HOT DIP Galvanizing TODAY 67
Hot Dip Galvanizers Association Southern Africa 2017 Volume 14 Issue 3

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Executive Director's Comment

At a recent manufacturing productivity conference some statistics were shown that highlight what many know. Manufacturing's contribution to S.A. GDP has fallen from 24% in the early 1980's to 13% in 2015, shedding half a million jobs along the way.

Manufacturing has the highest job multiplier of any sector. If good strategic initiatives are implemented to stimulate manufacturing, it is estimated that at a level of 28% contribution to GDP a theoretical 800 000 jobs may be created.

Strategic initiatives are the responsibility of both the captains of industry and our government. Many academics state that governmental meddling in a free market economy is a bad thing; however this statement does require some scrutiny.

In essence two things only are required from government. In the first instance domestic conditions must be addressed to set the table for business to operate in. The second crucial role is for government to ensure that local companies are competing on a level playing field with our trading partners.

In terms of the first criteria:

The provision of a good infrastructure especially road, rail, ports and telecoms is crucial. The provision of security for people and property stimulates a willingness to invest.

Education is also of vital importance. Access for all to high-quality primary education is infinitely more powerful and also a natural method of addressing and correcting the inequalities of the S.A. past. Lets' start to look after our teachers and sort out our substandard schools. Artificial instruments, presently touted as the way to shift the means of production into previously disadvantaged hands do not seem to be very successful. Largely they are or meaningless to the general population.

Clarity and consistency is needed on matters related to energy strategies and policies. Can price agreements be reached with those offering "green energy"? Is nuclear the way to go and can our country afford to pay back an estimated 5% of its entire tax revenue per annum for a new nuclear plant?

Our existing labour laws are largely compiled to ensure that the historical exploitation of labour cannot be repeated. This is absolutely correct, but it must be asked: have certain elements of the legislation not, at least in part, become a roadblock to dealing with the 27% unemployment rate.

It is imperative that leadership deal with failing state-owned enterprises. Competent management that is free of "undue influence" is urgently needed to clean up S.O.E that are currently diverting funds from value adding projects. Of concern is that the leadership does not appear to have a strategy to reverse these positions.

If decisive action is taken to deal with the above, leadership would be setting the table. In parallel with this and to draw out the cliché further, it is imperative that no deals now take place "under the table".

With regard to the second responsibility of our leadership:

Free market forces can only truly exist if the playing field is level for all teams. It defies belief that trade agreements are entered into with countries that patently have no intention of ensuring a level playing field. Mammoth manufacturing capacities have been created by trading partners on the back of heavy subsidies and investment incentives, softer laws and policing related to labour and environmental issues. This "sponsored" capacity needs to be filled. Once local consumption is saturated, they will export. Most of Europe and America have buffered this onslaught through sensible trade agreements, imposition of duties and enforcement of standards and codes to ensure that only quality product is imported. By sharp contrast most of Africa has left the door open and largely left its manufacturing industry to fend for itself against uneven odds.

Our country is in desperate need of credible leadership that has the resolve to deal with both issues.

Robin Clarke

In this issue...

The weakest link is always the challenge to be overcome. From fasteners to new investment opportunities and the confusion arising from names associated with various forms of corrosion control. The opportunities that arise from meeting these challenges in a constructive manner must be explored. This issue addresses:

- The need to specify the correct fasteners and the means of ensuring best practice in the use thereof is addressed in the article – ***Fasteners "...therein lies the rub"***.
- The stark realities of starting up a hot dip galvanizing plant require serious evaluation in the face of the many challenges to be addressed. ***STARTUP – The reality of starting up a hot dip galvanizing plant*** looks at the plethora of information and understanding of the economy required when considering such an investment.
- The "cold galvanizing' moniker has been used across a broad swathe of products, all purporting to deliver equivalence to hot dip galvanized coatings. ***The "cold galvanizing" business*** article addresses the need for clarity for end user to fully understand the benefits of all options for corrosion control.
- The interesting concept of ***active and passive corrosion*** control considerations is well set out in an interesting technical article which shows that synergy between corrosion control systems is often in the interest of all parties seeking the best solution to challenging case.
- The HDGT personality profile introduces the Corrosion Institutes incoming President to our readers and provides an insight into ***Donovan Slade*** as a leader and solutions provider elected to lead CorrISA in to the future.
- The farewell to the loved and respected, ***Anthony O'Donnell***, is published as a tribute to a man of action with a love of and passion for excellence; R.I.P Tony.
- ***INTERGALVA*** is only a few months away, some of the workshops and galvanizing plant visits planned are shared in this issue as a preview for all who can to attend the 25th International Galvanizing Conference in Berlin in June 2018.
- **HDGASA training** and those who attended are profiled to celebrate the ongoing pursuit of education and training to provide the best understanding of the benefits the Hot Dip Galvanizing offers, an understanding of the technology and how it should be professionally evaluated in accordance with the relevant standard.

With a year of challenges drawing soon to an end, the HOT DIP GALVANIZERS ASSOCIATION takes this opportunity to wish all our readers and contributors "Happy Holidays" and a year of great achievements in 2018.

Anthony Botha

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Dont just Galvanize it, Monogalv it

Fasteners "...therein lies the rub"

Extracts and edited from SAIC Journal Volume 41 No. 2 2017

A chain is said to be only as strong as its weakest link. With cladding the weakest link is the fastener.

It is necessary to understand the background to the classification of coatings on fasteners and washers as a starting point. Metals and metallic coatings are vulnerable to atmospheric corrosion in the presence of moisture. The extent of corrosion is dependent on the concentration of pollutants and amount of moisture. The International Organization for Standardization (ISO) developed a series of standards addressing the corrosivity of atmospheres which were divided into the six categories as detailed below.

CATEGORY	CORROSIVITY
C1	Very low
C2	Low
C3	Medium
C4	High
C5	Very high
CX	Extreme

The classes for the protective coatings on fasteners as defined in SANS 1273 and numerous other internationally recognized standards match directly with these ISO categories i.e. a class 3 fastener is required in a category C3 atmosphere. Revisions to SANS 1273 will also include washers.

Since the opening of the South African market post-1994, we have had access to the best products the world has to offer, regrettably the converse is as true. The South African market has become awash with a plethora of inferior foreign products, sold at best by gullible vendors but mainly by rogues centred on a low cost price rather than suitability for purpose and durability. The vast majority of these products do not comply with the National Building Regulations, SANS National Standards or other internationally recognized standards.

What is not generally understood by specifiers, quantity surveyors and project managers is that there is no longer a local manufacturer of self-drilling roofing fasteners and only a limited range of self-tapping fasteners are currently manufactured locally.

Also prevalent in our market is the misleading and often fraudulent claims made by unscrupulous vendors. Products are claimed to have withstood hundreds of hours of salt spray testing or are type class-3 or 4 etc. Some even boldly claim their products comply with recognized standards and when challenged produce 'certificates' issued by questionable or spurious bodies. Yet when independently tested, these products fail to meet the necessary criteria.

Another area of concern is the weather-proofing gaskets on flanged head fasteners and bonded washers. These can be anything from sealed sponge rubber through various plastics to EVA and EPDM. Gaskets need to be capable of operating at temperatures between -10° to +80°C, be UV resistant and be free of active carbon. No sponge based products and the majority of plastic gaskets do not meet the specified criteria required. Their early failure leads to premature failure of the fastener and accelerated corrosion of the cladding. Based on historical performance EPDM has proved to be the superior product with a service life in excess of thirty years.

However, there are a few, reputable suppliers who do supply quality and standards compliant products.

SANS 10400 Part-B and the soon to be released revised SANS 10400 Part-L stipulates a minimum design working life for cladding (including fasteners and ancillary items) of fifteen years. In addition, Part-L requires any roof covering component to during its design working life to resist, amongst other things:

- Effects of UV radiation without deterioration of its essential properties.
- Chemical attack from common atmospheric gases and saline atmospheres.
- Accumulation of hail after moderate hail storms shall not cause water to penetrate the interior of the building.

It is compulsory to comply with the National Building Regulations of which the various parts of SANS 10400 constitute the minimum criteria deemed to satisfy requirements. It is therefore of paramount importance when specifying or evaluating cladding systems to ensure compliance with SANS 10400 together with the manufacturer's conditions of warranty.

One approach for users is to insist on only using products that preferably comply with SANS standards, failing which other verifiable internationally recognized standards should be used. Test results of compliance with such standards should be from a SANAS (SA National Accreditation System) accredited organization.

Ignorance is definitely not bliss when it comes to corrosion control. The HDGASA and their fellow institutes and associations can provide invaluable training and advice. Further details of courses and assistance can be found on our website at *www.hdgasa.org.za*.

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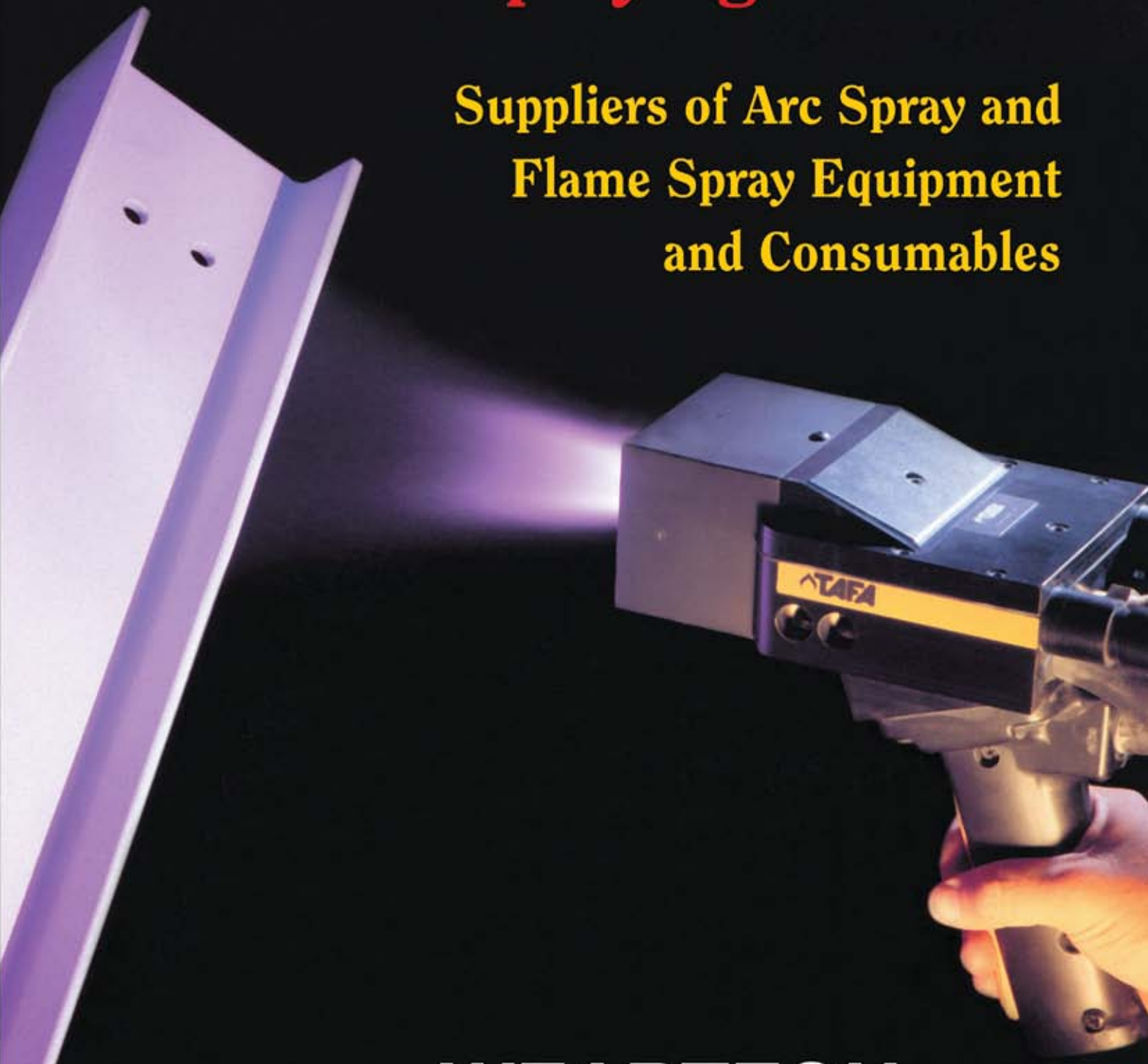

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The reality of starting up a hot dip galvanizing plant

Requests for information on the setting up of a hot dip galvanizing plant are received regularly by the HDGASA. A common thread evident in these requests is the assumption that hot dip galvanizing is relatively simple to set up and run.

The truth is, however, that it requires gathering of substantial information about the market to be served and a broad range of engineering and technical skills and competencies to be able to determine the long term realization of a going concern.

The market being served is not merely the amount of hot dip galvanizing that may currently be available. Rather the amount of base load and future business over the payback period of a plant must be identified.

The HDGASA encourages potential investors to consider the availability of utilizing existing capacity through partnering with galvanizers who have spare capacity. These opportunities ensure that experience and competence in hot dip galvanizing are leveraged. The cost of running the plant and the benefits from the scale of economies may provide a more feasible alternative than a new plant being stated from scratch.

A paper was presented several years ago and addresses the numerous considerations and vital steps in establishing a hot dip galvanizing operation. A synopsis with some key considerations has been developed and follows.

Feasibility study

A detailed study to determine the viability of a hot dip galvanizing plant is essential, prior to any decision being made. The following facts must be determined by way of a market survey. Available work for hot dip galvanizing, including quantity, a breakdown of dimensions, distance to be transported, prices currently paid by potential customers and the level of competition from other galvanizers that could be expected.

- The quantity of material that will be available for hot dip galvanizing determines whether the project is financially viable or not.

- The dimensions and type of steel structure required hot dip galvanizing is essential information as this determines the dimensions of chemical cleaning baths and the galvanizing bath.

- The distance that customers or the galvanizer will have to transport material is important in assessing the prospects for securing work since transport is expensive.

- Finally, competition from other existing galvanizers can be a threat as it can lead to price-cutting if a new galvanizer enters the market. The capacity of existing plants and the amount of spare capacity available from these galvanizers will determine whether there is room for another plant.

Preliminary budget

Before any decisions are made, a budget must be prepared. This will be based on the information gleaned by way of the feasibility study. The degree of reliability of the preliminary budget will be determined by the degree of thoroughness with which the feasibility was carried out and the accuracy of the statistics obtained. A conservative approach to the preparation of the preliminary budget is essential. Over optimism and preconceived conclusions reach before the cold facts are available can be dangerous and highly misleading at the decision stage. The preliminary budget must contain the following information.

- *Capital expenditure:* This must provide an estimated cost of all equipment i.e. production line, handling equipment, buildings, tools and testing equipment. Once a total cost has been arrived at, add an additional percentage to cover inevitable contingencies.

- *Manpower:* Provide for the number of operators, supervisors and administrative personnel that will be required. The labour content of the cost of hot dip galvanizing can be a major cost centre. This will depend on the type of plant, the layout and handling equipment employed. Calculations will relate to volumes and margins offsetting this expenditure.

- *Raw materials:* Estimate the cost of materials and energy required to galvanize. Zinc is normally the major cost followed by labour, pre-treatment chemicals and power consumption. Most budgets underestimate the cost of maintenance which can be high in a hot dip galvanizing plant, particularly as the plant becomes older. Items such as protective clothing, neutralising chemicals for pollution control, water etc. must not be overlooked.

- *Administrative costs:* The need to provide for sales personnel to liaise between the galvanizer and its customers is important.

After all, hot dip galvanizing is in most cases, a service industry.

- *Income from hot dip galvanizing:* It is common to arrive at an average selling price per tonne or per kilogram of steel galvanized. The direct costs of hot dip galvanizing as well as the fixed overheads can also be estimated on a cost per ton or cost per kilogram basis.

- *Energy costs:* The need for a continuous, efficient and reliable energy source cannot be overstated. Loss of energy in the process is a major risk. The cost of energy and the stability of energy pricing are other considerations of vital importance.

- *Labour:* In our market the role of labour and the technological alternatives must be balanced. A larger labour force using a plant design with less automation versus a highly automated operation must be given much thought. Rates of pay, reliance on technological support by a third party and the availability of the right personnel for the choice of plant will have long term consequences.

Once fairly accurate calculations have been made with regard to fixed costs, direct operating costs and revenue from operations, it will be possible to arrive at the return on the investment that can be anticipated. It is only when this information has been secured that it will be possible to reach a reliable decision as to whether the project is a viable investment.

It should be noted that for the budget figures to be acceptably accurate, access to historic costs and consumption figures encountered generally in the hot dip galvanizing industry is important. A basic knowledge of the hot dip galvanizing process is therefore a distinct advantage.

Frequently overlooked is the quantity of zinc required to fill the galvanizing bath at the outset. This is a permanent zinc stock that remains for the life of the plant. Assuming the results produced by the preliminary budget are favourable and a decision is reached to proceed with the project, the next stage will be design and planning.

Designing a hot dip galvanizing plant

Five important features to be borne in mind are:

- the need to provide for suitable handling to facilitate process effectiveness
- the engineering for labour efficiency,
- optimization of production capacity,
- the best possible coating quality
- the lowest maintenance and production costs.

It is extremely important to secure expert advice in all these aspects when designing a hot dip galvanizing plant. While the process may appear to be a fairly simple one, it is in fact fairly complex. To illustrate, inadequate materials handling facilities will seriously impact on productivity and production costs while inadequate storage space will create bottlenecks. The production line in particular should be designed by an expert.

Special attention is required with respect to the pre-treatment section where the number of baths required for an efficient operation must be determined. Bath dimensions are important. Underestimating the number of acid cleaning is a common stumbling block. The provision of adequate degreasing, water rinsing and material selection for the pre-treatment facilities will determine the durability of the equipment, bearing in mind that corrosive chemicals are used.

A further aspect frequently overlooked is the essential need to provide for the treatment of spent acid and contaminated rinse water as well as flux purification. By far the most important and critical item of equipment is the hot dip galvanizing bath and its heating system. These must be designed by an experienced expert.

For efficient production and long term replacement free life to be achieved key decisions must be made. The galvanizing bath must be correctly fabricated using the correct materials of manufacture. The furnace must be designed to provide uniform heating. Overheating or hot spots can result in disastrous premature failure of the bath. A temperature control system with adequate backup safety controls is essential if expensive breakdowns are to be prevented.

Operating a hot dip galvanizing plant

It is important that all personnel in a hot dip galvanizing plant receive the necessary training. Production workers should have an in-depth knowledge of the various pre-treatment chemicals and why they are used. Of vital importance is an understanding of the effects of molten zinc on different types of steel and at different temperatures. Ultimately a galvanizers success or failure relies on how to handle material through the plant, how to galvanize it and how to avoid the formation of substandard coating quality.

Process monitoring and recording

Regular tests are required on all chemicals e.g. degreaser, acid and flux while control of the quality and concentration of these products will determine the quality of the final galvanized coating. Zinc consumption, dross and ash formation must be recorded, monitored and measured against volume or mass of material galvanized. If accurate records are not maintained, costs will inevitably escalate and substantial losses may be incurred. Accurate pricing is not possible if actual hot dip galvanizing costs are not effectively collated.

Inspection

Quality control is extremely important. It can be classified into three sections viz. incoming inspection to ensure that material is suitable for hot dip galvanizing, in line inspection during processing and final inspection prior to despatch. Stripping and re-galvanizing of rejects is a major cost and is ultimately the result of a badly controlled operation.

Safety is an absolute requirement

Hot dip galvanizing is an operation with many hazards. All plant personnel must be provided with protective clothing and hard hats etc. Articles from clients not fabricated to suit the hot dip galvanizing process can result not only in poor quality but also in explosions in the molten zinc which will result in causing serious injuries. A disciplined and safety driven ethos is a non-negotiable for incident free hot dip galvanizing operations.

Environmental controls and legislation

In particular new facilities are being evaluated for compliance with a variety of emissions and waste management regulations. The installation and management cost of these are not insignificant.

Communication with customers

Hot dip galvanizing is a service industry thus, an efficient communication system between the company's customers and the production management team is very important. Traceability of a customer's material throughout the plant is essential. Misplaced items and broken delivery promises i.e. inefficient service will soon give the company a bad name.

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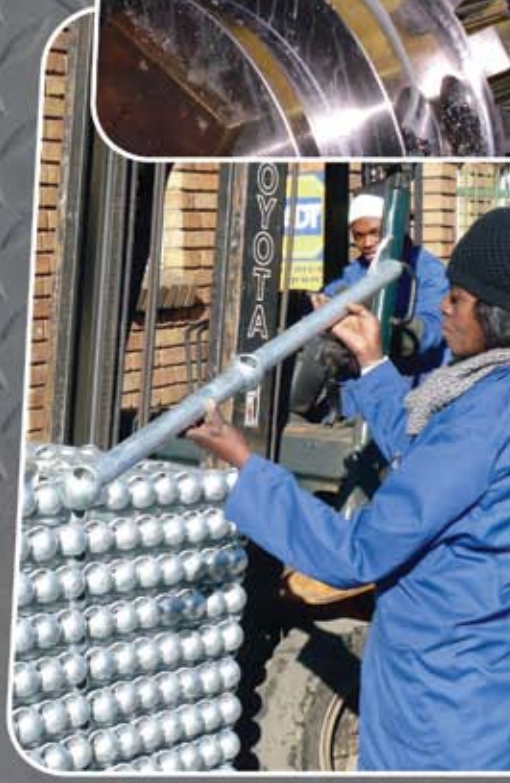

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The "cold galvanizing" business

By Robin Clarke – Executive Director HDGASA

In 1742, French chemist Paul Jacques Malouin described a method of coating iron by dipping it in molten zinc in a presentation to the French Royal Academy. In 1836, Sorel in France took out the first of numerous patents for a process of coating steel by dipping it in molten zinc.

Galvanizing is therefore defined as the process in which perfectly cleaned carbon steel or iron is immersed in a bath of molten zinc and most importantly, a metallurgical reaction follows which causes the formation of a coating that consists of zinc and zinc/iron alloys. No other coating applied at room temperature or thereabouts, whether they contain some form or quantity of zinc or not and no matter how applied, is therefore "galvanizing". As an aside the Oxford dictionary reinforces the spelling of this word with a 'z', presumably as a link to the 'z' in zinc.

The excellent corrosion control characteristics imparted to products through hot dip galvanizing have been established over the past 250 years. This has resulted in the word "galvanizing" being rather liberally used to promote other coating types. A few examples include "Electro-galvanized" rather than "Electroplated" for components plated with pure zinc or even worse "Cold galvanized" when referring to zinc rich paint formulations.

Of interest is the fact that the term "cold galvanizing" was legally challenged in Germany and in a verdict delivered in March 1961, "cold galvanizing" was considered an illegal product description. In South Africa a company distributing a "cold galvanized" product had made some rather optimistic claims following some incomparable accelerated weathering tests. It was claimed that the product was superior to hot dip galvanized coatings. Tests that disproved these claims were published in the magazine "Hot dip galvanizing today" This incident triggered discussions between the Hot Dip Galvanizers Association and the Standards authority. It was, after extensive discussions decided not to pursue a similar ruling to the German ruling. This decision was based purely on the time and cost of such an action.

Appropriate applications exist for electro-plated coatings, considering that the life of a zinc coating is more or less proportional to it thickness in a given environment. In the case of the electroplated zinc articles, this coating is are approximately 4 to 10 times leaner than for the same article having been hot dip galvanized. The use of electroplated articles is therefore more appropriate in mildly corrosive environments rather than external applications where a thicker hot dip galvanized coating will provide relatively longer corrosion control service life. Similarly, the application of Zinc rich type paints, manufactured to a variety of standards are allowable as a repair medium for hot dip galvanized product provided that the appropriate surface preparation is done and sufficient paint is applied to obtain a minimum finished dry film coating thickness of at least 100µm.

Specify with specifics

A decision was made that in order to ensure a clear understanding of the difference between hot dip galvanized articles and other products purporting to be "galvanizing", in the marketplace, this would be achieved through the dissemination of information to and the education of users, specifiers and other interested parties. The HDGASA therefore refers at all times to "hot dip galvanizing" rather than merely "galvanizing" and encourages all specifiers of other corrosion control products to do the same. To ensure clarity when requiring hot dip galvanizing, specifying alignment to the SANS121:2011(ISO 1461:2009(E)) standard is considered best practice.

It is simpler for all if we just "called a spade a spade", label products correctly and let each technology and product stand on their own merits.

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COATINGS & CHEMICALS

Corrosion coating considerations – active and passive

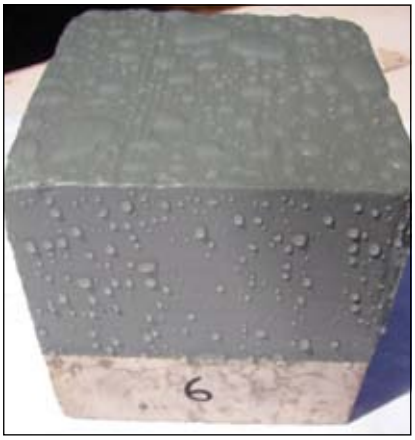
Edited from a submission by Daniel van der Westhuizen of Afrisun Coatings

In this article we look at a better understanding of some corrosion control terms that are bandied around the corrosion control industry. In many ways these terms relate typically to the variety of products currently available. In broad terms corrosion control can be classified as either *'Passive Corrosion Control'* or *'Active Corrosion Control'*.

Passive Corrosion Control, is typically a barrier coating which controls corrosion through mechanically isolating the steel from the aggressive corrosive agents, or triggers, including water, oxygen, acids, etc. in a given environment. Such passive films do not alter or react with the substrate but merely separate the metal from the 'environment'. In general, passive protective films cure to a hard finish. In general these 'hard' films have a high tendency to crack usually when applied to components that undergo movement, such as lattice tower joints or production plant pipe supports. Once this barrier cracks it may allow corrosion to be triggered, especially in difficult to see, crevice type joints.

A typical passive coating Duplex Paint System would typically employ polyurethane, vinyl, epoxy, enamel, bitumastic or zinc rich coatings. When applied over hot dipped galvanizing, this passive barrier or inert film requires special substrate preparation such as sweep-blasting to create a substantial key for the mechanical bonding to be effective.

HRCSA Red Penetrant.



HRCSA Topcoat Grey.

Corroding anchor bolts and nuts.

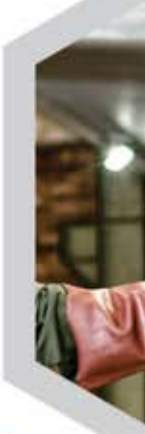
When in-situ application is needed, for instance, on existing electrical lattice towers, the necessary processes add to the cost and technical difficulty of achieving effective passive barrier corrosion control congruent to the service life of the hot dip galvanized members.

Active Corrosion Control includes hot dipped galvanizing, sherardizing, electroplating, zinc metal spraying, mechanical plating, impressed cathodic protection and HRCSA amongst others.

Hot dip galvanizing affords an attractive long service life option directly proportional to the thickness of the hot dip galvanized coating, composed of zinc and zinc-iron alloys. When steel is dipped into the molten zinc a series of zinc-iron alloys form and the coating metallurgically bonds to the substrate. When the hot dip galvanized steel is removed from the molten zinc, the coating surface reacts with the oxygen and moisture in the atmosphere forming combinations of zinc oxide and zinc hydroxide. The carbon dioxide in the atmosphere thereafter converts these to a zinc carbonate film which tightly adheres to the surface and is insoluble in water. This is referred to as hot dip galvanizing's first level of protection and provides hot dip galvanized steel articles with a long service life. The cathodic protection capability of the zinc is the second level of protection. This is initiated principally when the steel is exposed to the environment due to damage and obviously when the zinc carbonate has been depleted over time.

Zinc coating processes, other than hot dip galvanizing, used on fasteners and various other smaller components produce a thinner zinc coating layer. These plated fasteners and nuts will inevitably corrode before any hot dipped galvanized components viz. those which they hold together, unless they are over coated with a suitable barrier coating.

HRSCA comprises both a penetrant and a topcoat. The penetrant has a low viscosity



KROME

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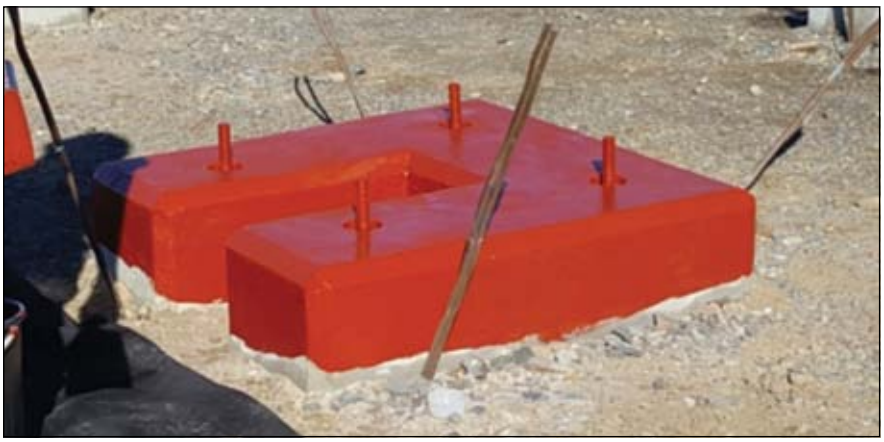

Newly Hydrophobic HRSCA coated substation foundations.

and has been formulated to specifically combat crevice corrosion by 'seeping' into the crevice where it provides a viscous barrier. The HRSCA topcoat contains diffused Calcite which reportedly creates a 'long path' interfering with moisture and oxygen being able to reach the surface of the steel. These characteristics evidently render the HRCSA coating hydrophobic. By effectively preventing the two most important corrosion agents from reaching the substrates surface HRCSA *actively* prevents the initiation of corrosion within such encapsulated joints. Adhesion of the HRCSA is claimed to be achieved by way of Van Der Waals forces thereby simplifying the coating adhesion requirements. As such the HRSCA to metal interface surface reportedly needs little more than elementary preparation. Due to its very low electrical conductance, HRCSA is also said to preclude the formation of a corrosion cell through effectively preventing the flow of electrons or currents.

A HRSCA Wet Film Thickness (WFT) of 600 µm is purportedly achievable with a single coat. As HRCSA is very thixotropic the coating is not prone to sagging or dripping when applied as instructed. The rate of erosion of HRCSA has been determined as being around 12.5 µm a year in a CX5 pollution environment. While the HRCSA is a 'firm' coating it does not become 'hard'. This characteristic ensures that where the structure flexes the HRSCA coated joints have not shown evidence of any cracking in this application.

The at hand suggests that HRCSA is a first-class coating partner for hot dip galvanizing when employing a Duplex Coating System. It is particularly well suited to the sealing of the joints on lattice steel structures and the overcoating of fasteners. The use of HRSCA has been shown to be effective against corrosion and thus is able to deal effectively with the *"weakest link"* of these types of structures.

HRCSA used as an active joint sealing technology over hot dip galvanized components and fasteners.

The Association would like to acknowledge the advertisers and thank them for their support

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South African Galvanizing Services (Pty) Ltd .....page 7
Transvaal Galvanisers (Pty) Ltd ..... Inside Front Cover
Weartech (Pty) Ltd .....page 5

Update on Intergalva 2018

25th International Galvanizing Conference

INTERGALVA
17-22 June 2018 Berlin

*Martin Kopf incoming EGGA President. **

Having reviewed numerous submission proposals the organisers of Intergalva 2018 have confirmed the list of workshops to be held during the event will be:

- Improving zinc efficiency
- Floating dross – causes and avoidance
- Energy savings in galvanizing plants
- Zinc purchasing and price hedging on the LME
- Kettle management and optimising kettle life
- Waste acid disposal and regeneration
- Factors affecting choice of zinc melt composition and alloying
- Challenges of variable steel composition
- Flux technology, recycling and regeneration
- Pollution control and fume extraction
- Passivation and other post-treatments
- Improving your turnover with additional services
- Duplex coatings – painting and powder-coating of galvanized steel

To accommodate the attendance of delegates from across the globe these papers are planned to be simultaneously translated in English, German, Italian, Spanish, French, Polish, Japanese and Chinese.

Galvanizing plants to be visited within Intergalva 2018 have also been announced. The plants to be visited are:

- Zinkpower Berlin GmbH & Co. KG
- Coatinc Siegen GmbH und Coatinc PreGa
- Zinkpower Schopsdorf GmbH & Co. KG
- Verzinkerei Lennestadt GmbH & Co.KG
- Müritz-Zink GmbH, Waren
- Niedax GmbH & Co. KG
- Feuerverzinkerei Meyer, Großbölkow
- W. Pilling Riepe GmbH & Co KG
- Zinkpower Radebeul
- ZinkPower Remels GmbH & Co. KG
- Zinkpower Neumünster
- Feuerverzinkung Holdorf GmbH & Co. KG
- Rendsburger Feuerverzinkerei GmbH
- Feuerverzinkung Bremen GmbH & Co. KG
- Zinkpower Schörg GmbH & Co. KG

*HDGT apologizes for the image used in the previous issue which was actually of outgoing Jeremy Woolridge. Incoming EGGA President, Martin Kopf is shown above.

EVENT SCHEDULE

Date	Event
Sunday, 17 June	Registration Exhibition set-up Welcome Tour (optional)
Monday, 18 June	Registration Conference, Workshops and Exhibition Welcome Reception and 'Verzinkerparty' (an Exhibition Networking Evening)
Tuesday, 19 June	Conference, Workshops and Exhibition Gala Dinner
Wednesday, 20 June	Conference, Workshops and Exhibition
Thursday, 21 June	Visits to galvanizing plants (optional)
Friday, 22 June	Visits to galvanizing plants (optional)

A great selection of optional sightseeing tours for accompanying persons will be available throughout Intergalva 2018.

Registration should be opened at www.intergalva.com/2018 in mid-December 2017.

Hot Dip courses steaming ahead

A Level I – Introduction to Hot Dip Galvanizing course was held at Transvaal Galvanisers in Nigel with Divan White; Dain Subramoney; Candy Baloi; Neville McAllister; Nico Jansen van Vuuren from Heinnemann and Conitta du Plessis from Titan Geotech in attendance.

Twenty two delegates attended three separate Level II courses. A course was held at Phoenix Galvanizing in Durban and was attended by RAK Technical Services' Rabia Al Kaassamany and Navendran Naidoo as well as Phoenix's own Kista Munsamy and Nishan Kesoo.

A Level II course was held at Riverside Lodge, attended by eleven delegates from SMEI, Stefanutti Stocks, CIS Engineering and several were sponsored by Monoweld Galvanizers and Transvaal Galvanisers.

Transvaal Galvanisers hosted a Level II course, at the beginning of September 2017, at their facilities in Nigel. Seven delegates from Grinrod Rail Construction, Transnet, All Blue Technologies and SMEI attended.

Phoenix Galvanizing – Level II Course: (from left to right) Navendran Naidoo, Kitsa Munsamy, Nishan Kesoo, Rabia Al Kassamany (HG).

Level I – Introduction to Hot Dip Galvanizing course – Companies: Titan and Heintzmann.

Transvaal Galvanisers Level II: Xander Bezuidenhout, Carlos Andrade, Des Ungerer, Johan Harmse, Ryan Muller, Danie Geldenhuys, Jaco Venter, Eugene Steyn, Eugene Ngwenya, Jaque Denysschen, Johan Erasmus.

Transvaal Galvanisers Level II Course: Back (from left to right): Gerhardus Botha, Chris Roos, Patrick, Linda Mathe. Front (from left to right): Tony Marshall (HG), David Atang Sele, Tshepiso Serame.

THE CORROSION INSTITUTE OF SOUTHERN AFRICA

COURSE SCHEDULE 2018

Not Just Rust
31st January 2018 — Johannesburg, GP
28th March 2018 — Johannesburg, GP

NACE CIP 1 – Coating Inspector Program
22nd – 27th January 2018 — Johannesburg, GP
5th – 10th March 2018 — Johannesburg, GP

NACE CIP 2 – Coating Inspector Program
12th – 17th February 2018 — Sasol, TBC

NACE CIP 3 – PEER Review
7th – 9th February 2018 — Johannesburg, GP

NACE CP 1 – Cathodic Protection Tester
12th – 16th February 2018 — Johannesburg, GP

Corrosion Engineering (5 Day Exam)
12th – 16th March 2018 — Johannesburg, GP

"Knowledge is the only instrument of production that is not subject to diminishing returns" John Maurice Clark

COURSES OFFERED

Level I: Introduction to Hot Dip Galvanizing

The HDGASA one day INTRODUCTION TO HOT DIP GALVANIZING course is designed to provide an initial understanding of the concepts relating to hot dip galvanized coatings applied for corrosion control of steel components. The course comprises six modules. In order for the course to be viable we require six or more candidates to attend. Arrangements can also be made for this course to be held at a venue of your choosing for more than six candidates. In addition to the course, a special visit to a hot dip galvanizing plant may be arranged on a separate date, should six or more candidates be interested and able to attend.

Level II: Certified Galvanizing Inspectors

The HDGASA advanced Level II course provides the necessary skills to assess the quality and conformance of Hot Dip Galvanized coatings and Duplex Systems to the applicable specification. Delegates are introduced to other metallic type coating specifications and their application for corrosion control design.

The course provides an in-depth interpretation of the specifications and accepted best practice procedures for determining coating thickness, visual inspection of surface finishes as well as the evaluation of these coatings for corrosion control of steel components. The course includes a visit to a hot dip galvanizing plant where delegates will have an opportunity to assess finished product against the relevant quality standards on a real time first hand basis.

Three Continuous Professional Development (CPD) points are awarded to delegates attending the entire course. Bookings are limited to a maximum of 10 people, with applications treated on a first-come-first-serve basis. In order for the course to be viable we require 6 or more candidates to attend. Arrangements can also be made for the course to be held at a venue of your choice for more than 6 candidates.

ENROL IN A COURSE TODAY!
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HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

Personality Profile

DONAVAN SLADE

INCOMING CHAIR CORRISA

How did you get involved in the corrosion control industry?

I was introduced to the corrosion industry by Graham Brown and Rey Roodt in the early 1990s. My real interest and passion arose when The Corrosion Institute Of Southern Africa launched the NACE courses in South Africa.

Tell us a little about yourself, your home life, your hobbies and passions.

I am literally married to the girl of my dreams, Lauren Slade, who is my rock and my confidant. We have two children, Cora my little girl of 8 yrs. old and Bryn a little boy of 4 yrs. old. I don't have much time for hobbies as I am always working or spending any free time available with my family. I have always wanted to fly helicopters and airplanes and I am sure I will get a chance to chase that passion a little later on in life.

What professional achievement are you most proud of?

Owning a sizeable share in NUI and leading an incredible team of people.

What are your thoughts on the development of corrosion control in the context of Africa and in particular Southern Africa?

We are not winning the battle in Africa and are putting up a good show in South Africa. South African people and companies have a lot to offer Africa and the rest of the world and we should not be shy to take our rightful place in Africa and globally.

Who has had the biggest influence in your life?

My mom Maureen and my wife Lauren.

What is your philosophy of life?

Work as hard as humanly possible every day!

What is your favourite reading?

Business autobiographies

Do you have any dislikes?

Rich people who think they are better than everyone else and racists of any colour.

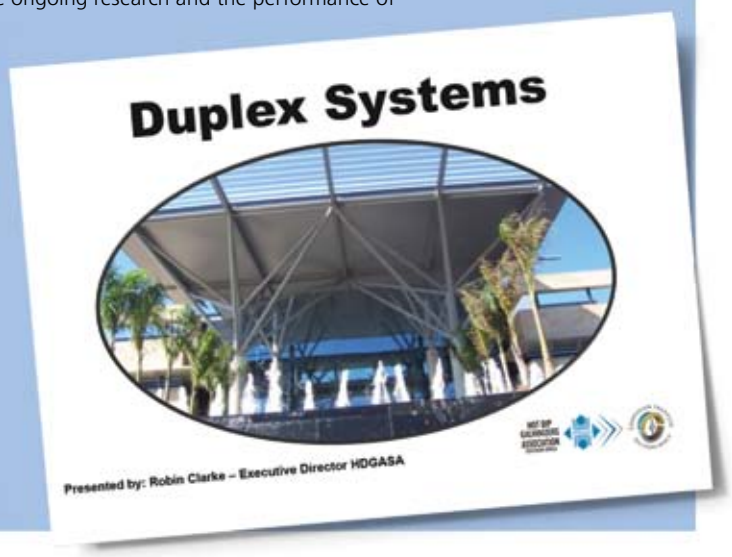
Complete the sentence: Five o'clock on a Friday, you...

are sitting at my desk working. I leave work early on a Friday at 18h30.

Symbiosis – HDGASA / CorrISA

The HDGASA undertook to participate in activities of the Corrosion Institute of South Africa in 2017 and will continue to create value for our members through our reciprocal membership in 2018. The purpose of our active involvement at CorrISA is to profile Hot Dip Galvanizing in the environment of general corrosion control and to interface with the broad range of professionals in this field. To date the HDGASA have:

- Sponsored CorrISA technical evenings in Johannesburg and Cape Town during which technical feedback was given by a renowned corrosion specialist. The sessions updated the delegates to the ongoing research and the performance of hot dip galvanizing coatings in a variety of environments.
- With the kind sponsorship of Sebastian Swartz of DUPLEX COATINGS, the HDGASA made a presentation to CorrISA members, in Johannesburg, on the benefits and technical aspects of Duplex Systems. The presentation seemed to be well received with plenty of participation from the floor and positive comments regarding past projects. A copy of this presentation is available on request from the HDGASA.
- Due to both organisations' commitments to education and training, an agreement was reached to cooperate in the advertising of courses available through both the HDGASA and CorrISA.



ENJOY THE MARKETING BENEFITS OF PROFILING AT THE

HOT DIP GALVANIZING AWARDS 2018

Several of the finalists of the SAISC Steel awards included a galvanizer as part of the team. The same submission may be entered to the HDGASA 2018 Awards Gala Evening to be held in the last quarter of 2018. The awards need a critical mass of submissions for the event to be undertaken. The prestige of being a contender and more so of receiving laurels for the work done is a perfect opportunity to maximize your organizations professionalism and excellence in the field of corrosion control. By submitting a project or application the profile of the team involved is highlighted, a marketing benefit for any professional galvanizer in these highly competitive times.

CATEGORIES:

The categories for the 2018 awards are:

Architectural:
All forms of architectural endeavour where hot dip galvanizing has be used to facilitate the structure in its corrosion protection or as an integral element of the aesthetics is welcomed. From Sculptures to facades and integrated building elements the use of Hot Dip Galvanizing technology can be shown as a key component of the submission

Infrastructure:
This category focusses on the 'Traditional' role of Hot Dip Galvanizing. From mining infrastructure to bridges and towers using galvanized elements integrated into the structure or as stand-alone features. To the use of hot dip galvanizing in the road and transport arenas as well as at ports and harbours, airports and for reticulation of utilities and energy projects.

Duplex:
The exceptional corrosion protection of duplex systems in any application to provide essential benefits to projects where challenging corrosion environments; legal requirements or pure aesthetics is used to the benefit of the client.

Rejuvenation:
In these times, the rejuvenation of existing environments for repurposing or upgrading using hot dip galvanizing is highlighted. The reestablishment of a former historically significant structure or similar projects showing how hot dip galvanizing and /or duplex systems are integral to each project.

SUBMISSIONS:

Submissions open and there is no entry fee for submissions. Each submission must conform to a prescribed format and be accompanied by at least five (5) high resolution (> 300 dpi) colour photographs of the entry. The submission format and T's & C's of the event may be downloaded from the Hot Dip Galvanizers Association website at www.hdgasa.org.com.

SPONSORSHIP:

The event offers a superb opportunity for effective marketing as a sponsor for the event. Sponsorships are available in three primary categories. *The Platinum Sponsor* is key to the event with a negotiated sponsorship opportunity delivering outstanding value. Sponsorships as *Gold and Silver sponsors* are also available with excellent marketing benefits. Additional sponsorships for specific elements of the event can also be discussed with our team.

The challenge has been made and the champions will be rallied to once again compete for the laurels in the 2018 Hot Dip Galvanizing Awards.

THE QUESTION REMAINS... *do you have what it takes?*

Should you require any further assistance or clarification please contact Lara Teixeira at our offices on +27 (0)11 456 7960 or by email to hdgasa@icon.co.za

Somebody, somewhere is having their ear bent!

Obituary – AJ O'Donnell

According to Tony, I have known him since 1982. In those days he was already at the South African Bureau of Standards as part of a team with competence we now only dream of, including other characters such as Dennis Twigg and Eric Duligal. Tony was part of the team that supported the SABS Mark in the galvanizing industry amongst others.

He successfully completed a Masters (already having one from the UK) and PhD in the corrosion performance Galvalume and Galfan at the University of Pretoria under Prof Sandenbergh. He always considered this his alma mater and kept good contact with the Department for the rest of his life.

He was a committed Christian and supportive family man with a wide social circle from the church and assisted with many of their charitable activities.

Most people will never forget Tony for his garrulous and kind nature. When the Corrosion Institute of South Africa put in its 1996 bid, in Melbourne, for the 1999 International Corrosion Congress, it was

Some of the Corrosion Institute 1996 bid team in Melbourne, (from left to right) Godwin Ibe (Nigeria), Craig Stevenson, Tony O'Donnell, Spanish representative, Jurgen Gnoinski, Roelf Sandenbergh, Rob White, Ande von Bennekom (rear right).

Tony who pounded the streets from hotel to hotel in the wee hours pushing leaflets under hotel doors encouraging the voting members to support the bid. That effort, often overlooked, played a significant role in ensuring that South Africa was always front of mind, with voting delegates, and assisted in securing the Congress for Cape Town in 1999.

After his retirement Tony kept active assisting many in the steel industry. He was always cheerful and willing to help, provided they were prepared to listen. I am sure that he will be bending someone's ear somewhere. Glad to have known you Tony. May your soul rest in peace.

Rob White

Condolences from the Association

Dr Anthony O'Donnell, or as he preferred to be called, Tony lived life with passion. As with all passionate people he could by no means contain his enthusiasm, his pursuit of excellence and his love of people.

At the HDGASA Tony was a brother in arms, a superb ally, standing beside us in addressing the challenges that affected our industry. His unfettled support and tireless effort were his tools and his immense knowledge; together with his profound love of pragmatism were his ammunition. Tony knew who to speak to across a vast national and international network of experts, specialists and engineers. His desire to keep everyone well informed and up to date with telephone conversations was legendary.

Tony's support will not be forgotten and his assistance forever appreciated. The HDGASA send their sincere condolences to Tony's family and friends in this time of parting, may he rest in peace.

Do Not Go Gentle Into That Good Night

By Dylan Thomas

Do not go gentle into that good night,
Old age should burn and rave at close of day;
Rage, rage against the dying of the light.

Though wise men at their end know dark is right,
Because their words had forked no lightning they
Do not go gentle into that good night.

Good men, the last wave by, crying how bright
Their frail deeds might have danced in a green bay,
Rage, rage against the dying of the light.

Wild men who caught and sang the sun in flight,
And learn, too late, they grieved it on its way,
Do not go gentle into that good night.

Grave men, near death, who see with blinding sight
Blind eyes could blaze like meteors and be gay,
Rage, rage against the dying of the light.

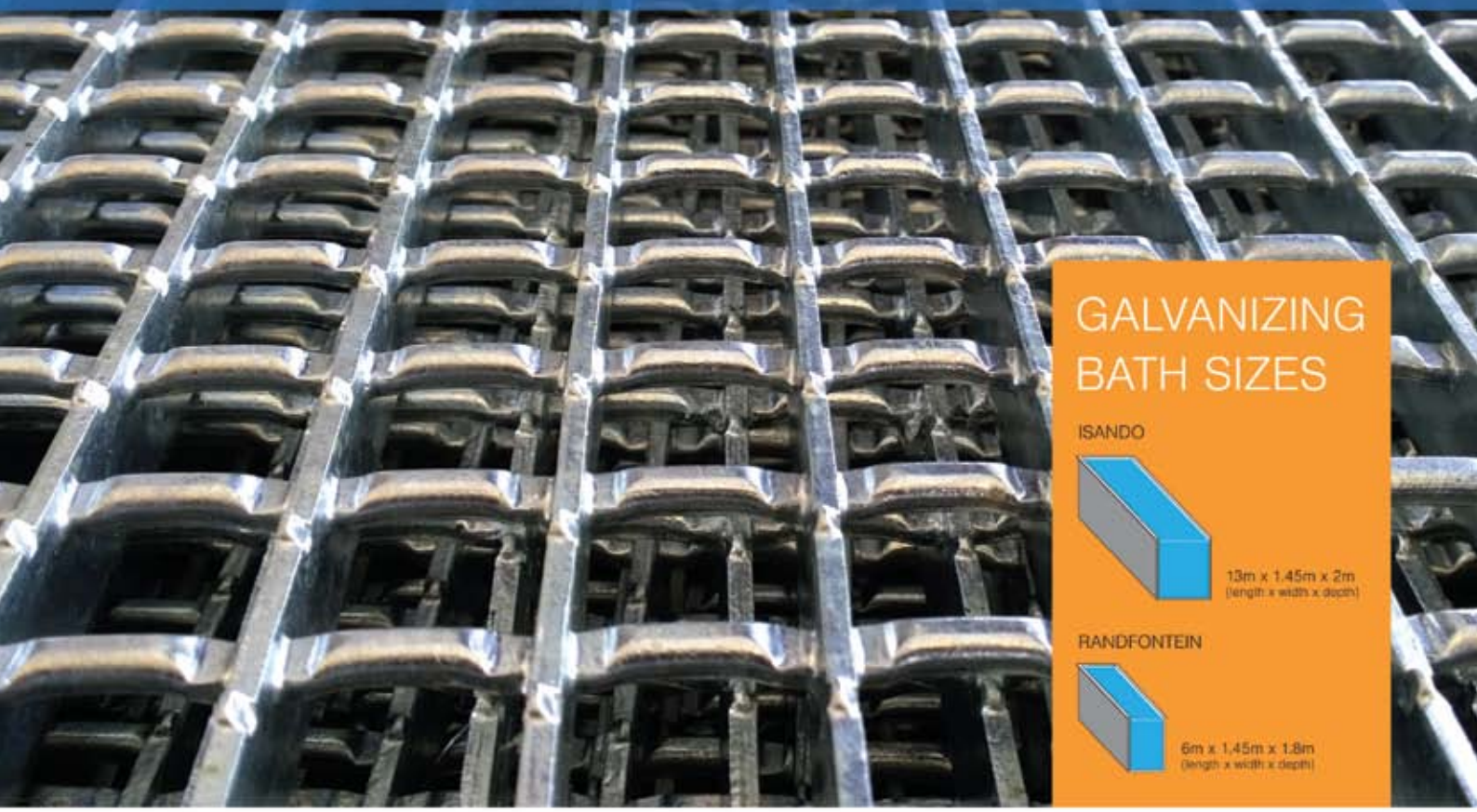
And you, my father, there on the sad height,
Curse, bless me now with your fierce tears, I pray.
Do not go gentle into that good night.
Rage, rage against the dying of the light.

Hot dip Galvanizing Members

GALVANIZER	LOCATION	TEL. NO	SPIN	NO. OF LINES	BATH SIZES (L x W x D) (m)
GAUTENG					
ArcelorMittal South Africa	Vanderbijlpark	016 889 9111		3	Sheet galvanizer
Armco Galvanizers	Isando	011 974 8511		1	13.2 x 1.5 x 2.2
Armco Galvanizers - Randfontein	Randfontein	011 693 5825		1	6.5 x 1.3 x 2.0
Babcock Ntuthuko Powerlines (Pty) Ltd	Nigel	011 739 8200		1	12.0 x 1.4 x 1.8
Galferro Galvanisers In-line and general	Springs	011 817 3667		4	13.5 x 1.65 x 2.5 6.8 x 0.9 x 1.4 6.5 x 0.9 x 1.5 6.45 x 0.755 x 0.9
Lianru Galvanisers cc	Nigel	011 814 8658		2	7.2 x 1.3 x 1.6 4.5 x 1.3 x 1.6
Monoweld Galvanizers	Germiston	011 876 2900		3	14.0 x 1.35 x 2.5 10.0 x 2.0 x 4.0
			Tube		Dia 42mm to 114mm max tube length 6.7m
Pro-Tech Galvanizers (Pty) Ltd	Nigel	011 814 4292	•	2	3.2 x 1.1 x 1.5 3.0 x 1.1 x 1.2
Silverton Engineering	Silverton	012 843 8000		1	7.0 x 1.7 x 2.0
SMT Galvanizers	Benoni South	011 421 1495	•	2	2.6 x 1.0 x 1.5 2.0 x 1.0 x 1.5
Transvaal Galvanisers In-line and general	Nigel	011 814 1113		4	15.5 x 2.0 x 3.2 – 1 of 12.5 x 1.2 x 1.8 – 1 of 8.0 x 1.2 x 1.5 – 2 of
WESTERN CAPE					
Advanced Galvanising (Pty) Ltd	Bellville	021 951 6242		1	14.0 x 1.4 x 3.0
Helderberg Galvanizing	Strand	021 845 4500		1	5.5 x 0.8 x 2.4
South Cape Galvanizing (Pty) Ltd (NB: big line is not in operation)	George Industria	044 884 0882		2	3.7 x 0.94 x 2.3 (5.5 x 1.0 x 2.6)
EASTERN CAPE					
Galvanising Techniques cc	Port Elizabeth	041 486 1432		1	12.0 x 1.3 x 2.3
Morhot (Pty) Ltd	East London	043 763 1143		1	7.0 x 2.5 x 1.5
KWAZULU/NATAL					
A&A Galvanisers	Pietermaritzburg	033 387 5783	•	1	3.8 x 0.9 x 1.8
Bay Galvanisers	Richards Bay	035 751 1942		1	5.0 x 1.2 x 2.5
Durban Galvanizing (Pty) Ltd	Briardene	031 563 7032		1	9.5 x 1.3 x 3.0
Phoenix Galvanizing (Pty) Ltd	Phoenix	031 500 1607	•	2	14.0 x 1.4 x 2.5 3.0 x 1.2 x 1.2
Pinetown Galvanizing	Pinetown	031 700 5599		1	9.0 x 1.2 x 3.0
Voigt & Willecke (Pty) Ltd	Durban	031 902 2248		1	14.0 x 1.3 x 2.5
INTERNATIONAL					
MAURITIUS					
Galvanising Co Ltd	Port Louis	+230 234 5118		1	7.0 x 0.75 x 1.68
ZIMBABWE					
Essar Tubes	Graniteside	+263772833477		1	10.0 x 1.1 x 1.0

- *Sheet, wire, pipe and other in-line galvanizing members dedicate their plants to the galvanizing of their own products. The bath sizes are inside dimensions and not maximum component size. Kindly take note of the expansion of the component when dipped into molten zinc or discuss with relevant galvanizer.*

HOT DIP GALVANIZING... THE **BEST PROTECTION!**



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Armco Galvanizers Isando has been operating since 1989. Geared up to accommodate heavy structural steel up and till 13m in length. Isando has an average output of plus minus 2000 tons per month. With an improved lay down area and increased loading capacity by addition of a tower crane we strive to give "A" class service to all our customers big or small.

Armco Galvanizers Randfontein is our second facility based in the Randfontein area. Randfontein has an average output of plus minus 800 tons per month and is geared up to handle light to medium structural steel up and till 6m in length.

The company has it's own SANS 121 2000 ISO 1461 accredited Hot Dip Galvanizing plants. And is listed under the SABS ISO 9001 scheme.

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