

AUSTRALIAN STAINLESS

SPECIALISING IN STAINLESS STEEL AND ITS APPLICATIONS

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ASSDA

FITNESS NEVER LOOKED SO GOOD

Sydney's Fifty Four Park Street is not your average gym. The exclusive venue recently underwent a luxury makeover requiring 250 square metres of stainless steel to fully portray the club's intended style and class.

ASSDA Accredited Fabricator Townsend Group worked with designer Blainey North to create a stunning and sustainable interior.

Mirror finished columns are a focal point of the indoor pool, featuring circular column cladding joined with chrome coloured silicon to maximise waterproofing. Two of the columns double as large features with water pumped up the centre of each, that spill out and over the top.

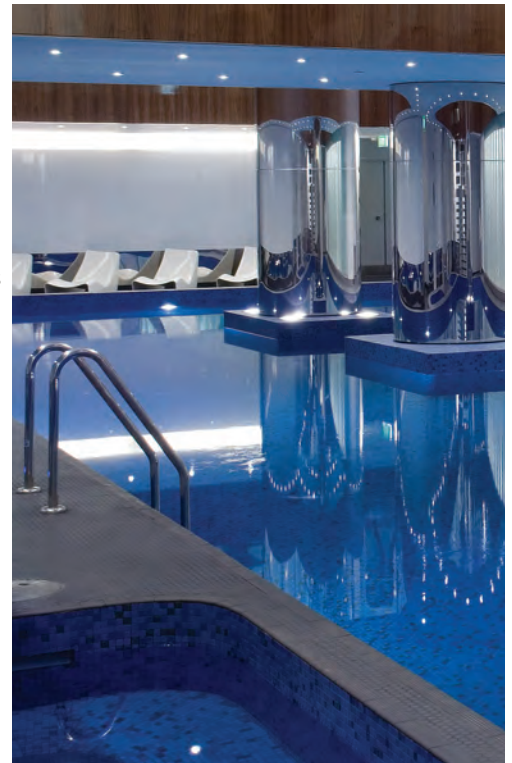
Townsend Group's Mark Ryan says the columns are constantly drenched in warm, chlorinated pool water, so grade 316 stainless steel with a No.8 finish was the best choice for corrosion resistance in the humid, damp environment.

Skirting, handrails, patch fittings, stair soffits, a dividing-wall feature and balustrades were mostly vee-cut prior to rolling or bending to achieve tight radii bends. All polishing was done by hand to a mirror finish to produce a highly reflective surface as specified by the designer.

"Blainey North specialises in upmarket fit-outs and is meticulous about workmanship and quality," said Mr Ryan, who added that clean, reflective surfaces were a high priority.

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A STEP UP IN STAINLESS DESIGN



When a Melbourne design company decided to expand their business to a neighbouring space, a challenge was set: the adjoining office was on an upper level and a walkway was needed to connect the two.

The challenge was met by Carr Interior's Daniel Stellini who envisioned a simple, strong and aesthetically refined stainless steel "hanging" staircase to allow for transit between the floor levels.

"Considering the portal represents such a high traffic area, we required a material that was durable, strong and low maintenance: stainless steel met our brief on all three counts," he said.

"It was our intent to express the raw edge detail of the 3mm stainless steel highlighting its fine yet strong characteristics," Mr Stellini said.

ASSDA Accredited Fabricator Hi-Tech Stainless Fabrications used 620 kilograms of grade 304 stainless steel to construct the skeleton of the stairwell off-site. Due to the confined 900mm working space the pieces were assembled, TIG welded, screwed on from the inside and polished on-site.

Upon arrival at reception, the portal is seen as a crisp, polished insertion to the building's brickwork, representing a refined sculptural element against the raw, distressed solid wall. Its fixing to only the upper level of the tenancy allows it to project and hover over the lower floor, whilst maintaining a weight capacity of 340 kilograms.

The stair's profile has been left exposed, making it a feature of the space. Mr Stellini said challenging the conventional use of materials such as stainless steel is something he continues to do. Not a bad idea when you look at the possibilities!

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SUBWHARFYEN STEELS YOUR IMAGINATION



A childhood spent yacht racing was Newcastle artist Braddon Snape's inspiration for his intriguing new piece entitled *The SubWharfyn* at Darling Harbour.

"I was always surrounded by beautifully machined or crafted stainless steel rigging and equipment," he said. So when Sydney Wharf commissioned Mr Snape to create a large-scale work depicting the relationship between people and the sea, stainless steel seemed like a natural choice.

Mr Snape's experience in working with hardy materials and a highly evolved visual language proved a winning combination. The finished product is a great success as a premium contemporary development for the area.

Sydney Wharf recognised the potential for stainless steel to meet the requirements of the project for both aesthetics and durability.

"The use of stainless steel relates to its surroundings on both a conceptual and material level," Sydney Wharf's Shaun Farren said. "It has a connection with the maritime context and is durable in a marine environment."

ASSDA Accredited Fabricator Marko Stainless provided their fabrication services for the project, using 450 kilograms of laser cut 3mm sheet in grade 316 stainless steel to produce *The SubWharfyn* from a one-in-twenty wooden model. Three panels comprise the body, which were rolled to form the curved sides. The panels were TIG welded, and blades MIG welded after initial polishing. All welds were pickled, and the entire sculpture passivated after completion.

On Mr Snape's specification, a minimum 320 grit finish was used for its satin-like quality. "The finish allows the sculpture to respond to the light and colour of its surrounding environment without being consumed by busy reflections," Mr Snape said.



Mr Snape describes the sculpture as "a synthesis of my aesthetic, poetic, intellectual and practical response to the particular site and the surrounding locale".

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Changing costs of alloying elements



Sustained economic growth in China and the rest of the developing world has seen the demand for all the metals grow faster than the minerals industry can develop new mines and smelters. The result is soaring prices for metals, and for coal and oil. For a country like Australia - a big supplier of metals - it's good news, and we have all enjoyed the benefits of the minerals boom. But those of us in the stainless steel industry have seen prices increase markedly, and it has been hard to cope with. We live in interesting times.

Much of the increase in stainless steel prices has come from the increase in the price of raw material inputs, and particularly nickel, which went through a peak over US\$50,000/ton in May 2007.

It's back to around \$20,000/ton now, but that's still four times as high as it was in October 2001 - under \$5,000/ton.

But it's not just nickel. As we saw nickel start to get over its spike, the press filled with stories of the increases our big miners were seeking for their iron ore. And quietly, the price of chromium has soared from under \$600/ton to over \$6,000/ton.

Molybdenum, the element added to improve corrosion resistance above what you can get with chromium, has outdone all the rest, from \$6,200/ton to a peak over \$95,000/ton. It's lucky a mere 2 per cent of molybdenum is so effective in improving corrosion resistance.

In response, stainless steel makers and users have sought to get the best value from the alloying elements they use, by shifting between grade families and grades.

We have seen the rise of the 200 series austenitics, which use manganese instead of some or all of the nickel to get the ductile austenite structure. They peaked at about 10 per cent of world production - but of course the increase in demand for manganese then pushed up its price, making the 200 series less attractive economically.

Duplex grades also offer a potentially cheaper alternative, most using only half the nickel of an austenitic grade with similar corrosion resistance. A new development, LDX 2101 from Outokumpu, combines the approaches by substituting nearly all of the nickel with manganese.

Ferritic grades have a completely different crystal structure to austenitic grades because they have no nickel added. That can make their alloying costs much lower, but the steelmaking needed to make good quality steels is more exacting, so the overall cost savings are not as dramatic.

Nevertheless, they can offer useful cost savings. In recent years they have grown from about 20 per cent of world stainless steel production to 25 per cent or more, and the major steelmakers are predicting they will continue to grow.

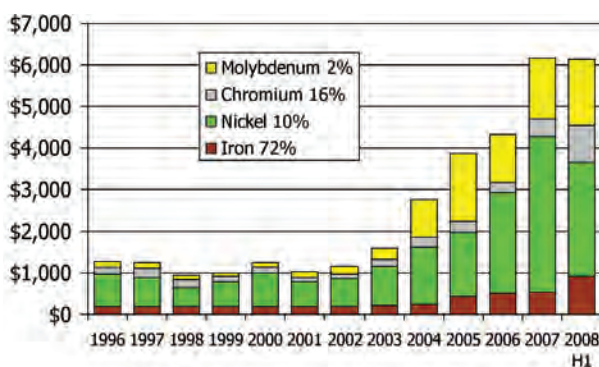
A recent publication by the International Stainless Steel Forum (ISSF) details the possibilities with this family of grades.

All the talk of metals price increases makes it hard to know what relative contribution each of the elements makes to the overall cost of stainless steel. Believe it or not, many people are not even aware that all stainless steels are mostly iron, so the news about iron ore prices tends to be lost on them. What does doubling the cost of iron ore do to the cost of stainless steel? And how does that compare with the other alloying elements? Come to that, what effect does the oil price have? It's not so long since respected economists were predicting \$200 per barrel for oil.

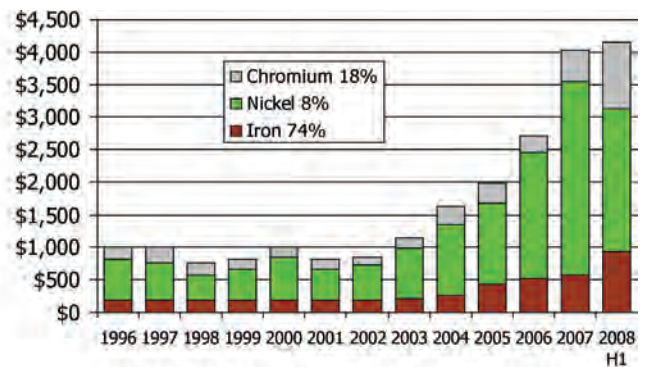
These graphs show the ingredient contributions for the two most common grades of stainless steel, 304 and 316. The bars show the main alloying elements in the grades, each bar representing the average for the year, except the last bar, which is the average for the first half of 2008.

The costs are an estimate of what the steelmaker has to pay to assemble the raw materials to make stainless steel. They don't take into account the yield achieved, or possible premiums or contract prices paid. Nevertheless, the graphs illustrate what has happened with alloy costs. Of course, the steelmaker then has to turn these ingredients into stainless steel, so his overall costs are much higher. We might expect higher conversion costs for ferritics, duplex steels and the manganese austenitics over traditional stainless steels such as 304 and 316.

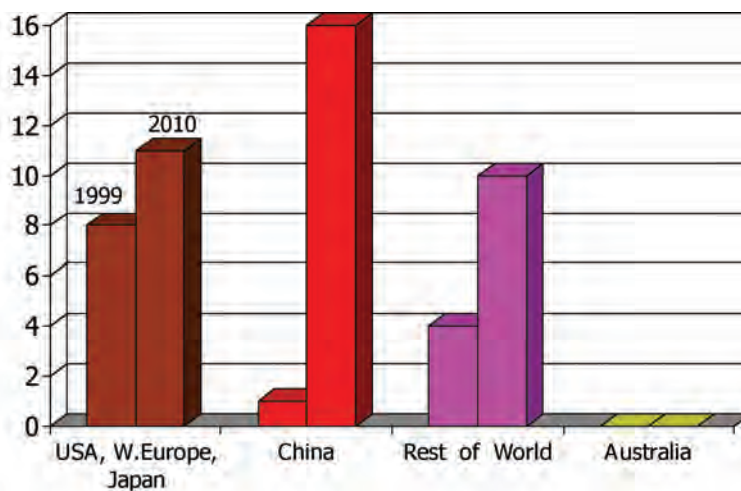
It is important to recognise that raw materials costs are not the only factor in steel pricing and that many factors will influence the day to day prices offered by suppliers. We are only looking at the costs of the main alloying elements here which is fundamental but not the whole story.



Alloying cost elements in austenitic grade 316



Alloying cost elements in austenitic grade 304



Stainless steel consumption in different parts of the world (1995 actual, 2010 predicted).

In 304 the biggest culprit for cost rises has been nickel, but in 2008 nickel cost has fallen back to the 2006 level – and chromium and iron have taken over. Notice that the iron in stainless steel now costs more than all the alloying elements in stainless steel together did in the early 2000's – and chromium is now costing more than nickel used to.

Astute observers will know that the price of stainless steel has actually been falling in 2008, despite the alloying costs being higher than in 2007. The lull in the demand for stainless steel has forced the mills to reduce their prices to stimulate sales, and these are tough times for the mills.

The effect of the oil and coal price increases? Studies suggest it takes about 12 barrels of oil to make a ton of grade 304, so the \$100 rise in the price of a barrel since 2002 adds about \$1,200 to the cost of a ton of 304. To put that in perspective, the base price of stainless steel in 2002 bottomed at about that level!

So what has caused all these surges in prices, and where do we go from here – higher, stable, or a return to the earlier levels? The cause is clear; it is economic growth in the developing world, outside the mature, stable economies that used to dominate the world economy.

This is particularly true for the BRIC group: Brazil, Russia, India and China. These have all been growing strongly and sustainably for a number of years, China being pre-eminent.

While their economies were still small, the net increase in demand for metals was not much affected, but their overall demand has now grown to the extent that even when their economies slow, world net demand keeps growing strongly.

The IMF continues to forecast growth rates over 10 per cent for China out to 2013. After all, over a billion people have lived in poverty for a long time, and their government is committed to developing the country to help them out of it. Analysts reckon that only about 15 per cent of the demand for metals in China is fuelled by demand outside China, the rest is for domestic consumption.

Stainless steel has not been singled out by these shifts in the world economy. All the metals, except aluminium and zinc, are currently at about five times the price they were when the boom started. So much for materials substitution as a way of getting over the price increases!

China has grown so strongly that over the current decade it will consume over half of the copper, aluminium, nickel and zinc used in the world. Even if China does falter, the other developing countries are not far behind.

The rate of growth in demand is a real challenge for the minerals industry to keep up with it. It's not quite the same situation as we see in oil, but it's not markedly different. Does anybody think we will ever return to \$30 a barrel for oil? Unlikely, and it's unlikely we'll see a return to historical levels for metal prices either.



STANDING THE TEST OF TIME



The \$10 million stainless steel revamp of Melbourne's Bourke Street Mall has certainly lived up to its original purpose, providing a durable, clean and simple linear theme.

In 2006, inspired by success stories of nearby stainless street furniture, the City of Melbourne council conducted a life cycle costing analysis – with astounding results.

The City of Melbourne Industrial Design team has found that the use of stainless steel significantly reduces maintenance costs over a 15 year period and ensures design flexibility.

A comparison found that while stainless steel may initially cost more, over a 20 year period maintenance costs can be up to 50 per cent less than powder coated steel.

They said powder coated finishes require regular retouching for chipping and corrosive management. Whilst there will always be a need to maintain painted finishes in the city,

stainless steel furniture will greatly reduce the amount of painted surfaces and will instead only require a monthly pressure clean.

They said scratches do not show up as easily because the furniture is brushed stainless steel unlike powder coating which is prone to fading over time.

MME provided smooth mechanical finishing which minimises dirt retention for optimum corrosion resistance.

The project included new seating, drinking fountains, recycle bins, banner poles and a new fit-out for the tram zone. Stainless steel was chosen as, when the correct surface finish is applied, it is virtually maintenance free.

John Bainbridge of ASSDA member MME Surface Finishing presented the department with information on the value of considering the life cycle cost advantage of stainless steel and the importance of specifying the correct surface finish.

ASSDA member TRJ Engineering fabricated the commemorative totem poles. The poles use grade 316 stainless steel in a No.4 scratch finish. Each consisted of two pressed cylinders at the base of the pole which had L.E.D. lights mounted on both sides behind a glass facia.

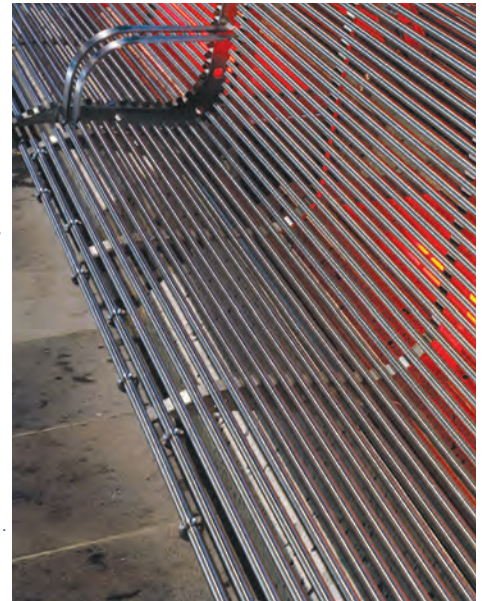
The cylinders were formed in a CNC brake press which worked very well to prevent any surface roughness.

The last part of the project was completed in-house before installation and electro-polishing.

The Melbourne Technical Design Department has since recommended that all future street furniture commissioned by the council be stainless steel specified.

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Photography courtesy Andrew Curtis

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STAINLESS TO REDUCE GREENHOUSE GAS EMISSIONS



To overcome environmental concerns around landfill, Perth's largest waste management authority, Mindarie Regional Council, is building a facility for the 70 per cent of household waste that is organic material and can be composted.

The \$80m building is due for completion in 2009 and will save on landfill, reduce greenhouse gas emissions, and will produce a rich organic matter that may be added to Perth's sandy soil.

The new composting facility, to be built using a prize-winning technology developed by Canadian firm, Conporec, comes at a time when the ongoing feasibility of landfill in crowded cities is questionable.

In September this year a new hazard came to light when residents of the outer-Melbourne suburb of Cranbourne were advised to leave after pockets of methane were found in their homes at a dangerous 60-65 per cent concentration. The methane had leached from a nearby landfill - concentrations of 5-15 per cent are considered an explosion risk.

The composting building's odour removal system uses extraction ducts to capture and then transport air to a biofilter. Stainless steel was specified because of its corrosion resistance. Organic waste is broken down as it would be in nature, but the composting process is much faster.

The compost is produced in a sealed building at negative pressure, where moist air is forced through. The resulting atmosphere in the building is hot, humid and corrosive. Composting produces heat which quickens the corrosion process, particularly in Perth's hot climate.

Turbo Air Technology Pty Ltd of Bayswater, Perth, fabricated the extraction ducts from AWM 404GP® stainless steel, supplied by ASSDA Major Sponsor Austral Wright Metals.



John Dubbelman, Managing Director of Turbo Air Technology Pty Ltd, says the best specification for the job wasn't necessarily what had been used in the past.

"Experience with similar installations in Canada led the project managers Kerman Contracting Limited (KCL) to specify grade 304 stainless steel for the ducts," John says.

"With the help of Austral Wright Metals, we were able to convince them of the fabrication and cost benefits of AWM 404GP®, a ferritic stainless steel with equivalent corrosion resistance to 304. We have used it for the lock-seamed spiral ducts, lobsterbacks, and plenums. We fabricated the new grade without dramas, and KCL is now installing it. It looks good."

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CONFERENCE PAPERS NOW AVAILABLE FOR PURCHASE

PacRim Stainless 2008 was held in Townsville on the 30-31st October 2008 with an excellent line up of speakers and delegates. If you missed out on the conference, but would like to remain informed on industry issues and developments, consider purchasing the conference papers.

Whether you are a fabricator, designer, end-user or distributor, there is something for you:

- Big picture issues such as prices, markets and the global outlook.
- The end-user and specifier perspectives on stainless steel in the foodservice and minerals processing sector.
- Opportunities and challenges in the Queensland Water Grid.
- Australian innovation with lean duplex tubular product.
- The first ever fabrication forum looked at fabricator-related issues such as stainless steel clusters, lean manufacturing, how to be competitive and profitable, and sponsoring overseas skilled workers.

Conference papers are available on CD through ASSDA at a cost of \$55 for members and \$66 for non-members including GST. To purchase your copy, contact ASSDA on (07) 3220 0722.



SPEAKER HIGHLIGHTS

- Mr Juha Rantanen, President & CEO Outokumpu Group (Finland)
- Mr Arturo Chao Maceiras, Executive Director, Núcleo Inox (Brazil)
- Mr John Doolan, CFO, Xstrata Technology; Head of Tankhouse, Technology Business Unit
- Mr Tim Smallwood, Director, Foodservice Consultants Aust Pty Ltd
- Ms Rebecca McCallum, Commodity Analyst, ABARE
- Mr Gary Crisp, Chief Technical Officer, SureSmart Water
- Mr Colin Neasbey, Stainless Steel Sales Manager, OneSteel
- Cr Paul Bell, President, Australian Local Government Association
- Mr Darren Haidley, Tom Stoddart Pty Ltd
- Mr David Pettigrew, GM, QMI Operations
- Mr James Johnson, MD, Millatec Pty Ltd
- Ms Marianne Bregovic, Skilled Migration Adviser, Australian Industry Group

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