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HOT DIP GALVANIZING TODAY 86

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CORROSION CONTROL OF STEEL

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THE ASSOCIATION IS AN INFORMATION CENTRE ESTABLISHED FOR THE BENEFIT OF SPECIFIERS, CONSULTANTS, END USERS AND ITS MEMBERS.

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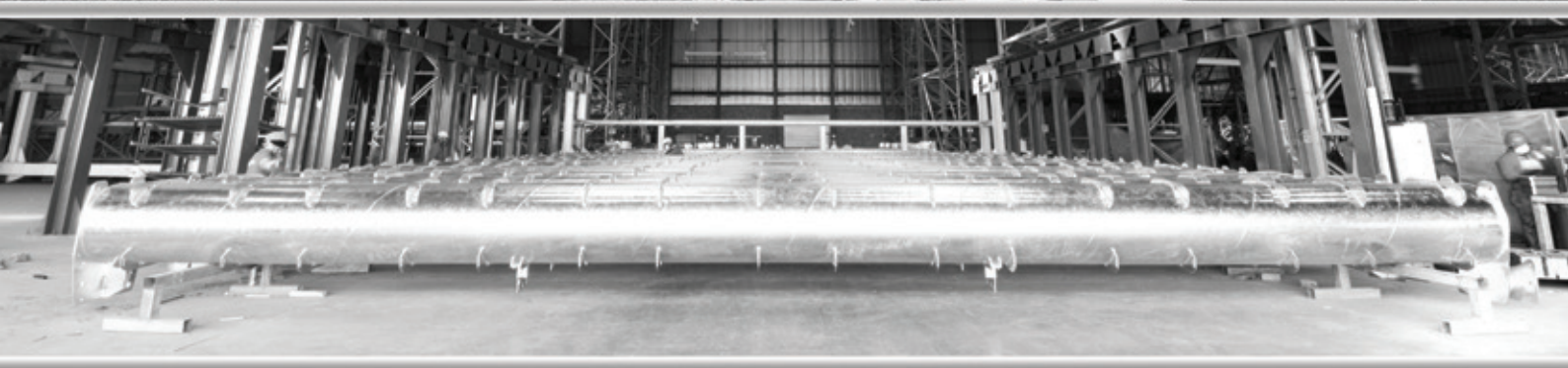
PUBLISHED BY:
Hot Dip Galvanizers Association Southern Africa
Bedfordview Office Park, Building 1, Ground Floor, 3 Riley Road, Germiston
P.O. Box 2212 Edenvale 1610 Tel: 010 746 8927 Email: hdgasa@icon.co.za Website: www.hdgasa.org.za

Executive Director: Robin Clarke Cell: 082 902 5119 Email: robin@hdgasa.org.za

Publication Liaison: Anthony Botha Cell: 082 326 6080 Email: anthony@hdgasa.org.za

Design and Layout: Sandra Addinall Tel: 083 601 7209 Email: cbtdesign@adcot.co.za



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EXECUTIVE DIRECTOR'S Comment

Telling it as it is has been a cornerstone of the Hot Dip Galvanizers Association operating policy. Whether advising on corrosion control options, critiquing a hot dip galvanized article at the galvanizer or dealing with a customer complaint, straight talk enhances our credibility as representatives of the technology.

The above has become more important lately when the Association has been retrospectively engaged in the assessment of materials and coatings inappropriately specified for certain applications.

When contemplating the use of various corrosion control options, a variable that is critical for defining the most appropriate solution is the operating environment. Where and how will the coated item be used? The principles for determination of service life of coated articles are the same whether the articles being assessed are heavy section steel, light section steel, roofing and cladding sheets or fasteners.

Broad-based data exists for the predicted behaviour of zinc-based coatings in various environments such as air, soil and water and even man-made such as encased in cement. For large projects in which overlaps occur, say many posts driven into soil and/or partially encased in a concrete foundation, over a large area, it is often recommended that a full, site-specific environmental analysis is done. This will entail an assessment of the atmospheric conditions – proximity to the ocean and presence of chlorides, time of wetness as well as influence of pollutants from industrial activities are all to be considered. Either empirical or sampled data may then be used to estimate the corrosivity category and from this the probable rate of zinc consumption and hence service life. Similarly, the pH, electrical conductivity and drainage characteristics of soil will tell us about rate of consumption of zinc and service life.

The Association uses these tools to make scientific assessments for recommendations of material selection and specification of standards for coatings that will achieve the desired service life of steelworks on a project-for-project basis. Early engagement at the project design phase is essential, to ensure investor expectations are met.

Hot dip galvanizing of steel is a price competitive and robust solution for extending the service life of the steel in almost all applications. From time to time when faced with extremely corrosive conditions, duplex systems – that is hot dip galvanized steel with the application of an additional paint system – may be required.

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EDITORIAL COMMENT:
Going forward

"There is no excellence without labour. One cannot dream oneself into either usefulness or happiness." ***Liberty Hyde Bailey***

Labour and usefulness are the pillars atop which we build excellence.

- Training drives the pursuit and achievement of an organization's journey in excellence. By training we pass on the skills, encourage and motivate and ensure that all strive for excellence as empowered members of the galvanizing industry and the greater steel sector in South Africa.
- A focused evaluation on bolted connections, provides our reader with a clearer view of the nature of this key technical aspect of structural integrity and how hot dip galvanizing can be used to ensure longevity of this link in the service lifespan of fabricated articles.
- A case study of the use of specialized markers to avoid uncoated areas on marked steel in fabrication had some positive insights into the approach of design for purpose, proven in local galvanizing facilities.
- Steel, quality and training must be maintained. The SAISC puts forward a strong argument for maintaining high standards and training to keep the South African economy healthy for longer.
- Renewable energy and the need to ensure quality is highlighted in a press release that was made available to media across all sectors where understanding the requirements of site and corrosion control are the high stakes of this form of energy. Ensuring long service life of the structural systems is critical for this sector.

This is our first fully digital magazine and we will continue to improve your access and beneficiation from the publication. Please feel free to send any correspondence to *Admin@hdgtoday.com* for our attention.

CONGRATULATIONS Viva Engineering

The HDGASA congratulates VIVA ENGINEERING on its superb achievement for SAISC 2024 Awards. Viva Engineering were honoured with three prestigious awards: *Best Mining Project, Best Export Project and Best Overall Project.*

"These accolades reflect Viva's commitment to excellence, innovation, and leadership in the steel fabrication industry. Winning the Best Overall Project fills us with immense pride, as it represents the pinnacle of recognition in our field." said Viva's MD Collen Gibbs

The award-winning project, 'The Copper Mine Expansion in Chile', showcased Viva's technical expertise and dedication to safety. "Operating in one of the world's most seismically active regions, we navigated stringent building codes and testing standards essential for critical infrastructure. To ensure the resilience of the feeders against seismic activity, Viva meticulously tested all materials, sampling and airfreighting them to accredited laboratories in Chile."

Collen Gibbs accepted the accolades stating "We take immense pride in delivering innovative solutions, competitive pricing, top-tier craftsmanship, and efficient project turnaround times. Our success demonstrates our ability to drive excellence and innovation within the South African steel industry, proving that we can not only meet – but exceed the demands of international projects."

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BENEFITS OF HOT DIP GALVANIZING
in the lifting industry

Corrosion resistance: HDG provides effective corrosion control, which is crucial for lifting equipment exposed to environments, including exterior atmospheric and marine conditions.

Durability: The zinc coating applied through HDG is a diffusion coating which is metallurgically bonded to the steel, offering proven ongoing protection that can extend the life of lifting equipment.

Maintenance reduction: Galvanized coatings require less frequent maintenance compared to steel coated with purely barrier-type coatings. HDG coatings reduce long-term maintenance costs and downtime through their ability to provide both barrier and cathodic protection to steel.

Cost-effectiveness: At times it may arise that the initial cost of galvanizing may require a higher initial investment, the extended service life and reduced maintenance make it the best lifetime-cost choice over the service life of the article.

Enhanced safety: Corrosion can compromise the structural integrity of lifting equipment. By controlling corrosion, HDG maintains the strength and reliability of the equipment, thereby contributing to safer operations.

Environmental resistance: HDG can withstand various environmental factors, including exposure to, atmospheric conditions as well as soil and water environments making it suitable for a wide range of lifting applications.

Applications of hot dip galvanizing in the lifting industry

Crane components: Galvanizing crane parts such as beams, columns, and other structural elements to ensure they withstand the elements and to maintain

the design strength of the components over an extended service life.

Hoists and winches: Protecting hoist and winch components from corrosion, especially when used in outdoor or harsh environments lowers maintenance costs and allows for greater availability over the service life of the articles.

Lifting slings and hooks: Enhancing the durability of lifting slings, hooks, and other accessories that are frequently exposed to moisture and wear.

Support structures: Galvanizing support structures, such as towers and poles, that are integral to lifting systems.

Safety barriers and rails: Coating safety barriers and railings are used in conjunction with lifting equipment to ensure their longevity and effectiveness.

Considerations for using hot dip galvanizing

Preparation of articles: Proper surface preparation is essential for effective galvanizing. The metal must be clean and free of contaminants before coating. Comprehensive standards are available to guide the fabricator and manufacturer as well as the designer in components and materials to be hot dip galvanized such as ISO 14712 parts 1 and 2

Size and shape limitations: Potential limitations regarding the size and shape of components to be immersed in the galvanizing bath are best dealt with at the design phase in conjunction with the galvanizer.

Heat sensitivity: Hot dip galvanizing occurs at a temperature of around 450°C. Iron and steel will not be affected by this temperature range as the transformation of the metal and thus changes to its properties will only occur at temperatures above 700°C. However, careful consideration is required for materials that may be subject to stresses which may be relieved at the galvanizing temperature end may result in potential to distort or warp the material unless dealt with appropriately, affected by the galvanizing process.

Aesthetic considerations: The finish of hot dip galvanized steel may not always be as smooth or uniform as other coatings, which may be a consideration for applications where appearance is important. However, the limits of the aesthetics may be enhanced by a system known as Duplex coating for aesthetic and/or legal reasons, such as orange and white stripping of high tower equipment to conform to aviation regulations. Aesthetics for architectural, identifying coloured or camouflage appearances and extended service life may also employ Duplex systems.

Overall, hot dip galvanizing is historically and industrially widely used as the most effective method for protecting steel components, in the lifting industry, ensuring their durability, safety, and performance in challenging environments.

AVOIDING MICROBIOLOGICALLY induced corrosion (MIC)

IN RECENT YEARS, MOST SECTORS HAVE ACKNOWLEDGED MICROBIOLOGICALLY INDUCED CORROSION (MIC) AS A SEVERE CONCERN. ALMOST ALL METALS AND ALLOYS ARE IMPACTED BY THE PROCESS, WHICH OCCURS IN MOST AQUATIC SYSTEMS. THIS BEHAVIOUR IS ALSO OBSERVED IN POTABLE WATER SYSTEMS. MIC REFERS TO CORROSION INDUCED BY A RANGE OF MICROORGANISMS; HOWEVER, WE WILL FOCUS OUR ARTICLE ON BACTERIA.

Water quality can alter as a result of drinking water being distributed over a convoluted network of pipes, reservoirs, and consumer installations. Additionally, systems that provide drinkable water contain a variety of bacteria and other microbes. Despite disinfection, the proliferation of bacteria in potable water distribution networks has been extensively documented. Numerous bacteria contribute to the creation of biofilm, which can corrode building materials and have an impact on the distribution system's water quality. When flowing water comes into contact with a solid item, like the surface of a pipe, it will go through many chemical and biological changes that will eventually lead to the growth and formation of a biofilm.

The initial colonization of surfaces is predominantly carried out by bacteria that generate slime. Following the establishment of these slime-producing bacteria on the pipe surface, additional organisms may become ensnared within this substrate, resulting in the development of a complex biofilm composed of diverse bacterial species, inorganic surface films, and corrosion byproducts.

Once this biofilm is established, sulphate-reducing bacteria (SRB) inhabit the interface between the biofilm and the metal surface, as this area is anaerobic

and conducive to their preference for low-oxygen environments. SRBs are the microorganisms most frequently linked to microbiologically influenced corrosion (MIC) in industrial settings. They adhere to the steel surface, making it crucial to obtain scrapings directly from the metal when attempting to determine their presence. Relying solely on water sampling will typically yield few or no SRBs, despite their potential to cause significant corrosion issues.

SRB induces corrosion through the development of tubercles, which lead to pitting corrosion of the underlying steel substrate. These tubercles typically exhibit a brownish hue, and upon rupture, reveal a soft black core. Underneath this soft black layer, the metal surface presents a grey and shiny appearance, indicating

ongoing corrosion characterized by the presence of pits.

Numerous studies supported by the Water Research Commission have been conducted by the CSIR to investigate this specific type of corrosion in drinking water systems within Gauteng Province. The principal findings are summarized as follows:

- Despite the application of chlorination, biofilm formation was observed on all alloys across all locations.
- Tubercle development and colonization by sulfate-reducing bacteria (SRB) were primarily noted on carbon steel coupons at every site.
- Carbon steel coupons experienced SRB colonization within three months of exposure.
- Pitting corrosion beneath the tubercles was detected within three to six months following SRB colonization.
- The carbon steel coupons located at the Pretoria site were the first to be colonized by SRB.
- While chlorination can delay SRB colonization, it does not completely prevent it.
- The galvanized coupons maintained their protection due to the zinc coating, with no substrate penetration observed after 20 months at any location.

SRB can induce corrosion in metallic piping within potable water systems, even in the presence of chlorination. Their existence is frequently disregarded when assessing the aggressiveness of potable waters through various corrosion indices, which may occasionally result in misleading conclusions.

While SRB can corrode a wide range of metals and alloys, unlined carbon steel in potable water is particularly vulnerable to this form of corrosion. For instance, in sprinkler systems, corrosion of the unlined small-bore piping is typically not anticipated due to the minimal oxygen levels present. However, if SRB contamination occurs, the conditions become favourable for their proliferation, which is a primary factor contributing to corrosion and leaks in sprinkler systems. SRB can lead to corrosion issues in hot, cold, and low-temperature water systems.

It is crucial to prevent the introduction of SRBs into any new water system, as their establishment makes removal nearly impossible. The following guidelines should be observed:

- Utilize only potable water that has been adequately chlorinated for hydro-testing.
- Refrain from using stagnant water or water sourced from dams, ponds, etc.
- After repairing leaks, ensure that all water is flushed out of the system.
- If feasible, flush the system with an inert gas.

HOT DIP GALVANIZERS ASSOCIATION
shines new light on renewable energy

The Hot Dip Galvanizers Association of Southern Africa (HDGASA) plays an important role in supporting the energy value chain – which spans clean, renewable and green energy – as it powers towards key sustainability targets, according to Executive Director, Robin Clarke.

After a nine year 'teething period', during which key energy sector stakeholders and local galvanizers found common ground, he says hot dip galvanizing is now the preferred corrosion control mechanism for this sector, enabling substantial return on investment for energy infrastructure projects and the industry as a whole.

"As an Association, we support the move to renewable energy. We are pleased that the sector has embraced hot dip galvanizing. What we do prolongs the life of the most essential element – steel," Clarke points out.

Part of the transition

According to the International Trade Administration, 85% – or 42 000MW – of South Africa's electricity is generated via coal-fired power stations. Coal will continue to provide most of the country's power for the next decade, although the share from renewables is expected to develop faster than the market.

Clarke says that the HDGASA has always fostered a close, constructive relationship with Eskom: "As an association, we have advised the parastatal regarding corrosion control of transmission lines and distribution equipment – and the relevant standards – over the past several decades. We expect this to continue with the 14 000 kilometres of transmission lines due to be provided under Eskom's strategic development programme."

The solar learning curve

This started with a rush to complete photovoltaic installations built according to generic European specifications in the Northern Cape.

Solar installations grew on the back of load shedding: "They were scattered across the length and the breadth of the country. We ran into headwinds related to corrosive environments that had not been factored into the original generic designs intended for the Northern Cape," Clarke explains.

It has taken time for stakeholders to replace generic specifications with site-

and location-specific alternatives. This means pre-approving a quality plan before accepting a design, to ensure that the corrosion control needed for each installation is correctly specified to meet the service life requirements. For example, a solar installation on the West Coast requires a different thought process and specification to an identical facility in Kakamas in the Northern Cape.

"We began working very hard as an Association to interface with key players to ensure that this was done – and that a thorough environmental assessment was completed to ensure that the specifications for corrosion control and the selection of the materials were correct," Clarke advises.

Although this initially applied to large solar farms, it soon extended to far smaller installations on the roofs of commercial buildings such as shopping malls.

"We have been advising commercial property groups to not only correctly determine the corrosion control specifications for individual solar installations, but also to assess the baseline corrosion condition of the roof and the roof sheeting – on top of which PV panel installations will be installed. These roofs are predominantly galvanized or duplex-coated galvanized substrates. As such, the roofs need to have a service life equal to – or exceeding – that of the renewable energy installation, to ensure acceptable projected return-on-investment and sustainability targets," he explains.

Bridging the gap

The HDGASA's role has included highlighting the parallels between standards used in South Africa and those applied internationally, including the Americas, Europe, India, Australia and New Zealand. 'We have provided solid proof to the renewables industry role players that our galvanizers can provide hot dip galvanizing equal to – or exceeding – the standards specified by designers of plants in Europe and in America," he continues.

The Association also advises on other ranges of galvanized materials used for corrosion control. For example, where some designers have resorted to using thinner steel sections protected by continuous galvanizing coatings, the HDGASA has found several instances showing the articles to be incongruent with the projected service life of the renewable plant.

"Our advice has been to recommend that the designer specify batch dipping of fabricated steel elements," Clarke says. This will inevitably provide greater service life from a coating that is substantially thicker, thereby providing greater durability and service life – with a marginal cost variance when compared to the overall project cost.

Currently, he says that the HDGASA is working on two large remedial projects, resulting from poor storage and transportation: "Bundling, nesting of pre-galvanized steel components and strapping them together too tightly when importing such articles in a ship's hold carries a disproportionate risk of damage to the corrosion control coating. Long periods when pregalvanized material is exposed to moisture and chlorides means that they have most likely begun to corrode at excessively high rates, by the time they arrive on site – affecting the service life of the renewable energy facility."

The winds of change

Lessons learnt from the solar sector will also assist with the wind power sector which has, over a 10-year period, blown hot and cold – and only now seems to be gaining traction again as an alternative in the renewable energy arena.

Clarke says the HDGASA will continue to work closely both in-country and offshore with South African role players, championing the capacity and expertise of South African galvanizers to supply the solar, wind and developing renewable markets.

"The renewable energy sector provides a powerful growth opportunity for South Africa's galvanizing fraternity, and the HDGASA will do all we can to support and facilitate this," he concludes.

BOLTED CONNECTIONS and corrosion control

Bolted connections are one of the most widely used, versatile and reliable methods for joining structural steel members. Some of the advantages of bolting over methods such as welding and riveting are:

- Economy, speed and ease of erection;
- Reliability of service;
- Ease of inspection;
- Fewer, and less highly skilled operators are required;
- Reliable performance under fluctuating stresses;
- No pre-heating of high-strength steels;
- No weld cracking or induced internal stresses;
- No lamellar tearing of plates;
- No heat damage to the coating on hot dip galvanized or painted structures.

Type of structural bolts and fastening devices

Low-carbon steel bolts, generally known as grades 4.8, 5.8 and 8.8 have been in use for many years. High-strength structural bolts for use in high-strength bearing-type joints and high-strength friction type joints, which are referred to as grades 10.9 and 12.9. These 'high' strength bolting grades were introduced to increase the scope of structural bolting.

The strength of structural bolts is specified in terms of the tensile strength of the threaded fasteners. Two numbers separated by a full stop are stamped on the bolt head. The first number represents one-hundredth of the nominal tensile strength and the second number represents one-tenth of the ratio between nominal yield stress and nominal tensile strength expressed as a percentage. For example, a grade 4.8 bolt has:

- Tensile strength of 4 x 100 = 400MPa;
- Yield strength of 0.8 x 400 = 320MPa.

A large variety of fastening devices, other than bolts and nuts, are used throughout industry and these include components such as spring clips where permanent retention of clamping force is essential.

Corrosion control

While the mechanical properties of fastener assemblies are structurally dependable and cost-effective, the durability of such connections will be influenced by the degree of corrosion encountered in service. Deterioration brought about by rusting can lead to the seizure of fasteners and premature failure, in the form of corrosion fatigue.

Adequate corrosion protection of fasteners is, therefore of paramount importance if the overall integrity of a structure is to be retained throughout its life *(Figures 1, 2 & 3)*.

In bolted steel structures the bolts and nuts are critical items on which the integrity of the entire structure depends. Protection from corrosion is provided by using corrosion resistant materials or by providing a protective coating, either before or after installation.

Corrosion resistant metals

The use of fasteners, manufactured from corrosion resistant metal alloys, frequently provides the most cost effective method of avoiding degradation by corrosion in very aggressive environments.

Contact between dissimilar metals can result in galvanic corrosion, particularly where a large cathode is in electrolytic contact with a small anode. Austenitic stainless steel fasteners are used with success in many applications where there is contact with metals such as zinc and in mild to moderately corrosive environments, hot dip galvanized fasteners have proved successful for connecting components manufactured from Corten steel.

The use of an organic coating over one or both metal coating interfaces of a joint prior to fastening, or the sealing of that joint

Figure 1: An assortment of zinc coated bolts showing the importance of coating thickness in a particular environment.

Figure 2 (above) and Figure 3 (above right): Corrosion protection of holding down bolts should be equal to that provided for main structures.

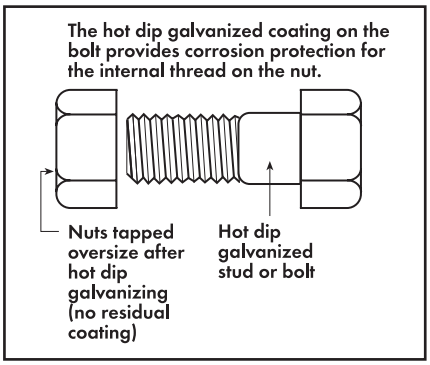

Figure 4.

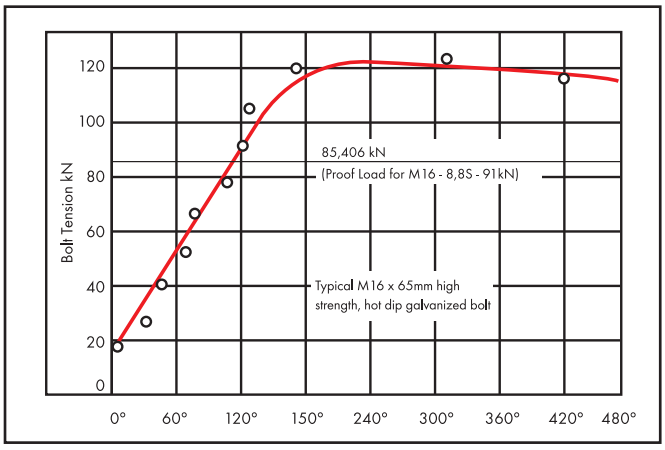

Figure 5: Demonstration of tensioning results obtained by the turn of the nut method.

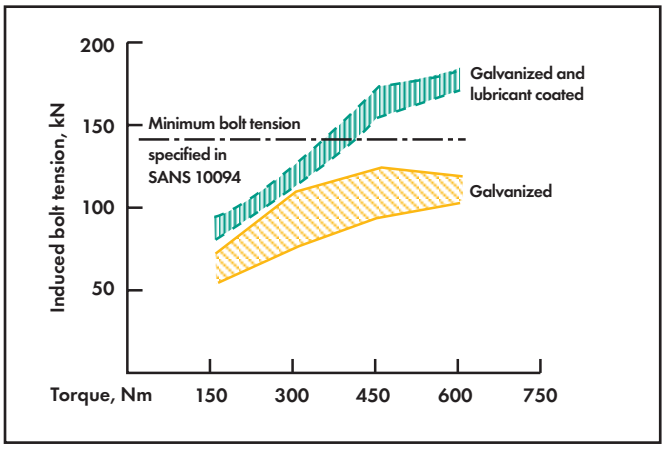

Figure 6: Torque/induced tension-relation for M20 high strength structural bolts, only galvanized and galvanized and lubricant coated.

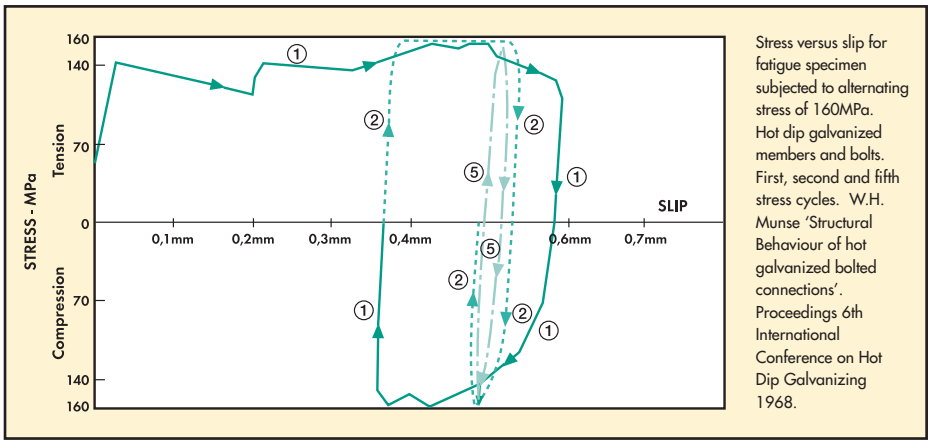

Figure 7.

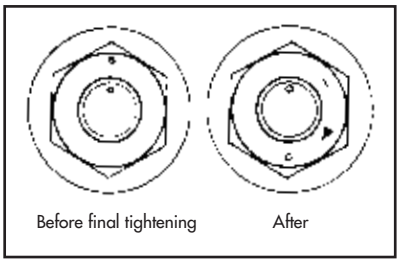

Figure 8: Where accurate tensioning is critical, permanent indication of the extent of part turn tightening can be identified by match marking.

	CONTACT MATERIAL (FASTENER/WASHER)											
	Aluminium and aluminium alloys		Copper and copper alloys		300 series stainless steels		Zinc coated steel and zinc		Aluminium/zinc coated steel		Lead	
Sheeting material	Industrial & marine	Rural	Industrial & marine	Rural	Industrial & marine	Rural	Industrial & marine	Rural	Industrial & marine	Rural	Industrial & marine	Rural
Aluminium and aluminium alloys	A	A	C	C	B	B	B	A	A	A	C	C
Copper and copper alloys	C	C	A	A	B	B	C	C	C	C	B	B
300 series Stainless Steels	C	B	B	B	A	A	C	C	C	B	B	B
Zinc coated steel and Zinc	A	A	C	C	B	B	A	A	A	A	B	A
Aluminium/Zinc coated steel	A	A	C	C	B	B	B	A	A	A	C	C
Lead	C	C	A	A	A	A	B	A	C	C	A	A

Legend:
A = Acceptable. Increase in the corrosion rate of the sheeting or contact material will be zero or slight.
B = Acceptable, but increase in the corrosion rate of the sheeting or contact material can occur.
C = Do not use. Accelerated corrosion will occur, or the difference in the lives of the two materials is too great, or both.

Table 1: Metals and alloys between which direct contact is acceptable.

after bolting, in an aggressive atmosphere will substantially increase the corrosion resistance of that joint.

Table 1 provides a guide to the compatibility of various metals and alloys in contact in building applications. For example, it will be observed from the table that a zinc coated fastener (anode) connected to 300 series stainless steel (cathode) is unacceptable in a corrosive environment whereas zinc coated steel connected with 300 series stainless steel is acceptable.

Protective coatings

A coating applied to fasteners must, of necessity, be tightly adhering and resistant to damage during and after assembly. For this reason, metal coating before assembly, is preferable. Additional protection, after assembly by means of an additional paint coating is beneficial in aggressive environments, particularly when these metal coatings have been applied.

Coating metals used include zinc and noble metals such as nickel and tin. In the case of the more reactive metals, such as zinc, coating thickness is of paramount importance as corrosion control service life is more or less proportional to the coating thickness.

Where metals, such as nickel and tin are used, thinner coatings will usually provide long-term protection provided that these coatings are free from imperfections and not subjected to mechanical damage which, in corrosive conditions, will lead to accelerated corrosion of exposed underlying steel. The cost of providing protection employing the more noble metals is high and as such has restricted the general use of these coatings for the corrosion protection of fasteners in the structural steel industry.

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OVERSIZE TAPPING ALLOWANCE FOR HOT DIP GALVANIZED NUTS	
Nominal Size of Thread	**Allowance (mm)**
M8 to M12	0.33
M16 to M24	0.38
>M24 = M27	0.43
>M27 = M30	0.47
>M30 = M36	0.57
>M36 = M48	0.76
>M48 = M64	1.0

Table 2: Recommended oversize tapping allowance.

	LENGTH OF BOLT, mm	
Nominal bolt diameter	**Nut rotation 1/2 turn with 60° tolerance over no tolerance under**	**Nut rotation 3/4 turn with 60° tolerance over no tolerance under**
M16	up to 120mm	120 up to 240mm
M20	up to 120mm	120 up to 240mm
M24	up to 160mm	160 up to 350mm
M30	up to 160mm	160 up to 350mm
M36	up to 160mm	160 up to 350mm

Table 3: Nut Rotation from the snug-tight condition. Refer to SABS 094.

Threaded Articles Class 10.9 Fastener Diameter	Local Coating Thickness (min.) µm or gms/m²	Mean Coating Thickness (min.) µm or gms/m²	Maximum Coating Thickness (min.) µm or gms/m²
ø > 6mm	40 (285)	50 (360)	65 (465)
Note: Excessively thick hot dip galvanized coatings (i.e. zinc immersion time of longer than 2 minutes), results in excessive growth of the hard Fe/Zn alloy layers and possible fatigue failure from crack propagation at stress raisers. Excessively thick coatings on threads will interfere with thread tolerances. Threads are to be clearly defined and free from excess solidified zinc, allowing for ease of nut fitting and tensioning.			

Table 4.

Hot dip galvanizing of fasteners

Hot dip galvanizing of fasteners is a specialised process and the products should, therefore, be purchased from an approved bolt manufacturer who will ensure that the correct manufacturing and galvanizing procedures, including oversize tolerances, etc., are adhered to.

Oversize tapping allowance for hot dip galvanized nuts

The zinc coating on external threads shall be free from lumps and shall not have been subjected to a cutting, rolling or finishing operation that could damage the zinc coating. The zinc coating of an external standard metric thread that has not been undercut shall be such as to enable the threaded part to fit an oversized tapped nut *(Figure 4)* per the allowances given in *Table 2*. On bolts greater than M24, undercutting of bolt threads is frequently preferred to only oversizing of nut threads.

Influence of galvanized coatings on thread stripping strength

In high-strength bolting, correct tightening is essential, and the oversized tapping of galvanized nuts does not necessitate a reduction in the level of minimum tension which applies to uncoated fasteners. To meet this requirement, galvanized high-strength nuts have a higher specified hardness than that demanded in the case of ungalvanized nuts.

Bolt relaxation

The possible effect of bolt relaxation, caused by the relatively soft outer zinc layer of the galvanized coating on the mating surfaces have been investigated. Tests carried out by the Hot Dip Galvanizers Association and the SABS revealed no substantial relaxation confirmed by international studies which shows that a maximum loss of bolt load of 6.5% for galvanized plates and bolts can arise, as opposed to 2.5% for uncoated bolts and members. This loss occurs within about five days and little further loss is recorded. This loss can be allowed for in design and is readily accommodated.

Slip factor of mating surfaces in friction-type joints

In the case of galvanized friction grip joints the galvanized coating behaves initially as a lubricant and a co-efficient of friction of normally less than 0.2. After the first

few cycles, under alternating stress, the galvanized surfaces tend to lock up and further slip, under alternating stress, is negligible *(Figure 7)*. If the initial slip is undesirable, the application of a zinc silicate paint, to mating surfaces before assembly, will provide a slip factor above 0.4 and, this enables hot dip galvanized assemblies to be designed for performance which is similar to that of uncoated steel.

Zinc metal spraying or alternatively light abrasive blasting of mating surfaces will also provide an acceptable slip factor.

Lubrication of threads

For high-strength galvanized fasteners to be tensioned to the required level, thread lubrication, employing molybdenum disulphide-based lubricant or alternatively, a wax such as beeswax, is essential *(Figure 5)*.

Bolt and nut assemblies

Hot dip galvanized bolts and nuts should ideally be supplied in the nutted- up condition. This ensures that bolts and nuts have been matched and supplied by the same manufacturer while the possibility of bolts being supplied with clogged threads is avoided.

Washers

High-strength washers are required to be through hardened before hot dip galvanizing.

High strength fasteners – Class 10.9 (Refer to SANS/ISO10684)

Class 10.9 fasteners may be hot dip galvanized, provided that a certificate of compliance is issued by the galvanizer, stating that the hot dip galvanizing has been carried out per SANS/ISO 10684 typically this is done by the following procedures

1. All pretreatment cleaning is achieved by lightly wheel-abrading for less than 5 minutes instead of acid pickling. This is preferred to eliminate the liberation of hydrogen ions (H+1) and remove the potential for hydrogen embrittlement.
2. Thick hot dip galvanized coatings are avoided by limiting the immersion times to less than 2 minutes, agitating in the molten zinc and ensure that all components are immersed for similar periods followed by efficient centrifuging *(Table 4)*.
3. No stripping and re-galvanizing of rejected sub-quality coating is allowed.
4. No uncoated areas are acceptable.

Note: Users of fasteners must be aware of dangers during tightening procedures if they are not applied correctly.

Bolt tensioning procedures

Extensive tests have been carried out in order to arrive at the most effective method of tensioning hot dip galvanized fasteners while ensuring that this can be performed reliably by semi-skilled personnel. The torque required to tension hot dip galvanized fasteners, even after lubrication, can vary substantially from one fastener to another and, while this fact also applies to uncoated fasteners, the scatter is greater in the case of galvanized fasteners. It is recommended that reliable tensioning of

high strength hot dip galvanized fasteners should not be based on torque/tension values, particularly in the case of friction grip connections. This recommendation is in line with results obtained in countries elsewhere and, for this reason, torque control tensioning is not encouraged either for coated or uncoated high-strength fasteners.

Recommended method of tensioning (turn of the nut method)

If hot dip galvanized fasteners are to be used, it is recommended that the turn of the nut method of tensioning should be adopted. This method has proved to be reliable and slight variations in the degree of final nut turning do not significantly influence the ultimate bolt tension *(Figure 6)*. The procedure is simple and does not entail the use of specialised equipment. Nuts are tightened to a snug tight position and variations in tightness at this stage do not significantly influence the final result. Snug tight is defined in many specifications as the full effort of a man on a standard podger spanner or the point at which there is a change in the note or speed of rotation when a pneumatic impact wrench begins impacting solidly. Podger spanners are graded in length, in relation to bolt size and strength and, for example, a spanner of some 450mm in length is regarded as appropriate for an M20 high strength structural bolt. It must be repeated that the clamping force supplied by snug tight is highly variable but this is not significant when bolts are subsequently fully tightened. The bolt tension/bolt elongation-curve is relatively flat once the proof load is exceeded and, hence, variations in the snug tight condition results in only small variations in the final bolt tension.

For the final tightening the standards in *Table 3* are recommended. The table provides for rotation up to 60° in excess of the recommended nut rotation or a total of 240° in the case of M16 and M20 fasteners up to a length of 120mm.

Where accurate tensioning is critical such as in the case of friction grip connections, a permanent indication of the extent of part-turn tightening can be identified by match marking the bolt end and nut, at the snug tightening stage, before the final tightening *(Figure 8)*.

Part torque – part turn method

This procedure entails the use of a torque wrench to induce a snug tight condition to all bolts before applying full tension by the turn of the nut procedures.

Alternative methods of tensioning hot dip galvanized fasteners

The use of load indicator washers provides effective tensioning but this entails the use of specially manufactured washers with protrusions which are flattened as tension increases and a reduction of the gap by a specified amount indicates that the minimum bolt tension has been reached.

Hydraulic tensioning equipment, which stresses the bolt to the required extent prior to nut tightening, is also available. These alternative methods entail the use of specialised equipment and for this reason the use of the uncomplicated and reliable turn-of-the-nut method is recommended.

The effect of hot dip galvanizing on strength properties of fasteners

The hot dip galvanizing process does not adversely affect the mechanical properties of high-strength fastener steel or even material such as spring steel. Hardened steels <1000MPa yield strength, are not considered to be prone to hydrogen embrittlement as a result of pickling, before galvanizing, and any absorbed hydrogen would be diffused during immersion in the molten zinc at 450°C.

In the case of a high strength grade 10.9 and above fasteners as well as products manufactured from spring steel, excessively thick galvanized coatings (>65µm) should be avoided since excessive growth of the hard Fe/Zn alloy layers can result in fatigue failure due to crack propagation from these layers into the substrate where a potential stress raiser may be present. In any case, excessively thick coatings on threads are undesirable as this will interfere with the thread tolerance and may also result in galling during tensioning. Ideally a maximum coating thickness of 65µm applies to all male threaded components.

The use of hot dip galvanized Class 10.9 bolts and nuts are permitted provided that a certificate of compliance is issued by the galvanizer that the fasteners have been processed in terms of SANS/ISO10684.

ENSURING A QUALITY LEGACY for SA steel

While the Southern African Institute of Steel Construction (SAISC) is closely monitoring seismic changes happening upstream, it has taken a strategic decision to focus on ensuring a steady supply of good quality steel for downstream steel businesses, says Chief Executive Officer (CEO) Amanuel Gebremeskel.

Against a backdrop of economic and policy uncertainty and potential facility closures – albeit that, for now, these have been deferred – Gebremeskel says the SAISC will concentrate on supporting the steel supply chain rather than on the struggles of specific mills.

"While a steel mill might employ around 2 500 people, the downstream sector, which includes the automotive, construction, energy and mining sectors, is the far larger employer, supporting more than 600 000 jobs.

Therefore, the SAISC must prioritise building a dynamic sector similar to Canada's, where downstream fabricators remain strong, despite the absence of large steel mills – rather than following Australia – where the closure of large mills has virtually incapacitated the downstream sector," he explains.

Two streams of investment

As the custodian and sole representative of South Africa's downstream steel industry, Gebremeskel says the SAISC is prioritising quality and availability: "We are most concerned about ensuring a steady supply and good diversity of steel in our market. This must be predicated on quality and not where steel comes from."

He says the SAISC has identified two important areas for investment – the development of stringent quality standards through the South African Bureau of Standards (SABS) and the implementation of a sound quality regime.

"This includes the development of a SAISC 'quality certification stamp'– signifying that companies with the stamp have voluntarily completed SAISC quality training. The quality regime will also include the development of a database

by the SAISC's technical committee, which will allow designers to understand – and design around – the particular products which fabricators can access.

He notes that the SAISC's input into contributing to SABS standards and then providing supporting literature which explains these standards – and illustrates how companies can comply with them – necessitates a considerable investment of time, technical expertise and related resources.

Strengthening sustainability

Another pivotal area where both the upstream and downstream industry needs to improve is sustainability – both from a business and an environmental perspective. While steel may be one of the most widely used – as well as the 'greenest' and most widely recycled materials of construction – it has a rather poor environmental record.

"Older mills which rely on dated technology – known as legacy mills – cannot compete with new mills in Asia and Europe that rely on modern technology. These newer mills use more energy-efficient arc furnaces, as opposed to dated oxygen furnaces which require large amounts of coking coal.

Although many newer steel mills across the world have also invested in renewable and cleaner energy – in contrast to the carbon-intensive coal-fired energy used locally – such investments are yet to reach South Africa," he advises.

According to Gebremeskel, even though the so-called 'mini' (or smaller) mills which have sprung up to process scrap metal are using more energy-efficient induction furnaces, there is still some way to go.

"As they are relatively new – and because they rely on scrap that is often of poor quality – the mini-mills need to elevate themselves to meet the higher standards to which we are accustomed in the market – and that does take time," he admits.

While some of these mini-mills have invested considerably to increase volumes, additional spending is now also required to expand product ranges if they are to effectively take up the slack should the facilities of the ArcelorMittal long product ultimately lose capacity, he adds.

Building a digital 'skills bridge'

The South African steel sector is also navigating the loss of key skills to retirement and emigration.

The SAISC needs to respond by retaining the knowledge that is lost to the sector. The 'silver bullet' solution would be to upload much of the accumulated expertise onto a digital platform for SAISC members, according to Gebremeskel.

"Through our website and online learning platform, we are aiming to link the older generation of steel professionals with future generations. Hopefully, in this way, we can build a digital 'skills bridge' and make this invaluable information readily accessible," he says.

The SAISC is also reaching out to engineers. Those who attended the Institute's breakfast discussion earlier this year – which focused on challenges to the availability and quality of steel – reported that the event was extremely beneficial, and an important opportunity to engage with the steel sector. Other events, including the annual SAISC Steel Awards, are similarly well attended by a wide range of SAISC members and steel supply chain participants – from designers and consulting engineers to fabricators and construction contractors.

In addition, engineers are now being included on the SAISC Board.

Quality engagement

Gebremeskel concludes with a firm commitment that the SAISC will provide further opportunities for stakeholders to engage: "We would like to energise everyone to work together to solve the problems that can be solved. The SAISC needs to set the tone for the steel sector so that people do not give up and lose out on important opportunities to further the skills, quality and sustainability of the steel industry."

AVAILABLE FROM THE ASSOCIATION

METAL-PRO GALV-FRIENDLY MARKERS

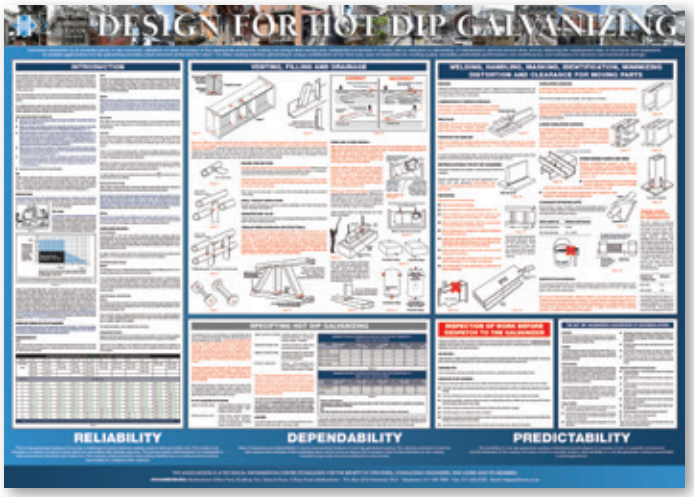
Designed for use in the hot dip galvanizing process, this **marking pen** stays on during fabrication but is removed completely in the galvanizing process.

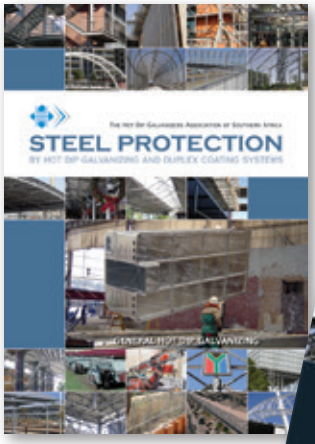
PRO FEATURES

- Permanent marks during fabrication
- Ergonomic non-slip rubber PRO GRIP®
- Marks on wet and oily surfaces
- Durable clip cap
- Fast drying
- Weather resistant marks
- Crisp lines or bold lines
- Suitable for all metal surfaces

DESIGN FOR HOT DIP GALVANIZING WALL CHART

The **wallchart** is an invaluable reference chart for fabricators and specifiers. Key information is readily available to allow for best engineering practice for galvanizing.





TECHNICAL GUIDES

The HDGASA **Steel Protection Guide** and **Facts about Hot Dip Galvanizing** are available in high-gloss printed material for reference and guidance.

HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

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CASE STUDY

GALVANIZING FRIENDLY marker evaluation

by Chantell Aucamp

Background

Specially formulated markers are imported into South Africa by The Hot Dip Galvanizers Association of Southern Africa (HDGASA). This marker is specifically designed for use in the hot dip galvanizing process, as this marking pen stays on during fabrication but is removed completely in the galvanizing process.

Marker features

- Permanent marks during fabrication
- Ergonomic non-slip rubber grip
- Formulated for industrial use
- Marks on wet & oily surfaces
- Durable clip cap
- Fast drying
- Weather resistant marks
- Crisp lines or bold lines
- Suitable for all metal surfaces
- Design for Fabricators & Galvanizers
- Multi-lingual packaging
- Multiple colours (creamsicle, white & yellow)

Case study

Tests were conducted to verify the performance of the markers in different environments and galvanizing conditions.

Steel preparation

A 6m length angle iron was cut into 9 x 300mm lengths, in order to test all three colours supplied at three different galvanizers. A 6mm Ø hole was drilled into each piece in order to assist with the jigging process. The following references were written on the nine pieces of steel as per *(Figure 1)* and left outside in the sun to weather for approximately 3 to 4 weeks as per *(Figures 2, 3 & 4)*.

As per the above figures, it is noticeable that the writing has faded, and the steel corroded during the weathering process as anticipated.

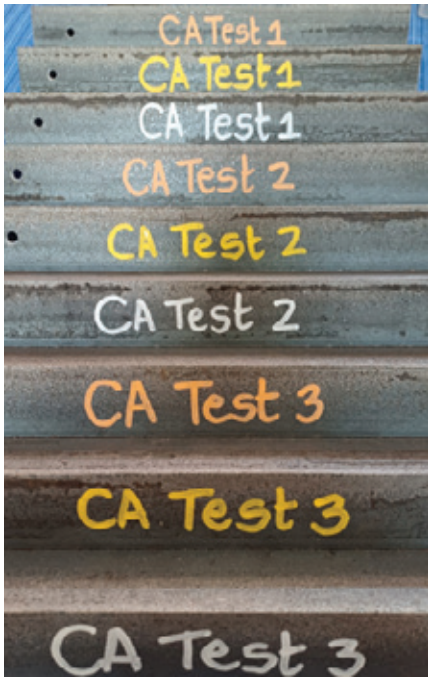
We conducted tests on the nine pieces of marked steel, by putting them through the hot dip galvanizing process at three different galvanizers, to verify if the marking pen will be completely removed during the galvanizing process.

Hot dip galvanizing process

Hot dip galvanizing is a process used to apply a protective coating of zinc to steel or iron surfaces. It involves immersing the cleaned and prepped steel or iron articles into a bath of molten zinc at a temperature of approximately 450°C to 460°C. The process of hot dip galvanizing consists of three key steps: surface preparation, galvanizing and inspection.

Step 1: Surface preparation

Degreasing – organic pollutants such as dirt, paint marks, grease, and oil are removed from the metal surface using a hot alkali solution.



1

Figure 1: References written on the 9 pieces of steel.

2

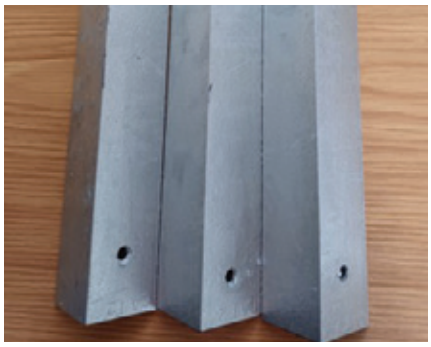
3

Figures 2, 3 and 4: The steel was left outside in the sun to weather for approximately 3 to 4 weeks.

4

5

Figures 5, 6, 7 and 8: The markings were completely removed during the galvanizing process *(see comparison between Figure 1 and Figure 8).*



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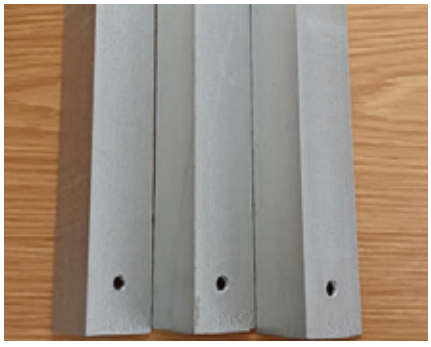

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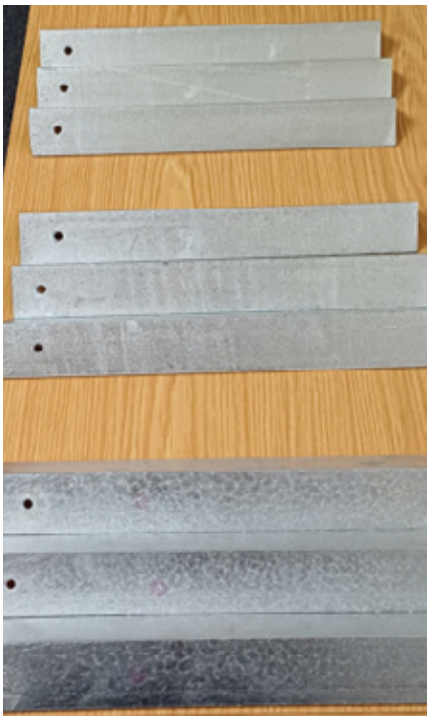

8

Pickling – mill scale, and iron oxides are removed from the steel surface using a diluted solution of ambient hydrochloric acid.

Fluxing – the cleaned articles are dipped into a flux solution. The flux prevents the formation of oxides from the surface and provides a protective layer on the steel, promoting the formation of a uniform zinc coating.

Step 2: Galvanizing

The steel is entirely immersed in a bath (kettle) of molten zinc, the galvanizing step of the process happens. The bath chemistry must be at least 98% pure zinc and kept at a temperature of around 450°C, according to the specifications. The crane lowers the steel at an angle. This allows air to escape from tubular shapes or pockets in the design of a fabricated component, as well as molten zinc to displace the air. The zinc reacts with the iron in the steel in the kettle to generate a sequence of zinc-iron intermetallic alloy layers. The coating growth is complete after the fabrication item reaches batch temperature, and the products are slowly removed from the galvanizing bath. Draining, vibrating, and/or centrifuging are used to remove excess zinc. As long as the pieces remains around bath temperature after being removed from the bath, the metallurgical reaction will continue. Articles are cooled either by immersing them in a passivation solution or by leaving them out in the open air.

Step 3: Inspection and Finishing

The final stage of the procedure, inspection, is straightforward and rapid. Coating thickness and coating appearance are the two aspects of the hot dip galvanized coating that are thoroughly examined. Products are galvanized in accordance with the SANS121:2024 standard that have been long established, accepted, and approved.

Conclusion

As per the tests conducted at the three different galvanizers during their galvanizing process in accordance with SANS121:2024, it was concluded that the galvanizing friendly marker upheld the function it was designed for. The markings remained during the fabrication but was completely removed during the galvanizing process as per *(Figures 5, 6, 7 & 8)*.

COURSES OFFERED

"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 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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HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

QUALITY AND TRAINING
could safeguard the future of the steel sector

There is no time like the present to address the ongoing concerns of quality and training in the steel value chain, according to Amanuel Gebremeskel, CEO of The Southern African Institute of Steel Construction (SAISC).

As the custodian of steel industry knowledge and standards across Africa, the SAISC is calling for realistic planning. Gebremeskel explains: "We especially need to safeguard the future of the downstream steel industry, which employs over half a million people. It is well known that the steel sector has experienced quality and training issues for several years. However, this has now become even more relevant. Merchants do not want to inadvertently supply low quality steel products – and rejecting steel after fabrication or erection can be very expensive. From both sides, we need a more holistic, over-arching programme which caters to any eventuality."

Steeling for change

Gebremeskel notes that the greatest risk remains the pervading uncertainty: "The well-publicised prospective closure of the primary steel producer ArcelorMittal (AMSA) long products division would have had massive repercussions for the automotive, construction and mining industries, amongst others. For now, however, this has been suspended – and the good news is that the 'longs' business is to remain operational.

However, the AMSA long products division remaining operational – but without firm lead-times – could introduce another challenge. Projects are planned months, if not years, in advance and any fabricator trying to ensure procurement of materials requires supplier commitment. Decisions need to be made now, Gebremeskel warns.

"With such uncertainties mini-mills which are already producing limited amounts of long products from scrap will come under increased pressure, as will merchants sourcing replacement supplies – not only from these local mini-mills – but also from many different countries," he adds.

Gebremeskel believes steel could therefore be sourced from "anywhere and everywhere" – with importers searching for the best prices and most viable logistics. This, inevitably, brings up the issue of quality.

"For the foreseeable future, quality is going to be a significant issue in the steel sector. This dovetails with the question of human capital. With the loss of skills to retirement and immigration, are there enough people who can evaluate whether or not the steel is of good quality?" Gebremeskel asks.

He continues: "Fabricators will need to implement stricter quality control of steel. At present, this process is based on trust. Fabricators trust merchants, who in turn trust the mills. However, with the diversification of steel sourcing, this process must be rejigged. What initiatives can the industry afford – and in which direction will it go to address these challenges? We need quality training, supported by a stringent quality regime."

Making its quality mark

With ever-greater pressure on steel merchants, mills and mini-mills to provide quality and adhere to standards, the SAISC's proposed quality certification programme and quality mark will become more important than ever. This first-of-a-kind quality certification oversight programme will refine, monitor and uphold quality standards across the steel supply chain – and will be signified by its own steel quality certification brand mark or stamp. This is on track for roll-out within the next 24 months, Gebremeskel confirms.

Drawing from well-established international best practices, including US and UK standards, it fills an important gap, he explains: "The SAISC has always recognised the dire need for quality

standards monitoring and measurement for steel products and projects in South Africa – and, in fact, throughout the region. There is currently no independent regional assessment body to which the industry can turn for the measurement and enforcement of quality controls even on a professional, voluntary / self-regulated certification basis."

Poor quality comes at a high price

Gebremeskel adds that the entire value chain needs to be trained on quality because – as per the lesson of the national power utility failing to adhere to technical standards during the construction of certain major power plants – due to the use of poor quality products, fabrication and erection can result in costs running into billions of rands.

"The final price tag on inferior quality materials and products is always much higher than if one took the time to gain the knowledge to ensure the correct quality is specified and delivered in the first place. The SAISC's new quality certification programme aims to confront this challenge head-on and, eventually, uplift the entire steel industry," he says.

The programme will involve the training of staff in all aspects of quality at companies that apply to quality for the SAISC quality certification stamp. This will be followed up by the Institute's steel experts who will monitor product and project quality before a company can qualify for certification.

Stamp of quality

As the future of South Africa's entire steel sector could hinge on quality control, Gebremeskel is calling for an 'all hands on deck' approach, with stakeholders integrating quality into their business strategies, working closely with the SAISC on training and promoting the use of the SAISC quality certification stamp.

"Our ultimate vision is for this to be recognised as the highest voluntary quality certification stamp on the continent. By obtaining the SAISC certification, companies throughout the steel value chain will be able to set the standard in Africa from a quality perspective – while also ensuring the sustainability of the critical downstream steel sector," Gebremeskel concludes.

TRAINING: The driver for excellence and continuous improvement

WHEN EMPLOYEES AND ORGANIZATIONS INVEST IN WORKPLACE TRAINING, THEY OPEN DOORS TO ENHANCED KNOWLEDGE AND SKILLS, LEADING TO MORE EFFECTIVE JOB PERFORMANCE.

The benefits of proper training extend to improved technical capability, strengthened teamwork, and enhanced workplace safety. Additionally, training presents both the employer and employee with opportunities for career development and advancement. As employees undergo training, they gain a sense of accomplishment and recognize their integral role in the company, ultimately resulting in heightened job satisfaction and motivation. It's clear that workplace training is a proven method for organizations to elevate productivity and uphold quality standards. Well-trained employees exhibit greater skill in their roles and are less prone to errors, ultimately leading to improved efficiency and effectiveness. Furthermore, employers can utilize workplace training to address specific needs within individual employees, teams, or departments, filling gaps resulting from attrition and the creation of new roles.

Quality training is a necessity in the galvanizing sector. Training to ensure that products meet certain quality standards, required by the company, industry or third parties. In some cases, employees who complete a quality training program will receive certification. The requirement for quality training covers topics such as:

- Compliance with quality standards
- Quality control processes
- Product observation techniques
- Prevention and elimination of poor-quality products
- Evaluation and improvement of the galvanizing process and quality system

The purpose of team training is to enable the members of the galvanizer's team to build stronger relationships with one another and work together cohesively. It empowers employees, improves their technical understanding of function and process, decision-making, problem-solving and team-development abilities which all contribute to the continuous development required of the modern organization. Some of the topics that employers discuss in team training include:

- Improving communication
- Creating a positive work environment
- Improving team collaboration
- Increasing team productivity

- Establishing good relationships with teammates
- Identifying and leveraging the strengths of team members
- Keeping teammates motivated

Regardless of the type of training employees undergo, it is important to recognize training opportunities to foster growth within the company and warrant excellence as a habit rather than an experience. The employee is the best person to engage well with current and future customers. By keeping their skills and abilities in top condition the organization will ensure the customer experiences this as excellence in product and service.

In the last trimester the HDGASA has run several training courses for third party and galvanizing members. The three-day Level II course was well received and internalized operator and supervisor courses ensured galvanizers and their customers of the highest level of quality and engagement.

For training that sensitizes third parties to the nature, standards and corrosion control of hot dip galvanizing as a short one-day workshop or course to in depth training for the understanding of hot dip galvanizing of steel across all practical aspects spanning three days of training and examination, the HDGASA can assist galvanizers and their networks and customers with the leading training in the field of hot dip galvanizing. For further details and information contact the HDGASA at *www.hdgasa.org.za.*

LIFT AIRLINES: Experience in excellence

I was privileged to experience excellence in an unexpected place. I fly regularly to Durban, Cape Town and have been in the company and provided services by many cabin crews. Generally, these crews are professional and poised albeit with a touch of aloofness. I was amazed that on both my last trip to Durban and the return from Durban to Johannesburg I experienced excellence in service and attitude with the same cabin crew on both occasions. Their difference in the attitudes and professionalism stood out clearly from all others I have experienced. The airline was LIFT a local inexpensive carrier who have not sacrificed excellence for affordability.

GALVATECH UNVEILS ADVANCED HOT DIP GALVANIZING FACILITY – redefining corrosion protection services in the WC

by Larry Claasen

BELVILLE-BASED GALVATECH'S NEW GALVANIZING FACILITY ENABLES IT TO TAKE ON BIGGER PROJECTS.

In a significant move, Galvatech, a Belville-based corrosion protection service provider, launched its new hot dip galvanizing facility in Cape Town, South Africa in early 2024.

The new advanced facility, which replaces the old one that has been around for about 30 years, utilises modern technology to improve efficiencies and has expanded the group's capabilities.

BIGGER KETTLE. BIGGER JOBS

Galvatech offers a comprehensive range of services, including hot dip galvanizing, abrasive grit-blasting, industrial painting, zinc metal spraying, and various powder coatings, providing a holistic solution in the field of corrosion prevention.

With its old facility, the group was previously seen as a mid-sized operator. But a key feature of its new facility, the installation of a 14m zinc kettle, now enables Galvatech to handle significantly larger articles as well as larger projects.

"Our previous facility limited our capacity for larger projects due to equipment constraints. With the installation of the 14m zinc kettle at our new facility, we can now undertake more substantial projects and compete effectively on large-volume contracts," says Galvatech GM Marcel le Roux.

"We can now handle large structural steel fabricators' requirements and galvanize building trusses up to 13m in length, which was previously unattainable," he adds.

Three decades combined with global best practice

The new facility also enables Galvatech to be more competitive in some of the region's rapidly growing industries.

"With our enhanced capacity and capabilities, we can now actively engage in hot dip galvanizing for solar power projects, including hot dip galvanizing of large-scale structural components used in solar panel mounting systems and support structures."

The technical enhancements at Galvatech's new facility have improved the group's efficiency and productivity with automation of certain processes as well as increased throughput capacity.

"Our new facility integrates three decades of experience in hot dip galvanizing with global best practices. The facility boasts enhanced automation, a larger zinc kettle, a 14m compared to the previous 7.5m, and significantly increased throughput capacity," says le Roux.

The combination of modern technology and its own experience can be seen in the new facility's layout, now enabling a modern hot dip galvanizing processes, creating a loop system and optimising efficiency.

A distinctive pattern

Products galvanized at Galvatech also have a distinctive pattern on them.

"Our coatings exhibit a unique visual pattern, a result of extensive research and process enhancements to improve its appearance while maintaining SANS 121 certification."

State-of-the-art

The new state-of-the-art facility, which is just across the road from its old one, is the most modern of its kind in South Africa.

"The new Galvatech facility represents a significant advancement in hot dip galvanizing technology in South Africa, potentially ranking among the most advanced facilities in South Africa."

In line with its commitment to environmental sustainability, Galvatech has equipped its new facility with advanced extraction systems and scrubbers to minimise emissions and comply with regulations.

"Environmental compliance is a top priority," says le Roux.

Aside from the technological advancements of the facility, its expansive lay-down area offers practical benefits like accommodating large vehicles and storage of large-volume projects.