

Laisamis OR19-12 Test Site – Atmospheric Corrosivity

Site OR19-12

Installation: 11-12-2019



Laisamis Test Site (Image by Geosun).

Background:

Laisamis is a small East African town in Kenya, in Marsabit County, with about 2 700 inhabitants [1]. Apart from a nearby hybridized Diesel, Solar and Wind Power Station [2], a primary highway, the A2 - Isiolo-Moyale Highway, also passes through the town [1]. The atmosphere is typically classified as a hot, dry (arid/desert) environment, with an average temperature of $28 \pm 2^{\circ}\text{C}$, fluctuating from cool to warm/hot daily. The minimum average daily temperature is approximately 23.7°C , and the maximum is near 33.0°C .

Two rainy seasons are experienced, i.e., March to May and October to December, with the dry season being from June to September [3]. According to records, the area has experienced a significant decrease in rainfall since 2012 [3]. The windiest period is May to November, during which gusts of near 50 km/h may be experienced [3]. The annual rainfall is only about 232 mm, and the climate (per the Köppen and Geiger Map [4], is classified as BWh (hot desert climate).

From a corrosivity perspective, the site is classified as very low to Low (C2) corrosive - typical of a rural (desert-like) environment with low pollution levels.

Orytech (Pty) Ltd.

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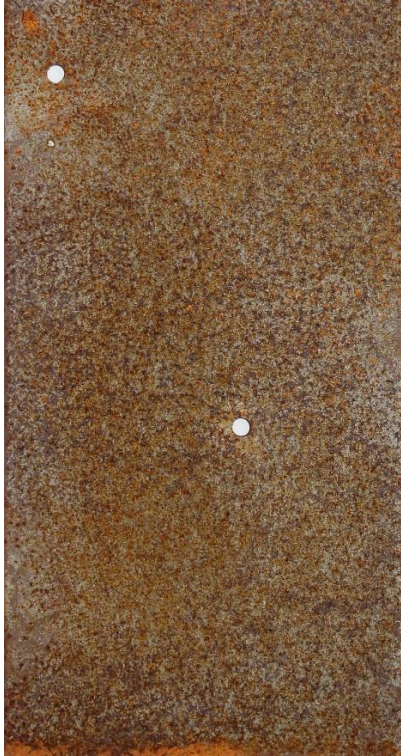
Google Inc Map of Laisamis [5].

GPS Coordinates of Site:	1°36'07.2"N 37°48'00.0"E	Elevation above Sea Level (m):	~576 m	Distance from Ocean (km):	~550 km
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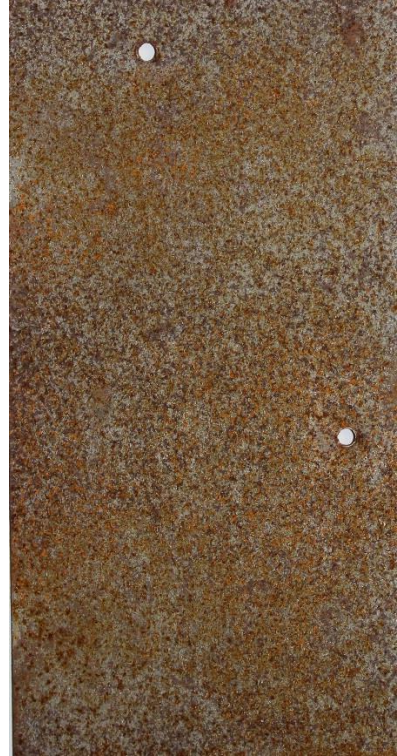
ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification

R_{CORR} Mild steel (µm/yr)	3.44 ± 0.03 µm/yr (1 st year) to 4.35 ± 0.04 µm/yr (2 nd year)
R_{CORR} Aluminium (µm/yr)	<0.1 µm/yr (Negligible) (1 st and 2 nd year)
R_{CORR} Hot Dip Galvanised Steel (µm/yr)	0.25 ± 0.02 µm/yr (1 st year) to 0.19 ± 0.01 µm/yr (2 nd year)
R_{CORR} Copper (µm/yr)	0.28 ± 0.01 µm/yr (1 st year) to 0.20 ± 0.01 µm/yr (2 nd year)
ISO 9223 Corrosivity Classification	Low (C2) corrosive – Dry atmospheric environment with low pollution
Typical surface contaminants	Pollution - some chloride deposition Specific contaminants include: Water-soluble salts – 14 mg/m ² Chlorides – <25 ppm pH – Slightly acidic to neutral

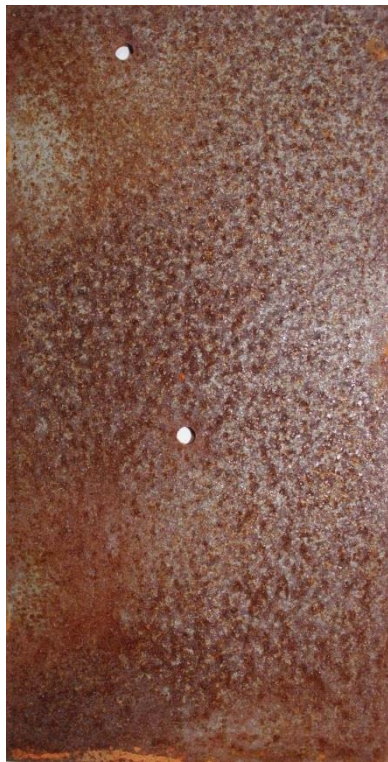
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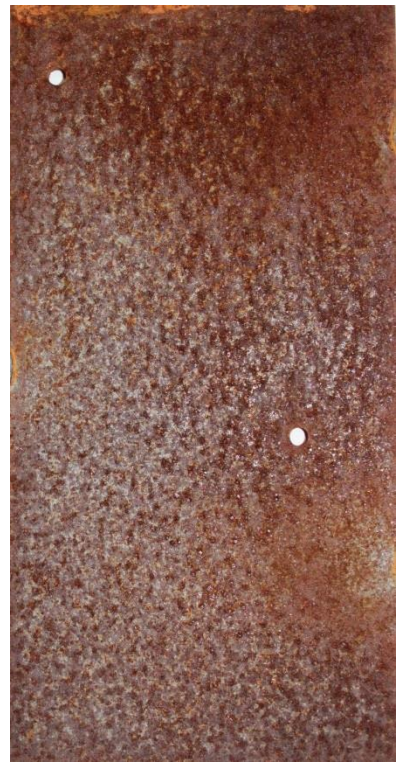
Mild steel – 12 months



Mild steel – 12 months

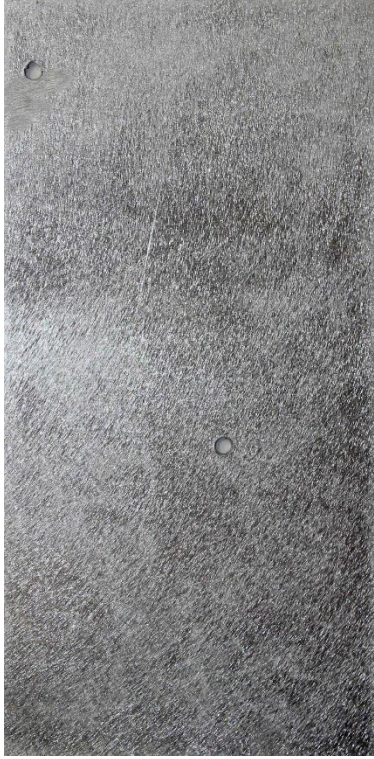


Mild steel – 24 months

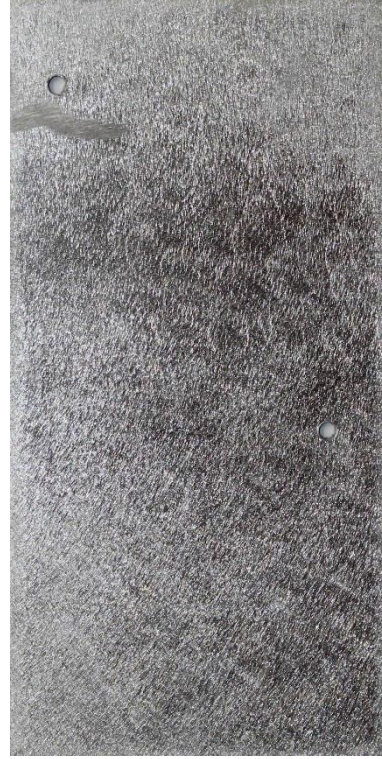


Mild steel – 24 months

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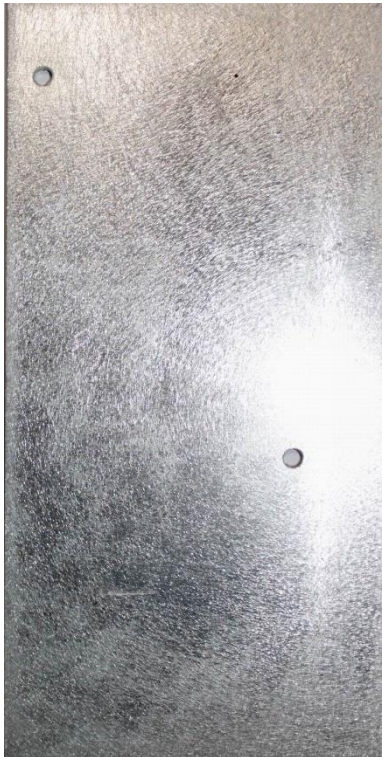
Aluminium – 12 months



Aluminium – 12 months



Aluminium – 24 months



Aluminium – 24 months

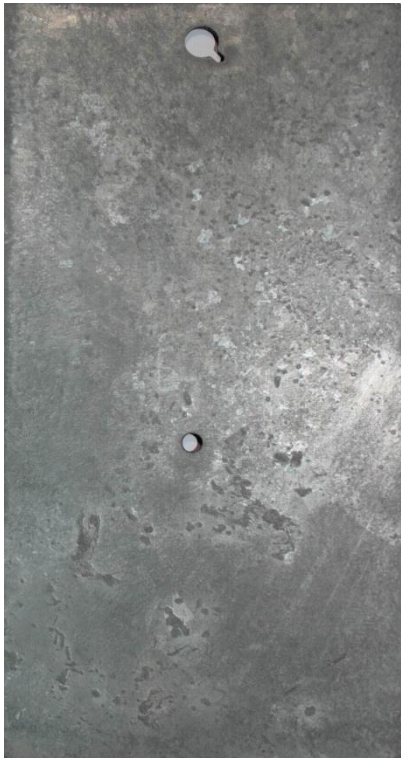
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HDG – 12 months



HDG – 12 months



HDG – 24 months

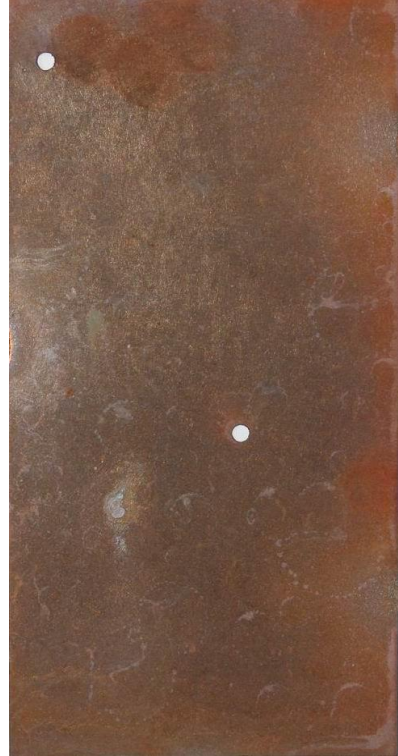


HDG – 24 months

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Copper – 12 months



Copper – 12 months



Copper – 24 months



Copper – 24 months

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Works Cited

- [1] Wikipedia, "Laisamis," 27 April 2021. [Online]. Available: <https://en.wikipedia.org/wiki/Laisamis>.
- [2] Worldweatheronline, "Laisamis Monthly Climate Averages, Eastern, KE," Worldweatheronline, 27 April 2021. [Online]. Available: <https://www.worldweatheronline.com/laisamis-weather-averages/eastern/ke.aspx>. [Accessed 27 April 2021].
- [3] Wikipedia, "Köppen climate classification," Wikipedia, 28 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/K%C3%B6ppen_climate_classification. [Accessed 28 April 2021].
- [4] African Association of Rural Electrification, "The Rural Electrification Authority - Kenia," September 2017. [Online]. Available: <https://www.club-er.org/files/fichiers/fichier170119185608-6.pdf>. [Accessed 28 April 2021].
- [5] Google Inc, "Google Maps," 27 April 2021. [Online]. Available: <https://www.google.com/maps/place/Laisamis,+Kenya/@1.5921255,37.7995849,3534m/data=!3m1!1e3!4m13!1m7!3m6!1s0x178fba880fd4c249:0x677f60366de90ed4!2sLaisamis,+Kenya!3b1!8m2!3d1.5962079!4d37.8061146!3m4!1s0x178fba880fd4c249:0x677f60366de90ed4!8m2!3d1.5962079>. [Accessed 27 April 2021].