Majuro, Marshall Islands OR19-1 Site – Atmospheric Corrosivity

Site OR19-1

The Majuro, Marshall Island Site (Image by Geosun).

Background:

The site is located at the Marshall Islands Amata Kabua International Airport [1], in Majuro, the capital and largest city of the Marshall Islands [2]. Majuro is also a coral reef atoll comprising 64 islands in the Pacific Ocean [2]. The site is close to the atoll's lagoon and Pacific Ocean waters from all directions, including the airport runway and urban/business centre located to the east, approximately 12 km away [1], with a population of just more than 20 000 people [2]. The central economy districts include a port, shopping zone, hotels, and international airport [3].

According to the Köppen-Geiger system, the site, located just north of the equator [2], exhibits a tropical rainforest climate (Köppen Af), i.e., with yearly mean temperatures above 28.2 ± 0.8ºC, varying between lows of 25.6ºC and highs of 29.9ºC. The average humidity is 83.3 ± 5.6%, and the annual precipitation is approximately 3 600 mm per annum, with winds experienced predominantly in an easterly direction, i.e., at 5.1 ± 1.8 m/s [4].

Apart from significant salt deposition from the nearby atoll lagoon and ocean water, other airborne contaminants likely include pollution from the airport and nearby villages and city activities.

Per the atmospheric corrosion data below, this (high humidity) tropical marine site is classified as Very High (C5) corrosive with significant effect/deposition of chlorides (ISO 9223) [5].

The location of the Majuro, Marshall Islands Site [1].

Satellite view of the Majuro Site [6].

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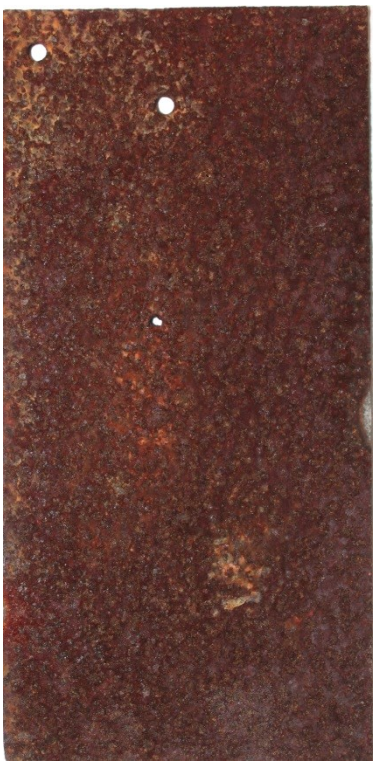
GPS Coordinates of Site:	7°03'54.0"N 171°16'08.0"E	**Elevation above Sea Level (m):**	5 m	**Distance from Ocean:**	85-165 m

ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification	
R_{CORR} Mild steel (µm/yr)	88.0 ± 9.9 µm/yr (1st year) and 141.5 ± 5.2 µm/yr (2nd year)
R_{CORR} Aluminium (µm/yr)	0.2 ± 0.1 µm/yr (1st year) and 0.2 ± 0.1 µm/yr (2nd year)
R_{CORR} Hot Dip Galvanised Steel (µm/yr)	4.6 ± 0.3 µm/yr (1st year) and 3.2 ± 0.1 µm/yr (2nd year)
R_{CORR} Copper (µm/yr)	3.6 ± 0.2 µm/yr (1st year) and 3.1 ± 0.1 µm/yr (2nd year)
ISO 9223 Corrosivity Classification	Very High (C5)
Typical surface contaminants	Pollution: High to very high salt mix deposition Specific contaminants include: Water-soluble salts – 14-270 mg/m^2 Chlorides – 24-69 ppm pH – Slightly alkaline

 **Mild steel – 12 months**	 **Mild steel – 12 months**
 **Mild steel – 24 months**	 **Mild steel – 24 months**

Aluminium – 12 months

Aluminium – 12 months

Aluminium – 24 months

Aluminium – 24 months

 **HDG – 12 months**	 **HDG – 12 months**
 **HDG – 24 months**	 **HDG – 24 months**

 **Copper – 12 months**	 **Copper – 12 months**
 **Copper – 24 months**	 **Copper – 24 months**

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