

# HOT DIP GALVANIZING TODAY <sup>70</sup>

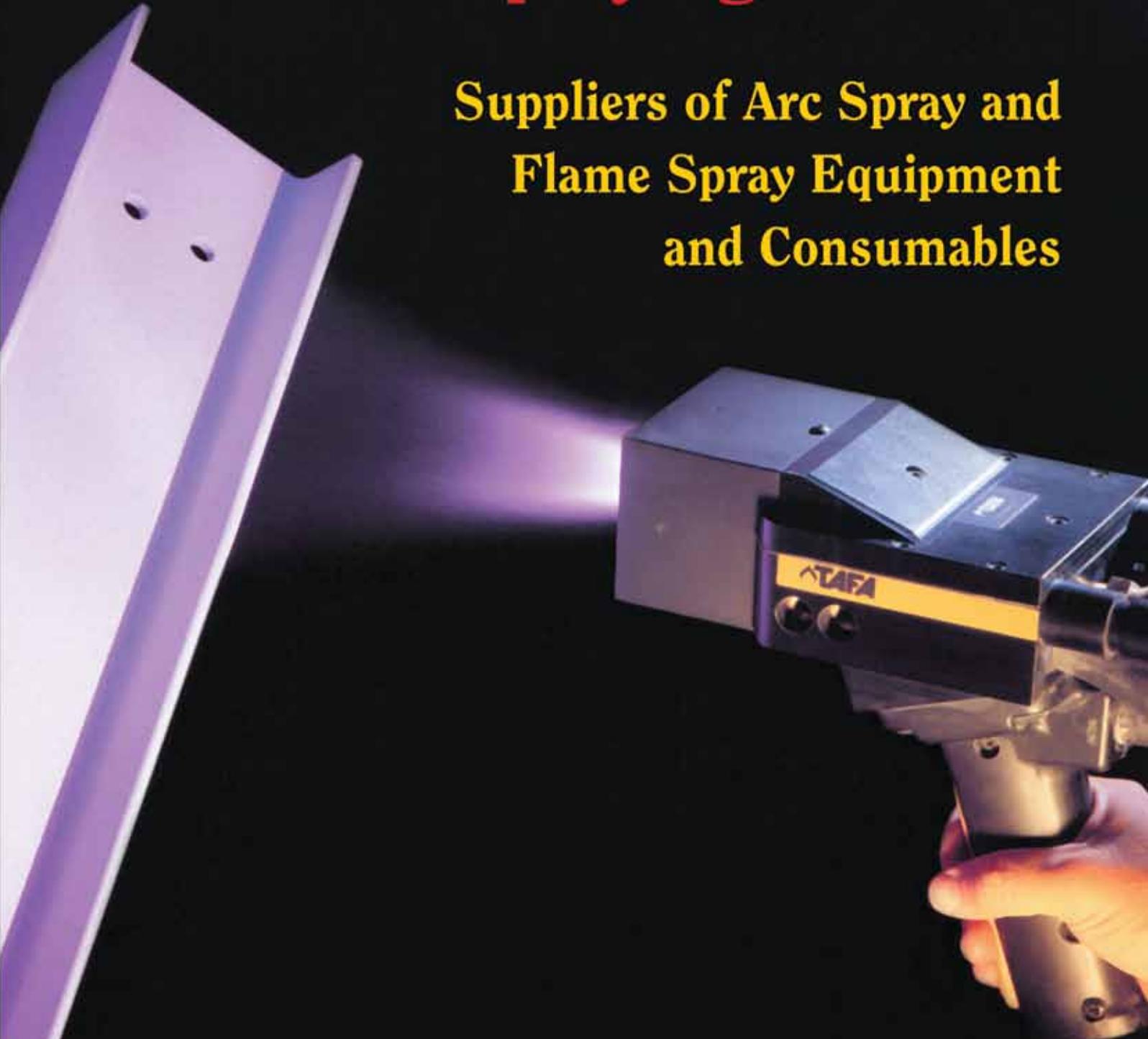
The Official Publication of the Hot Dip Galvanizers Association Southern Africa

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## EXECUTIVE DIRECTOR'S Comment

Both Anthony Botha and I were able to attend the Intergalva conference in Berlin in June this year. The conference is convened every three years to address and discuss matters relevant to the hot dip galvanizing industry. Strategic issues, technical issues and developments in the industry are shared by participants from across the globe. The event and some of the salient points to come out of the conference are discussed in detail in an article in this edition.

One point however that does bear some amplification is the concept of the circular economy. A stirring presentation was made and supported by examples in which steel structures were chosen as the preferred material for construction. Here, through clever design, steel modules can be configured to be joined in many ways. Any or all such modules may be repurposed at a time in the future when the original building reaches the end of its present application. Graphs of energy use, mass of waste generated during the repurposing exercise all reinforce the benefits of steel in terms environmental conservation.

Further international networking was achieved through our participation in the AfriCORR 2018 conference and expo.

On the home front various sources of funding have become available to Eskom. This we are told will be used for various projects inclusive of engaging in various independent power producer programs. Already a large Eastern Cape project has been given the green light. This will put a high tonnage of hot dip galvanized steel into the system. It is hoped that the balance of the funding will unlock several more projects and that the terms and conditions tied to these loans do not lock out local content. This is especially important to the Association, since we have actively participated in defining and setting of specifications required for corrosion control of transmissions lines and associated equipment.

The Association has spent a significant amount of time on refreshing its electronic media offerings. Both the website as well as the printed version of the magazine have been refreshed and our first you tube insert has been completed. More are planned. Lara Teixeira has included an article on these initiatives.

The Associations traditional offerings remain in place. We spend a significant amount of time liaising with engineers, architects and other specifiers to ensure a full understanding of hot dip galvanizing technologies and the benefits that are on offer. It is of interest that many zinc based products are developed to participate in the arena of corrosion control of carbon steels and leverage the zinc connection to hot dip galvanizing. While many products may have their applications it must again be stated that hot dip galvanizing is a process of submerging carbon steel or cast iron in a molten zinc bath which then results in a metallurgical reaction leading to the formation of layers of zinc and zinc/iron alloys. The EGGA has decided to differentiate this technology from other zinc related offerings by designing a unique mark for use specific to hot dip galvanizing.

Also encouraging is the rail and port expansion project in the Eastern Cape with an investment of around R800 million rand. The project was undertaken to increase the capacity of exporting Manganese. The Manganese is mined in Hotazel in the Northern Cape and railed to Ngqura Port from where it is exported. So far the project has seen spent some R140 million of the R800 million. Again it is hoped that the remainder of this project, around R660 million, will be used to acquire significant local content and provide significant employment opportunities to these regions.

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## EDITORIAL COMMENT

### in this issue

The quote-"obstacles are those frightful things you see when you take your eyes off your goals"-has been variously attributed to both Henry James and Henry Ford. By this the speaker shared the philosophy that success is accomplished when one remains focused on the goal and avoids distractions that divert that focus towards peripheral details or complications. The quote is important because it illuminates the importance of focus and perseverance. In this issue we have sought to provide some focus for opportunities rather than focusing on the negativism that pervades our current economic environment.

- The Circular Economy and Hot Dip Galvanized Steel looks at solutions already being utilized in Europe to provide economic delivery with an approach that is sustainable and repeatable.
- Intergalva 2018 Berlin – The three yearly international conference was a lighthouse of hope for those from SA who attended. Growth, development and strong international networking can help us achieve more than we have dared to dream.
- Hot Dip Galvanizing of Scaffolding brings the heights to which the benefits of hot dip galvanizing can be applied.
- Markers for hot dip galvanizing are the way that fabricators should mark steel to be hot dip galvanized thereby avoiding uncoated areas and the necessary remediation of such.
- HDGASA's digital footprint grows and is available to all for the latest information and learning, from Facebook to You Tube and an interactive website, the HDGASA is actively reaching out to allow free access to relevant information on corrosion control and associated topics to all who use the digital world.
- The association has moved to the building next door, see our latest address details. The new facilities offer more space for accommodating more delegates in the courses that are available. The HDGASA invites all their readers and members to take full advantage of these value adding courses.
- The article regarding the Muizenberg line was kindly submitted by Mr Iain Dodds. Iain is the ex-director of a large galvanizing plant that was intimately involved with Transnet on the development of corrosion control systems. The Muizenberg line is Iain's living test bed. Iain is a friend of the HDGASA and he retains his passion for hot dip galvanizing technologies.



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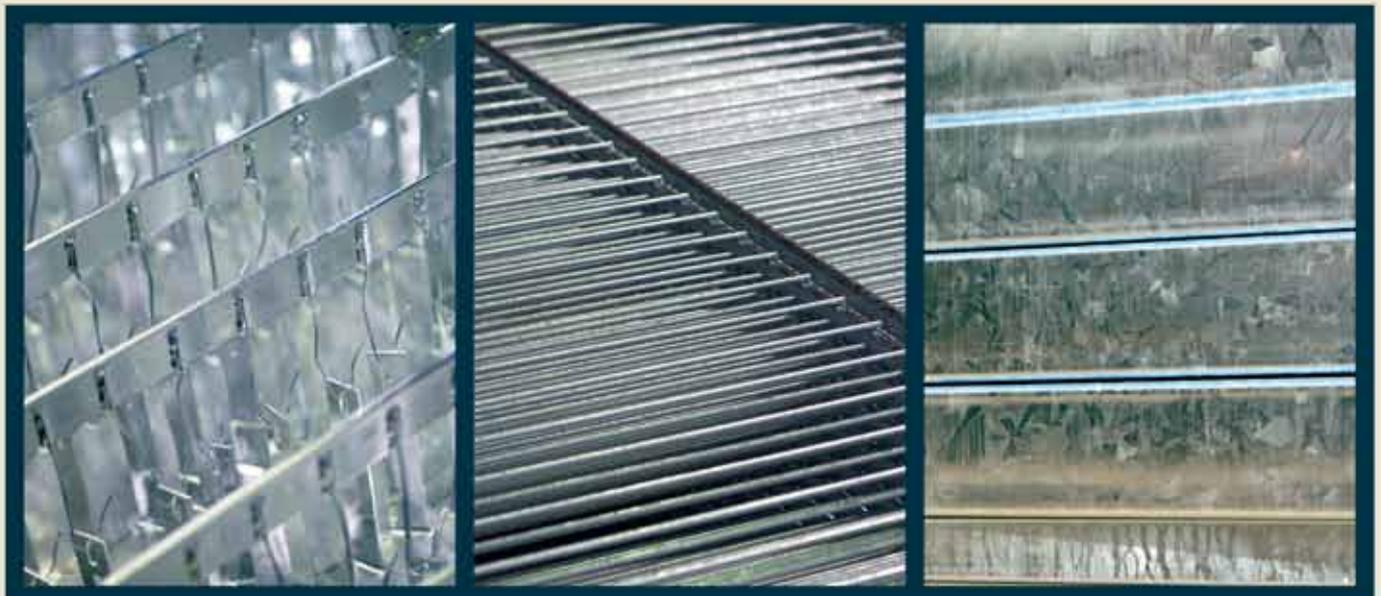
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# INTERGALVA 2018

THE INTERGALVA CONFERENCE 2018, HOSTED BY THE EUROPEAN GENERAL GALVANIZERS ASSOCIATION, WAS HELD IN BERLIN FROM 17 JUNE TO 22 JUNE 2018 AT THE ESTREL HOTEL AND CONFERENCE VENUE.



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Over 600 galvanizers and 300 delegates affiliated with the industry attended the event. Amongst the attendees fourteen delegates from South Africa participated.

The event was divided into three days of conferencing in which speakers delivered papers of interest related to the technology of hot dip galvanizing. An awards ceremony was held to celebrate excellence in the design and application of structures that have been hot dip galvanized. With regard to the awards, the submissions were mainly related to hot dip galvanized steelwork utilized

in architectural applications. It was interesting that architects and designers were cognizant of the changing nature of the hot dip galvanized coating as it weathers from a bright colour to the duller zinc carbonate layer and indeed embraced this as a positive characteristic of a "living" buildings.

The event concluded with two days of tours to batch type galvanizing plants around Germany.

Key themes that emerged from the discussion and debates during the



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1 The Estrel Hotel – Berlin  
Germany

2 The Silo – Denmark;  
Judges Award Winner

3 Exhibition at Intergalva 2018

4 The Saar-Polygon Ensldorf  
Germany

5 Arts West Building  
University of Melbourne,  
Australia: Industry Award  
Winner

conference were:

1. Recognizing and embracing changes in customer expectations was essential to ongoing market growth.
2. The concept of the circular economy and the positive implications for the use of steel in building of structures. Steel framed, hot dip galvanized buildings, or even parts thereof are able to be re-used in different applications after many years. By contrast, concrete buildings must be demolished and only a low percentage of material is recoverable.
3. Ongoing technical research related to

hot dip galvanizing of re-bar and high tensile fasteners

4. The benefits of medium and smaller pedestrian bridge construction using steel. In essence the advantages are short site construction times since fabrication and hot dip galvanizing is completed prior to arrival on site. Several Japanese case studies were shown to illustrate the point.

**The hot dip galvanizing mark**

Preceding the general conference, a gathering of international hot dip galvanizing associations was held

6 The Green House, Utrecht, The Netherlands

7 Global Hot Dip Galvanizing Leadership Gathering at Intergalva 2018

8 The Hot Dip Galvanizing Mark (International)



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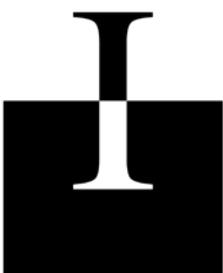
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on Sunday 17 June 2018. A notable development was the research done by the EGGA (European General Galvanizers Association), into the concept of developing a Technology Identification symbol for hot dip galvanizing. Several proposals were evaluated and a new mark or symbol, illustrating an I-beam section being lowered into a kettle was chosen to represent the hot dip galvanizing process. The need for such a verification symbol stems from the misuse of the terms "galvanizing", "galvanising" or "galvanization" to describe various corrosion control products that contain zinc.

Hot dip galvanizing is unique in that it is a metallurgical process that occurs

when suitably cleaned iron or steel is submerged in a bath of molten zinc and a reaction occurs. This results in the development of a coating that consists of zinc and zinc-iron alloys. This metallurgical bond cannot be achieved through any other means.

By using this mark and ensuring that end users, specifiers, architects and engineers understand that this verifies the product as being hot dip galvanized, all parties can be assured of the reliability, dependability, predictability and sustainability of the corrosion control technology. Hot dip galvanizing has weathered history's test of time and is the leader in corrosion control of iron and steel products.

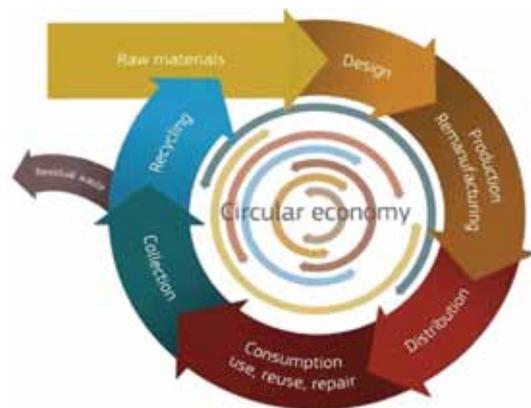


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“THE EARTH IS A COMMUNITY TO WHICH WE BELONG AND NOT A COMMODITY FOR US TO EXPLOIT”

# HOT DIP GALVANIZED STEEL and the circular economy

There is an obvious paradox in our economy; on the one hand we see many new buildings being constructed, while at the same time a huge number of existing buildings remain vacant. This paradox could have been avoided by thinking and designing in accordance to a circular model. The developing society has an expectation that in the future we must use natural resources sparingly. In a nut shell this is the circular economy of the future.



(Source: Bauke Bonnema – Tata Steel)

A circular economy ensures that value is maintained within a product when it reaches the end of its service life while at the same time reducing or eliminating waste. This employs the fundamental triple-bottom-line concept of sustainability, which focuses on the interplay between environmental, social and economic factors.

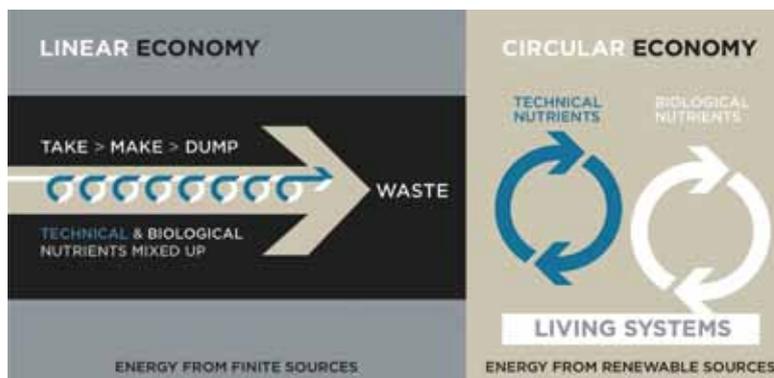
The circular economy is a move away from linear business models, in which products are manufactured from raw materials and then discarded at the end of their useful lives. The circular business models requires intelligent design which leads to products or their parts being repaired, reused, returned and recycled.<sup>(1)</sup>

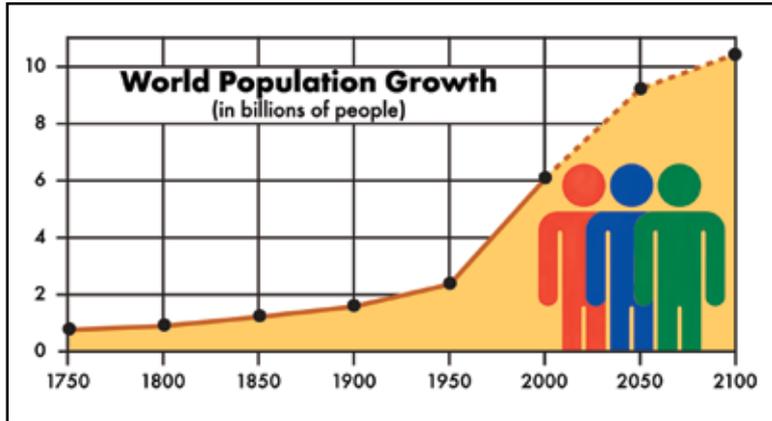
The concept of the circular economy drives optimal resource efficiency. Products need to be designed to be durable, easy to repair and, ultimately, to be recycled. The cost of reusing, repairing or remanufacturing products has to be competitive to encourage these practices. Simply replacing a product with a new one should no longer be the norm.

Without a life cycle approach, it is impossible to have a genuine circular economy.

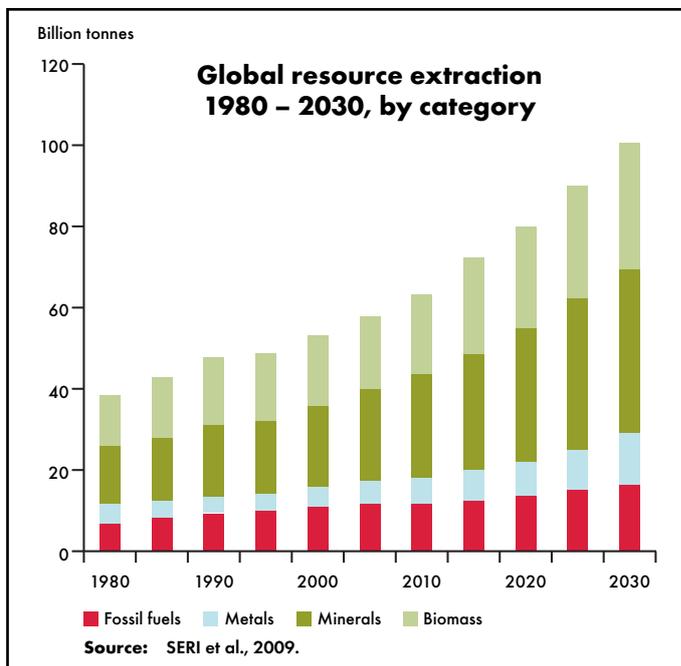
Why must our society push for the circular economy?<sup>(2)</sup>

- Population growth puts increasing pressure on authorities to act.
- In Europe there is a desire to invest in supply security which at current speed of consumption is being jeopardized.
- We wear a huge responsibility for future





(Source: Bauke Bonnema – Tata Steel)



generations, so striving for sustainability has become a moral duty.

- We need to capitalize on the huge potential in financial-economic, social and environmental benefits of a circular economy.
- We are strongly dependent on imports. This is a major strategic risk that has to be reduced.

The change from a linear to a circular economy offers a number of direct and indirect benefits:

- Saving 2.9 – 3.7 trillion \$ in 2030 worldwide through increasing resource efficiency (McKinsey, 2011)

- Supply security
- Development of new knowledge
- Boost innovation
- Creation of new (industrial) activities

On the other hand, we encounter a number of challenges in changing from a linear to circular economy:

- Institutional (vested interests)
- Organizational (no coordination)
- Legal (legislation slows down innovation)
- Economical (current focus on existing business models)
- Technical (today innovations are mainly aimed at sustenance)

**Construction a priority**

Quick wins can be achieved if we focus on construction.

Circular construction means building the LEGO way. A building is designed in order to be able to dismantle its components easily at the end of the buildings’ service life. We then either reuse them or give them back to nature.

In the linear model resources are transformed into building products and components, which are demolished at the end of the lifetime of the building and discarded in landfills. In the best case scenario steel may be recycled, while other materials are usually down-cycled (concrete) but often end up as pure waste of value. Not to mention the environmental damage.<sup>(3)</sup>

**Another way of building**

Infrastructure needs to be changed through:

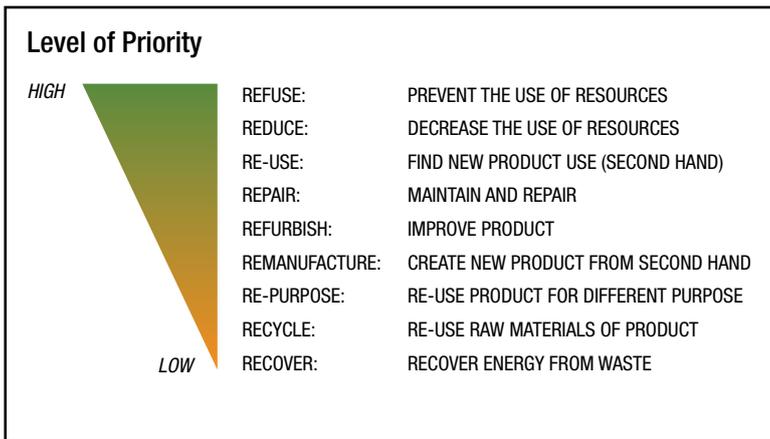
- Design flexible and adaptable buildings, which provide basic functions for extended periods, yet at the same time can be adapted.
- Design in a ‘re-functionable’ way. At design stage take into account future new functions and new users for a building.
- Make sure that components are

re-usable and design the building accordingly.

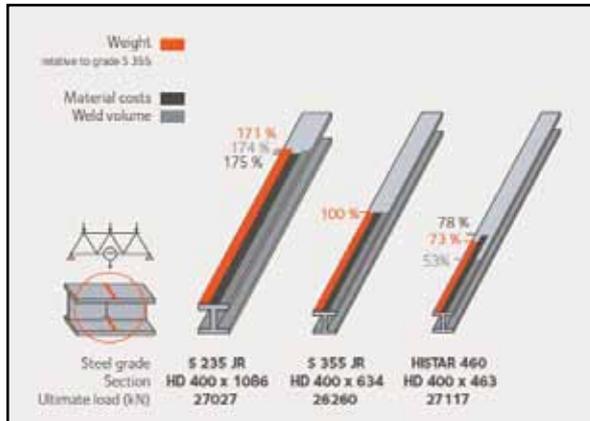
- Use resources with a high residual value; preferably steel because steel may be easily dismantled and can provide a premier second life.

**The R's in the circular economy**

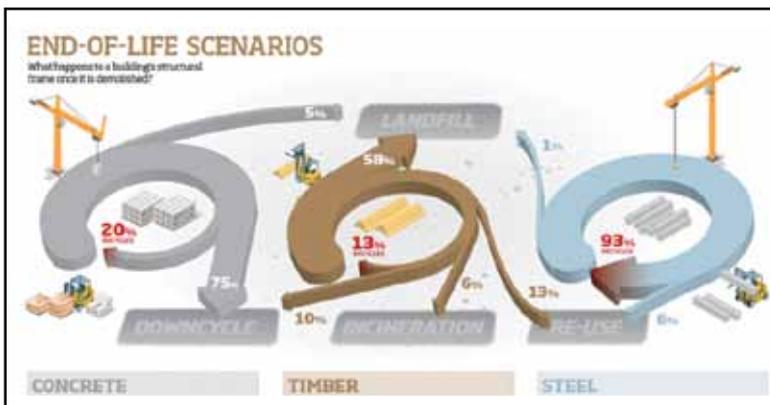
A commonly used model for the circular economy



(Source: Jacqueline Kramer – Utrecht Sustainability Institute)



(Source: ArcelorMittal)



**The case for steel and hot dip galvanizing<sup>(5)</sup>**

How does steel fit in and where lies its competitive advantage over competing materials?

**REDUCE:** Reducing the weight of products, and therefore the amount of material used, is key to the circular economy. The steel industry is actively promoting and developing the use of high-strength and advanced high-strength steel grades in many applications. These grades contribute to the light weighting of applications where less steel is needed to provide the same strength and functionality.

**REUSE:** Due to its durability, steel can be reused or repurposed in many ways, with or without remanufacturing. Reuse of steel is not limited to its original application. Rates of reuse will increase as design for reuse and recycling and resource efficiency become typical.

**REMANUFACTURE:** Many steel products, such as automotive engines and wind turbines, can be remanufactured for reuse to take advantage of the durability of steel components. Remanufacturing restores durable used products to like-new condition. This differs from repair, which is a process limited to making the product operational, as opposed to thorough disassembly and restoration with the possible inclusion of new parts.

**RECYCLE:** Recycling has been carried out since steel was first made. Steel is 100% recyclable and can be recycled over and over again to create new steel products in a closed material loop. Recycled steel maintains the inherent properties of the original steel. The magnetic property of steel ensures easy and affordable recovery for recycling from almost any waste stream while the high value of steel scrap guarantees the economic viability of recycling. Today, steel is the most recycled material in the world. Over 650 Mt of steel are recycled annually, including pre- and post-consumer scrap.

In the circular economy, the steel industry has significant competitive advantages



(Source: Bauke Bonnema – Tata Steel)

over competing materials. Co-operation throughout the entire production chain is necessary to ensure that reused or remanufactured products have the same properties as new steels.

**Hot dip galvanizing**

Undoubtedly, batch hot dip galvanizing has many influences that strengthen ‘the steel case’ with regards to circular building.

**REUSE:** if designers want to integrate reusable steel elements in the structural part of a building, they should use hot dip galvanizing (HDG) as the ideal coating system. HDG steel will not suffer from demounting and remounting activities as opposed to painted steel which will need to be repainted or at least repaired. Moreover, HDG historically offers longer service life expectations to steel than any other coating systems. HDG thereby allows frequent reuse of the material.

**REPAIR:** although batch HDG requires lower maintenance compared to other coating systems, it is easily repairable if needed. Many techniques exist to repair damaged parts and they are readily available on the market today.

**RECYCLE:** Zinc is recycled from most of its applications again and again without any loss in quality. In this respect Zinc differs from many other synthetic materials for which recycling leads to a lower quality (down cycling) or for which high-energy-recovery is the only way to make further use of a product after the service phase.

(Source: Cepezed)





(Source: Cepezed)

### Conclusions

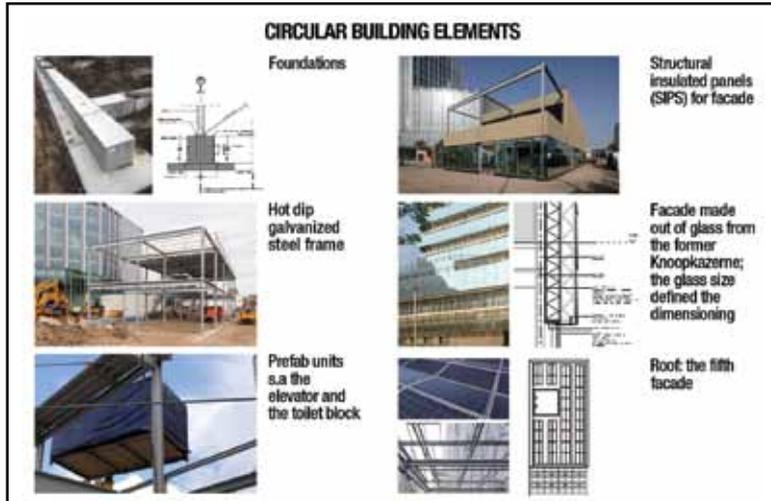
- A shift from linear to circular economy is inevitable and has already started in Europe.
- A useful model can be developed based on the 10 R's
- Collaboration at early stage between stakeholders within the construction chain is already underway.
- Role of the industry in design and manufacture products for circular use is necessary.
- Role of the authorities require that they:
  - o initiate (through circular sourcing),
  - o stimulate innovation
  - o facilitate bottom up initiatives (repair shops, etc.)
  - o adapt regulations
- Steel has a strong case with hot dip galvanizing strengthening the pro-steel opportunity.
  - Hot dip galvanized steel:
    - o Is easily demountable and remountable
    - o Is suited for designing prefabricated elements

- o Provides the highest % recyclability when compared to concrete, wood or synthetic / polymer materials.
- o Hot dip galvanizing ensures low maintenance cost, lower lifetime costing affecting long term returns for serious investors.
- o Hot dip galvanized steel requires very limited or no repairs before reuse.
- o Hot dip galvanized steel provides excellent Total Lifetime Costing when compared to painted steel.

The following cases are evidence of the practical nature of the circular economy and the use of hot dip galvanized steel at this time in Europe.

### The Greenhouse – Utrecht (2018)<sup>(6)</sup>

In 2014, Cepezed was commissioned to convert the former Knoop Barracks in Utrecht into a modern government office complex. The Central Government Real Estate Agency (Rijksvastgoedbedrijf) requested, as part of the project, a solution for the space between the barracks and the neighboring Rabobank head office. As a definitive use for this



(Source: Cepezed)

location does not have to be determined until fifteen years from now, a temporary function was sought to liven up the site, which otherwise would remain unused. A plan was developed whose function and architecture was based on the circular building concept model.

The Green House houses a 'circular' hotel/catering concept plus conference facilities. True to the principles of circularity, the entire building can be disassembled. In fifteen years, it can be taken apart and rebuilt at another site. Re-use also played an important part in the choice of materials for the project.

The two-layer pavilion was designed as a generic construction steel frame comprised of hot dip galvanized profiles able to be disassembled for reuse elsewhere. While dimensions were derived from those of the smoked-glass facade cladding of the former barracks – the cladding was re-used for the building's second skin and the pavilion's small greenhouse.

The Glass House's circularity can also be found in the fact that the right floor was selected for the right location. Pavement stones from an old quay in Tiel were employed for the ground floor in place of the usual poured floor. They lie on a compacted layer of sand with floor heating. The floor in the second layer consists of prefabricated timber elements.

For the roof, light perforated steel plate, filled with insulation, was opted for.

The eighty-square-meter vertical-farming greenhouse is located in the second layer, beside the conference rooms. Here, vegetables and herbs are grown for the restaurant. A mezzanine in the pavilion renders the (publicly accessible) greenhouse clearly visible from the restaurant below. Large green walls also substantially contribute to the overall feel of The Green House. The pavilion's roof is filled with solar panels.

The Green House features a 'first': a plugless kitchen in which meals are prepared without the use of electricity, but, rather, with energy-efficient ovens heated with renewable fuels.

#### **Motivation for the use of hot dip galvanized steel for The Green House**

The circular pavilion, The Green House, is to remain at its present location in Utrecht for a limited period. Following this initial use, it will take up a new function at a new location. The design's relocatability is facilitated by a modular and reassemblable construction system, featuring a steel main load-bearing construction. Owing to their high degree of precision, steel components are easy to take apart and put together again. A special feature of the steel frame of The Green House is its square grid, with which multiple building configurations are possible with one-and-the-same construction kit.

Both the pavilion's structure and steel profiles are fully visible. In terms of appearance, the hot dip galvanized steel underscores perfectly the bold character of The Green House and the urban-farming greenhouse. After all, hot dip galvanized steel is often used in farmhouse construction.

Additionally, hot dip galvanizing lends itself well to disassembly and reassembly, as the coating will not be damaged through work or transport.

In devising a self-contained circular business case, the submitters also searched for sustainable materials that

were as economically advantageous as possible. Hot dip galvanized steel has a good price/quality ratio and is an excellent choice in terms of sustainability.

#### Temporary car park<sup>(7)</sup>

A temporary parking garage in Leiden, the Netherlands – The building fits into its urban planning setting at the edge of the city center. The parking floors have been divided up in a readily accessible way, with parking places that are easy to turn into, and are furnished with clear signals and signs. The facade is partly transparent, allowing a view out onto the surroundings. In addition, a minimum number of slim columns have been used, in order not to block sight lines and to provide a feeling of safety. The parking garage contains 410 parking places, but the building is very

compact, allowing the existing stands of trees along the road to be retained.

The garage will be operated by the municipality over the next 10 years. This period could possibly be extended for a flexible period of 10 years, with regard to structure and management. Ultimately, the ground has to be made available again for urban development. The use of recyclable materials means the building is easy to remove.

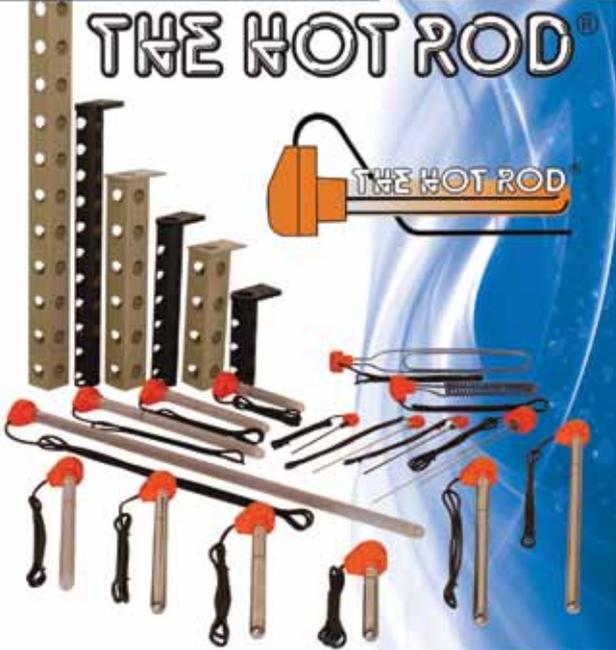
#### Hot dip galvanized steel

The entire structure of the car park is made of hot dip galvanized steel elements: columns, beams (high grade steel), cross members, fences... Hot dip galvanized steel proved to be perfect choice for a car park that had to be easily



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(Source: Continental Car Parks)

demountable afterwards. HDG doesn't require periodic maintenance and after demounting/remounting it will need little or no after-treatment. The self-healing effect of the zinc layer ensures a second life to the steel structure. Steel offers a lightweight solution allowing a design with slender columns. And as we all know, slenderness means more daylight into the building.

#### References

- (1) + (5) Brochure "Steel in the circular economy. A life cycle perspective®" World Steel Association, 2015. [www.worldsteel.org](http://www.worldsteel.org)
- (2) Jacqueline Kramer – Utrecht Sustainability Institute : "From a linear towards a circular economy" [www.usi.nl](http://www.usi.nl)

- (3) *Nederland circulair ! : E-book: " maak je bouwproject circulair"* [www.circulairondernemen.nl](http://www.circulairondernemen.nl)
- (4) *Transitieteam Circulaire Bouweconomie: Transitieagenda 2018-2023*
- (6) *Cepezed - The Greenhouse, 2018* [www.cepezed.nl](http://www.cepezed.nl)
- (7) *Paul de Ruiter Architects, Parkeergarage Centrum Morspoort, 2012*

#### Acknowledgements

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# HOT DIP GALVANIZING achieves great heights

THE HOT DIP GALVANIZING OF SCAFFOLDING HAS COME TO PROMINENCE IN THE EARLY 1990'S AS THE PREFERRED MEANS OF PROVIDING CORROSION CONTROL FOR SCAFFOLD ELEMENTS.



The advantage of hot dip galvanized scaffolding is that no "under corrosion creep" can occur as is the possibility with painted components. Furthermore, and particularly relevant to the tubes is that hot dip galvanizing of the tubes coats the inside of the tube and consequently reduces the risk of undetectable corrosion from within.

For these reasons, hot dip galvanizing of scaffolding components has now become the preferred and in some instances legislated, technology for corrosion control of scaffolding components in Europe. We have largely followed suit in S.A.

Related to the coefficients of friction of hot dip galvanized scaffold planks, the zinc and zinc iron alloy layers that form on the surface are not the dominant factors in determining the available traction.

For general interest only the following coefficients are used in general design considerations:

Steel to steel – dynamic coefficient of friction approximately 0.4 to 0.6

Zinc to steel – dynamic coefficient of friction approximately 0.45

These studies and the figures quoted above however bear little or no relation to understanding the quality of traction between workman's safety boots and the hot dip galvanized scaffold planks. It is safe to say that the greatest influence on traction would be the type and condition the workman's boot, the dynamic of walking and the cleanliness of the scaffold plank. Here spillages or pooled water may be a factor. Other important factors will include the size, shape and prominence of the "rosettes" stamped into the surface of the plank to assist with grip, as well as the spacing between the rosettes.

Smartly designed scaffold systems that are hot dip galvanized and well maintained in the field result in safe and durable systems.

# HOT DIP GALVANIZING

## in the service of the False Bay rail line



**IN A SEVERE MARINE ENVIRONMENT THERE IS NO SAFER COATING THAN USING HOT DIP GALVANIZING AS A PRIMER FOR HEAVY DUTY PAINT COATINGS.**

False Bay was given its name by pioneering navigators who mistook the vast natural bay for Table Bay when seeking to replenish their supplies at the station established by the Dutch East India Company in 1652.

False Bay was used as a safer winter anchorage by the company after Simon's Town was discovered by Simon Van der Stel in 1687. The lack of facilities however did not prove popular with the ships, many of which chose to risk the danger of Table Bay to enjoy the superior amenities of Cape Town. Over the next 120 years, the cape was under the control of France and the Dutch, until Britain recognized The Cape's strategic value seizing control in 1806.

The Railway Line was built from Cape Town to Muizenberg in 1882 and later extended to Simons Town in 1890, primarily to service the town that had become a Royal Navy base to protect British ships in the South Atlantic in 1813. This ended in 1957.

This False Bay coastline is notorious for its challenge to protect structures against corrosion especially those made of steel. The reasons are the following:

- 1) The prevailing wind is South East 8 months of the year which is directly onshore in most places. In Summer, this wind is exceptionally strong and due to heavy wave action, the sea spray is carried many kilometers inland.
- 2) No rain comes out of the South East so there is no wash down of sea facing structures to remove the salt.
- 3) Many areas lose the sun by lunchtime due to the proximity of the mountain which extends the time of wetting on articles, which in many cases may never get dried off by the setting sun. This is very noticeable in galvanized coatings where the sea facing side might be totally corroded but on the landside the zinc coating is still intact.
- 4) Proximity to the sea – remarkable difference in corrosion can be seen on articles placed 2 to 3 meters from the sea and effectively in the splash zone and items 10 to 15 meters away.

Faced with all of these problems Metrorail has tried and tested different coatings and materials over the years to protect their structures. These have ranged from the use of concrete in their masts, to aluminum metal spraying to different paint systems on galvanizing, and even experimenting in hot dip galvanizing the railway track. Concrete masts have proved to be durable and successful. At less

than half the cost they have replaced many of the steel ones, especially between Fish Hoek and Simon's Town where only one mast is required on the single line. On the double line, two concrete masts are required to carry the weight of the overhead booms, as against one steel mast. This brings the cost closer. Concrete failures have been limited to spalling due to rusting of the steel reinforcing. Today this reinforcing is specified hot dip galvanizing.

Steel's advantage lies in its extra strength. The strength of steel was shown to good effect in the early 1990's in Kalk Bay. A train was stationary on the track, due to fog as well as a malfunctioning signal light, when another train collided into it. Three carriages were derailed but were leaning on two steel masts over the sea. A potential disaster was averted due to

the strength of the steel, which prevented the carriages from falling into the sea.

Metro rail have tried many different paint coatings over the years as additional barriers over galvanized steel, ranging from: bitumen products, chlorinated rubber, various epoxies, polyurethane to water-based acrylics. All have proved reasonable successful specifically when the coating dry film thickness is over 150 microns. Two different water-based products have been used on the masts, the first one specified, 28 years ago with a coating thickness of about 100 microns and the second one used 20 years ago, a single pack elastomeric coating to a thickness of 450 microns. This heavy coating has proven to be very successful and items that have been painted, using this specific coating are still in excellent condition. The thin coating paint failed fairly quickly, for obvious reasons.

However, these duplex coated masts where the paint failed remain in a good condition after 28 years as the galvanized coating is in the range of 250 microns of zinc. Only those masts in the splash zone are showing signs of corrosion. Heavy steel sections over 12mm thick do not allow the galvanizer to put on anything but a very thick zinc coating. This is because the galvanizing coating thickness is determined by the immersion time in the zinc kettle and whether the steel is aluminum or silicon-killed. The thicker the steel profile the longer it is normally in the zinc bath and the heavier the final coating. In coastal areas this is a very important feature.

In a severe marine environment there is no safer coating than using hot dip galvanizing as a primer for heavy duty paint coatings. Such paints should be specified to have minimal porosity, good adhesion, UV resistance, a high solids content and be applied as a very thick barrier coating. In these environments maintenance is generally non-existent and this must always be an important consideration for the client.

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HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

# MARKING PENS

## ensure the correct choice!

Surface cleanliness is paramount in achieving good coating development when hot dip galvanizing. In short, we always say, 'if it is not clean it will not galvanize'. This is the reason hot dip galvanizing is referred to as an honest coating. Any contaminants that have not been removed during the hot dip galvanizing preparation phases will cause uncoated areas that are immediately visible to the eye.

During preparation for hot dip galvanizing, degreasing chemicals and pickling, normally greases, oils, rust, mill scale and most other contaminants, but paints other than water soluble products are not readily removed by these means. To avoid uncoated areas, after hot dip galvanizing, only water soluble paint and



appropriate marking pens should be used for identification purposes during the fabrication process.



## AFRICORR 2018



The HDGASA participated in the Africorr 2018 Expo held at the Ditsong National Museum of Military History in Saxonwold Johannesburg in July. The event hosted delegates and speakers from the entire African continent.

The forum created for the interaction between scientists and industry was well attended and all participants look forward to the next Africorr event.

# EDUCATION and training



## HDGASA LEVEL II INSPECTORS COURSE HDGASA BEDFORDVIEW

The new training room hosted the HDGASA LVL II Inspectors Course with three high level candidates in attendance. The course was run from the 14th to the 16th August 2018. The delegates favourably reviewed the course and the Association was also very pleased with the full and active participation of those attending.

Excellent results were achieved by all three candidates achieving higher grade passes and being accredited as registered HDGASA LVL II Galvanizing Inspectors after attaining pass marks above the required 80% threshold. Superbly well done to all !

1 Left to right: Chris Oosthuizen, Mbuso Zulu and Terence Gordon

## INCREASING our digital footprint

If you have ever visited [www.hdgasa.org.za](http://www.hdgasa.org.za) you will agree there is a wealth of information at your fingertips. Whether it is a Galvanizer you are looking for or a past issue of Hot Dip Galvanizing Today you are certain to find it at the click of a button.

For convenience you can book your place on the next training course or submit a project for our galvanizing awards.

Of greater value is our technical section. The visual evaluation guide and comprehensive guidelines to inspection & repair to hot dip galvanized coatings, with colour pictures and definitions, will give you added incite when inspecting to SANS 121:2011 (ISO 1461:2009). The information sheets provide an understanding on a number of topics, from colour variation to steel composition. If we have missed anything, you are sure to find it in the steel protection guide, technical papers or case studies. For designers and architects you will find it interesting reading the considerations when designing for Hot Dip Galvanizing.

Some new features include our Facebook page- @HDGASA and our entry into YouTube- HDGASA Hot Dip Galvanizers Association of SA.

So whether you are a like, follow, share and subscribe kind of person or you are more of an email, pop past or pick up the phone kind of person, you are sure to find informative technical content, be it in cyberspace or on the ground.



*“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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# PERSONALITY PROFILE

## GERALD HAYNES



**What general studies did you do and how did you get involved in Corrosion Control?**

A degree in Metallurgical and Materials Engineering, of which corrosion is one of the many branches of Metallurgy.

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

I'm happily married with two great kids and have a very supportive and incredible wife, so what more could you ask for in today's hectic world. My hobbies include running, cycling and calisthenics. I'm passionate about my family, life and work in general.

**What professional achievement are you most proud of?**

There are many, but in terms of the HDGASA, it is simply being one of three professional affiliate members.

**Why was hot dip galvanizing specified for the Sasol/TCTA bridges?**

We used ISO 9223 to assess the environment and define the corrosivity of the area. We took measurements from adjacent Eskom pylons that were manufactured, fabricated and erected in 1974-1976 and there was still 40-60µ of

galvanizing. Hot Dip Galvanizing (HDG) was therefore the most viable and cost effective corrosion protection system, and what paint system could give you 40 years maintenance free service?

**Can you share a little about a helicopter crash?**

We crashed in rural Mozambique in November 2012, it took almost 12 hours to be airlifted to RSA and be hospitalised, but the good news was that we all survived to tell the tale.

**Who has had the biggest influence in your life?**

My parents and close family.

**What is your philosophy of life?**

If it isn't working for you, only you can change it.

**What is your favourite reading?**

Reference materials and sources.

**Do you have any dislikes?**

Now that would be telling...

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

Still asleep, if it is five o'clock.

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

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## NEWS

## THE HOT DIP GALVANIZERS ASSOCIATION HAS MOVED OFFICES

In May 2018 we accepted an offer to move to the adjacent building, due to our neighbours wanting to expand their operation. This resulted in more floor space. We are still located in the Bedfordview Office Park, 3 Riley Road but now in building number one.

The move allowed for a bigger training room and a more direct visual presence from the parking area.

The next time you are in the area, pop in for a cup of coffee and some technical talk.

### THE CORROSION INSTITUTE OF SOUTHERN AFRICA COURSE SCHEDULE 2018



NACE CIP 1 – Coating Inspector Program Level 1  
1st – 6th October 2018      The CORē, Midrand

NACE CIP 2 – Coating Inspector Program Level 2  
19th – 24th November 2018      The CORē, Midrand

NACE PCS 1 – Protective Coating Specialist: Basic Principals  
15th – 17th October 2018      The CORē, Midrand

NACE PCS 2 – Protective Coating Specialist: Advanced  
18th – 20th October 2018      The CORē, Midrand

REGISTRATION LINK: [https://docs.google.com/forms/d/1e9ZGDsMO1Sd8aXuCvys2bst\\_r5SrpVBxuqEQPK9IfUM/viewform?c=0&w=1](https://docs.google.com/forms/d/1e9ZGDsMO1Sd8aXuCvys2bst_r5SrpVBxuqEQPK9IfUM/viewform?c=0&w=1)

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

## GALVANIZING BATH SIZES

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

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

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