



REFERENCES & DESCRIPTIONS OF ZINGA® APPLICATIONS ON BRIDGES AND SIMILAR STRUCTURES

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UNIQUE CHARACTERISTICS AND ADVANTAGES OF ZINGA

ZINGA is in fact much more effective than any other existing anti-corrosion system. This efficiency is based on a number of unique characteristics and advantages, as explained in the following summary.

1. ZINGA protects the metal against rust in two ways: an active, cathodic, galvanic protection due to its high zinc content and a passive barrier protection due to the zinc salt on top of the surface, and due to the binder in ZINGA that reduces the disintegration of the zinc.
2. The application of ZINGA is very easy. It can be painted onto the surface with a brush or a roll. It can also be sprayed with a pistol, and it can be applied in a bath. There is no need for sophisticated equipment that can only be found in a workshop. ZINGA can be applied on site, even by non-professionals.
3. ZINGA can be applied in a wide range of weather conditions. ZINGA can be applied on a damp surface (but not on drops of water). Humidity can even intensify the cathodic action and accelerate the formation of the zinc salts on the surfaces that offer the barrier protection. ZINGA can be applied at very high or low temperatures (up to 40° C or 104° F and down to -15° C or 5° F).
4. The surface preparation can be reduced to a minimum: the metal must be clean (free from dirt, grease, oil, salts, paint, and mill scale) and rough. It is not always necessary to grit-blast the metal first.
 - Application on bare metal: Mostly grit-blasting is necessary, but in some cases the substrate already has the required roughness degree due to former grit-blasting or due to corrosion.
 - Application on top of hot-dip galvanisation: Old and corroded hot-dip only needs to be cleaned and already has the required roughness degree. New hot-dip can be treated in order to obtain the required roughness.
 - Application on an old ZINGA layer: When ZINGA is applied on an old ZINGA layer, then the surface just needs to be cleaned.
5. ZINGA is always applied under ambient temperatures, so that delicate metal structures cannot be deformed. Even dipping is done in ambient temperature. No energy is wasted to warm up ZINGA, which is necessary for hot-dip galvanisation wherefore you need temperatures up to 460 °C.
6. ZINGA has a quick drying time. A new layer of ZINGA can be applied after 1 hour. Topcoats can be applied after 6 to 24 hours, depending on layer thickness and atmospheric conditions.
7. ZINGA does not peel off and is not brittle. In case of mechanical damage the ZINGA layer will be compressed or squashed, but it will not crack due to its flexibility.
8. One of the most decisive advantages of using ZINGA is that the zingalisation system can be recharged. Each new layer of ZINGA blends perfectly with the previous one. Additional layers all blend to one single, homogeneous ZINGA layer. There is no risk for accumulation of layers that are different in structure, which could cause peeling off. You cannot distinct different layers, as is the case with galvanising by hot-dip. Moreover, this capacity of recharging reduces the surface preparation to an absolute minimum. Other coating systems, for instance with paints, demand an elaborate and often expensive surface preparation before the application of a new layer.



9. This property of recharging can be of use if you still have to do some drilling or welding on the surface, or if the structures still have to be transported. In that case the first layer is meant as a primer. It can intercept possible damages. Even welding is possible on top of ZINGA. Afterwards, the final layer of ZINGA can be applied and local damages can be repaired. The new layer makes the former layer liquid again and the result is one homogeneous ZINGA layer. When there is no need to recoat the whole structure, you can apply a small quantity of ZINGA on the damaged spots and the whole structure is free from rust again. Repairs will be invisible after a certain time.
10. Structures that have been metallised or galvanised by hot-dip will begin to rust after a certain period. Such worn-out and damaged structures can also be recharged by ZINGA.
11. ZINGA has a zinc content of 96 % in the dry layer. The zinc is pure to 99.995 %. In order to obtain a real cathodic protection you need at least 92 % of zinc in the dry layer. That is scientifically proven. The so-called zinc-rich paints do not meet this condition.
12. Moreover ZINGA is based on protected zinc. The zinc particles are protected by a special resin that allows the formation of the galvanic couple, but that also gives an additional protection. Therefore protection with ZINGA is a superior alternative for galvanisation by hot-dip.
13. The zinc granules have been specially shaped so that they have a bigger contact surface through which they can attach to one another. For your information: the zinc used in ZINGA is made by the Belgian company Umicore, well-known all over the world, since they are the number 1 manufacturer in the world of these atomised zinc dust pigments, further electronically prepared for Zingametall. This atomisation process provides unique qualities and a very high zinc purity. This is also one of the reasons why ZINGA does not have one single true competitor in the world.
14. ZINGA is uniquely characterised by the fact that it sacrifices itself or that it is “consumed”. Together with the quality of not peeling off, this results in the depletion of each applied layer: between 2 – 15 µm per year depending on the environmental conditions. This is an important factor in monitoring the application and the evaluation of the lifetime of the system. Hence, it is a true benefit in terms of maintenance and budget scheduling.
15. With ZINGA, a customized and personal solution can be offered. Customers are not always in need of a long term corrosion protection or don't have the budget for it. In case of a limited budget and desired protection time of for instance only 5 – 7 years, the layer thickness can be reduced and this will have an effect on the price per m². In other words: ZINGA is the most “flexible” customized solution.
16. ZINGA can be topcoated by a large number of compatible paints. Such duplex systems will more than double the lifetime of ZINGA. In order to reinforce the duplex qualities of the ZINGA system a topcoat can be applied. We can supply you with different compatible paints: acryl, epoxy, polyurethane; with or without micaceous iron oxides, the so-called MIO's. These paints can be applied directly on ZINGA (using the mist/full coat technique).
17. These topcoats can be bought from the same supplier. You just need to speak to one contact person and only that one company can be held responsible for the total application.
18. ZINGA is composed of non-toxic elements according to European Standards and can be used in contact with potable water (BS 6920).
19. ZINGA is heat resistant up to 120° C. ZINGA can also intercept occasional and short thermal shocks up to 150° C.
20. a) ZINGA has an unlimited pot and shelf life.
b) ZINGA is a one component coating.



OVERVIEW OF MAIN REPORTS OF TESTS PERFORMED WITH ZINGA

to download the actual reports, please visit www.zinga.eu

ZINGA quality label

SGS Systems & Services Certification (Belgium)

Certificate ISO 9001 for quality management

The company Zingametall has implemented a quality management system that is based on the standard ISO 9001. Hereby we commit ourselves to strive for continuous improvement and customers' satisfaction.

(http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=46486)

British Board of Agrément (BBA) (United Kingdom)

BBA certificate n° 03/4047

After thorough evaluation (effect on water quality, fire propagation, surface spread of flame, welding, resistance to abrasion, weathering, etc.) ZINGA received the approval from the BBA, which is the UK's major approval body for new construction products and installers. The BBA, in collaboration with SGS Coating Services, carries out regular inspections of the manufacturing process of ZINGA. This includes all the procedures involved with the production and the control of the delivered raw materials as well as of the quality of the final product. Traceability of the delivered product is assured by means of a specimen of each production batch.

(<http://www.bbacerts.co.uk/>)

Australian Paint Approval Scheme (APAS) (Australia)

APAS certificate n° 0180

After a thorough research of test reports, applications in Australia and a visit to the factory in Belgium, Zingametall BVBA was acknowledged as a recognized manufacturer by the APAS.

"APAS (Australian Paint Approval Scheme) is the largest and most widely recognized paint scheme in the world".

(<http://www.apas.gov.au/index.asp>)

NATO Approval (International)

Manufacturer's n°: BE0421689088; NSN for ZINGA: 8030131137027

In 1989 Zingametall received a Manufacturer's card and a NATO Stock Number for ZINGA. A NATO Stock Number is recognised as a stock number of the armies of the member states. Every product that is accepted by the NATO can be used by all the armies of the NATO member states without the necessity or obligation to test the product again.

(http://www.nato.int/structur/ac/135/ncs_guide/english/e_1-6-5.htm)

Engineers India Limited (India)

Based on reports, test certificates from independent European and Chinese test organisations combined with other information documents, the 'Engineers India Limited' sees ZINGA as an effective protective coating system in various corrosive environments.

They state that ZINGA would be a 'better replacement' for inorganic zinc silicates and hot dip galvanisation.

(<http://engineersindia.eil.co.in/>)

London Underground (United Kingdom)

ZINGA has been accepted by the 'London Underground' for use as a protective system on ferrous metals and as alternative to hot-dip galvanisation or metallisation. They sent us this Certificate after extensive study of existing documents in combination with doing tests on ZINGA's behaviour in contact with fire themselves.

(<http://www.tfl.gov.uk/corporate/modesoftransport/1574.aspx>)



ZINGA galvanic protection

ISO 12944-6 (COT bv) (Netherlands)

Test according to the ISO 12944-6 standard

ZINGA applied in 2 layers of each 90µm DFT got the classification:

C5I-High/C5M-High

and Im2-Medium/Im3-Medium.

ZINGA applied in 2 layers of each 60µm DFT got the classification:

C5I-Medium/C5M-Medium or C4-High.

and Im2-Medium/Im3-Medium.

ZINGA applied in 1 layer of 60µm DFT + Alufer N applied in 1 layer of 80µm DFT got the classification:

C5I-High/C5M-High

NORSOK Certificate (COT bv) (Netherlands)

Test according to the NORSOK standard M-501, rev. 5, system 7

ZINGA has passed the 4200 hours seawater immersion test and the 4200 hours cyclic test without any formation of rust, blisters, cracks, flakes or cathodic disbondment. The pull-off adhesion test on ZINGA resulted in values of more than 7MPa.

Det Norske Veritas (DNV) (Norway)

Ballast Tank test

ZINGA was applied on blast-cleaned test panels that were placed in a ballast tank filled with sea water with wave movement and cyclic heating. Other test panels were placed in a condensation chamber.

No corrosion of the steel substrate could be demonstrated. Based on the results of the testing, ZINGA meets the requirements of a B3 classification. In the report is stated that ZINGA has a beneficial corrosion protective performance.

Field test (Sintef) (Norway)

ZINGA duplex system compared to TSZ/TSA

This report gives the field test results of visual inspection of the panels after 5 years marine atmospheric exposure started in September 2002 and terminated in May 2008. The system that was tested was ZINGA + Alufer N + Alufer WR and performed excellently compared to systems based on TSZ/TSA (metallisation).

Bodycote Materials Testing (United Kingdom)

Cathodic Disbondment test

ZINGA applied at 60 µm DFT was exposed during 26 weeks at -1,0 volt. The results was no cathodic disbondment at all.

Potential Performance Test (COT bv) (Netherlands)

Determining the galvanic protection

The results showed active behavior of this film (-1110mV using Ag/AgCl). This means that it will provide cathodic protection to damaged, uncoated or improperly coated metal surfaces.

Trial protection of Crevices on Młyńskie bridges in Wrocław (Poland)

Crevice Corrosion field test

On the basis of an agreement between IBDiM in Warsaw and The Administration of Roads and Local Services in Wrocław trial application tests of various systems for the protection of crevices on Młyńskie Bridges in Wrocław were conducted.

Upon this test ZINGA was approved for use on bridges in Poland.



ZINGA in comparison with hot-dip galvanisation

University of Ghent (RUG) (Belgium)

Measurement of the short circuit current flow of ZINGA in comparison to hot-dip

In this test (based on electro-chemical measurements) is demonstrated that ZINGA offers cathodic protection equal to that of hot-dip.

BNF Fulmer Research Centre (United Kingdom)

Electrochemical tests on ZINGA in comparison to hot-dip

The open circuit voltage and galvanic current between the galvanising layers and the bare steel were measured. The conclusion of the report is that ZINGA offers galvanic protection to steel comparable to that offered by hot-dip galvanisation. In other words: a layer of ZINGA is a completely metallic layer exactly like a hot-dip galvanising layer, and will behave as such in all aspects. Moreover, this test demonstrated that the corrosion rate of ZINGA is 1/3 of the corrosion rate of hot-dip galvanising under similar (immersion) conditions.

Forschungs- und Materialprüfungsanstalt Baden-Württemberg (FMPA) (Germany)

Different tests on the efficiency of ZINGA in comparison to hot-dip: potential measurement and short circuit current measurement

In this test is demonstrated that the electrochemical behaviour of ZINGA is similar to that of a hot-dip layer.

South African Bureau of Standards (SABS) (South Africa)

Salt spray test on ZINGA in comparison to hot-dip (loss in weight)

In this test is demonstrated that the loss in weight of ZINGA is 1/10 of the loss in weight of hot-dip galvanising after a 400 hours salt spray test. The layer thickness of ZINGA diminishes because ZINGA is being consumed, contrary to a paint that will start to peel off after a certain period of time. This illustrates the fundamental difference between a paint and a galvanising system.

Direction Départementale de l'Équipement – Service Maritime de la Vendée (France)

Field test on the efficiency of ZINGA in comparison with hot-dip on sea buoys

Two buoys (one treated with ZINGA, the other one hot-dip galvanised) have floated in the Atlantic Ocean for four years. After those four years, the buoy treated with ZINGA showed no trace of rust while the hot-dip galvanised buoy was severely corroded in several places.

ZINGA on rebars

Steel Authority of India (India)

Measurement of corrosion rate by salt spray and immersion tests

A comparison was made between uncoated steel rebars, fusion bonded epoxy coated rebars (FBEC), hot-dip galvanised rebars (HDG) and zinganised rebars (ZINGA). The corrosion rate per year was measured after immersion and salt spray. This test demonstrated several advantages of ZINGA: the greater degree of galvanic protection, the lower sacrificial zinc consumption due to the dispersion of zinc dust in the binder and the additional barrier protection created by the binder.

→ ZINGA > FBEC > HDG > Uncoated

Jadavpur University (India)

Different tests on the efficiency of ZINGA in comparison with other coatings on rebars

A comparison was made between uncoated steel (Mild steel and Stainless steel) rebars, fusion bonded epoxy coated rebars (FBEC), hot-dip galvanised rebars (HDG) and zinganised rebars (ZINGA). The salt spray test pointed out that the zinganised rebars have a corrosion resistance that is about 2 times higher than that of hot-dip galvanised rebars. ZINGA is also least susceptible for stress corrosion cracking.

→ in NACE solution: ZINGA > HDG > FBEC > Stainless steel > Mild steel



Amirkabir University Poly Technic Tehran (Iran)

Different tests on the efficiency of ZINGA in comparison with uncoated rebars

The zinganised rebars passed the 500 hours salt spray test without formation of rust, peeling or blistering, not even in places where the coating was mechanically damaged. The rebars that were not zinganised were heavily corroded.

Bend test (COT bv) (Netherlands)

Bend test of ZINGA in layer thickness of 50µm DFT over 12 mm

ZINGA, dry film thickness about 50 µm, shows no cracks when bending on a cylindrical mandrel with a diameter of 12 mm.

University of Ghent (Belgium)

Pull-out test on zinganised rebars

A pull-out test was performed to evaluate the influence of a ZINGA layer on the bond strength of the rebar with the concrete. The conclusion was that coating with ZINGA does not negatively affect this.

Adherence of concrete to zinganised rebars at B-Holding (Belgian Railways)

Adherence of concrete to zinganised rebars

The conclusion of the report is:

It is clearly more difficult to cleave the rebar bloc containing the steel rod protected by Zinga. The adherence of the concrete to the steel rod is better. The actual cleavage happens in the concrete.

Other tests on ZINGA

❖ Reports concerning health

National Institute of Public Health (Poland)

Use of ZINGA on the inside of potable water storage tanks

Conclusion is:

ZINGA is approved for covering the inner surfaces of steel containers designed to store potable water.

Water regulations Advisory Scheme (United Kingdom)

Test on the influence of ZINGA on water quality

These tests were performed according to the standard BS 6920 to determine whether or not the quality of potable water is affected when it is in contact with a ZINGA layer. The water was analysed on taste, appearance, growth of micro organisms, extraction of harmful substances and extraction of metals. The obtained results complied with the requirements and ZINGA was found suitable for contact with potable water.

EDF - Gaz De France (France)

Toxicological advise

A positive toxicological advise was written and distributed in the company EDF-Gaz De France concerning the national use of ZINGA.

❖ Reports concerning reliquification

University of Ghent (Belgium)

Test on how successive ZINGA layers blend with each other

This test demonstrates that a newly applied ZINGA layer makes the former layer liquid again so that both layers blend together to one single homogeneous layer. The new layer recharges the old one. The ZINGA film galvanising system is very easy to maintain and to recharge: there is no need for grit-blasting, contrary to the surface preparation that is required when a traditional paint has been used.

Stangers Consulting Engineers and Scientists (United Kingdom)

Tests a.o. how successive ZINGA layers blend with each other

ZINGA is easy to apply by brush and resoftens caked Zinga or dry Zinga films as claimed by the manufacturer. This property enables ZINGA to be built up into thick composite layers avoiding the discrete films achieved with conventional coatings.

Their end conclusion was: It is evident that the product has special properties which place it, as far as we know, into a unique category.

❖ Report on the surface spread of flames

SGS Yarsley Technical Services (United Kingdom)

Test on the fire propagation on ZINGA

The results of the test according to the BS 476: part 6 show that ZINGA has a class 0 surface. ZINGA did not ignite during exposure to heating.

❖ Reports concerning friction coefficient

KTA-TATOR (United States of America)

Test on the friction coefficient of ZINGA

The slip coefficient of ZINGA applied at 100µm DFT is 0,52.

China National Construction Steel Quality Supervision and Test Center (China)

Test on the friction coefficient of ZINGA

The slip coefficient of ZINGA applied on steel plates and bolts, ranges from 0,54 to 0,67.

❖ Report concerning weldability

University of Ghent (Belgium)

Test on the influence of ZINGA on welding steel

A set of 3 x 2 plates, covered with a layer of Zinga, the thickness of which was respectively 15µm DFT, 40µm DFT and 60 µm DFT.

After a polymerisation period of seven days the two plates covered with the same coating thickness were welded together by hand.

The conclusion was:

None of the 3 specimens shows any deficiency, neither in the welding seams nor in the steel itself.



OVERVIEW AVAILABLE REFERENCES

Please find hereafter an overview of our references. Some of the references are enclosed. All other mentioned references can be obtained upon request.

Reference structure:

First letter: ISO letter of the country of the ZINGA application
Following letters: Theme references

Example: FI-AG-FO- Cattle and Pigfarm

FI: Finland (country)
AG: Agriculture (theme)
FO: Food (theme)
Cattle and Pigfarm: Title of the reference

AG: Agriculture

1. COW SHED BEAMS - BELARUS	BY-AG-Cow Shed
2. DAIRY FARM VITEBSK - BELARUS	BY-AG-Dairy farm
3. MARTENS DIRK – AGRICULTURAL MACHINERY - BELGIUM	BE-AG-OL-TE-Martens
4. CATTLE- AND PIGFARM - FINLAND	FI-AG-FO-HD-Cattle and Pigfarm
5. GRAIN SILOS NADOR CEREALES – MOROCCO	MA-AG-HD-TA-Grain Silos Nador Cereales
6. YUZHNY GREENHOUSE FARM - RUSSIA	RU-AG-HD-Yuzhny
7. KENSINGTON PALACE SUNKEN GARDENS – UNITED KINGDOM	UK-AG-AM-CI-TP-Kensington Palace Sunken Gardens
8. EDEN GREENHOUSE DOME – UNITED KINGDOM	UK-AG-HD-HT-TP-Eden

AL: Alu ZM

1. FENCE SUNNY EUROPE – BELGIUM	BE-AL-CR-HD-Fence Sunny Europe
2. RENOVATION SCHOOL SAINT-JOSEPH – LEVIS QUEBEC	CA-AL-AM-HD-Saint-Joseph
3. SEOUL AIR CONDITIONING – SOUTH KOREA	KR-AL-PI-Seoul Air Conditioning
4. HIGHWAY DEPARTMENT - THAILAND	TH-AL-Highway Department

AM: Historical and recreational buildings

1. MUSEUM HOTEL IN WENDAKE - QUEBEC	CA-AM-CO-Wendake
2. BIRD'S NEST - CHINA	CN-AM-Bird's Nest
3. GENT - KIOSK – BELGIUM	BE-AM-CO-OL-Gent Kiosk
4. METRO – MINSK – BELARUS	BY-AM-LT-TC-Metro
5. RENOVATION SCHOOL SAINT-JOSEPH – LEVIS QUEBEC	CA-AL-AM-HD-Saint-Joseph
6. PARLIAMENT BUILDING - QUEBEC	CA-AM-Parliament Building Quebec
7. EGLISE SAINTE THERESE – CHURCH – CANADA	CA-AM-Eglise Sainte Thérèse
8. WALT DISNEY – HONG KONG	CN-AM-TE-Walt Disney HK
9. NATIONAL GRAND THEATRE BEIJING - CHINA	CN-AM-MA-Theatre Beijing
10. OHENE DJAN SPORT STADIUM LIGHT POLES - GHANA	GH-AM-HD-PY-OheneDjanStadium
11. KENSINGTON PALACE SUNKEN GARDENS – UNITED KINGDOM	UK-AG-AM-CI-TP-Kensington Palace Sunken Gardens
12. ROYAL TRAIN SHED – UNITED KINGDOM	UK-AM-CI-RoyalTrainShed
13. ZIMBALI CONDOMINIUM – WORK OF ART – SOUTH AFRICA	ZA-AM-Zim Condomin

AP: Airports

1. GUANGZOU NEW BAIYUN AIRPORT - CHINA	CN-AP-HD-Baiyun
2. DÜSSELDORF - AIRPORT - GERMANY	DE-AP-CO-HD-OL-TE-Düss.Airport
3. MUMBAI DOMESTIC AIRPORT - INDIA	IN-AP-Mumbai Domestic airport
4. SUVARNABHUMI – AIRPORT - THAILAND	TH-AP-DI-SuvarnabhumiAirport

**AR: Armies and military organisations**

1.	NATO – NATO PUMP STATIONS - BELGIUM	BE-AR-OL-PI-TE-NATO
2.	BELGIAN ARMY - NAVY SHIPS AND ANTENNA - BELGIUM	BE-AR-OL-PY-SH-Belgian Army
3.	USNS ZEUS CABLESHIP - USA	CA-AR-MA-HD-SH-USNS Zeus Cableship
4.	POLES ARMY TENTS - UNITED KINGDOM	UK-AR-DI-Poles Army Tents
5.	US ARMY - ARMY VEHICLES - UNITED STATES OF AMERICA	US-AR-HD-OL-TE-TR-US Army
6.	MISSISSIPPI DEPARTMENT OF TRANSPORTATION BILOXI BRIDGE – UNITED STATES OF AMERICA	US-AR-BR-TE-MDOT
7.	NEXRAD TOWER – UNITED STATES OF AMERICA	US-AR-PY-Nexrad Tower

AS: Automatic spraying lines

8.	REBAR SPRAYING INSTALLATION TEHRAN HARA - IRAN	IR-AS-RE-AutomSprayLine
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AZ: Aquazinga

1.	FLOREAC – COAL FUNNEL – BELGIUM	BE-AZ-HT-OL-Floreac
2.	CARSID - BELGIUM	BE-AZ-HT-OL-TE-Carsid
3.	J.M. INDUSTRIAL – RACKS, METAL EQUIPMENT AND STRUCTURES IN BRICK MANUFACTURING FACTORIES- BELGIUM	BE-AZ-CE-HU-OL-TE-JM Ind
4.	YUEHAI PASSAGE TRAIN FERRY PIER TERMINAL - CHINA	CN-AZ-MA-RW-YuehaiTrainFerry
5.	SULTAM – CHIMNEY - ISRAEL	IL-AZ-HT-OL-Sultam
6.	DERBY – TURBINE EXHAUST STACKS - UNITED KINGDOM	UK-AZ-HT-OL-TE-Derby
7.	PORT ELISABETH ELECTRICITY DEPARTMENT - FUEL TANKS AND EXHAUST – SOUTH AFRICA	ZA-AZ-HT-TA-Port.El

BR: Bridges

1.	MOLISSON STREET BRIDGE- AUSTRALIA	AU-BR-Molisson Street Bridge
2.	QUEENSLAND RAILWAY BRIDGES - AUSTRALIA	AU-BR-RW-QR Railway Bridges
3.	REYNELLA BRIDGE - AUSTRALIA	AU-BR-TC-Reynella Bridge
4.	EUROPEAN TECHNICAL ASSOCIATION FOR PROTECTIVE COATINGS - BELGIUM	BE-BR-OL-TE-ETAPC
5.	DE BRANDT – FENDER CONSTRUCTIONS - BELGIUM	BE-BR-IM-OL-De Brandt
6.	MELLE BRIDGE - BELGIUM	BE-BR-OL-TC-Melle Bridge
7.	GENT - KEIZER BRIDGE - BELGIUM	BE-BR-CR-OL-Keizer Bridge
8.	WEGENFONDS BRIDGE - BELGIUM	BE-BR-OL-Wegenfonds
9.	RUMST BRIDGE – BELGIUM	BE-BR-Rumst Bridge
10.	RAILWAY OFFICE - BENIN	BJ-BR-OL-RW-Chemins Fer
11.	DR QUESNELL BRIDGE EDMONTON CANADA	CA-BR-Dr Quesnell Bridge Edmonton
12.	CONFEDERATION BRIDGE - CANADA	CA-BR-OL-Confederatie
13.	BC FERRY TERMINALS - CANADA	CA-BR-MA-OL-TE-BC Ferry
14.	OVERLANDER BRIDGE - CANADA	CA-BR-OL-TE-Overlander
15.	HANGZHOU BAY BRIDGE - CHINA	CN-BR-RE-Hangzhou Bay
16.	BLANICE RIVER BRIDGE – CZECH REPUBLIC	CZ-BR-OL-Blanice
17.	EL SALAAM BRIDGE - EGYPT	EG-BR-MA-PI-TE-Salaam
18.	AUTOMATED PARKING SYSTEMS SILODAM AMSTERDAM – NETHERLANDS	NL-BR-CO-Automated Parking Systems Silodam Amsterdam
19.	KALVOYA BRIDGE - NORWAY	NO-BR-MA-OL-TE-Kalvoya
20.	BRIDGE GIRDERS – POLAND	PL-BR-Girders
21.	FOOTBRIDGES AND PROTECTION BARRIERS BYDGOSZCZ - POLAND	PL-BR-CR-Bydgoszcz
22.	RENOVATION OF THE SIERKIERKOWSKI BRIDGE IN WARSAW, NATIONAL ROAD- POLAND	PL-BR-CR-Sierkierkowski Bridge



23.	ST PAUL – JETTY – REUNION	RE-BR-MA-St. Paul
24.	TEMPVAR BRASOV BRIDGE – ROMANIA	RO-BR-PI-Tempvar Brasov Bridge
25.	NEWARK MARINA BRIDGE - UNITED KINGDOM	UK-BR-OL-Newark Mar.
26.	TAXI BERTH BRIDGE IN CARDIFF BAY - UNITED KINGDOM	UK-BR-Taxi Berth
27.	MISSISSIPPI DEPARTMENT OF TRANSPORTATION BILOXI BRIDGE – UNITED STATES OF AMERICA	US-AR-BR-TE-MDOT

BW: Breweries

1.	KBL LTD – BREWERY - BOTSWANA	BW-BW-KBL
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CE: Cement factories and brick manufacturing companies

1.	HOLCIM GRANULATS - CEMENT FACTORY - BELGIUM	BE-CE-OL-TE-Holcim
2.	J.M. INDUSTRIAL – RACKS, METAL EQUIPMENT AND STRUCTURES IN BRICK MANUFACTURING FACTORIES- BELGIUM	BE-AZ-CE-HU-OL-TE-JM Ind.
3.	PAESEN - CONCRETE MILL - BELGIUM	BE-CE-TA-Paesen
4.	SCHWENK – CEMENT FACTORY - GERMANY	DE-CE-OL-TE-Schwenk
5.	SIAM CEMENT - THAILAND	TH-CE-SiamCement
6.	THE INFRASTRUCTURE OF THE COMPANY LAFARGE – SOUTH AFRICA	ZA-CE-OL-Lafarge

CI: Cast iron

1.	DULLE GRIET - CANNON – BELGIUM	BE-CI-TC-Dulle Griet
2.	DE GIEY – THE FENCE OF THE CASTLE - BELGIUM	BE-CI-CR-OL-De Giey
3.	KLEIN KASTEELKEN – CAST IRON FENCE - BELGIUM	BE-CI-CR-OL-TC-Klein Kasteelken
4.	TEATRO MUNICIPAL - BRAZIL	BR-CI-CO-TC-Teatro
5.	FOUNTAINS IN PEOPLE'S PARK - DUBLIN – IRELAND	IE-CI-Fountains
6.	KENSINGTON PALACE SUNKEN GARDENS – UNITED KINGDOM	UK-AG-AM-CI-TP-Kensington Palace Sunken Gardens
7.	ROYAL TRAIN SHED – UNITED KINGDOM	UK-AM-CI-RoyalTrainShed

CN: Cranes

1.	ANTWERP - PORT CRANES – BELGIUM	BE-CN-OL-Antwerp Port Cranes
2.	HARBOUR OF GENK – BELGIUM	BE-CN-OL-TE-KHG
3.	MENGE – THE TOWER CRANE OF THE COMPANY MENGE, SPECIALISED IN RENOVATION OF CHIMNEYS - BELGIUM	BE-CN-Menge
4.	PACIFIC GRAIN ELEVATOR - CANADA	CA-CN-MA-Pacific Grain Elevator
5.	OFFICE TOGOLAIS DES PHOSPHATES PHOSPHATE MINE OFFSHORE - CHARGING CRANES - TOGO	TG-CN-MA-OL-PE-Off. Togolais

CO: Construction and engineering

1.	GENT - KIOSK – BELGIUM	BE-AM-CO-OL-Gent Kiosk
2.	DENDERMONDE - BACOB BANK – BELGIUM	BE-CO-OL-Bacob
3.	CNO – A COOLING TOWER - BELGIUM	BE-CO-OL-CNO
4.	BLANKENBERGE - PARAVENT – BELGIUM	BE-CO-CR-MA-OL-Paravent
5.	DUFERCO – A SHELTER – BELGIUM	BE-CO-Duferco
6.	LAFAUT – PRIVATE HOME FAMILY JOY – BELGIUM	BE-CO-Lafaut
7.	SE INDUSTRIES - CONSTRUCTION AND ENGINEERING – BELGIUM	BE-CO-OL-SE Industries
8.	TRACTEBEL – POWER STATION - BELGIUM	BE-CO-EL-OL-TE-Tractebel



9.	METAL CONSTRUCTIONS – VAN HEE - BELGIUM	BE-CO-Van Hee
10.	MAKO BETON - RACKS - BELGIUM	BE-CO-Mako Beton
11.	OPMETAAL - CHASSIS - BELGIUM	BE-CO-Opmetaal
12.	TEATRO MUNICIPAL - BRAZIL	BR-CI-CO-TC-Teatro
13.	ROHR – BUILDING INDUSTRY (SCAFFOLDING, TUBES, ...) - BRAZIL	BR-CO-Rohr
14.	TECHNICAL FAIR - BULGARIA	BG-CO-TE-TechnFair
15.	MUSEUM HOTEL IN WENDAKE - QUEBEC	CA-AM-CO-Wendake
16.	METRO VANCOUVER SKYTRAIN – CANADA	CA-CO-Metro Vancouver Skytrain
17.	DÜSSELDORF - AIRPORT - GERMANY	DE-AP-CO-HD-OL-TE-Düss.Airport
18.	SCHALKE 04 – FOOTBALL STADION - GERMANY	DE-CO-Schalke
19.	ZDF TELEVISION BROADCASTING STATION – CONSTRUCTION -GERMANY	DE-CO-OL-ZDF
20.	JEAN D'HUART - STEEL SUPPLIER AND APPLICATOR - FRANCE	FR-CO-D'Huart
21.	LE MANS CENTRE OF SPORTS AND CULTURE STEEL CONSTRUCTION FRANCE	FR-CO-OL-Le Mans
22.	RENAULT - CAR MANUFACTURING COMPANY - FRANCE	FR-CO-OL-TE-TR-Renault
23.	DUBLIN HOME – IRELAND	IE-CO-DublinHome
24.	MINISTRY OF PUBLIC WORKS – KUWAIT	KW-CO-Ministry of Public Works
25.	VENTILATION PIPES - MOROCCO	MA-CO-Ventilation shaft
26.	AUTOMATED PARKING SYSTEMS SILODAM AMSTERDAM - NETHERLANDS	NL-BR-CO-Automated Parking Systems Silodam Amsterdam
27.	CONTAINERS AND METAL GIRDERS - POLAND	PL-CO-TA-ZREMB
28.	LONDON – CARDINAL PLACE - UNITED KINGDOM	UK-CO-Cardinal Place
29.	EXXARO KUMBA GROOTGELUK COALMINE – SOUTH AFRICA	ZA-CO-TE-UN-Kumba Mine

CR: Crash barriers, metal sheet walls, railings and fences

1.	FENCE SUNNY EUROPE – BELGIUM	BE-AL-CR-HD-Fence Sunny Europe
2.	BLANKENBERGE - PARAVENT – BELGIUM	BE-CO-CR-MA-OL-Paravent
3.	ANTWERP - CRASH BARRIERS – BELGIUM	BE-CR-OL-Antwerp
4.	INTERCOMMUNALE E3 - METAL CONSTRUCTIONS - BELGIUM	BE-CR-OL-TE-Intercomm.
5.	CALLUWAERTS - FENCE – BELGIUM	BE-CR-Calluwaerts
6.	CHIMAY – SIGN OVER THE HIGHWAY - BELGIUM	BE-CR-Chimay
7.	DE GIEY – THE FENCE OF THE CASSTLE - BELGIUM	BE-CI-CR-OL-De Giey
8.	SLAUGHTERHOUSE CHARLEROI - BELGIUM	BE-CR-FO-HD-LT-OL-TE-Abattoir Charleroi
9.	HERAS – A FENCE – BELGIUM	BE-CR-OL-Heras
10.	GENT - KEIZER BRIDGE - BELGIUM	BE-BR-CR-OL-Keizer Bridge
11.	KLEIN KASTEELKEN – CAST IRON FENCE - BELGIUM	BE-CI-CR-OL-TC-Klein Kasteelken
12.	ZEEBRUGGE - UNDERGROUND CROSSING - BELGIUM	BE-CR-OL-Zeebrugge
13.	NO-PARKING POSTS BRUSSELS	BE-CR-TC-Amsterdammertjes Stad Brussel
14.	ECOVIAS – CRASH BARRIERS - BRAZIL	BR-CR-Ecovias
15.	DÜSSELDORF HIGHWAY - CRASH BARRIERS - GERMANY	DE-CR-OL-TE-Düss.Highway
16.	CRASHBARRIERS ON OUM RABII BRIDGE - MOROCCO	MA-CR-Bridge D'Oum Rabii
17.	CRASH BARRIERS - TROST – THE NETHERLANDS	NL-CR-Trost
18.	FOOTBRIDGES AND PROTECTION BARRIERS BYDGOSZCZ - POLAND	PL-BR-CR-Bydgoszcz
19.	RENOVATION OF THE SIERKIERKOWSKI BRIDGE IN WARSAW, NATIONAL ROAD- POLAND	PL-BR-CR-Sierkierkowski Bridge
20.	LAND TRANSPORT AUTHORITY - GUARD RAIL PANELS - SINGAPORE	SG-CR-OL-Land Transport Authority

DI: Dipping

1.	CAMPA – STEEL PANELS - BELGIUM	BE-DI-Campa
2.	SUARNABHUMI – AIRPORT - THAILAND	TH-AP-DI-SuvarnabhumiAirport



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| 3. | POLES ARMY TENTS - UNITED KINGDOM | UK-AR-DI-Poles Army Tents |
| 4. | DURAPIPE STEEL PRODUCTION - SOUTH AFRICA | ZA-DI-OL-Durapipe steel production |

DS: Do-it Yourself**EL: Electricity, Power stations**

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| 1. | ALCOA LTD - AUSTRALIA | AU-EL-HD-LT-PY-Alcoa |
| 2. | TRANSEND NETWORKS - AUSTRALIA | AU-EL-PY-TE-Transend Networks |
| 3. | TRANSGRID NETWORKS – NEW SOUTH WALES | AU-EL-PY-Transgrid Networks |
| 4. | TRACTEBEL – POWER STATION - BELGIUM | BE-CO-EL-OL-TE-Tractebel |
| 5. | FURNAS – ELECTRICITY PYLONS - BRAZIL | BR-EL-PY-TE-Furnas |
| 6. | CONTRACTOR – TURBINES - CHINA | CN-EL-CWTW |
| 7. | KRASIKOV TRANSFORMER STATION - CZECH REPUBLIC | CZ-EL-OL-PY-Krasikov |
| 8. | SLAVETICE TRANSFORMER STATION – CZECH REPUBLIC | CZ-EL-PY-Slavetice |
| 9. | TEMELIN NUCLEAR POWER PLANT - CZECH REPUBLIC | CZ-EL-OL-Temelin |
| 10. | RWE - AG – ELECTRICITY COMPANY - GERMANY | DE-EL-OL-TE-RWE |
| 11. | PLN HIGH TENSION PYLONS – INDONESIA | ID-EL-HD-PY-PLN High Tension Pylons |
| 12. | TRANSFORMERS – SOUTH KOREA | KR-EL-Transformers |
| 13. | TRASH RACKS POWER PLANT – SOUTH KOREA | KR-EL-IM-MA-TC-Trash rack |
| 14. | MINISTRY OF ELECTRICITY AND WATER – KUWAIT | KW-EL-OL-TE-Ministry of Electricity and Water |
| 15. | NATIONAL GRID CORPORATION PHILIPPINES – PHILIPPINES | PH-EL-HD-PY-National Grid Corporation Philippines |
| 16. | SANTA RITA BALFOUR BEATTY – PHILIPPINES | PH-EL-HD-PY-Santa Rita Balfour Beatty |
| 17. | REDE ELECTICA NACIONAL
POWER STATIONS AND SUPPLY LINES - PORTUGAL | PT-EL-OL-PY-TE-REN |
| 18. | ENERGOPROJECT – TRANSMISSION TOWERS - QATAR | QA-EL-OL-PY-TE-Energoproject |
| 19. | ELECTRICA - NATIONAL ELECTRICITY SUPPLIER - ROMANIA | RO-EL-OL-TE-Electrica |
| 20. | ARAD POWER STATION - ROMANIA | RO-EL-PY-Arad |
| 21. | GLOW ENERGY PUBLIC COMPANY MONOPOLES - THAILAND | TH-EL-HD-PY-Glow Energy Public Company Monopoles |
| 22. | FORMOSA PLASTICS COMPANY TRANSMISSION TOWERS - TAIWAN | TW-EL-HD-PY-TE-Formosa |
| 23. | POWER COMPANY – POWER PYLONS - TAIWAN | TW-EL-HD-OL-PY-TE-TPC |
| 24. | POWER PLANTS - TAIWAN | TW-EL-TC-ZC-Power Plants |
| 25. | CHERNOBYL NUCLEAR POWER STATION - UKRAINE | UA-EL-Chernobyl |
| 26. | KIEV ENERGO POWER PLANT - UKRAINE | UA-EL-HD-PY-Kiev Energo |
| 27. | ZUYEVSKAYA THERMAL POWER PLANT - UKRAINE | UA-EL-Zuyevskaya |

FO: Food

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| 1. | SLAUGHTERHOUSE CHARLEROI - BELGIUM | BE-CR-FO-HD-LT-OL-TE-Abattoir Charleroi |
| 2. | SLAUGHTERHOUSES - BELGIUM | BE-FO-OL-Goossens |
| 3. | IGLO OLA – METAL STRUCTURES - BELGIUM | BE-FO-Iglo Ola |
| 4. | DOSSCHE – CATTLE FEED TANKS - BELGIUM | BE-FO-TA-Dossche |
| 5. | QUARTES CATTLE FEED COMPANY - BELGIUM | BE-FO-HD-OL-TA-TE-Quartes |
| 6. | VERDEGEM CATTLE FEED COMPANY - BELGIUM | BE-FO-TE-Verdegem |
| 7. | CATTLE- AND PIGFARM - FINLAND | FI-AG-FO-HD-Cattle and Pig farm |
| 8. | SLAUGHTERHOUSE NÎMES MARCHÉ GARE - FRANCE | FR-FO-Nîmes |

HD: Applications on Hot-Dip

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| 1. | ALCOA LTD - AUSTRALIA | AU-EL-HD-LT-PY-Alcoa |
| 2. | CULVERTS - AUSTRALIA | AU-HD-HU-IM-UN-Culverts |



3.	FENCE SUNNY EUROPE – BELGIUM	BE-AL-CR-HD-Fence Sunny Europe
4.	SLAUGHTERHOUSE CHARLEROI – BELGIUM	BE-CR-FO-HD-LT-OL-TE-AbattoirCharleroi
5.	QUARTES CATTLE FEED COMPANY - BELGIUM	BE-FO-HD-OL-TA-TE-Quartes
6.	DE LIJN – PYLONS – BELGIUM	BE-HD-OL-PY-RW-De Lijn
7.	SILOS DE COCK – BELGIUM	BE-HD-TA-De Cock
8.	SILO'S DUBO DEUREN – ERPE-MERE	BE-HD-TA-Silo's Dubo Deuren
9.	RENOVATION SCHOOL SAINT-JOSEPH – LEVIS QUEBEC	CA-AL-AM-HD-Saint-Joseph
10.	USNS ZEUS CABLESHIP - USA	CA-AR-MA-HD-SH-USNS Zeus Cableship
11.	MINISTRY OF TRANSPORT - QUEBEC	CA-HD-TE-Ministry of transport
12.	GUANGZOU NEW BAIYUN AIRPORT - CHINA	CN-AP-HD-Baiyun
13.	CHONGQING BROADCASTING COMPANY - CHINA	CN-HD-PY-Chong Broad
14.	DÜSSELDORF AIRPORT - GERMANY	DE-AP-CO-HD-OL-TE-Düss. Airport
15.	CATTLE- AND PIGFARM - FINLAND	FI-AG-FO-HD-Cattle and Pigfarm
16.	DIRECTION DEPARTEMENTALE DE L'EQUIPEMENT, VENDEE SEA BUOYS – FRANCE	FR-HD-IM-MA-OL-TE-Sea Buoys
17.	ZINGA ANTICORROSION DISTRIBUTOR - FRANCE	FR-HD-TE-Guerin
18.	OHENE DJAN SPORT STADIUM LIGHT POLES - GHANA	GH-AM-HD-PY-OheneDjanstadium
19.	PLN HIGH TENSION PYLONS – INDONESIA	ID-EL-HD-PY-PLN High Tension Pylons
20.	GRAIN SILOS NADOR CEREALES – MOROCCO	MA-AG-HD-TA-Grain Silos Nador Cereales
21.	TENAGA NASIONAL BERHAD - PYLONS - MALAYSIA	MY-HD-PY-Tenaga Nasional Berhad
22.	PHCN - POWER HOLDING COMPANY OF NIGERIA - NIGERIA	NG-HD-PY-PHCN
23.	NATIONAL GRID CORPORATION PHILIPPINES – PHILIPPINES	PH-EL-HD-PY-National Grid Corporation Philippines
24.	SANTA RITA BALFOUR BEATTY – PHILIPPINES	PH-EL-HD-PY-Santa Rita Balfour Beatty
25.	YUZHNY GREENHOUSE FARM - RUSSIA	RU-AG-HD-Yuzhny
26.	GLOW ENERGY PUBLIC COMPANY MONOPOLES - THAILAND	TH-EL-HD-PY-Glow Energy Public Company Monopoles
27.	LIGHT POLES – DON MUANG TOLL WAY – THAILAND	TH-HD-PY-Don Muang Toll
28.	FORMOSA PLASTICS COMPANY TRANSMISSION TOWERS - TAIWAN	TW-EL-HD-PY-Formosa
29.	POWER COMPANY – POWER PYLONS - TAIWAN	TW-EL-HD-OL-PY-TE-TPC
30.	EDEN GREENHOUSE DOME – UNITED KINGDOM	UK-AG-HD-HT-TP-Eden
31.	CULVERTS – UNITED KINGDOM	UK-HD-HU-IM-UN-Culverts
32.	KIEV ENERGO POWER PLANT - UKRAINE	UA-EL-HD-PY-Kiev Energo
33.	US ARMY -UNITED STATES OF AMERICA	US-AR-HD-OL-TE-TR-US Army
34.	LIGHT POLES, TERMINAL CUENCA DEL PLATA, PORT OF MONTEVIDEO, URUGUAY	UY-HD-PY-Katoennatie Light Pole

HT: High temperatures

1.	FLOREAC – COAL FUNNEL – BELGIUM	BE-AZ-HT-OL-Floreac
2.	CARSID - BELGIUM	BE-AZ-HT-OL-TE-Carsid
3.	SULTAM – CHIMNEY - ISRAEL	IL-AZ-HT-OL-Sultam
4.	DERBY – TURBINE EXHAUST STACKS - UNITED KINGDOM	UK-AZ-HT-OL-TE-Derby
5.	EDEN GREENHOUSE DOME – UNITED KINGDOM	UK-AG-HD-HT-TP-Eden
6.	PORT ELISABETH ELECTRICITY DEPARTMENT - FUEL TANKS AND EXHAUST – SOUTH AFRICA	ZA-AZ-HT-TA-Port.El.

HU: Humidity and vapour

1.	CULVERTS - AUSTRALIA	AU-HD-HU-IM-UN-Culverts
2.	J.M. INDUSTRIAL – RACKS, METAL EQUIPMENT AND STRUCTURES IN BRICK MANUFACTURING FACTORIES - BELGIUM	BE-AZ-CE-HU-OL-TE-JM Ind.
3.	BASF – CHEMICAL COMPANY - BELGIUM	BE-HU-PE-TA-TE-BASF



4.	GREENHOUSE - FINLAND	FI-HU-TP-Greenhouse
5.	CULVERTS - UNITED KINGDOM	UK-HD-HU-IM-UN-Culverts

IM: Immersion

1.	CULVERTS - AUSTRALIA	AU-HD-HU-IM-UN-Culverts
2.	DE BRANDT – FENDER CONSTRUCTIONS - BELGIUM	BE-BR-IM-OL-De Brandt
3.	DIRECTION DEPARTEMENTALE DE L'EQUIPEMENT, VENDEE SEA BUOYS – FRANCE	FR-HD-IM-MA-OL-TE-Sea Buoys
4.	BANGOR PIER – IMMERSED PILES - IRELAND	IE-IM-MA-Bangor
5.	KILLYBEGS FISHING PIER - IMMERSED PIER LEGS - IRELAND	IE-IM-MA-TE-Killybegs pier
6.	SLUICE GATES WEST BENGAL – INDIA	IN-IM-Sluice gates West Bengal
7.	TRASH RACKS POWER PLANT – SOUTH KOREA	KR-EL-IM-MA-TC-Trash rack
8.	SEA BUOYS - SENEGAL	SN-IM-MA-Sea Buoy
9.	CULVERTS - UNITED KINGDOM	UK-HD-HU-IM-UN-Culverts

LT: Low temperatures

1.	ALCOA LTD - AUSTRALIA	AU-EL-HD-LT-PY-Alcoa
2.	SLAUGHTERHOUSE CHARLEROI - BELGIUM	BE-CR-FO-LT-OL-TE-Abattoir Charleroi
3.	BONNETS OF SRC BUNDLES - BELGIUM	BE-LT-TE-SPX Cooling Technologies
4.	METRO – MINSK – BELARUS	BY-AM-LT-TC-Metro

MA: Marine environments and offshore

1.	BLANKENBERGE - PARAVENT – BELGIUM	BE-CO-CR-MA-OL-Paravent
2.	BLOMMAERT - SHIP HATCHES - BELGIUM	BE-MA-SH-BlommaertHatches
3.	DECLOEDT – DREDGING COMPANY - BELGIUM	BE-OL-MA-TE-Decloedt
4.	DRILLING PLATFORM - BRAZIL	BR-MA-PE-Polvo
5.	USNS ZEUS CABLESHIP - USA	CA-AR-MA-HD-SH-USNS Zeus Cableship
6.	BC FERRY TERMINALS - CANADA	CA-BR-MA-OL-TE-BC Ferry
7.	PACIFIC GRAIN ELEVATOR - CANADA	CA-CN-MA-Pacific Grain Elevator
8.	CITY OF BURNABY – A SLOPE - CANADA	CA-MA-TE-CityOfBurnaby
9.	NATIONAL GRAND THEATRE BEIJING - CHINA	CN-AM-MA-Theatre Beijing
10.	YUEHAI PASSAGE TRAIN FERRY PIER TERMINAL - CHINA	CN-AZ-MA-RW-YuehaiTrainFerry
11.	EL SALAAM BRIDGE - EGYPT	EG-BR-MA-PI-TE-Salaam
12.	DIRECTION DEPARTEMENTALE DE L'EQUIPEMENT, VENDEE SEA BUOYS – FRANCE	FR-HD-IM-MA-OL-TE-Sea Buoys
13.	TRANSOCEAN SEDCO FOREX – OFFSHORE DRILLING COMPANY INDONESIA	ID-MA-PE-TransSedcoForex
14.	BANGOR PIER – IMMERSED PILES - IRELAND	IE-IM-MA-Bangor
15.	KILLYBEGS FISHING PIER - IMMERSED PIER LEGS - IRELAND	IE-IM-MA-TE-Killybegs pier
16.	TRASH RACKS POWER PLANT – SOUTH KOREA	KR-EL-IM-MA-TC-Trash rack
17.	SHELL TANK - MOROCCO	MA-MA-PE-TA-Shell
18.	NATIONAL ELECTRICITY COMPANY - MOROCCO	MA-MA-PI-ONE
19.	SHELL - PETROCHEMICAL COMPANY - NETHERLANDS	NL-MA-PE-TE-Shell
20.	KALVOYA BRIDGE - NORWAY	NO-BR-MA-OL-TE-Kalvoja
21.	ST. PAUL – JETTY – REUNION	RE-BR-MA-St. Paul
22.	SEA BUOYS - SENEGAL	SN-IM-MA-Sea Buoy
23.	STATIONARY DOCK - SENEGAL	SN-MA-Dry Dock
24.	OFFICE TOGOLAIS DES PHOSPHATES PHOSPHATE MINE OFFSHORE CHARGING CRANES - TOGO	TG-CN-MA-OL-PE-Off. Togolais
25.	YACHT WATER TANKS - UNITED KINGDOM	UK-MA-OL-Adela
26.	OFFSHORE COMPANIES – UNITED KINGDOM	UK-MA-Offshore



27.	SHIPS – UNITED KINGDOM	UK-MA-SH-Ships
28.	VECTOR INTERNATIONAL – OFFSHORE NUTS AND BOLTS – UNITED KINGDOM	UK-MA-NB-PE-TE-Vector

NB: Nuts and bolts

1.	VECTOR INTERNATIONAL – OFFSHORE NUTS AND BOLTS – UNITED KINGDOM	UK-MA-NB-PE-TE-Vector
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OL: Applications ≥ 10 years

1.	DIRK – AGRICULTURAL MACHINERY– BELGIUM	BE-AG-OL-TE-Martens
2.	GENT KIOSK - BELGIUM	BE-AM-CO-OL-GentKiosk
3.	NATO – NATO PUMP STATIONS - BELGIUM	BE-AR-OL-PI-TE-NATO
4.	BELGIAN ARMY - NAVY SHIPS AND ANTENNA - BELGIUM	BE-AR-OL-PY-SH-Belgian Army
5.	CARSID - BELGIUM	BE-AZ-HT-OL-TE-Carsid
6.	FLOREAC – COAL FUNNEL - BELGIUM	BE-AZ-HT-OL-Floreac
7.	EUROPEAN TECHNICAL ASSOCIATION FOR PROTECTIVE COATINGS - BELGIUM	BE-BR-OL-TE-Etapc
8.	DE BRANDT - BELGIUM	BE-BR-IM-OL-DeBrandt
9.	MELLE BRIDGE - BELGIUM	BE-BR-OL-TC-Melle Bridge
10.	WEGENFONDS BRIDGE - BELGIUM	BE-BR-OL-Wegenfonds
11.	HOLCIM GRANULATS - CEMENT FACTORY - BELGIUM	BE-CE-OL-TE-Holcim
12.	J.M. INDUSTRIAL - BELGIUM	BE-AZ-CE-HU-OL- TE-JM-Ind
13.	DE GIEY - BELGIUM	BE-CI-CR-OL-De Giey
14.	KLEIN KASTEELKEN – CAST IRON FENCE - BELGIUM	BE-CI-CR-OL-TC-Klein Kast.
15.	ANTWERP PORT CRANES - BELGIUM	BE-CN-OL-AntwerpPortCranes
16.	HARBOUR OF GENK - BELGIUM	BE-CN-OL-TE-KHG
17.	BACOB BANK DENDERMONDE - BELGIUM	BE-CO-OL-Bacob
18.	CNO - A COOLING TOWER - BELGIUM	BE-CO-OL-CNO
19.	BLANKENBERGE PARAVENT – BELGIUM	BE-CO-CR-MA-OL-Paravent
20.	SE INDUSTRIES - BELGIUM	BE-CO-OL-SE Industries-
21.	SLAUGHTERHOUSE CHARLEROI - BELGIUM	BE-CR-FO-LT-OL-TE-AbattoirCharleroi
22.	HERAS - A FENCE - BELGIUM	BE-CR-OL-Heras
23.	INTERCOMMUNALE E3 - METAL CONSTRUCTIONS - BELGIUM	BE-CR-OL-TE-Intercomm
24.	KEIZER BRIDGE GHENT - BELGIUM	BE-BR-CR-OL-Keizer Bridge
25.	ZEEBRUGGE UNDERGROUND CROSSING - BELGIUM	BE-CR-OL-Zeebrugge
26.	TRACTEBEL – POWER STATION - BELGIUM	BE-CO-EL-OL-TE-Tractebel
27.	SLAUGHTERHOUSES - BELGIUM	BE-FO-OL-Goossens
28.	CATTLE FEED COMPANY - BELGIUM	BE-FO-HD-OL-TA-TE-Quartes
29.	DECLOEDT – DREDGING COMPANY - BELGIUM	BE-MA-OL-TE-Decloedt
30.	TOTAL PETROCHEMICAL FELUY - PIPELINES - BELGIUM	BE-OL-PE-PI-TE-Fina
31.	WOLF OIL CORPORATION - BELGIUM	BE-OL-PE-TA-Wolf oil
32.	ASSOCIATION COMPANY OF PRODUCTION OF ELECTRICITY - S.P.E.- BELGIUM	BE-OL-PI-TE-SPE
33.	KLUIZEN WATER PURIFICATION STATION - BELGIUM	BE-OL-PI-TC-Kluizen
34.	PIT COAL MINE - BELGIUM	BE-OL-PI-UN-Kemp.Steenk
35.	STORA ENSO PAPER MILL - BELGIUM	BE-OL-PP-TE-Stora Enso
36.	PUBLIC FOUNTAIN IN GHENT - BELGIUM	BE-OL-PW-TC-TE-Gent fount.
37.	ELECTRABEL - BELGIUM	BE-OL-PY-Electrabel
38.	DE LIJN – PYLONS - BELGIUM	BE-HD-OL-PY-RW-De Lijn
39.	CITA – RAILWAY WAGON - BELGIUM	BE-OL-RW-TE-CITA
40.	DREDGING COMPANIES DECLOEDT - BELGIUM	BE-OL-SH-TE-Dredging



41.	NARAI – SAILING SHIP - BELGIUM	BE-OL-SH-TE-Narai
42.	DE GRAEVE SHIPYARDS - BELGIUM	BE-OL-SH-TC-TE-De Graeve
43.	MERCATOR – SAILING SHIP - BELGIUM	BE-OL-SH-TC-Mercator
44.	WESTHINDER – LIGHTSHIP - BELGIUM	BE-OL-SH-TC-Westhinder
45.	RAILWAY OFFICE - BENIN	BJ-BR-OL-RW-Chemins Fer
46.	CONFEDERATION BRIDGE - CANADA	CA-BR-OL-Confederation
47.	BC FERRY TERMINALS - CANADA	CA-BR-MA-OL-TE-BC Ferry
48.	OVERLANDER BRIDGE - CANADA	CA-BR-OL-TE-Overlander
49.	BLANICE RIVER BRIDGE - CZECH REPUBLIC	CZ-BR-OL-Blanice
50.	KRASIKOV TRANSFORMER STATION - CZECH REPUBLIC	CZ-EL-OL-PY-Krasikov
51.	TEMELIN NUCLEAR POWER PLANT - CZECH REPUBLIC	CZ-EL-OL-Temelin
52.	DÜSSELDORF AIRPORT - GERMANY	DE-AP-CO-HD-OL-TE-Düss.Airport
53.	SCHWENK – CEMENT FACTORY - GERMANY	DE-CE-OL-TE-Schwenk
54.	ZDF TELEVISION BROADCASTING STATION - GERMANY	DE-CO-OL-ZDF
55.	DÜSSELDORF HIGHWAY - CRASH BARRIERS - GERMANY	DE-CR-OL-TE-Düss. Highway
56.	RWE - AG – ELECTRICITY COMPANY - GERMANY	DE-EL-OL-TE-RWE
57.	STROM UND HAUFENBAU HAMBURG HARBOUR COMPAGNY - GERMANY	DE-OL-PE-TA-TE-Strom
58.	LE MANS CENTRE OF SPORTS AND CULTURE STEEL CONSTRUCTION - FRANCE	FR-CO-OL-Le Mans
59.	RENAULT - CAR MANUFACTURING COMPANY - FRANCE	FR-CO-OL-TE-TR-Renault
60.	DIRECTION DEPARTEMENTALE DE L'EQUIPEMENT - FRANCE	FR-HD-IM-MA-OL-TE-Sea Buoys
61.	SOCIETE NATIONALE DE CHEMINS DE FER - FRANCE	FR-OL-RW-TE-SNCF
62.	SULTAM – CHIMEY - ISRAEL	IL-AZ-HT-OL-Sultam
63.	ABADAN & SHIRAZ REFINERIES - IRAN	IR-OL-PE-TE-Abadan Shiraz
64.	MINISTRY OF PUBLIC WORKS - KUWAIT	KW-CO-OL-TE-Ministry of Public Works
65.	MINISTRY OF ELECTRICITY AND WATER - KUWAIT	KW-EL-OL-TE-Ministry of Electricity and Water
66.	KALVOYA BRIDGE - NORWAY	NO-BR-MA-OL-TE-Kalvoja
67.	RYSTRAUM MOTOR SHIP - NORWAY	NO-OL-SH-TE-Rystraum
68.	REDE ELECTICA NACIONAL - PORTUGAL	PT-EL-OL-PY-TE-REN
69.	ENERGOPROJECT – TRANSMISSION TOWERS - QATAR	QA-EL-OL-PY-TE-Energo
70.	ELECTRICA - NATIONAL ELECTRICITY SUPPLIER - ROMANIA	RO-EL-OL-TE-Electrica
71.	SNCFR - ROMANIAN RAILWAYS - ROMANIA	RO-OL-RW-TE-SNCFR
72.	LAND TRANSPORT AUTHORITY GUARD RAIL PANELS - SINGAPORE	SG-CR-OL-Land Transp. Auth.
73.	PHOSPHATE MINE OFFSHORE CHARGING CRANES - TOGO	TG-CN-MA-OL-PE-Off. Togolais
74.	POWER COMPANY – POWER PYLONS - TAIWAN	TW-EL-HD-OL-PY-TE-TPC
75.	DERBY – TURBINE EXHAUST STACKS - UNITED KINGDOM	UK-AZ-HT-OL-TE-Derby
76.	NEWARK MARINA BRIDGE - UNITED KINGDOM	UK-BR-OL-Newark Mar.
77.	YACHT WATER TANKS - UNITED KINGDOM	UK-MA-OL-Adela
78.	LONDON UNDERGROUND - UNITED KINGDOM	UK-OL-RW-TE-UN-London Underground
79.	US ARMY - UNITED STATES OF AMERICA	US-AR-OL-TE-TR-US Army
80.	LAFARGE - SOUTH AFRICA	ZA-CE-OL-Lafarge
81.	DURAPIPE STEEL PRODUCTION - SOUTH AFRICA	ZA-DI-OL-Durapipe steel production

PE: Chemical, Petrochemicals

1.	FLUXYS - BELGIAN LARGEST GAS SUPPLIER - BELGIUM	BE-PE-TE-Fluxys
2.	BASF – CHEMICAL COMPANY - BELGIUM	BE-HU-PE-TA-TE-BASF
3.	FINA CHEMICALS - PIPELINES - BELGIUM	BE-OL-PE-PI-TE-Fina
4.	WOLF OIL CORPORATION - BELGIUM	BE-OL-PE-TA-Wolf oil

5.	VAN BROEKHOVENS - DIESEL STORAGE TANKS – BELGIUM	BE-PE-TA-TE-Van Broekhoven
6.	DRILLING PLATFORM - BRAZIL	BR-MA-PE-Polvo
7.	KOBRIN OIL PUMPING STATION - BELARUS	BY-PE-TA-TC-Kobrin
8.	SHANGHAI DOVECHEM BOMTA TERMINAL - CHINA	CN-PE-TA-Bomta
9.	SHANGHAI PRAXAIR YIDIAN - GAS PROCESSING COMPANY - CHINA	CN-PE-Praxair
10.	STROM UND HAUFENBAU HAMBURG HARBOUR COMPAGNY - GERMANY	DE-OL-PE-TA-TE-Strom
11.	ABU QIR FERTILIZERS - EGYPT	EG-PE-AbuQirFert.
12.	TRANSOCEAN SEDCO FOREX – OFFSHORE DRILLING COMPANY INDONESIA	ID-MA-PE-TransSedcoForex
13.	ABADAN & SHIRAZ REFINERIES - IRAN	IR-OL-PE-TE-Abadan Shiraz
14.	NATIONAL IRANIAN GAS COMPANY - REBARS - IRAN	IR-PE-RE-NIGC
15.	KUWAIT OIL COMPANY - KUWAIT	KW-PE-TE-KOC
16.	PETROCHEMICAL COMPANY - NETHERLANDS	NL-MA-PE-TE-Shell
17.	SHELL TANK - MOROCCO	MA-MA-PE-TA-Shell
18.	OFFICE TOGOLAIS DES PHOSPHATES PHOSPHATE MINE OFFSHORE CHARGING CRANES - TOGO	TG-CN-MA-OL-PE-Off.Togolais
19.	VECTOR INTERNATIONAL – OFFSHORE NUTS AND BOLTS – UNITED KINGDOM	UK-MA-NB-PE-TE-Vector
20.	CLAMPS CCS – UNITED KINGDOM	UK-PE-PI-Clamps CCS
21.	OIL STORAGE TANK - EXXON MOBILE - UNITED KINGDOM	UK-PE-TA-Exxon Mobile

PI: Pipelines

1.	NATO – NATO PUMP STATIONS - BELGIUM	BE-AR-OL-PI-NATO
2.	FINA CHEMICALS - PIPELINES - BELGIUM	BE-OL-PE-PI-TE-Fina
3.	KLUIZEN WATER PURIFICATION STATION – BELGIUM	BE-OL-PI-TC-Kluizen
4.	KEMPENSE STEENKOOLMIJNEN – PIT COAL MINE - BELGIUM	BE-OL-PI-TE-UN-Kemp.Steenk.
5.	ASSOCIATION COMPANY OF PRODUCTION OF ELECTRICITY S.P.E – BELGIUM	BE-OL-PI-TE-SPE
6.	EL SALAAM BRIDGE - EGYPT	EG-BR-MA-PI-TE-Salaam
7.	GASCO COMPANY UNDERGROUND PIPELINES - EGYPT	EG-PI-UN-Gasco
8.	METRONCO – PIPELINES - GHANA	GH-PI-Metronco
9.	SEOUL AIR CONDITIONING – SOUTH KOREA	KR-AL-PI-Seoul Air Conditioning
10.	NATIONAL ELECTRICITY COMPANY - MOROCCO	MA-MA-PI-ONE
11.	GAS PIPELINES - POLAND	PL-PI-Wtoctawek
12.	TEMVAR BRASOV BRIDGE – ROMANIA	RO-BR-PI-Temvar Brasov Bridge
13.	MOSVODOKANAL – WATER SUPPLIER - RUSSIA	RU-PI-Mosvodo
14.	CLAMPS CCS – UNITED KINGDOM	UK-PE-PI-Clamps CCS

PP: Pulp and paper mills

1.	STORA ENSO PAPER MILL – BELGIUM	BE-OL-PP-TE-Stora Enso
2.	PULP AND PAPER INDUSTRY - CANADA	CA-PP-Pulp and Paper Industry

PW: Potable water

1.	GHENT - PUBLIC FOUNTAIN – BELGIUM	BE-OL-PW-TC-TE-Gent fount.
2.	RUBLEVO WATER INTAKE PLANT - RUSSIA	RU-PW-RE-Rublevo
3.	FURMANITE – A REFERENCE LETTER - UNITED KINGDOM	UK-PW-TE-Furmanite
4.	BRAITHWAITE TANK – UNITED KINGDOM	UK-PW-TA-Braithwaite tank

PY: Pylons, light poles, towers and wind mills

1.	ENERGEX - PYLONS - AUSTRALIA	AU-PY-Energex
2.	ALCOA LTD - AUSTRALIA	AU-EL-HD-LT-PY-Alcoa



3.	TRANSEND NETWORKS - AUSTRALIA	AU-EL-PY-TE-Transend Networks
4.	TRANSGRID NETWORKS – NEW SOUTH WALES	AU-EL-PY-Transgrid Networks
5.	BAKCELL COMMUNICATION TOWER - AZERBAIJAN	AZ-PY-TE-Bakcell Communication Tower
6.	BELGIAN ARMY - NAVY SHIPS AND ANTENNA - BELGIUM	BE-AR-OL-PY-SH-Belgian Army
7.	ELECTRABEL – ELECTRICITY COMPANY - BELGIUM	BE-OL-PY-Electrabel
8.	MULLEM WIND MILL – BELGIUM	BE-PY-Mullem Mill
9.	DE LIJN – PYLONS – BELGIUM	BE-HD-OL-PY-RW-De Lijn
10.	FURNAS – ELECTRICITY PYLONS - BRAZIL	BR-EL-PY-TE-Furnas
11.	MOBIMETAL – TELECOMMUNICATION PYLONS - CONGO	CD-PY-TE-Mobimetal
12.	CHONGQING BROADCASTING COMPANY - CHINA	CN-HD-PY-Chong Broad
13.	GUANGZHOU TV TOWER - CHINA	CN-PY-Guangzhou TV tower
14.	KRASIKOV TRANSFORMER STATION - CZECH REPUBLIC	CZ-EL-OL-PY-Krasikov
15.	SLAVETICE TRANSFORMER STATION – CZECH REPUBLIC	CZ-EL-PY-Slavitice
16.	KECHABIA - ALGERIA	DZ-PY-Kecahbia
17.	OHENE DJAN SPORT STADIUM LIGHT POLES - GHANA	GH-AM-HD-PY-OheneDjanStadium
18.	PLN HIGH TENSION PYLONS – INDONESIA	ID-EL-HD-PY-PLN High Tension Pylons
19.	LIGHT POLES OF THE ANFA AVENUE - MOROCCO	MA-PY-Anfa
20.	TENAGA NASIONAL BERHAD - PYLONS - MALAYSIA	MY-HD-PY-Tenaga Nasional Berhad
21.	PHCN - POWER HOLDING COMPANY OF NIGERIA - NIGERIA	NG-HD-PY-PHCN
22.	NATIONAL GRID CORPORATION PHILIPPINES – PHILIPPINES	PH-EL-HD-PY-National Grid Corporation Philippines
23.	SANTA RITA BALFOUR BEATTY – PHILIPPINES	PH-EL-HD-PY-Santa Rita Balfour Beatty
24.	REDE ELECTICA NACIONAL POWER STATIONS AND SUPPLY LINES - PORTUGAL	PT-EL-PY-TE-REN
25.	ENERGOPROJECT – TRANSMISSION TOWERS - QATAR	QA-EL-OL-PY-TE-Energoproject
26.	ARAD POWER STATION - ROMANIA	RO-EL-PY-Arad
27.	MUNTENIA – PYLONS - ROMANIA	RO-PY-TE-Muntenia
28.	PSA LIGHTING MASTS	SG-PY-PSA Lighting Masts
29.	GLOW ENERGY PUBLIC COMPANY MONOPOLES - THAILAND	TH-EL-HD-PY-Glow Energy Public Company Monopoles
30.	LIGHT POLES – DON MUANG TOLL WAY – THAILAND	TH-HD-PY-Don Muang Toll
31.	FORMOSA PLASTICS COMPANY TRANSMISSION TOWERS - TAIWAN	TW-EL-HD-PY-TE-Formosa
32.	POWER COMPANY – POWER PYLONS - TAIWAN	TW-EL-HD-OL-PY-TE-TPC
33.	TAIWAN POWER COMPANY - ZEPHYROS WIND MILLS - TAIWAN	TW-PY-ZC-Zephyros
34.	KIEV ENERGO POWER PLANT - UKRAINE	UA-EL-HD-PY-Kiev Energo
35.	KIEV ROAD ADMINISTRATION - UKRAINE	UA-PY-Kiev Road Administration
36.	NEXRAD TOWER – UNITED STATES OF AMERICA	US-AR-PY-Nexrad Tower
37.	LIGHT POLES, TERMINAL CUENCA DEL PLATA, PORT OF MONTEVIDEO, URUGUAY	UY-HD-PY-Katoennatie Light Pole
38.	HAI PHONG TOWER - PYLONS - VIETNAM	VN-PY-Hai Phong Tower

RE: Rebars

1.	TRANSFO ZWEVEGEM - BELGIUM	BE-RE-Transfo
2.	HANGZHOU BAY BRIDGE - CHINA	CN-BR-RE-Hangzhou Bay
3.	CONTRACTOR – TURBINES - CHINA	CN-RE-RW-CWTW
4.	NATIONAL IRANIAN GAS COMPANY - REBARS - IRAN	IR-PE-RE-NIGC
5.	REBAR SPRAYING INSTALLATION TEHRAN HARA - IRAN	IR-AS-RE-AutomSprayLine
6.	CHABAHAH PORT – REBARS - IRAN	IR-RE-TE-Chabahar
7.	OMRAN SAHEL INSTITUTE – REBARS - IRAN	IR-RE-TE-OmranSahelInst.
8.	PERLITE CONSTRUCTION - SULFUR EXPORT WHARF - IRAN	IR-RE-TE-PerliteConstr



9.	RAHE SAHEL INSTITUTE – REBARS - IRAN	IR-RE-TE-RaheSahelInst.
10.	PARS OIL & GAS CO. – REBARS - IRAN	IR-RE-TE-Pars Oil & Gas Co.
11.	RUBLEVO WATER INTAKE PLANT - RUSSIA	RU-PW-RE-Rublevo
12.	BUILDING WITH REBARS - RUSSIA	RU-RE-Building

RW: Railway

1.	QUEENSLAND RAILWAY BRIDGES - AUSTRALIA	AU-BR-RW-QR Railway Bridges
2.	DE LIJN – PYLONS – BELGIUM	BE-HD-OL-PY-RW-De Lijn
3.	CITA – RAILWAY WAGON - BELGIUM	BE-OL-RW-TE-Cita
4.	RAILWAY OFFICE - BENIN	BJ-BR-OL-RW-Chemins Fer
5.	DORBRAS RAILWAY COMPANY - BRAZIL	BR-RW-TE-Dorbras
6.	YUEHAI PASSAGE TRAIN FERRY PIER TERMINAL - CHINA	CN-AZ-MA-RW-YuehaiTrainFerry
7.	CONTRACTOR – TURBINES - CHINA	CN-RE-RW-CWTW
8.	MAGLEV TRANSRAPIR RAILWAY - CHINA	CN-RW-Maglev
9.	SOCIETE NATIONALE DE CHEMINS DE FER - FRANCE	FR-OL-RW-TE-SNCF
10.	SNCFR - ROMANIAN RAILWAYS - ROMANIA	RO-RW-OL-TE-SNCFR
11.	TELEGONDOLA – ROMANIA	RO-RW-TE-Telegondola
12.	TRAIN CARRIAGE TRANSRAIL - SENEGAL	SN-RW-TA-Train Wagon
13.	LONDON UNDERGROUND – UNITED KINGDOM	UK-OL-RW-TE-UN-London Underground
14.	LONDON UNDERGROUND – UNITED KINGDOM	UK-OL-RW-TE-Underground

SH: Ships

1.	BELGIAN ARMY - NAVY SHIPS AND ANTENNA - BELGIUM	BE-AR-OL-PY-SH-Belgian Army
2.	BLOMMAERT SHIP HATCHES - BELGIUM	BE-MA-SH-BlommaertHatches
3.	BONNE INDUSTRIAL - SHIPS - BELGIUM	BE-SH-TC-Bonne Industrial
4.	COBBAERT SHIP - BELGIUM	BE-SH-Cobbaert
5.	DE GRAEVE SHIPYARDS - BELGIUM	BE-OL-SH-TC-TE-De Graeve
6.	DREDGING COMPANIES DECLOEDT, JAN DE NUL & DREDGING INTERNATIONAL - BELGIUM	BE-OL-SH-TE-Dredging
7.	DUPON BOAT - BELGIUM	BE-SH-Dupon
8.	FULTON MARINE - BELGIUM	BE-SH-Fulton
9.	MERCATOR – SAILING SHIP - BELGIUM	BE-OL-SH-TC-Mercator
10.	NARAI – SAILING SHIP - BELGIUM	BE-OL-SH-TE-Narai
11.	WALTZING MATHILDE SHIP - BELGIUM	BE-SH-Waltzing
12.	WESTHINDER – LIGHTSHIP - BELGIUM	BE-OL-SH-TC-Westhinder
13.	SHIP - BELGIUM	BE-SH-TE-West-Vl.
14.	USNS ZEUS CABLESHIP - USA	CA-AR-MA-HD-SH-USNS Zeus Cableship
15.	EXXON MOBIL PLATFORM - MALAYSIA	MY-SH-ExxonMobil
16.	RYSTRAUM MOTOR SHIP - NORWAY	NO-OL-SH-TE-Rystraum
17.	COAL TRANSPORT SHIP - TAIWAN	TW-SH-TC-Coal Tr Ship
18.	SHIPS – UNITED KINGDOM	UK-MA-SH-Ships
19.	ITCHEN MARINE – UNITED KINGDOM	UK-SH-Itchen

TA: Tanks, containers and silos

1.	DOSSCHE – CATTLE FEED TANKS - BELGIUM	BE-FO-TA-Dossche
2.	QUARTES CATTLE FEED COMPANY - BELGIUM	BE-FO-HD-OL-TA-TE-Quartes
3.	BASF – CHEMICAL COMPANY - BELGIUM	BE-HU-PE-TA-TE-BASF
4.	VAN BROEKHOVENS - DIESEL STORAGE TANKS – BELGIUM	BE-PE-TA-TE-Van Broekhoven
5.	DUMON AGRO - CONTAINER - BELGIUM	BE-TA-Dumon



6.	GENT PUBLIC WORKS – SALT FUNNELS - BELGIUM	BE-TA-Gent Pub.
7.	COCA COLA - BELGIUM	BE-TA-Coca Cola
8.	SILOS DE COCK – BELGIUM	BE-HD-TA-De Cock
9.	SILO'S DUBO DEUREN – ERPE-MERE	BE-HD-TA-Silo's Dubo Deuren
10.	SNACK FOODS VEURNE - BELGIUM	BE-TA-SnackFoods
11.	PAESEN - CONCRETE MILL - BELGIUM	BE-CE-TA-Paesen
12.	WOLF OIL CORPORATION - BELGIUM	BE-OL-PE-TA-Wolf oil
13.	MAKRO – A TANK - BELGIUM	BE-TA-Makro
14.	SILOS VANDENBERGHE - BELGIUM	BE-TA-Vandenberghe
15.	KOBRIN OIL PUMPING STATION - BELARUS	BY-PE-TA-TC-Kobrin
16.	SHANGHAI DOVECHEM BOMTA TERMINAL - CHINA	CN-TA-PE-Bomta
17.	STROM UND HAUFENBAU HAMBURG HARBOUR COMPAGNY - GERMANY	DE-OL-PE-TA-TE-Strom
18.	GRILLO WERKE AG GAS CYLINDERS GERMANY	DE-TA-Grillo Werke AG
19.	WATER STORAGE TANKS ROUREKELA – INDIA	IN-TA-Water Storage Tanks
20.	GRAIN SILOS NADOR CEREALS – MOROCCO	MA-AG-HD-TA-Grain Silos Nador Cereales
21.	HYDRO-TANK - MAROC	MA-TA-Hydro-tank
22.	SHELL TANK - MOROCCO	MA-MA-PE-TA-Shell
23.	TANK - MOROCCO	MA-TA-Kettle construct
24.	STORAGE TANKS - NORWAY	NO-TA-Storage tanks
25.	TANKS – NEW PLYMOUTH – NEW ZEALAND	NZ-TA-New Plymouth
26.	CONTAINERS AND METAL GIRDERS - POLAND	PL-CO-TA-ZREMB
27.	TRAIN CARRIAGE TRANSRAIL - SENEGAL	SN-RW-TA-Train Wagon
28.	MAERSK CONTAINERS - TAIWAN	TW-TA-TE-Maersk
29.	OIL STORAGE TANK - EXXON MOBILE - UNITED KINGDOM	UK-PE-TA-Exxon Mobile
30.	BRAITHWAITE TANK – UNITED KINGDOM	UK-PW-TA-Braithwaite tank
31.	PORT ELISABETH ELECTRICITY DEPARTMENT - FUEL TANKS AND EXHAUST – SOUTH AFRICA	ZA-AZ-HT-TA-Port.EL

TC: Topcoats

1.	REYNELLA BRIDGE - AUSTRALIA	AU-BR-TC-Reynella Bridge
2.	MELLE BRIDGE - BELGIUM	BE-BR-OL-TC-Melle Bridge
3.	DULLE GRIET - CANNON – BELGIUM	BE-CI-TC-Dulle Griet
4.	KLEIN KASTEELKEN – CAST IRON FENCE - BELGIUM	BE-CI-CR-OL-TC-Klein Kast.
5.	NO-PARKING POSTS BRUSSELS	BE-CR-TC-Amsterdamertjes Stad Brussel
6.	WATER PURIFICATION STATION – BELGIUM	BE-OL-PI-TC-Kluizen
7.	PUBLIC FOUNTAIN IN GHENT – BELGIUM	BE-OL-PW-TC-TE-Gent fount.
8.	BONNE INDUSTRIAL - SHIPS - BELGIUM	BE-SH-TC-Bonne Industrial
9.	DE GRAEVE SHIPYARDS - BELGIUM	BE-OL-SH-TC-TE-De Graeve
10.	MERCATOR – SAILING SHIP - BELGIUM	BE-OL-SH-TC-Mercator
11.	WESTHINDER – LIGHTSHIP - BELGIUM	BE-OL-SH-TC-Westhinder
12.	TEATRO MUNICIPAL - BRAZIL	BR-CI-CO-TC-Teatro
13.	METRO – MINSK – BELARUS	BY-AM-LT-TC-Metro
14.	KOBRIN OIL PUMPING STATION - BELARUS	BY-PE-TA-TC-Kobrin
15.	TRASH RACKS POWER PLANT – SOUTH KOREA	KR-EL-IM-MA-TC-Trash rack
16.	POWER PLANTS - TAIWAN	TW-EL-TC-ZC-Power Plants
17.	COAL TRANSPORT SHIP - TAIWAN	TW-SH-TC-Coal Tr Ship

TE: Testimonials

1.	TRANSEND NETWORKS - AUSTRALIA	AU-EL-PY-TE-Transend Networks
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2.	BAKCELL COMMUNICATION TOWER - AZERBAIJAN	AZ-PY-TE-Bakcell Communication Tower
3.	QUARTES CATTLE FEED COMPANY - BELGIUM	BE-FO-HD-OL-TA-TE-Quartes
4.	DREDGING COMPANIES DECLOEDT – BELGIUM	BE-OL-SH-TE-Dredging
5.	DE GRAEVE SHIPYARDS – BELGIUM	BE-OL-SH-TC-TE-De Graeve
6.	INTERCOMMUNALE E3 – METAL CONSTRUCTIONS - BELGIUM	BE-CR-OL-TE-Intercomm
7.	EUROPEAN TECHNICAL ASSOCIATION FOR PROTECTIVE COATINGS – BELGIUM	BE-BR-OL-TE-Etapc
8.	PIT COAL MINE – BELGIUM	BE-OL-PI-TE-UN-Kemp.Steenk
9.	SLAUGHTERHOUSE CHARLEROI – BELGIUM	BE-CR-FO-HD-LT-OL-TE-AbattoirCharleroi
10.	ASSOCIATION COMPANY OF PRODUCTION OF ELECTRICITY – S.P.E. – BELGIUM	BE-OL-PI-TE-SPE
11.	TOTAL PETROCHEMICAL FELUY – PIPELINES – BELGIUM	BE-OL-PE-PI-TE-Fina
12.	NARAI – SAILING SHIP – BELGIUM	BE-OL-SH-TE-Narai
13.	NATO – NATO PUMP STATIONS – BELGIUM	BE-AR-OL-PI-TE-NATO
14.	HOLCIM GRANULATS - CEMENT FACTORY – BELGIUM	BE-CE-OL-TE-Holcim
15.	DECLOEDT – DREDGING COMPANY – BELGIUM	BE-OL-MA-TE-Decloedt
16.	HARBOUR OF GENK – BELGIUM	BE-CN-OL-TE-KHG
17.	STORA ENSO PAPER MILL – BELGIUM	BE-OL-PP-TE-Stora Enso
18.	CITY – RAILWAY WAGON – BELGIUM	BE-OL-RW-TE-CITA
19.	J.M. INDUSTRIAL – BELGIUM	BE-AZ-CE-HU-OL-TE-JM-Ind
20.	CARSID – BELGIUM	BE-AZ-HT-OL-TE-Carsid
21.	MARTENS DIRK – AGRICULTURAL MACHINERY	BE-AG-OL-TE-Martens
22.	PUBLIC FOUNTAIN IN GHENT – BELGIUM	BE-OL-PW-TC-TE-Gent fount.
23.	TRACTEBEL – POWER STATION – BELGIUM	BE-CO-EL-OL-TE-Tractebel
24.	VERDEGEM CATTLE FEED COMPANY – BELGIUM	BE-FO-TE-Verdegem
25.	FLUXYS (BELGIAN LARGEST GAS SUPPLIER) – BELGIUM	BE-PE-TE-Fluxys
26.	BASF – CHEMICAL COMPANY – BELGIUM	BE-PE-HU-TA-TE-BASF
27.	VAN BROEKHOVENS – DIESEL STORAGE TANKS – BELGIUM	BE-PE-TA-TE-VanBroekkh
28.	SPX COOLING TECHNOLOGIES – BONNETS OF SRC BUNDLES – BELGIUM	BE-LT-TE-SPX Cooling Technologies
29.	WEST-VLAANDEREN SCHEEPSWERF – BELGIUM	BE-SH-TE-West-VL
30.	FURNAS – ELECTRICITY PYLONS - BRAZIL	BR-EL-PY-TE-Furnas
31.	DORBRAS RAILWAY COMPANY – BRAZIL	BR-RW-TE-Dorbras
32.	TECHNICAL FAIR – BULGARIA	BG-CO-TE-TechnFair
33.	BC FERRY TERMINALS – CANADA	CA-BR-MA-OL-TE-BC Ferry
34.	OVERLANDER BRIDGE – CANADA	CA-BR-OL-TE-Overlander
35.	MINISTRY OF TRANSPORT - QUEBEC	CA-HD-TE-Ministry of transport
36.	CITY OF BURNABY – CANADA	CA-MA-TE-CityofBurnaby
37.	WALT DISNEY – HONG KONG – CHINA	CN-AM-TE-Walt Disney HK
38.	MOBIMETAL – TELECOMMUNICATION PYLONS - CONGO	CD-PY-TE-Mobimetal
39.	EL SALAAM BRIDGE - EGYPT	EG-BR-MA-PI-TE-Salaam
40.	SOCIETE NATIONALE DE CHEMINS DE FER - FRANCE	FR-OL-RW-TE-SNCF
41.	RENAULT - CAR MANUFACTURING COMPANY - FRANCE	FR-CO-OL-TE-TR-Renault
42.	DIRECTION DEPARTEMENTALE DE L'EQUIPEMENT - FRANCE	FR-HD-IM-MA-OL-TE-Sea Buoys
43.	ZINGA ANTICORROSION DISTRIBUTOR - FRANCE	FR-HD-TE-Guerin
44.	DÜSSELDORF HIGHWAY - CRASH BARRIERS - GERMANY	DE-CR-OL-TE-Düss.Highway
45.	STROM UND HAUFENBAU HAMBURG HARBOUR COMPAGNY - GERMANY	DE-OL-PE-TA-TE-Strom
46.	DÜSSELDORF AIRPORT - GERMANY	DE-AP-CO-HD-OL-TE-Düss.Airport
47.	RWE - AG – ELECTRICITY COMPANY - GERMANY	DE-EL-OL-TE-RWE



48.	SCHWENK – CEMENT FACTORY - GERMANY	DE-CE-OL-TE-Schwenk
49.	ABADAN & SHIRAZ REFINERIES - IRAN	IR-OL-PE-TE-Abadan Shiraz
50.	OMRAN SAHEL INSTITUTE – REBARS - IRAN	IR-RE-TE-OmranSahellnst
51.	PARS OIL & GAS CO. – REBARS - IRAN	IR-RE-PE-TE-Pars Oil & Gas
52.	PERLITE CONSTRUCTION SULFUR EXPORT WHARF - IRAN	IR-RE-TE-PerliteConstr
53.	RAHE SAHEL INSTITUTE – REBARS - IRAN	IR-RE-TE-RaheSahellnst.
54.	CHABAHAR PORT – REBARS - IRAN	IR-RE-TE-Chabahar
55.	KILLYBEGS FISHING PIER IMMERSED PIER LEGS - IRELAND	IE-IM-MA-TE-Killybegs pier
56.	MINISTRY OF PUBLIC WORKS - KUWAIT	KW-CO-OL-TE-Ministry of Public Works
57.	MINISTRY OF ELECTRICITY AND WATER - KUWAIT	KW-EL-OL-TE-Ministry of Electricity and Water
58.	KUWAIT OIL COMPANY - KUWAIT	KW-PE-TE-KOC
59.	RYSTRAUM MOTOR SHIP - NORWAY	NO-OL-SH-TE-Rystraum
60.	KALVOYA BRIDGE - NORWAY	NO-BR-MA-OL-TE-Kalvoya
61.	REDE ELECTICA NACIONAL - PORTUGAL	PT-EL-OL-PY-TE-REN
62.	ENERGOPROJECT – TRANSMISSION TOWERS - QATAR	QA-EL-OL-PY-TE-Energop
63.	ELECTRICA - NATIONAL ELECTRICITY SUPPLIER - ROMANIA	RO-EL-OL-TE-Electrica
64.	SNCFR - ROMANIAN RAILWAYS - ROMANIA	RO-OL-RW-TE-SNCFR
65.	SERVSPEC - ROMANIA	RO-TE-Servspec
66.	MUNTENIA – PYLONS - ROMANIA	RO-PY-TE-Muntenia
67.	TELEGONDOLA - ROMANIA	RO-RW-TE-Telegondola
68.	EXXARO KUMBA GROOTGELUK COALMINE – SOUTH AFRICA	ZA-CO-TE-UN-Kumba Mine
69.	FORMOSA PLASTICS COMPANY TRANSMISSION TOWERS - TAIWAN	TW-EL-HD-PY-TE-Formosa
70.	MAERSK CONTAINERS - TAIWAN	TW-TA-TE-Maersk
71.	SHELL PETROCHEMICAL COMPANY - THE NETHERLANDS	NL-MA-PE-TE-Shell
72.	LONDON UNDERGROUND – UNITED KINGDOM	UK-OL-RW-TE-UN-London Underground
73.	DERBY – TURBINE EXHAUST STACKS – UNITED KINGDOM	UK-AZ-HT-OL-TE-Derby
74.	VECTOR INTERNATIONAL – UNITED KINGDOM	UK-MA-NB-PE-TE-Vector
75.	FURMANITE – UNITED KINGDOM	UK-PW-TE-Furmanite
76.	LONDON UNDERGROUND – UNITED KINGDOM	UK-OL-RW-TE-UN-London Underground
77.	US ARMY - UNITED STATES OF AMERICA	US-AR-HD-OL-TE-TR-US Army
78.	MISSISSIPPI DEPARTMENT OF TRANSPORTATION BILOXI BRIDGE – UNITED STATES OF AMERICA	US-AR-BR-TE-MDOT

TP: Tropical environments

1.	TROPICAL ISLAND DOME - GERMANY	DE-TP-Trop Islands
2.	GREENHOUSE - FINLAND	FI-HU-TP-Greenhouse
3.	KENSINGTON PALACE SUNKEN GARDENS – UNITED KINGDOM	UK-AG-AM-CI-TP-Kensington Palace Sunken Gardens
4.	EDEN GREENHOUSE DOME – UNITED KINGDOM	UK-AG-HD-HT-TP-Eden

TR: Trucks and trailers

1.	DANZAS –TRUCK - BELGIUM	BE-TR-Danzas
2.	ICC - TRUCK CHASSIS - BELGIUM	BE-TR-ICC
3.	LAMBREGT - TRUCK CHASSIS - BELGIUM	BE-TR-Lambregt
4.	RENAULT - CAR MANUFACTURING COMPANY - FRANCE	FR-CO-OL-TE-TR-Renault
5.	CARTS TO CONVEY STONES - MOROCCO	MA-TR-Transit trailer
6.	CHASSIS – UNITED KINGDOM	UK-TR-Chassis
7.	US ARMY – UNITED STATES OF AMERICA	US-AR-HD-OL-TE-TR-US Army

UN: Underground



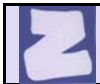
www.zinga.be

1.	CULVERTS - AUSTRALIA	<i>AU-HD-HU-IM-UN-Culverts</i>
2.	KEMPENSE STEENKOOLMIJNEN – PIT COAL MINE - BELGIUM	<i>BE –OL-PI-TE-UN-Kemp.Steenk.</i>
3.	GASCO COMPANY UNDERGROUND PIPELINES - EGYPT	<i>EG-PI-UN-Gasco</i>
4.	LONDON UNDERGROUND – UNITED KINGDOM	<i>UK-OL-RW-TE-UN-London Underground</i>
5.	CULVERTS - UNITED KINGDOM	<i>UK-HD-HU-IM-UN-Culverts</i>
6.	EXXARO KUMBA GROOTGELUK COALMINE – SOUTH AFRICA	<i>ZA-CO-TE-UN-Kumba Mine</i>

WE: Welding

ZC: Zingaceram

1.	POWER PLANTS - TAIWAN	<i>TW-EL-TC-ZC-Power Plants</i>
2.	TAIWAN POWER COMPANY - ZEPHYROS WIND MILLS - TAIWAN	<i>TW-PY-ZC-Zephyros</i>



MOLISSON STREET BRIDGE- AUSTRALIA

The Molisson Street Bridge is situated in Kyneton, Northern Victoria, Australia and has served the past 100 years for traffic over the Compaspe River.

It is the first steel bridge structure treated with ZINGA for VicRoads Design.

In the last decade it was showing rapid deterioration caused by corrosion.

Therefore it was decided to treat this bridge in May 2007.

The old coating had to be removed completely because of this rapid advancement of corrosion.



**Site inspection May 2007.
Note the increased beam corrosion.**



**Typical view of coated steelwork.
All rivets, edges and bolts were stripe coated.**

Site Visit: Supplier – Contractor Technical Support

www.zinga.eu



Photo Shows ZINGA “Liquid Galvanising”.
Scratched with coin.
Note: the pure zinc exposed.



System:

ZINGA	1 x 80 µm
Alufer N	1 x 80 µm
Alufer WR Alu	1 x 80 µm

As this coating was lead based,
the complete bridge had to be encapsulated.

The ZINGA Coating system used on this bridge will provide exceptional long term protection for this Heritage structure, including excellent UV resistance and weathering properties. The distinct advantage of using ZINGA as primer coat is that in many years to come the high volume of pure zinc content of ZINGA will extend the service life by some 30+ years.

All steel bridges flex. When using this system, the coating will never become brittle and will remain flexible throughout the service life of the coating system, thus preventing possible coating failures.



after application



QUEENSLAND BRIDGES - AUSTRALIA

Customer:

Queensland Main Roads, Queensland Rail
Department of Infrastructure, Energy & Resources

Queensland Rail has specified and used ZINGA since 2001.
All Queensland Rail Bridges re-coats since that date have been specified ZINGA Liquid Galvanising. The bridges were in poor condition.



The Burdekin River Bridge



Pre-treatment: SA 2,5

System:

ZINGA

2 x 60 µm



Queensland Railway Corduroy Bridge



System:
ZINGA 2 x 60 µm



WEGENFONDS BRIDGE - BELGIUM

The railings and the supporting steel structures of the bridge of the Wegenfonds in Afsnee (Ghent) were treated with ZINGA in **1985** by the applicator Peiniger.

This bridge is built over one of the busiest motorways of Belgium: "E40 from Brussels capital to the Belgian coast (Ostend, Zeebrugge harbour), so it is constantly exposed to pollution."



System:

ZINGA 2 x 60 µm



Pictures taken in **January 2006** demonstrate that the ZINGA is still in excellent condition.





Below you can read the SGS report that was carried out on **16th November 2007**.


REPORT

ZINGAMETALL BVBA

Industriepark – Rozenstraat 4
9810 Eke

Date:
19/11/2007

Our reference:
File 03.0001-02

Your reference:
--

after 22 years

Type of intervention	INSPECTION	
Object	Balustrades Bridge of Afsnee – Gent, Belgium	
Location	Gent, Belgium	
Date inspection	16/11/2007	

Attendees	Company	Report
Mr. Guy Willemot	Zingametall bvba	1 x original by mail, scanned copy by e-mail
Mr. Mike Morley	SGS Belgium – Coating Services	File

1. Introduction

A visual examination was carried out to determine the integrity of the Zinga coating applied in 1985 to the balustrades of the Bridge of Afsnee situated in Gent, Belgium. The bridge is located over a motorway and during the winter months the coating is subjected to a highly saline environment from salting of the road.



3. Conclusion

The objective evidence demonstrates that where the coating has not been subjected to physical or mechanical damage, the coating was intact, soundly adhering and still fit for purpose 22 years after application.

In addition, where the breakdown of the coating that exposes the substrate has occurred, the lack of all but superficial corrosion demonstrates that the Zinga is providing the galvanic protection for which it was designed.

SGS Belgium NV – Coating Services


MIKE MORLEY
MSc, DIC, FICorr, ATSC


SGS Belgium NV
Noorderlaan 87
B-2030 Antwerpen





RAILWAY OFFICE - BENIN

In 1906, 2 metal bridges were built across the Zou and the Ouémé Rivers, under the authority of the Railway Office of Benin (Office de Chemins de Fer de Bénin). The line Bénin-Niger links Cotonou to Parakou. The Zou bridge consists of 3 spans of 20 m and the Ouémé bridge has 8 spans of 20 m.



Ouémé Bridge

System:

ZINGA

2 x 60 μ m

An important repair was necessary in 1994 after so many years of use. The work was executed by the French company Africaine de Montage. This was done without interruption of the traffic, within 26 weeks. The entire structure was grit-blasted and protected with ZINGA. The French engineering company Sofrerrail acted as the controlling organism.



Zou Bridge



Zou Bridge



BC FERRY TERMINALS - CANADA

BC Ferries is one of the largest ferry operators in the world, providing year-round vehicle and passenger service on 25 routes to 47 terminals, with a fleet of 35 vessels. We are an essential transportation link that connects coastal communities and facilitates the movement of people, goods and services.

The ferry ramps of the BC Ferry terminals in Tsawwassen, Schwarz Bay and Horseshoe Bay (in aggressive marine environment), were coated with ZINGA between 1988 and 1992.



VILLHOLTH JENSEN & ASSOCIATES LTD.
ENGINEERING CONSULTING ENGINEERS

PACIFIC EVERGREEN INDUSTRIES LTD.
1480 14th Street
West Vancouver, B.C.
V7T 2S3

May 22, 1998

Attention: Mr. Maurits Vander Cruyssen

Subject: The ZINGA Cold Galvanizing System

Dear Sirs:

This is to confirm that we have specified the use of ZINGA on numerous projects since 1989.

We have used the system on ferry ramps and structural steel in industrial plants.

Our experience is that the system should not be used on structures to be submerged in salt water without a protective top coat. The system is excellent for use on all types of steel structures. We rate the system as good as hot dip galvanizing.

When the surface preparation and application are done to the specifications, we have had no complaints. And repair work after construction is never required even when chains and hooks are used during installation of the structures.

We have just completed a major project for a local grain elevator involving approximately 200 tonnes of steel structures. The ZINGA system was used on all major parts of the structures and hot dip galvanizing was used on the smaller components. It takes an expert to define which part has the ZINGA surface or the hot dip galvanizing surface.

Yours truly,

Villholth Jensen & Associates Ltd.

[Signature]
J.V. Jensen, P.Eng.
President

3965 Sunset Blvd., North Vancouver, British Columbia V7R 3Y4
Telephone (604) 985-0781 (604) 522-4897 Telefax (604) 985-7921

This is a testimonial, dated 22/05/1998, from the engineering office 'Villholth Jensen & Associates'.

Since then, inspections in 2002 and 2005, showed the ZINGA in good condition.

The dry film thickness had hardly diminished in 2011, thanks to the formation of a passive barrier on top of the active zinc in ZINGA.

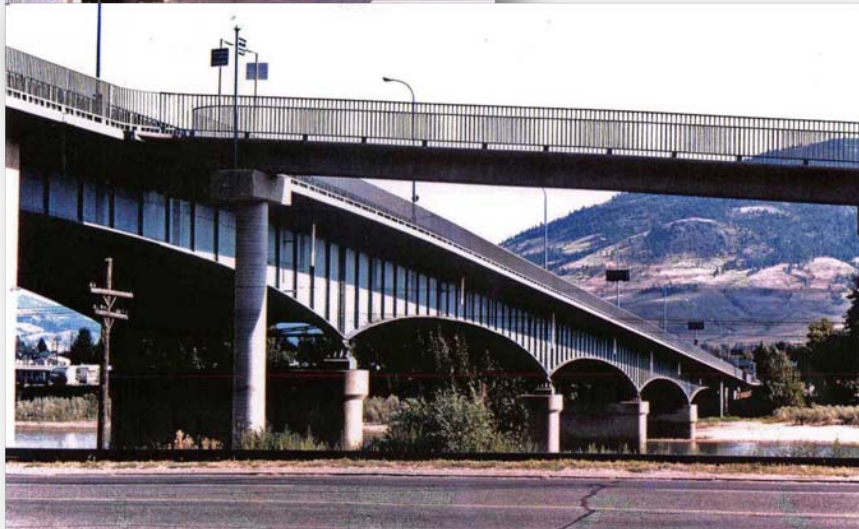
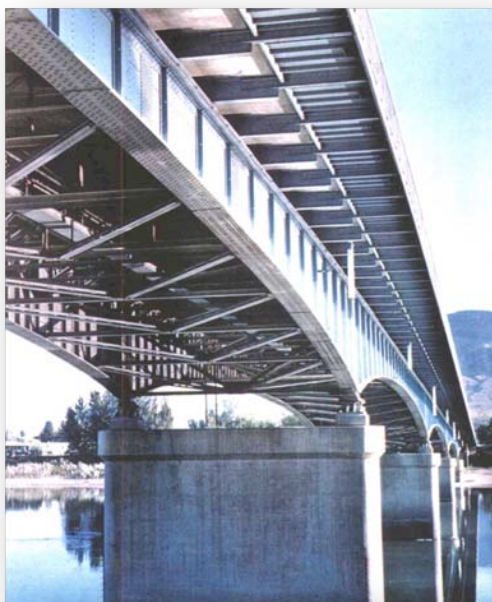
System:

ZINGA 2 x 40 µm DFT

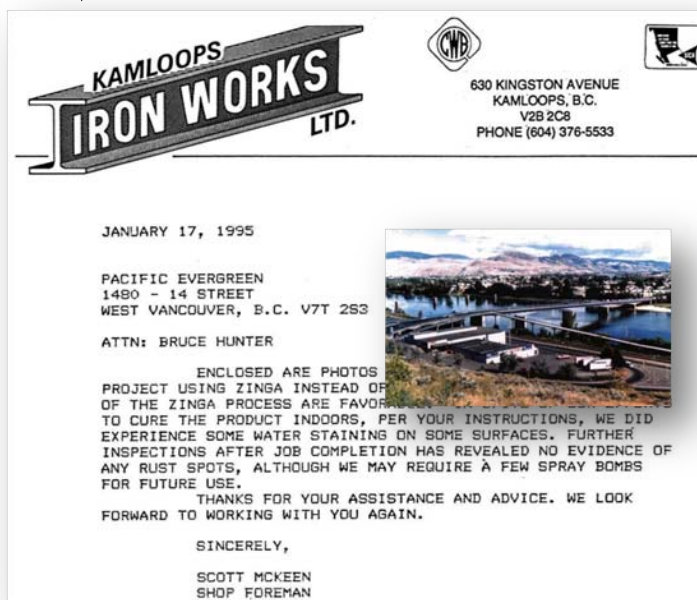


OVERLANDER BRIDGE - CANADA

In 1995-1996 the Overlander Bridge was treated with ZINGA by the contractor Iron Works, under the supervision of the engineering office John Watson.



Testimonial letter from Kamloops Iron Works Ltd.,
contractors, dated 17/01/1995, to Pacific
Evergreen concerning the application of ZINGA on
the Overlander Bridge in Kamloops.



In September 1997, there was a new invitation to tender
for minor repairs to the Overlander Bridge,
with free choice between galvanising and zinganising.



HANGZHOU BAY BRIDGE - CHINA

The Hangzhou Bay Bridge is located in the bay of Hangzhou and connects the harbours of Shanghai and Ningbo. In May 2005, ZINGA was applied on the rebars used for this project.

A supplementary extension to the project (emergency platform) prescribes ZINGA on the entire construction.



System:

ZINGA

1 x 60 μ m



Brush application with ZINGA



Rebars treated with ZINGA



DÜSSELDORF HIGHWAY CRASH BARRIERS - GERMANY

In 1989 ZINGA was applied on the steel shields and crash barriers along the highway in Düsseldorf.

These pictures were taken at the time of the application.



On 28/06/99, Mr. Helmut Schwarz received a testimonial from the Landeshauptstadt Düsseldorf concerning the good results of the ZINGA application on road barriers after 10 years.


Briefpostanschrift: Stadtverwaltung, Amt 66, 40200 Düsseldorf

Herrn
Dipl.-Ing.
Helmut Schwarz
Agnes-van-Brakel-Str.34
D-41748 Viersen

Datum und Zeichen Ihres Schreibens
Mein Zeichen: 66/4

**Landeshauptstadt
Düsseldorf**
Der Oberstadtdirektor
Straßen- und Ingenieurbauamt
Auf'm Hennekamp 45 (nahe Willystraße)
☎ 701, 705, 707, 711, Haltestelle Auf'm Hennekamp
☎ 780, 782, 785, Haltestelle Feuerbachstraße oder Uhl-Kirchen
☎ S 6, S 7, Haltestelle D-Volksgarten, S 8, S 11, Haltestelle DB&K

Auskunft erteilt: Herr Neuss Telefon (02 11) 89 - 94603	Zimmer 1001 Telefon (02 11) 89 - 29277
--	---

Datum
28.06.1999

Re: Maintenance of city highway-protective-steelshields
City of Düsseldorf/GERMANY

Dear Sirs,

(*)
up on your request, we have pleasure to confirm that we recoated above mentioned steelshields in 1989 with your AGESO(R)- KALTZINK HS 300/ ZINKFILM which were formerly hot-dip-galvanized.

Although the environment there is very corrosive, we have not detected any corrosion over this time period of now 10 years.

We may express our satisfaction with your product.

Yours faithfully
Im Auftrag

Neuss
(Dipl.Ing.)

Konten der Stadtkasse: Stadt Sparkasse Düsseldorf 10 000 495 (BLZ 300 501 10) Postbank Essen 32 69 - 431 (BLZ 360 100 43)
Frachtpostanschrift: Auf'm Hennekamp 45 40225 Düsseldorf
Telefonzentrale: Stadtverwaltung: (02 11) 89 - 91
Tele: Stadtverwaltung: 8582921 skid d
Internet: <http://www.duesseldorf.de>
Sprechzeiten: montags bis donnerstags 8:00 bis 15:30 freitags 8:00 bis 13:30 Uhr

(*) AGESO is the name under which ZINGA was previously commercialised in Germany.

System :

ZINGA 2 x 60 µm





EL SALAAM BRIDGE – EGYPT

The treatment of the El Salaam Bridge in Egypt, was part of the Bridge Maintenance Program in 2007. This bridge carries a gas pipeline of the Egyptian Natural Gas Company (GASCO).



Approval letter by the Egyptian Natural Gas Company, stating that the job was completed with high efficiency.



Egyptian Natural Gas Co.
gaseco

الشركة المصرية للغازات الطبيعية
جاسكو

إلى من يهمه الأمر

تشهد الشركة المصرية للغازات الطبيعية (الإدارة العامة للمشروعات) بأن شركة غاز مصر قد اعتمدت واستخدمت مادة الجلفنة على البارد (zenga) من إنتاج شركة لوس اميغوس في أعمال جلفنة القطاعات المعدنية ومسورة الغاز لكويبري تحذية خط غاز ٢٤ لترعة السلام وذلك ضمن عملية صيانة الكويبري في عام ٢٠٠٧ وتمت الأعمال بكفاءة عالية تحت إشراف الإدارة العامة للمشروعات .

وهذه شهادة منا بذلك .

الإدارة العامة للمشروعات
مدير عام مساعد الأعمال المعنية
C. N. T. 10
المهندس / أحمد منحت

GASCO

٢٠٠٨/٩/١٥

To whom it may Concern

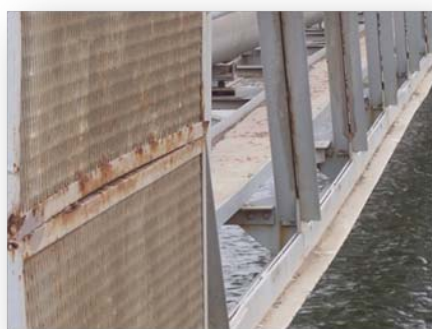
The Egyptian Company for Nature Gas (Projects General Department) certify that Gas Misr Company is accredited and used Cold film Galvanization (Zinga) from Los Amigos GTC in Galvanization works for Metal Sectors and the gas pipeline 24" for El Salam Bridge, included in the Bridge maintenance program in 2007.

The job completed with high efficiency under Projects General Department supervision.

Ring Road, El Tesen Str.,
5th Settlement - New Cairo
Tel. : 6171510 / 11/12/13
Fax : 6171514 P.O. Box 115 Al Andalus

الطريق الخامس - شارع القسمين
التجمع الخامس - القاهرة الجديدة
تليفون : ١١٧١٥١٠ - ١١٧١٥١٢ / ١١ / ١٢ / ١٣
فاكس : ١١٧١٥١٤ ص.ب ١١٥ الأندلس

The bridge had suffered severe corrosion. Some pictures before the application.



BEFORE



And pictures after the ZINGA application:



AFTER



Surface preparation:

Sandblasting:

SA 2,5

Rz 75 µm

System:

Most critical areas

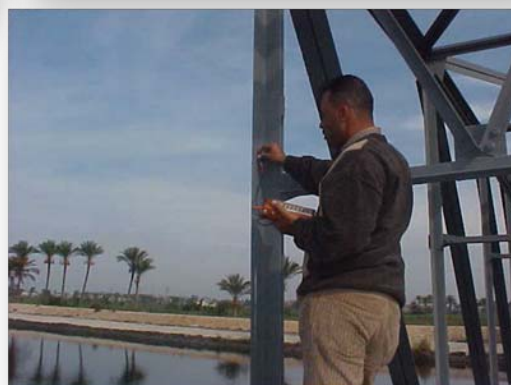
ZINGA (airless spray)

2 x 60 µm

Elsewhere:

ZINGA (airless spray)

1 x 60 µm





KALVOYA BRIDGE - NORWAY

In 1985 ZINGA was applied by brush on the steel structures of the Kalvoya Bridge in Norway. Paint gloves were used for the carrying cables.



In April 1995, 10 years after the application, the Kalvoya Bridge was inspected by the controlling organism Det Norske Veritas (DNV).



On 01/12/98 the Baerum Kommune, owner of the bridge, wrote this testimonial stating that the DNV found the Kalvoya Bridge in a good condition compared to the DNV inspection in 1985 on the previous coating system that had protected the bridge before the repair with ZINGA. In 1995 only 5 Kg of ZINGA were necessary for touch-ups on spots that had been mechanically damaged.

BÆRUM KOMMUNE
AVDELING LEVEKÅR
KOMMUNALTEKNISK SEKSJON
Samferdsel - drift

ROTORKONTROLL A/S
PB 31
2014 BLYSTADLIA

Deres ref: Jon-Ivar Hagen Vår Ref: 614-730 /97-lhm Dato: 01.12.1998

BRIGDE TOO KALVØYA.

The Kalvøyabrua was inspected in April 1995 by det Norske Veritas Certification A/S.

Their comment in 1995 was that this bridge was in a good condition. Compared with the control in 1985 (another system for about the same period of time) the bridge was in a considerable better condition regarding corrosion protection of the steel parts and carrying cables.

It took 5 kg ZINGA to touch up the entire bridge for some small scratches, and this 10 year after the first treatment.

Med hilsen
Haakon Skogstad
Haakon Skogstad
Avd.ing.

Leiv H. Moe
Leiv H. Moe
Avd.ing.

document1 Post adresseres til etaten - ikke til enkeltpersoner

System:

ZINGA

2 x 60 µm



In 1999 the ZINGA system has been accepted by the Norwegian Ministry of Roads for the complete treatment of steel bridges, as stated in this letter from Rotorkontroll, dated 04/06/99.



T E L E F A X
ROTORKONTROLL A/S
Teknisk/Kjemisk

FB. 31
N - 2014 BLYSTADLIA
Telefax 47-63838724
Telefon 47-63838724

Til/To/An Zingametall	Telefax 00 32 93 855 869	Dato 040699
Att. Patrick Willemot		
Fra/From/Von J I Hagen	Antall sider inkl. denne 1	

Dear Sirs,

Re.: "Kalvoeya Bridge" in Baerum, Norway

We refer to previous information with report as well as phonecall yesterday and have the pleasure in confirming that

Kalvoeya Bridges outside Sandvika in Baerum, Norway was in 1985 recoated by the Road Division of Akershus County and later taken over by the Council of Baerum. The specification has been approved by the norwegian Ministry of Transport (Bridge Department).

In 1999 the Zinga-System has been accepted as a system by the Norwegian Ministry of Roads for complete treatment of steel-bridges.

Hope that this confirmation will be at your satisfaction.

Best regards

ROTORKONTROLL A/S
Avd Teknisk/Kjemisk

Jon-Ivar Hagen

In February 2010, 25 years after the application, the layer thickness of ZINGA on the Kalvoja Bridge was measured.

The loss in layer thickness after 25 years was approx. 30 µm.



LAND TRANSPORT AUTHORITY (LTA) GUARD RAIL PANELS – SINGAPORE

In April 1998 a test application with ZINGA was done on the guard rails on Ulu Pandan Road in Singapore. After 12 months of monitoring and observations, the LTA (Land Transport Authority) finally accepted Zinga.

Since then LTA has embarked on a program of rehabilitating stretches of previously hot dipped galvanized guardrails using Zinga.

The high quality protection against corrosion, the ease of application for maintenance, the non-toxicity of process and the reduction in road closures also provided for substantial cost-saving benefits for the LTA.



System:

Surface preparation:

- Removal of loose rust by wire brush.
- Removal of contaminants by water.

System:

- ZINGA 2 x 40µm DFT (using brush and roller)



NEWARK MARINA BRIDGE - UNITED KINGDOM

These are pictures of the Newark Marina Bridge in the United Kingdom.
The bridge was blast-cleaned, zinganised and painted in 1998.

An inspection was carried out in 2005.

The system that was used (ZINGA + single-pack polyurethane paint), was still in very good condition seven years after the application.

**System:**

ZINGA 1 x 60 µm
single-pack polyurethane paint



MISSISSIPPI DEPARTMENT OF TRANSPORTATION BILOXI BRIDGE – UNITED STATES OF AMERICA

In **November 2002** the steel parts of the Back Bay Bascule Bridge over the Mississippi in Biloxi, were coated with ZINGA.

For the refurbishment of the Bascul Bay Bridge in Biloxi, the Mississippi Department of Transportation (MDOT) has chosen for ZINGA, taking into account the corrosion control research of the US Army.



Biloxi, Back Bay Bascule Bridge
(MDOT US 1-110)

Corrosion Prevention & Control Update

A Bulletin Dedicated to the
Establishment and Operation of an Aggressive Corrosion Prevention Control Program

In 1995, Battelle Corporation scientists updated a joint Battelle - National Institute of Standards 1978 report entitled "Economic Effects of Metallic Corrosion in the United States". In that update, it was estimated that corrosion of metal costs the United States economy almost \$300 billion per year. It was also suggested that one-third of these costs could be reduced by broader application of corrosion resistant materials and the application of best corrosion-related technical practices. The bottom line conclusion based on the current contract efforts and a decade of corrosion specific research and testing, is that the United States Army can save over 30% of its current corrosion related annual costs. This can be accomplished through continued aggressive implementation of recently adopted Army Material Commands (AMC) corrosion prevention control practices and application of commercially available corrosion protection technologies.

Extracted from the Fielded Fleet Corrosion Control Program Report, 1997

The purpose of the Corrosion Prevention & Control Update is to make important product information available to you about the approved

commercial sources referred to in the referenced study. The data provides information about commercial vendors, which are approved and available for providing information and products. The vendor information, here in, is provided in alphabetical order, with no preference given or inferred. Each company participated in the Fielded Fleet Corrosion Control Program and was chosen as an approved vendor for corrosion products and applications.

Commercial Vendor List

- **Carwell Products Inc.**
275 cooper Avenue, Suite 105
Tonawanda, NY 14150
(716) 877-2363 or 1-800-856-6798
Fax: (716) 877-2364
POC: Barry O'Halloran/ Bill Balcom
Bill@carwell.com
- **Sulzer Metco**
1101 Prospect Avenue
Westbury, NY 11590-0201
(516) 338-2303
Fax: (516) 338-2134
POC: Peter Foy/Patty Cook
- **Tafa - Midwest Thermal Spray**
2013 Marie Street
Westland, MI 48185
(313) 729-2990
Fax: (313) 729-2992
POC: Thomas Gross/Michael Poe

Product List Continued

Zingametal
Industriepark VENECO
Zeehavenstraat, Belgium
385.68.81
Tel: 09 385.58.69
Fax: 09 385.58.69
Piet Van Riet

Products/Applications
Zingametal
Products, Inc.
Inhibitor Spray (NSN 3892-1413) - This product is approved for the inside of wheel wells of trucks. The use of this product does not affect the infrared reflectance. Product performance was improved 30% in corrosion resistance. Additionally, the use of corroded hinges and other parts was restored to original condition with the use of this product.

approved for use on the exterior of vehicles.

Zingametal
Zinc Rich Coating - The performance of this zinc rich coating also proved to be well above the 30% improvement in corrosion protection. This product has been approved for use on the exterior of vehicles.

Points of Contact

United States

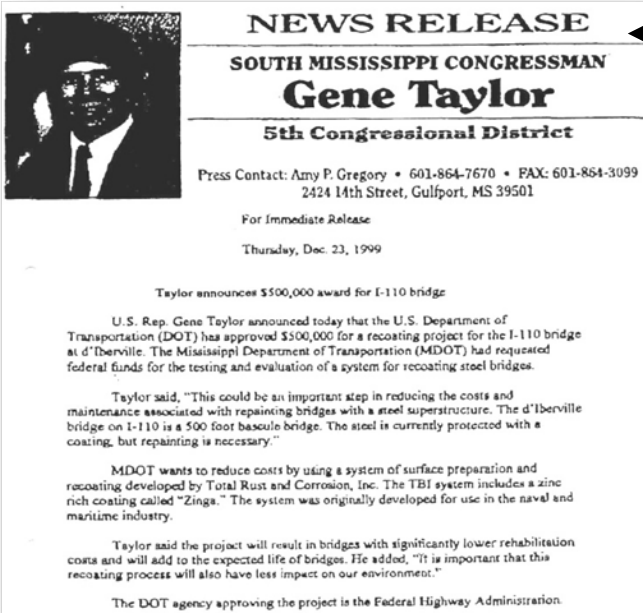
Mr. Donald Tappett
Materials Modification Inc.
2929 Eskridge Road
Eskridge Centre, Merrifield
Laboratory/Suite P1
Fairfax VA 22031
(703) 560-1370 Ext. 12
Fax: (703) 560-1372

IMMC

Ms. Mary Grzenkiewicz or
Mr. Gene Teufel
USATACOM
ATTN: AMSTA-IM-HHH
Warren, MI 48397-5000
(810) 374-8496/8900
DSN 786-8496/8900
Fax: (810) 574-7510

Spray System, Arc
- The performance of this product proved to be well above the 30% improvement in corrosion resistance. This product has been approved for use on the exterior of vehicles.

The "Corrosion Prevention and Control Update", issued in 1997, describes the US Army research to reduce the costs spent on anti-corrosion protection, with 30%. Included is a list of approved vendors, amongst which Zingametal. This approval is based on the tests that are performed by the US Army Tank Automotive Command (TACOM) in Hawaii in 1995. ZINGA has been selected from a large range of anti-corrosion protection products, together with only a few other products (no direct competitors).



In the press release dated **23/12/99**, congressman Gene Taylor announced the **recoating of the bridge with ZINGA**. This bascule bridge is the first of all bridges over the Mississippi that will be coated with ZINGA: the start of an enormous project in the USA!



Before application



The application has successfully been done in **November 2002** in presence of Zingametall and the controlling organism SGS Axa-Med.

System:

ZINGA 2 x 75 µm
(or 2 x 3 mills)





Below you can read the CAB report that was carried out on **15th November 2007**.

**COATING ADVIESBUREAU BVBA****Coating Consulting Office****'T HOGE 11, B - 8200 BRUGGE (BELGIUM)****ASSESSMENT REPORT**

SUBJECT : Back Bay Bridge - Assessment
SITE : Back Bay Bridge Biloxi,
Louisiana, USA

INSPECTION DATE : 5/11/2007

1. SPECIFICATIONS**1.1. Object description**

Back Bay Bridge – Northern approach (section 4) of the I-110 bridge in Biloxi, MS.
Estimated surface coated: 25.000 ft² (2.322,98m²)

1.2. System specifications

Surface preparation :

Shop :

Yard : SSPC – Roughness : Rz 2 to 3 mil

DFT limits :

80/20 rule : Min. 80 % of the values must be higher than the minimum DFT
Measurements lower than the absolute minimum DFT are not accepted.
Absolute minimum DFT = 0,8 x minimum DFT.



3. CONCLUSION

The coating works executed on the Biloxi bridge in 2002 remain in a very good condition.

So far no beginning of corrosion was stated.

No accumulation of zinc salts was seen and the surfaces were equally dull grey.

Pigeons are living on the bridge parts but no destructive influence was stated due to this aggression.

Below you can see pictures taken during the inspection on the **15th November 2007**.





ZINGA

ZM-RE-PRO-04-A (01/08/06)

The film galvanising system Zinga is a one pack coating that contains 96% zinc in the dry film and provides cathodic protection to ferrous metals. It can be used as a unique system as an alternative to hot-dip galvanisation or metallisation, as primer in a duplex system or as a recharging system for hot-dip galvanisation or metallisation. It can be applied by brushing, rolling or spraying on a clean and rough substrate in a wide range of atmospheric circumstances. Zinga is also available as an aerosol and is sold as Zingaspray.

Physical data and technical information

• Wet product

Components	- zinc powder - aromatic hydrocarbons - binder
Density	2,67 Kg/dm ³ (± 0,06 Kg/dm ³)
Solid content	- 80% by weight (± 2%) - 58% by volume (± 2%) according to ASTM D2697
Type of thinner	Zingasolv
Flash point	≥ 40°C to < 60°C
VOC	474 g/L (EPA method 24) (= 178g/Kg)

• Dry film

Colour	matt metallic grey (colour darkens after contact with humidity)
Zinc content	96% (±1%) by weight, with a purity of 99,995% Zinga gives full cathodic protection and conforms to the standard ISO 3549 in regard to its zinc purity of 99,995 % and to the standard ASTM A780 in regard of its use as repair coating for hot-dip galvanisation.
Special characteristics	- atmospheric temperature resistance - minimum : -40°C - maximum : 120°C with peaks up to 150°C - pH resistance in immersion: from 5,5 pH to 9,5 pH - pH resistance in atmospheric circumstances: from 5,5 pH to 12,5 pH - excellent UV resistance
Non-toxicity	A dry layer of Zinga is not toxic and can be used in contact with potable water, according to the standard BS 6920.



- **Packing**

500 ml	aerosol
1/4 Kg	available as sample (on request)
1 Kg	available, packed in undividable boxes of 12 x 1 Kg
2 Kg	available, packed in undividable boxes of 6 x 2 Kg
5 Kg	available
10 Kg	available
25 Kg	available

- **Conservation**

Storage	store in a cool and dry place
Shelf life	unlimited In case of long time storage it is recommended to shake the unopened tin in an automatic shaker at least once every 3 years.

Application data

- **System recommendations**

Unique system	- Zinga is used as a stand-alone system, applied in 2 or 3 layers to obtain a total maximum DFT* of 120 to 180 µm. - This system is strongly recommended because of the easy maintenance. In time the layer will become thinner as the Zinga sacrifices itself due to the cathodic protection. A new layer of Zinga can be directly applied once the surface has been properly cleaned and it will re-liquidise and recharge the previous Zinga layer. The DFT of Zinga that should be applied depends upon the remaining Zinga layer. - The system Zinga 2 x 60 µm DFT conforms to the standards: NORSOK M-501 syst. 7 ISO 12944-6: 2 x 60µm DFT ZINGA: C4-High, C5M-Medium and C5I-Medium 2 x 90µm DFT ZINGA: C5M-High and C5I-High
Duplex system	- In a duplex system, Zinga should be applied in one single application, preferably by spraying, to obtain a maximum DFT of 60 to 80 µm. - The surface of the Zinga should be free of zinc salts and other contaminations prior to application of a topcoat. - Zinga can be topcoated with a wide range of compatible sealers and topcoats. To avoid pinholes when topcoated, use the mist coat & full coat technique (meaning a standard diluted coat of 25 to 30µm DFT followed by a full coat of the same product).
Stripe-coat	It is recommended to apply a stripe-coat of Zinga by brush on all sharp edges, nuts and bolts and weld areas before the application of the first full layer of Zinga.
Recharging system	Zinga can be applied on top of a hot-dip galvanising layer, a metallisation layer or an old Zinga layer in order to renew or enhance the cathodic protection. The DFT of Zinga that should be applied depends upon the existing galvanising layer.

*DFT & WFT : dry film thickness and wet film thickness ; to be measured **above the peaks** of the roughness profile



- **Coverage and consumption**

Theoretical consumption	- for 60 µm DFT : 0,28 Kg/m ² or 0,10 L/m ² - for 120 µm DFT : 0,55 Kg/m ² or 0,21 L/m ²
Theoretical coverage	- for 60 µm DFT : 3,62 m ² /Kg or 9,67 m ² /L - for 120 µm DFT : 1,81 m ² /Kg or 4,83 m ² /L
Practical coverage	depends upon the roughness profile of the substrate and the application method

- **Environmental conditions during application**

Ambient temperature	- minimum -15°C - maximum 40°C
Relative humidity	- maximum 95%
Surface temperature	- minimum 3°C above the dew point - no visual presence of water or ice - maximum 60°C
Product temperature	During application the temperature of the Zinga liquid must remain between 15 and 25°C. A lower or higher temperature of the product will influence the smoothness of the film when drying.

- **Drying process and overcoating**

Drying process	Zinga dries by evaporation of the solvent. The drying process is influenced by the total WFT, the number of coats applied, the ambient air and surface temperatures and the air circulation.
Drying time	for 40 µm DFT at 20°C in a well-ventilated environment: - touch-dry: after 10 min. - dry to handle: after 1 hour - fully cured: after 48 hours - ready for immersion: after 2 hours
Overcoating	- with a new layer of Zinga : - brush : 2 hours after touch dry - spray gun : 1 hour after touch dry - with a compatible paint : after 6 to 24 hours depending on the drying conditions
Reliquidisation	Each new layer of Zinga reliquidises the former Zinga layer so that both layers form one homogeneous layer.



Instructions for use

- Surface preparation

Cleanliness	- The most common method to obtain a clean (and at the same time rough) surface for the application of Zinga is: The metal substrate should first be degreased, preferably by steam-cleaning at 140 bar at 80°C. After that it should be grit-blasted or slurry-blasted to cleanliness degree SA 2,5 according to the standard ISO 8501-1 or to the cleanliness degree described in the standards SSPC-SP10 and NACE nr 2. This means that the surface must be free from rust, grease, oil, paint, salt, dirt, mill scale and other contaminants. Once the grit-blasting is completed the surface should be de-dusted with non contaminated compressed air according to the standard ISO 8502-3 (class 2) or in case of slurry-blasting the surface should be dried with non-contaminated compressed air. - Another method to obtain a clean surface is UHP water-jetting to cleanliness degree WJ2 according to the standards NACE nr 5 and SSPC-SP12 level SC1. But keep in mind that this method does not create surface roughness. - This high degree of cleanliness is not needed when Zinga is applied on a hot-dip galvanisation or a metallisation layer, or when it is applied on top of an existing Zinga layer. Please consult with the Zingametall representative. - For substrates that will not be immersed Zinga can be applied on mild flash rust (FWJ-2) occurring in the allowed time limit. For applications that will be immersed Zinga can only be applied on an SA 2,5 prepared surface with contaminants to NACE No5/SSPC SP-12 level SC1 unless otherwise agreed with the Zingametall representative. - On small areas or on non-critical applications Zinga can be applied on a surface that is manually prepared to degree St 3 according to ISO 8501-1. Please consult with the Zingametall representative.
Roughness	- Zinga should be applied on a metal substrate that has roughness degree Rz 50 to 70 µm (for total DFT < 280 µm) or Rz 60 to 80 µm (for total DFT > 280 µm) according to the standard ISO 8503-2. This can be obtained by grit-blasting (with sharp particles) but not by shot-blasting (with spherical particles). Make sure that the surface is degreased before the grit-blasting. - This high degree of roughness is not needed when Zinga is applied on a hot-dip galvanisation or a metallisation layer, or when it is applied on top of an existing Zinga layer. Please consult with the Zingametall representative. - On small areas or on non-critical applications Zinga can be applied on a surface that is manually prepared e.g. with a needle gun or a grinding disk, in order to obtain an adequate roughness for Zinga. Please consult with the Zingametall representative.



Maximum time to application	Apply the Zinga as soon as possible on the prepared surface. - in dry circumstances : depending on the location - in case of water-cleaning or if the relative humidity is close to 80%: max. 4 hours waiting time If contamination occurs before coating, the surface must be cleaned again as described above. Flash rust can be removed by means of a wire brush.
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- **Special instructions**

Stirring	- Zinga must be thoroughly stirred to achieve a homogeneous liquid before application. After a maximum of 20 min. re-mixing is necessary. - During the spraying application, the product must be stirred continuously.
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Dilution	Zinga can be diluted with 0 to 5% (volume on volume) of Zingasolv when using airless spray equipment and 0 to 25% for air supported applications. The Zingasolv must be added whilst stirring.
Rinsing of tools and equipment	Before and after using the spraying equipment, it must be rinsed with Zingasolv. Brushes and rollers should also be cleaned with Zingasolv. Never use White Spirit.
Special demands for spraying equipment	- Pour the Zinga through a filter of 100 mesh (150 µm) into the drum. - For the spraying of Zinga, it is better to remove all filters from the pistol and from the drum to avoid blockage. - The spray gun must be equipped with reinforced needle springs.

- **Application by brush and roller**

Viscosity	Zinga is ready for use when applied by brush or roller. Do not dilute.
First layer	The first layer must never be applied by roller, only by brush, in order to fill the cavities of the roughness profile and to wet the surface.
Type of brush and roller	- short hair roller (mohair) - industrial round brush

- **Application by conventional spray-gun**

Dilution	0 to 25% (volume on volume)
Spray viscosity	25 to 35 sec. Ford cup nr. 4 at 20°C
Pressure at the nozzle	2 to 4 bar
Nozzle opening	2,2 to 2,5 mm
Remark	Make sure ZINGA is stirred frequently so the zinc in ZINGA cannot settle to the bottom.

- **Application by conventional spray-gun with pressure pot**

Dilution	0 to 25% (volume on volume)
Spray viscosity	25 to 35 sec. Ford cup nr. 4 at 20°C
Pressure at the nozzle	3 to 4 bar
Pot pressure	0,8 to 1,5 bar
Nozzle opening	1,8 to 2,2 mm



- **Application by airless spraying**

Dilution	0 to 5% (volume on volume)
Pressure at the nozzle	± 150 bar
Nozzle opening	± 0,023 inch

- **Other application methods**

Please consult with the Zingametall representative.

For more specific and detailed recommendations concerning the application of Zinga, please contact the Zingametall representative. For detailed information about the health and safety hazards and precautions for use, please refer to the Zinga **safety data sheet**.

Waiver*

* The information on this sheet is merely indicative and is given to the best of our knowledge based on practical experience and testing. The conditions or methods of handling, storage, use or disposal of the product cannot be controlled by us and are therefore outside our responsibility. For these and other reasons we retain no liability in case of loss, damage or costs that are caused by or that are linked in any way to the handling, storage, use or disposal of the product. Any claim concerning deficiencies must be made within 3 months upon reception of the goods quoting the relevant batch number. We retain the right to change the formula if properties of the raw material are changed. This data sheet replaces all former specimens.



ALU ZM

ZM-RE-PRO-04-A (01/08/06)

Alu ZM is a quick drying one pack coating based on aluminium flakes. It can be applied either without primer on an old, non-corroded hot-dip galvanisation or metallisation layer or as topcoat on top of Zinga. It can be applied by brushing or spraying in a wide range of atmospheric circumstances. Alu ZM is mainly applied for esthetical reasons as it gives a nice aluminium aspect and has a good chemical resistance which allows it to be used in industrial environments.

Physical data and technical information

- **Wet product**

Components	- aluminium powder - aromatic hydrocarbons - binder
Density	1,01 Kg/dm ³ ($\pm$ 0,05 Kg/dm ³)
Solid content	- 35% ($\pm$ 2%) by weight - 25% ($\pm$ 2%) by volume
Type of thinner	Zingasolv (does not contain xylene or MEK)
Flash point	$\geq 40^{\circ}\text{C}$ to $< 60^{\circ}\text{C}$

- **Dry film**

Colour	aluminium
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- **Packing**

1 L	available, packed in undividable boxes of 6 x 1 L
2,5 L	available
15 L	available

- **Conservation**

Storage	store in a cool and dry place
Shelf life	unlimited In case of long time storage it is recommended to shake the unopened tin from time to time.



Application data

• System recommendations

As topcoat on Zinga	Alu ZM can be applied in 1 layer of 40 to 60 µm DFT as topcoat (by airspray or airless) on top of the anti-corrosion system Zinga on a metal substrate. Even though we always recommend maximum 60 µm DFT for Zinga in a duplex system, in combination with Alu ZM, the maximum layer thickness of Zinga is 120µm DFT in 1 layer applied by airless.
Stripe-coat	We recommend applying a stripe-coat of Alu ZM by brush on all sharp edges, nuts and bolts and welding areas before the application of the first full layer of Alu ZM.

• Coverage and consumption

Theoretical consumption	- for 40 µm DFT : 0,16 L/m ² - for 80 µm DFT : 0,32 L/m ²
Theoretical coverage	- for 40 µm DFT : 6,19 m ² /L - for 80 µm DFT : 3,09 m ² /L
Practical coverage	depends upon the application method

• Environmental conditions during application

Ambient temperature	- minimum -15°C - maximum 40°C
Relative humidity	- maximum 95%
Surface temperature	- minimum 3°C above the dew point - no visual presence of water or ice - maximum 60°C

• Drying process and overcoating

Drying process	Alu ZM dries by evaporation of the solvent. The drying process is influenced by the total WFT, the number of coats applied, the ambient air and surface temperatures and the air circulation.
Drying time	for 40 µm DFT at 20°C in a well-ventilated environment with at least 60% relative humidity : - touch-dry : after 25 min. - dry to handle : after 1,5 hour - fully cured : after 24 hours
Overcoating	- with a new layer of Alu ZM : 1 hour after touch dry - Any intermediate coat contamination that could disturb the adherence of the next coat should be removed by appropriate cleaning.
Reliquidisation	Each new layer of Alu ZM reliquidises the former Alu ZM layer so that both layers form one homogeneous layer.



Instructions for use

• Surface preparation

Cleanliness	- When Alu ZM is applied on top of Zinga, the surface should be free of zinc salts and other contaminations. That means that the Alu ZM must be applied within 24 hours after the application of the Zinga. In case the application of the Alu ZM can only be done after 24 hours, the Zinga surface should first be washed preferably by steam-cleaning at 140 bar at 80°C.
Roughness	When Alu ZM is applied on top of a new hot-dip galvanisation layer, the surface should be roughened by blasting with wet inert product, by using Scotch Brite or a nylon brush.
Maximum time to application	Apply the Alu ZM as soon as possible on the prepared surface. - in dry circumstances : max. 24 hours waiting time - if the relative humidity is close to 80% : max. 4 hours waiting time If contamination occurs before coating, the surface must be cleaned again as described above.

• Special instructions

Stirring	- Alu ZM must be thoroughly stirred to achieve a homogeneous liquid before application. After a maximum of 20 min. re-mixing is necessary. - During the spraying application, the product must be stirred continuously.
Dilution	Alu ZM can only be diluted with Zingasolv.
Rinsing of tools and equipment	Before and after using the spraying equipment, it must be rinsed with Zingasolv. Brushes should also be cleaned with Zingasolv. Never use White Spirit.

• Application by brush

Viscosity	Alu ZM is ready for use when applied by brush. Do not dilute.
Type of brush	- industrial round brush

• Application by roller

Viscosity	Alu ZM is ready for use when applied by roller. Do not dilute.
Type of brush	Industrial short haired roller (not foam based)



- **Application by conventional spray-gun**

Viscosity	10 to 20% Zingasolv (volume on volume)
Pressure at the nozzle	2 to 4 bar
Nozzle opening	1,4 to 1,8 mm

- **Application by conventional spray-gun with pressure pot**

Viscosity	10 to 20% Zingasolv (volume on volume)
Pressure at the nozzle	2 to 4 bar
Pot pressure	0,8 to 1,5 bar
Nozzle opening	1,4 to 1,8 mm

- **Application by airless spraying**

Dilution	0 to 5% (volume on volume)
Pressure at the nozzle	100 to 200 bar
Nozzle opening	0,017 to 0,021 inch

For more specific and detailed recommendations concerning the application of Alu ZM, please contact the Zingametal representative. For detailed information about the health and safety hazards and precautions for use, please refer to the Alu ZM **safety data sheet**.

Waiver*

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ALUFER N

ZM-RE-PRO-04-A (01/08/06)

Alufer N is a moisture curing one pack polyurethane. Micaceous iron oxides create the special lamellar structure which create a very tight paint film

→ excellent water and corrosion resistance.

Alufer N can be applied as an intermediate and/or topcoat on Zinga.

Alufer N can be used for immersion in water, sea water and several chemicals.

Physical data and technical information

- **Wet product**

Components	- micaceous iron oxides - aluminium silicates - magnesium silicates
Binder	moisture curing aromatic polyisocyanate prepolymers.
Density	1,52 Kg/dm ³ (± 0,05 Kg/dm ³) at 20°C
Solid content	- 79% by weight (± 2%) - 66% by volume (± 2%)
Viscosity	105 KU (± 5 KU) at 20°C
VOC	300 g/L (= 198 g/Kg)

- **Dry film**

Colour	Grey
Gloss	Mat

- **Packing**

1 L	available (per box of 6 L)
4 L	available
20 L	available

- **Conservation**

Storage	2 years in the original, unopened package stored in a dry environment at temperatures between -20°C and +40°C.
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Application data

- **Surface preparation**

When the waiting time between the successive coats is abnormally prolonged or in extremely polluted areas, the primed surface can become contaminated. All contamination that hampers the adhesion of the paint should be removed by appropriate means.

Surfaces contaminated with oil and grease should be washed down with solvent, alkaline solutions or emulsifier.

Salt deposits or other water-soluble contaminations should be removed with water and brush, water under high pressure or steam. Possible white zinc rust on zinc dust primers should be removed with water and rigid nylon brush.

- **Coverage and consumption**

Theoretical coverage	- for 80 µm DFT: 7,5 m ² /L - for 100 µm DFT: 6,0 m ² /L - for 150 µm DFT: 4,0 m ² /L
Practical coverage	depends upon the roughness profile of the substrate and the application method

- **Environmental conditions during application**

Ambient temperature	- minimum 0°C - maximum 35°C
Relative humidity	- minimum 30% - maximum 98%
Surface temperature	- minimum 3°C above the dew point

- **Drying process and overcoating**

Drying time	for 80 µm DFT at relative humidity of 75%: - 10°C: dustdry: 2,5 hours tackfree: 4 hours dry: 6 hours - 20°C: dustdry: 1 hours tackfree: 2,5 hours dry: 4 hours - 30°C: dustdry: 40 minutes tackfree: 1,5 hours dry: 3 hours
Overcoating	for 80 µm DFT at relative humidity of 75%: 10°C: minimum: 24 hours maximum: 3 months 20°C: minimum: 6 hours maximum: 1 month 30°C: minimum: 4 hours maximum: 1 week Remark: At longer intervals a good cleaning is necessary to avoid intermediate coat contamination which could disturb the adherence of the next coat.



Instructions for use

- **Application by brush and roller**

Dilution	5 to 10% with Zingasolv
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- **Application by conventional spray-gun**

Dilution	10 to 20% with Thinner 41
Pressure at the nozzle	3 to 5 bar
Nozzle opening	1,2 to 1,5 mm

- **Application by airless spraying**

Dilution	5 to 15% with Thinner 41
Pressure at the nozzle	100 to 300 bar
Nozzle opening	0,017 to 0,024 inch

- **Remarks**

Stripe coat	It is always recommended to treat corners, sharp edges, bolts and nuts before applying a uniform coat.
Dry layer thickness	Recommended: 60 to 100 µm Maximum: 120 to 160 µm
Cleaning	With Zingasolv

For more specific and detailed recommendations concerning the application of Alufer N, please contact the Zingametall representative. For detailed information about the health and safety hazards and precautions for use, please refer to the Alufer N **safety data sheet**.

Waiver*

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