Chuuk International Airport (Weno Island), Federated States of Micronesia OR19-15 Site – Atmospheric Corrosivity

Site OR19-15

Chuuk International Airport (Weno Island), Federated States of Micronesia Site (Image by Geosun).

Background:

The test site is located near Chuuk International Airport [1], on the northern side of Weno Island, a small (20 km^2) municipality of Chuuk State of the Federated States of Micronesia (FSM) [2]. The site is very close, i.e. within 50 m from the waters of Chuuk Lagoon, an atoll in the central Pacific Ocean [3], enclosed by a coral reef. Weno Island houses several villages, with a combined population of about 14 000 people, of which the main economic activities include fishing, agriculture and tourism. The nearest town is Weno city. Chuuk Lagoon, comprising eleven islands, forms part of the Caroline Islands group [3].

According to the Köppen-Geiger system, the site exhibits a tropical high humidity climate (Köppen Af), i.e. with an average yearly temperature of 28.5 ± 0.7ºC, varying between 25.6ºC and 30.2ºC, and an average humidity level of 84.5 ± 4.5%. The annual rainfall figure is about 2 850 mm, and the average wind speed is 5.3 ± 2.6 m/s, predominantly in an east to the southeasterly direction [4].

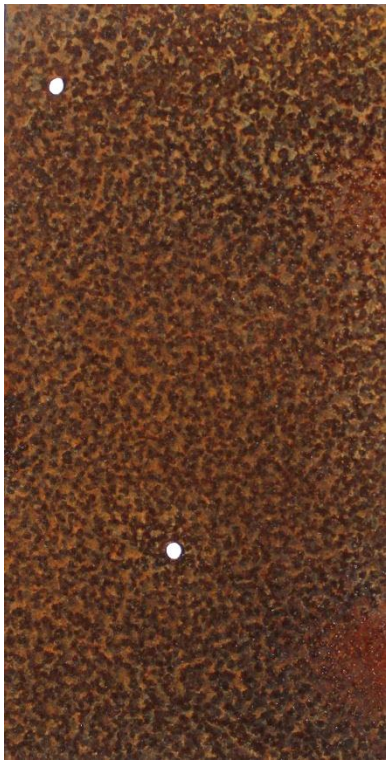
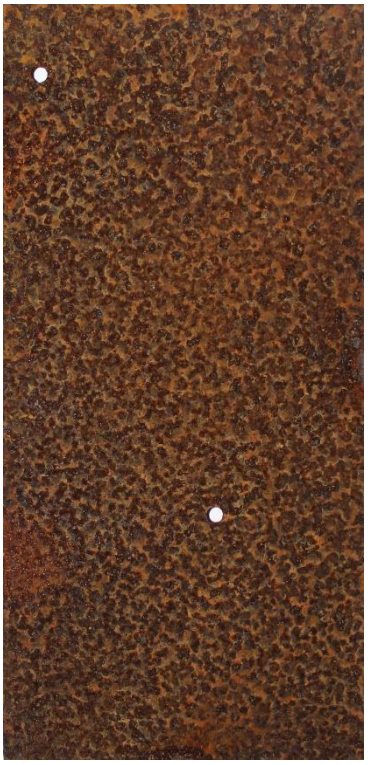
The site is positioned about 4 m above sea level [4]. Apart from significant salts deposition from the sea, other sources of air pollution include the airport and nearby urban settlements. However, the general air quality of Chuuk is said to be good (most times of the year) [5].

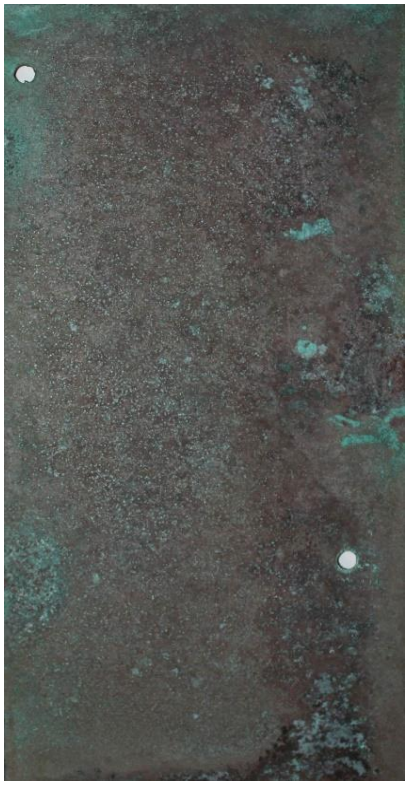
Per the atmospheric corrosion data below, the tropical marine site is classified as Very High to Extremely corrosive with very high deposition of chlorides (ISO 9223) [6].

Position of the site on Weno Island, in the Federated States of Micronesia [1].

Satellite view of the site on Weno Island [7].

Chuuk International Airport (Weno Island), Federated States of Micronesia OR19-15 Site – Atmospheric Corrosivity					
GPS Coordinates of Site:	7°28'03.1"N 151°50'59.4"E	**Elevation above Sea Level (m):**	4 m	**Distance from Ocean:**	<50 m
ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification					
12-month R_{CORR} Mild steel (µm/yr)	80.1 ± 1.1 µm/yr				
12-month R_{CORR} Aluminium (µm/yr)	0.4 ± 0.1 µm/yr				
12-month R_{CORR} Hot Dip Galvanised Steel (µm/yr)	8.9 ± 0.1 µm/yr				
12-month R_{CORR} Copper (µm/yr)	3.2 ± 0.3 µm/yr				
ISO 9223 Corrosivity Classification	High to the Extreme (C5-CX)				
Typical surface contaminants	Very high salt mix deposition Specific contaminants include: Water-soluble salts – 11-24 mg/m^2 Chlorides – 19 ppm pH – Neutral				

	
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**

Works Cited

[1] Google Inc, "Google Maps," Google Inc, [Online]. Available: https://www.google.com/maps/place/7%C2%B028'03.1%22N+151%C2%B050'59.4%22E/@7.4480969,151.864475,10192m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d7.467517!4d151.849834. [Accessed 9 November 2021].

[2] Wikipedia, "Weno," Wikipedia, 21 October 2021. [Online]. Available: https://en.wikipedia.org/wiki/Weno. [Accessed 9 November 2021].

[3] Wikipedia, "Chuuk Lagoon," Wikipedia, 10 September 2021. [Online]. Available: https://en.wikipedia.org/wiki/Chuuk_Lagoon. [Accessed 9 November 2021].

[4] Geosun, *107-World Bank-Micronesia - Meteorological Data*, 2020-2021.

[5] Air.plumelabs.com, "Air-quality-in-Chuuk," [Online]. Available: https://air.plumelabs.com/air-quality-in-chuuk-aw-40778_pc. [Accessed 10 November 2021].

[6] ISO (International Organization for Standardization), *ISO 9223 - Corrosion of metals and alloys — Corrosivity of atmospheres — Classification, determination and estimation*, Geneva, Switzerland: ISO, 2012.

[7] Google Inc, "Google Maps," [Online]. Available: https://www.google.com/maps/place/7%C2%B028'03.1%22N+151%C2%B050'59.4%22E/@7.4671927,151.8494846,1274m/data=!3m1!1e3!4m5!3m4!1s0x0:0x9a361afaca5169d8!8m2!3d7.4675278!4d151.8498333. [Accessed 17 November 2021].