.

DESCRIPTIONS AND GENERAL USES

303 (INDENT ONLY)

Especially developed for machining - especially where it involves extensive machining in automatic screw machines. Sulphur or selenium is added to give excellent free machining and non-seizing properties. As sulphur or selenium is added corrosion resistance is lower than T304. T303 is not recommended for welding. Non-magnetic when annealed but becomes slightly magnetic when cold-worked.

304

The most widely used stainless steel with the best all round performance. Its carbon content is lower and its corrosion resistance after welding is higher than T302. It is less susceptible to intergranular corrosion after welding. Non-magnetic but slightly magnetic when cold worked.

304L

A low carbon stainless steel with general corrosion resistance like T304, but with superior resistance to intergranular corrosion following welding or stress relieving. Highly recommended for parts which are fabricated by welding and which can not be annealed. Generally limited to temperatures up to 426°C. The physical properties and thermal treatments of T304L are similar but not identical to T304. Non-magnetic when annealed but slightly magnetic when cold-worked.

316

Also known as marine grade stainless steel. T316 has 2-3% molybdenum which improves corrosion resistance. T316 has superior corrosion resistance to other austenitic steels when exposed to many types of chemical corrodents as well as marine environments - T316 also has applications in the chemical, textile, and paper industries. It has better strength and creep resistance at high temperatures than T304 and greater work hardening properties. Non-magnetic but slightly magnetic when cold-worked.

316L

Has lower carbon than T316, with corrosion resistance similar to T316, but superior resistance to intergranular corrosion following welding or stress relieving. It is recommended for parts which cannot be subsequently annealed. Service temperatures up to 426°C. The physical properties and thermal treatments of type 316L are similar but not identical to type 316. Non-magnetic when annealed but slightly magnetic when cold-worked.

MARTENSITIC GRADES

This grade contains 12%-18% chromium and 0.08%-1.00% carbon. The high carbon content allows the stainless steel to respond well to heat treatment to give various mechanical strengths such as hardness. However the carbon is detrimental when welding and care must be taken.

Grades 409, 410, 420 and 431 are typical martensitic grades.

FERRITIC GRADES

These are nickel free. They have varying chromium content of 12%-22% but a lower carbon content than the martensitic grades.

The increased chromium increases corrosion resistance at elevated temperatures, however the lack of mechanical properties due to the fact that it cannot be heat-treated limits its application.

DESCRIPTIONS AND GENERAL USES

430

A corrosion and heat resisting stainless steel with superior corrosion and heat resistance compared to type 410. Type 430 is non hardenable and possesses only mild cold-working properties due to the high chromium content. Its weldability is excellent and does not require subsequent annealing. Magnetic in all conditions. Common uses include builders hardware, domestic appliances (driers, dishwashers) and automotive trim.

DUPLEX STAINLESS STEEL

Duplex stainless steels have a structure of approximately equal amounts of ferrite and austenite and therefore may be referred to as ferritic-austenitic stainless steel.

The chromium varies from 18%-28% and a nickel content of 4.5% to 8% is insufficient to develop a fully austenitic crystal structure. Most grades contain molybdenum in the 2.5%-4% range, plus a small nitrogen addition which enables both strength and pitting resistance. Common uses include applications such as heat exchanger panels and tubes, tanks and vessels where high chloride concentrations are present eg sea water cooling, desalination, food pickling plants and aggressive marine waters.

STAINING AND CORROSION OF STAINLESS FITTINGS – PREVENTION IS BETTER THAN CURE

Stainless steel is an incredibly resistant building product but it is not impervious to mild staining or even corrosion in some instances. There are several factors and agents that cause both unsightly staining and more serious metal corrosion. These include exposure to marine salt or other corrosive environments, poor design or installation, surface finish and the grade of stainless steel.

Coastal conditions may be experienced as much as 20km inland from the sea, with airborne salt finding its way onto the surface and into welds and joints of stainless fittings. This salt, as well as dirt, can cause tea staining.

Tea staining is a brown discolouration of the surface. It does not structurally affect the metal but is unsightly. Washing on a regular basis with detergent or soap reduces the chances of staining. Care should be taken with all chemical cleaners and those containing chloride, such as bleach, can potentially cause surface marking on the metal. Avoid steel wool or any carbon steel cleaning tools (such as scrapers) as these may actually cause more corrosion through reaction with the stainless steel.

The design and position of the stainless steel can also impact on its appearance. If water is allowed to pool on the surface, or dirt and dampness collect in corners and hollows the stainless steel is likely to stain. Well ventilated, free-draining installations are best.

316 grade stainless is recommended for marine or corrosive areas as it has a small percentage of molybdenum added, improving resistance to tea staining and corrosion.

304 grade is slightly less corrosion resistant and is used extensively away from the coast. Using a higher polish/grit number can reduce the deposits or contaminants in most instances. All handrails and fittings in this publication are 316 or 304 grade unless otherwise indicated.

The recommendations given here for the maintenance of stainless fittings are general guidelines only. It is better to take extra care of your stainless than to follow minimum guidelines. These suggestions are based on recommendations from the Australian Stainless Steel Development Association (ASSDA).



STAINLESS – NOT STAIN-FREE

Pollen and other airborne matter, as well as salt can create corrosion on stainless steel. Rain washing the stainless steel surface may help reduce tea staining, and should therefore be an important project design consideration. Best results are achieved by washing with soap or mild detergent and warm water followed by rinsing with clean cold water.

The frequency of cleaning required will vary depending on the environment and distance from the sea, but should be at least every three months, and more frequently as required.

IF STAINING HAS OCCURRED, CONSIDER THE FOLLOWING CLEANING OPTIONS:

Fingerprints – wash with alcohol, trichloroethylene or acetone. Rinse with water and wipe dry.

Oil and grease – wash with alcohol, trichloroethylene or acetone, followed by a detergent or soap wash, rinse with water and wipe dry.

Stains and discolouration – wash with mild abrasive detergent or soap, rub in the same direction as the visible structure or surface pattern. Rinse with water and wipe dry, or wash with weak phosphoric acid solution, rinse with ammonia solution followed by water and wipe dry.

If necessary, use a plastic abrasive pad such as Scotchbrite with soapy water for a more vigorous clean (follow the visible structure or surface pattern).

Rust stains – coat the affected area with oxalic acid solution for 15-20 minutes, water rinse and wipe dry. Use abrasives (as above) if necessary.

Paint – coat the paint with a proprietary paint solvent using a soft nylon brush, water rinse and wipe dry.

Notes:

- Do not use steel brushes or steel wool, and do not use hydrochloric acid on stainless steel.
- Always use protective equipment (rubber or latex gloves, protective eyewear etc) and work in a well ventilated area when using chemicals.

PERFORATED SHEET

PERFORATED 304 SHEET

| CODE | THICKNESS MM | WIDTH MM | LENGTH MM | HOLE DIAMETER MM | OPEN AREA % | HOLE CENTRES MM | FINISH |
|----------|--------------|----------|-----------|------------------|-------------|-----------------|--------|
| S153PS* | 1.5 | 1200 | 2400 | 3.00 | 32.6 | 5.00 | 2B |
| S15476PS | 1.5 | 1200 | 2400 | 4.76 | 50.9 | 6.35 | 2B |
| S156PS* | 1.5 | 1200 | 2400 | 6.00 | 40.0 | 9.00 | 2B |
| S158PS* | 1.5 | 1200 | 2400 | 8.00 | 58.0 | 10.00 | 2B |
| S1510PS* | 1.5 | 1200 | 2400 | 10.00 | 46.0 | 14.00 | 2B |
| S1520PS | 1.5 | 1200 | 2400 | 20.00 | 63.0 | 24.00 | 2B |

WALKWAY SHEET & PLANK PROFILES

These planks are punched and folded in New Zealand to meet the needs of industry where steps, walkways and ramps are required. Standard size is 300mm wide x 50mm deep with 25mm return. Available in 3 metre lengths. Custom sizes available upon request. 304 grade standard. 316 grade available upon request.

Product codes:

S21224WWS:

WALKWAY SHT 2.0mm x 1200mm x 2400mm 304

15mm Dia Dimple x 6.35mm Dia Hole

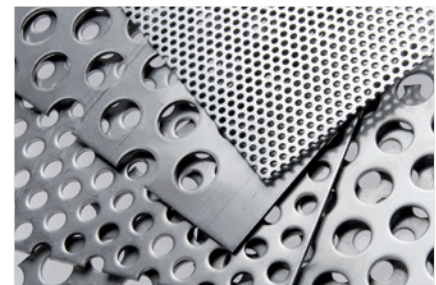
S2123WWS:

WALKWAY SHT 2.0mm x 1200mm x 3000mm 304

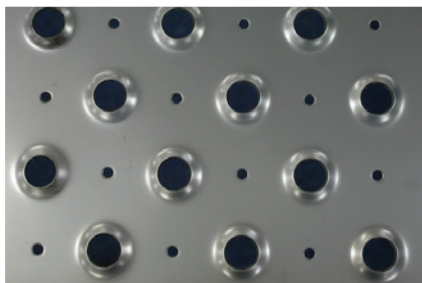
15mm Dia Dimple x 6.35mm Dia Hole

S2WWP:

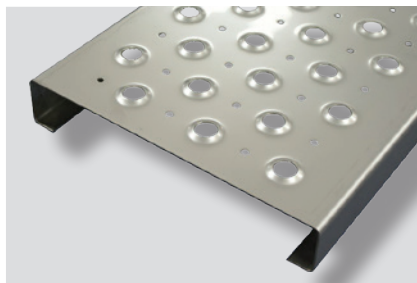
WALKWAY PLANK 2.0mm x 25mm x 50mm x 300mm 304 6.35mm Dia Hole, 3000mm long



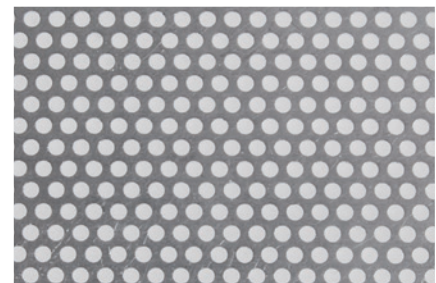
PERFORATED SHEET



WALKWAY SHEET



WALKWAY PLANK



3MM DIAMETER SHEET



6MM DIAMETER SHEET



8MM DIAMETER SHEET



10MM DIAMETER SHEET

* Denotes normal stock items, other sizes and grades are available by request only.

Notes:

- Additional services: Individually custom designed perforations and patterns can be supplied.
- Perforations also available in No.4 and mirror finish upon request.
- Lead times may apply.

STAINLESS STEEL STANDARD MESH



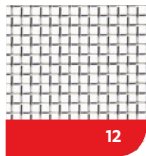
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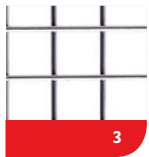
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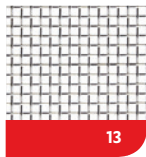
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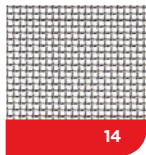
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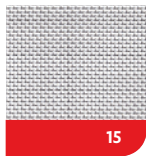
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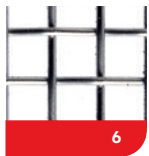
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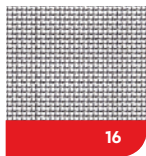
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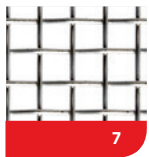
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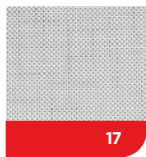
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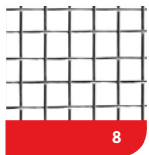
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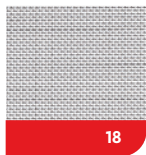
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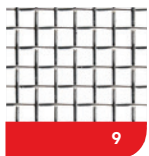
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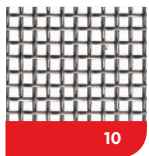
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WELDED MESH

| PIC# | SQUARES PER INCH | APERTURE MM | WIRE DIAMETER MM | WEIGHT KG/M ² | 304 |
|------|------------------|-------------|------------------|--------------------------|--------|
| 1 | 1 x 1 | 23.4 | 1.6 | 1.25 | S116M* |
| 2 | 2 x 2 | 11.1 | 1.6 | 2.53 | S216M* |
| 3 | 4 x 4 | 5.55 | 0.8 | 1.25 | S48M* |

WOVEN MESH

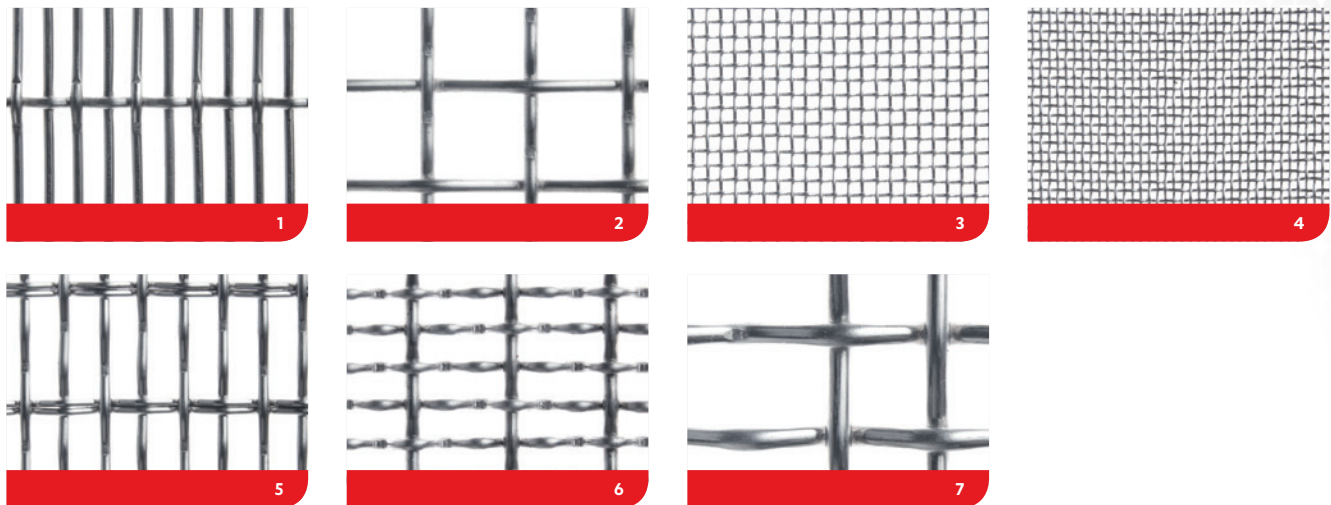
| PIC# | SQUARES PER INCH | APERTURE MM | WIRE DIAMETER MM | WEIGHT KG/M ² | 304 |
|------|------------------|-------------|------------------|--------------------------|------------|
| 4 | 2 x 2 | 11.1 | 1.6 | 2.53 | S21625M* |
| 5 | 4 x 4 | 4.75 | 1.6 | 5.07 | S41625M* |
| 6 | 4 x 4 | 5.15 | 1.2 | 2.73 | S41219M* |
| 7 | 6 x 6 | 3.43 | 0.8 | 1.85 | S6812M* |
| 8 | 8 x 8 | 2.72 | 0.45 | 0.79 | S8457M |
| 9 | 10 x 10 | 2.04 | 0.5 | 1.23 | S10503M* |
| 10 | 14 x 14 | 1.24 | 0.57 | 2.2 | S1457M* |
| 11 | 16 x 16 | 1.29 | 0.29 | 0.66 | S16294M* |
| 12 | 20 x 20 | 0.98 | 0.29 | 0.83 | S20294M* |
| 13 | 24 x 24 | 0.77 | 0.77 | 1.26 | S24294M |
| 14 | 30 x 30 | 0.55 | 0.29 | 1.24 | S30294M* |
| 15 | 40 x 40 | 0.4 | 0.23 | 1.03 | S40233M |
| 16 | 50 x 50 | 0.31 | 0.19 | 0.9 | S50193M* |
| 17 | 60 x 60 | 0.23 | 0.19 | 1.1 | S60193M* |
| 18 | 80 x 80 | 0.19 | 0.12 | 0.55 | S801219M* |
| 19 | 100 x 100 | 0.15 | 0.1 | 0.47 | S1001016M* |

* Denotes normal stock items.

Notes:

- Other sizes and grades (316) are available upon request only.
- All standard mesh supplied in roll-form – 1m x 30m.
- Sold cut-to-length.
- New Item: S146M will replace S1457M.

STAINLESS STEEL DESIGNER MESH



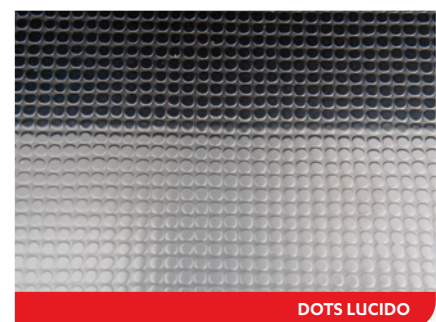
| PIC# | MESH TYPE | APERTURE MM | WIRE DIAMETER MM | OPEN AREA % | WEIGHT KG/M ² | SHEET SIZE | 316 |
|------|-------------|-------------|------------------|-------------|--------------------------|-------------|--------|
| 1 | Mono Weave | 2.5 x 30 | 2 | 52 | 6.60 | 2500 x 1200 | SMWM6* |
| 2 | Mono Square | 12.5 x 12.5 | 2.5 | 69 | 5.30 | 2500 x 1200 | SMSM6 |
| 3 | Protecta | 1.4 x 1.4 | 0.71 | 44 | 3.20 | 2500 x 1200 | SPRM6* |
| 4 | Herringbone | 0.71 x 0.9 | 0.56 | 34 | 3.00 | 2500 x 1200 | SHWM6 |
| 5 | Duo Weave | 4 x 15 | 2.0/2 x 1.25 | 57 | 5.60 | 2500 x 1200 | SDWM6 |
| 6 | Uno Weave | 12.5 x 3.55 | 2.5/2.0 | 53 | 7.40 | 2500 x 1200 | SUWM6* |
| 7 | Duo Robusto | 11.2 x 150 | 4.0/ 2 x 4.0 | 70 | 8.50 | 2500 x 1200 | SDRM6* |

* Denotes stock holding at the date of publication, other sizes are available upon request – minimum order quantities may apply.

STAINLESS ARCHITECTURAL SHEET

EMBOSSED SHEET

| DESCRIPTION | SHEET SIZE MM | THICKNESS MM | 304 |
|-------------|---------------|--------------|--------------|
| DOTS LUCID | 2500 x 1250 | 0.8 | SAS8DL |
| LINO LUCID | 2500 x 1250 | 0.8 | SAS8LLS |
| PELLE | 2500 x 1250 | 0.8 | SAS8PL |
| AUSTENIT | 2500 x 1250 | 0.8 | SAS8AP |
| LINO SATIN | 3000 x 1000 | 1.2 | SAS1210003LS |
| DOTS LUCID | 3000 x 1250 | 1.2 | SAS1212503DL |
| LINO LUCID | 3000 x 1000 | 1.2 | SAS1213LL |
| LINO LUCID | 3600 x 1000 | 1.2 | SAS12136LL |
| DOTS LUCID | 4000 x 1250 | 1.2 | SAS1212504DL |
| LINO LUCID | 3000 x 1250 | 1.2 | SAS1212503LL |



RIGIDISED SHEET

| DESCRIPTION | SHEET SIZE MM | THICKNESS MM | 304 |
|---------------|---------------|--------------|---------------|
| DIMPLED - 6WL | 2500 x 1250 | 1.5 | SAS156W* |
| DIMPLED - 5WL | 1800 x 1200 | 0.6 | SAS61250185W* |
| DIMPLED - 2WL | 2500 x 1250 | 0.6 | SAS62W* |
| STRIPES | 2500 x 1250 | 0.6 | SAS6ST* |



* Denotes stock holding at the date of publication, other sizes, profiles and colours are available upon request.