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COVER PAGE

CIGWELD have released a complete family of six Transmig 3-in-1 MIG, STICK and TIG welding inverters to the market, ranging from 175 Amps right up to 550 Amps.

In November 2011, the Transmig 200i and Transmig 250i single phase portable Multi-Process Inverters with power factor correction (PFC) hit the market and created quite a stir, and now in early 2012 CIGWELD have realised the 3 phase versions to complete the Transmig inverter range.

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Structural Steel Related Welding Codes

Disclaimer – This article is for the members of AWI™.

No comment is intended and the individual should satisfy themselves of any interpretations stated here.

Note: The word structural in this case is intended to apply to load bearing steel structures that are not pressure retaining

State OHS Regulations Require Fixed Platforms, Walkways, stairways and Ladders (AS1657) and Cranes, Hoists and Winches (AS1418) to be welded to AS/NZS1554		Code of Practice AS/NZS 4100 Steel Structures, AS/NZS 4600 Cold-formed Steel Structures and AS/NZS 3990 Mechanical Equipment - Steelwork requires welding to be to AS/NZS 1554 Part 1 to 7 AS/NZS 1554 suite used as a non mandatory industry standard	
AS/NZS 1554.1 2004 Structural Steel Welding Welding of Steel Structures	AS/NZS 1554.2 2004 Structural Steel Welding Stud Welding	AS/NZS 1554.3 2003 Structural Steel Welding Welding of Reinforcing Steel	AS/NZS 1554.4 2010 Structural Steel Welding Welding of High Strength Q&T Steels
AS/NZS 1554.5 2004 Structural Steel Welding Welding of steel structures subject to high levels of fatigue	AS/NZS 1554.6 1994 Structural Steel Welding Welding Stainless steel for structural purposes	AS/NZS 1554.7 2006 Structural Steel Welding Welding of Sheet Steel Structures	
AS/NZS 2980 2007 Qualification of Welders for fusion welding of steels	AS/NZS 2214 2004 Certification of Welding Supervisors Structural Steel Welding	AS/NZS 1796 2001 Certification of Welders and Welding supervisors	

The flowchart above reveals the related structural steel welding codes and the interrelationship between them. This article is an attempt to give AWI™ members a brief explanation of each standard within the structural steel welding suite.

Structural steel welding is related to the Occupational Health and Safety (OHS) Regulations.

For example, the requirements mandated by OHS regulations for



cranes and walkways, building structures' etc. relate back to the codes of practice for steel structures and mechanical equipment. These codes then go on to cross-reference many standards, but their main thrust is the seven welding standards which have deal with the distinctly separate areas of structural steel welding.

These standards deal with the welding of:

- Structural steel with yield strengths below 500MPa
- Welding of steel studs
- Welding of high strength quenched and tempered steels
- Steel structures that are subjected to high fatigue loads
- Stainless steels and
- Welding of sheet steel structures

Apart from the stud welding standard, all of these standards allow fabricators the common welding processes:

- Manual metal-arc
- Submerged arc
- MIG and TIG
- Flux-cored

Obviously on thicker materials a more suitable welding process may be electroslag and electrogas welding. As the flowchart reveals, there are seven welding standards and all have different parts to play in meeting structural welding.

AS/NZS 1554.1 deals with welding of structural steel with yield strengths below 500MPa but allows for the welding of dynamically loaded structures such as hoists, cranes and bridges etc. However there are one or two caveats to the use of this standard. Namely:

It excludes welding of structures that are subject to high fatigue loads but does allow dynamic loading conditions that comply with fatigue provisions of AS 3990 and AS4100

The stress ranges that are allowed must be with categories C to F of AS 3990 and up to 80% of category B of the same standard

Use of other applicable standards must have directly equivalent fatigue provisions

Does not apply to pressure vessels nor pressure piping

AS/NZS 1554.1 also excludes a few welding process, these are:

- Oxyacetylene
- Friction
- Thermit
- Resistance and
- Underwater welding



The welding of steel studs is covered by **AS/NZS 1554.2**; which details the requirements for welding steel studs to steel members for connection, anchoring (into concrete) and for fastening applications. It deals with:

- Allowable stud materials
- Parent material requirements
- Welding procedures and operators
- Workmanship and testing

You can use this standard for the application of welding of studs to light-gauge sheet steels but again, it is invalid for pressure vessels



AS/NZS 1554.3 specifies the requirements for welding reinforcing steel used in concrete structures. It also applies to welding connection devices, inserts and anchors. To be applicable to this standard, the reinforcing steels must comply with AS/NZS 4671. The following processes are covered:



- Manual metal-arc
- MIG
- Flux-cored
- Flash butt welding
- Flame pressure welding

AS/NZS 1554.4 specifies the requirements for welding of high strength quenched and tempered steels with the following welding processes



- Manual metal-arc
- Submerged arc
- MIG and TIG
- Flux-cored

Again, thicker materials can use electroslag and electrogas welding techniques.

The standard allows for the welding of dynamically loaded structures such as hoists, cranes, bridges and earthmoving equipment etc. However there are some rules to the use of this standard. Namely:

It excludes welding of structures that are not subject to fatigue conditions but allows dynamic loading conditions that comply with fatigue provisions of AS 3990 and AS 4100

The stress ranges that are allowed must be with categories C to F of AS 3990 and up to 80% of category B welds (if it is a category SP weld) of the same standard. The stress range can be greater than 80% of that permitted by category B of AS 3990 if the

weld is a category FP weld. Use of other applicable standards must have directly equivalent fatigue provisions

Just as in part one, AS/NZS 1554.4 also excludes a few welding process, which are:

- Oxyacetylene
- Friction
- Thermit
- Resistance and
- Underwater welding

The standard does not apply to pressure vessels nor pressure piping or the production and rectification of castings.

AS/NZS 1554.5 specifies the requirements for welding steel with yield strengths below 500MPa. Although this standard is aligned to AS/NZS 1554.1 it specifically applies to welding of steel structures that are subjected to fatigue loading and like AS/NZS 1554.1 is also limited to a single dynamic loading factor.

The standard applies only to the stress range greater than 80% of that permitted by category B of AS 3990.



This standard also allows for the welding of structures such as hoists, cranes, bridges and steelwork to be used in other

applications other than structural. For example – transport equipment. It allows the following welding processes:

- Manual metal arc
- Submerged arc
- MIG and TIG
- Flux-cored
- Electroslag and electrogas welding

The standard does not apply to pressure vessels nor pressure piping or the production and rectification of castings and also excludes the following welding process:

- Oxyacetylene
- Friction
- Thermit
- Resistance and
- Underwater welding

AS/NZS 1554.6

identifies the materials of construction for welds related to structural stainless steel fabrication. The welding processes covered are:

- Manual metal arc
- Submerged arc
- MIG and TIG
- Flux-cored and additionally
- Plasma welding

Like most of the suite of structural standards, it does not apply to pressure vessels nor pressure piping or the production and rectification of castings and additionally does not cover the selection of grades of stainless steel to suit corrosion applications.

The standard does however, prescribe weld preparations and weld qualities. It identifies surface finishes and details fabrication and inspection requirements as well as qualification of welding procedures and personnel.



The standard covers a range of material forms and combinations made up of plate, sheet stainless steel sections (including hollow sections) and castings and forgings.



AS/NZS 1554.7 specifies the requirements for welding steel structures in a range of material forms and combinations made up of plate, sheet stainless steel sections (including hollow sections and pipe) with the maximum thickness of 4.8mm.

It is limited to welding steel with yield strengths below 550MPa and allows for the following processes:

- Manual metal arc
- Submerged arc
- MIG and TIG
- Flux-cored

The limitations are that where dynamic conditions are present welding shall comply with AS/NZS 1554.1 category SP and for joints subject to fatigue, welding shall comply with AS/NZS 1554.5

Brittle fracture provisions and if category GP is specified shall use those identified in AS/NZS 1554.1 and if stud welding through material covered in this standard then AS/NZS 1554.2 applies.

The standard does not apply to pressure vessels nor pressure piping or the production and rectification of



castings but is allowed to be used in other applications other than structural.

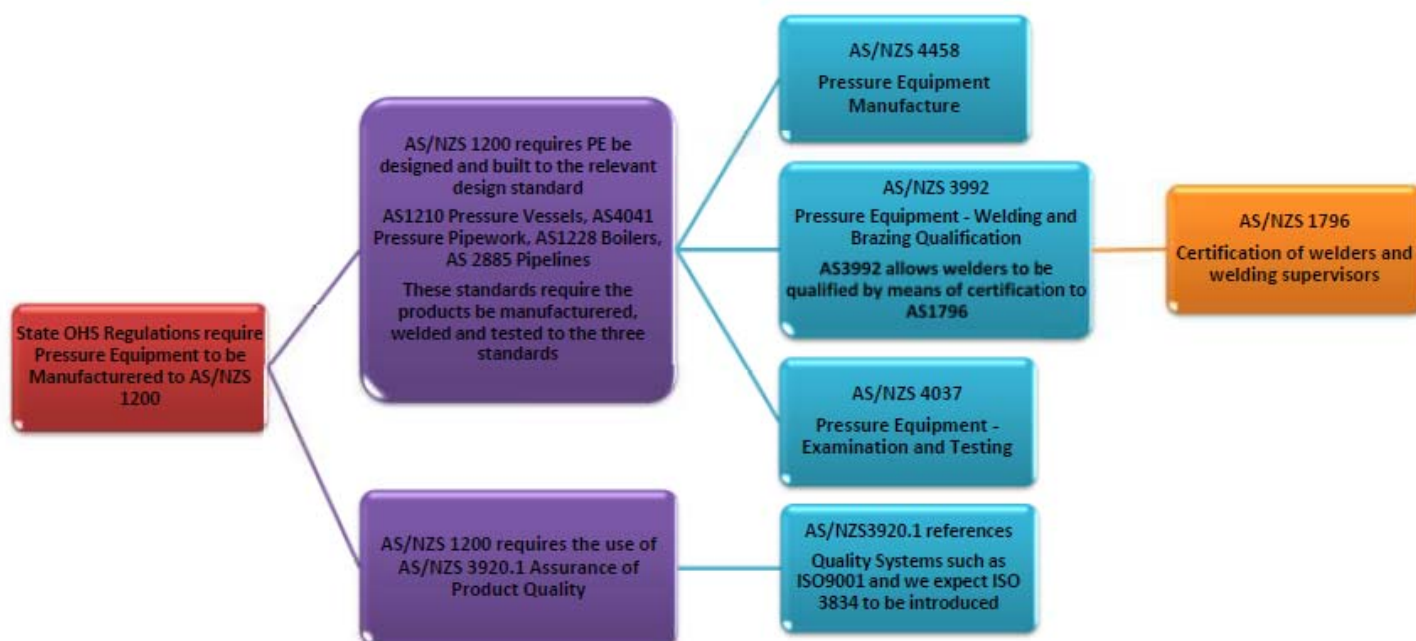
All the above mentioned standards do not exclude novel processes or 'innovation' and all generally have in their appendices a list for 'matters for resolution between the fabricator and the principal. They detail testing requirements and the requirements for the qualification of welds, welders etc.

Linked to all the standards are those specifically detailed with qualification and certification of welders, welding supervisors and inspectors – AS/NZS 2980, 2214 and 1796.



Pressure Equipment Related Welding Codes

Disclaimer – This article is for the members of AWI™. No comment is intended and the individual should satisfy themselves of any interpretations stated here.



The flowchart above reveals the related pressure equipment (PE) codes and the interrelationship between them. Much like the previous article, it is an attempt to give AWI™ members a brief explanation of each standard within the applicable PE standards suite.

AS/NZS 1200 is to be the ‘parent’ to the pressure vessel standards used in Australia and New Zealand and its main coverage is the materials, design, manufacture, examination, testing and commissioning of pressure equipment (PE). Its objective is to provide requirements and guidance for asset managers for use in contracts such that they achieve:

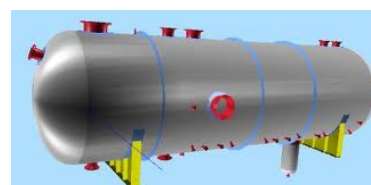


- Safe and economic supply of PE
- Provide assistance in complying with PE basic requirements and
- Disseminate the experience and know-how from both Australia, New Zealand as well as world ‘best practice’

PE covered by this standard typically consists of pressure vessels, boilers and pressure pipework. Clause A3 of the standard gives a detailed list of equipment “under pressure” but not specifically covered, for example:

- Gas cylinders
- Domestic water pipes
- Sewage and roofing pipes
- Tyres and other inflatable equipment

AS 1210 sets out the minimum requirements for the materials, design, manufacture, examination, testing and commissioning of pressure equipment (PE) constructed in ferrous and non-ferrous metals.



Generally the standard covers all forms of welding or brazing and forging and casting. It covers cladding and lining requirements as well as non-metallic vessels and linings.

Designers, fabricators and asset managers who follow the requirements of AS/NZS 1210 are on the right side of ensuring that PE performance criteria are met, which are typically:

- Providing “reasonably certain” protection to persons, property and the environment
- Providing over a reasonably long life the appropriate:
 - Economy
 - Performance

- Reliability
- Operability
- Inspectability and
- Maintainability
- Control of risks to satisfy applicable health, safety and environment laws

As the flowchart reveals, the standard refers to a complete suite of specific other standards and it is of course imperative that the appropriately qualified personnel use these standards

AS 1210 is intended for vessels; with internal pressures ranging from 2kPa to 50kPa. The actual pressure is dependent on the inside diameter; which has a range from 2 to 30 meters. Operating temperatures are defined for the various materials etc.

The standard does not include such items as cranes, walkways, platforms etc but does ask that any loads applied by such structures are taken into consideration. The standard also excludes those vessels identified under clause A3 of AS 1200.



AS 4041 is the standard that deals with pressure piping. Much like the aforementioned standards it sets out the minimum requirements for the

materials, design, manufacture, examination, testing and commissioning of piping subject to internal and external pressures. This standard refers heavily on other standards such as AS/NZS 3992, AS 4037 and AS 4458.

There are general requirements identified for non-metallic piping and specific requirements identified for piping constructed of:

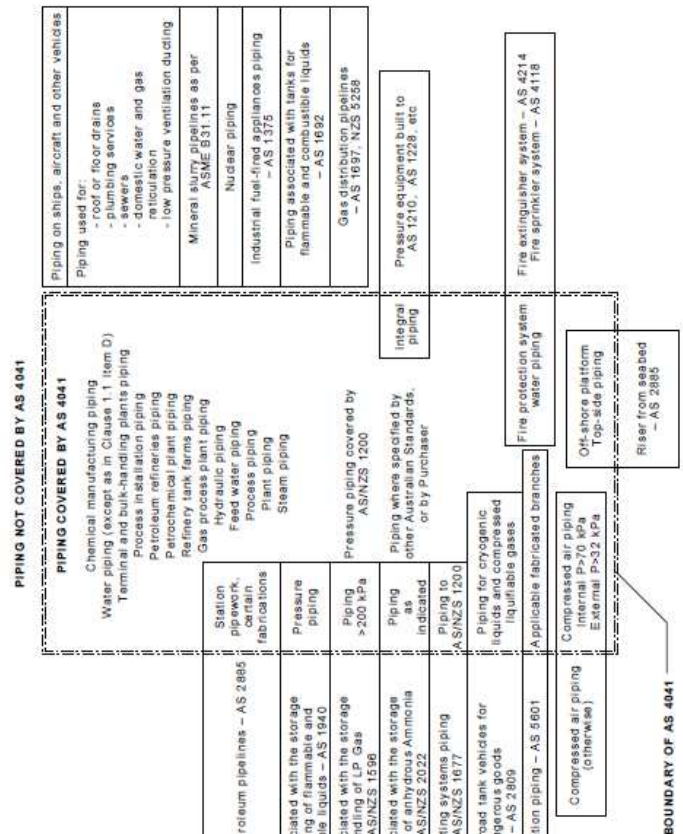
- Carbon
- Carbon-manganese
- Low and high alloy steels
- Ductile and cast iron materials
- Copper, aluminium, nickel, titanium and their alloys

AS 4041 is not intended to apply to piping for:

- Gas and liquid petroleum pipelines (covered by AS 2885)

- Gas distribution pipelines
- Piping on shipping or aircraft
- General sewer and domestic water pipes etc
- Nuclear piping

The piping not covered by AS 4041 is clearly identified in the Figure below



AS 1228 gives us the requirements for the materials, design, construction, inspection and testing of boilers and specifically to the design and construction of:

- Superheaters
- Reheaters
- Economisers

The standard also applies to fluid containing pressure parts up to the separation valving between the fluid and other equipment.

And if you're a train buff there is guidance on locomotive and other heritage boilers and the design on blowdown vessels



The flowchart also identifies that **AS 2885** is another referenced standard. The scope of AS 2885 applies to steel pipelines and components that transmit hydrocarbon fluids such as:

- Natural and LPG gases
- Petrol's
- Crude oils
- Natural gas and liquid petroleum liquids



There are some special circumstances where this standard could be applied and the reader will need to refer to the standard. Exclusions to AS 2885 are typically:

- Petroleum processing plants and tank farms
- Gas distribution systems
- Systems where operating temperatures of the fluid is lower than 30°C or higher than 200°C
- Wellhead assemblies
- Heat exchangers and pressure vessels



A very important standard in the suite of PE standards is **AS 3920.1**. This specifies the requirements for assuring product quality in the manufacture of boilers, pressure vessels and pressure piping. This is a dated standard (1993) so care must be taken in its use as the regulatory authorities for NSW, VIC and TAS no longer endorse its provisions.

This standard is very soon to be revised

The next standard that has an important position is **AS 4458** which sets out the requirements for the manufacture of PE detailed in the other codes (AS 1210, AS 1228 and AS4041).



It details the conditions for fabrication and heat treatment both in forged and cast conditions and also identifies testing requirements.

Obviously the term 'fabrication' involves welding and brazing, forming by pressing, rolling and cutting and bending etc.

AS/NZS 3992 deals specifically with the qualification of welding and brazing procedures, the requirements welding and brazing personnel and for production weld testing.

Welding processes covered are:

- Manual metal arc
- Submerged arc
- MIG and TIG
- Flux-cored and additionally
- Electroslag and oxy-acetylene welding
- Brazing processes
 - Torch
 - Furnace
 - Resistance and induction

The standards allows for welding and brazing of materials such as:

- Carbon
- Carbon-manganese
- Low and high alloy steels
- Ductile and cast iron materials
- Copper, aluminium, nickel, titanium and their alloys

There are specialised welding processes that are specifically excluded and these include:

- Stud welding
- Electrode gas welding
- Electron beam
- Plasma arc and
- Friction welding
-



The standard does state that compliance with other internationally recognised codes are acceptable. These codes are typically ASME and BS EN.

A vital standard to the PE group is that of examination and testing, which is fully covered by **AS 4037**. It details non-destructive examination (NDE) of PE specified in all the standards mentioned in the flowchart.

AS 4037 determines what is required for the NDE of welded joints the acceptance criteria for welding imperfections, the NDE of production and welder qualification test welds as well as for construction specific materials such as forgings and castings but Non-metallic or composite materials are not covered.

The standard gives information on the reporting obligations.



CIGWELD Pty Ltd
A.B.N 56 007 226 815
A Division of Thermadyne Industries, Inc.
71 Gower Street, Preston
Victoria, Australia 3072

CIGWELD have released a complete family of six Transmig 3-in-1 MIG, STICK and TIG welding inverters to the market, ranging from 175 Amps right up to 550 Amps.

In November 2011, the Transmig 200i and Transmig 250i single phase portable Multi-Process Inverters with power factor correction (PFC) hit the market and created quite a stir, and now in early 2012 CIGWELD have realised the 3 phase versions to complete the Transmig inverter range.

The right tool for every job... big or small!

The CIGWELD Transmig Series 3-in-1 multi process welding systems are changing the game in welding. A new standard for portable welding equipment, that delivers 3-in-1 MIG, Stick and TIG capability from one integrated system.



The Transmig single phase inverters (175i, 200i and 250i) are light weight units weighing in at under 30kg.

CIGWELD

These inverters are packed full of functionality and safety features such as integrated wirefeeders, adjustable

burnback control and VRD, making them suitable for the serious tradesperson/ fabricator who is looking for the total welding package and value for money.

All 3 machines are portable power houses able to deliver high output and high duty cycle for the serious hobbyist wanting to complete a home project right through to the boiler maker wanting to complete light

industrial welding in a workshop or out and about on site.

The 200i and 250i can save you nearly 50% on your annual power costs over other conventional based machines due to Power Factor Correction, a widely recognised method of reducing the electrical power consumption of inverter power supplies and allowing maximum performance to be achieved for a given input.



The CIGWELD Transmig 350i, 450i and 550i are three phase multi process welding inverters that meet workshop and site standards as they are AS 60974.1 and AS 1674 compliant



They are equipped with an integrated voltage reduction device (VRD), an electrical safety device that protects the user against electric shock by reducing the open circuit voltage when not welding.

Arcair

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STOODY

Fitted with digital voltage and amperage meters, fan on demand, 10 welding setup programs, fault indicators, and a host of other advanced features, the Transmig 3 Phase Inverters will fully satisfy the broad operating needs of the modern welding professional requiring welding amperage between 40-550 Amps.



The versatility of the Transmig Multi-process inverters means that you only need one machine to complete a range of jobs.



For example a metal fabricator who is using a Transmig Inverter to build a steel staircase would be able to use all 3 welding processes to assist in completing the one job.

Firstly he could mount the staircase to the landing platform by using flux cored MIG

welding wire, offering him the convenience and portability of gas free welding.

Then he can arc weld his supports to the existing brace, and lastly he can finish off the hand rail by TIG welding the joints.



The entire Transmig Inverter range provides excellent welding performance across a broad range of applications when used with the correct welding consumables and procedures and are backed by a 3 year limited warranty*.



All units come with a plant option which includes a Tweco MIG gun, feed rolls, electrode holder leads, clamp leads and Professional Argon regulator / flowmeter. There are also a range of optional extras which include wire feed units, trolleys and roll cages.

Tweco

**Further warranty details provided in operating manual or on the company website:*
www.thermadyne.com.au.

For additional information, please contact:

Laura Carrazza

Marketing Communications Manager – Asia Pacific
CIGWELD Thermadyne

T: 03 9474 7329

M: 0435 968 356

laura_carrazza@thermadyne.com.au

www.thermadyne.com.au





Australian Owned & Operated

Boston Engineering was founded in 1995 by Paul Mooney. www.bostonengineering.com.au

With many years of experience working for numerous Sydney companies as a sub-contractor, a niche market was established with



the purchase of our 1st orbital welder. We travelled to the USA for training with one of the industry leaders, AMI Arc Machines Inc., www.arcmachines.com and put our orbital welder into service in the Sydney market.

After some extensive market research and to keep up with the changing industry, Boston Engineering made the decision to invest in and promote the orbital welding method. There were only a small number of operators in the Sydney market that could offer orbital welding.

Boston Engineering decided that it was time to diversify the business so to offer another level of service.

During many years subcontracting Paul was fortunate to work with many orbital welding machines from suppliers such as Polysoude, ESAB and Fronius. However, he became somewhat of an expert with the ARC Machines orbital welding equipment and this was paramount in his decision to go with ARC Machines.

They have been among the top of their class in orbital welding technology since the 60's. Further factors to his purchase were their extensive product support and customer service.

Paul states that:

"Having the orbital welder in service has opened us up into new industries, i.e. semi conductor and nuclear."

"As the industry keeps evolving we have found with the right equipment we are in a good position to provide our clients with what they require".

The AWI asked what has it meant in terms of welding quality for Boston Engineering. Paul's response was emphatic:

"Second to none, the quality is of the highest and also importantly the orbital always allows the repeatability of the welds"

Of course the sticky question, that potentially a lot of industry would ask is - What about training operators?

Paul stated that after purchasing the equipment he was invited to visit ARC in Pacoima, California for intensive training on the equipment.



Paul said:

"The training was invaluable and I was able to bring home and apply this training to our home market and continue to train our staff".

"The team at ARC Machines, with their vast experience, are always on hand to assist whenever it is needed".

"Training is the most important element of using the orbital welder. Once the basic skills are learned it still takes an experienced welder; to produce the high standards that the orbital allows".

At Boston Welding & Engineering our focus is on building solid client relationships to ensure that each client receives the right design and quality every time with any project that is specified.

Our Industry Experience:

Boston Engineering is involved in the

- Semi Conductor
- Water Treatment
- Nuclear
- Pharmaceutical
- Construction
- Steam Systems
- Food/Beverage
- Mining and Petrochemical.

Services we Provide:

- Orbital Welding
- Coded welders
- High Purity Gas systems
- Steam Systems
- Critical Flow Systems
- Stainless Steel fabrication
- Clean Room Installations
- Cutting & Pressing
- Specialty pipe spooling
- Tank Fabrication and installation
- Pump Skid fabrication
- General Fabrication.

Boston Engineering also provide Project Management, Compliance Documentation, Pressure testing and Helium leak testing operations.



One recent project that Boston Engineering completed was at the ANSTO – Mo99 Waste Storage facility. This project involved thousands of full penetration welds in both small bore and larger pipework. To guarantee a fully leak tight and maintenance-free installation, the inspection criteria was for class 1 welding, with 100% X-ray.

To add to the complexity, the whole installation required full helium leak testing on every weld. Boston Engineering is justly proud in their achievement with only three welds requiring rework.

Boston Welding & Engineering is based in Silverwater and services the greater Sydney area.

Feel free to contact us if you have a project you would like to discuss or just want some professional advice.

74 Asquith Street

Silverwater NSW 2128

Ph: (02) 9334 2310

Email: info@bostonengineering.com.au



We support our industry partners; Australian Welding Institute to ensure we have an industry body the supports the Australian standards;

Fronius takes mine welding safety to new heights

Fronius, the world leader in Welding Technology and its Australian distributor SMENCO, have released the latest and safest version of the most compact MMA welder in the range, the TP125VRD-10 Mine-Spec.



Further refinement in recent months has resulted in several new and innovative features designed and built into this small 4.7kg Fronius MMA welding machine that's very big on safety – especially for welding in mines and other confined spaces. The new Fronius TP125VRD-10 now has 125 Amp output with a maximum effective supply current $I_{\text{eff}} = 10\text{A}$ and a welding current range of between 10-125A.



Anthony England, Managing Director SMENCO Pty Ltd, Australian importers of Fronius Equipment, said the company was again

leading the field in MMA VRD (Voltage Reduction Device) welding machines which exceeded the Australian standards for safe welding in mines.

"We already have some of the toughest standards for welding safety in the world and they just got tougher."

"It has resulted in Fronius becoming the welding machine of choice for many leading Australian mine sites as it complies with the additional safety features requested by the mining industry. We have worked hard to ensure our machines lead the field in aspects like 'Fail to Safe', 10Amp maximum effective supply current, HiVis cables and braided cables," he said.

The mining industry is demanding that welding equipment be made safer and conform to even more



stringent safety regulations to minimise potential accidents and injury in the future.

Preferred welding equipment manufacturer, Fronius is taking a proactive approach with its latest Mine-Spec machine, the TP125VRD-10.

Weighing just 4.7 kg, TP125 Mine-Spec is most compact MMA welder in the Fronius range.

Mr England said that to his knowledge the Fronius TP125VRD-10 was the only VRD machine that currently meets the new mine OH&S specifications making it the safest MMA machine on the market in Australia.

The Fronius TP125VRD-10 has been designed in direct response to the mines OH&S safety demands – and then some.



Fig 1 - The TP125VRD-10

Take the safety critical aspect of open circuit voltage (OCV) for example. Australian standards demand a maximum of 35V OCV at the electrode when a MMA VRD machine is not welding. The Fronius TP125-10 VRD is 12V – three times lower than the standard.

When the welding circuit resistance is greater than 200 ohms (for example when touching the human body) the OCV is limited to 12V and the VRD must be active within 0.3 seconds after welding stops.



The software that controls the machine is designed to put the machine in fault mode if the VRD is not working, hence the TP125VRD-10 Mine-Spec machine is deemed to be 'Fail to Safe'.

Unlike other VRD alternatives, there is no need to continually hold down buttons when you are welding which adds to operator fatigue.

The braided heavy-duty input power cable gives extra strength and protection. An earthed braided cable is recommended for all applications where OH & S 'Duty of Care' is essential.

Other key features include:

- Generator compatible (Min 8KVA)
- IP23 rated for wet areas
- Thermostatically controlled fan
- CE and C-tick approved
- Anti stick electrode function
- Meets AS6097/ AS1674.2-2007 standard
- Arc force dynamic functions

About Fronius

Fronius International is a family owned Austrian company with nearly 2600 staff worldwide.

Fronius is a world leader in the fields of welding technology, battery charging systems and solar electronics.

Fronius Welding Equipment is distributed in Australia by SMENCO Pty Ltd,

1300 731 873 or www.froniuswelding.com.au

For further information:

SMENCO Pty Ltd 1300 731 873

Dave Smith



Technoweld Inspection Kit



Managing the quality of welds requires quality inspection equipment

Technoweld supplies the finest quality inspection equipment, whether its inspection kits or individual gauges.



We have popular gauges in stock

Technoweld is committed to providing competitively priced, high quality professional inspection kits or individual inspection products



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apprenticeships & traineeships

Celebrating the Sydney Harbour Bridge

March 19 2012
marked the



Sydney Harbour Bridge's 80th birthday so 1300apprentice figured this would be a good time to have a look at the skilled workers required to build the bridge all those years ago and how even with a changing economy, Sydney still requires skilled workers and how 1300apprentice partners with our host employers to help 'bridge' this gap.

Construction of the harbour bridge took 10 years to complete utilising the skills of Engineers, Surveyors, Architects, Blacksmiths, Boilermakers, Carpenters, Concreters, Stonemasons, Riggers, Crane Drivers, Painters and Day Labourers.



The Boilermakers played a crucial role in the construction of the harbour bridge as they formed the

structural steelwork of the bridge and led 'gangs' of workers to insert the bridge's six million hand driven rivets amongst other tasks.

When recruiting the labour to build the bridge, much of the workforce needed to build the bridge were able to be sourced locally but certain elements of the workforce were sourced from across the globe including qualified boilermakers from Ireland and Scotland.

Tradesmen's families encouraged their sons to start an apprenticeship working on the bridge for Dorman Long's managers and many of these apprentices completed most of their apprenticeship working

solely on the bridge. Back in the early 1930s apprenticeships were completed over 5 years and the apprentices' studied at Technical College of a night.

How is all this relevant today?

As stated, the Sydney Harbour Bridge recently turned 80 and the coverage highlighted what an achievement the bridge was and how large scale infrastructure projects have a long lasting benefit for the community. In schools today, students are encouraged to go to university while trades are often overlooked as a career option.

This has lead to many of the best candidates being lead towards university study and the apprenticeship pathway being seen as second rate, which is far from the truth. It can't be forgotten that to have qualified tradesmen for tomorrow, we have to train apprentices today. At 1300apprentice we attempt to break through this barrier and educate school leavers on what an apprenticeship is today and what trades they can study to ensure there will be qualified tradesmen for tomorrow so we can continue to build the harbour bridges of tomorrow.

After watching some of the celebrations for the 80th birthday of the Harbour Bridge, at 1300apprentice we feel it's



important to reflect on the ongoing need to develop people's skills sets by offering apprenticeship opportunities. If you'd like to learn more about the economic and social benefits of apprenticeships

www.ncver.edu.au has plenty of well researched information.

Alternatively, if you would like to discuss anything apprenticeship related, feel free to contact our Business Development Manager Rebecca Johnson on 0418 441 570 or by email r.johnson@1300apprentice.com.au.

Australian Government Skills Connect

Australian Government Skills Connect is a new program designed to link eligible businesses with a range of skills, workplace development programs and funding specific to their business or industry. The program aims to help build productivity and improve the overall success of businesses.

Skills Connect provides businesses large and small with access to people who can advise on access to a range of Australian Government funded programs. Six major programs are briefly described below.

For more information about any of the Skills Connect programs visit <http://www.skills.gov.au> or contact MSA on:

02 9955 5500 or 1800 358 458

and ask to speak with one of our Industry Coordinators

National Workforce Development Fund

The National Workforce Development Fund (NWDF) will provide \$558 million in funding over four years to support industry training and workforce development.

Manufacturing Skills Australia (MSA) manages applications for priority occupations in the manufacturing industries on behalf of the Australian Government.



There have been two application rounds since the fund's inception in 2010. Applications for 2012/13 will be on a continuous rolling basis instead of funding rounds. This means a business can submit an application at any time

Who can apply?

- Enterprises
- Professional associations, industry bodies and other lead agents representing a consortia of enterprises
- Employment Service Providers

Registered Training Organisations may not apply on behalf of eligible organisations, however may assist participating organisations to prepare and submit an application.

Enterprise contribution

All participating organisations are required to contribute a set amount to the costs of the program. The contribution will vary according to the number of employees engaged at the enterprise (full time or equivalent). The table below sets out the respective Government and Participating Organisation contributions.

Size of Workforce (Full Time Equivalent)	Government Contribution (%)	Participating Organisation Contribution (%)
1 -99 (small)	66	33
100 - 199 (medium)	50	50
200 and above (large)	33	66

For more information contact MSA on **02 9955 5500 or 1800 358 458**



The Workplace English Language and Literacy (WELL) Program

WELL funding is available for businesses, partnering with a training organisation, to provide reading, writing and maths training linked to job-related workplace training. It also helps Indigenous Employment Program (IEP) participants who need reading, writing and maths training.

Accelerated Australian Apprenticeships initiative



Despite the name, this initiative is not about speeding through apprenticeships, but providing support to

Australian Apprentices to progress through their training as they demonstrate the required competencies, rather than on a time served basis. This aims to help business and industry to get the qualified tradespeople needed as soon as possible without compromising the need to achieve and demonstrate competence to the standards expected by industry. Naturally, some apprentices may progress at faster rates than others, from which the label "accelerated" may have arisen.

Funding is available as one-off grants to Industry Skills Councils, peak industry bodies or other lead organisations.

Australian Apprenticeships Mentoring Program



Manufacturing Skills Australia

The Mentoring program is aimed at supporting Australian Apprentices in industries or occupations with demonstrated skills need, particularly those employed in

small to medium enterprises; and who

who may face additional barriers to participation or may be at risk of withdrawing.

The Mentoring program will provide funding for:

- 144 advisers to guide apprentice candidates in choosing the right trade
- 330 mentors each year to support around 10,000 Australian Apprentices

Individual employers may benefit from partnering with a peak industry organisation to deliver effective mentoring and/or adviser projects.



Experience+

Experience+ Training supports employers to enable their mature age workers to pass on their valuable skills and experience to new workers. It helps provide quality training to up-skill mature age workers (aged 50 years or over) so that they can gain the skills needed to successfully mentor and supervise apprentices or trainees in the workplace.

Funding is also provided to Small business owners who employ registered Australian apprentices and who are themselves mature age workers

Experience+ More Help for Mature Age Workers

Experience+ More Help for Mature Age Workers provides workers aged 50 years and over who have trade and related relevant skills but no formal qualifications with the opportunity to have their skills assessed and formally recognised, and undertake gap training if required. This way; employers are better able to retain valuable skills and experience in the workplace.



Sir,

I read, with interest, the article by Doug Hawkes on Offshore Fabrication in Volume 9 of WeldEd and in particular the section on Language and Interpretation.

Having had first-hand experience of working overseas and with formulation of foreign language contracts, there are a few areas in the narrative that may, with respect, benefit from clarification. Firstly, though, there is total agreement that the issue of language can be significantly underestimated. A very real difference exists between an Interpreter and a Translator. An Interpreter works with the spoken word to convey the corresponding meaning and is relied upon to deliver that message at speed. A Translator, meanwhile, works extensively with the written word and is relied upon to convey a more accurate rendition of the corresponding meaning without the constraint of time.

There is a flourishing industry supported by the legal system in which Interpreters and Translators are employed in the courts to assist in the resolution of disputes brought about by agreements and contracts that have been translated by unqualified and unaccredited personnel. It is not sufficient to be bi-lingual without having formal qualifications in both languages, yet many important documents are "translated", for example, by a "bloke in the office who can speak Polish". From the perspective of qualification and with the subject article appearing in a welding journal with its industry familiarisation of qualifications and testing, the analogy can be drawn for both welders and inspectors. Indeed, you would not allow your sophisticated pipework to be welded by an unqualified welder or the attendant documentation reviewed by an unqualified inspector.

Accredited Interpreters and Translators are not trained in the "conversational" form of a language, and if one is seeking to employ a professional practitioner then this is most definitely a level which would not be used. Many organisations exist that provide accreditation for Interpreters and Translators. In Australia for example, it is the National Accreditation Authority for Translators and Interpreters (NAATI) with the minimum requirement to degree or diploma level for those with English as their mother tongue to qualify as Professional Interpreters and Translators.

While there are several levels of accreditation, up to and including United Nations Conference Simultaneous Interpreting, it must be pointed out that there are no levels termed "literal" or "convenient" and to employ this mode of thinking to the construction of a foreign language contract will inevitably lead to retaining a suitably

accredited Interpreter assisting your barrister in court. When arguing that HVAC is not "high voltage alternating current", costs associated with hiring qualified people pale significantly against those of litigation.

So too does the cost of rework where the Interpreter or Translator is not of an educational level to carry out research; recognising, for example that a piping elbow is termed a "knee joint" in Russian and that a hydraulic ram is not a "semi-aquatic sheep" in French. Multiple revisions, proof reading and editing of sometimes sizeable documents may be considered cost prohibitive and is usually avoided, unfortunately this often leads later to disputation due to "misinterpretation".

In the engineering world specifications, codes of practice and National directives govern much of what is designed, built and installed and the complexity of these documents require a level of translation expertise and knowledge equal to that of the original authorship. This also holds true for the contractual side of an agreement where the legal terminology and nuances can have a significant influence on the eventual outcome of an international project. There definitely is a need for clear expression and instruction, and, with the decline in the requirement for educational qualifications in the English language for engineers, the work of the Translator is increased, rather more so than for Interpreters. On the other hand Interpreters are nowadays more often confronted by the dreaded 'TLA', the three-letter-acronym, which abounds especially in the welding and process industries and which is almost a language unto itself. With the foregoing in mind it underscores the need for a level of expertise in language transactions commensurate with your engineering, contractual and commercial endeavours to ensure success and to avoid pitfalls brought about by a lack of awareness, as highlighted in Doug Hawkes' article, and also the potential costs resulting from disputes arising from the use of unqualified and unaccredited personnel.

Terry Andrews

AWI Member 0030

Terry Andrews BE (Mech) is a Senior Member of the American Society for Quality, a Member of the Chartered Quality Institute and a Life Member of the American Welding Society. He is a Director of Andrews-Hay & Associates which also provides AUSIT; NAATI; and AIIC internationally accredited Interpreting and Translating services.

Response from Doug Hawkes

"I concur. The response highlights another potential cost that is often not considered, plus the significant challenge of resourcing qualified people in all roles at all stages of a project."



Technical Session on Welding Duplex and Super Duplex and the associated problems

With the kind support of the Lincoln Electric Company a technical session on the weldability of the Duplex series of materials was held on Tuesday 20th March at Challenger TAFE'S Munster complex in Perth.

This evening session was an outstanding success thanks to the generosity of the Lincoln Electric Company who made available their International Welding Engineer and Stainless Steel Specialist Mr Fred Neessen. Fred was visiting Perth from Lincoln Smitweld in The Netherlands. Fred presented a very interesting humorous overview of the problems associated with these materials particularly in regard to heat inputs and corrosion resistance.

The attending members were entertained by Fred with a detailed technical overview of these materials and will look upon future duplex welding in a different light. Fred humorously "arced up" over the use of the expression "hot pass" which is how we typically describe the second pass in a butt weld.

The use of a "hot pass" in practical terms when welding the duplex materials has the potential to increase the heat input to a level detrimental to the longevity and corrosion resistance of the weld joint and surrounding material.

Illustrations and Macro Photographs during the presentation highlighted the results of a hot pass in a typical butt weld compared to the alternative "Cold pass" option.

Corrosion resistance of the weld metal and adjacent base material might be decreased when low welding speeds (high heat inputs) are applied to these materials susceptible to inter-crystalline corrosion.

In some applications with the 22% Cr Duplex materials an energy range of 0.5kJ/mm to 2.5kJ/mm is

encouraged with a max of 150°C interpass temperature. With the 25% Cr Super Duplex range the maximum range can be at 1.5 kJ/mm and 100°C max interpass temperature.

Considering the fact there is the potential for a wide range of possible parameters for a given application and with each particular job appropriate parameters should be selected and tested.

Typical welder techniques such as a slow travel speed due to "walking the cup" should not be encouraged to avoid the risk of high heat inputs.

Note: The Australian Standard AS/NZS 3992 – Pressure Equipment lists in the essential variables for Weld Procedure Qualifications (Table 5.1 item 7 note C) Material Groups M (Duplex) arc energy outside the range of 1 to 3 kJ/mm requires requalification. This range is outside material best practice and a Technical Query may be required to a client at the tender stage of a project requesting a dispensation for a qualified WPS with arc energy outside this range.

AWI™ is encouraged by the response we have had from industry regarding this technical session on the Duplex materials. Many calls and supporting emails from across Australia have highlighted the need for Fred Neessen to return for a more comprehensive visit to other States.

AWI extends sincere appreciation to the Lincoln Electric Management for their support and making Fred Neessen available. Our thanks are also extended to Greg Guppy for his support and the use of Challenge TAFE facilities.



ING. Fred Neessen, EWE
Technical Support Consumables,
LINCOLN SMITWELD B.V.

Since 1980 Fred has been employed by Smitweld and later Lincoln Smitweld as a qualified Welding Engineer and as a welding consultant. In his current position, Technical Manager Consumables, he is active as an international welding consultant and gives lectures on seminars and technical welding training. In addition, he regularly publishes articles in leading welding journals. He is also a teacher at the IWE course at Center for Nature and Technology in Utrecht.

National framework of education and certification – AWI™ Certification and endorsement for AS 1796 Welders certificates 1-9

A part of the AWI's initial strategies and prime objectives were to establish an alternative certification system for Welders Certification 1-9 endorsement and recognition. We have worked methodically with Manufacturing Skills Australia, TAFE and RTO partners from every state to achieve this objective.

We take a great deal of pleasure in confirming to our members and the Australian Fabrication Industry as a whole that the AWI™ can now receive applications from AS 1796 (certificates 1-9) qualified personnel for an AWI™ endorsed Certificate and Wallet card.

AWI™ endorsement confirms nationally that an individual's training; academic record, qualifications and work experience meet the essential criteria of AS 1796 Welders Certificates 1-9. It adds weight to these elements and proves to the Australian Fabrication Industry and potential employers, the skill level and competency of the certificate holder

This Certification system forms part of the prerequisites process and leads to endorsement for the AS 1796 Welder Supervisors Certificate 10.

Applications:

Apply by emailing the Australian Welding Institute at:

admin@austwelding.com.au

An application form will be returned

Each application is reviewed by the AWI E & C Committee upon approval the individual receives a AWI endorsed Certificate and Wallet card.

The AWI™ would like to give thank the efforts that the MSA, our TAFE and RTO partners have given to make this objective achievable.

AWI™ and TAFE NSW Tradeshow



The AWI and TAFE SWSi have also been very busy organising another tradeshow. We believe this is going to be bigger and better than the hugely successfully 2011 show.

The tradeshow **will be on the 26th June** and has expanded from welding and fabrication to cover both sheet-metal and machining industries.

Because of its size the Tradeshow will need to be relocated to the Miller TAFE, Cnr Hoxton Park and Banks Roads Miller NSW 2168

TAFE SWSi is working with both local industry and national companies to provide this Tradeshow. From all the information we have received so far, it is a very welcome even.

SWSi is one of Australia's largest TAFE Institutes, which attracts over 72,000 students each year and also provides and delivers training to over 4,500 International students. Students enrol in over 700 courses and programs offered by the Institute.



Letter to the Editor

Many thanks to Mr Terry Andrews for his response to our Doug Hawkes article titled: *ENGINEERING (AND OTHER) CHALLENGES WITH OFFSHORE FABRICATION* - which was published in volume 9 of WeldED. A well written letter which had the author of the article agreeing wholeheartedly.

As well as the online forum, this is a great chance for members to raise issues that affect their industry

CIGWELD Esky Bar Competition.

Register online for your
chance to win.

For your chance to win our new CIGWELD
Esky Bar simply register your details online
with your promo code 'CIG-ESKY'.



apac.thermadyne.com/south-pacific > About Us > Registration > Competition Entry

BONUS

And as a **BONUS** prize if you also 'LIKE' us on facebook,
you will go in the running for a CIGWELD promotional pack.



Promotional pack includes: backpack, coolerbag, drink bottle, cap, polo, tshirt, and multi tool plyers.
To be eligible for the bonus prize, the entrant must register online and on facebook. (If your facebook ID differs from
your real name, please notify us on our online registration form in the comments box so we can verify you.)

Competition ends 31st May 2012. The winner will be drawn by CIGWELD Pty Ltd on the 4th June 2012 and notified
via phone and email. The winners name will be published on CIGWELD's website on 7th June 2012.

All terms and conditions are online upon registration, or in the About Us section on the website.

If you would like to stay up to date with CIGWELD and our products, also follow us on Twitter and Youtube
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Australasian Project
Supplies Pty Ltd
Trading as
ABN 14 079 381 481

47 Dowd Street
Welshpool,
Western Australia 6106

P: +61 8 9258 5113
F: +61 8 9258 4963
M: 0427 916 034
E: geoff.thomson@shindaiwa.com.au
W: www.shindaiwa.com.au

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admin@technoweld.com.au
www.technoweld.com.au

Inspection
Consultancy

WPS / PQR
Development

+61 409 698 968

CIGWELD Pty Ltd
A Division of Thermadyne Industries Inc.
71 Gower Street
Preston VIC 3072 Australia

Tel: 1300 654 674
Fax: +61 3 9474 7391
enquiries@thermadyne.com.au
www.thermadyne.com.au

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Paul HOSKING
Technical Work Co-ordinator

Asset Integrity and Reliability
Services Pty Ltd
35-37 Stirling Street
Thebarton, South Australia, 5031
Australia

Phone: +61 (0) 8 8416 5337
Fax: +61 (0) 8 8416 2760
Mobile: +61 (0) 410 221 484
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