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TODAY⁸³ The Official Publication of the Hot Dip Galvanizers Association Southern Africa **C** did toh



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EXECUTIVE DIRECTOR'S Comment

It may be said that the hot dip galvanizing industry has, as a collective, been operating at significantly less than its optimal utilization factor for several years. Spare capacity has been available, and contraction has resulted, either through the shedding of shifts or the closure of plants.

Pre-dating this situation was that a baseline of steel tonnage to be hot dip galvanized has resulted from governmental infrastructure spend. In particular power generation and transmission as well as road and rail projects.

The relatively recent acceleration in the processing of independent power producer bids bodes well for potential improvements in electricity supply and for the attainment of stability of our power grid. Whilst an increase in generation capacity is welcomed, a plan to ensure the transmission of this power in a manner that effective distribution is achieved will be essential.

It was therefore most gratifying to have line of sight of the Transmission Development Plan earlier this year. This Eskom-developed document sets out the requirements for the grid development in the window from 2023 to 2032.

In essence, the plan integrates the existing capacity, but with recognition of present constraints in certain areas to the probable location of the additional 53 GW of new generation capacity to be added by circa 2032. The resultant of these deliberations is the need for approximately 14 200km of extra high voltage lines and the concomitant substations and transformer capacity.

Challenges are summarized within this document. These relate to budgets, rate of acquisitions of servitudes as well as matching rate of implementation of new generation being created to "tie-in" capacity. To add context to the challenge, the present annual average for transmission line erection is about 500km. Some years ago, a single peak of 1 200km was achieved.

The Hot Dip Galvanizing Association and its members wish to impress upon the government and particularly Eskom related to the matter under discussion, that South African capacity does exist to service its needs for the execution of the TDP and the corrosion control requirements. The principles of designation, aimed at the generation of local capacity and the creation of employment and employee development must be supported. As a caveat to this principle, effective planning and speedy conclusion of tendering processes will be vital. This allows for a high level of collaborative engagement with fabricators and their downstream support functions to ensure proper resource planning for effective execution.

HOT DIP GALVANIZING TODAY



GOLDEN JUBILEE

50 YEARS (1973 - 2023)



METSEP IS PROUD TO CELEBRATE ITS 50TH ANNIVERSARY

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As a thank you to all HDGASA members, Metsep has undertaken a sponsorship program of focused industry and education specific events to be held in Durban, Cape Town and Gauteng in 2024.

Metsep would like to thank all of our customers for their support over the years and look forward to many more years of mutual beneficiation to come.

Robert Watchorn, Managing Director



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EDITORIAL COMMENT in this issue

Marty Rubin, author of The Boiled Frog Syndrome said *"Time does not pass, it continues"* As we continue from 2023 into 2024 may the festive season see us celebrate our successes, learn from our errors and be safe and strong as we venture into the future.

In this issue:

- Intergalva 2024 will be in Belgium in June of 2024, the EGGA event will once again see global players sharing their wisdom, developments, and successes with the most eclectic delegates. As a member of the HDGASA, a discount is available from the EGGA at the time of booking.
- Metsep is 50 years old and as a stalwart of the galvanizing support industry once again shows how the support of a technology can uplift and ensure the effectiveness of an industry through its application.
- SAISC promotes the brand-for-hire concept which the association supports as a reciprocal member of the steel and steel construction industry. An unwavering champion for the use of steel in construction and committed to the growth of the Southern African Steel Industry.
- ABECO Tanks or should be say Water Banks are critical for the region which even with resources like the Lesotho Highlands Water Project (LHWP) require the infrastructure to keep the water flowing and ensuring supply in spite of aging infrastructure, climate change, growing demand and agricultural dependency.
- Distortion and warping are consistent themes when it comes to structural steel and hot dip galvanizing. This challenge is best understood technically as a cooperative coordinated effort between the fabricator and galvanizer. The devil is in the detail and the only way to rid this challenge is cooperative efforts.
- Training Ever upwards. Without trained and developed personnel no industry or industry related organizations can achieve effectiveness and head towards optimization. The war against ignorance cannot be won in retrospect. Training in hot dip galvanizing remains the only way to ensure effective use of the time-proven corrosion control technology that has served us for centuries.

May you all have a regenerative season of rest, and reflection and regain the energy you have used to make 2023 a successful year and 2024 a year of promise and improvement.







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INTERGALVA 2024 **Distance Struges**, Belgium

June 2024

INTERGALVA 2024 WILL BE HELD IN BRUGES, BELGIUM, 10-14 JUNE 2024 AND IS ORGANIZED BY EUROPEAN GENERAL GALVANIZERS ASSOCIATION IN CONJUNCTION WITH ZINK INFO BENELUX. ALTHOUGH NORMALLY A 3-YEAR CYCLE, WE ARE GETTING BACK ON TRACK AFTER THE COVID INTERRUPTIONS, SO IT'S JUST 2 YEARS AFTER INTERGALVA ROME.

> The conference is well-known as the meeting place for the world's galvanizing industry and will cover technical, commercial and environmental topics for the general (batch) hot dip galvanizing industry. The 2024 event will include an extensive exhibition of plant, equipment, materials and services for the industry – with suppliers from across the globe displaying and explaining their latest products, equipment and services.

For those that have not previously attended an Intergalva event, the format is for a 3-day conference programme on the latest industry developments, with simultaneous interpretation (including French/German/Italian/Spanish/English/ Turkish/Chinese/Japanese although exact languages are still to be confirmed). Other features include:

- Extensive exhibition of plant, equipment and other services
- Great networking opportunities
- Visits to galvanizing plants in the Belgium and the Netherlands
- Masterclasses or workshops on 'hot topics'
- Sightseeing tours

The history of Intergalva is worthwhile to explain. The first International Conference on Hot Dip Galvanizing was held at the Institution of Danish Civil Engineers in Copenhagen from 17 - 21 July 1950. That first conference was organised by the British Hot Dip Galvanizers Association, which at that time was affiliated to the Zinc Development Association. The 80 experts that gathered in Copenhagen debated many of the topics that still



1 Delegates to Intergalva 2022 Rome enjoyed their visits to galvanizing plants – similar visits will be available to plants in Belgium/Netherlands during Intergalva 2024.



feature in today's Intergalva conference sessions. Technical sessions included papers and discussions on the role of aluminium additions to the galvanizing bath, influences on dross formation, inhibition of white rust and methods of drossing. The session on 'The Future of General Galvanizing' and discussions on 'Rivals to Galvanizing' make fascinating reading over 70 years on and looking back on how the industry did flourish much as was predicted at the time!

Another notable feature of the first conference was the presence of Dr Heinz Bablik. Generally accepted as the 'father' of the industrialisation galvanizing process, Heinz Bablik combined being a lecturer in the Technical University of Vienna with managing the family galvanizing factory in Brunn (a plant that still operates today as part of the Zinkpower Group). This combination of

PAST INTERGALVA EVENTS - HOW MANY HAVE YOU ATTENDED?				
2024 Bruges	2003 Amsterdam	1982 London	1961 Interlaken	
2022 Rome	2000 Berlin	1979 Paris	1958 Benelux	
2018 Berlin	1997 Birmingham	1976 Madrid	1956 Milan	
2015 Liverpool	1994 Paris	1973 Stresa	1954 Oxford	
2012 Paris	1991 Barcelona	1970 Düsseldorf	1952 Düsseldorf	
2009 Madrid	1988 Rome	1967 London	1950 Copenhagen	
2006 Naples	1985 Munich	1964 Paris		

theory and practice resulted in his classic book on galvanizing first published in 1926. By 1950, it was in its third edition and also translated into English. He attended the 1950 event and delivered a keynote speech on 'The Relative Merits of Flux Galvanizing and Dry Galvanizing'. Of course, this is one debate that we will not be holding at today's Intergalva events.

A digital version of the full 160-page Proceedings of the first International Conference on Hot Dip Galvanizing is free to download at the 'Origins of Intergalva' page at www.intergalva.com , so you can read more of those first discussions and collaborations that gave birth to today's spirit of Intergalva.

By 1955, three international conferences had stimulated demand for a European Galvanizers federation but the sheet, wire and tube galvanizing industries were largely served through the steel industry and it was left to the general galvanizers to form their own association in November 1955. By ballot, Heinz Bablik was first choice for President and EGGA was born. EGGA took over the organisation of the conferences, which were then held in Milan (1956) and Belgium (1958). That started the pattern of conferences every 3 years with the host country nominating the EGGA President. From then on, the series of International Galvanizing Conferences (also known as Intergalva) has never looked back as the leading international forum for the industry.

I hope you find this historical perspective interesting and that we see you in Bruges in June 2024. We can provide full support for visa applications (but please start them early!) and advice on the best travel options will soon be available on the event web site. Bruges is located in Flanders region of, Belgium. The easiest way to reach Bruges is by flying to Brussels and taking the train which takes 80 minutes. It is then a short 10 minute walk to the city centre. The Intergalva venue, the BMCC is located in the heart of Bruges, within walking distance of hotels, tourist attractions and some world-famous museums. EGGA and Zink Info Benelux hope to welcome you there! More info: www.intergalva.com

KLEINGARN CURVE – Galvanizing process

When steel is pickled in a hydrochloric acid solution, the reaction produces soluble ferrous chloride (FeCl₂). Once the solution is completely saturated with hydrochloric acid and ferrous chlorides, green ferrous chloride crystals precipitate out of the solution and the pickling reaction can no longer take place. At this point, the acid is considered spent. Previously, the options for dealing with the spent acid included on-site neutralization, off-site disposal, decanting the acid



for further use, or some other off-site beneficial re-use.

Essentially, the Kleingarn Curve is the isotherm solubility curve between hydrochloric acid concentration and iron concentration in solution at 20°C (68°F). The chart depicts an optimum pickling line showing the optimum iron concentration for each hydrochloric acid concentration. It also shows the saturation concentrations where pickling is no longer possible. The information in the Kleingarn Curve now allows galvanizers to control their acid solution with the addition of either water or acid to reduce the iron concentration.

The Kleingarn Curve, *Figure* 1, shows the optimum iron concentration for every hydrochloric acid concentration for steel pickling. Ideally, the two concentrations would intersect on the red line which would produce optimum pickling times. The further the point is away from the red line, the longer the pickling time will be. Pickling cannot take place if the point is above the blue saturation line. If the point is below the green line, pickling may still take place, but at a greatly reduced rate.

Conversions

The Kleingarn Curves concentrations are reported in units of grams per liter. However, most galvanizers in North America generally report their hydrochloric acid and iron concentrations in percentage by weight. In order to convert percentages by weight of hydrochloric acid and iron to grams per litre, the following steps should be taken:

- 1. Use the chart in *Table 1* to convert HCl percentage to grams/litre.
- 2. Using the nomogram in *Figure 2*, draw a line from the acid concentration on the right, to the solution's



TABLE 1		
%HCI	g/L	
2	20.2	
4	40.7	
6	61.7	
8	83.0	
10	104.7	
12	126.9	
14	149.5	
16	172.4	
18	195.8	
20	219.6	
22	243.8	
24	268.5	
26	293.5	
28	31.0	
30	344.8	

Figure 1 The Kleingarn Curve.

Figure 2	2 Nomogram
for HCI	g/l.

TABLE 2				
	Volume m ³	%HCI	% Fe g/L	
Spent Acid	33	4	13.2	
Fresh Acid	12	32	0	
Regenerated Acid	45	13.1	8.9	

TABLE 3				
	Volume m ³	% HCI	% Fe g/L	
Spent Acid	33	4	13.2	
Water	12	0	0	
Regenerated Acid	45	2.8	9.3	

specific gravity on the left. The iron concentration will be given by the point where the line crosses the middle axis.

Example

In his paper, Kleingarn pointed out some curious consequences of the solubility



curve that may produce different results than expected when regenerating spent acid. For example, let us assume we have a tank (33 cubic meters) of spent acid with a composition: of 4% HCl, 13.2% Fe, and a specific gravity of 1.37 at 20C (68F). One might assume any addition of fresh acid would regenerate the solution and allow more rapid pickling. However, if 12 cubic meters of fresh 32% HCl was added to regenerate the acid, the approximate solution would be presented in *Table 2*.

If these values are plotted on the Kleingarn Curve, we see that the solution would have become saturated and no pickling could take place. So, the addition of fresh acid, in this case, has made the pickling solution useless. If on the other hand, only fresh-water (pH 7) were added to the solution, the composition would be presented in *Table 3*. With this composition, the pickling solution would become usable, albeit with less than optimum pickling times.

SAISC 'BRAND FOR HIRE' CONCEPT raises members' profiles and ensures sustainability





1 SAISC Chief Executive Officer.

2 SAISC Marketing and Management Consultant.

An innovative Southern African Institute of Steel Construction (SAISC) initiative will give member companies and other industry professionals the opportunity to directly benefit from its substantial brand credibility, boosting their profiles across South Africa and the rest of Africa.

The SAISC is facilitating a dynamic and ongoing programme of events, networking platforms, digital training sessions and more as part of its new 'brand for hire' marketing and revenuegeneration model. In terms of this new model, the Institute's members – from across the entire steel value chain are invited to co-sponsor initiatives, conference visits, and events. Sharing the brand space will allow these members to leverage the SAISC's brand equity and credibility accordingly.

The initiative will also unlock new sources of revenue for the Institute, which until now has relied largely on membership fees for its income.

A custodian marketing the steel value chain

Commenting on the new initiative, the SAISC's Chief Executive Officer Amanuel Gebremeskel says that the revenue derived from this new marketing model will ensure sustainability, while helping the Institute to expand on its traditional role as a custodian of quality and the industry's marketing arm.

"This is vital to the continued wellbeing of the entire steel value chain," Gebremeskel says.

"We would like to give a lot more opportunity to member companies to be associated with us in the eyes of the market. The advantage we have as the Institute is that we have an excellent brand. People look at us and they see technical excellence, knowledge, methodology regarding how to design and build in steel in the best manner. They also know that the SAISC brand is one inherently associated with quality and safety – which we promote strongly," he explains.

Although the Steel Awards will remain the flagship in the SAISC's marketing calendar – the premier showpiece celebrating the industry – the Institute is also keenly and proactive exploring other avenues through which to assist members to access new markets.

Developing quality standards for Africa

Members hoping to export to the rest of Africa as regional trade treaties – such as the African Continental Free Trade Area (AfCFTA) agreement – come into force, spurring infrastructure development, will improve their prospects greatly if they help to shape industry standards which will be applied across the continent.

Gebremeskel says that the SAISC – as the only Institute of its kind in Africa and indeed one of only 6 worldwide – is the only body in the region which can facilitat this standardisation process. As such, he would like to see member companies – or groups of companies – associating with and sponsoring the Institute's efforts.

"Our work will target specific markets and products and include foreign visits to help draft common specifications and codes – aimed at achieving steel construction standards harmonisation – and to assist with education and training at African universities," he says.

He points out that this is likely to be a boon for SAISC members' businesses in the future, but the groundwork is not something individual members can achieve alone. Gebremeskel believes the South African steel industry has a lot to offer the continent, particularly when it comes to developing product and quality standards for the steel sector.

"We have been working on and with product and quality standards for decades – so it would be a pity for us not to engage in the latest pan-African standards developments; as well as the market developments that are unfolding on the continent," he says.

Synergistic education, digitisation and promotion

Touching on the SAIC's commitment to education and digitisation, Gebremeskel envisions the Institute as supporting more self-directed learning, enabling geographic reach to profile what he terms the "essential excellence" of the local steel industry.

Here, he sees opportunities for member companies to provide sponsorship and associate themselves with training and standards development, while synergistically benefitting from the Institute's 'brand for hire' concept.

Gebremeskel hopes to see more steel companies "benefiting from the SAISC brand". He says this can include "something as simple as travelling with us to other countries".

"We are known in the United States, but a South African fabricator or supplier might not be known," says Gebremeskel, mentioning the American Institute of Steel Construction's conference which he attended with a delegation of local fabricators in April 2023.

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THERMAL SPRAY DIVISION Telephone: +27 (11) 824-6010/2/3/4/5 Fax: +27 (11) 824-6090 Email: sales@weartech.co.za Website: www.weartech.co.za The conference, in North Carolina, is one of the largest events of its kind in the world, bringing together thousands of delegates to share research, unveil new products and equipment, network – and ultimately, seek that next big deal.

Gebremeskel says the conference was the first major event SAISC has attended recently, marking a real return to international steel conferencing, networking and marketing efforts since the Covid-19 pandemic.

Industry's business development 'calling card'

He stresses that it is vital for members to provide sponsorship so the Institute can attend these events and for members – representatives of companies, or groups – to accompany the SAISC. To this end



 while sending delegates abroad is expensive – the business development potential for the industry is vast, Gebremeskel explains.

"For example, if a South African fabricator manages to win a 3000 ton job, even if they spent R1 million to go and do this, it makes sense. It's still very affordable when compared with the potential return-oninvestment in the form of excellent new business," he says.

While it is true that conference visits do not always bring immediate benefits, Gebremeskel likens their value to the metaphorical stone cast into water: it causes ripples, the results of which can be far-reaching.

He says the by facilitating attendance at global steel events, the Institute is providing members with a 'calling card' that allows them to cast those stones into the proverbial 'pool' of business development opportunities. In this way, members attending can benefit from reputational endorsement and direct access to players working on large multinational steel projects.

Selective sponsorship

Gebremeskel says the SAISC will be selective about sponsors for the various 'brand for hire' revenue generating initiatives it has planned, aiming to team up with member companies which do quality work, strive for technical excellence and which are legally compliant. More than this, he says SAISC seeks partners which share its vision.

"We would like our brand to be hired by companies aligned with our ethos, and our goals to support quality and professionalism in the steel value supply chain. And we would like companies and groups that share our vision to invest their resources and their support because they wish to be part of ensuring there is a vibrant, sustainable and strong SAISC – empowered to serve the interests of the entire steel value chain – going forward," he says.



GALVANIZE your STUDIES

The Hot Dip Galvanizers Association Southern Africa (HDGASA) will be visiting campuses across South Africa to interact with future mining engineers, mechanical engineers, and civil engineers as well as metallurgists about hot dip galvanized steel in 2024.

Through the **Galvanize Your Varsity** events, students will learn about the hot dip galvanizing process, design, sustainability, performance, standards and specifications, and inspection. The program is starting out in 2024 with on-campus presentations and engagements by the HDGASA at events where students can comfortably interact with our specialist advisors.

Educating specifiers and designers of the future is paramount to the HDGASA's mission. **The Hot Dip Galvanizers Association Southern Africa** (HDGASA) is a non-profit trade organization committed to educating current and future engineers, owners, developers, fabricators, and specifiers about hot dip galvanizing for corrosion control.

The HDGASA is dedicated not only to educating current specifiers of the galvanizing industry but also future members. One of the biggest market limitations to the specification of hot dip galvanized steel is ignorance. The majority of architecture and engineering students are only exposed to the fundamentals of galvanized steel while studying at varsity. However, in the real-world hot dip galvanizing is extensively used to combat corrosion of iron and steel.

KEEP your eyes PEELED for the 'GALVANIZE YOUR VARSITY' EVENT 2024!

HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

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ABECO TANKS: Pioneering water security solutions in Lesotho

Lesotho, known as the "Kingdom in the Sky" due to its mountainous terrain, faces a pressing crisis related to water security and aging infrastructure. This landlocked nation's economy, agriculture, industries, and services sector heavily depend on a reliable water supply. However, infrastructure challenges have threatened this crucial resource. Abeco Tanks, a renowned provider of water storage solutions, is playing a pivotal role in addressing Lesotho's water crisis and ensuring a sustainable future for the nation.

Lesotho has struggled to maintain a consistent water supply due to various factors, including:

Aging Infrastructure: Much of Lesotho's water infrastructure is old and deteriorating, leading to water losses, inefficiency, and interruptions in supply.

Climate Change: The country is vulnerable to climate change, with shifting weather patterns affecting water availability. **Growing Demand:** Increasing population and economic activities place greater stress on the existing water infrastructure.

Agriculture Dependence: Agriculture, which accounts for a significant portion of Lesotho's economy, requires abundant water resources for irrigation and livestock.

In response to these challenges, Lesotho has undertaken major water infrastructure developments. Notable projects include the Lesotho Highlands Water Project (LHWP) and the Metolong Dam Project. While these initiatives have aimed to improve water supply, there is still room for additional solutions, such as water tanks.

The role of water tanks

Water storage tanks play a vital role in complementing Lesotho's water infrastructure. Here's why they are beneficial:

Firstly, water tanks provide a buffer against supply interruptions, ensuring a consistent water supply during peak demand and emergencies.

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To find out why we're the leaders in water storage solutions, **visit** www.abecotanks.co.za



Secondly, in a country with ample rainfall, harvesting rainwater through tanks offers a sustainable water source, reducing reliance on strained river systems.

Thirdly, Water tanks support the agricultural sector by enabling efficient irrigation, safeguarding crops, and ensuring food security.

And finally, Lesotho's industries and services sector, key contributors to the economy, benefit from tanks by ensuring uninterrupted operations and reducing water-related costs.

Why Abeco Tanks is the right partner

Abeco Tanks stands out as the ideal partner for Lesotho in addressing its water security and infrastructure challenges. The company has a rich history of providing innovative water storage solutions across Africa, bringing valuable experience and expertise to Lesotho's projects.

Abeco Tanks customises its solutions to meet the specific needs of Lesotho's water storage needs, ensuring maximum efficiency.

Their products are known for their durability and quality, delivering long-term value to Lesotho's investments.

With a focus on sustainability, Abeco Tanks promotes responsible water management and environmental conservation.

Abeco Tanks maintains a local presence in Southern Africa, offering rapid support, maintenance, and local knowledge.

THE ASSOCIATION WOULD LIKE TO ACKNOWLEDGE THE ADVERTISERS AND THANK THEM FOR THEIR SUPPORT

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Abeco Tanks' diverse product range ensures that they can serve a wide spectrum of industries and sectors, including agriculture, municipal water supply, industrial processes, and more. Their ability to provide tanks in various sizes and types underscores their commitment to offering effective and efficient solutions for water storage and liquid containment needs.

Bolted steel tanks made by Abeco come in sizes ranging from small capacities to large industrial tanks with capacities exceeding millions of litres. They are versatile and durable, suitable for various applications, including water storage and fire protection.

Fire water tanks are specifically designed to store water for fire suppression systems. They come in various sizes to accommodate the water requirements of different facilities, ensuring safety and compliance with fire safety regulations.

Abeco Tanks also offers tanks suitable for agricultural applications, including irrigation, livestock watering, and crop protection. These tanks come in various sizes to meet the needs of farms and agricultural operations.

In addition, the company can provide custom water tanks for sale tailored to the specific requirements of their customers. These tanks can vary in size, shape, and materials to accommodate unique applications and site constraints.

Lesotho's water security and infrastructure challenges are significant, but they are not insurmountable. Major water infrastructure projects have paved the way for improvements, but integrating water tanks into the solution can further enhance the nation's resilience.

Abeco Tanks, with its experience, expertise, and commitment to sustainability, is well-positioned to be Lesotho's partner in safeguarding its precious water resources. By embracing Abeco Tanks' solutions, Lesotho can ensure a reliable water supply for agriculture, industry, and services, thereby bolstering its economy and securing a better future for its people.



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DISTORTION AND WARPING during galvanizing

Distortion and warping may arise from the relief of locked-in stresses within a steel section or fabrication. At room temperature, the steel is sufficiently strong to accommodate such stresses, but at the galvanizing bath temperature, 430°C to 450°C, the steel's yield strength may be reduced by up to 40% (note the steel recovers its full strength when it cools to ambient temperature). If the internal stresses, then exceed the steel's yield strength they will not be accommodated and the steel may distort due to plastic deformation taking place (see Figure 1). The occurrence of distortion is dependent upon the level and distribution of internal stresses and in some cases, stresses may balance out such that distortion does not occur

Stresses may be present for a variety of reasons and these include:

- The process by which a steel section is manufactured will affect the level of internal stresses
- Fabrication can lead to the introduction



of stress due to the welding process

- Variable steel section thickness may result in thermal stresses during the dipping process
- Poor design can also contribute towards distortion by creating unbalanced stresses or leading to increased thermal stresses during the dipping process

Remedies

Given that the potential causes of distortion can be identified, it is possible to take precautions which should significantly reduce the potential for distortion including:

- Use of hot rolled sections rather than cold rolled or cold formed sections where possible as these sections will have inherently lower internal stresses
- Prior to welding, a fabrication should not be jigged excessively tightly as this may lead to increased internal stresses
- The amount and size of welds should be kept to a minimum so as to minimise heat input and potential stresses
- Fabrication should be conducted using a balanced welding procedure so as to balance out stresses which might otherwise contribute towards distortion
- Maintain as uniform a steel section thickness as is practically possible so as to avoid the introduction of thermal stresses and issues with differential thermal expansion and contraction during the cycle of the galvanizing process. Ideally section thicknesses should not vary by a ratio of more than 2.5:1
- Try to ensure that the article has as symmetrical a design as is practically possible. Asymmetric designs are more likely to result in unbalanced stresses which may result in distortion

- Ensure that consideration is given to good design for galvanizing. For example, provision of well-positioned vent holes of the correct size will enable the galvanizer to immerse work as rapidly as is practically possible so minimising the introduction of potential thermal stresses
- Where there is particular concern about distortion of large articles, consideration might be given to ensuring that it is single dipped. Double dipping while perfectly acceptable will introduce some level of thermal stresses which might contribute towards potential distortion
- Where an article can not be single dipped due to its size consider splicing the structure so that it can be dipped as two separate parts, each being single dipped. The pieces may then be joined by bolting or welding after galvanizing.



• Where possible, consideration might be given to stress relieving an article prior to hot dip galvanizing.

Other product - specific guidance

Where thin sheet or mesh is welded into a frame it is very likely that it will distort by buckling or bowing during the galvanizing process. The potential for distortion is significantly reduced by galvanizing the frame separate to the sheet or mesh and then joining after galvanizing. Thin sheet has a relatively low rigidity and may also contain high internal stresses due to having been cold rolled. Increased rigidity might be achieved by folding over the edges of the sheet so reducing the potential for distortion. Alternatively, temporary bracing may in some instances also help avoid distortion.

Conclusions

There is always some potential for an article to distort during the hot dip galvanizing process. However, by taking suitable precautions it is normally possible to prevent distortion from occurring in the vast majority of cases.



https://docs.google.com/forms/d/1e9ZGDsMC 1Sd8aXuCvys2bstXr5SrpVBxuqEQPK9IfUM /viewform?c=0&w=1

TRAINING – Ever upwards

Advanced course on hot dip galvanizing

The Level II course on hot dip galvanizing (HDG) was presented to delegates, from the Northern Cape to KZN and Gauteng, in the first half of the financial year 23-24. The three-day courses focussed on zinc and how it protects, the corrosive environments (ISO 9223 / ISO 12944), the HDG process, Duplex Systems, HDG rebar and inspection, standards, methodology, and certification of HDG articles.

The internationally acclaimed course allows for maximum interaction with the delegates and ensures a high level of knowledge transfer. A plant tour ends the course with the delegates being engaged in the workings and procedures of a modern HDG plant.

Introductory course on hot dip galvanizing

The Level I course was attended by a large number of delegates over the first half of FY 23-24. The one-day course is a workshop that engages delegates in the theories most relevant to understanding hot dip galvanizing as a corrosion control technology on a fundamental level. The one-day course empowers the delegate through close interaction and examples of the theory to provide a sense of how hotdip galvanizing is achieved in its corrosion control mechanism and a brief insight into the specifications and standards thereto.

Direct engagement workshops

The ESKOM TRMSCAAC 6 training program to engage with the wide range of ESKOM personnel and their contractors participated in each of the two quarters in FY 23-24. Between 40 and 70 delegates were given fundamental yet pertinent training on hot dip galvanizing, its standard in South Africa, and the methodologies for field evaluation and acceptance.

The HDGASA continues to foster and develop effective networking throughout infrastructural-reliant organizations to ensure that hot dip galvanizing is understood and implemented rationally and in line with international best practices.



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

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 INCLUDES ELECTRONIC 'HDGASA INSPECTOR TOOLKIT' 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.

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