

# Stainless steel welding from Unique Welding

Unique Welding, through its national branch network, comprehensive product range, global partnerships and over 40 years of expertise, is able to assist fabricators to reduce welding costs, improve productivity and reduce weld safety risks in the stainless-steel industry.

Unique Welding supplies a flagship range of MMA, MIG, TIG and Plasma welding machines and equipment through its in-house brand, Thermamax, which has proven to be an affordable yet high-quality workhorse of industry. High reliability enables the company to offer three-year guarantees, supported by a network of service centres and after-sales support networks.

The Thermamax APOLLO MIG machines are fitted with gas selection charts that enable the welder to quickly and accurately select the right shielding gas for the common welding applications. With a powerful 500 A Synergic Pulse MIG machine in its Thermamax Range, no stainless steel job is too big to handle!

Besides an experienced welder, quality welding requires quality equipment, gas and consumables. Unique Welding has recently partnered with a new, proudly local, Level 2 B-BBEE producer of stainless-steel welding wire. This company has developed a comprehensive range of top-quality stainless-steel welding wires based on European technology, specifications and raw materials. Through this new partnership, Unique Welding is able to leverage international expertise, exceptional quality, support and knowledge to benefit our local market.

The new Thermamax Stainless Steel welding consumables

come with an array of international certifications, including AWS, EN, ISO, and TUV. These consumables also have ABS and BV approvals, which are critical to many South African industries, including the shipping industry. This ensures that they are manufactured to produce a controlled



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Welding stainless steel pipes.

weld metal ferrite content and designed to produce first class welds with reliable CVN impact toughness and lateral expansion at cryogenic temperatures. Despite the lower ferrite content, hot cracking resistance is good, even when welding thick-walled constructions.

As a leader in the manufacturing, supply and distribution of industrial and specialty gas in the Southern African region, Air Products and Unique Welding supply a number of gases used for stainless steel applications.

The addition of helium or hydrogen to argon for the welding of austenitic stainless steels has been shown to increase production speeds by up to 30% over the more traditional 100% argon shielding gas. The high thermal conductivity of hydrogen also enhances the cleaning effect, as it is a reducing gas. Helium on the other hand is a preferred gas enhancer for ferritic stainless steels.

Carbon dioxide is added to the welding process as it is slightly oxidising, providing increased heat in the arc through disassociation. The available heat increases

penetration, adding width to the weld and therefore improving side wall fusion.

Whilst technical performance is important, the gas supply solution is equally important. Unique Welding is able to supply shielding gases for applications from small to large, thus able to expand its supply arrangement as the customer's business grows. Supply ranges from single cylinder supply, to manifold packs, and on to Air Products' CryoEase mini bulk installations.

Taking a good weld to a great weld is as simple as finishing off the welding process effectively. Teaming up with German-based industry leader, Pelox, Unique Welding provides an array of pickling and passivating solutions for stainless steel welds. The stainless welding team is trained and ready to recommend the best solution to save both time and money, from manual application, to high-pressure spray solutions, to an entire pickling bath installation, which all leave flawlessly finished stainless steel weld beads.

Hexavalent chromium or Cr(VI) is one of the valence states (+6) of the element, chromium. It is usually produced by an industrial process. Cr(VI) is known to cause cancer. In addition, it targets the respiratory system, kidneys, liver, skin and eyes.

A major source of worker exposure to Cr(VI) occurs during hot-work such as welding on stainless steel and other alloy steels containing chromium and its compounds. Stainless steel fabricators may face future worker health claims, hence the need to



The Thermamax TruFlo PAPR (Powered Air Purifying Respirators) comes with the TruVision WH02 auto-adjustable welding helmet with TruBlu colour technology.

protect workers with PAPR-type personal protection welding helmets (Powered Air Purifying Respirators).

The Thermamax TruFlo PAPR is widely accepted in the welding industry due to its European design and extended warranty. The system comes with the TruVision WH02 auto-adjustable welding helmet with TruBlu colour technology, an array of specialised filters for multiple welding envi-

ronments, and a failproof warning system.

As the largest independent, black owned gas and welding distributor in South Africa, Unique Welding is at the forefront of welding technology, transforming the South African gas and welding industry with expertise, innovation and personal specialised services such as the end-to-end stainless steel offering outlined above.

[www.uniquewelding.co.za](http://www.uniquewelding.co.za)

## A simple guide to choosing stainless steel consumables

By John Du Plessis of Spesmet Technologies

The correct welding consumable grade must be used for each of the different austenitic stainless-steel grades. Matching consumables are available for most of the grades – 304, 309 and 316, for example – and these are either specified exactly according to the grade name, or the grade name for the consumable may carry a suffix such as -L, -H or -N. The L suffix means it is a low carbon alloy, an -N indicates it is nitrogen bearing and an -H indicates higher carbon content.

For shielded metal arc welding (SMAW) electrodes, there are different types of electrode coating, which are generally given a number suffix, 15, 16 and 17, depending on the coating type.

A Type 15 electrode coating has a lime-based coating and is intended for dc+ polarity only. The slag covering is not as thick as that found on the Type 16 and Type 17 coatings. The weld bead is normally convex in a horizontal fillet weld with excellent crack resistance. Type 15 stainless electrode coatings give the best all positional weldability, however the arc is harsher than the other types.

Type 16 electrode coatings are rutile-based and can be used with both dc and ac polarity. The weld bead in a horizontal

fillet is almost flat. The arc is much softer than Type 15 electrodes, with good all positional welding capabilities.

The Type 17 electrode coatings have a silica-rutile composition. These can also be used with both dc and ac polarity. The additional silicon in the coating acts as a wetting agent, having the effect of increasing puddle fluidity. Type 17 electrodes produce a concave weld bead in a horizontal fillet weld, and are often used in the flat and horizontal welding positions. These electrodes have limited vertical welding capability. The arc is smooth and relatively soft when welding.

Welding consumables from different manufacturers, although having the same classification, are by no means equal. There are significant differences in the consistency from batch to batch, chemistry, ferrite number and impurity levels.

Customers are advised to carefully scrutinise products on offer, as some manufacturers either do not comply to the standards or produce products at the low end of the composition requirements, which creates increased risks in critical applications. ■



Unique Welding supplies a complete range of products and services for stainless steel welding, including Thermamax MMA, MIG, TIG and Plasma welding machines; Thermamax Stainless Steel welding consumables; the full range of Air Products shielding gases and gas supply options, along with welding PPE such as Powered Air Purifying Respirators and pickling and passivating solutions.