GLOBAL PERSPECTIVES ON GENERAL GALVANIZING.

By
ROB WHITE
International Zinc Association of Southern Africa
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

The galvanizing industry represents the single largest market for zinc and provides the greatest opportunities to maximize the advantages of zinc to the world – that of protecting steel against corrosion, thus ensuring the longevity of the use of steel. The general, after fabrication, hot dip galvanizing industry protects around 25 million tonnes of steel per year and uses some 1.7 million tones of zinc representing around 22% or global demand. Nevertheless, the development of the industry varies from region to region and these differences, in types of markets serviced, market penetration and market maturity lead to product entering different markets and different user perceptions.

The International Zinc Association (IZA) was established in 1990 with the remit to produce a Sustainable future for the zinc industry. Therefore, through acting on behalf of the zinc producers, a major activity is the promotion of demand and the support of activities that assist in this process. The presentation will highlight some of these activities to show how developments in one region can be successfully transferred to another. Finally, the ubiquitous use of zinc in corrosion protection has allowed it to become a barometer of environmental conditions. The improvement in climatic conditions in northern Europe and the role the zinc industry sees in promoting its sustainability will be briefly discussed.

BIOGRAPHY – ROB WHITE

Rob has a B.Sc. in Chemistry and a M.Sc. in Engineering from the UK. He is professionally registered in the UK. He also holds a post graduate Diploma in Marketing Management from the University of South Africa. Rob is a past president and Gold Medal holder of the Corrosion Institute of Southern Africa and was Chairman of the 14th International Corrosion Congress held in 1999.

He has over 25 years experience in various aspects of the metals industry. He has worked in the UK (in the water industry and for the Royal Navy), the Middle East (in cathodic protection and corrosion monitoring) and in South Africa (in the mining, stainless steel, galvanizing and tube industries). He currently manages IZASA and various IZA zinc industry development projects.

TRENDS IN HOT DIP GALVANIZING TECHNOLOGIES

By
DR. FRANK E. GOODWIN
International Lead Zinc Research Organization, Inc.
Research Triangle Park, North Carolina

Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Challenges facing the hot dip galvanizing industry include the requirement to galvanize a wide variety of steels that includes many new grades, provide increased corrosion protection and develop capabilities for new applications. The galvanizability of modern steel grades will be considered from both galvanizing alloy and steel response perspectives. Several new alloys have been introduced in recent years to reduce reactivity and improve uniformity of appearance. A greater reliance upon recycled vs. primary steels, together with improved productivity of welding processes, has led to reassessment of steel galvanizability issues and processing needed to assure high quality production. Several new coatings, based on the Zn-Al system have been proposed from different research efforts and a review of the current status will be provided. Finally, new applications, including atmospheric applications that depend upon better quantification of the actual environment, together with growing applications for galvanized reinforcing bar in concrete, will be discussed.

BIOGRAPHY - DR. FRANK E. GOODWIN

Dr. Frank Goodwin joined ILZRO in 1982 as Manager of Program Development after serving as Assistant Director of Product and Process Development at Chromalloy Research and Technology Division in Orangeburg, N.Y.

Following his appointment as ILZRO's Manager of Metallurgy and Program Development in 1984, he was then promoted to Vice President of Materials Science in 1986. In February 2004, Dr. Goodwin was named Executive Vice President of ILZRO and also Director of Technology and Market Development of International Zinc Association.

He holds a S.M. and a Sc.D. in Materials Engineering from the Massachusetts Institute of Technology in Cambridge, MA and is the author of several U.S. and foreign patents as well as numerous articles and contributions to books.

INFLUENCE OF ALLOYING ELEMENTS IN MOLTEN ZINC WITH A SPECIAL VIEW ON GALVANIZING OF REACTIVE STEELS

By
ROGER PANKERT
Umicore Zinc Alloys, Belgium
Presented to
The Hot Dip Galvanizing Conference
Sandton, South Africa
February 6-7, 2006

ABSTRACT

In a general galvanizing bath, besides the Zinc and the Iron, some other elements are systematically added in order to influence:

- The mechanical properties of the Zinc like viscosity and surface tension
- The Zinc pick-up during the galvanizing of reactive steels
- The homogeneity and aspect of the galvanized material.

This paper describes the influence of most used elements with respect to the above mentioned topics. Based on the joint effects of different alloying elements, the working mechanism of several alloys for general galvanizing will be explained.

Finally, as for the different steel grades to be galvanized, the paper gives an indication about the alloy offering the best compromise between coating properties and economic situation.

BIOGRAPHY - ROGER PANKERT

Dr. Pankert was born in 1953 in Eupen, Belgium. After finishing school in Eupen he obtained a Masters degree in physics from RWTH Aachen, Germany and a Doctorate in material science at RWRTH Aachen.

Dr Pankert began his career as an Assistant at RWTH Aachen. He joined the steel development center in Germany to work within the cold rolling and coating sections. He is a guest lecturer at the university in Bochum. He joined Umicore in 1991 firstly to provide technical assistance to customers, he is currently responsible for R&D, Product- and Market-development within Umicore's Business Line Galvanizing

THE BENEFITS OF USING TEGOFLUX FERROKILL

By
HELMUT HERWIG
Herwig GmbH
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

The fluxing process is possibly the key pre-treatment step prior to immersion of product into the zinc kettle. Only through correct pre-treatment, however, is effective fluxing possible.

The prevention of flux contamination is important. This presentation will discuss the development and application of a new fluxing system to improve overall coating integrity. This system has proved capable of handling traditional and alloy based galvanizing systems.

Key advantages are improved zinc usage through lower ash and dross production, elemination of production interruptions and the reduction of environmental waste streams. Clearly, the need to operate the system efficiently is required.

Some key practical aspects will be discussed.

BIOGRAPHY - HELMUT HERWIG

Helmut Herwig graduated as an engineer in 1964 at the University of Engineering in Duisburg (Germany). He began his carrier as a project-engineer with a mining industry company in Germany and later with an iron ore mining company in Liberia over a period of five years.

Since 1972 he has been involved in the hot dip galvanising business with an engineering firm specialising in the corrosion prevention of metals.
He provides chemicals, zinc alloys and consulting services to the galvanising industry in Europe, South America, Middle America, Africa, Middle East, Asia and North America.

FLUXING – GETTING BACK TO BASICS

By
RIAAN LOUW
Barloworld Galvanizers
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

This project was a six sigma initiative to reduce zinc consumption of the galvanizing operation at Barloworld Galvanizers. By utilizing the Six Sigma methodology all the different factors that can affect zinc consumption is analyzed. The presentation is in fact a journey through the six sigma methodology and how it was used to optimize a flux solution and thereby reducing zinc consumption.

Six Sigma is a proven, data driven process focusing on process improvements and cost savings. The methodology is utilized by most major companies throughout the world such as Ford, Motorola, General Electric, Lear, and 3M to mention but a few.

BIOGRAPHY - RIAAN LOUW

After graduating as a physical metallurgist in 1981 Riaan joined the Armourments Corporation of SA. From the outset Riaan was involved with the corrosion protection of steel and spend the first 9 years of his career doing extensive research in the wear resistant properties of steel that suffered from high temperature erosion and corrosion. During this period processes such as hard chrome plating, electro less nickel plating, anodizing and hot dip galvanizing was also extensively researched.

Apart from a brief spell of 5 years in the foundry industry Riaan joined Barloworld Galvanizers, formally known as Monoweld. It is really during this period that his keen interest in hot dip galvanizing developed and it was the ideal playground to further his knowledge in this field.

In 2003 Riaan got involved with the Six Sigma methodology – a quality improvement initiative aimed at optimizing processes and cost saving. As a full time six sigma specialist most of the projects were obviously aimed at process improvement in the galvanizing industry.

Riaan is currently the operations director at Barloworld Galvanizers and is also the master black belt for six sigma and involved in the groups best practices initiative.

SAVINGS IN ELECTRIC HEATED KETTLE GALVANIZING SYSTEMS

By
TERJE EVENSEN
C.H.Evensen Industriovner AS
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

CHE develops, designs and produces industrial furnaces and heating equipment for a variety of heat treatment processes, but is more well known for heat treatment furnaces for aluminium and furnaces for hot dip galvanising. CHE owns Scangalv AB, a Swedish marketing company of complete galvanising lines and various equipment for the hot dip galvanising industry.

CHE installed its first electric heated galvanising furnace in 1950 and from then on pioneered the development of top heated ceramic lined galvanising baths, a majority being electrically heated. Later the Silicoat immersion heating rod was developed as well as a new design of resistance radiant wall heating for steel kettles. The energy balance of this type of galvanising furnace is discussed together with figures on energy consumption and how and where energy savings can be made.

BIOGRAPHY - TERJE EVENSEN

Terje Evensen is a Mechanical Engineer from Birmingham University, UK. After working as Design Engineer in the UK and Canada for 4 years, he joined C.H.Evensen Industriovner AS, Norway in 1973 as technical manager, and later on he became Managing Director of the company.

DOES THE ZINC PRICE MATTER?

By
Mark Willoughby
Zinchem
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Since August 2004 the LME Zinc price in Rands has doubled from a level of just over R6000 per ton to over R12 000 per ton. This very large increase in the price of the main raw material input for the galvanizing industry has placed a significant squeeze on the profitability of the industry which has not been able to increase prices to end users to recover the increased cost of the zinc input. Particularly in instances where long term contracts have been entered into on a fixed price basis, profits have been severely compromised.

The proposition is made in this paper that Zinc metal hedging can be used very effectively to reduce the risk of price volatility we have seen over the last 18 months and that through a combination of utilising hedging as an effective risk management strategy and customer price management, the Zinc price does NOT matter.

An overview of basic principles of hedging will be presented including a framework to assist in arriving at a decision if hedging is appropriate under a given set of circumstances or not and a number of simple practical examples showing how the process can actually work will be covered.

BIOGRAPHY - MARK WILLOUGHBY.

Mark Willoughby started his career as a sales engineer Air Products in 1986 rising though the ranks to hold positions of field sales manager, strategic planning manager, regional sales manager and national sales manager. He left the company in 1996 to join African Products as national sales manager, a position he held for the next 5 years. In 2000, with a security background gained through serving as a Major in the citizen force he was enticed to join the Chubb Group as sales and marketing director of the Safes Division. In 2003 Mark joined Zinchem as commercial director.

Mark has a BSc degree from Wits, has completed the MAP and EDP programmes at the Wits Business School and has a IMM diploma in marketing management.

THE TREATMENT OF HYDROCHLORIC ACID IN PICKLING OPERATIONS

By
Belinda Mew
Metsep
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Today's pickle plant operators in the steel manufacturing and processing fields have a complete solution to what is often considered to be their biggest problem: how best to manage their spent hydrochloric acid.

Metsep, through a series of dedicated, customer-focused services and processes, helps pickle plant operators to dispose of their waste acid simply, efficiently and cost effectively without risking the well-being of their production personnel or the environment.

Our core objective enable companies to manage, with optimum effectiveness, the waste acid generated from the steel treatment process. This is especially relevant for companies that have high standards for their quality and environmental management programmes.

BIOGRAPHY - BELINDA MEW

Belinda Mew was born and raised in Johannesburg and has been with Metsep for the last 3 years. She is the Communication Bridge between the customer and the Metsep operation. Her main functions are marketing, customer service and logistics. She has 10 years experience in Marketing and sales.

CHANGES IN THE SOUTH AFRICAN ENVIRONMENTAL LEGISLATION.

By
WILLIE POTGIETER
ECOpot CC
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

The promulgation of the Environmental Conservation Act, No 73 of 1989 was the first step towards the establishment of an integrated environmental management system in South Africa. Following upon this initiative, in order to meet the requirements of the new constitution, viz. to promote a clean and healthy environment for everybody, and to work towards an integrated environmental management system, it became evident that further new legislation had to be promulgated.

The aim of the newly promulgated legislation is,

- to work towards an integrated environmental management system,
- to promote conservation and secure ecologically sustainable development and
- to prevent pollution and the degradation of the environment.

The new legislation includes, i.a.,

- the National Environmental Management Act,
- the Water Act and
- the recently published Air Quality Act.

The aim of this paper is to briefly point out the changes that resulted from the new legislation in the field of environmental management in South Africa and to highlight the new challenges that all of us, but in particular industrialists, face.

BIOGRAPHY - WILLEM ALBERTUS POTGIETER

Mr. Potgieter has a B. Sc. (Chemistry and Physiology) and a B. Sc. (Hon.) Physiology/Biochemistry from Potchefstroom University for CHE. He also has a Post Graduate Diploma in Air Pollution Control Administration from the University of Southern California

Mr. Potgieter has worked in various capacities in the environmental and air pollution fields from 1967 to 1974. He then became the Chief Officer Air Pollution Control for the Pretoria City Health Department for 5 years and the Chief Air Pollution Control Officer of the Department of National Health for 16 years.

He is currently a Consultant in Environmental Matters with Ecopot cc.

He has been a **Member of the National Association for Clean Air** since 1979 and is a member of Professional Natural Scientist (Environmental Scientist) and S.A. Council for Professional Scientists.

FROM DECISION TO RECEIPT

By
TERRY SMITH
Hot Dip Galvanizers Association of Southern Africa
Johannesburg
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Based on references from other end-users / specifiers or past successful project experiences, the decision to specify hot dip galvanizing for structural and other steel components for new projects, can be a rewarding one for a number of reasons.

One of the major benefits of hot dip galvanizing is the aspect of long-term maintenance free service life that is available to the client, saving enormous amounts of capital, normally spent on coating maintenance over the prescribed life of the project.

Hot dip galvanized coatings perform very well in most atmospheres and imperfections in the coating, such as lumps, runs; protuberances, excessive dross, etc. will not necessary reduce the coating's corrosion protection performance. However, in order to avoid these aesthetically unacceptable imperfections, there are a number of steps that can be taken by the specifier and the galvanizer to ensure a greater degree of quality control and all round client satisfaction at the receipt stage of the project.

BIOGRAPHY - TERRY SMITH

Terry Smith has been intimately involved with the design and drawing of steel and reinforced concrete structures for about 20 years. He began as Technical Manager of an electrical wiring distribution and mechanical support systems company, he became intimately involved in the design of new products, most of which were required in corrosive environments. Materials ranged from structural steel - painted, hot dip galvanized or duplex coated, to aluminium, 3CR12, stainless steel and also glass reinforced polyester (GRP). The duplex concept, of powder coating hot dip galvanized mild steel components caught his interest for a number of reasons. Most important of which were cost and corrosion effectiveness.
Terry joined the Hot Dip Galvanizers Association of Southern Africa in 1996. He fills the post of Technical Marketing Director of the Hot Dip Galvanizers Association Southern Africa. His scope of work includes:

- Consulting on all aspects of hot dip galvanizing including process, standards, durability, QC and corrosion protection
- Promotion of the coating to specifiers
- Education and training of members and inspectors
- Involvement in the development of corrosion protection standards for capital projects
- Involvement in the SAISC and serves on two committees, Marketing and Membership, and the SAQCC where he is an Executive Committee Member and sits on the National Panel of Examiners.

HOT DIP GALVANIZING – THE VIEW OF STEEL WORK FABRICATORS

By
SPENCER ERLING
Southern African Institute of Steel Construction
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

"Hot dip galvanizing of steel work is, in a well-executed form, an extremely cost effective and long lasting corrosion protection system when used in most non-chemically corrosive environments."

Why then is it that many steel work fabricators do not appear to be of the same opinion?

Unfortunately the Hot dip galvanizing. process is the ultimate of "split responsibility processes" and is fully dependent upon the all parties doing their "bit" correctly to ensure a successful coating. With this split responsibility it is "Oh so easy" for the fabricator to blame the galvanizer for any short.comings that may occur in the system, often without looking carefully at his own shortcomings.

For a successful coating to be applied requires a serious commitment from all the players at all the stages of the process.

This paper covers some of these aspects and suggests a way forward to ensure that all the parties views will concur with the opening statement.

BIOGRAPHY - SPENCER ERLING

Spencer Erling has lived all his life in Johannesburg. He was schooled at Parktown Boys High; he graduated from Wits as a Civil engineer in 1966 and from the University of Cape Town with an MBA in 1969.
He served in the military in 1968 where he was fortunate enough to have been employed as an engineer with the rank of lieutenant.
From 1969 to Sept 2001 Mr Erling was employed in the structural steel contracting industry and have at various times covered every aspect of the industry from Design to Final hand over of virtually all types of steel structures from farm sheds to shopping malls; from mining plant, conveyors, shafts and heavy equipment (stacker reclaimers etc) to High rise structures, both in SA and in the Export market particularly the Middle East.
Since October 2001 he has been the Education Director of the Southern African Institute of Steel Construction where he also runs the advisory service
He is a fellow member of SAICE (SA Institution of Civil Engineering) and a member of the Institute of Structural Engineers (UK chartered engineer).

WELDING CONSIDERATIONS WITH HOT DIP GALVANIZING

By
JOHN DU PLESSIS
South African Institute of Welding
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Galvanizing has been in use for hundreds of years. Zinc forms a protective barrier between the steel and the environment. Welding steel before and after galvanizing is common industrial practice. Galvanized steel can be satisfactorily welded by all commonly used welding processes.

When welding steels, before hot – dip galvanizing, normal welding practices can be followed with a few exceptions. The weld metal and base metal chemistry must be matched to ensure even galvanizing coating thickness and appearance. The weldment and surrounding areas must be made free from slag and spatter before galvanizing. The design of the structure must be adapted to be suitable for galvanizing.

During the welding of galvanized steel closer control of the welding conditions are needed than when welding uncoated steels. Welding procedures are simple and well established. The major differences between welding galvanized and uncoated steel are that when welding galvanized steel larger root openings are required as well as a reduction in the travel speed used during welding.

The mechanical properties of the welded joints in galvanized steel are not adverse affected by the galvanized coating. The mechanical properties are similar to those of uncoated steels. The zinc will volatize during welding. The amount of welding fumes generated will be larger when welding galvanized steel than when welding uncoated steel. The zinc fumes could be hazardous if inhaled during. Adequate ventilation, local fume extraction and respiratory equipment should be used to ensure that welders are not exposed to the welding fumes.

BIOGRAPHY – JOHN DU PLESSIS

Mr. John du Plessis has a BSC Metallurgy; a BSc (Hons) Metallurgy and an MSc Engineering Management from the University of Pretoria
He is a registered professional scientist and is a Member of American Welding Society as well as the International Institute of Welding Subcommision 2C and ASM International. He has served as a member of the Executive Committee of Transnet Athletics club.
Mr du Plessis was previously an independent consultant with Spesmet Technology; thereafter a development metallurgist and then Factory Manager : Welding Consumables Factory with African Oxygen Limited (Afrox); and then with Spoornet in various capacities including a Metallurgist, then Manager : Scanning Electron Microscope Unit; thereafter Manager : Dynamic Test facility; lastly as Technology Manager: Material Properties. He is currently the Technology Manager of the Southern African Institute of Welding.

THE ROLE OF SUSTAINED BENEFITS IN THE ECONOMIC AND OPERATIONAL LIFE CYCLE OF HOT-DIP GALVANIZED STEEL STRUCTURES

By
RHC ANDREW
Bob Andrew Consulting Value Engineers CC
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

A significant advantage of hot-dip galvanized steel is its long term durability in a wide range of corrosive applications. Excellent adhesion of the zinc coating to the steel substrate and the sacrificial nature of its corrosion protective mechanism provide a high degree of tolerance to mechanical damage of the coating during service. The sustained benefit of durability is an important factor in the life cycle cost of hot-dip galvanized structures as well as mitigating risks of high maintenance costs and premature failure. This paper outlines practical methodologies for evaluating life cycle costs for hot-dip galvanized steel and conventional painted steel structures and for evaluating financial and technical risks during service.

BIOGRAPHY - RHC (BOB) ANDREW

Bob Andrew holds a BSc (Chemical Engineering) from the University of Witwatersrand and an MSc (Corrosion Science) from the University of Manchester. He has worked for the CSIR, AECI, JCI Ltd and Anglo Platinum, as well as a private Consultant. His career in corrosion science and engineering has spanned 35 years in the areas of fundamental research, applied research and development, consulting and the management of all aspects of corrosion protection and material selection. He is a retired Fellow of the SA Institute of Mining and Metallurgy, a retired Professional Engineer, a retired member of NACE and an Honory Life Member of the Corrosion Institute of Southern Africa and the Hot-dip Galvanizers Association of Southern Africa. He is the author of book on corrosion protection guidelines for the mining and metallurgical industry, published by NACE in 1997, and the author of numerous technical papers on corrosion engineering, published both locally and internationally. He has also had papers published on creativity and innovation in business and on knowledge creation and sharing by the *Sunday Independent*, the Journal of the Institute of Marketing Management and various Knowledge Management publications.

On retiring from Anglo Platinum in 2000, Bob has continued as a private consultant in the fields of corrosion engineering, knowledge management, value engineering e-learning and partnership building.

THE USE OF HOT DIP GALVANIZED STEELWORK IN SHAFTS AND OTHER UNDERGROUND APPLICATIONS AND THE PRACTICAL CONSIDERATIONS AND IMPLICATIONS THEREOF.

By
CHARLES HOWARD
Black Mountain (a division of Anglo Operations Ltd)
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

The benefits of using hot-dip galvanized steelwork, as opposed to conventional painting and other methods of corrosion protection, is becoming more and more evident in underground mining applications. The use of hot-dip galvanized steel is increasing dramatically and there is now a wide range of applications for shaft steelwork and other forms of steelwork in underground conditions.

The Black Mountain Deeps Project has made extensive use of hot-dip galvanized shaft steelwork in its Deeps main shaft. During the manufacturing and installation of the galvanized steelwork for the Black Mountain Deeps project, various problems and obstacles were encountered. The problems arose due to several issues that had not been foreseen in some of the applications.

The paper also details the precautions that had to be taken and requirements needed right from the design stage through fabrication, handling, installation and commissioning.

BIOGRAPHY - CHARLES HOWARD

Charles Howard has a National Diploma - Mechanical Engineering; and Government Certificate of Competency Mines and Works – Mechanical and Government Certificate of Competency Factories – Mechanical. He is a registered Professional Certificated Engineer and a Professional Construction Project Manager.

Mr Howard has 30 years working experience on the mines particularly with trackless mechanised mining and projects. The projects are predominantly constructing new infrastructure, shaft sinking, lining and equipping.

Mr Howard's current position is that of a Project Manager responsible for the Black Mountain Deeps Project. The project consists of the design, construction, installation of infrastructure and the shaft sinking, lining and equipping of one main and one ventilation shaft. The value of the project is US$110 million.

TRUE LIFE CYCLE COSTING WITH DUPLEX COATINGS

By
MIKE BOOK
Proprietor – Duplex Coatings and Bulldog Projects
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

A Coating system that is designed to fail, will fail.

Costs that have an impact on True Life Cycle Costing are:

- First costs
- Lifetime costs

First Cost
First Costs include all material, labour and supervision to apply the corrosion protection system during the initial construction period. Often during the course of a construction project decisions on corrosion protection becomes secondary to other engineering/budget issues and it is very tempting to take a minimum cost approach and deal with any problems later. This is easy for the construction team to do, as they handover and move on and leave the problems for the Maintenance Engineer to sort out. There is a well known saying that "the Painters on the Golden Gate Bridge have a full time Job: by the time they finish the one end, they start at the beginning again". This is not necessary with a Duplex System.

Lifetime Costs
This will be determined by the number of times the coating requires maintenance during the structure life, resulting in additional costs for access scaffold, loss of production, etc.

ISO 12944 Corrosion Protection of Steel Structures Parts 1-8 (1998)
The ISO 12944 standard is intended to assist Engineers and corrosion experts in adopting the best practices in the corrosion protection of structural steel for new construction works.

BIOGRAPHY – MICHAEL BOOK

Mr Book was born in 1953 in Bulawayo, Zimbabwe. His experience includes 34 years in the corrosion protection industry working as a Contractor in the Democratic Republic of Congo, Zambia, Tanzania, Turkey and all countries south of the equator. He is Proprietor of „Duplex Coatings and Bulldog Projects". He is an an affiliate member of the Hot Dip Galvanizers Association and serves on the Executive Committee. His interests include golf and fishing.

GALVANISING ARCHITECTS INTO ACTION: A VIEW ON HOW TO PROMOTE THE USE OF ZINK THROUGH SPECIFICATION BY ARCHITECTS.

By
AL STRATFORD
Stratford Architects
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Professional Registered Architects, amongst other built environment professionals, are currently responsible for specifying about 50 % of the materials that contribute to the annual top structure 'build spend' in South Africa. This talk looks broadly at the strategy that may be adopted by purveyors of building materials (and innovative use thereof) to encourage appropriate use and specification through architects, in particular, and other decision makers who influence the built environment.

Images of the aesthetic use of Zinc in architecture are presented together with functional galvanised products as a precursor to understanding the motivating forces that drive architects and other specifiers in the choice of building materials.

BIOGRAPHY - AL STRATFORD

Al Stratford is best known in South Africa for his development of innovative building technology. In particular, the WiN*blok*® Pre-cast Concrete Window System has been widely used in Southern Africa and South America.

Al is a unique multi-skilled individual with a formal education in mechanical design, experience in structural design, industrial design, production, building management and architecture. This experience has been generated through thirty five years of work in these fields linked to the management of his entrepreneurial endeavours. Al registered as an architect despite having no formal education in this discipline. This was accomplished through a passion for architecture, peer recognition by members of the South African Institute of Architects and the writing of a special qualifying examination in Professional Practice through the South African Council for the Architectural Profession in 2002.

Al has undertaken has resulted in numerous patents, registered designs and national awards from the SABS Design Institute, The South African Institute of Architects and other national organisations including the Industrelek Hot Dip Galvanising Award for 2001

Currently Al is practicing as an architect and continues to direct WINTEC® which develops and licences innovative building technology. He and Iris, live, work and sometimes play from their award winning guest house in East London.

MTN HEAD QUARTERS
ARCHITECTURAL USE OF HOT DIP GALVANIZING – ABSTRACT

By
TOMMÉ KATRANAS
Africon
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

From practical experiences attained during Phase 1 of the MTN Head Office project, where for a number of reasons the originally specified hot dip galvanized handrail was replaced by an equivalent stainless steel member, a number of valuable lessons were gained.

At the insistence of the HDGASA, numerous additional measures were introduced and accepted by the specifiers on the project, prior to Phase 2. These included, greater communication during the planning stage, between the architects, MTN (the owners) the structural engineers and the HDGASA. One such result was the compilation of an architectural checklist, by the HDGASA team for use by the specifiers, fabricators and the galvanizers on the project.

Further involvement by the HDGASA included technical advice in the manufacture of samples for approval and the attendance of certain strategic site meetings to assist the project team to eliminate potential problems.

Although not completely free of hot dip galvanized coating imperfections, the entire project stands as a fine example of the achievements that can be obtained as a result of high level co-operation between the project team members and the involvement of the HDGASA.

BIOGRAPHY - TOMMÉ KATRANAS

Mr T Katranas is a Technical Director at Africon, a large consulting engineering firm, who is responsible for the structural design, specification, detailing and construction supervision of projects.
Since graduation, Mr Katranas has gained extensive experience in the field of structural engineering. He has been responsible for the design and construction supervision of diverse projects including bridges, office and residential blocks, leisure facilities, retail buildings, schools, industrial buildings and civil structures. Mr Katranas has also been highly involved in the design of various facilities at existing airports e.g. maintenance hangars, terminal buildings, retail areas etc. and in doing so has gained valuable experience pertaining to structural alterations and additions within existing buildings. He is fully skilled in designing structures using reinforced and prestressed concrete, composite steel-concrete construction, timber, brickwork, and particularly well experienced in the field of structural steelwork. Through international projects he has gained valuable exposure to the construction industries in the middle east (Bahrain), far east (Malaysia and Vietnam) and Southern African neighbouring states.

CORROSION RESISTANT STEELS FOR REINFORCED CONCRETE STRUCTURES – A REVIEW OF CURRENT OPTIONS

By
Dr. RODERICK G.D. RANKINE
Cement and Concrete Institute
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

Worldwide, the corrosion of reinforcing steel in concrete structures continues to be their single biggest durability problem. The mechanisms of this deterioration are well understood and documented so that new structures can be designed and built to withstand corrosion. Nevertheless, despite this available knowledge, many recently built structures continue to suffer corrosion damage.

One trusted method of combating the problem has been to specify austenitic stainless steel reinforcing. Unfortunately, this material has always carried a precious metal price tag that has precluded its use in all but extreme environments and consequently it has never been produced in South Africa.

A more cost-effective option is the use of ordinary black steel reinforcing that has been hot dip galvanized. Existing concrete literature cites several initially convincing reasons not to specify hot dip galvanized reinforcing in concrete and consequently it has been seldom used in South Africa historically.

This paper explores the potential of hot dip galvanized reinforcing with reference to twenty structures built throughout South Africa during the past three decades. It provides possible explanations of why actual performance sometimes deviates from conventional expectations and it dispels a number of common misconceptions. Lastly, it provides some guidance for appropriate specification.

BIOGRAPHY: Dr. RODERICK G.D. RANKINE

Roderick Rankine is an expert in construction materials and is currently employed by the as a professional engineer and concrete technologist. His current title is Education and Training Manager but he also undertakes technical investigations of concrete related problems. In the late 1980's, he undertook a technical investigation on behalf of Middleberg Steel and Alloys – now Columbus to define appropriate properties for corrosion resisting steels such as 3CR12 to reinforce concrete. In the 1990's, he worked for the company R.J. Southey aboard the oilrig Actinia during the final stage of the Mosgas Project before starting Rankine Engineering and later joining Wits University as a lecturer. During this period, he explored several methods of combating corrosion in various environments and has become a strong advocate of hot dip galvanizing. He is currently an honorary lecturer at Wits University and author of more than 40 papers published in accredited journals, international conference proceedings and books.

‘A PERSPECTIVE ON THE LIMITS OF APPLICATION OF GALVANIZED STEEL IN STRUCTURAL APPLICATIONS’

By
PIET COETZER
Structa Technology (Pty) Ltd
Presented to
The Hot Dip Galvanizing Conference, Sandton, South Africa
February 6-7, 2006

ABSTRACT

The paper examines the perceived and real limits of application of galvanized steel in common and sophisticated structures in the light of structural performance, typical client requirements, limitations of competing material, development cycles and economy. The author examines some established and recently developed products in construction and infrastructure and defines the typical constraints encountered in the application of the material. A model for design philosophy and product development in pushing the boundaries of application of galvanized steel is derived and presented.

BIOGRAPHY – PIET COETZER.

Piet Coetzer is a structural engineer of some 28 years standing and he has had wide exposure to product development in aerospace, transport and infrastructure, in materials ranging from steel to modern composites.

He holds degrees in Mechanical Engineering from University of Pretoria and a Masters in Structural Design from Cranfield University, UK.

He is currently a director of Structa Technology (Pty) Ltd.