Guidance on the Relative Corrosion Performance of DuraGal AS/NZS 1163 C350L0 or AS/NZS C450L0 supplied as C450PLUS

AustubeMills
SHAPING POSSIBILITIES

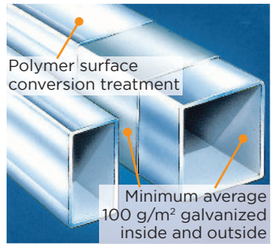
DuraGal sections are manufactured to AS/NZS 1163 C350L0 or AS/NZS 1163 C450L0 supplied as C450PLUS
The hot dip galvanized coating applied to DuraGal complies with the requirements of AS/NZS 4792 ZB100/100 or AS/NZS 4792 ZB 135/135
See the AustubeMills Product availability Guide for size, grade and coating combinations offered. The Guide can be downloaded from:
https://www.austubemills.com.au/resources/products-and-availability/

AS/NZS 1163 - Cold-formed structural steel hollow sections.
AS/NZS 4792 - Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialized process.

The table below provides guidance on the corrosion performance of DuraGal along with a range of hot dip galvanized coating systems.

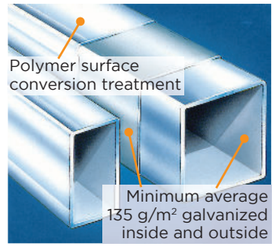
The table is reproduced with permission from AS/NZS 2312.2 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings, Part 2: Hot dip galvanizing, **TABLE 6.2**, modified to include Corrosivity Category C2 and Explanation of Corrosivity Categories, AS 4750 ZE 50 and deletion of AS 4750 ZE 100.

AS/NZS 4792 - ZB100/100



DuraGal AS/NZS 4792 - ZB100/100

AS/NZS 4792 - ZB135/135



DuraGal AS/NZS 4792 - ZB135/135

GUIDE TO LIFE TO FIRST MAINTENANCE FOR A SELECTION OF HOT DIP GALVANIZED COATING SYSTEMS IN A RANGE OF CORROSIVITY CATEGORIES

System	Reference Standard		Minimum thickness (Note 1)		Selected corrosivity category (ISO 9223) calculated min.–max. life (years) and durability class (VS, S, M, L, VL, EL)									
					C2		C3		C4		C5		CX	
			g/m²	µm	Most areas of Australia and New Zealand beyond at least 50 km from the sea are in this category, can extend as close as 1 km from seas that are relatively sheltered and quiet. Arid and rural inland regions, most inland cities and towns e.g. Canberra, Ballarat, Toowoomba, Alice Springs and Hamilton (NZ), and suburbs of cities on sheltered bays, e.g. Melbourne and Hobart. Proximity to the coast is an important factor.		Port Philip Bay, about 50 m from the shoreline to a distance of about 1 km inland. Gulf near Adelaide from 100 metres from the shoreline to about 3 to 6 km inland. Areas with breaking surf from about 1 km inland to 10 to 50 km inland, depending on the strength of prevailing winds and topography e.g. areas of Wollongong, Sydney, Newcastle, the Gold Coast, Auckland and Wellington, the whole of the Yorke Peninsula, from Victor Harbour to the Victorian border, extends between 30 and 70 km inland. Urban and industrial areas with low pollution levels e.g. for several kilometres around major industries, such as smelters and steelworks, and in the geothermal areas of New Zealand. Micro-environmental effects, such as result from proximity to airports and sewage treatment works, may also place a site into this category.		In sheltered bays extends up to 50 m inland from the shoreline. In areas with rough seas and surf, it extends from about several hundred metres inland to about 1 km inland. The extent depends on winds, wave action and topography. Industrial regions may also be in this category, but in Australia and New Zealand these are only likely to be found within 1.5 km of the plant. This category extends inside the plant where it is best considered as a micro-environment.		On the beachfront in regions of rough seas and surf beaches. The region can extend inland for several hundred metres. (In some areas of Newcastle, for example, it extends more than 0.5 km from the coast.) This category may also be found in aggressive industrial areas, where the environment may be acidic with a pH of less than 5.5.		Surf beach shoreline regions with very high salt deposition. Such corrosion rates would also be found in severe acidic industrial environments.	
Hot dip galvanizing	AS/NZS 4680 (Note 2)	HDG390	390	55	79>100	EL	26–78	EL	13–26	VL	6–13	M	2–6	S
		HDG500	500	70	100>100	EL	33–100	EL	16–33	VL	8–16	L	2–8	M
		HDG600	600	85	121>100	EL	40>100	EL	20–40	EL	10–20	VL	3–10	M
		HDG900	900	125	179>100	EL	60>100	EL	30–60	EL	15–30	VL	5–15	M
Hot dip galvanized sheet	AS 1397 (Note 3, 4)	Z350	140	20	29>100	EL	10–29	VL	5–10	M	2–5	S	1–2	VS
		Z450	180	25	36>100	EL	12–36	VL	6–12	M	3–6	S	1–3	VS
Electro galvanized tube	AS 4750	ZE50/50	50	7	10-70	EL	3-10	M	1-3	S	1-1	VS	0-0	VS
		ZE100/100	100	14	20>100	EL	6-20	L	3-6	S	1-3	VS	0-1	VS
Hot dip galvanized tube	AS/NZS 4792 (Note 5)	ILG100/	100	14	20>100	EL	6-20	L	3-6	S	1-3	VS	0-1	VS
		ZB100/100	100	14	20>100	EL	6-20	L	3-6	S	1-3	VS	0-1	VS
		ILG140/	140	20	28>100	EL	10–29	VL	5–10	M	2–5	S	1–2	VS
		ZB135/135	135	19	27>100	EL	9-27	VL	4-9	M	2-4	S	0-2	VS
		ILG300/	300	42	60>100	EL	20–60	EL	10-20	VL	5-10	M	1–5	S
		ZB300/300	300	42	60>100	EL	20-60	EL	10-20	VL	5-10	M	1-5	S
Mechanical plating	AS 5056 (Note 6)		55	8	11>100	EL	4–11	M	2–4	S	1–2	VS	0–1	VS
			175	25	35>100	EL	12–36	VL	6–12	M	3–6	S	1–3	VS
Electroplated coatings	AS 1897	Fe/Zn 8c	55	8	11-80	EL	4–11	M	2–4	S	1–2	VS	0–1	VS
		Fe/Zn 25c	175	25	35>100	EL	12–36	VL	6–12	M	3–6	S	1–3	VS

Notes:

DuraGal AS/NZS 1163 C350L0 AS/NZS 4792 ZB100/100 or DuraGal AS/NZS 1163 C450L0 (C450PLUS) AS/NZS 4792 ZB100/100

DuraGal AS/NZS 1163 C350L0 AS/NZS 4792 ZB135/135 or DuraGal AS/NZS 1163 C450L0 (C450PLUS) AS/NZS 4792 ZB135/135

1. It is impossible to achieve an exactly uniform thickness of any type of coating. The minimum thickness columns in this Table indicates the minimum average coating thickness for each system. In practice, the overall mean is likely to be substantially in excess of this minimum, which is important as zinc coatings are able to provide protection to adjacent areas that can lose their coating prematurely.
2. AS/NZS 4680 specifies the standard hot dip galvanized coating at the equivalent of 85 µm minimum for steel > 6 mm thick. Hot dip galvanized coating thicker than 85 µm are not specified in AS/NZS 4680 but the general provisions of that Standard apply and, together with the specific thickness figures, may form a specification capable of third-party verification. It is essential to know the composition of the steel to be used and the galvanizer should be consulted before specifying, as these coatings may not be available for all types of steel. Where the steel is suitable, thick coatings may be specified.
3. Unlike other hot dip galvanized standards referenced in Table 6.2, the thickness requirement in AS 1397 are recorded as the total of both sides, but are shown in the Table as approximate local thickness requirements on one side only for consistency.
4. Zinc/aluminium alloy coatings (with 5% to 55% aluminium) usually last linger than pure zinc of the same thickness; pending wider use, they are not included in this Table. There is widespread technical literature available on these classes of materials.
5. Hot dip galvanized tube manufactured to AS/NZS 4792 may be supplied with the internal surface uncoated. In this case the durability only applies to the coated external surface and the specifier may need to consider alternative corrosion protection methods for the internal surface, such as end caps.
6. Mechanical plated coatings in AS 5056 are specified on the basis of coating thickness and porosity rather than coating mass, Table 6.2 assumes that these coatings are 100% dense. This is only true in a limited number of cases, as Clause 7.4 and Appendix F in AS 5056 specifies a range of coating porosities from 40% to 0% (i.e. 60% to 100% sense). In practice, the lifetime of these coatings are likely to be up to 40% less than the figures in Table 6.2.
7. Durability Class: VS = Very short term 0 to ≤ 2 S years; S = Short term 2 to < 5 years; M = Medium term 5 to < 10 years; L = Long term 10 to < 15 years; VL = Very Long term 15 to < 25 years; EL = Extra Long term ≥ 25 years.
8. Reference should be made to AS/NZS 2312.2 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings, Part 2: Hot dip galvanizing, to confirm the content of the table and explanation of table content.
9. AS/NZS 2312.2 can be purchased from Standards Australia or distributors (https://www.standards.org.au/access-standards/buy-standards).