




# ZINGA VS HDG

ZINGA	Performance	HDG
Offers a cathodic protection throughout the layer, comparable to the cathodic protection of hot dip galvanising ( <i>Prof. Defranco - University of Ghent</i> ). ZINGA has a concentration of 96% special zinc in its dry layer which gives it its galvanic characteristics.	<b>Active Protection</b>	Steel members which have been hot dip galvanized have proven cathodic protection by the sacrifice of the Zinc on the surface. Damages to the steel substrate show protection by the throwing power of the zinc layer. The Zinc layer diminishes because of the depletion of the Zinc.
A layer of zinc salts slowly builds up on the ZINGA surface. This creates a barrier protection for the metal substrate. Next to this, a supplementary barrier protection is provided by the binder in ZINGA. The binder reduces the disintegration of the zinc.	<b>Passive Protection</b>	Comparable to ZINGA, a layer of zinc salts is formed on top of the HDG layer, but in contrast to ZINGA, the HDG layer is very smooth which promotes run off of soluble Zinc salts. In order to avoid the Zinc salt formation, most HDG steel is chromate passivated which reduces the active Zinc layer of HDG.
Does not need a topcoat. A single layer of ZINGA is in itself a Duplex system offering on one side an ACTIVE-CATHODIC protection, on the other side a PASSIVE-BARRIER protection.	<b>Unique System</b>	Does not need a topcoat either.
ZINGA containing 96 % of zinc remains a flexible layer, and resists to mechanical shocks by being compressed. There is no risk of disbonding (not even around the impact) within a multiple layer of ZINGA. It will not show adhesion failures. Even on thin metal ZINGA remains always the same flexible layer.	<b>Flexibility and Brittleness</b>	When hot-dipped structures are bent over a certain angle, the coating will be affected and the total structure will need to be hot-dipped again to restore the coating. It is also recommended to restore these coatings by using a zinc rich liquid coating (like ZINGA®). In general, it is advised to bend the structures before hot-dipping. In practice, this is not always possible (e.g. pipes that need to be fitted to form connections).
A polymerised ZINGA layer will re-liquidise upon contact with ZINGA, even after 20 years. This ensures the creation of 1 ZINGA layer with a continuous electrochemical contact between the Zinc particles and thus galvanic protection. If the ZINGA® layer is very old, the Zinc salts on the surface (ensuring a passive protection), need to be removed to ensure complete reliquidisation; this can be obtained by performing a light sweep blast.	<b>Reloading</b>	Hot dipped structures cannot be hot dipped again unless they are dismantled, blasted and dipped into the Zinc bath. ZINGA's mechanism of protection is so similar to conventional galvanising that they work in complete unison, as they are merely different forms of zinc. Rather than replacing galvanised assets, structures can simply have their protection "re-charged" by applying ZINGA® to the rough surface of the old galvanising after appropriate decontamination and removal of the salts.
<b>Application</b>		
ZINGA is applied on a clean and rough surface to be obtained by a blasting Sa 2 ½, 12.5 µm with the right blasting material. A complete cleaning to the white metal is not required.	<b>Surface Preparation</b>	Surface preparation for galvanizing consists of three steps: degreasing/caustic cleaning (a hot alkali or acidic solution removes dirt, grease, and oil from the metal surface. Old coatings must be removed before galvanizing by blasting); pickling (a dilute solution of heated sulfuric acid removes mill scale and rust from the steel surface); and fluxing (a zinc ammonium chloride solution, removes any remaining oxides and deposits a protective layer on the steel to prevent any further oxides from forming on the surface prior to immersion in the molten zinc).

<p>A ZINGA-coating can be applied everywhere under normal conditions, regardless of temperature and humidity. It does not require highly qualified personnel.</p>	<p><b>Work Force</b></p>	<p>HDG requires transportation of the metal structures to the HDG plant and a team of skilled galvanisers to prepare and dip the structures.</p>
<p>Zingaised steel can be welded without the release of any toxic fumes (tested according BS 6853) and with a very small burn back. Since the ZINGA is not in any way alloyed with the steel, there is no danger of zinc inclusion in the weld. Once the welding is finished, roughened and cleaned, a new ZINGA layer over the welding will provide an all over protection.</p>	<p><b>Welding areas</b></p>	<p>Welds are advised on steel free of zinc to prevent strength reduction through zinc inclusion in the weld itself (since the Zinc is molten into the steel – alloy). The zinc coating should be removed at least one to four inches from either side of the intended weld zone and on both sides of the steel part. Grinding is the most effective means of removing the galvanized coating.</p>
<p>ZINGA can be repaired and reloaded at any time. The old ZINGA surface should be clean of dust and loose rust. After a certain time repairs become invisible.</p>	<p><b>Repair</b></p>	<p>After erection, HDG steel members will show several areas with damages to the bare steel. These can not be hot dipped again as they are already installed and welded. As a general practice, the damaged areas are touched up with a zinc rich coating. ZINGA is ideally suited for this touch-up.</p>
<p>ZINGA can be overcoated with a fast drying, compatible paint. Care should be taken to avoid affection of the Zinc layer by aggressive solvents of the topcoat.</p>	<p><b>Overcoating with topcoat</b></p>	<p>Not only does HDG requires specialized, compatible paints; a thorough surface preparation is also needed before the application of a topcoat on HDG. This includes alkaline or acid rinsing and sweep blasting the surface. If not, there is no proper adhesion for any paint.</p>

ZINGA®	CHARACTERISTICS	HDG	PAINT
✓	Active cathodic protection	✓	✗
✓	Easy application on site	✗	✓
✓	Reloadable	✓ WITH ZINGA®	✗
✓	Overcoatable	✗	✓
✓	Application under extreme circumstances (high & low temperatures and in humid environments)	-	✗ / ✓*
✓	Unlimited shelf life	-	✗
✓	Contact with potable water = ok**	✓	✗ / ✓*
✓	Flexible layer, adjusts itself to the metal structure (resistant to temperature variations and mechanical shocks)	✗	✗
✓	Welding on coated steel***	✗	✗
✓	The structure keeps its form during application.	✗	✓

\* Requires special paints.  
 \*\* Authorisation depends on local legislation.  
 \*\*\* Please contact a Zingametall representative for more information.



With hot-dip galvanisation, deformation of the structure is possible due to the use of high temperatures of molten Zinc. There is also potential for hydrogen embrittlement within welds.