Efate, Vanuatu OR19-6 Site – Atmospheric Corrosivity

Site OR19-6

Efate, Vanuatu Site (Image by Geosun).

Background:

The site is positioned on the western side of the island of Efate, in the Pacific Ocean [1], which forms part of the Shefa Province in the archipelago Vanuatu [2]. The shortest distance from the site to the ocean is about 600 m, while the central urban hub at Port Vila (with a population of near 44 000 people) is located approximately 10-12 km to the east, across Mele Bay [1]. The population of Efate is given as 66 000 people [2], with the economy involving small-scale agriculture (mainly livestock farming), tourism and fishing [3].

The site has a hot tropical climate (Köppen Af) per the Köppen-Geiger system, with an average yearly temperature of 24.6 ± 1.6ºC, fluctuating between 19.4ºC and 28.0ºC, and the mean annual humidity level of more than 90%. The yearly precipitation level is ~1 500 mm, with the driest months spanning May to August. The average wind speed at the site is 1.2 ± 0.9 m/s, predominant in a westerly direction, with gusts of up to 19.0 m/s [4]. The surrounding ocean's pH is about 8.1 (as measured over 20 years) [5].

Apart from salts from the ocean, other airborne contaminants likely originate from forestry and human settlement-related activities. Per the atmospheric corrosion data below, this tropical marine site is classified as High to Very High corrosive with significant deposition of chlorides (ISO 9223) [6].

Position of the Efate, Vanuatu Site [1].

Satellite view of the Efate, Vanuatu Site site [7] .

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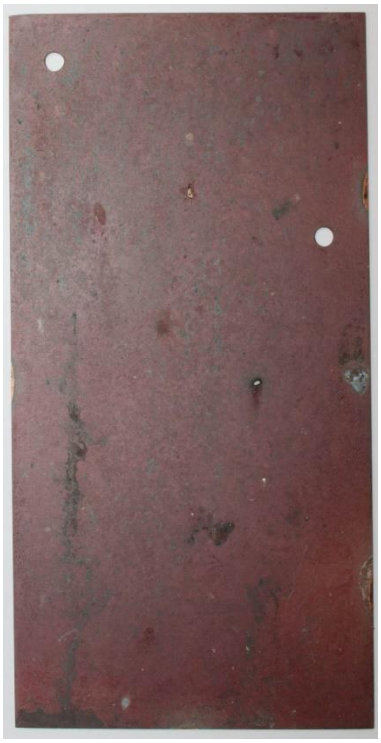
GPS Coordinates of Site:	17°42'35.1"S 168°12'41.2"E	**Elevation above Sea Level (m):**	152 m	**Distance from Ocean:**	~2 km
ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification					
12-month R_{CORR} Mild steel (µm/yr)			107.3 ± 14.3 µm/yr		
12-month R_{CORR} Aluminium (µm/yr)			0.18 ± 0.02 µm/yr		
12-month R_{CORR} Hot Dip Galvanised Steel (µm/yr)			1.4 ± 0.1 µm/yr		
12-month R_{CORR} Copper (µm/yr)			1.8 ± 0.4 µm/yr		
ISO 9223 Corrosivity Classification			High to Very High (C4-C5)		
Typical surface contaminants			Low to Medium salt mix deposition Specific contaminants: Water-soluble salts – 4-7 mg/m^2 Chlorides – 14 ppm pH – Somewhat alkaline		

 **Mild steel – 12 months**	 **Mild steel – 12 months**
 **Aluminium – 12 months**	 **Aluminium – 12 months**

 **HDG – 12 months**	 **HDG – 12 months**
 **Copper – 12 months**	 **Copper – 12 months**

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