

HOT DIPPED GALVANIZING STANDARDS

HOT DIP GALVANIZERS ASSOCIATION OF SOUTHERN AFRICA

Table no. 5
 Atmospheric Corrosive Elements Classified in terms of ISO 9223:2012
 Similar to ISO 14713:2011 and ISO 12944-5 for Paints

| Category | Corrosivity | Typical environments - Examples | |
|----------|-------------|--|---|
| | | Indoor | Outdoor |
| C 1 | Very Low | Dry, air-conditioned with low relative humidity and insignificant pollution, e.g. offices, schools, museums. | Dry zone very low pollution and time of wetness, e.g. certain deserts, central Arctic/Antarctica |
| C 2 | Low | Unheated, no air-conditioning with restricted variation in temperature, humidity and minimum condensation and pollution, e.g. storerooms, sports halls | Temperate zone (dry or cool) with minimum pollution ($SO_2 < 5 \mu g/m^3$), short time of wetness, e.g. rural areas, subarctic areas, some arid and desert areas, small villages or towns |
| C 3 | Medium | Moderate frequency of condensation, pollution from process plant, e.g. food-processing, laundries, breweries, dairies | Temperate zone with medium (SO_2 5 to $\leq 30 \mu g/m^3$) or some effect of chlorides, e.g. urban areas, between a one to thirty kilometres (depending on prevailing winds, buildings, vegetation and topography) from the ocean, or within one hundred metres of sheltered coastal areas with low chloride deposits |
| C 4 | High | High frequency of condensation, time of wetness, high pollution from production process, e.g. industrial processing plants, swimming pools | Temperate, subtropical to topical, low to high pollution (SO_2 30 to $\leq 90 \mu g/m^3$) or substantial chloride effect, e.g. < one kilometres of the ocean or within one hundred metres of sheltered coastal areas and outside the splash zone of salt water |

| Category | Corrosivity | Typical environments - Examples | |
|----------|-------------|---|---|
| | | Indoor | Outdoor |
| C 5 | Very High | High frequency of condensation, periods of time of wetness, and/or high pollution from production process, e.g. certain mines, caverns for industrial purposes, unventilated sheds in subtropical and tropical zones | Subtropical to tropical, periods of time of wetness, very high industrial pollution (SO_2 90 to $\leq 250\mu g/m^3$) or significant chloride effect/deposits, e.g. industrial polluted areas, jetties and offshore structures, within a few hundred metres of the ocean and certain exposed areas along the coastline |
| CX | Extreme | Almost permanent condensation or extended periods of exposure to extreme humidity and/or high pollution from production process, e.g. unventilated sheds in humid tropical zones with penetration of outdoor pollution including airborne chlorides and other pollutants and particulate matter | Subtropical to tropical, extended time of wetness, very high industrial pollution (SO_2 $>250\mu g/m^3$) or significant and extended chloride effect/deposits, e.g. highly industrialised and polluted areas, jetties and offshore structures, within a few hundred metres of the ocean with extended periods of on-shore prevailing winds and certain exposed areas along the coastline and within the splash zone of salt water |

Table 6 - Estimated Service Life for Hot Dip Galvanized Steel (zinc) complying with SANS 121 (ISO 1461:2009) and subjected to atmospheric environmental classified in terms of ISO 9223:2012

| Corrosivity Category | Corrosion Rates (r_{corr}) and service life in years for Hot Dip Galvanized Coated Steel (Ref ISO 1461:2009 & ISO 9223:2012) | | | | |
|----------------------|--|---------------------------|--|---|--|
| | Units | Zinc r_{corr} | 55 μm mean coating thickness for steel ≥ 1.5 mm to ≤ 3 mm (years) | 70 μm mean coating thickness for steel > 3 mm to ≤ 6 mm (years) | 85 μm mean coating thickness for steel > 6 mm (years) |
| C 1 | $\mu m/a$ | $r_{corr} \leq 0.1$ | > 80 | > 80 | > 80 |
| C 2 | $\mu m/a$ | $0.1 < r_{corr} \leq 0.7$ | < 78 | > 80 | > 80 |
| C 3 | $\mu m/a$ | $0.7 < r_{corr} \leq 2.1$ | 26 to ≤ 78 | 33 to < 80 | 40 to > 80 |
| C 4 | $\mu m/a$ | $2.1 < r_{corr} \leq 4.2$ | 13 to ≤ 26 | 16 to ≤ 33 | 20 to ≤ 40 |
| C 5 | $\mu m/a$ | $4.2 < r_{corr} \leq 8.4$ | 6.5 to ≤ 13 | 8.3 to ≤ 16 | 10 to ≤ 20 |
| CX | $\mu m/a$ | $8.4 < r_{corr} \leq 25$ | 2.2 to 6.5 | 2.8 to 8.3 | 3.4 to ≤ 10 |