

**การวิเคราะห์ข้อมูลและออกแบบการทดสอบการกัดกร่อนแบบเร่งสำหรับ  
 การพัฒนาผิวเคลือบต้านทานการกัดกร่อนและการบำรุงรักษาเชิงคาดการณ์ของชิ้นส่วนรถไฟ**

Data analytics and accelerated corrosion test design

for railway anti-corrosion coating development and predictive maintenance

<b>Source of Fund</b>	RNS, NSTDA	
<b>Collaborative agency</b>	State Railway of Thailand	
<b>Duration</b>	3 Years (15 September 2019 – 14 September 2022)	
<b>Project leader</b>	Wanida Pongsaksawad	
<b>Co-researchers</b>	Pranpreeya Wangjina	Piya Khamsuk
	Hathaipat Koiprasert	Chalermchai Sukhonkhet
	Kittichai Ninon	Maetee Khailaihong
	Siriwut Pedsontad	Panadda Sheppard
	Pitichon Klomjit	Sikharin Sorachot
	Tawee Pogfay	Konlawat Buncham
	Navin Innoy	Benjawan Moonsri
	Asst. Prof. Dr. Chaiyasit Banjongprasert, Chiang Mai University	

Environmental parameters and railway speed have significant effects on corrosion of railway components used under different locations. Corrosion that occurs on rail components may lead to catastrophic failure. For example, the underfloor area is subjected to water splash even after raining and the absence of sun for water evaporation, resulting in high corrosion rate. The condition of moving railway is different from static structure and has not been studied in Thailand. By applying atmospheric corrosion monitoring sensor, temperature-relative humidity sensors, speed sensor, and representative coupons at various locations of the wagon, the data of effective parameters on corrosion can be obtained. An accelerated corrosion test can be designed based on sensor data that are closely related to the actual environment. Moreover, the same approach is applicable to atmospheric corrosion of metallic structures at the train stations. This proposed project aims to develop an accelerated corrosion test that represents railway condition in marine route including the extended study on the atmospheric condition and to improve corrosion resistant coating made by arc spray and flame spray. The expected outcomes of this work are to reduce the corrosion testing time

and cost as well as predict the lifetime of coating or material. In addition, the study on coating for underfloor structure can increase the lifetime or may be applied as an efficient repairing technique.

### Publication

- W. Pongsaksawad, B. Moonsri, S. Sorachot, P. Wangjina, P. Khamsuk, N.S. Palsson, E. Viyanit, Accelerated corrosion test based on ISO 16539 for life prediction of carbon steel in tropical coastal areas, CORROSION. 79(6), (2023). <https://doi.org/doi/10.5006/4130>