



**GENERAL WARRANTY TERMS HOT-DIP GALVANISING  
for the Benelux of Zinkinfo Benelux  
filed at the Registry of the Court in The Hague  
on 04/04/2019 under number 12/2019**

These General Warranty Terms Hot-Dip Galvanising for the Benelux constitute an addition to the General Terms of Sale, Supply and Payment of Zinkinfo Benelux the Contractor has declared applicable to the Agreement (hereinafter referred to as: General Terms of Supply) for the specific application "hot-dip galvanising". In the event of any inconsistencies, the provisions of these General Warranty Terms Hot-Dip Galvanising for the Benelux shall prevail, unless these terms provide otherwise.

**1. Additional definitions**

General Warranty Terms Hot-Dip Galvanising for the Benelux: these General Warranty Terms Hot-Dip Galvanising for the Benelux, including appendices.

Territory: The Netherlands, Belgium and Luxemburg where Items are applied.

Zinkinfo Benelux: the foundation for hot-dip galvanising in the Benelux.

Items: - depending on the context - Items to be hot-dip galvanised or that have been hot-dip galvanised, such as constructions, parts, objects.

**2. 2. Terms for hot-dip galvanising**

The Customer shall supply the Items to be hot-dip galvanised in such a way that they can be hot-dip galvanised by the Contractor without any further pretreatment and in conformity with the agreed or applicable standard. The Customer shall therefore ensure amongst other things that:

- the Items to be galvanised are assembled in such a way that they can be galvanised in their entirety and without any special processing or special tools being required during the hot-dip galvanising (in conformity with the aforementioned standard);
- in hollow Items to be galvanised inflow and outflow holes have been provided of sufficient size, in conformity with the Contractor's instructions;
- the Items to be galvanised are provided with sufficient suspension holes, in conformity with the Contractor's instructions;
- assembled Items to be galvanised shall be supplied disassembled;
- for Items to be galvanised of which only the exterior needs to be galvanised, any associated flanges, pipework, bolts, nuts and gaskets shall be supplied separately;
- Items to be galvanised shall be provided free from heavy rust, grease, paint, varnish, bitumen, welding slags, covering layers and other contamination.

**3. Scope of the warranty**

3.1 The Contractor warrants towards the Customer that the hot-dip galvanising shall be carried out in conformity with the version of European standard EN-ISO 1461 applicable on the date of conclusion of the agreement.

3.2 The warranty entails that if within the warranty term over 5% of the hot-dip galvanised steel surface is no longer protected by zinc due to a defect in the hot-dip galvanising and other than as a result of mechanical and/or chemical processing, environmental factors or other exclusion grounds, the Contractor or a third party to be appointed by the Contractor shall repair the hot-dip galvanised Items or shall hot-dip galvanise them again, with due observance of Article 6, either at the company of the Contractor or at the company of the third party to be appointed by the Contractor or at the Customer, such at the discretion of the Contractor. Any costs exceeding the single obligation described in the previous sentence, including, without being limited to transport costs and travel and subsistence costs, as well as disassembly and assembly/installation costs, shall be borne by the Customer.

3.3 The warranty only covers the damage to the zinc coating. This warranty does not cover the removal or renewed application of other coatings than the zinc coating applied by the Contractor.



#### **4 Environmental factors**

The Contractor acknowledges that the nature of the atmosphere and the climatological circumstances in which the hot-dip galvanised Items are used are of vital importance to the quality and durability of the zinc coating. This means that warranty is given only if the hot-dip galvanised Items are permanently applied in specific atmospheric corrosion load categories as set out in Appendix 1 to these General Warranty Terms Hot-Dip Galvanising for the Benelux.

#### **5 Warranty terms**

Furthermore, the warranty shall only be given if the following additional conditions have been met:

- Items to be galvanised and the structures are suitable and correctly designed both for the intended use and for the hot-dip galvanising process;
- the galvanised surface shall not be exposed to temperatures that exceed 180°C and/or to an environment in which the circumstances are such (e.g. due to the presence of aggressive chemicals) that it can be reasonably foreseen that it could cause damage;
- the galvanised Items are permanently located in the Territory;
- the galvanised Items shall be demonstrably inspected for possible defects at least every five years;
- the galvanised Items shall be stored and used in accordance with the applicable regulations, advice and recommendations prior to and during assembly;
- no changes have taken place in the announced intended use of the galvanised Items nor in the immediate environment of the galvanised Items during the warranty period, unless after consultation with and written approval of the Contractor;
- no intermediate (repair, adjustment etc.) work has been carried out on the galvanised Items other than after consultation with and approval of the Contractor;
- the climatological and atmospheric circumstances in which the galvanised Items have remained comply with the criteria as set out in Appendix 1 of these General Warranty Terms Hot-Dip Galvanising for the Benelux;
- the Customer shall supply the proof that the Contractor has hot-dip galvanised the relevant Items;
- there are no grounds for exclusion from warranty according to the General Terms of Supply;

#### **6 Warranty period and warranty scope**

The warranty period is the period applicable according to Table 3 of Appendix 1 of these General Warranty Terms Hot-Dip Galvanising for the Benelux. In the event that a hot-dip galvanised zinc layer is restored/replaced under the warranty, only the remaining warranty period applies to the restored/replaced zinc layer.

The Contractor only pays (part of) the costs in the event that the repeated hot dip galvanising or restoration is undertaken by the Contractor or by a third party commissioned by the Contractor.

In the event of a warranty period of 30 years, the cost of renewed hot-dip galvanising or repair under these General Warranty Terms Hot-Dip Galvanising for the Benelux, shall be for fully for the account of the Contractor for the first 10 years after the commencement date of the warranty. After this period, the share of the Customer in these costs shall be calculated by multiplying these costs with the fraction of the expired full years after the first 10 years following the commencement date of the warranty divided by 20, being the warranty period remaining after 10 years. For example: in the event of a legally valid warranty claim after 12.8 years, the share of the Customer shall be: costs mentioned  $\times 2/20 = 10\%$  of the costs mentioned.

In the event that a warranty period of 30 years applies, the share of the Customer in these costs shall be calculated by multiplying these costs with the fraction of the expired full years after the commencement date of the warranty divided by the applicable warranty period.

The share of the Customer is shown in the table below as a percentage contribution to the warranty costs by the Customer within the warranty period.





Table 1: Percentage contribution in the warranty costs by the Customer within the warranty period

Expired full years after warranty commencement date	Hot-dip Galvanising 30 years warranty	Hot-dip Galvanising 20 years warranty	Hot-dip Galvanising 10 years warranty
0	0.00%	0.00%	0.00%
1	0.00%	5.00%	10.00%
2	0.00%	10.00%	20.00%
3	0.00%	15.00%	30.00 %
4	0.00%	20.00%	40.00%
5	0.00%	25.00%	50.00%
6	0.00%	30.00%	60.00%
7	0.00%	35.00%	70.00%
8	0.00%	40.00%	80.00%
9	0.00%	45.00%	90.00%
10	0.00%	50.00%	100.00%
11	5.00%	55.00%	
12	10.00%	60.00%	
13	15.00%	65.00%	
14	20.00%	70.00%	
15	25.00%	75.00%	
16	30.00%	80.00%	
17	35.00%	85.00%	
18	40.00%	90.00%	
19	45.00%	95.00%	
20	50.00%	100.00%	
21	55.00%		
22	60.00%		
23	65.00%		
24	70.00%		
25	75.00%		
26	80.00%		
27	85.00%		
28	90.00%		
29	95.00%		
30	100.00%		

If under the General Terms of Supply the Contractor is not bound to warranty, or to a lower amount in costs than set out in this Table 1, the General Terms of Supply shall prevail.

**7. Disputes**

If the Customer feels that he is entitled to warranty and this is disputed by the Contractor, the technical aspect of this dispute shall be submitted to an independent party to be appointed by the management board of Zinkinfo Benelux, which for the account of the unsuccessful party shall inspect the galvanised surfaces and shall record its results in an assessment report. The Parties agree to be bound to the inspection results of this technical assessment and to accept them.



**Appendix 1 to the General Warranty Terms Hot-Dip Galvanising for the Benelux**

For the benefit of the Customer the circumstances under which warranty on hot-dip galvanising is given, are set out below.

The categorisation into corrosion categories according to ISO 12944 is used as shown in Table 2 below:

A. Atmospheric corrosion load categories (simplified representation ISO 12944)

Corrosion load categories	Examples of typical environments in a temperature climate	
	Outside	Inside
C1 (very low)	-	Heated buildings with clean atmosphere, e.g. offices, shops, schools, hotels
C2 (low)	Atmosphere with low pollution levels Mostly rural areas	Unheated buildings where condensation may occur, e.g. depots, sports halls
C3 (moderate)	Urban and industrial atmospheres, moderate sulphur dioxide pollution. Coastal areas with low salinity	Production halls with high humidity and some air pollution, e.g. food processing factories, laundries, breweries, dairy
C4 (high)	Industrial and coastal areas with moderate salinity	Chemical factories, swimming pools, ports
C5 (very high)	Industrial areas with high humidity and an aggressive atmosphere	Buildings or areas with an almost permanent condensation and high pollution levels
CX (extreme)	Environment where the corrosion load is extremely high due to chemicals	Environment where the corrosion load is extremely high due to chemicals

B. Categories for water and soil (simplified representation ISO 12944)

Category	Environments	Examples of environments and constructions
Im1	Fresh water	River plants, hydropower plants
Im2	Sea or brackish water	Immersed constructions without cathodic protection (e.g. port areas with constructions such as lock gates, dams, piers)
Im3	Soil	Subterranean storage tanks, steel pillars, steel pipes
Im4	Sea or brackish water	Immersed constructions with cathodic protection (e.g. offshore constructions)

For the various corrosion load categories the warranty applies as shown in Table 3 below.



**Table 3**

**Warranty and warranty period for de corrosion load categories**

Galvanised Items that comply with standard EN-ISO 1461 and

are used in atmospheric corrosion load categories C1 and/or C2

do not contain parts that are thinner than 3 mm steel and are used in atmospheric corrosion load category C3.

contain parts thinner than 3 mm steel and are used in atmospheric corrosion load category C3.

do not contain parts that are thinner than 6 mm steel and are used in atmospheric corrosion load category C4.

contain parts thinner than 6 mm steel and are used in atmospheric corrosion load category C4.

do not contain parts that are thinner than 6 mm steel and are used in atmospheric corrosion load category C5.

contain parts thinner than 6 mm steel and are used in atmospheric corrosion load category C5.

For galvanised Items that are applied in the (atmospheric) corrosion load categories CX, Im1, Im2, Im3 and Im4 no warranty is given

	Benelux territory	
	warranty	warranty period
are used in atmospheric corrosion load categories C1 and/or C2	√	30 years
do not contain parts that are thinner than 3 mm steel and are used in atmospheric corrosion load category C3.	√	30 years
contain parts thinner than 3 mm steel and are used in atmospheric corrosion load category C3.	√	20 years
do not contain parts that are thinner than 6 mm steel and are used in atmospheric corrosion load category C4.	√	20 years
contain parts thinner than 6 mm steel and are used in atmospheric corrosion load category C4.	√	10 years
do not contain parts that are thinner than 6 mm steel and are used in atmospheric corrosion load category C5.	√	10 years
contain parts thinner than 6 mm steel and are used in atmospheric corrosion load category C5.	x	-
For galvanised Items that are applied in the (atmospheric) corrosion load categories CX, Im1, Im2, Im3 and Im4 no warranty is given	x	-

√ = warranty / x = no warranty

If galvanised Items are used in multiple atmospheric corrosion load categories during the term of the warranty, the warranty for the highest atmospheric corrosion load category (lowest C1 and highest Im4) applies.

*\*to determine the percentage contribution in the warranty costs by the Customer within the warranty term, see Table 1 in the Warranty Terms Hot-Dip Galvanising for the Benelux.*

Contact corrosion

If galvanised Items come into contact with metals and/or are applied in circumstances as referred to in Table 4 below, they shall also be excluded from this warranty scheme, unless



stated otherwise in this table. Contact corrosion with zinc contacting metals as referred to in Table 4 below in the presence of an electrolyte also comes under this exclusion.

Table 4

Metal	Atmospheric exposure			Immersed in	
	Rural climate	Industrial/urban climate	Sea climate	Fresh water	Sea water
Aluminium			X	X	X
Brass	X	X	X	X	X
Bronze	X	X	X	X	X
Cast iron	X	X	X	X	X
Copper	X	X	X	X	X
Led		X	X	X	X
Stainless steel	X	X	X	X	X

X warranty scheme not applicable/exclusion does not apply to stainless steel fasteners

Furthermore, an overview is given in Table 5 below of chemicals and substances, to which the hot-dip Galvanising coating is not resistant. Moreover, warranty is not given if the hot-dip galvanised Items have been in contact with chemicals and substances referred to in Table 5 below during the warranty period.

Table 5

	Column 1		Column 2	
	chemicals and substances that may not get in contact with the zinc coating when wet		chemicals and substances that may corrode the zinc coating in dry conditions	
inorganic				
	all acids all alkalines (bases)	pH <5.5 pH ≥11	alkalines (bases)	pH < 11
			ammonia	
	ammonium	-acetates -fluoride -chloride -phosphate -nitrate -sulphate	ammonium	-bromide -carbonate -chromate -sulfonate
	arsenic compounds		antimony salts	
	barium	-chloride -hydroxide	barium	-nitrate -sulphate
	bromides			

	Column 1		Column 2	
	chemicals and substances that may not get in contact with the zinc coating when wet		chemicals and substances that may corrode the zinc coating in dry conditions	
	cadmium	-chloride -sulphate	cadmium	-nitrate
	calcium	-sulphate	calcium	-chlorate -chloride -hydroxide (dry)
	caesium	-hydroxide	caesium	-acetate
	chlorinated water		-chlorates	
	chrome	-chloride -sulphate	chrome	-oxide
			fluorides	
			phosphorus	
	halogen (wet)	Fluorine Chlorine Bromine Iodine astatine	halogen (dry)	Fluorine Chlorine Bromine Iodine astatine
	potassium compounds			
	copper compounds			
	lead	-nitrate -sulphate		
	lithium hydroxide			
	magnesium	-chloride oxychloride	magnesium compounds	
	sodium compounds			
	nickel compounds			
	perborates			
	peroxides			
	persulphate			
			hydrogen peroxide	
	zinc	-chloride	zinc	-chromate -sulphate -sulphide



	Column 1		Column 2	
	chemicals and substances that may not get in contact with the zinc coating when wet		chemicals and substances that may corrode the zinc coating in dry conditions	
	silver compounds (wet)		silver compounds (dry)	
organic				
	organic acids		ethyl acrylate acid butyl acrylate acid	
	acetates			
	acetylene (vapour)		acetylene (60%)	
	alcohols	≥50% solutions		
	aldehydes			
	allyl chloride			
			amides	
			amines	
			amino acids	
	aniline	-sulphate		
	chlorinated hydrocarbons			
	citrates			
	cresols			
			ethanol	
	ether			
	phenols			
	formaldehyde			
	glycols			
			hydrazides	
	lactic acid			
	naphtha			
	fruit juices			
various				
	concrete (water)		fertilizer	



	Column 1	Column 2
	chemicals and substances that may not get in contact with the zinc coating when wet	chemicals and substances that may corrode the zinc coating in dry conditions
	cement (water)	green maize
	jute	animal feeds
	various types of wood (wet)	
	precious metals	

The above Table 5 is based on amongst others the tables from  
 Corrosion Resistance of Zinc and Zinc Alloys, Frank Porter 1994 ISBN 0-8247-9213-0  
 Zink, Korrosionsverhalten von Zink, Verhalten von Zink gegen Chemikaliën, Dr W. Wiederholt 1977 ISSN 0342-1759