

## **Root Cause Spectroscopic Failure Investigation Aided by High Resolution SEM/EDS, FT-IR, XPS Instruments and Microscopes.**

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My talk will demonstrate the very serious Consequences when Quality Control and Testing Protocols are lacking or ignored.

We will investigate and study a devastating failure that affected more than 100,000 homes in the Southeastern United States where the home environment became dangerously toxic along with causal environmental factors.

Our laboratory team was forewarned about this potentially severe, widespread environmentally induced and amplified disaster.

This geographically concentrated, yet widespread Manufacturing/environmental problem, was harshly affecting/deteriorating the indoor atmosphere/the living conditions of coastal residents of Southeastern United States.

In addition, to the persistently poisoning residents by an unknown hazardous fume substance in their own homes, the interior fixtures, appliances, HVAC systems, along with any other metal components, were showing signs of severely persuasive corrosion and tarnishing.

This problem was harshly affecting these coastal Southeastern residents, whose living conditions were rapidly deteriorating as a highly corrosive substance was poisoning and damaging the indoor atmosphere of their homes while simultaneously creating a serious health hazard.

An immediate investigation was initiated to identify and act quickly to eliminate the source of this hazardous condition.

The scope of my presentation is to demonstrate and accurately identify the root causes of the problem while focusing on the essential role and value of the Systematic Analytical Characterization Approach through applied and integrated use of Standard and Micro-Scale Spectroscopic Tools in Failure Analysis (e.g., FT-IR, SEM/EDS, XPS, & more).

At the conclusion, you will have gained an understanding of the value of the approach used as the emitted corrosive substance is was properly identified and the root cause of the problem determined through the implementation and aid of the above systematic spectroscopic and microscopic approach, including special surface techniques and XPS.

As a result of our investigation, class action lawsuits were filed, and residents were duly compensated.

In closing, the enormous (nearly 2-billion-dollar cost) of this devastating failure could have easily been prevented had the following practical solutions and measures been adhered to:

- Demand and do not accept domestic and imported goods & materials without a certificate of analysis (COA)
- Mandate the controlled distribution of domestic and imported goods & materials
- Require a proper quality control plan in place with materials characterization and testing
- Continuous, on-going monitoring and certification programs