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Published three times a year and  
mailed out together with  
*MechChem Africa* by:

**Crown Publications (Pty) Ltd**

Crown House  
Cnr Theunis and Sovereign Streets  
Bedford Gardens 2007  
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**Deputy publisher:** Wilhelm du Plessis

**Production & layout:** Darryl James

**Circulation:** Brenda Grossmann

**Printed by:** Tandym Print, Cape



ESAB WeldCloud: *African Fusion* talks to ESAB SA product manager Keith Saunders about InduSuite WeldCloud, ESAB's collection of digital solutions for enhanced weld quality and productivity, reduced downtime, and simpler automatic process documentation.

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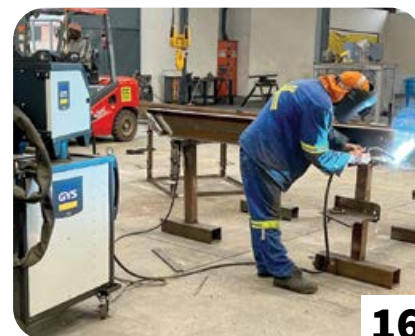
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# SAIW / ISO 3834 certification is vital for successful mining.

By using SAIW / IIW ISO 3834 certified suppliers for your mining operations, you'll ensure the quality of welded fabrications, improve safety on the mine and minimize costly downtime as well.

Since 2008, the Southern African Institute of Welding (SAIW) in association with the leading global authority on welding The International Institute of Welding (IIW) has been ensuring and verifying compliance with international ISO 3834 standards.

## SAIW / IIW ISO 3834 Certification is good for mining.



**SAIW**  
Certification



## SAIW and SAIW Certification

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As the President of Africa's TWF, I was very proud to have been part of our first Annual Assembly and International Conference in Cairo.

TWF is a dynamic and forward-thinking organisation dedicated to advancing the welding industry in Africa. It provides a platform for professionals in the welding industry to network, share knowledge and collaborate towards achieving sustainable industrial development.

During the conference we had the opportunity to meet with the leadership of the IIW to discuss cooperation that could foster the accelerated growth of the welding industry across the continent. There are 54 countries in Africa, and the SAIW is currently the only IIW Authorised National Body (ANB).

While SAIW has been able service the needs of some African countries by delivering training and setting up Approved Training Bodies (ATBs), we have had to apply to the IIW for an Extension of Scope to operate in each country. We feel that the TWF, the IIW and the SAIW should cooperate to develop a Strategy for Africa that is affordable to African countries and will assist them in fast-tracking industrial growth – with welded fabrication at its core.

Here in South Africa, we have recently had meetings with our fellow industry associations, SAISI, Sassda and others, with a view to organising a Metals Conference, probably this August. While SAIW will present NDT, welding and fabrication, we are looking at a conference with the theme of growing the South African Steel Industry. We want to bring out the World Steel Association's Secretary General to give a talk and we hope to get strong support from our local steel and stainless steel producers.

We are targeting fabrication companies, our ISO 3834 clients and our corporate members, and we hope to put together an exhibition for suppliers to the steel and fabrication industry to exhibit new products, technologies and services. If we get a number of associations together, we think we can organise a decent sized conference with different breakaway sessions that would offer maximum benefit to our fabricators and a boost to the steel industry as whole.

We have recently done an ISO 3834 presentation to the Small Enterprise Development Agency (SEDA) and some entrepreneurs looking to supply local mines from factories in Middleburg. SEDA is exploring funding its members to get ISO 3834 certification. The reason is most pleasing. These local fabricators are suppliers to the mines in the area but are increasingly being excluded because more and more mining houses are insisting that fabricators are certified to ISO 3834. So the value of raising and controlling weld quality standards through our flagship SAIW ISO 3834 Certification Scheme is now beginning to be of interest to mining, our biggest industry.

We've got Sasol Group back for 2023, as well, a very strong group of 20 individuals. They will be with us for a year doing a comprehensive collection of courses, in NDT, process plant inspection, competent persons, ASME Codes, Paint Inspectors, Welding Inspectors and practical welding. Many of these courses will be run in Secunda to make access easier and more cost effective. Only those courses requiring laboratory equipment will be run at the SAIW. We also have a group of IAEA students from Malawi who will be with us for around six months, doing NDT.

I am pleased to report that the growth in student numbers and income for the first few months of this year is exceeding our expectations. Although we are still well down on where we were in 2019, we are already nearly 50% up on budget expectations. We are back on a sustainable growth trajectory, which suggests that our restructuring has been worthwhile. Long may this continue.

John Tarboton





# TWF's 2022 year culminates in First Annual Assembly and Conference

At the opening of the 1<sup>st</sup> TWF Africa Annual Assembly and Conference in Cairo on March 14, 2023, TWF President John Tarboton presented the welcome and the annual report for the Federation's 2022-2023 year. African Fusion reports.

“It is my pleasure to welcome you all to the Inaugural General Assembly and International Conference of The Welding Federation, with the theme ‘Welding and Allied Processes – Blueprint Africa. This conference marks a significant milestone in our journey towards promoting and advancing the art and science of welding in Africa and beyond,’” began John Tarboton, SAIW executive director and TWF president for the 2022 year.

“As the President of The Welding Federation, I am proud to represent a dynamic and forward-thinking organisation dedicated to advancing the welding industry in Africa. Our goal is to provide a platform for professionals in the welding industry to network, share knowledge, and collaborate towards achieving sustainable development through welding.

“The theme for this conference, ‘Welding and Allied Processes - Blueprint Africa,’ could not be more timely. The African continent is rapidly developing, and the role of welding in this development cannot be overemphasised. Welding has become an essential tool in various industries, including construction, manufacturing, and oil and gas. It is, therefore, imperative that we come together to explore ways to optimise the use of welding technology to drive economic growth and development in Africa,” he said.

There have been numerous challenges faced by organisations worldwide in 2022,



A panel discussion at the TWF Africa Annual Assembly in Cairo. From left: Hamed Abdel-Aleem, CMRDI; Ama Ikuru, NCDM; Grace Erhimona, PTI; and Iman El-Mahallawi, BUE.

including recovery from the Covid-19 pandemic, the war in Ukraine, and the resultant global inflation problem. This has led to higher interest rates that have dampened global growth rates. In addition, the transition from fossil fuels to renewable energy is a threat to many countries in Africa. “We must ensure this is a just transition and that the process is managed carefully to minimise any negative impacts on our continent,” he added.

Despite the potential advantage of Africa's growing population, the corresponding challenges are mass unemployment and a gross lack of infrastructure. “The fact is, there is an urgent need for Africa to think differently and innovatively. We need to move away from long-standing survival tactics to a cohesive developmental strategy to address our centuries' old socio-economic limitations. We need to harness the collective strength of Africa to address these challenges,” Tarboton urged conference delegates.

“This is the model

that we, as TWF, have adopted to build our success in 2022. We have responded positively to Africa's call for a solutions platform to drive and manage our industrial interests. A solutions platform that complements and not necessarily competes with international benchmarks. A solutions platform that accurately enmeshes the African ideal and identity and emphasises the need to build skills, create opportunities, and sustain the productivity of manufacturing industries.”

He reported that in 2022, despite the lack of funds, TWF was able to achieve most of its programmes and projects. Impressively, TWF through the committed effort of members, followed through with its road map to provide quality solutions in terms of human and corporate capacities.

“In 2022, TWF made significant progress. Our successes include forging partnerships such as signing an SLA with the SAIW to promote and jointly implement ISO 3834 company certification schemes as a vehicle to growing quality and improving productivity across manufacturing industries in Africa.

“TWF also successfully onboarded PETAN – the Petroleum Technology of Nigeria. And we were able to enter into partnership with the biggest energy conference and exhibition in Africa through our embrace of PETAN onto the Board of TWF. This led to



Delegates at the 1<sup>st</sup> TWF Africa Annual Assembly and Conference in Cairo, which was held from March 14 to 17, 2023.



our participation in the recent SAIPEC event – the Sub-Saharan Africa International Petroleum Exhibition and Conference.

“In terms of membership, we are proud to have welcomed Uganda and Cameroon to the TWF family, and we look forward to working closely with them and our other members to advance our mission. Furthermore, TWF is committed to providing quality solutions in terms of human and corporate capacities. Thanks to the commitment of experts in each of TWF’s TNB committees, the welder and fitter syllabuses and implementation structures were developed and successfully concluded.

“We have developed the TWF Welding Inspection Certification Scheme and structure, which we plan to launch soon. This programme is a noteworthy accomplishment for our organisation, and we are confident it will initiate significant progress in Africa’s industrial sector,” said the TWF president.

In 2022, TWF participated in key regional events including the TWF SDG event in Cameroon, the TWF Regional Symposium in Egypt, TWF’s participation in WAITRO conference, TWF’s participation at the Oil and Gas Trainers Association of Nigeria, OGTAN’s Technical Industry Lecture and the TWF Regional Symposium in Uganda were other successes.

“As we look ahead to 2023, TWF is committed to participating in key events across Africa and beyond, including the Sub-Saharan Petroleum International Exhibition and Conference and the IIW Annual Assembly and Conference. We are also



*TWF governance team, Fellows and recipients of Africa’s Continental Manufacturing Champions award sponsored by SAIW. From left: John Tarboton, South Africa; Ibrahim Talla, Senegal; Ayo Ardeniyi, Nigeria; Abdel Momen, Egypt; Simbi Wabote, Nigeria; Samuel Onyechi, Nigeria; Nik Odinuwe, Nigeria; Charles Kwesiga, Uganda; Abiy Awoke Tessema, Ethiopia; Matiwos Ashenafi, Ethiopia; and Ronald Ssezibwa, Uganda.*

excited about the launch of our Welding Inspection Certification Scheme, which we believe will be instrumental in promoting the art and science of welding in Africa.

“In 2023, we will also look to working with the International Institute of Welding (IIW). We are looking to find synergies between TWF and IIW so TWF schemes complement IIW schemes in Africa within the TWF Skill Management Map. We hope, going forward, that the relationship with IIW and TWF will grow to further our mutual interests,” said Tarboton.

“2023 holds much promise for Africa as we work together, albeit with challenges in view. TWF remains committed to promoting and advancing the welding industry in Africa, and we look forward to a bright future ahead.

“In closing, I would like to acknowledge the TWF management team for their hard work and contribution over the past year.

“I would particularly like to thank and congratulate our Executive Director, Mr Ayo Ardeniyi, for his tireless efforts in launching TWF and driving the developments that we see here today.

“And so, over the next few days, we will have the opportunity to hear from a distinguished line-up of experts in welding and allied processes. We will engage in meaningful discussions, exchange ideas, and learn from one another. I have no doubt that this conference will be a catalyst for innovative solutions and ideas that will positively impact the welding industry and beyond,” John Tarboton concluded.

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

## Positive feedback from TWF Assembly and meetings

Giving some feedback following the 1<sup>st</sup> Annual Conference and Assembly of the TWF in Cairo during March, John Tarboton says that 16 African countries and eight non-African countries participated and 78 papers were presented during the four-day event, which followed a hybrid model with presenters able to deliver both live online and in person. The event was hosted by Egypt’s Central Metallurgical R&D Institute (CMRDI), under the coordination of Prof Bahaa and Prof Monem.

“The paper given by Chris Smallbone, about assisting African countries to build-up national welding capabilities was particular well received,” notes Tarboton. “He highlighted how to convert talk about developing welding capability into reality: how we should go about upskilling and growing the skills pool for the benefit of the whole continent,” he adds.

Tarboton also cites the importance of a meeting between the TWF and the International Institute of Welding (IIW). “The TWF board met with IIW CEO, Luca Costa and president elect, Thomas Böllinghaus. They agree that the IIW’s global strategy isn’t working for Africa. Across the whole continent, SAIW is the only IIW Authorised National Body (ANB),” Tarboton points out.

As well as being costly to be an IIW-associated body, Tarboton

also suggests that many countries on the continent cannot easily access the necessary foreign exchange. The TWF, therefore wants to develop its own welder, pipe-fitter and inspector training schemes, believing that the international schemes tend to over qualify-people for the levels of industrialisation initially involved. “Whatever scheme emerges needs to be fit-for-purpose, though, with a strong quality assurance component,” he points out.

“At the moment, a multi-national Federation such as TWF cannot become an associate member of the IIW, but Luca and Thomas agreed to take this issue back to the IIW board to see if TWF can become a pan African IIW-ANB, so it can collectively foster welding capability and industrial growth across the continent in more cooperative, cost effective and relevant ways,” Tarboton reveals.

Following up, he says the 2024 TWF Annual Conference and Assembly will take place in Nigeria, which has a strong oil and gas industry, and it will move to Ethiopia in 2025.

“As a starting point on this growth journey, Cairo was very worthwhile. It makes one realise how important face-to-face meetings are in getting to know the people well enough to cooperate on an inter-continental level,” Tarboton concludes.





# ISO 3834: For mining suppliers seeking

This article outlines the key advantages of adopting ISO 3834 Certification for the welding operations of mine equipment and infrastructure providers.

In a development that looks set to become a long-term requirement, there is a move in the South African mining industry to specify that welding fabricators and associated suppliers must obtain ISO 3834 welding certification to ensure the quality and safety of the products and services they supply.

"This is a welcome and overdue development given that suppliers to a variety of other safety-critical sectors – including the power, petrochemical and rail industries – have all moved to mandatory ISO 3834 requirements for companies seeking to obtain contracts with them," says SAIW Executive Director John Tarboton.

## Health & Safety seizes the day

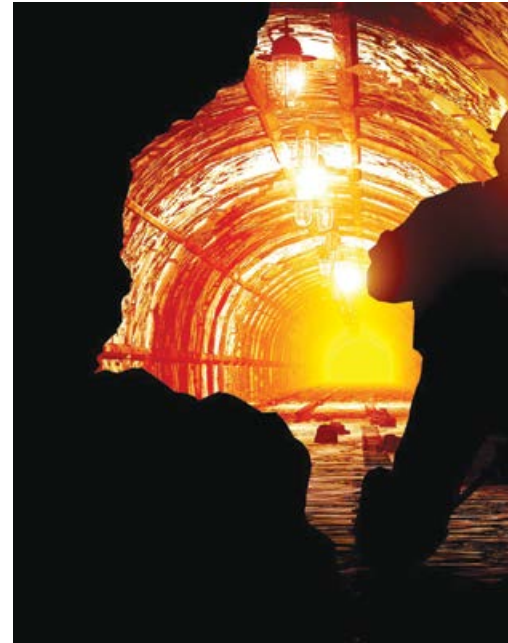
Renewed attention to this form of endorsement stems from the ravages of the Covid-19 pandemic, which has brought quality requirements into far sharper focus with a newfound appreciation for the importance of these core facets of manufacture and production, and the need to ensure that mining personnel and products are at the correct level.

This is vital given that in terms of current mining health and safety regulations if, for example, there is a safety incident in a mine due to a weld defect, the mine can most certainly be held liable.

## Cost savings

In addition, current global and local financial constraints have seen a move towards cost savings and welding is one of the key areas where producers have been able to initiate cost savings. This is because the use of ISO-compliant standards and procedures results in an improvement in quality with fewer failures, and less downtime and overall lost production revenue.

"The benefit for ISO 3834 certified fabricators and mining suppliers is that they operate at a globally recognised level, which in turn increases their new business opportunities in a far broader range of markets," Tarboton says. "In addition, ISO 3834 is an excellent way to develop start-ups by ensuring their quality management is up to scratch and they can fabricate at a higher level for larger, better paying clients."



## An unbiased, objective and highly experienced partner

Overall, SAIW Certification can draw from the collective training and technical expertise of the broader Southern African Institute of Welding in which it operates. The SAIW has been in existence since 1948 as a founder member of the International Institute of Welding (IIW) and specialises in a variety of welding and NDT related services.

## SAIW champions successful NDT developmental programme

SAIW NDT manager, Mark Digby, talks about some exciting recent projects and the successes that are helping the NDT division at SAIW to grow.

The SAIW's Non-Destructive Testing (NDT) department is soaring ahead in 2023 thanks to a record 12-month performance, and new projects underway in collaboration with a range of strategic entities such as Sasol and Eskom.

One of the most exciting projects has seen the SAIW join forces with TUV-SUD South Africa Pty Ltd in a dedicated TUV-SUD Skills Development Initiative that has resulted in extensive training of NDT personnel since 2021.

SAIW NDT Manager, Mark Digby reports: "At least 15 ex VUT students have been assisted by TUV-SUD to achieve a Level 3 Qualification/Certification with at least one method of specialisation. This has proven to be one of the most successful NDT Level 3 developmental strategies ever undertaken

by a South African NDT Service provider, with the programme being extended into 2023, and anticipated to run until at least 2025."

## Sasol collaboration

Further evidence of the success of the NDT services offered by the SAIW includes the highly successful SASOL Learnership Programme (Groups A to H) that was established in 2007 and has seen at least 160 school leavers trained in four methods up to Level 2. These students have subsequently entered the lucrative inspection programme as highly competent Statutory Competent persons or Inspectors of Pressurised Equipment.

The SAIW has also actively participated in the Department of Employment and

Labour's established SAQCC Board and supports the activities undertaken by this professional body for NDT in South Africa.

Digby explains: "One of the workstreams of the SAQCC-NDT Board is to include tertiary qualified students within the regulatory framework of NDT personnel. The transition examinations established during 2017 have proven to be a very useful means to include these students within the industry requirements."

## Legacy counts

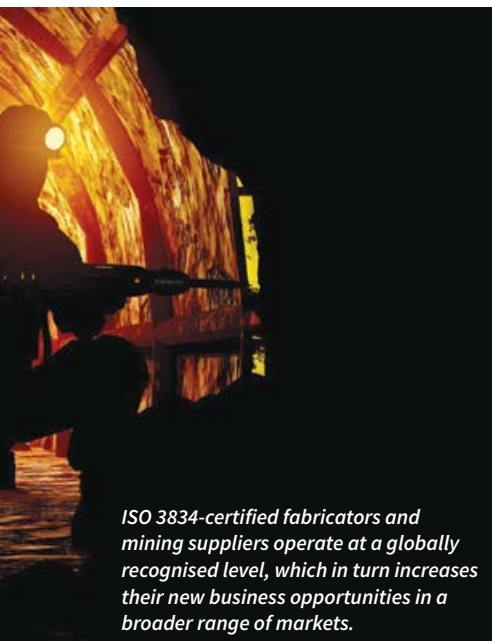
Overall, the SAIW NDT division's level of success is unsurprising considering its depth of experience and historic performance in the South African economy. It has provided NDT Training since 1980, with active participation during the construction of PetroSA, Koeberg, SASOL and other power stations across SA.

Its highly experienced and competent lecturing personnel also have more than 100 years of combined experience in the Power

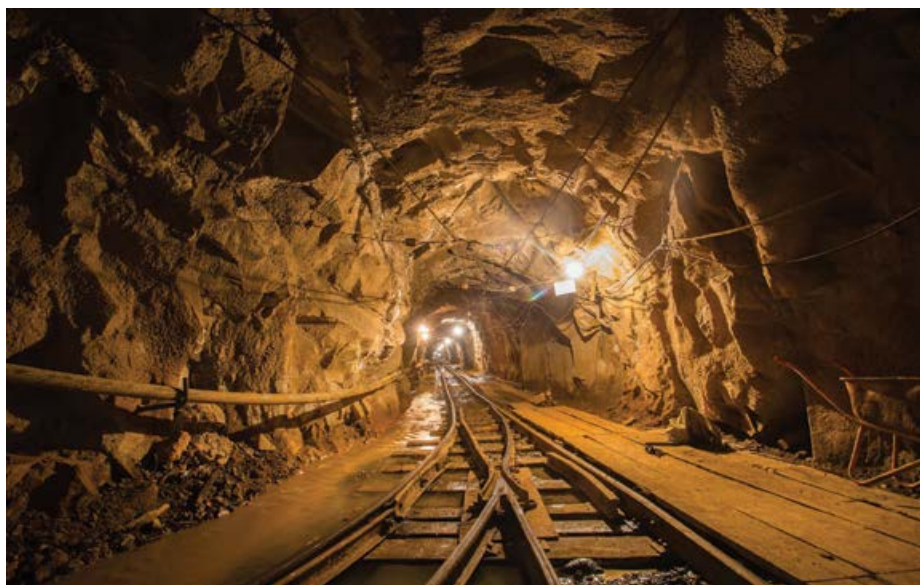




# world-class recognition



*ISO 3834-certified fabricators and mining suppliers operate at a globally recognised level, which in turn increases their new business opportunities in a broader range of markets.*



*In terms of current mining health and safety regulations, if there is a safety incident in a mine due to a weld defect, the mine can most certainly be held liable.*

SAIW Certification received its first ISO 3834 accreditation in 2008 through the International Institute of Welding (IIW) and is home to more than a century of collective wisdom and experience. It's now the only ISO 3834 certification body recognised by the International Institute of Welding (IIW) as an Authorised Nominated Body for Company Certification (ANBCC) in South Africa.

Given its role as the custodian of ISO 3834 certification in South Africa, it

remains 100% committed to being an unbiased, objective, and balanced partner of choice for clients' ISO 3834 requirements, and SAIW is fully certified to the latest revision of ISO 3834 (2021).

This not only enables it to provide certification of personnel and processes, but SAIW can also endorse mine-based training centres on mines to allow them to progress to the level where they can train their own personnel.

## Easing the financial burden

To assist clients in maintaining their ISO 3834 Certification requirements, SAIW Certification has instituted several market-related payment plans to ease the financial burden companies face when keeping up with the annual requirements of ISO 3834 certification.

The SAIW also offers free company ISO 3834 information visits.

[ISO3834@saiw.co.za](mailto:ISO3834@saiw.co.za)

Generation (Conventional, Nuclear & Renewable); Petrochemical; Mining; Transport; Sugar & Pulp and Foundries industries.

A key differentiator for the SAIW NDT offering in the market is the fact that it is home to the most extensive training and examination sample library of any training school or Personnel Certification Body – SAIW Certification – in South Africa. The Institute's facilities are substantial, with ten classrooms and five dedicated testing laboratories that are home to equipment, calibration and reference samples for facilitating NDT classes of up to a maximum of 10 (UT; RT; ECT) to 15 (VT; PT; MT) students per class.

## Industry-centric

Another core strength of SAIW NDT's division is its ability to provide a flexible customised service to its clients, where training and examination can be provided at a company's premises – dependent on suitable class facilities. Examinations can also be arranged 24/7, 365 days a year, dependent on demand and location.

Digby says this industry-centric approach stems from the fact that SAIW NDT was established by the industry and for the industry. "The SAIW is owned by its members, who are leading industry representatives, and our courses and content – while compliant with international norms and standards – are based on local industry needs and requirements."

This ensures the SAIW facility is fully compliant with international standards via SANAS accreditation, while the SAIW is an ISO 9712 Approved Training Body provider in six basic methods up to Level 3.



*SAIW's highly experienced and competent lecturing personnel have more than 100 years of combined experience in the Power Generation (Conventional, Nuclear & Renewable); Petrochemical; Mining; Transport; Sugar & Pulp and Foundries industries.*

SAIW Certification is an ISO/IEC 17024 SANAS Accredited Personnel Certification Body under the scope of ISO 9712.

Looking ahead, Digby says some of the key NDT training innovations in 2023 include digital formative and summative assessments during classroom training as well as online theoretical exams (General & Specific) as part of the SAIW Certification qualification process.

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# WeldCloud: the complete digital workflow solution for fabricators

*African Fusion* talks to ESAB SA product manager Keith Saunders about InduSuite WeldCloud, ESAB's collection of digital solutions for enhanced weld quality and productivity, reduced downtime, and simpler automatic process documentation.

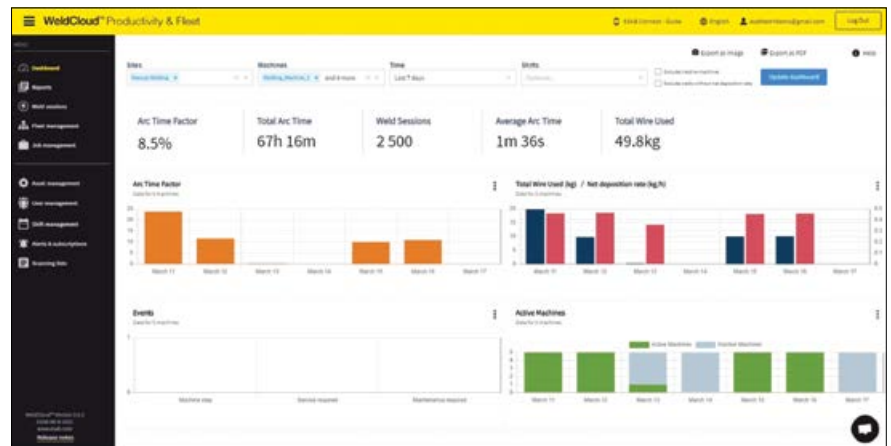
InduSuite from ESAB is a portfolio of digital solutions developed to help ESAB customers to improve efficiency and weld quality at every step of the fabrication process, from plate to finished product.

In countries across the world the software is being used with ESAB and non-ESAB welding equipment to improve performance: an Italian manufacturer of agricultural equipment has gained 6 000 additional hours of welding time; a Finnish manufacturer of mining equipment increased arc-on time to 20% – about double the industry average; and a Brazilian petrochemical giant has saved thousands of hours of engineering time while improving weld quality and reducing risk.

InduSuite solutions include WeldCloud Productivity, WeldCloud Fleet and WeldCloud Notes, along with data analytics solutions for plate nesting and cutting and offline robot programming.

The apps help users to:

- Raise welding quality by developing and ensuring compliance with procedures, standards and regulations.
- Raise productivity by tracking and ana-



*WeldCloud productivity benefits include improved productivity, faster responsiveness, easy deployment and investment justification.*

lysing welder productivity, quality and consumables usage.

- Maintain fleet equipment in optimal working condition through machine health monitoring.
- Assure welder accountability and oversight by tracking key welding and cutting progress.

“We can offer solutions for fabricators from small workshops with a few welding machines to large companies with fleets of equipment on multiple sites. WeldCloud software can be downloaded and run on a laptop, tablet, smartphone, or any device with a Wi-Fi connection and a web browser,” says Keith Saunders, product manager for ESAB South Africa.

“It enables supervisors to see production rates, arc on time, wire usage and a host of other welding parameters more easily than ever before. The data gets downloaded onto a supervisor’s device, who can immediately see, via easily accessible charts, what all the machines are doing; how many welds are being completed; whether they have been done according to the Welding Procedure Specification, and much more. WeldCloud helps supervisors to see exactly what is going on across all shop floors of the operation and it provides much better control over the quality and consistency of welding,” Saunders says.

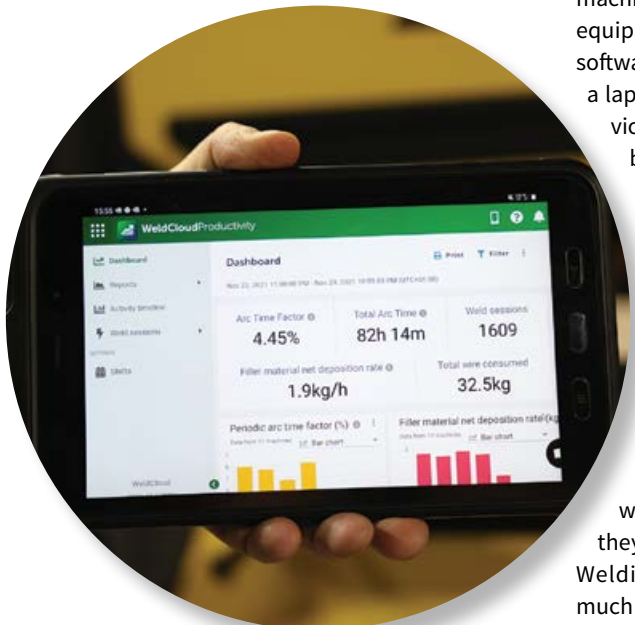
In terms of hardware, it is also very easy to install. The latest ESAB’s digital power sources have the option of been ordered with the WeldCloud system installed. For older ESAB and non-ESAB machines, there is an external device called a Universal Connector, which gets installed onto the welding machine. These units can be connected to the Wi-Fi and be ready to capture welding data within five minutes. “So it doesn’t matter how old the welding machines being used are or if a fabricator has a mix of brands, the same data can be collected and the quality can be raised across the organisation,” Saunders explains.

“We are currently setting the system up on a robot fitted with the ESAB Aristo 500ix,” he adds. “And on the industrial side, we have a system on trial at Howden and we are installing trial systems at fabrication facilities such as K5 Heavy Engineering; power and piping specialist, Steinmüller; and National Stainless Steel Centre,” he informs *African Fusion*.

“It’s a new system being rigorously tested and we are positive customers will see this as a successful tool in their welding and cutting shops. Via efficiency and productivity gains, the investment is well worth it,” Saunders concludes.

## A case study from ADR Group

WeldCloud Productivity has helped an axle supplier in the agricultural industry to



*WeldCloud software can be downloaded and run on a laptop, tablet, smartphone, or any device with a Wi-Fi connection and a web browser.*



improve weld productivity at its facility in Poland by 500-hours every month. This because WeldCloud's analytics functions have enabled quick identification of productivity bottlenecks and reduced non-value-added time to an average of only 26 minutes per shift, per station. These two factors alone have justified the company's investment in ESAB's WeldCloud welding solutions.

ADR specialises in the manufacturing of braked axles, suspensions and bogies – fully assembled axles ready to be fitted – for leading heavy trailer and agricultural machinery manufacturers. With headquarters in Uboldo, Italy, the ADR Group has twelve plants with locations around the world and a rich history of R&D, customer collaboration, and a strong after-sales service culture.

The company's facility in Poland is an early adopter of WeldCloud online data management and analytics tools.

In addition to online data management solutions, ADR wanted one global provider that could support it in every country with a broad portfolio that included equipment, filler metals, robotics and value-added engineering services. Long term, ADR also wanted to enhance its documentation and traceability functions; providing customers with added confidence in the quality of its products.

The ADR Polska S.A. production facility in Zagórz, Poland, now has a completely integrated ESAB system featuring 30 AristoMig 5000iw inverter-based welding systems with embedded WeldCloud communication modules.

WeldCloud helped ADR Group to compare operator-reported welding performance with the actual production data captured in real time directly from the welding plant. "The analytic capabilities of WeldCloud helped us evaluate our heavy production processes. After the first year of monitoring, we achieved a 19% reduction in downtime by optimising our welding practices," says Daniele Radrizzani, ADR Group plant manager and member of the ADR Board.

WeldCloud productivity benefits include improved productivity, faster responsiveness, easy deployment and investment justification.

### Improved productivity

By identifying and eliminating waste, ADR gained an additional 500 hours of productivity per month. Most welding stations at ADR Polska feature a robotic welding cell with an operator that manually loads parts into a jig, makes some of the welds



*ESAB's WeldCloud Universal Connector can be installed on any welding machine, enabling mix brand fleets of equipment to be connected to WeldCloud via Wi-Fi.*

and loads/unloads the robot. "We talked to the operators to identify the root cause of problems," says Paolo Morandi, Manufacturing Engineer, ADR.

"We told the welders that WeldCloud supports them and is not against them. If the productivity is not there, it means we need to improve our production planning, material preparation and part flow, equip each station with better jigs and provide more tools, such as for cleaning," he adds.

### Faster responsiveness

"Thanks to WeldCloud, I can monitor the work of each welding station on a daily basis," says Jacek Nowacki, Production Director at ADR Polska. "I can also better control the non-value-added time after the shift starts, before the shift ends and around breaks."

By using WeldCloud Productivity, ADR improved the arc-factor of its robots and operators, increasing axle production without adding more operators. "With WeldCloud, I can control production in real time and react quickly to unjustified interruptions at work," Nowacki says.

Arc-factor reports generated by WeldCloud Productivity prove that low-spatter wires and processes reduce downtime for cleaning.

### Easy deployment

WeldCloud is easy to deploy from a technical perspective because the ESAB Aristo Mig units connect to the plant's Wi-Fi system. ESAB provided an on-site firmware updated on the Aristo Mig inverters and trained ADR's IT personnel on how to remotely connect from their laptops.

Due to Covid, Nowacki started in his role without in-person training on how to use the WeldCloud Productivity application. After a brief tutorial, he found the application intuitive and was quickly able to obtain all the benefits.

### Investment justification

ADR invested in high-performance, high-productivity Aristo MIG power sources and



*ADR uses 30 ESAB AristoMig 5000iw inverters with factory installed WeldCloud communication modules.*



*Arc-factor reports generated by WeldCloud Productivity prove that premium processes and low-spatter consumables, such as ESAB's OK Autrod 12.51 welding wire, reduce downtime for cleaning.*

wire feeder systems, as well as premium OK Autrod 12.51 welding wire. "WeldCloud helps us to optimise our investment by opening the door behind each welding cell. With greater visibility, we can gain the full productivity benefits of our equipment," says Radrizzani.

As a next step, he adds, ADR will unlock more efficiency by using the weld parameter documentation and part traceability functions of WeldCloud.

*indusuite.com*

# IIW: assisting industry in welding and allied processes

At the 1<sup>st</sup> Annual Assembly and Conference of the TWF in Cairo in March 2023, Luca Costa and Elisabetta Sciacaluga of the International Institute of Welding (IIW) presented the history and global service offering of the IIW, with an overview of key future trends. *African Fusion* presents a summary.

The International Institute of Welding was founded in 1948 by Welding Institutes and Associations in 13 countries. This followed their experience of the second World War, when the importance of welding technology was proven to be essential for industrial development, and not only for military applications.

The main goal of the IIW at that time was: 'To allow exchange of knowledge in the field of welding'. Since then, welding technologies have developed, widened, and embraced allied technologies and related approaches. IIW followed this development, expanded its membership – now having more than 50 members on all five continents of the world – and widened its scope to include all welding processes applied to metallic and polymeric materials, from the nano- to the full-scale, and approaching design, fabrication, repair and life extension, quality management, and training and certification.

Science and technology excellence in research and industrial institutions is delivered through the IIW community of experts consisting of over 2 500 individuals, who meet at least twice every year to discuss research topics, construction and failure cases, and to develop collaborative work in the form of books, ISO standards, recommendations, statements, training guidelines and other industrial tools.

## From the stone age to founding the IIW

Welding is an ancient art. Some historical artefacts demonstrate that humankind has been able to join metals since the stone age. At that time, given the limited power density available from heat sources, the only processes were forge welding – from 5 000 BC – and soldering – from 3 000 BC.

Despite welding probably being older than writing, its development stalled until the end of the 19<sup>th</sup> century, when modern welding processes were discovered in several different regions of the world. In the USA in 1877, Elihu Thomson invented Resis-

tance Welding; in 1903 Edmond Fouché and Charles Picards from France developed the first applications of oxyacetylene welding; and in 1907 in Russia, Nikolai Slavianov registered a covered electrode for arc welding.



Figure 1: Andirons for a stone age fireplace joined by forge welding.

As often happens, wars gave significant impulses to developing manufacturing technologies, including welding. Between World War 1 and World War 2 membership associations were established to study welding technologies and applications aimed at understanding the profitability, advantages and reliability of welded joints compared to traditional joining methods such as riveting and bolting. This happened in several countries, including the UK, France, Germany and the USA.

One of the first industrial sectors to understand welding-related opportunities was shipbuilding. A well known example are the Liberty ships, which were built during World War 2 to secure the naval bridge linking the USA to Europe. These ships resulted from a design developed in the UK to include welding to speed up production, and they are most famous in the scientific community for several incidents of brittle fractures that occurred. They should, however, also be remembered for the pioneering use of welding that helped to defeat Nazism. The speed of production offered by welding instead of studding, bolting and riveting was a key turning point for modern manufacturing history.



Figure 2: The SS John W. Brown, one of the last Liberty ships to sail. These ships were the first to be constructed using welding to speed up production.

At the end of WW2, the possibilities achievable by welding were clear to the engineering community, who joined national membership organisations to study, exchange information, and develop welding applications.

This happened in several countries in the Americas, Europe, Africa and Japan. In many cases, the founding fathers of these national organisations developed their knowledge abroad, which created the first seeds of a global approach and culture in welding.

As a consequence, in 1948 national welding membership organisations in 13 countries agreed to found the International Institute of Welding (IIW). Some consider this moment a cornerstone in the history of the manufacturing industry: definitively transforming welding from an ancient art form to a genuine and promising industrial processing technology.

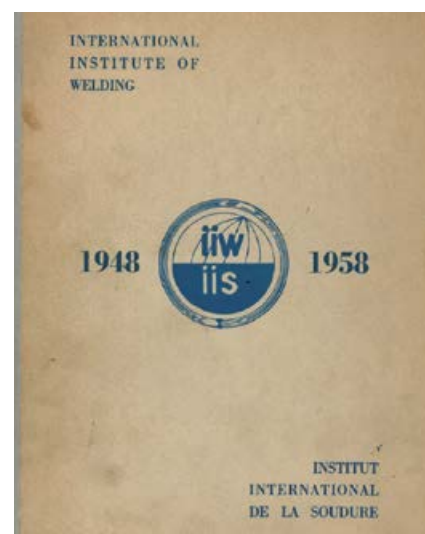


Figure 3: Book "IIW 1948-1958", IIW

## The growth of IIW up to the 21<sup>st</sup> Century

After the first meeting of the IIW Governing Council on 11 June 1948, IIW started operating based on the scope given by its constitution: 'To promote the develop-



ment of welding by all processes'. It was also agreed that membership be limited to not-for-profit distributing organisations and that the IIW should not engage in any commercial or trade activity, identifying IIW as a scientific organisation.

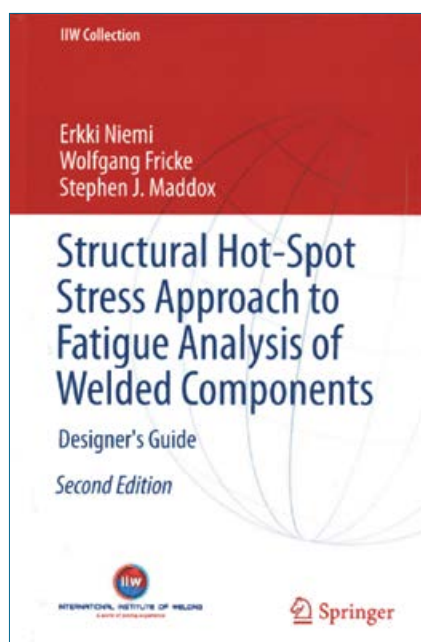
Even more important, it was clearly stated in the constitution that the aim of the association was considered to, "allow the exchange of knowledge on welding as refers to materials, technologies, standardisation, terminology, testing and construction problems".

The approach chosen to deal with these matters made the IIW a unique organisation: each of these items is dealt with by a Commission, populated by experts and delegates sent by all members, which should meet at least annually and develop consensus work to be reported to the Assembly of members and published to make it available to all involved stakeholders: industry, training and research institutions, and standardisation bodies. A few years after the foundation of IIW, it was agreed that an annual gathering of all commissions should be held in the form of an Annual Assembly.

As was common in those times, the IIW was a bilingual organisation: every document was written and published in English and French. The IIW was managed by two secretariats, an administrative secretariat in London at the Welding Institute, and a technical Secretariat in Paris at the Institute Soudure. Since 1994, IIW has adopted English as its only official language towards the goal of speaking with one voice. The two secretariats were gathered in a General Secretariat in Paris in 1995, and in 2020 the management of the organisation moved to Italy, hosted by IIS – the Italian Institute of Welding – where the organisation is currently incorporated.

In its history, IIW had to overcome an evolving scenario, surviving and growing across the reconstruction after WW2, the cold war, and the many economic and political crises and environmental disasters affecting international relationships.

Within ten years of its foundation, IIW had gathered 52 members from 27 countries worldwide, and no continent was excluded. In 1999 it had more than 35 countries involved and, to date, IIW members represent the welding communities from over 50 countries. From the initial 15 commissions, IIW currently has 18 Commissions and 3 Groups, accommodating many new technologies and approaches developed since the foundation, such as: joining of non-metallic materials, bonding, joining



**Figure 4:** The IIW book *Structural Hot-Spot Stress Approach to fatigue analysis of welded components*, one of many IIW publications.

at the nano- and microscale, metal additive manufacturing, and the IIW-branded education, training, qualification and certification schemes it operates.

The IIW vision, mission and strategies are constantly adapted. The latest review was carried out in 2018, and defined the IIW Mission as: 'To advance welding and joining through a worldwide network' with the Vision to be: 'The leading global community linking industry, research and education to the advancement of welding and joining for a safer and sustainable world'.

The strategy is focused on increasing the impact on stakeholders interested in welding and allied activities and having the IIW recognised as the best international provider of certification and best practices, ensuring the highest standards for all welding projects with global scope and impact.

Several milestones are associated with the IIW history, a few of which are outlined below.

- In 1963, the first issue of the IIW flagship journal, *Welding in the world* was published, mostly aimed at the dissemination of IIW's work. In 1983, the publication of the journal was taken over by Pergamon Press, and in 2014 the journal finally landed on the publishing platform of Springer.
- In addition to its journal, IIW has published many books, statements and best practices on a variety of themes.
- Many of the IIW deliverables have become common practice in the welding industry, such as Carbon Equivalent (CE) formulas; Preheat calculation models; a variety of recommendations on fatigue

design of welded components; reference radiographs on welded defects; recommended practices for welding different base materials; and many more. Some of these documents have also been further developed into ISO Standard.

### Standardisation

In 1985, IIW applied to ISO to become an international standarding body. Given the high reputation of the organisation, IIW was officially approved – by ISO resolution 24-1986 – to develop standards in the field of welding and related processes. This was reinforced in 1991, when the 'Vienna Agreement' was signed by ISO, CEN and IIW to avoid duplicating work. Protocols were developed and adopted to enable the standardisation work of one of the three bodies to be adopted by the others.

IIW played a further significant role in standardisation when ISO accepted the principle of 'cohabitation', which allows two paths for a standard, where two somewhat different systems of national/regional standards have evolved in the world market. The case of welding consumable classification is the most commonly known example.

Several widespread standards were developed in IIW, such as the calibration Blocks for Ultrasonic testing of welds, ISO classification of welding consumables, and a variety of standards dealing with resistance and friction stir welding processes. Welding terminology is another success in IIW standardisation work.

### Qualification and certification of personnel and companies

In 1950, soon after IIW was established, commission XIV 'Welding instruction' was created to deal with teaching methods and qualification standards. This task has been weighty due to the cultural differences in the world, as reflected in the different standards applied to welding related topics.

For this reason, the Commission initially decided to deal with the standards reflected by training organisations and the established syllabuses. Throughout the years, the commission has been improving practices and materials for training at all levels, from welders to engineers.

In 1974, the European Council for Cooperation in Welding (ECCW) was founded in Europe to meet the wider interests and prevailing needs in Europe for harmonising qualifications of welding professionals, such as welding engineers, technologists, specialists and welders. The council later

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Figure 5: An IWE diploma from 2001. By 2019, this qualification had been issued to over 55 000 welding professionals.

became EWF – European Federation for Welding, Joining and Cutting – which, in the early 90s, developed the guideline for the education, training and qualification of European Welding Engineers. This was extended by the end of the century to Welders, Practitioners, Technologists and Inspectors.

Having signed an agreement with EWF in 1999, the IIW adopted the European System – which then became global – and developed qualifications with international scope. This led to the establishment of a new board of IIW, the International Authorization Board (IAB), which is still managed by EWF based on a recently updated agreement between the two parties.

IAB develops and manages the IIW Certification of companies in accordance with ISO 3834, and almost 20 education, training and qualification programmes for welding personnel. Over 162 000 diplomas had been awarded by 2019 and, amongst these, the IWE® (International Welding Engineer) qualification was issued to over 55 000 individuals, making this the most known IIW product in the industry.

### Meetings and gatherings of the IIW community

A few years after the Foundation, the international welding community started gathering at the IIW Annual Assembly. Soon after the first one held in 1948 (the founding assembly), numbers started growing and after only seven years, the number of participants was over 500. Since 1983, a concurrent IIW International Conference

has facilitated access for the local welding industry and young professionals to international experts and leading-edge research and technology, and has provided a platform for showcasing global developments in host nations of the welding world.

The IIW Annual Assembly is considered to be the 'yearly world gathering of the who's who in welding', with 600 to 800 participants, and more, attending. Intermediate meetings have also been established to enable participants to present the results of their work, openly share their concerns, and to have other experts comment and contribute.

This allows professional growth to anyone attending; facilitating human relationships amongst the most widely recognised experts, while always welcoming newcomers to the IIW family.

[www.iiwelding.org](http://www.iiwelding.org)



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WELDING, PLASMA CUTTING & INDUCTION HEATING 2023 GYS

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see money differently





# Nedbank partners with the automotive industry to drive competitiveness amid turbulence

By Amith Singh | National Manager: Manufacturing

The South African automotive industry, which generates around 18,7% of domestic manufacturing output, plays a significant role in our country's economy, with a GDP contribution comparable to that of mining and agriculture. The 2022 Automotive Export Manual, released by the Automotive Industry Export Council earlier this year, also revealed that vehicle and automotive component exports increased by 18,1% in 2021 to comprise 12,5% of total South African exports.

Unfortunately, the industry has been hit hard by recent global and local events, including global supply chain disruptions and operational levels at South African ports being at well below international standards, further exacerbated by riots and cyberattacks. More recently, the flooding in automotive-intensive KwaZulu-Natal and onerous load-shedding schedules resulted in the manufacturing production figures released for April 2022 showing a substantial decline of 7,8% year on year.

With most of these setbacks hopefully behind us, and efforts being made to stabilise electricity supply and improve the situation at our ports, savvy automotive manufacturing firms should consider the five trends that Deloitte's 2022 manufacturing industry outlook highlighted. With business agility critical for organisations to operate through unprecedented turbulence, the report identifies key strategies to drive competitiveness.

These include embracing technology to create more connected, reliable, efficient and predictive processes; carefully reviewing cyberdefences and resilience in the event of cyberattacks; and closely monitoring the fast-evolving environmental, social and governance (ESG) landscape and adjusting operations accordingly. Proactive approaches to these challenges will help automotive manufacturers mitigate setbacks while creating a competitive advantage.

Nedbank's deep understanding of the manufacturing industry has enabled it to develop tailor-made solutions in this field, making it the expert strategic banking partner to grow its clients' businesses. The bedrock of our manufacturing portfolio is the deep, lasting and value-adding relationships we develop with our clients and key industry stakeholders. These solutions are underpinned by our continuous drive to innovate in our financial and administrative functions, enabling you to take your business to the next level.

Through this profound insight we provide bespoke, innovative financial solutions to help grow our clients' businesses and strengthen their competitiveness in the market. For example, because we know that current macroeconomic challenges coupled with power supply issues lead to having cash flow constraints that could prohibit delivery and growth, we have a range of solutions to mitigate that risk.

Similarly, as the green bank, we offer a comprehensive range of solutions to promote the sustainability of our clients' businesses, giving them the competitive advantage that is so vital in the market.

Our vast experience in global trade enables quicker, more efficient cross-border transactions when importing and exporting, and easy access to funds smooths out cash flow fluctuations between production cycles, enabling clients to take advantage of discounts and bulk offers.

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Singh is Nedbank Commercial Banking's national manager for the manufacturing sector. He holds a degree in business management from the University of Cape Town, a postgraduate degree in sales management, and is a qualified Neethling Brain Institute practitioner. He has been in banking for 19 years.

**NEDBANK**



# GYS welding products introduced to SA

B.E.D. has secured a partnership with French designer, manufacturer, and supplier of cutting and welding equipment, GYS, for the supply of a mid-tier range of welding inverters and MIG welding transformers into the South African market. *African Fusion* talks to Alexis Hacques, area sales manager for GYS, along with Craig Bister, welding and cutting division manager, and Sean Christian, welding and cutting specialist from B.E.D.

**G**YS was founded in 1964 by Guy Yves Stephany, after the mains power grid in France changed from 110 V to 230 V. “Following this, we developed the knowledge and skills to build chargers (in the 1960s) and welding machines (in the 1970s),” says Alexis Hacques of GYS.

“Keeping it family owned, in 1997, the company was bought by its current owners, father and son Nicolas and Bruno Bouygues. Nicolas and Bruno have always believed in investing in the future and from the start embraced electronics and started to develop inverters. When they bought the company, it employed 60 people and had a turnover of around €10-million. Nowadays, we employ almost 1 000 people – of which 100 are engineers in our research and development department – make €125-million per year, and are the largest inverter manufacturer in Europe,” Hacques tells *African Fusion*.

“We have factories in France and China and subsidiaries in Germany, the UK and Italy, as well as a subsidiary in Spain which celebrates its first anniversary in March this year, and a distribution presence all

over the world. Importantly, our factory in China is 100% owned by GYS. We do not outsource to any local companies and all the products we manufacture are based on our own engineering designs and built by our own people,” he explains.

From a distribution perspective, Hacques says the company has recently completed a 10 000 m<sup>2</sup> extension to its warehouse in France, which has doubled the holding capacity with 20 000 m<sup>2</sup> now under roof. “Our tagline and ethos is to invest in the future. Logistics, particularly in the electronics industry, became a big problem during Covid. The new warehouse was built to enable us to store more components for production, along with machines and spares, so that we could keep producing and shipping our products in response to market needs. The GYS response to a crisis is always to invest, in this case in two years’ worth of electronical components and stock,” Hacques states.

Looking a little into the future, Hacques says that in France, from January 2023, legislation came into effect preventing European manufacturers of welding equipment



Alexis Hacques, area sales manager for GYS, France.



B.E.D. Group welding & cutting division manager Craig Bister, with welding & cutting specialist, Sean Christian.

from commercialising transformer-based equipment. “We are entering a new era of eco-design and eco-energy consumption, which is very good for GYS. Most of our products are already inverter-based and we see opportunities to develop additional product ranges for applications where transformers still dominate,” he says.

## The GYS-B.E.D. partnership

Craig Bister, the welding and cutting division manager for B.E.D. relates how he and cutting and welding specialist Sean Christian became aware of GYS and its welding offering. “By 2020, we were all experiencing the global Covid pandemic. While locked down at home we were hoping we had a future to come back to. During that time, we began to take notice of the email information we were getting from GYS about its new machines and product launches.

“We soon saw opportunities for us in the mid-range equipment market, because the machines in this range were the ones that were selling. Owing to supply chain challenges at that time, our ability to service the mid-range market in agriculture, small engineering workshops and micro-enterprises was affected and needed improvement.

“So we made contact with GYS and started having online meetings. Formal



An agricultural company in the Free State, Bok Implemente, replaced its entire fleet with MAGYS 400 and 500 (water-cooled) transformer-based welding machines.





*Consulmet Construction has now purchased nine MAGYS MIG transformers.*

discussions started in early 2021, but because of travel restrictions we were unable to meet in person. It wasn't until March of 2022, when Alexis was able to come over from France, that we managed to launch GYS properly in South Africa. We had all our area sales, branch and operations managers from across the country together for the launch of the GYS brand, and we have had a lot of success since," says Bister.

B.E.D. and GYS share similar practices, values and strategies – and creating shared value for staff, customers and suppliers is at the core of both companies' business strategies. Both are also known for their abilities to revitalise products and markets, redefine productivity in the value chain, and enable local customer development.

In terms of the GYS product focus for South Africa, Bister says that many mid-tier customers in South Africa still prefer to use transformer-based welding machines, particularly for MIG/MAG welding in the 350 to 500 A range. "They see these machines as much simpler to operate and more robust and reliable, particularly when used in outdoor, remote, and rural environments. We are now supplying many transformer based MIG welding machines to numerous customers in the agriculture and small fabrication industries," he says.

Also, though, B.E.D. is distributing the GYS range of 200 A stick/SAW inverters, plasma cutters and DC TIG inverters. "The whole of this range is targeted at the agricultural segment, repair shops and small fabricators supplying local services," he notes, adding that B.E.D. is striving to become the industry leader in agricultural fabrication.

Turning attention to the local service side, Bister says all B.E.D. service technicians have now been trained to service the GYS machines available in South Africa.

"They also have easy access to excellent backup from France because of the comprehensive internet and remote support services available from GYS. If any of our technicians has a problem, they have immediate access to relevant information. And if that does not help, they can connect into the GYS technical support centre in France, where a specialist technician will be on hand to help," Craig Bister explains.

Along with the initial shipment of welding machines into South Africa, a set of spare PC boards and other replacement parts were made available to the technical team to enable any warranty repairs to be locally done with minimum delay. "We are already fully prepared on the local service side," Bister assures. "All B.E.D. service technicians have been trained to service the GYS machines available in South Africa and we have the parts and components required for most known warranty issues. And, if a new issue arises, we can report it to GYS in France and they will send the parts we need to South Africa under the warranty agreement," he adds.

Citing some of the successes B.E.D. has already had with the GYS range, B.E.D. welding and cutting specialist Sean Christian, who specialises in the GYS product portfolio, cites an agricultural company in the Free State called Bok Implemente. "This company was unhappy with the MIG welding machines being used and has now replaced its entire fleet with MAGYS 400 transformer machines. The owner is over the moon with them. His productivity has



*The B.E.D. team at the GYS product launch, 18 March 2022.*

increased and the welders using the equipment prefer the ease and the simplicity of using the MAGYS MIG transformers to their predecessor's," Christian tells *African Fusion*.

Another 2022 success was a company in Klerksdorp called Consulmet Construction that manufactures mobile plant equipment for the mining industry. "Consulmet Construction builds entire mining plants, such as crusher plants with the conveyor systems needed to feed them. These get fully built before being shipped into Africa for installation by specialist teams. Consulmet Construction has now purchased nine MAGYS MIG transformers and, like Bok Implemente, they are very happy with production performance and we've had no comebacks from them either," he adds.

"Those are the big successes, but setting up a single farmer with a decent 200 A inverter is also a success. When he looks at the machine, I demonstrate it, he tries it and we work together to get the results he wants, then he will buy it, because the GYS machines are different from what people have had before.

For me, that's also a big success and we have sold many inverters in this way, especially in the agricultural sector," Sean Christian concludes. ■

# The five biggest dangers in welding and grinding and how to solve them

“You cannot make an omelette without breaking eggs and you cannot weld without producing fumes and gases,” says Anja Saldigk, sales manager for PPE and accessories for voestalpine Böhler Welding. In this article, she talks about the dangers associated with welding and grinding, and highlights some of the solutions available.

“Driven by the Health and Safety Executive (HSE), personal safety at work is becoming more and more important. Ever-changing standards and regulations mean we must ensure we bring the latest protection that meets these regulations to people in the workplace,” begins voestalpine Böhler Welding’s, sales manager for PPE and accessories, Anja Saldigk.

“The legal requirements for employers and employees regarding the use of PPE are to protect us.

Health needs to be our priority. Personal protective equipment serves as the last line of defence against welding and grinding injuries.

“And for every danger, there is a solution,” she assures.

## Danger 1: UV and IR from the welding arc

The welding arc produces dangerous ultraviolet (UV) and infrared (IR) radiation. The PPE solution for this problem is to wear eye protection in the form of a good quality, modern and automatic welding helmet.

Böhler automatic welding helmets are equipped with auto-darkening filters (ADF) that filter 99.9997% of all UV and IR rays,



*Böhler automatic welding helmets are equipped with auto-darkening filters (ADF) that filter out 99.9997% of all UV and IR rays.*



even if the ADF is not active. In addition, the ADFs are characterised by ‘true colour technology’. The filter lens used for this is blue

and not green as in standard welding helmets.

The blue true-colour auto-darkening filter glass provides the welder with an optimal view that offers the best possible protection against both the radiation and eye fatigue, especially for long-duration welding tasks. This clearer view of the weld seam ensures more efficient and better-quality welding performance by the welder.

Also, Böhler Welding’s ADF welding helmets are composed of light weight nylon, which makes them comfortable and provides excellent impact and heat protection against hard and hot welding and grinding particles.

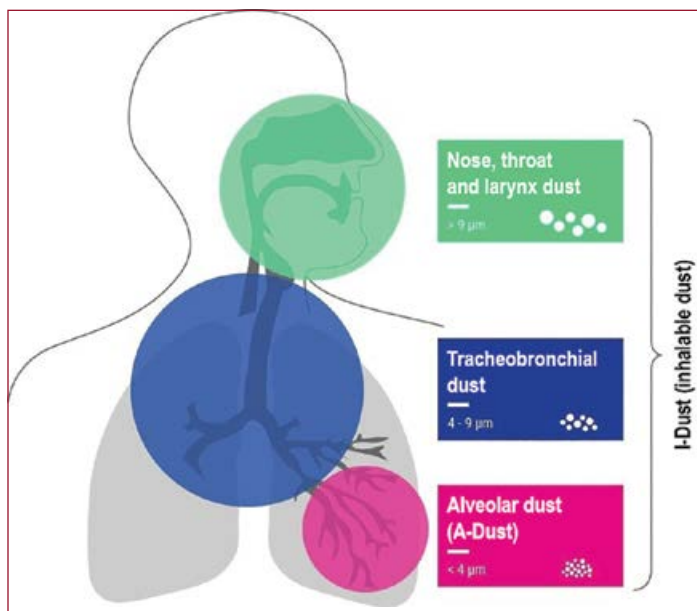
## Danger 2: Welding fumes and particles

Welding produces fumes and gases that can penetrate deep into our lungs without us noticing. This is an ongoing problem, and we often only feel the consequences of welding fumes years later.

The solution is to use respiratory protection, such as a Böhler powered air-purifying respiratory (PAPR) system, while welding.

The Böhler PAPR corresponds to the highest possible technical standard for the protection of a welder’s lungs with filtered breathing air that is 99.8% particle-free. This air quality level meets the highest level of certification, which is TH3, emphasising just how important we believe it is to protect welders and other workers in fabrication shops against welding particles and fumes.

Furthermore, our PAPR system has the facility to add gas filters with an active carbon medium. These go beyond protecting for welding fumes and particles, and can also filter out dangerous gases such as carbon monoxide, ozone and nitrogen oxides, which can be carcinogenic, particularly when welding at very high amperages.







*The Böhler PAPR corresponds to the highest possible technical standard for the protection of a welder's lungs with filtered breathing air that is 99.8% particle-free.*

### Danger 3: Hot and sharp objects

Contact with sharp, pointed, rough and hot objects is one of the most common causes of workplace injuries. In addition, there is an increased electrical hazard when welding. The solution is to protect the hands of welders and grinders using purpose made welding gloves.

“Böhler's latest welding glove selection offers customers an even more robust and complete portfolio from which to choose. They are made of durable leather with aramid fibre stitches that provide temperature resistance and strength. Each type of glove has its own features, which allows us to build a full range of gloves from a classic to an ergonomic shape for every kind of welding process,” says Saldigk.

With these welding gloves, Böhler meets the highest demands for cutting, tearing and perforation resistance as well as heat protection as the last line of defence against hand injuries. Materials and products used in and for the gloves comply with Europe's REACH health regulation.

### Danger 4: Welding and grinding particles and spatter

Welding and grinding produce hot weld beads, bright arcs, flying sparks and grinding particles, which not only cause skin irritation but can also lead to serious injuries. The solution to this danger is to use body protection apparel made using FR leather.

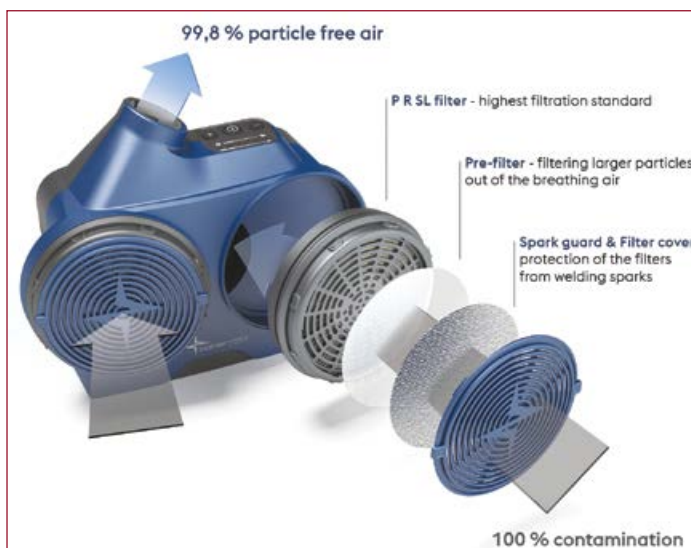
Böhler's protective clothing, made of leather combined with breathable and flame-retardant cotton, ensures perfect protection with maximum wearing comfort and a feel-good factor. The clothes are certified to the highest possible ISO standard.

The gaiters, sleeves and aprons made of high-quality leather in combination with aramid fibre seams (Kevlar) also protect the welder when welding, grinding and cutting in difficult positions, such as sitting, kneeling or lying flat, as well as when welding under more severe thermal conditions where spatter levels may be raised.

### Danger 5: Flying grinding sparks and spatter

When grinding weld seams and metal, it is quite possible that grinding particles can get behind conventional protective goggles and into the eye. The solution is head and face protection using a purpose designed grinding visor.

“With our Big Vision, Böhler offers full protection for the eyes and face with an unrestricted view of the workplace. In addition, Big Vision is also available as Big Vision Air, which includes a fresh air supply for optimal protection of the eyes, face and respiratory tract,” adds Saldigk.



*When grinding weld seams and metal, it is quite possible that grinding particles can get behind conventional protective goggles and into the eye.*

“As renowned welding specialists, we have of course dealt with the greatest risk factors as described above and have brought appropriate protective equipment onto the market that not only offers the best possible protection but is also comfortable and affordable.

“Apart from that it looks cool,” Saldigk concludes.

[www.voestalpine.com/welding](http://www.voestalpine.com/welding)

### Anja Saldigk

Anja Saldigk has been working in the welding industry for 15 years in different sales related positions. She is responsible for the sales development of voestalpine Böhler Welding's PPE and Accessories range, which was added in 2017.

Her key focus is on the support of global sales teams for this range of products. Saldigk enjoys visiting key customers and providing product training to distributors and colleagues, which she does on a regular base. “My aim is always to get as much feedback as possible, which we use for continuous product improvement and new developments, in close co-operation with product management.

“I thoroughly enjoy PPE products and it is quite easy to become passionate about them. I like the approach of being a full welding solutions provider, and it makes me proud when I see welders working with our PPE,” she says.

# Local fabrication experts serve niche in pressurised equipment

In the 10 years since Efficient Engineering launched its pressurised equipment division, the company has built a world class reputation among its customers. These include leading players in the petrochemical, oil and gas sector, who rely on the company's depth of technical expertise, specialised equipment and reliable delivery of complex solutions.

**S**outh Africa's oil, gas and petrochemical market is based on stringent global standards, and Efficient Engineering's pressurised equipment division has shown it is up to the mark in consistently meeting these demands.

It has been little more than a decade since the division was launched, but the company has already established a customer base that has become accustomed to the highest level of quality and certification. According to Gerhard van Zyl, Business Unit Manager of the pressurised equipment division at Efficient Engineering, the company's success is based on its embedded experience, its specialised infrastructure, skilled artisans and its certification and compliance with global standards.

"From preliminary design through to fabrication and delivery, our customers are confident in our ability – having experienced our commitment to service levels



*A typical pressure vessel produced by Efficient Engineering.*

for many years now," says van Zyl.

He highlights that the oil and gas industry adheres to the strictest technical requirements, so the company has always positioned itself in line with the highest standards and protocols. This is supported

by its fully integrated ISO 9001 quality certification and ISO 45001 occupational health and safety management system.

"Customers in our sector will often also conduct detailed audits on our capability before entrusting us with any of their contracts," he says. "Our progress to date is therefore built on earning their trust through our compliance and consistent delivery of quality while providing cost effective results."

Among the demands on the technical side are that fabrication must be guided by a full engineering package including quality plans, welding procedures and detailed equipment performance and testing specifications. Van Zyl says customers are also aware that the company has its own certified professional engineer with international accreditation to ECSA standards who signs off on its designs before these progress to a SANAS-approved inspection authority.

"We have the infrastructure to conduct almost all tasks in-house and can therefore control quality and lead times very closely," he says. "We also source the materials – which are often specialised to suit specific applications – from trusted local and overseas vendors."

In the pressurised equipment segment, welding skills and compliance are vital to ensuring quality and safety, he emphasises. Efficient Engineering also has internation-



*Efficient Engineering has the infrastructure to design and fabricate specialised pressurised equipment and heat exchangers.*





*A converter fabricated at Efficient Engineering's facility.*



*A process column leaving the Efficient Engineering facility.*

ally qualified welding engineers, recognised by the Southern African Institute of Welding, who conduct the prerequisite in-process welding inspections during fabrication.

The market's trust in the pressurised equipment division can be demonstrated through the completion of a number of impressive projects. In one of the leading examples of this, the company locally produced the largest liquid petroleum gas (LPG) storage 'bullets' yet to be fabricated

in the southern hemisphere. These measured 70 metres long and six metres in diameter, weighing 580 tonnes each. Five were produced for a gas storage facility on South Africa's west coast.

"The division is also involved in maintenance and replacement of plant and equipment during shutdowns, where our capabilities have created a real niche for us," says van Zyl. "Customers really appreciate the pride we have in our work, our attention to detail and our ability to work

in line with their extremely demanding shutdown schedules."

Its well-equipped Germiston premises includes column and boom welders that can operate up to six metres high and with six metre reach and automatic state-of-the-art orbital tube-to-tube sheet welding equipment, as well as non-destructive hydraulic testing and coating applications in its dedicated, environmentally friendly grit blasting and painting facilities.

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

## Building SA's engineering base for growth

Already leveraging the global economic recovery, Efficient Engineering is gearing up for continued growth – while strengthening the industrial foundation of the South African economy.

According to Gary Colegate, chief operating officer at Efficient Engineering, the company has seen exciting growth in orders from OEM customers in the mining sector who recognise its world class design and fabrication capability. Its ongoing upskilling efforts have been matched by the latest technology, including a recent R55-million investment in state-of-the-art CNC floor- and table-type machining centres – probably the largest in the country.

Buoyant commodity prices have been driving both new projects and expansions across the mining sector, Colegate points out. Much of the company's new business is from significant aftermarket demand, such as buckets or bowls on rigid earthmoving trucks. He notes that many global OEMs active in South Africa are looking to maximise their local content, due to considerations of cost effectiveness and disruptions in global logistics.

As a result, Efficient Engineering has had considerable success in capturing business from its overseas competitors. Its agility and ability to fulfil orders rapidly have given it an advantage in an environment where issues in global supply chains have led to longer lead times.

"With our engineering legacy dating back over half a century, we employ some of the most experienced artisans and boilermakers in South Africa," he says. "Our quality systems and in-house design and production capacity ensure that we compete toe-to-toe with the world's best; matching them in terms of our cost-competitiveness and quality," he says.

"On the strength of the growing interest from global customers

in our offerings, we believe the future looks bright," he continues. "Based on our record performance this year, we continue to invest in technical capacity so we can constantly improve our output capacity and turnaround times.

"As a leading player in the engineering sector, we have always worked hard to support South Africa's industrial platform as a basis for economic success. In fact, there is widespread commitment in the private sector to developing the local economy and creating employment opportunities. We need a combined effort from all stakeholders, including state-owned enterprises, to support local production," Colgate concludes.



*Efficient Engineering is a local fabricator geared for continued growth.*

# An introduction to TIG welding/GTAW

Air Products' Welding Specialist, Sean Young talks about the basic requirements of the Tungsten Inert Gas (TIG) welding process – also known as Gas Tungsten Arc Welding (GTAW) – and highlights some of the uses and benefits of this process.

**“W**elding is a combination of skills, experience and knowledge of the equipment, gases and consumables required for the different processes,” begins Sean Young, Welding Specialist for Air Products in South Africa. “At Air Products, he adds, “we take pride in the quality of our products as well as the technical expertise and guidance we can provide our customers.”

Welded fabrication involves two or more parts of a material being fused together by using pressure, heat or both pressure and

heat. This creates a welded joint or weldment. Each welding process used requires specialised skills, and a whole component or fabrication can be compromised if incorrect gases are used.

During a live demonstration in Air Products South Africa's Welding Laboratory in Kempton Park, Young explains that TIG/GTAW is a process that uses a non-consumable electrode to fuse metallic material, so the different parts of a weldment become permanently connected.

“The range of materials we can weld us-



Air Products Welding Specialist, Sean Young, demonstrates the TIG/GTAW welding process.



ing this process starts from mild and stainless steels, which are welded using direct current from a welding machine and a torch with a tungsten electrode connected to the negative welding cable. And, by switching over to using alternating current from the welding machine, aluminium and copper can also be welded using the TIG/GMAW process,” he says.

Highlighting the best shielding gases, he says pure argon is commonly used for welding mild and stainless steels, as well as for thinner section aluminium and copper. “For thicknesses greater than 3.0 mm in aluminium and copper, though, we start to look at using argon-helium gas mixtures to increase the heat being put onto the weld joint. This is because of the high thermal conductivity of these materials, which tends to carry the heat away from where it is needed.

“Adding helium to a gas shielding mixture raises the ionisation potential of the shielding gas, which results in a hotter arc for the same amperage. This helps to ensure that enough heat stays in the weld joint to guarantee proper fusion,” Young explains.

Describing the requirements of the tungsten electrodes needed for TIG/GTAW,





*Thermamax PRO-TIG 200 AC/DC welding inverter*

he says that the standard electrode for welding mild steel is a 1.2% thoriated tungsten – with a red tip – while for aluminium or copper in ac current mode, a zirconium impregnated tungsten electrode – with a white tip – is preferred.

Turning attention back to the shielding gas requirements, he says the gas flow rate required depends on the size of the ceramic shroud being used on the torch. “The shrouds have little numbers on them. The one I am welding with is a number six and it needs a shielding gas flow rate of between 6.0 and 9.0 l/min for ideal shielding,” he notes.

Why such low flow? “To protect the weld from atmospheric contamination it is very important to have laminar flow of the shielding gas. If we raise the flow too high, to say 15 l/min, we run the risk of turbulence and vortices developing, which will suck air into the gas stream and cause porosity.

On the other hands, a flow rate that is too low might cause the shielding gas to be blown away by a slight breeze, which would also cause contamination of the weld,” he explains, demonstrating how to connect a regulator and flowmeter onto a 200 bar argon gas cylinder, before carefully opening the gas valve, while checking that the con-



*The Thermamax PRO-TIG 200 AC/DC welding inverter is a versatile machine that can accommodate aluminium and copper as well as mild and stainless steels.*

nection and the piping are sealing properly.

“I am using a Thermamax PRO-TIG 200 AC/DC welding inverter, which is a versatile machine that can accommodate aluminium and copper as well as mild and stainless steels. Currently it is set for stainless steel or mild steel welding using electrode negative direct current.

“I am using a thoriated electrode with a sharp point and will join two pieces of steel strip along their edges,” he adds.

The welding arc is ignited using a high frequency (HF) start function and the Thermamax PRO TIG 200 M ac/dc machine has foot control so the welder can regulate the arc current and heat. “The more you press the pedal, the more heat you have. I am going to fuse these two strips of mild steel without using any additional filler material. This is known as autogenous welding,” he says.

Following the demonstration, Young changes to using ac power from the power source to demonstrate aluminium welding. “We also have to change the tungsten electrode to a zirconiated one and, when I start to weld, you will hear a change in the frequency of the machine due to the ac power being applied,” he says, adding that the positive half cycle of ac current helps to break up the oxide layer on the surface of the aluminium, which would prevent proper puddle fluidity and weld fusion if not removed.

“The TIG/GMAW process is very versatile and can be used to weld a large variety of materials in different settings. On the negative side, as the flow rate is low a slight draft will blow away the shielding gas, and highly skilled welders are needed to get good results. The welding equipment itself is quite expensive and the process is relatively slow



*The TIG/GMAW process is very versatile and can be used to weld a large variety of materials in different settings.*



*For TIG welding using a number six shroud a very low shielding gas flow rate of between 6.0 and 9.0 l/min is ideal shielding, says Young.*

compared to other processes.

“But for use indoors or in well protected environments where we can close the doors and windows, and where high-quality welds are required, this process is ideal.

“We at Air Products South Africa and our subsidiary Unique Welding are proud of the quality of our products and services. We are welding specialists in South Africa, and if you have any technical queries with regards to the TIG/GMAW welding process, the shielding gases we offer, or the equipment and consumables available from Unique Welding, please contact me directly at Air Products South Africa or through one of our distributorships nationwide,” Young concludes.

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



# Steinmüller celebrates 60 years in Africa

Steam generation and high-pressure piping expert, Steinmüller Africa, celebrates 60 years of successful business in Africa.

**W**ith very humble beginnings after its registration as a South African business in 1962, Steinmüller Africa's sole African location was a post box in South Africa, which was checked only when the company's first managing director, Werner Oehler, passed through South Africa enroute to Australia from Germany. It was at this location that Steinmüller Africa received its first invitation to tender – an Eskom tender for its Grootvlei Power Station – which led to the company building its first African head office, just outside of the Grootvlei Power Station, in the 1970s.

Steinmüller has since conducted ongoing boiler and high-pressure piping maintenance at the Arnot, Camden, Duvha, Hendrina, Matimba, Kriel, Tuthuka, Matla, Majuba, Grootvlei and Komati power stations. Its milestones are many and the company's development is linked to South Africa's industrial growth. Forerunners of

this development were the boiler plants built at the Hendrina, Kriel, Duvha, Thuthuka, Majuba, and Mathimba power stations from 1967 through to the early 1980s.

The 1990s saw Steinmüller Africa increase its South African footprint with the Sasol rejuvenation project, the replacement of boilers at Mossgas and the Iscor blast furnaces. It also expanded by undertaking work for the SAPPI Mill in Swaziland and conducting the refurbishment of the Zimbabwe Iron and Steel Company (ZISCO) plant.

The South African-based entity took its footprint to Europe where it was contracted to fabricate PF (pulverised fuel) boilers in Iskenderun, Turkey. Between 2004 and 2010, the company also undertook the return to service of mothballed plants at the Camden, Komati and Grootvlei power stations, and began fabrication of boilers and high-pressure pipework at these plants.

In addition to its work for ZISCO and

the Zimbabwe Electricity Supply Authority (ZESA), Steinmüller Africa has a footprint in Botswana, Mozambique and Namibia.

Moso Bolofo, Executive Director at Steinmüller Africa, says the company's progression has been directly linked to South Africa's industrial development. "Initially – in the early to mid-90s – our technical expertise was overseas-based and our offering to the African market largely based on our local capabilities." He adds that Steinmüller Africa now employs advanced engineering tools in its South African-based design office and has invested significantly in automated welding technologies at its fabrication facilities. "Both these developments are aligned to our drive to improve productivity, shorten lead times and be a premier utility boiler and steam piping service provider on the African continent," he says.

Industries that have benefitted from Steinmüller Africa's progression include power generation, pulp and paper, chemical and petrochemical, and mineral beneficiation. "Our growth and sustainability, however," says Bolofo, "have remained within the power generation and chemical sectors. "Our expertise focuses on steam generation and reticulation, with an emphasis on complex, efficient, high-temperature and high-pressure steam,



*From humble beginnings in 1962, when Steinmüller Africa's presence in South Africa was a mere post box, the current Pretoria-based 30 000 m<sup>2</sup> facility under roof enables one million productive hours per year. The company also has workshops in Sasolburg and Bethal.*



meaning we are capable of providing solutions across the entire utility sector, where fuel efficiency is paramount.”

Steinmüller Africa, which has supported the lion’s share of leading power generation and chemical utilities in South Africa, was one of the earliest companies to undertake transformation and localisation activities in line with the B-BBEE scorecard, and has been a Level 1 contributor for the past several years. “We are proud to be a highly ethical organisation and a preferred employer in our sector,” says Bolofo. “We have trained and produced a significant number of artisans and technicians for the South African industry.”

In addition to its B-BBEE rating and local skills development, Steinmüller Africa has contributed significant funding to 24 tertiary institutions across Africa to benefit science and technology undergraduates.

“We have covered a great amount of ground over the past 60 years, both geographically and on the innovation front,” Bolofo concludes. “We look forward to another 60 years of growth, to the betterment of our company, the communities in which we work, and the industrial sectors we serve.”

[www.steinemuller.bilfinger.com](http://www.steinemuller.bilfinger.com)

## Steinmüller Africa’s specialised induction bending solutions

Steinmüller Africa holds the only Cojafex PB 850 induction bending machine in Africa. The machine was purchased in 2010 and, to date, has conducted over 6 300 induction bends on a local and international scale at its 30 000 m<sup>2</sup> manufacturing facility in Pretoria.

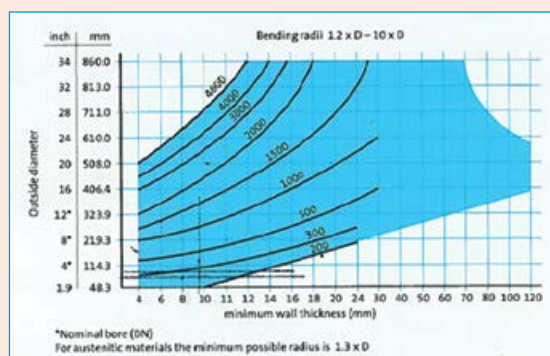
Induction bending reduces the required number of field welds, expedites construction and optimises project schedules. The cost and complexity of long-term maintenance is improved by reducing the number of welds that require regular inspections. Complex 3-dimensional bends are the real benefit of using induction bends in pipeline systems.

The machine can bend pipes with a minimum outside diameter of 48.3 mm and a maximum of 870 mm, with wall thicknesses of between of 4.0 mm and up to a maximum of 120 mm. Thicker walls can also be considered, pending specific technical details.

Steinmüller Africa offers

its service to the paper and pulp, power, petrochemical, mining and metallurgical industries. Induction bending is especially beneficial for high-pressure (HP) piping, steam piping and industrial piping systems.

The company has almost ten thousand welding procedure specifications across a wide range of alloy materials. It is a specialist service provider across the fields of welding, environmental technology, manufacturing, maintenance, lifetime extension plans and project management.



Steinmüller’s Cojafex PB 850 induction bending machine can conduct the pipe bending options indicated in the chart.

# AIR PRODUCTS

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# Dekra on the rise in the oil and gas sector

Dekra Industrial SA has been involved in non-destructive testing (NDT) and inspection in the oil and gas sector – locally and pan-Africa – for some five years now, and the company continues to grow its presence in this critical area of the energy arena.

According to global management consulting firm McKinsey in its Global Energy Perspective 2022, released in April last year, the peak in fossil-fuels demand continues to move forward, with oil projected to peak in the next five years, while gas remains the most resilient fossil fuel.

This trend is evident from the high level of activity off the coast of Africa and exemplified by TotalEnergies' pivotal offshore liquid natural gas project in Northern Mozambique.

Dekra Industrial managing director Johan Gerber explains: "Offshore oil and gas rigs present potentially hazardous working conditions while the crew members carry out the required drilling. Rig teams are dealing with highly combustible materials, on an ocean-based platform where cranes are swinging heavy equipment overhead, and other large-scale moving parts are also a constant presence in the immediate environment."

Johann Dorfling, Dekra Industrial's Western Cape branch manager, notes: "We are active in the oil and gas and maritime sector both on- and offshore; and have carried out 'before and after' NDT welding integrity inspections around Africa, including Las Palmas in the Canary Islands, Ghana, Angola and Mozambique."

"On oil rigs, we undertake crane and slew bolt inspections and we work extensively on drilling risers, which form the connection between the subsea field developments and production and drilling facilities. An extremely high level of welding is required to ensure that the longevity and structural integrity of the components, structure and pipework on the risers is maintained, as many of these items undergo extreme pressure during their service. NDT and inspection help to prevent the failure of these critically important elements," Dorfling explains.



*Dekra Industrial MD, Johan Gerber.*



*Johann Dorfling, Dekra Industrial's Western Cape branch manager.*



*MC Liebenberg, NDT Level 3 technician.*

## The role of NDT and inspection on drilling risers

MC Liebenberg, NDT Level 3 technician at Dekra Industrial, continues: "Similar to pipelines or flowlines, risers act as conduits to transport hydrocarbon products, as well as the production materials such as injection fluids, control fluids and gas lift. The cost of a marine drilling riser system can be tens of millions of dollars, but the cost of operational downtime associated with a riser loss or failure can exceed more than one hundred million. This therefore needs to be prevented."

"In non-destructive testing, there is not one method that is superior to another; the methods complement each other. In offshore inspection, we most commonly see the use of magnetic particle (MT) and visual inspection (VT), as well as thickness gauging."

Dorfling adds: "We have performed eddy current; MT and VT inspections; liquid penetrant testing (PT); volumetric as well as ultrasonic (UT); and phased-array ultrasonic testing (PAUT) during welding inspections on drilling risers. It is of vital importance to ensure that these risers are 'in class' and do not fail in service. The result of a leak can be catastrophic for the environment and general safety."

Liebenberg clarifies: "Depending on the acceptance criteria of the inspection, NDT can determine if all areas of inspection are in or out of class, and reported on, detailing the extent of wear, corrosion or defects discovered."

"Dekra Industrial does not determine if a vessel is out of class or not, this is determined by the results of our NDT inspection, which are presented to the client, who then makes the decision on whether to replace the component or repair it to conform to class standards."

## Rope inspections: a competitive differentiator

Dorfling explains that DEKRA Industrial offers rope access inspection across multiple NDT methodologies, including advanced disciplines such as PAUT. "Dekra's capabilities in performing NDT offshore with rope access competitively differentiates us from a number of our competitors, and this is of great importance in the industry, as is the ability to provide a diverse offering," he enthuses. "We are proud to be able to perform advanced inspection using rope access, as building scaffolding on a rig is not a viable option."

Managing Director John Gerber concludes: "Dekra Industrial in South Africa has played a major role in the fields of local NDT and inspection – across a wide range of industry sectors – for the past 40 years. We are proud to include NDT and inspections in the oil and gas arena in our field of expertise. We anticipate doing even more maritime-related work in the future."

[www.dekrsa.com](http://www.dekrsa.com)



*Phased Array Ultrasonic Testing (PAUT) is designed to detect volumetric and linear defects.*



# How Toyota SA navigated severe flooding

In response to the flooding disaster of April 2022, Yaskawa Southern Africa worked closely with Toyota to establish a priority list for rapidly repairing the damages robotic welding systems.

On the 18<sup>th</sup> of April 2022, President Cyril Ramaphosa declared a national state of disaster when heavy rainfall led to severe flooding and landslides in KwaZulu-Natal, causing the death of 448 people and destroying over 12 000 houses, while displacing a further 40 000 people. Many businesses also suffered from the damage, including leading car manufacturer, Toyota South Africa Motors.

On the 12<sup>th</sup> of April at 5:30 am, Toyota management breathed a short-lived sigh of relief when staff on site sent pictures of no damage from the reported flooding with rain beginning to subside at its Durban production plant, which produces popular vehicles such as the Corolla Cross and Quest, Hilux, Fortuner, Hino, and more.

But by 6:20 am, the plant was under 1.5 m of mud. "What had happened was when the Shongweni Dam sluice gates released at capacity, they sent a deluge of water all the way down the Umlazi River that broke through its banks," explains Andrew Kirby, CEO at Toyota SA. The deluge then hit nearby empty container yards, sending containers down the N2 in the floodwater.

The financial impact was severe, with extensive damage across the 87 hectare site including electrical, mechanical and IT equipment. "Toyota had to order just over 100 000 new equipment parts to replace the damaged ones, while around 4 300 flood-damaged vehicles had to be crushed," says Kirby.

Despite a top disaster management executive stating that it was the most extensive damage to any production facility within Toyota globally, swift action from both Toyota and its partners' management teams enabled the plant to bounce back to production in a mere three months.

Industrial robotics partner Yaskawa Southern Africa worked closely with Toyota to establish a priority list of repairs. "We brought every available person from all Yaskawa branches throughout South Africa to our Durban branch to assist," recalls Andrew Crackett, Managing Director at Yaskawa Southern Africa. "Temporary/casual labour along with an international team of Yaskawa experts, whose members comprised colleagues from the UK, Germany, and Japan, were sent to Durban."

With no immediate spares on hand – as



*Yaskawa offers mechatronics and robotics solutions for companies throughout Europe, the Middle East and Africa.*

they needed to be expedited from around the globe – and no user manual for repairing damage to this extent, Yaskawa's team was required to think on its feet and consistently come up with new ideas to be successful. In the end, approximately 400 robot controllers and 600 welding devices were successfully repaired, a noteworthy feat for a team that had never dealt with a project of this magnitude before.

Crackett notes that Yaskawa Southern Africa learned helpful lessons from the disaster. "We now know how to recover flooded equipment and what type of facility is required. We also learnt by hard experience what worked and what did not when it came to money and time. Another key lesson was maintaining open and honest communication with the customer. Their understanding of our progress was key to everyone's planning and expectations."

Similar sentiments were echoed by Toyota, with Kirby stating that "while it is not something we'd ever wish on anyone, as an organisation, the challenges helped us to grow and develop our capabilities and resilience: to be able to survive and even flourish," he observes.

The leading car company's new internal recovery slogan is Rebuilding Better Together. This philosophy speaks to working together as a team, while using crisis situations to improve future site planning.

Toyota's Durban plant regained its full production levels from September 2022.

[www.yaskawa.za.com](http://www.yaskawa.za.com)



*Approximately 400 robot controllers and 600 welding devices were successfully repaired by Yaskawa Southern Africa.*



*Yaskawa's robots offer highest quality and outstanding welding and handling performance, and are widely used by automotive manufacturers.*

# An ongoing success story starring First Cut and Special Steels

First Cut and Special Steels are celebrating their longstanding relationship following the delivery of five new Everising cutting machines to complement Special Steels' existing Everising installed base.

**T**he relationship between First Cut, a leading South African provider of cutting, welding and grinding consumables and equipment, and Special Steels, a supplier of specialised steels and industry expertise to the local engineering and manufacturing sector, continues moving from strength to strength. First Cut is the primary supplier of machines and consumables to Special Steels, with a strong relationship spanning some 20 years.

This is according to Eben van Eeden, Sales Manager at Special Steels, who explains: "Our company provides certified engineering steel grades – cut to length at competitive prices – used for mechanical and allied engineering purposes. We have a particular emphasis on low- to high-carbon and alloy steels. In addition, we have a strong focus on customer service, speedy delivery and minimising downtime – as well as value-added offerings," van Eeden says.

"Special Steels has grown organically since its establishment in 2002, with a significant stockholding and an efficient logistics capability. We source our steel from top-quality international suppliers and recognise that it is essential to partner with a first-class supplier of machines and consumables. We have had this relationship with First Cut for almost two decades: the team there understands our requirements completely, and that we need machines

that facilitate our company ethos and culture of speed, accuracy and quality."

Reggie Chiliza, Machine Sales and Technical Manager at First Cut, adds: "Special Steels has given us a substantial amount of highly valued repeat business over the years, and our relationship is built on trust and mutual respect. We also appreciate working with company management who know exactly what they want, and make quick and effective decisions: an element of their business, which has resulted in their ongoing success."

Van Eeden notes: "This certainly is a relationship that works very well for both parties. Time is of the essence in the fabrication sector, and process efficiency plays an important role in customers reaching their goals and achieving the desired productivity and profitability. In addition to supplying us with excellent machines, First Cut is adept in its customer service.

Our machines work 24 hours a day, seven days a week, and the support from First Cut is outstanding. They willingly share their technical knowledge and expertise, allowing us to keep downtime to a minimum while ensuring that the service levels to our own customers remain consistently high. In return for this generous knowledge sharing, we gladly continue giving First Cut our ongoing business loyalty."

This loyalty manifested in the acquisition, last year, of five Everising machines: the H560HA, S250HB, H260HB, H460HB and P150ILA models, complementing Special Steels' existing Everising installed base.

"The P150ILA is an ultra-high-speed billet saw with advanced inclined linear cutting action, using circular blades tipped with either tungsten carbide or cermet," explains Chiliza. "The other four machines – the H560HA, S250HB, H260HB and H460HB – are fully automatic band saws, with particular specifications to suit different requirements and industry applications."



Harry Botha (left) and Eben van Eeden (right) of Special Steels with Reggie Chiliza (centre) of First Cut, celebrate the acquisition of five Everising machines.

The four band saw machine specifications are as follows:

- The H560HA has a capacity of 560 mm (round and hollow bar) and 610×560 mm (square bar), a blade speed of 18 to 90 m/min and a machine weight of 4 500 kg.
- The S250HB is a pivot-type machine for bundle cutting, with a capacity of 250 mm (round and hollow bar) and 300×250 mm (square bar), a blade speed of 20 to 100 m/min and a machine weight of 1 460 kg. The bundle cutting specifications are width 145 to 190 mm and height 30 to 120 mm.
- The H260HB for bundle cutting, has a capacity of 260 mm (round and hollow bar) and 300×260 mm (square bar), a blade speed of 20 to 100 m/min and a machine weight of 1 750 kg. The bundle cutting specifications are width 145 to 190 mm and height 30 to 130 mm.
- The H460HB for bundle cutting has a capacity of 460 mm (round and hollow bar) and 460 x 460 mm (square bar), a blade speed of 20 to 100 m/min and a machine weight of 3 030 kg. The bundle cutting specifications are width 195 to 310 mm and height 120 to 230 mm.

"We are pleased to have been able to grow with Special Steels in its business journey to date," comments Chiliza.

"Our two companies share the common goals of offering top-quality products, maintaining high standards of productivity and excellent customer service levels to customers. We look forward to continuing to partner with Special Steels, as their trusted long-term machine and consumables supplier."

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



The H460HB for bundle cutting, has a capacity of 460 mm (round and hollow bar) and 460 x 460 mm (square bar).



# The future of engineering is female

Felicia Dolo, Process Engineer at leading South African firm Erudite, shares her journey to joining a sustainably transformed EPCM company with a rapidly increasing market share. She explains why she believes more women should feel encouraged to enter the profession.

**G**ender diversity in the fields of science, technology, engineering and mathematics (STEM) remains alarmingly low, with latest statistics from the Engineering Council of South Africa (ECSA) revealing that only six in every one hundred professional engineers are female.

But, as pupils across the country consider their future careers and select their subjects, more young women should feel encouraged to consider engineering as a profession. This is according to Felicia Dolo, Process Engineer of leading engineering, procurement, and construction management (EPCM) company Erudite.

“Engineering is one of the most exciting careers available because it offers a platform for lifelong learning. It is empowering and enabling, allowing you to think independently and solve complex problems,” she says.

“Engineering has the potential to change the world and to improve every global citizen’s life. It allows us to create innovative solutions for some of the world’s most pressing challenges, such as extracting resources from the earth without permanently damaging the natural environment.”

Dolo’s own journey to becoming a professional engineer began at a very young age, and with vital support from her family and teachers. “I was a curious child. I was the little girl who always wanted to understand why sound was coming from the radio, or how kitchen appliances worked, and would not stop asking until I received a satisfactory answer or could open something to find out for myself.”

Defying the myth that women are not as good as men at subjects such as physical science and mathematics, she excelled at school. And next, despite fearing that her voice would be drowned out in what is an extremely male-dominated industry, or that she would not receive the same employment opportunities as her male peers, she then went on to pursue metallurgy and materials engineering at the University of the Witwatersrand.

Finally, when she began her career as an engineer in 2018, she was pleasantly

surprised to find that her co-workers were supportive and encouraging and included her in all work-related tasks and discussions. Today, she is proud to work at one of the fastest-growing EPCM firms in South Africa, and Africa, where she feels highly valued as an engineer and her gender is never a consideration, she says.

“As an engineer, I have seen how important it is to have the input of diverse thinkers from various backgrounds working together to find new solutions. That’s why I believe as soon as a child begins to show an interest in engineering, their parents and teachers should encourage them to find out more and practise skills associated with the trade.

“To high school learners, I would add that if you find physical science and mathematics interesting, do not be afraid to select these as elective subjects, and to truly enjoy them and give them your all. If you want to pursue engineering, don’t let anyone tell you that you can’t do it.

“Despite many myths about the profession, engineering is a field in which gender plays absolutely no role in how well someone can do their job. Women are strong and intelligent, and engineering teams are always better off having both men and women onboard.”

Dolo adds that minerals and mining related engineering, in particular, is one of the most exciting fields available today.

“The mining industry is currently in a period of rapid change, as mining is moving to more sustainable solutions. Young, fresh-minded engineers are needed to drive efforts onward and I hope to see more women step forward and contribute their unique abilities to ever-expanding sustainable projects.”

Notably, as one of South Africa’s new EPCM firms, Erudite is involved in several global mining projects, with a strong track record in countries such as Madagascar, Namibia, Tanzania, Zambia, Peru and South Africa. Through a tailored approach, which emphasises transformation, local partnerships and skills development, the company assists local mining industries to develop sustainable socio-economic solutions to



*Process Engineer Felicia Dolo’s responsibilities include analysing and troubleshooting process issues, developing and implementing process improvement strategies, and enhancing current processes to ensure optimal processing of raw material into a useable end product.*

compete in the international market.

Dolo’s responsibilities include analysing and troubleshooting process issues, developing and implementing process improvement strategies, and enhancing current processes to ensure optimal processing of raw material into a useable end product.

Dolo has five tips for encouraging girls to become engineers:

1. Start young: Gradually introduce girls to engineering and its associated skills at an early age.
2. Find role models: Don’t just tell girls about engineering; show them examples of successful and inspiring women in the field.
3. Get involved in engineering: Encourage girls to participate in special engineering programmes and workshops online and in person.
4. Learn through play: Incorporate engineering into girls’ playtime by playing with building blocks or computer games with building mechanics.
5. Encourage mentorships: Find a mentor willing to talk to girls about engineering during their high school years and consider becoming a mentor to other girls and women if you are a professional engineer.

“Workplaces thrive on having a diversity of ideas and perspectives, which is why transformation is so vital. Erudite excels in this regard, which is what I think makes the company an employer of choice and the partner of choice for mining projects across the continent,” she concludes.

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

## Linc-Cobot: collaborative robot welding made simple

Finding qualified and reliable welders continues to be a challenge in the manufacturing industry. For many manufacturers, the thought of automating can be daunting because of the high investment and learning curve involved. Many shops also require mobility, without the static footprint and guarding that traditional automation requires.

The Linc-Cobot robotic welding system from Lincoln Electric features simplified programming with a new tablet based



*The Linc-Cobot robotic welding system from Lincoln Electric features simplified programming with a new tablet based teach pendant and the ability to teach at the torch.*

teach pendant and the ability to teach at the torch. Programming can be done by simply moving the cobot's arm as if welding from the start to the finish of the joint.

The Linc-Cobot system is built for the industrial space and has access to all of Lincoln Electric's highest productivity welding programs, allowing users to maximise productivity and minimise welding costs. Key features include:

- Intelligent torch system: Guide the robot into the correct position by hand, using the torch-mounted enabling device. Use the torch handle to manipulate the push angles and weld points when in the joint. Operators with any skill level can teach the robot from the torch.
- A dual-action pushbutton interface: This allows points to be recorded directly at the torch, reducing cumbersome part programming procedures. The pushbutton interface designed directly into the torch allows the operator to record approach and weld start/end points, and to change robot translation.
- Touch panel tablet teach pendant: The new tablet teach pendant, which features icon-based, timeline program-

ming, reduces the learning curve. Simply swipe icons in or out of the timeline or tap them to modify key welding program parameters.

With this collaborative robot system operators can work alongside robot systems. Linc-Cobot is suitable for use by operators at any level of experience with robotics, and the icon-based programming is straightforward and user-friendly. The flexible working zone of the robot arm provides greater part flexibility, and the small footprint optimises work space.

Linc-Cobot is ideal for jobbing shops with a high mix of components; repair and remanufacturing work; part resurfacing and reconditioning; roof and bridge truss welding; mechanical contracting and piping shops; agricultural equipment; steel fabricators and metal service centres; and training and educational programmes.

Linc-Cobot systems have been set up and are available for demonstration and onsite implementation from Lincoln Electric's Applications Resource Centres (ARCs) in Pretoria, South Africa and in Dubai in the UAE.

[www.lincolnelectric.com/en-za](http://www.lincolnelectric.com/en-za)

## Babcock Ntuthuko and Babcock & Wilcox alliance

South Africa-based Babcock Ntuthuko Engineering Pty Ltd and US-based The Babcock & Wilcox Company have announced the creation of a strategic alliance to bring advanced, world-class power generation and environmental technology solutions to utility and industrial customers in the South African market. Although unaffiliated with each other, the two companies have well over a century of experience delivering cutting-edge solutions to the steam generation markets they serve.

Founded in 1867 by George Babcock and Stephen Wilcox, Babcock & Wilcox set the industry standard for inherently safe and reliable water-tube boilers, and today is a global leader in steam genera-

tion, emissions' reduction, carbon capture, decarbonisation and hydrogen generation technologies for utilities, manufacturers and other industries around the world.

In 1891, Babcock Ntuthuko's parent company supplied the first boiler to South Africa's gold mining industry; and has since designed and supplied many steam boilers used in the utility and industrial sectors in the region. Today, as an original equipment manufacturer, Babcock Ntuthuko has the expertise to design, build, operate, maintain and manage complex steam-generated infrastructure to meet the critical requirements of its customers.

Babcock Ntuthuko and Babcock & Wilcox support sustainable development and are

committed to helping customers optimise their operations, reduce impact on the environment and help meet global decarbonisation and climate change objectives.

"Through this alliance, our organisation's power and industrial customers will have access to a wealth of proven international technologies that can be applied to address local challenges such as emission reduction, power reliability and renewable energy," says

Thava Govender, chief executive officer of Babcock Ntuthuko.

"Some of these technologies have already been successfully implemented in South Africa, including a nitrogen oxide (NOx) abatement solution that Babcock Ntuthuko and Babcock & Wilcox provided for a large industrial petrochemical plant," Govender says.

David Milner, Babcock & Wilcox director of sales and business development for sub-Saharan Africa, says, "We look forward to collaborating with Babcock Ntuthuko to customise engineering solutions for virtually any complex steam generation challenge. This is an exciting opportunity for our companies to work together to provide steam generation and environmental solutions for our customers in the region."

"We manage the entire combustion value chain, from engineering to execution," adds Govender. "Together with our technology partners and suppliers, we can identify opportunities to implement environmental and optimisation solutions throughout the various stages of the lifecycle, from analysing how a boiler manages a specific type of coal, to how emissions can be reduced," he concludes.

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



*Chris Riker of Babcock and Wilcox announces a strategic alliance to bring advanced, power generation and environmental technology solutions to South Africa.*



## Mirror finish from nitrogen offering

Nitralife – a local pioneer in the manufacture and supply of industrial nitrogen generation equipment since 1996 – is expanding its Nitraspray nitrogen generator offering. Managing director Tom Sowry elaborates: “Inspired by a recent customer win, we will be placing a renewed focus on Nitraspray, our application which uses nitrogen for spray painting to excellent effect.”

Nitralife introduced its NitraSpray generator in 2018, specifically designed for professional spray painting in many different sectors, and offering a spray painting delivery mechanism which is consistent and reliable, resulting in a superior paint transfer.

Sowry explains: “Pretoria-based specialist company, Hydro & Chrome, is involved in hydrographic dipping and painting. One of their offerings is a turnkey spray-on chrome solution. This is not a paint but is applied in a similar manner and includes a layer of pure silver metal. This achieves a mirror finish in a variety of applications, such as interior and exterior automotive parts and motorcycles, mags or rims.

“Since the customer began making use of our Nitraspray solution, they have found that the quality of the spray has vastly improved, allowing for a perfect mirror finish. They have been delighted with the results and have found enormous value through the improved quality of the finish.”

Sowry notes that compressed nitrogen is inert, clean and without any moisture and contaminants. These properties allow for a superior finish over air-based spray painting, with a reduction in overspray.

Celia Rocha, Director at Hydro & Chrome, adds: “We have been renting a Nitraspray generator from Nitralife since mid-2021. We use the nitrogen for the spray-on chrome preparation process, and certainly it gives a wonderfully superior finish and quality. The nitrogen is a much cleaner, drier gas, with no dust particles in it and this provides a much smoother and cleaner finish.”

While quality and an excellent finish are particular advantages of using nitrogen for spray painting, it can also allow for time-saving



*Hydro & Chrome is using Nitraspray generators from Nitralife for its spray-on chrome preparation process, which gives a superior finish and quality.*

and improved productivity, notes Sowry. “For example, when working with chrome as our customer Hydro & Chrome does, the job would need to be redone if it was spoiled by a flawed finish, taking both additional time and materials. This is now far less likely when using compressed nitrogen,” he points out.

Currently, notes Sowry, Nitralife operates three main divisions, namely Nitralife, offering nitrogen generators for passenger, commercial trucking and mining vehicle tyre inflation; Nitracut, which offers nitrogen generators for laser cutting and industrial applications; and Nitraspray, which offers nitrogen generators for use in spray painting processes.

“Moving forward,” he says, “Nitraspray will be positioned – with a renewed focus – within our Nitralife industrial and food-grade solutions portfolio. We have seen a massive increase in demand from the general industrial, pharmaceutical and food-grade modified atmospheric packaging (‘MAP’) markets, so this makes good strategic sense.

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

## The Thermamax Griffin PRO-TIG AC/DC Inverter Range

The Thermamax PRO-TIG 200 and 315 AC/DC welding inverters feature intelligent digital control technology and pulse capabilities. These advanced technologies increase the usability, reliability, performance and stability of the machines, as well as enabling a more dynamic response to the welding environment.

The PRO-TIG range also includes automatic protection-and-recovery functions, causing the machines to power off when faced with unstable voltage spikes. They will then automatically recover once the voltage stabilises. All faults are digitally displayed for easier detection.

These multi-process machines are able to perform MMA welding, AC and DC TIG welding, as well as spot and pulse TIG welding.

The Thermamax PRO-TIG 200 and 315 AC/DC welding system is ideal for TIG welding on mild steel, stainless steel and aluminium for high-integrity fabrication and maintenance projects.

Thermamax welding equipment is available in South Africa from Unique Welding and the PRO-TIG range comes with a three-year conditional warranty.

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



*The Thermamax PRO-TIG 200/315 AC/DC welding inverter is ideal for TIG welding on mild steel, stainless steel and aluminium for high-integrity fabrication and maintenance projects.*



## Cosmo Group showcases community spirit

Following a Cosmo supplier-customer day at its Silverton premises in Pretoria, and in advance of a second demonstration day for its industrial clients, *African Fusion* talks to marketing manager, Petra van den Bergh, about some of the community initiatives that underpin the Cosmo Group's business outlook.

**O**n Wednesday February 2, Cosmo Group held a supplier-customer day at its Welding Superstore in Silverton, Pretoria. "The idea is to showcase the products we offer, especially new products being launched. We like to give our suppliers the opportunity to interact with our customers on the day, and our customers the chance to speak to experts in their various fields," says Petra van den Bergh of Cosmo Group.

"Also, we want to show off our complete range of supplementary products. Many customers know about our welding equipment and consumables offering, but they may not know that we also have the Jonsson Workwear & Dromex offering, for example, along with a full range of PPE," she points out, adding that Cosmo also distributes a full range of professional/industrial and DIY power tools, along with a comprehensive range of fasteners. Key brands exhibited on February 2 were Pferd, UniArc, Kennedy, Alexander Binzel, Framgram, Trade Professional, Lincoln Electric and Dromex.

Following this success, a second supplier-customer day has been planned for Wednesday May 3, this time with a focus on industrial clients. "From the supplier side, Air Products and Lincoln Electric will be attending, along with the power tools and accessories brand, Vermont Tools, and HiKOKI, the new brand name for Hitachi's robust industrial range of power tools.

"We are also focusing a little more on demonstrations," van den Bergh continues. "We are expecting the LINC-CUT® S 1530w

plasma cutting system from Lincoln Electric in the next few months. It is an economical, plug and play, CNC air plasma cutting system, ideal for cutting mild and stainless-steel plate of up to 1500 x 3000 mm, with a piercing capacity of up to 25 mm. The system is compact to make best use of floor space, and installation is fast and minimal – a LINC-CUT plasma system can be ready to cut within an hour of arriving on site; installation and training takes two to three days."

The system comes with a 2-year warranty and includes: a Lincoln Electric FLEXCUT® 125 CE, a water table embedded into the steel frame construction, the plasma torch and all the accessories, the CNC controller with a 20-inch multi-touch screen, and 36 pre-loaded standard and adjustable shapes from basic rectangles to complex circular flanges. In addition, a laser positioning mode simplifies aligning the cutting sheet and defining the starting point.

"The LINC-CUT® S 1530w System is ideal for use by fabrication shops, sheet metal contractors, custom vehicle manufacturers, as well as those offering prototyping services and education and training," she adds.

Turning attention to the support side of Cosmo's offering, van den Bergh says the comprehensive welding range is fully supported by services such as the Cosmo Training Academy. "We strive to serve our whole community, from people wanting to do DIY, to our industrial clients offering local

fabrication and manufacturing services. We also support our young people, and not only from the Training Academy. For the past four years we have been offering a unique internship programme for between five and seven young matriculants," she relates.

Currently interviewing for its fourth group of interns, van den Bergh



*The Cosmo supplier-customer open day, at its Silverton premises in Pretoria on February 2, featured the company's supported brands, including Pferd, UniArc, Kennedy, Alexander Binzel, Framgram, Trade Professional, Lincoln and Dromex.*

says that the interns come to Cosmo for six months to get experience of all aspects of the business. "We take them through everything: the supply chain, direct store sales, our accredited workshop, industrial gases – and they do a short course on Basic Welding at our Training Academy. Of the seven interns that started with us in 2019, three of them are still employed here and have been promoted up the ladder," she tells *African Fusion*.

"Through this initiative we help young people to gain work experience and it is another way to create a flow of young blood moving through Cosmo and into South African industry," she adds.

On Saturday May 27, Cosmo Group will again be hosting its 10th Cosmo Run, which typically attracts between 1 000 and 1 500 people from the local community. "We started doing this when Cosmo turned 20 as part of our birthday celebrations, and all the money raised is used for community projects," van den Bergh informs *African Fusion*. Runners and walkers have the option of doing five or ten kilometres and all ages are welcome.

"At Cosmo Group we have a strong business ethos. We believe in making a difference in our communities and in our country. We are a local success story, and we are very happy to share that success with suppliers and customers, and with those in the broader community who need a helping hand," she concludes.

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



*The LINC-CUT® S 1530w System.*



# IT owns

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There's a lot of misinformation surrounding ERP. That's why it is imperative you separate fact from fiction. Read the compelling report from Frost & Sullivan in collaboration with SYSPRO entitled ***Dispelling Misconceptions About Enterprise Resource Planning Systems.***

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