

Message From The Director

We would like to personally thank all our customers for their support which made our reputation as a frontrunner in the galvanizing industry.

Galvatec was established in 2009 to meet the needs of the hot dip galvanizing industry and has grown to become one of the largest galvanizing plants located in Riyadh, Kingdom of Saudi Arabia.

The success of our company today is a result of our long history of commitment to quality and superior customer service.

We are committed to provide High Quality coatings with "On-Time, delivery schedules at competitive prices" .

Thank you for your support & You are invited for a visit to our works or Please give us a call to discuss all your hot dip galvanizing needs.



Galvatec holding ISO 9001, ISO14001 (SAFETY & HEALTH)
& ISO 18001(ENVIRONMENT)



Dr. Nabil Al Ashoury
Director



Engr. Eid Al Ashoury
CEO & Partner



Introduction

Fabrication & Galvanizing Technologies Co. Ltd - GALVATEC is a premier hot-dip galvanizing plant, established in 2009 at the second industrial area, Riyadh, Kingdom of Saudi Arabia.

Our facility was built on a total area of a 17000 sq. m, of which, the Buildings Area is more than 6000 sq.m.

The plant is equipped with 15 meter long x 1.6 meter wide x 2.8 meter deep Zinc kettle, with 512 cubic meter Dryer, One Degreaser tank, Five Hydrochloric Acid Tanks, Two numbers of rinsing tanks, One Flux tank, One Quenching tank, One passivation tank (As per required by customer), five bridge cranes (double hoist) with a capacity of 10 tons each that run to the complete length of our facility and a monorail crane for comprehensive operation.

GALVATEC has a galvanizing capacity of 50,000 tons per year.

We expanded our services by including an Automatic Grit/ shot blasting machine to facilitate our customers' needs

GALVATEC, is technically specialized for galvanizing miscellaneous metal fabrications such as Structural Steel, Telecommunication Transmission tower members, lighting poles, pipes, welded brackets, beams, frames, rods, gratings, cable trays, cable ladders and all types of cable support systems, as well as many other items for a wide variety of customers and industries.

Mission: Our business is your business.

Our **MISSION** is to provide a **QUALITY** service that meets or exceeds the customer's expectations by:

1. Focusing on the customer
2. Employee involvement
3. Continuously improving all aspects of our business

The three **PROMISES** of **GALVATEC's** to our customers are:

(Quality, Service and Value)

Quality:

The commitment to quality and customer service led us to rapid growth, Galvanizing is conducted under controlled circumstances to ensure uniform coating and appearance. **GALVATEC** strives for excellence in Quality by taking the time to ensure all employees have a full understanding of all Quality and Inspection procedures.

Service:

We work hard at **GALVATEC** will meet your scheduling requirements. Each job is scheduled based on when the material is received at works. Our plant has the capability of working around-the-clock in shifts to meet your production requirements.

Value:

Our competitive prices, high quality products together with good services are our tools to make our customers satisfied, in the return they will be our best marketing tools.

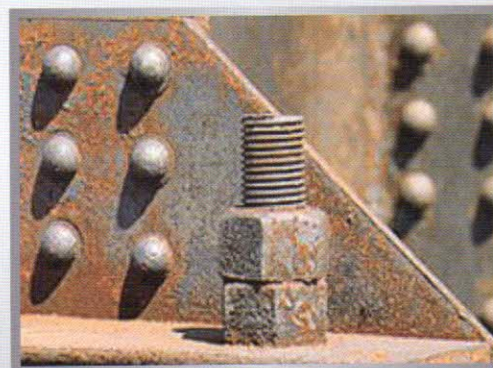
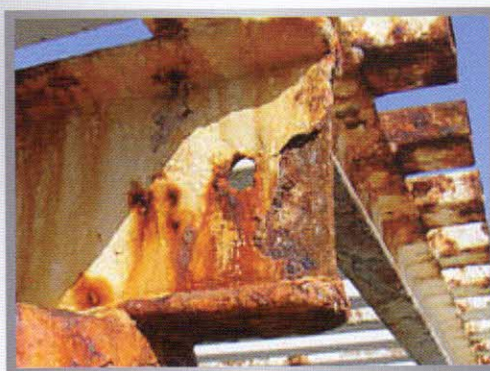
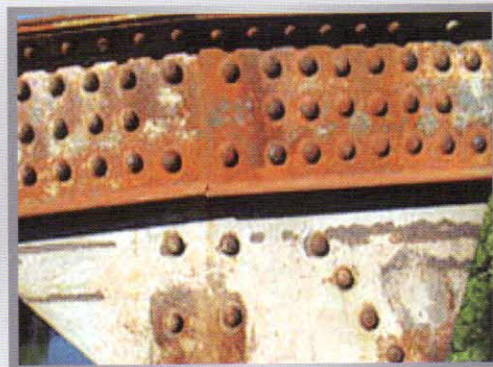
We pride ourselves on being people of integrity who excel at delivering optimal results and continually improving our services to ensure that our solutions are second-to-none

Corrosion

Steel is an excellent building material, fully recyclable and has a high strength-to-weight ratio, low environmental impact, and long-term durability. However, it is inevitable steel corrodes.

Corrosion is the gradual destruction of materials (usually metals) by chemical reaction with their environment.

In the most common use of the word, this means electrochemical oxidation of metals in reaction with an oxidant such as oxygen. Rusting, the formation of iron oxides is a well-known example of electrochemical corrosion. This type of damage typically produces oxide(s) or salt(s) of the original metal.



Protection From Corrosion.

Hot-dip galvanizing is the best way to protect steel from corrosion since its lowest initial cost, durability, longevity, availability, versatility, sustainability, and even good appearance and finish.

What is Hot Dip Galvanized Coating?

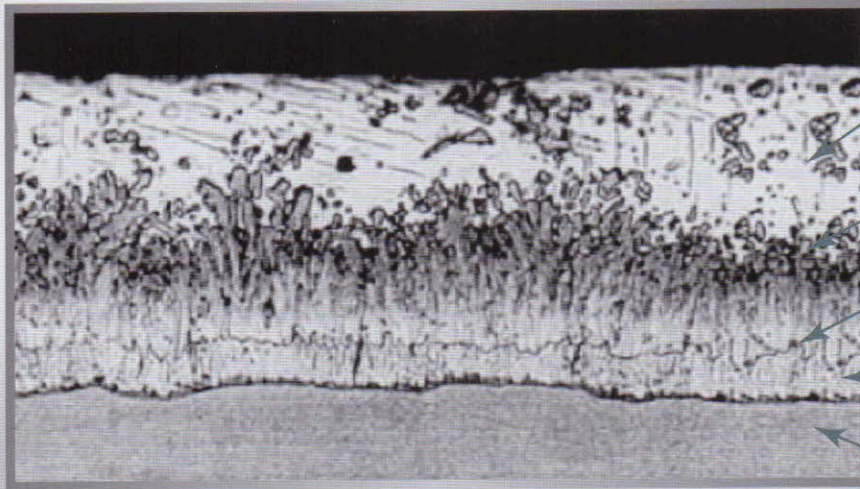
Hot-dip galvanizing (HDG) is the process of immersing fabricated steel or iron into a kettle (bath) of molten zinc. While in the kettle, iron in the steel metallurgical reacts with the zinc to form a tightly-bonded alloy coating. During the reaction in the kettle, the zinc interacts with the iron in the steel to form a series of zinc-iron alloy layers.

The photo below is a cross section of the galvanized steel coating, showing a typical microstructure comprised of three alloy layers in addition to a layer of pure metallic zinc. So even when the first layer (ETA) is scratched the steel still protected by another Three hard layers.

- The thin Gamma layer composed of an alloy that is 75% zinc and 25% iron
- The Delta layer composed of an alloy that is 90% zinc and 10% iron
- The Zeta layer composed of an alloy that is 94% zinc and 6% iron
- The outer Eta layer that is composed of pure zinc

The Galvanized Coating:

Metallurgically bonded to base steel

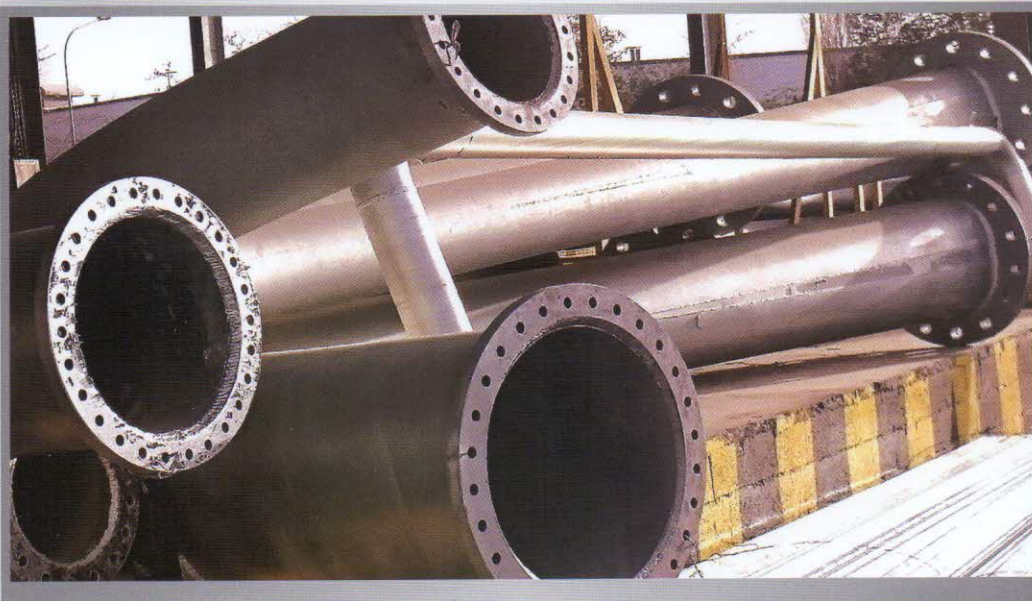


Eta
(100% Zn)
70 DPN Hardness
Zeta
(94% Zn 6% Fe)
179 DPN Hardness
Delta
(90% Zn 10% Fe)
244 DPN Hardness
Gamma
(75% Zn 25% Fe)
250 DPN Hardness
Base Steel
159 DPN Hardness

Hard, tough and adherent coating

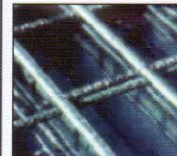
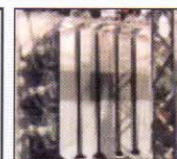
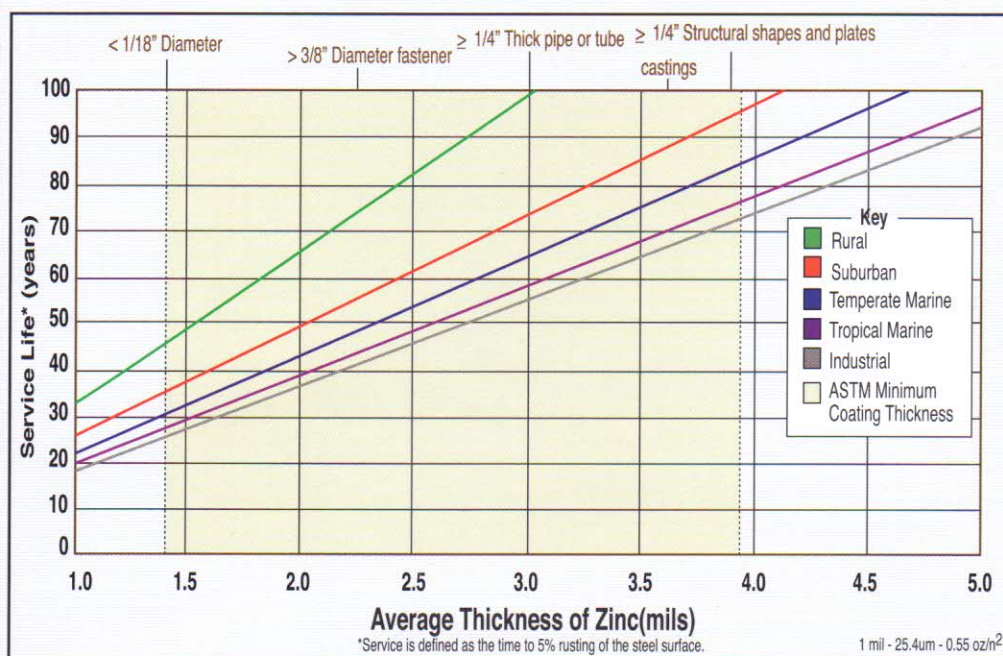
The ASTM. (American Society for Testing Materials) sets the specifications required for zinc thickness based on size and use of the products.

We take pride in our ability to furnish you a quality zinc coating to meet your specifications. It is our desire to always make our commitments to all of our customers.



Service Life Chart For Hot-Dip Galvanized Coatings

derived from the zinc coating life predictor



Details

The Service Life Chart (SLC) was developed based on decades of corrosion rate data collected galvanized steel sample exposed to the five defined environments in cities all over the world, and a corrosion prediction models based on statistical methods and neural network technology.

The data points of the SLC are based on macroscopic environmental data, thus, may vary from the actual corrosion rate observed, due to site-specific environmental conditions.

Atmospheric levels of relative humidity, sulfur dioxide, airborne salinity, precipitation, and temperature influence actual corrosion rates in a specific geographic location.

Parameters such as wind direction, frequency drying, alloying composition, and surface orientation may also affect corrosion rates, but because of their variable and usually minor nature, are not included in the SLC model.

Zinc coating thickness is linearly related (on a macrolevel) to the service life of hot-dip galvanized steel.

Cost

The initial cost of galvanizing is \$1.67/ft², assuming 250 ft²/ton of steel for 100,000 ft² project (average size job according to NACE Paper #509, Costing Consideration for Maintenance and New Construction Coating Work).

American Galvanizer Association

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www.galvanizeit.org

aga@galvanizeit.org

Galvanizing Standards

Galvatec (Fabrication & Galvanizing Technologies Co. Ltd)

products comply with the most updated galvanization international standards and specifications:



A 123/A 123M - 02

TABLE 1 Minimum Average Coating Thickness Grade by Material Category

Material Category	All Specimen Tested Steel Thickness Range (Measured), in. (mm)				
	<1/16 (1.6)	1/16 to <1/8 (1.6 to <3.2)	1/8 to 3/16 (3.2 to 4.8)	>3/15 to <1/4 (>4.8 to <6.4)	≥1/4 (≥6.4)
Structural Shapes and Plate	45	65	75	85	100
Strip & Bar	45	65	75	85	100
Pipe and Tubing	45	45	75	75	75
Wire	35	50	60	65	80

TABLE 2 Coating Thickness Grade

Coating Grade	mils	oz/ft ²	μm	g/m ²
35	1.4	0.8	35	245
45	1.8	1	45	320
50	2	1.2	50	355
55	2.2	1.3	55	390
60	2.4	1.4	60	425
65	2.6	1.5	65	460
75	3	1.7	75	530
80	3.1	1.9	80	565
85	3.3	2	85	600
100	3.9	2.3	100	705

The values in micrometers(μm) are based on the Coating Grade. The other values are based on conversions using the following formulas:
 mils = μm x 0.03937; oz/ft² = μm x 0.02316; g/m² = μm x 7.067.



INTERNATIONAL STANDARD

ISO
1461

Second edition
1999-02-01

Hot dip galvanized coatings on fabricated Iron and steel articles - Specifications and test methods

Table -2 Coating minimum thickness on samples that are not centrifuged

Article and its thickness	Local coating thickness (μm)	Mean coating thickness (μm)
steel > 6mm	70	85
steel > 3mm \leq 6mm	55	70
steel \geq 1.5mm \leq 3mm	45	55
steel < 1.5mm	35	45
castings \geq 6mm	70	80
castings < 6mm	60	70

Table -D-2 Coating minimum masses (related to thickness) on samples that are centrifuged

ARTICLE AND ITS THICKNESS	LOCAL COATING		MEAN COATING	
	g/m^2	μm	g/m^2	μm
Article with threads > 20 mm diameter > 6 mm to < 20mm > 6 mm diameter	325	45	395	55
	250	35	325	45
	145	20	180	25
other article (including castings) > 3 mm < 3 mm	325	45	395	55
	250	35	325	45

Also

- ASTM A 780: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
Touch-up procedures for coating bare spots on an existing hot-dip galvanized product.

GALVATEC's Abrasive grit blasting Facility:

Galvatec (Fabrication & Galvanizing Technologies Co. Ltd) has been equipped with an Abrasive grit blasting machine with a capacity of by Size of (70cm height, 1m width & 1.0 ton weight) meant for the services, to accommodate our customers' needs

In the galvanizing process, all interior and exterior surfaces are coated with corrosion-inhibiting zinc, which metallurgically bonds with the base steel. This metallurgical bond occurs if all surfaces to be galvanized are entirely clean.

The first phase in the hot-dip galvanizing process is intended to obtain the cleanest possible steel surface by removing all of the oxides and other contaminating residues.



Abrasive grit blasting is a vital surface treatment process widely used in cleaning,

Abrasive grit blasting cleaning is the process by which an abrasive media is accelerated through a blasting nozzle by means of compressed air, this method used not only to remove rust, mill varnish and paint coating. But also prepares surface for high performance coatings, good luster and surface texture



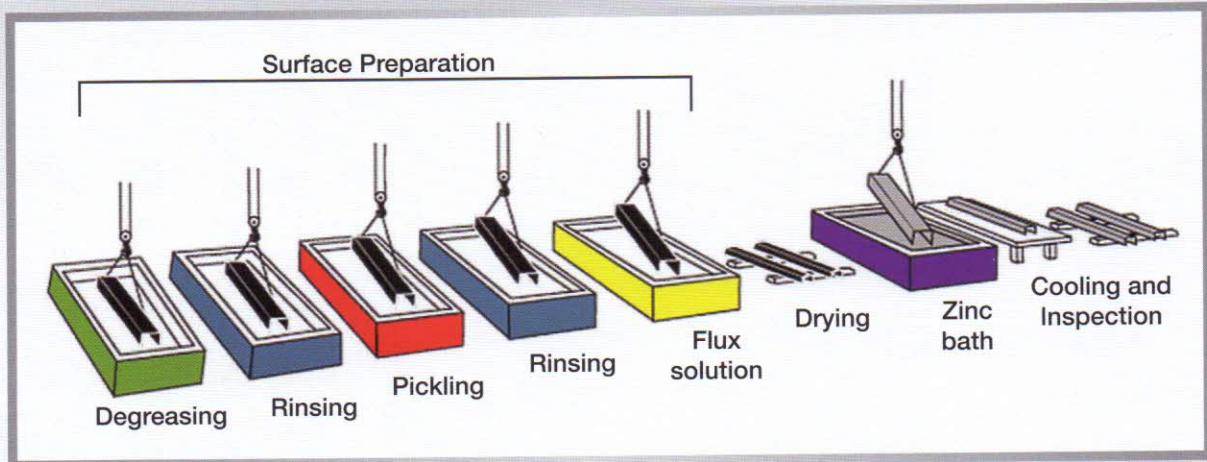


PROCESS FLOW CHART



Hot-Dip Galvanizing Process

The galvanizing process consists of three basic elements: surface preparation, galvanizing, and inspection.



Surface Preparation : Surface preparation is the most important step in the application of any coating. In most instances where a coating fails before the end of its expected service life, it is because of incorrect or inadequate surface preparation. The galvanizing process has its own built-in means of quality control because zinc will not react with an unclean steel surface. Any failures or inadequacies in surface preparation will be immediately apparent when the steel is withdrawn from the zinc bath because the unclean areas will remain uncoated, and immediate corrective action can be taken.

Degreasing : A mild acid base with biological cleaning bath removes organic contaminants such as dirt, paint markings, grease, and oil from the metal surface.

Pickling : A dilute solution of Hydrochloric acid removes mill scale and iron oxides (rust) from the steel surface. As an alternative to or in conjunction with pickling, this step can also be accomplished using grit blasting.

Fluxing : The final surface preparation step in the galvanizing process, a zinc ammonium chloride solution, serves two purposes. It removes any remaining oxides and deposits a protective layer on the steel to prevent any further oxides from forming on the surface prior to immersion in the molten zinc.

Drying : A room where the temperature is between 70-90 °C , it makes all liquids of flux solution and water to dry and evaporate before immersing it into Zinc bath to avoid splashing.

Galvanizing : While immersed in the kettle, the zinc reacts with the iron in the steel to form a series of metallurgical bonded zinc-iron intermetallic alloy layers, commonly topped by a layer of impact-resistant pure zinc.

Once the fabricated items' coating growth is complete, it is withdrawn slowly from the galvanizing bath, and the excess zinc is removed by draining, vibrating,

The metallurgical reaction will continue after the materials are withdrawn from the bath, as long as it remains near bath temperature. Galvanized articles are cooled either by immersion in a passivation solution or water or by being left in open air.

Finishing & Final Inspection -

The inspection of hot-dip galvanized steel is simple and quick. The two properties of the hot-dip galvanized coating most closely scrutinized are coating thickness and appearance/surface condition. A variety of simple physical tests can be performed to determine thickness, uniformity, adherence, and appearance.

Products are galvanized according to long established, accepted, and approved. A variety of simply physical and laboratory tests are performed to determine thickness, uniformity, adherence, and appearance as per ASTM / BS Standard requirements/Specific customer requirements.

Work instructions are given for cleaning and rectification where ever necessary- Filing method or grinding by abrasive wheel is practiced to remove excess zinc. minor repairs are done by applying Rich zinc paint by brush.



Products are galvanized according to long-established, well accepted, and approved standards of the ASTM.

These standards cover everything from the minimum required coating thicknesses for various galvanized items to the composition of the zinc metal used in the process.

Types of Inspection

The various inspections are used to verify the necessary specifications for the galvanized product are met. These techniques for each test method are specified in ASTM A 123/A 123M, depending upon the type of product being inspected. The most common inspections, listed below, range from a simple visual inspection to more sophisticated tests to determine embrittlement or adhesion.

The Test reports below are the products of AL Ashoury factory that are Hot dip galvanized at GALVATEC & tested at approved / Listed independent Laboratory.



AL HOTY - STANGER CLIENT: **AL ASHOURY FACTORY FOR CABLE SUPPORTS & BLDG. ACCESSORIES** Date: 05 Feb. 2012
TWO NO: MOK120058
P.O. BOX 40107, RIYADH 11499
Job: To Follow
Report No.: 47545
Page: 1 of 1

PREECE TEST

"TEST REPORT ON EQUAL ANGLE BAR SAMPLE"

Sample Identification: **EQUAL ANGLE BAR**
Profile: L 100 X 100 X 10mm
Length: 18 inches
Mark #: B 75
Sawed by: **Client**
Date Received: **15.01.2012**
AMS Lab. Ref. No.: **20121205 / 002**
Required Test: **Preece Test**

TEST METHOD REF:
9 Standard Practice for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel
ASTM A 259-95

RESULTS

Solution Used: **Copper sulphate (CuSO₄, 24O)**
Specific Gravity of Solution: **1.198 @ 19°C**
Findings: **After several immersion of galvanized beam in copper sulphate solution, no adherent of copper deposit appearing on the galvanized surface indicate zinc coating on this beam surface is homogeneously applied and no thinnest spots were detected.**

Test Witnessed by: 1) Mr. Abdullah J. Al Jabir - National Grid S.A.
2) Mr. Waleed Azam - QA/QC Manager, Al Ashoury
3) Mr. Muhammad Farid Al-Jaber - Surveys

NAEEM ZAID, M. Sc.
Manager
Materials Analysis Dept.
For AL HOTY-STANGER LTD. CO.

A. N. M. OMAR, M. Sc.
Assistant Manager
Materials Analysis Dept.
Test Method Variation: NONE

INDEPENDENT LABORATORIES & MATERIALS TESTING
P.O. BOX 1122 AL KHAYMA 31001 TEL: 011 5694000 FAX: 011 5694001
Fax: 011 5694001 Email: info@equalitas.com.au
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AL HOTY - STANGER CLIENT: **AL ASHOURY FACTORY FOR CABLE SUPPORTS & BLDG. ACCESSORIES** Date: 05 Feb. 2012
TWO NO: MOK120058
P.O. BOX 40107, RIYADH 11499
Job: To Follow
Report No.: 47545
Page: 1 of 1

EMBODIMENT TEST RESULTS

PROFILE L 150 X 150 X 12mm
LENGTH 24 inches
MARK # L 139

Sample Identification: **Embodiment test of hot galvanized structural steel of Equal angle 150 X 150 X 12mm dimensions**

SAMPLE NO. 61

TEST RESULTS:
Dimensions of the galvanized angle are as noted below: 150 X 150 X 12mm.
Sum of the two distances of the punch marks and the edges measured are as below:
Distance 1 = 28.81 mm
Distance 2 = 30.87 mm
The sum of the distances measured = 60.68 mm
Original gauge length = 60.00 mm
% Elongation = 20.96%
Required % Elongation as per ASTM A 143-03 = 5% Minimum
Remark: **Pass**

TEST WITNESSED BY: 1) Mr. Abdullah J. Al Jabir - National Grid S.A.
2) Mr. Waleed Azam - QA/QC Manager, Al Ashoury
3) Mr. Muhammad Farid Al-Jaber - Surveys

Nageeh Balraj M
Asst. Manager
Mechanical & Mechanical Section
For AL HOTY-STANGER LTD. Co.

Tested by: Sybiliana T
Asst. Testing Engineer

Verified by: Mohd. Usman Khan
Mechanical Supervisor

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AL HOTY - STANGER CLIENT: **AL ASHOURY FACTORY FOR CABLE SUPPORTS & BLDG. ACCESSORIES** Date: 05 Feb. 2012
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Report No.: 47545
Page: 1 of 1

ZINC COATING WEIGHT

"TEST REPORT ON DUCTILE IRON PIPE SAMPLE"

Sample Identification: **DUCTILE IRON**
Profile: L 90 X 90 X 6mm
Length: 12 inches
Mark #: B 159
Sawed by: **Client**
Date Received: **15.01.2012**
AMS Lab. Ref. No.: **20121205 / 001**
Required Test: **Zinc coating weight**

TEST METHOD REF:
9 Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc and Zinc-Alloy Coatings (ASTM A646 / A646M-01)

RESULTS

WEIGHT OF ZINC COATING
(on outer surface light)

Specimen No. 1	=	1993
Specimen No. 2	=	1943
Specimen No. 2	=	1927
AVERAGE	=	1954
Equivalent zinc coating thickness (outer surface), micron	=	276

Test Witnessed by: 1) Mr. Abdullah J. Al Jabir - National Grid S.A.
2) Mr. Waleed Azam - QA/QC Manager, Al Ashoury
3) Mr. Muhammad Farid Al-Jaber - Surveys

NAEEM ZAID, M. Sc.
Manager
Materials Analysis Dept.
For AL HOTY-STANGER LTD. CO.

A. N. M. OMAR, M. Sc.
Assistant Manager
Materials Analysis Dept.
Test Method Variation: NONE

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GALVANIZED MATERIAL QUALITY :

In order to guarantee the finish, quality & cost saving of the hot dip galvanizing process, full cooperation between fabricator and galvanizer should be done.

EQUALITAS
CERTIFICATE OF REGISTRATION
Quality Management Systems

FABRICATION & GALVANIZING TECHNOLOGIES CO. LTD.
2nd Industrial City, Riyadh, Saudi Arabia

Equalitas Certifications Limited Certifies that the Management System of the above mentioned Company has been assessed and meets the requirements established by the following rules:
ISO 9001:2008
The Management System includes:
Providing Galvanizing Services

Certificate No: Q-02180205
Issue Date: 05 Feb 2015
Valid To: 04 Feb 2018

Original Issue Date: 05 Feb 2015
1st Sur. Due Before: 22 Jan 2017
2nd Sur. Due Before: 22 Jan 2017

After successful completion of surveillance audit, new certificate shall be issued.

In the event of validity of the present certificate the management system must permanently satisfy the requirements of the International Regulations. The failure of these regulations will be regularly monitored by Equalitas Certifications Limited.

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Accredited by Joint Accreditation System of Australia and the United Kingdom (JAS-ANZ)
FSCCA Member, 4 Princes Drive, Darwin, ACT 2901, Australia
For further information regarding Equalitas Certifications Limited, please contact: info@equalitas.com.au
The Certificate of Registration remains the property of Equalitas Certifications Limited and shall be returned immediately upon request.
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EQUALITAS
CERTIFICATE OF REGISTRATION
Occupational Health & Safety Management Systems

FABRICATION & GALVANIZING TECHNOLOGIES CO. LTD.
2nd Industrial City, Riyadh, Saudi Arabia

Equalitas Certifications Limited Certifies that the Management System of the above mentioned Company has been assessed and meets the requirements established by the following rules:
OHSAS 18001:2007
The Management System includes:
Providing Galvanizing Services

Certificate No: Q-01180205
Issue Date: 05 Feb 2015
Valid To: 04 Feb 2018

Original Issue Date: 05 Feb 2015
1st Sur. Due Before: 22 Jan 2017
2nd Sur. Due Before: 22 Jan 2017

After successful completion of surveillance audit, new certificate shall be issued.

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EQUALITAS
CERTIFICATE OF REGISTRATION
Environmental Management Systems

FABRICATION & GALVANIZING TECHNOLOGIES CO. LTD.
2nd Industrial City, Riyadh, Saudi Arabia

Equalitas Certifications Limited Certifies that the Management System of the above mentioned Company has been assessed and meets the requirements established by the following rules:
ISO 14001:2004
The Management System includes:
Providing Galvanizing Services

Certificate No: Q-01180205
Issue Date: 05 Feb 2015
Valid To: 04 Feb 2018

Original Issue Date: 05 Feb 2015
1st Sur. Due Before: 22 Jan 2017
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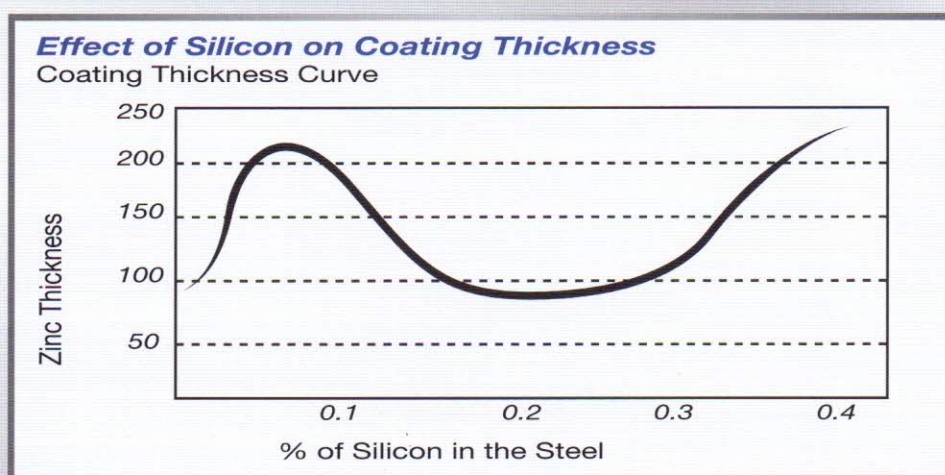
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STEEL FABRICATOR RESPONSIBILITIES :

Steel Purchasing :

The steel fabricator purchaser should do all the efforts to Purchase the steel under the following Chemical composition

- 1 - Levels of carbon less than 0.25%
- 2 - Phosphorus less than 0.04%
- 3 - Manganese less than 1.35%
- 4 - Silicon levels less than 0.04% or between 0.15% - 0.22%



The most common reason for galvanized steel to have different appearances is the chemistry of the steel pieces. There are two elements of steel chemistry which most strongly influence the final appearance; **Silicon** and **Phosphorous**. Both silicon and phosphorous promote coating growth, and this thicker coating is responsible for the differing appearance. (Thicker coating is also cause extra cost).

Steel Fabrication

Fabricators should study the following points carefully before sending the material for galvanizing:

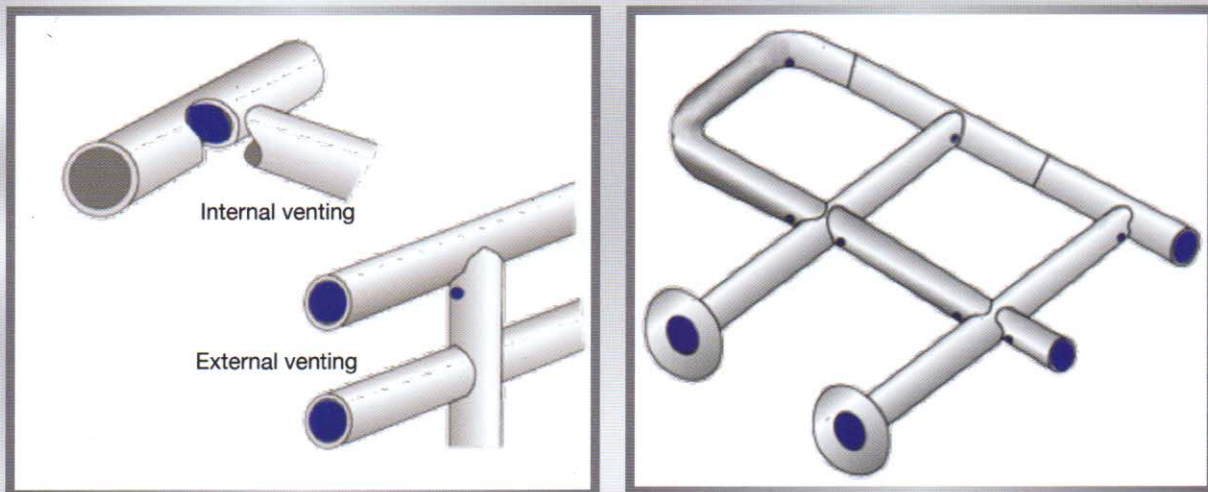
- 1 - Normal Chemical Pickling and steel surface preparation for galvanizing are useless if Some surface residues, such as mill lacquer, welding slag, varnish, water-insoluble paints, adhesives, and sand used in the making of castings, are not removed by the standard chemical cleaning methods can be removed by mechanical cleaning (in order to make the surface ready for galvanizing we recommend Grit blasting. (As mentioned above Galvatec is doing this services for our customers in competitive prices).

2 - Welding :

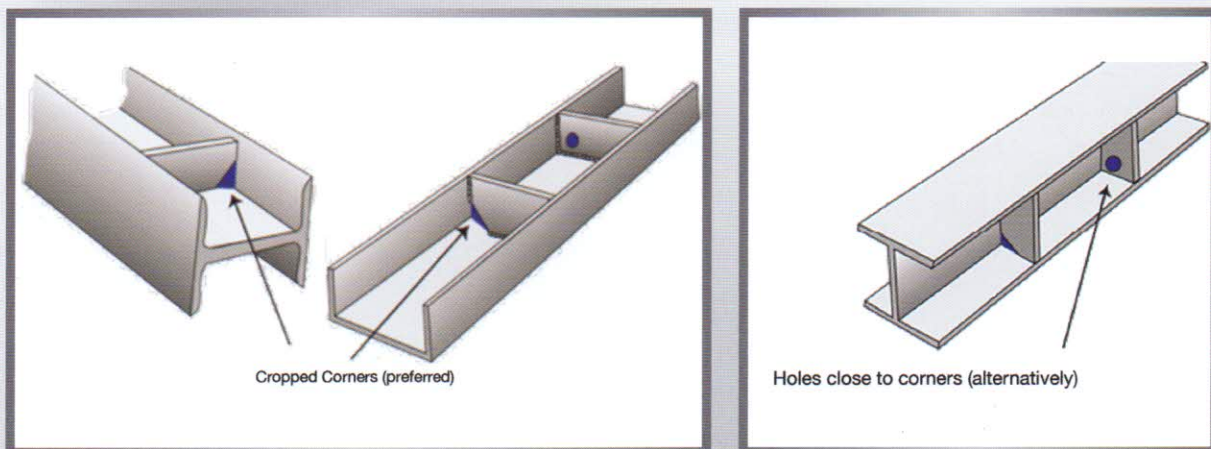
All welded areas must be clean and free of slag prior to arriving at the galvanizer's plant. The cleaning solutions do not remove the slag and the result is uncoated steel.

Vent / Drain Holes

When immersing welded round, square, and rectangular hollow structural sections (HSS) with closed ends in molten zinc, there must be holes somewhere near both ends to allow air to escape out the top and molten zinc to enter in the bottom. Otherwise, the air pressure doesn't allow the zinc to flow throughout the inside of the piece, and consequently no zinc coating forms on the inside where most corrosion begins.

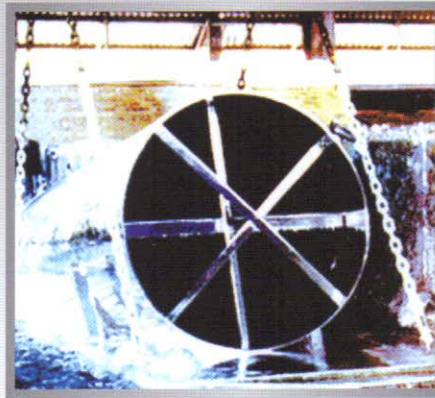


Example illustration of vent and drain hole location



Example: illustration for Stiffener Welding and Venting

Temporary Bracing:



Fabrications should always keep in mind that galvanizing steel is exposed to temperature variations.

Fabrications of asymmetrical design or with sections of unequal thickness can exhibit different thermal expansion and contraction stresses, leading to changes in shape and/or alignment (distortion and warping).



Welding - or bending-induced stresses that reside in the material after fabrication may be released during galvanizing, also resulting in structural changes in shape and/or alignment.

Bracing - permanent or removable after galvanizing provides stability during the thermal expansion and contraction cycle. Occasionally, when bracing is not used and warping and/or distortion occur, the part will return to its original shape during cool-down.



Defects Due Bad surface cleaning by fabricator :

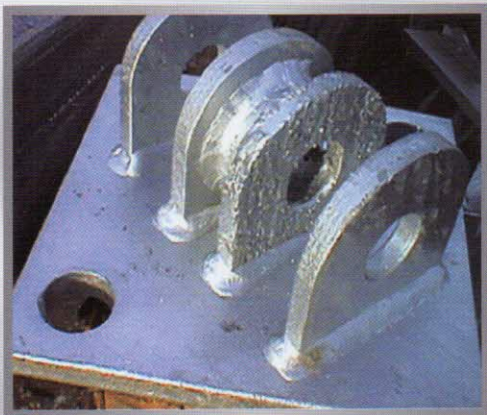
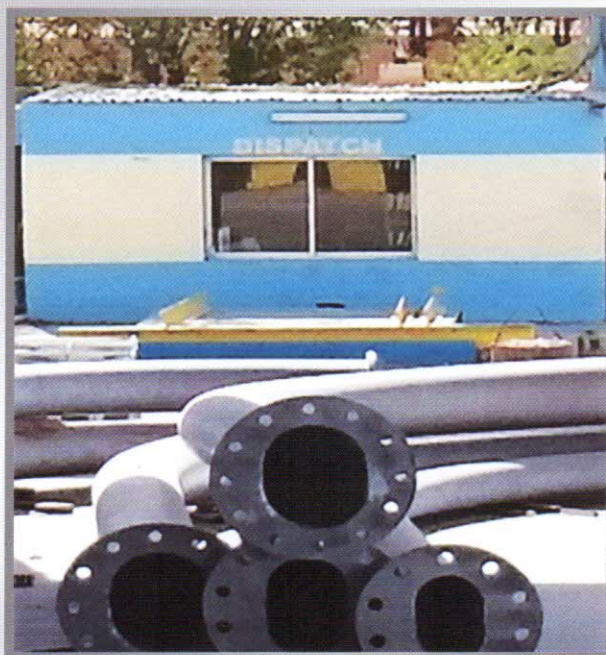


Illustration of galvanizing defects due bad surface cleaning in fabricator shop.



Weighing, Loading & Delivery

GALVATEC is equipped with Weigh Bridge Facility of: These services are available to customers & general public.



1. Platform weighing with a capacity of 10 tons for weighing small size materials.



2. Weighing bridge of capacity up to 50 Tons used for heavy material loaded on trailers trucks.

GALVATEC has a unique Capability to exercise full control of quality, cost & time which would be reflected on the customer satisfaction.

