FIGHTING DR. MOON DENIALS BASED ON RUST ANALYSIS

8-10-17

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Dr. Moon & GHD Publish *Metal Corrosion: A Qualitative Analysis*

Metal Corrosion: A Qualitative Analysis

N.Wells; C.A. Martinez; M, Bass; and R.E. Moon
GHD, Building Science Dept.,
4019 East Fowler Ave., Tampa, FL 33617.

Published Online Nov 9, 2015

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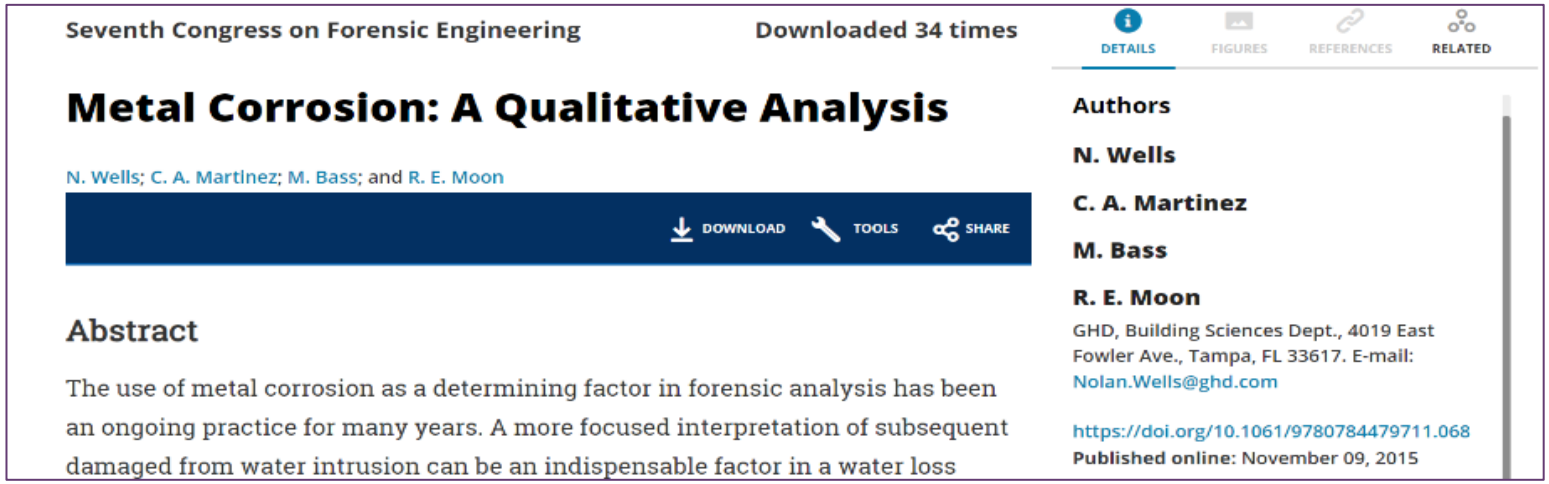
Wells et al., 2015 On The Rate of Rust Corrosion

Wells et al. 2015 is a write up of an oral presentation at the Forensic Engineering 2015 Conference by Moon (and several of his employees at GHD) on the rate of rust corrosion that **concludes** that the onset of rust is slow, and if rust is found deny claim due to long term loss.

However, the actual data in the presentation shows the opposite: That real world **metal rust is actually *FAST.***

Here we provide a critique of *Metal Corrosion: A Qualitative Analysis*" show where it goes wrong.



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DETAILS FIGURES REFERENCES RELATED

Metal Corrosion: A Qualitative Analysis

N. Wells; C. A. Martinez; M. Bass; and R. E. Moon

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Abstract

The use of metal corrosion as a determining factor in forensic analysis has been an ongoing practice for many years. A more focused interpretation of subsequent damaged from water intrusion can be an indispensable factor in a water loss

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https://doi.org/10.1061/9780784479711.068

Published online: November 09, 2015

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Using Wells et al., 2015 to Deny Claims

- Defense experts often reference Wells, et al. 2015 *"Metal Corrosion: A Qualitative Analysis"* when providing expert opinions that lead to claim denial based on the long term damage exclusion.
- Here we provide a critique of a case (we call it John Doe) where Ralph Moon uses Wells, et al. 2015 to provide support for claim denial based on long term damage exclusion.
- We expose where he has gone wrong.

The only reason that *Metal Corrosion: A Qualitative Analysis* on the rate of rust formation has been effective in supporting **denial of coverage** is that neither Plaintiff Attorneys nor Plaintiff Experts have actually read it!

They don't know what's in it.

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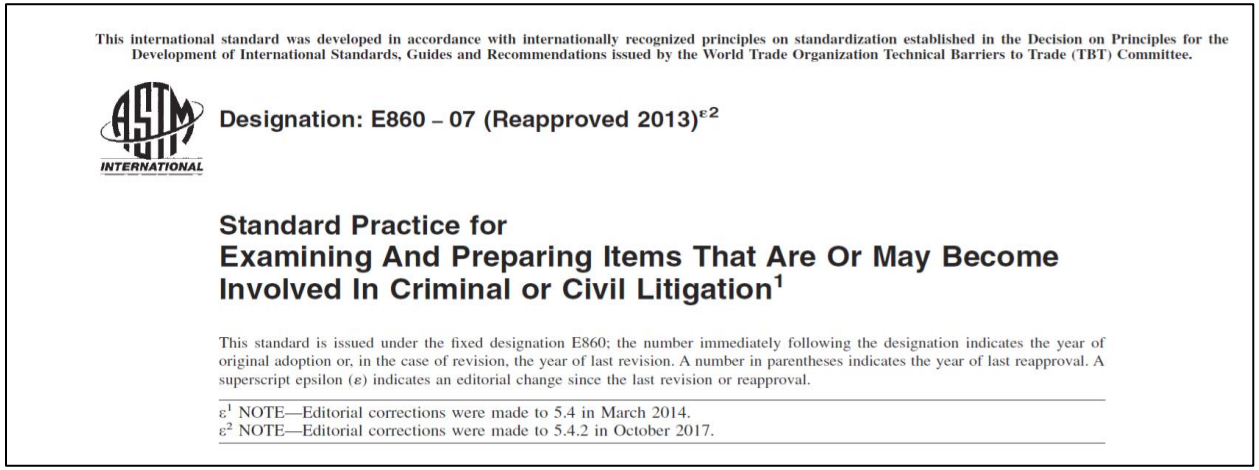
METAL CORROSION A QUALITATIVE ANALYSIS SAMPLE SET #1

Metal Corrosion: A Qualitative Analysis

N.Wells; C.A. Martinez; M, Bass; and R.E. Moon
GHD, Building Science Dept., 4019 East Fowler Ave., Tampa, FL

Metal Corrosion: A Qualitative Analysis
Incorrect / Inappropriate Reference

Wells et al., 2015: "The photographs provided comparative documentation of the **exemplars** for use in forensic reports when establishing the duration of moisture exposure (ASTM E860)."



This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: E860 – 07 (Reapproved 2013)$^{\varepsilon 2}$

Standard Practice for
Examining And Preparing Items That Are Or May Become Involved In Criminal or Civil Litigation[1]

This standard is issued under the fixed designation E860; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε^1 NOTE—Editorial corrections were made to 5.4 in March 2014.
ε^2 NOTE—Editorial corrections were made to 5.4.2 in October 2017.

ASTM E860 has nothing at all about "… forensic reports when establishing the duration of moisture exposure (ASTM E860)."

The authors of Metal Corrosion: A Qualitative Analysis just made that up to make one think the study was scientific.

The presentation talks about **exemplars.**

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Exemplar

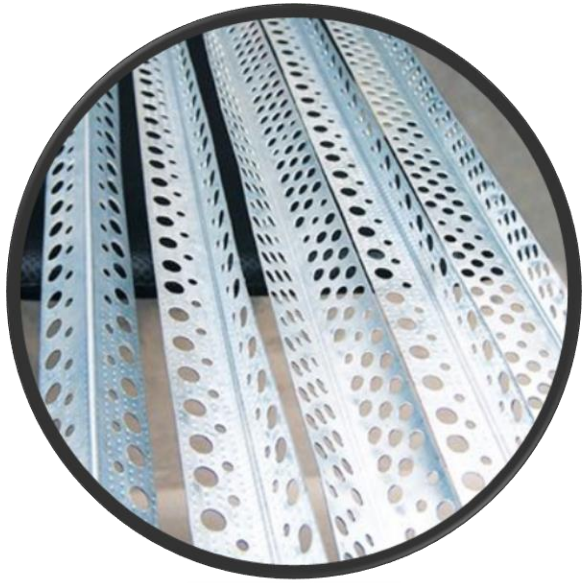
ex'em.plar

/ig'zemplar,ig'zemplar/

noun

A person or thing serving as a typical example or excellent model. "he became the leading exemplar of conservation philosophy" synonyms: epitome, **perfect example synonym**s: epitome, perfect example, paragon, ideal, exemplification, textbook example, embodiment, essence, quintessence.

- **Perfect or excellent examples/ models for comparison purposes.**
- Next, let's see what's actually in the paper: Sample Set #1.



Metal corner bead

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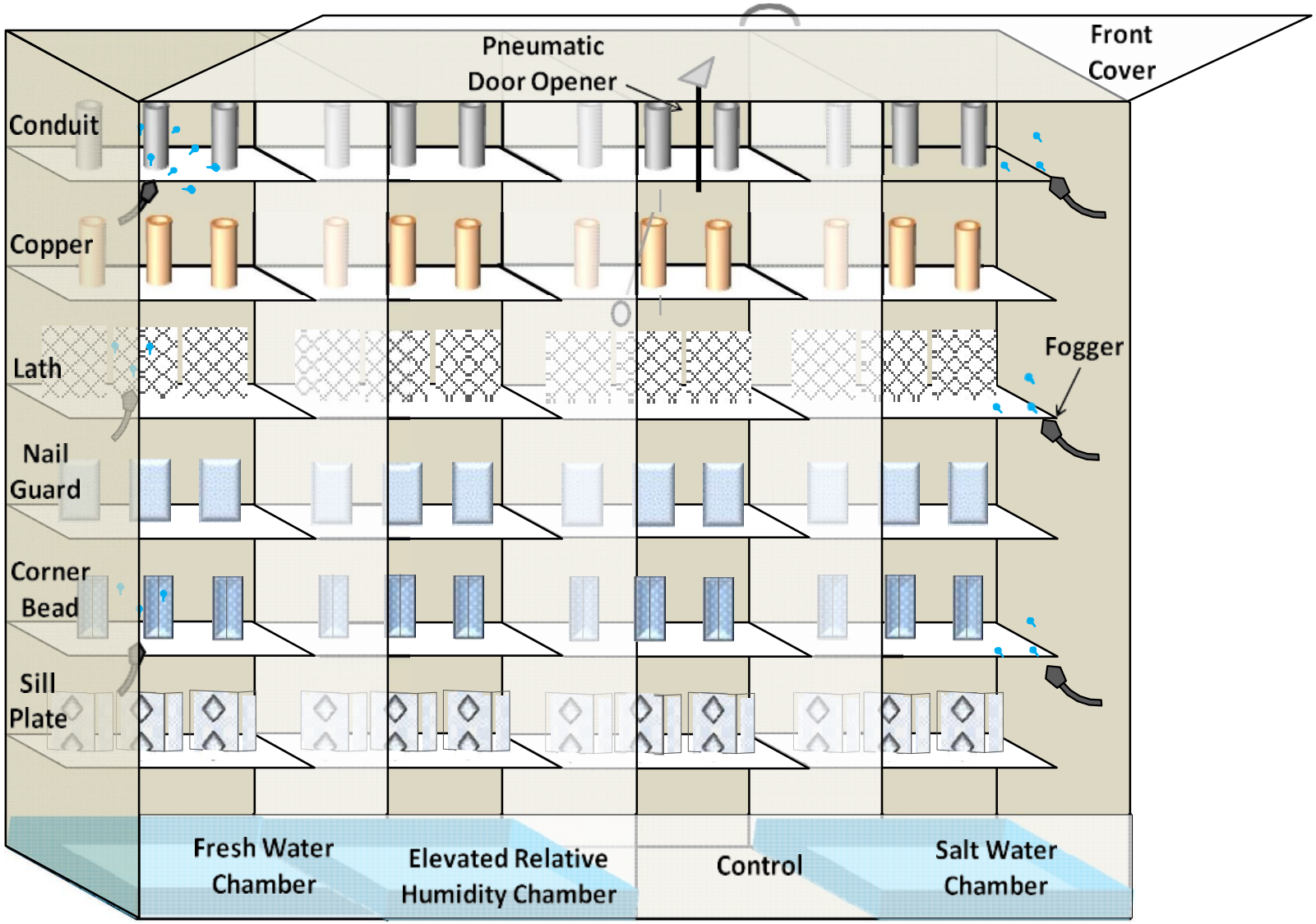
Wells et al., 2015 Studied Corrosion of Several Metals (Artist's Depiction of Test Chamber)



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Wells et al., 2015: Sample Set #1.

Wells et al., 2015: **"The specimens in the first set were prepared with exposed cut ends** (see Materials and Methods). This condition prompted earlier corrosion than the second sample set. **The corrosion gradually progressed from the cut ends to the face section of the specimens in the majority of the first sample set. The corrosion progressed at a slower rate in the second sample set;** however, the **ends appeared to be the location where the majority of the corrosion began.** These observations indicated that the unsealed cut ends encouraged earlier corrosion than unaltered portions of the same materials."

- Wells et al., 2015: The first experiment (Sample Set 1) left the ends of the galvanized (studs and corner bead) metal exposed — which reflects real world use.
- Samples Set 2: Had ends sealed with Rust-Oleum — which is not real world. Not an exemplar.
- Note the cut/non-galvanized ends is where rust/corrosion starts both in Wells et al as well as on metal framing elements and corner bead exposed to water on the floor/slab.
- Rust starts on wet non-galvanized cut ends sitting in flood water.
- So far, so good.

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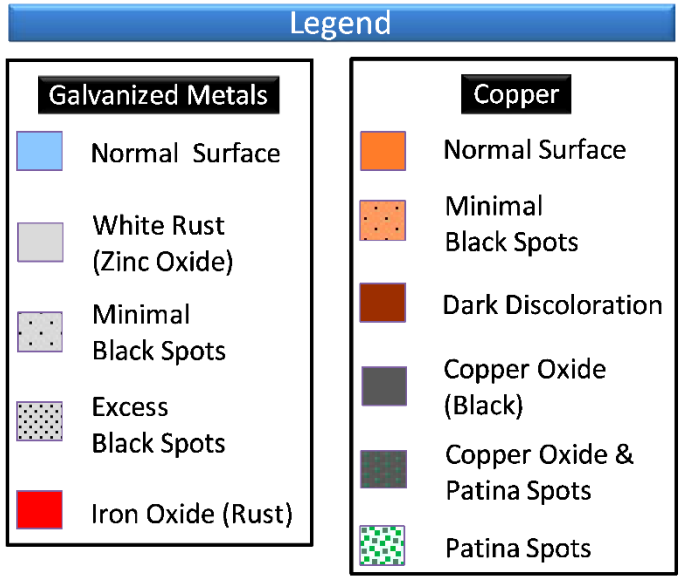
Wells et al., 2015 Results: Sample Set #1.



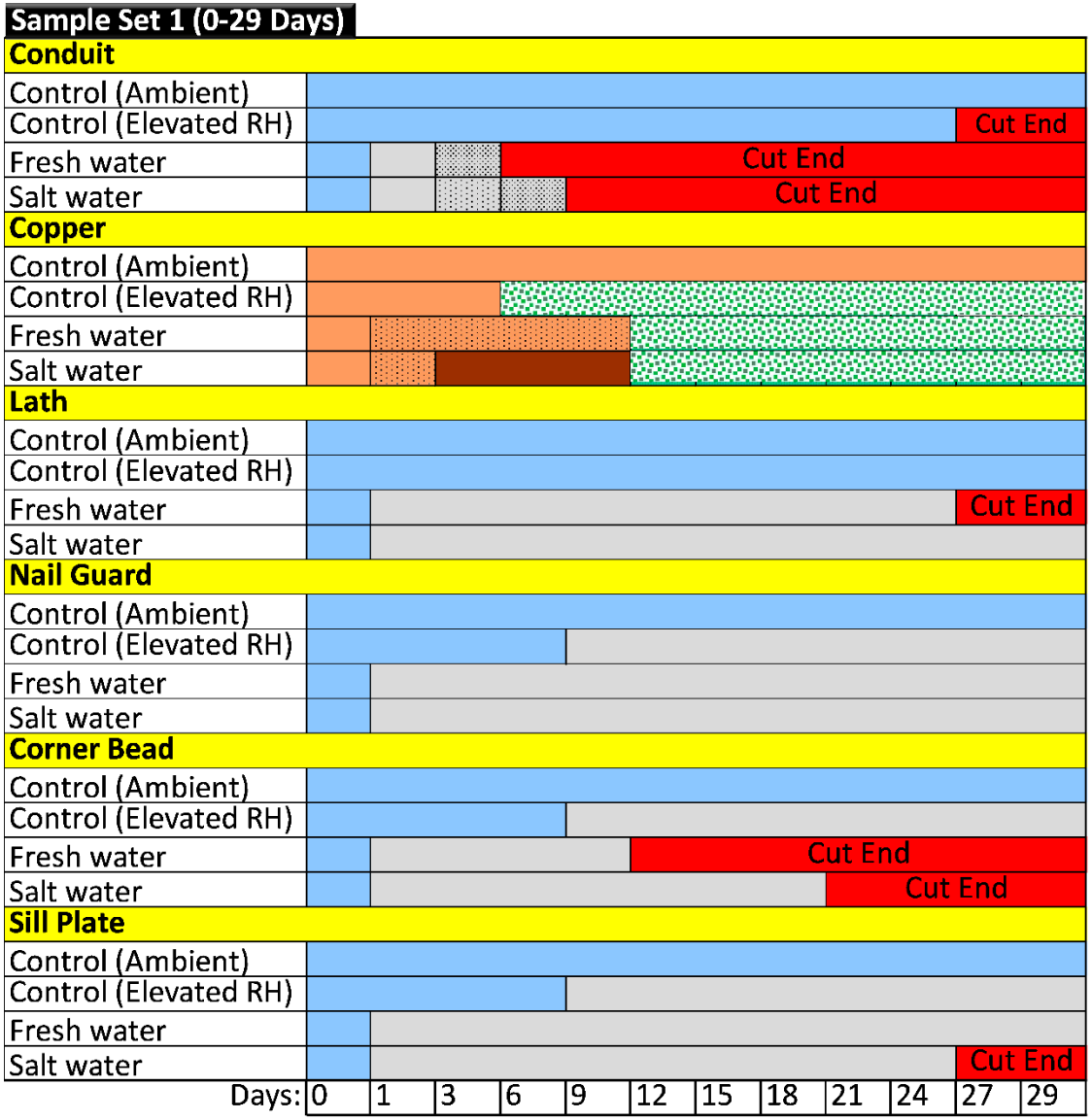


Table 1: Sample Set 1; Color coded changes on the surfaces of the different materials over time.

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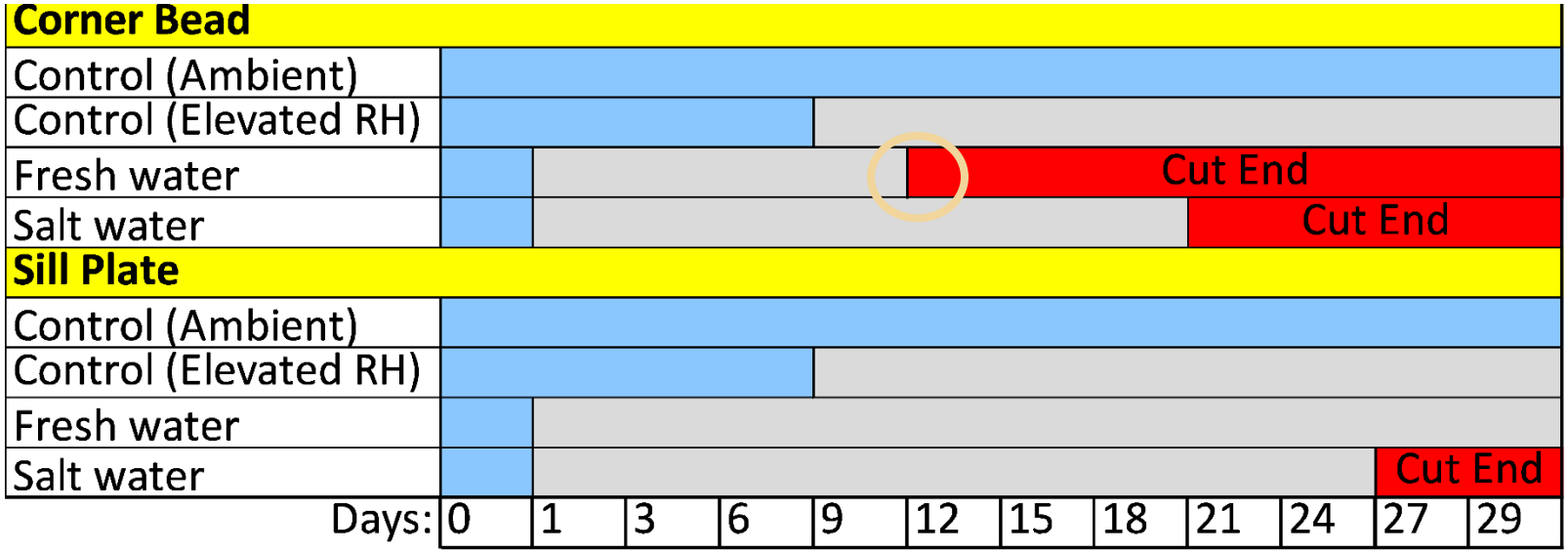
Results: Sample Set #1. Here We Focus on Corner Bead & Sill Plates (Galvanized Steel)



Wells et al., 2015: "Rust occurred on the cut ends of the fresh water comer [corner] bead on **day 13** and on day 22 for the salt water."

Rust starts forming on fresh water exposed galvanized Corner Bead on day 13. That's FAST.

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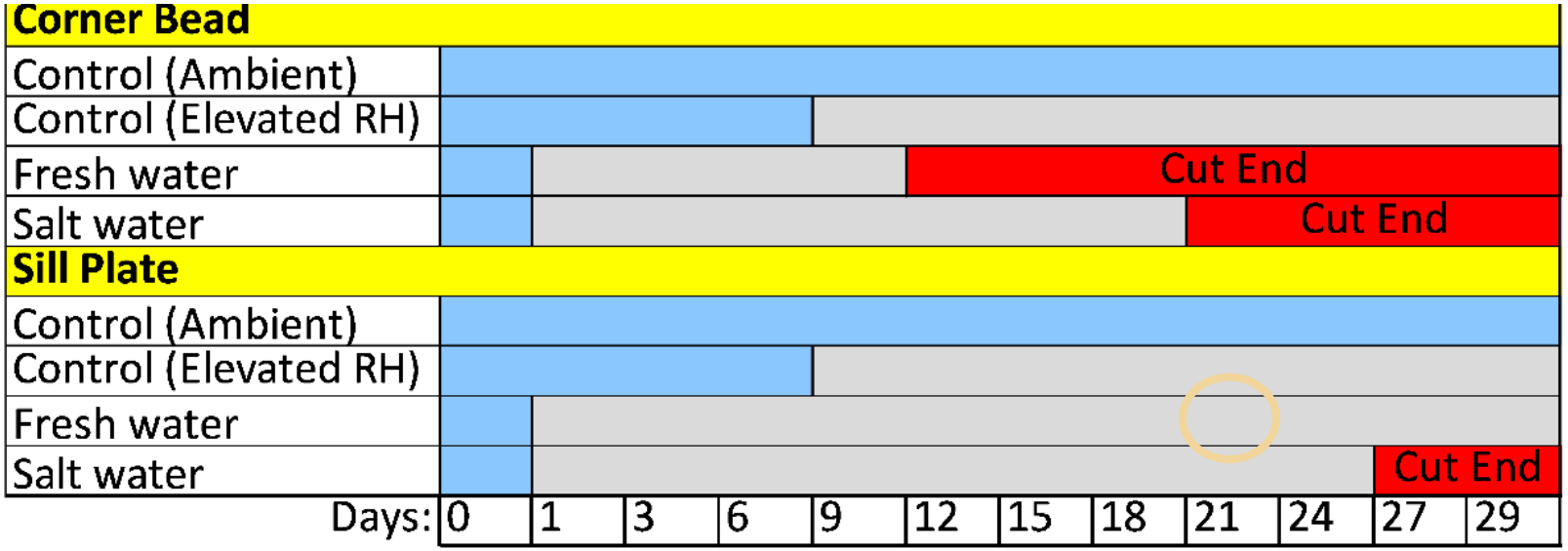
Results: Sample Set #1. Here We Focus on Corner Bead & Sills Plates (Galvanized Steel)



Wells et al., 2015: "Rust occurred on the cut end of the fresh water sill plate on **day 21** and day 27 for the salt water."

The chart from Wells et al., 2015 does not show that rust forms on fresh water exposed sill plate on day 21. That's FAST.

Sloppy work. Would you trust this study?

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Results: Sample Set #1

Cut Ends

- Corner Bead rust occurred day 13 when exposed to water. That's **FAST**.
- Sill Plate rust occurred day 21 when exposed to water. That's **FAST**.
- This is their data in the text of their Conference presentation.

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METAL CORROSION: A QUALITATIVE ANALYSIS SAMPLE SET #2

Wells et al: Sample Set #2.

Wells et al., 2015: "In subsequent tests a metal primer (Rust-Oleum) was applied on the cut edges to a height of three millimeters. After the primer dried the test specimen surfaces were cleaned with acetone to remove any surface contaminates."

The rust formed very fast with Sample Set #1 starting at cut ends. So for the second set of results, they **painted the cut ends with Rust-Oleum** and there was no corrosion.

No corrosion on metal painted with Rust-Oleum!

This is a great advertisement for Rust-Oleum but what does this have to do with measuring corrosion on metal framing and corner bead that always has non-galvanized cut ends?

What does this have to do with the real world?

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Sealed Cut Ends With Rust-Oleum. Second Set.

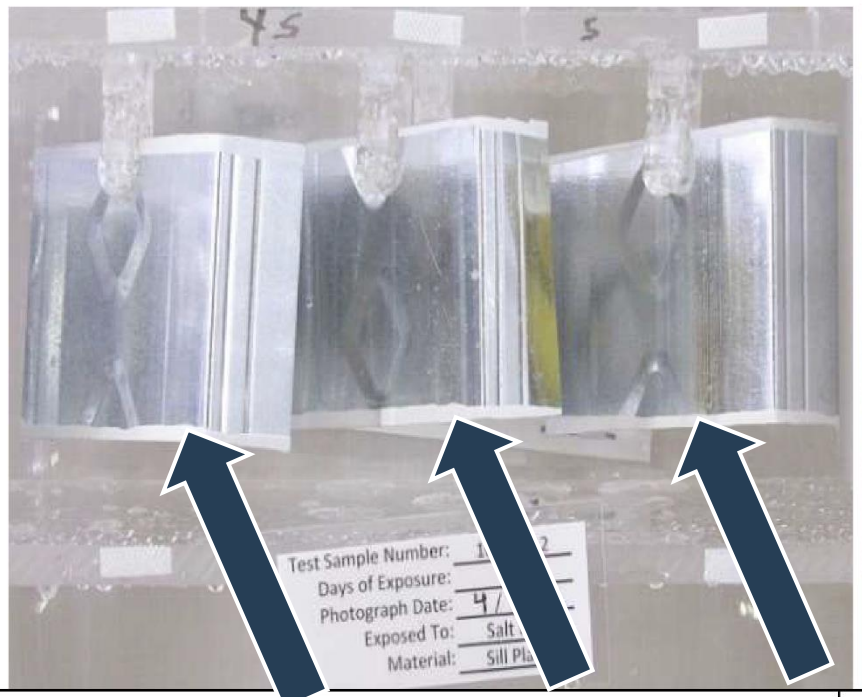

Photo 5: Sill plate in salt water Day 0

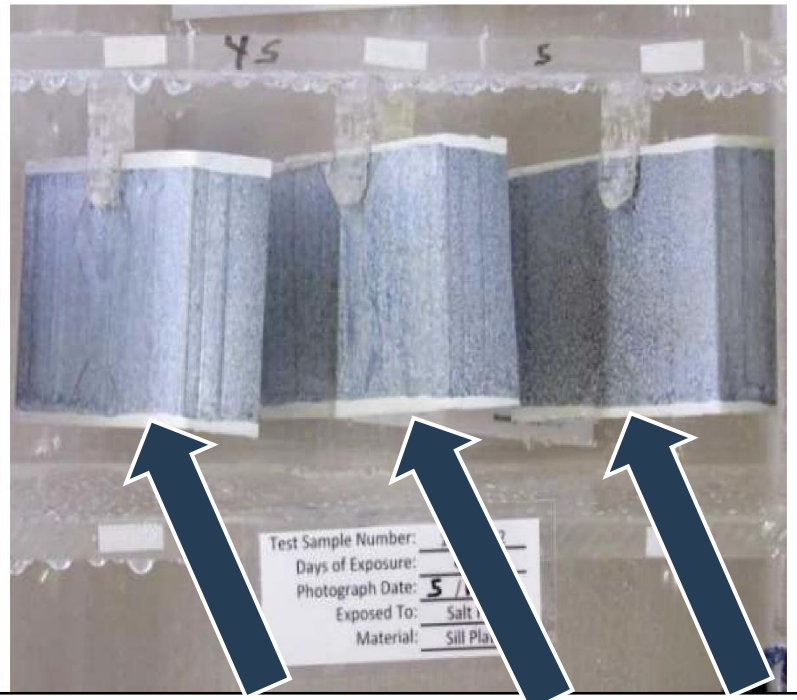

Photo 6: Sill plate on Day 43 in salt water

Wells et al., 2015 sealed cut ends for 2nd Sample Set.

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Wells et al., 2015: Chart Sample Set #2.

- In the second Sample Set they sealed the cut ends (which is where rust starts) with Rust-Oleum so there would be no corrosion.
- And then they measured the rate of corrosion! None by Day 43. **Then used this to deny claim.**

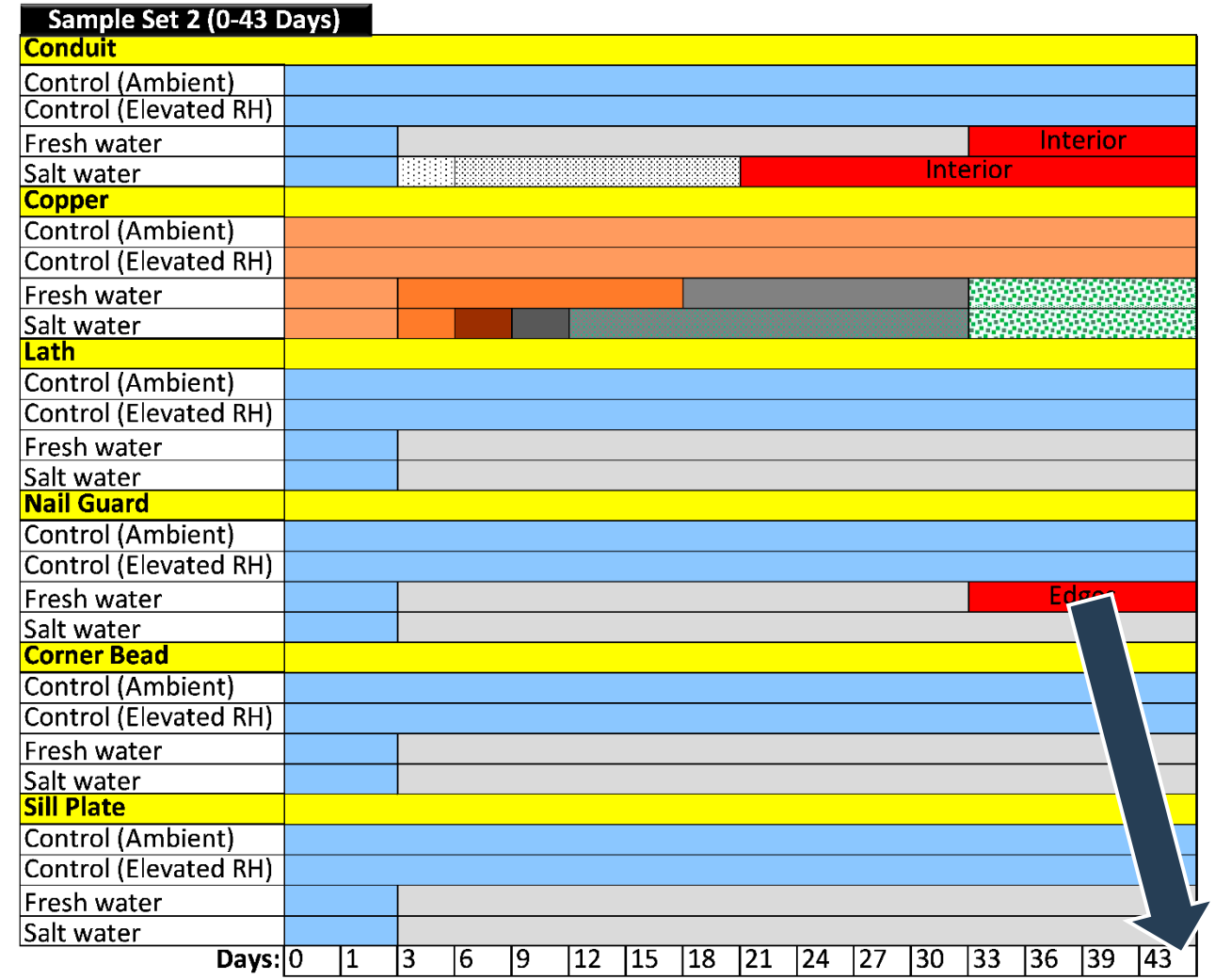

Table 2: Sample Set 2; Color coded changes on the surfaces of the different materials.

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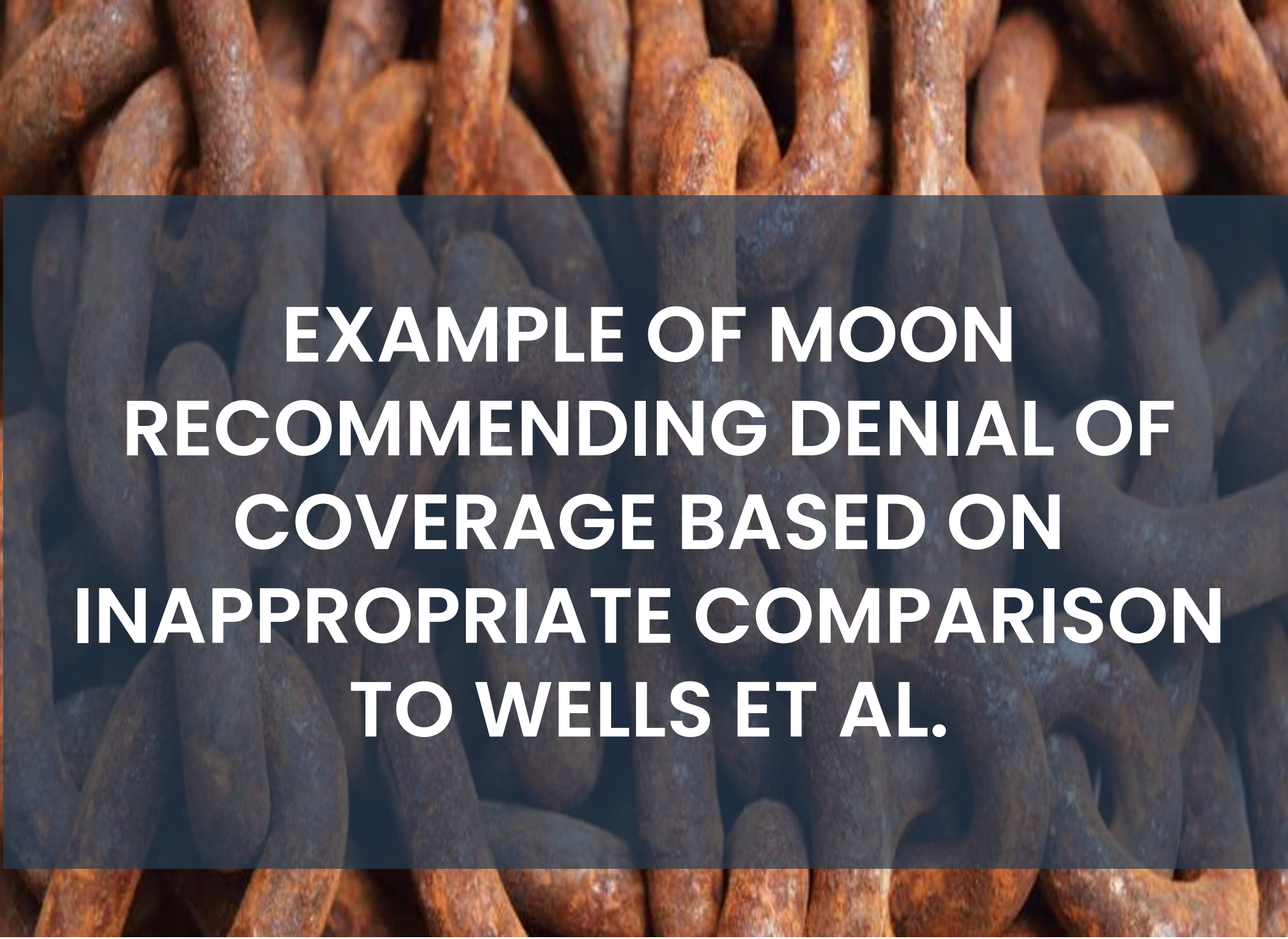

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Dr. Ralph Moon Denial of Coverage *John Doe* Kitchen

Per Moon Analysis of *John Doe* Kitchen Claim: "A second peer-reviewed study on the corrosion of galvanized steel materials revealed that the extent of oxidation documented on galvanized steel framing inside the *John Doe* kitchen wall was comparable to research exemplars exposed individually to either fresh water or salt water mists, elevated humidity and ambient conditions over a 60 day period (Wells et al., 2015)."

Above is Moon's conclusion from a Case Review/ Assessment he's recently performed on John Doe's kitchen.

He's used the presence of rust to recommend denial of coverage and referenced Wells et al. 2015 (Moon was the main author.)

Metal stud sill plate

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Moon Denial of Coverage. Is It 60 Days or 43 Days?

Per Moon Analysis of *John Doe* Kitchen Claim: "A second peer-reviewed study on the corrosion of galvanized steel materials revealed that the extent of oxidation documented on galvanized steel framing inside the *John Doe* kitchen wall was comparable to research exemplars exposed individually to either fresh water or salt water mists, elevated humidity and ambient conditions **over a 60 day period** (Wells et al., 2015)."

- Moon states that Wells et al showed that there was no rust at 60 days but note that the experiment was only run for 43 days.
- A clear misrepresentation of the facts. Sloppy work.

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Moon Denial of Coverage. Exemplars

> Per Moon Analysis of *John Doe* Kitchen Claim: "A second peer-reviewed study on the corrosion of galvanized steel materials revealed that the extent of oxidation documented on galvanized steel framing inside the *John Doe* kitchen wall was comparable to research **exemplars** exposed individually to either fresh water or salt water mists, elevated humidity and ambient conditions over a 60 day period (Wells et al., 2015)."

- Moon states "*comparable to research exemplars.*"
- How many homes are built with metal framing (studs/sill plates) and metal corner bead that have cut ends sprayed with Rust-Oleum. Zero.

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Summary: Dr. Ralph Moon Denial of Coverage

Moon states in his Case Review/Assessment: *Rust takes over **60 days** to form* based on the data presented at the Conference: N. Wells; C. A. Martinez; M. Bass; and R. E. Moon 2015.

But *Metal Corrosion: A Qualitative Analysis* does not say rust takes 60 days. It says rust is Fast.

Moon summarizes Metal Corrosion: A Qualitative Analysis saying rust takes over 60 days to form. Deny claim based on long term.

He gets away with this because no one actually goes back and reads the referenced presentation to see if this statement is made up or actually reflects the data presented.

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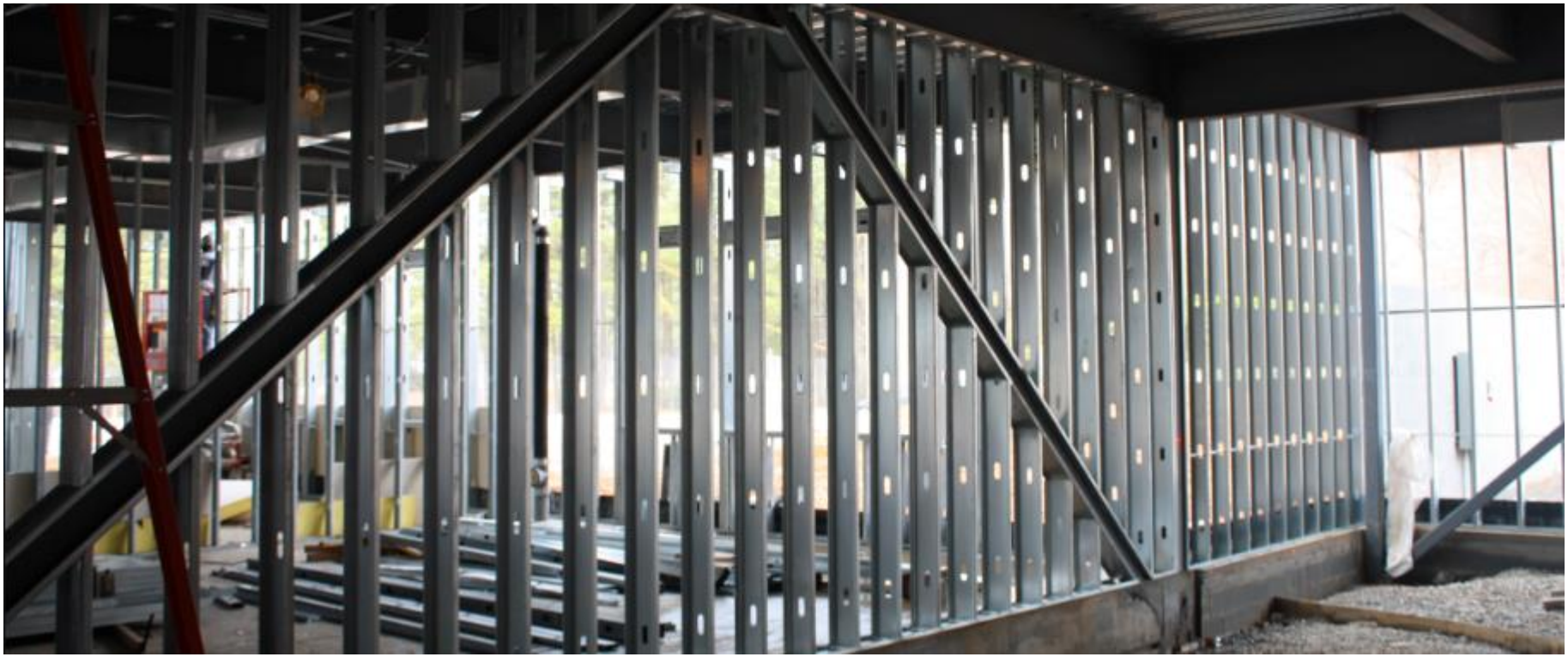
CONCLUSIONS

Study Contradictions

Wells et al: "In Sample Set #1 (fresh water) rust started Day 13 with Corner Bead and Day 21 for metal frame at the cut non-galvanized ends which is where rust starts on galvanized metal."

That's FAST.



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Often Pre-Existing Rust from Time of Construction

Often there is pre-existing rust on metal framing because during construction framing is often installed before roof is dried in or windows installed.

Defense experts find pre-existing rust not related to recent water event and use this as “proof” of long-term damage. Deny claim.

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Wells et al 2015: Repeat Experiment with Rust-Oleum

Because rust started so fast in Sample Set #1, they modified the experiment.

For Sample Set #2 they sprayed the cut ends with Rust-Oleum to protect the cut ends from rusting.

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Rust-Oleum Stops Rust

- With the cut ends protected with Rust-Oleum they find no rust on the galvanized steel in 43 days. What a surprise result!
- Now they have all the (exemplary!) data they need to deny a claim if no one reads the reference.

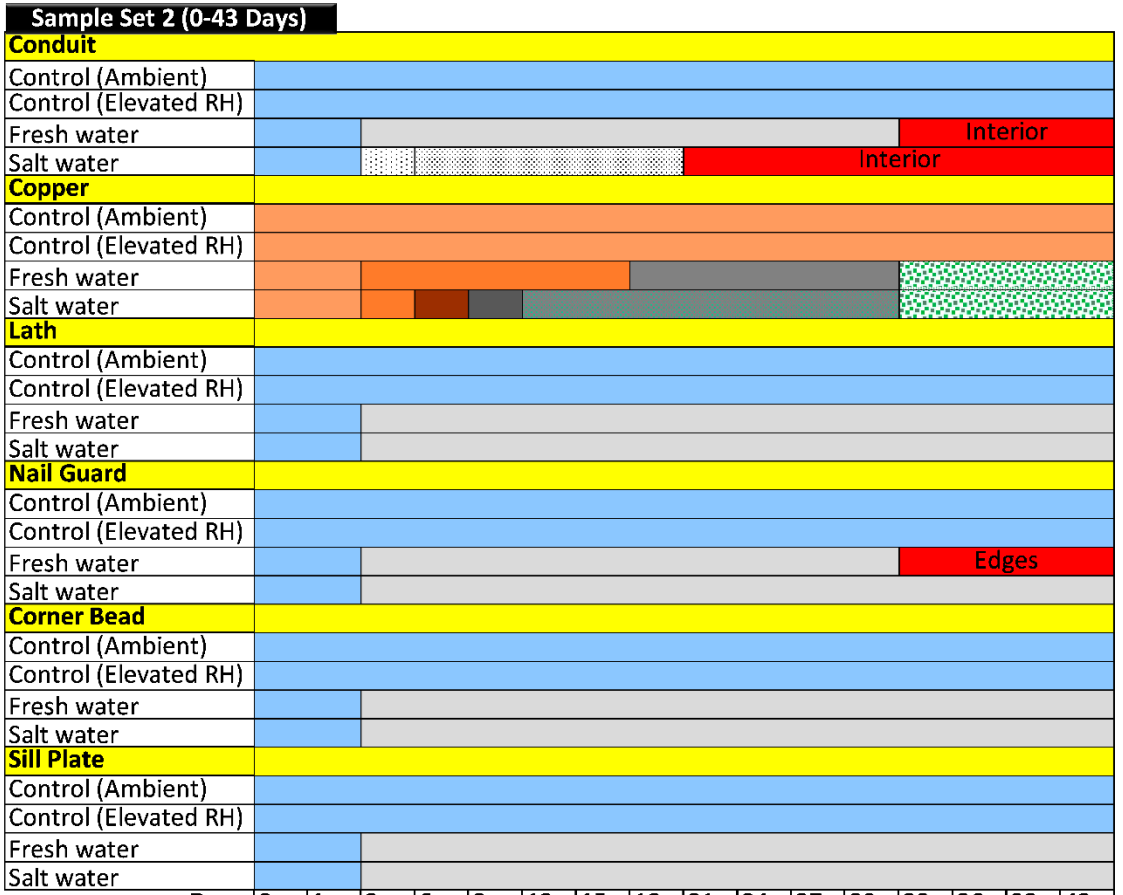

Table 2: Sample Set 2; Color coded changes on the surfaces of the different materials.

Arrow points to no rust at day 43 but with the cut ends painted with Rust-Oleum.

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Exemplars

Wells et al., 2015. A second peer-review study on the corrosion of galvanized steel material revealed that the extent of oxidation documented on galvanized steel framing inside the kitchen wall was **comparable to research exemplars** exposed individually to either fresh water or salt water mists, elevated humidity and ambient conditions over a **60 day period** (Wells et al., 2015).

- For Moon, spraying the cut ends of metal (corner bead and framing track) with Rust-Oleum is what he calls an Exemplar: A perfect or excellent example/ model for what occurs in a building.

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Exemplars

Does Moon think that builders spray the ends of metal with Rust-Oleum? Of course not.

Dumb? But if no one actually reads the research paper reference and the Carrier denies coverage and saves money … who is actually dumb?

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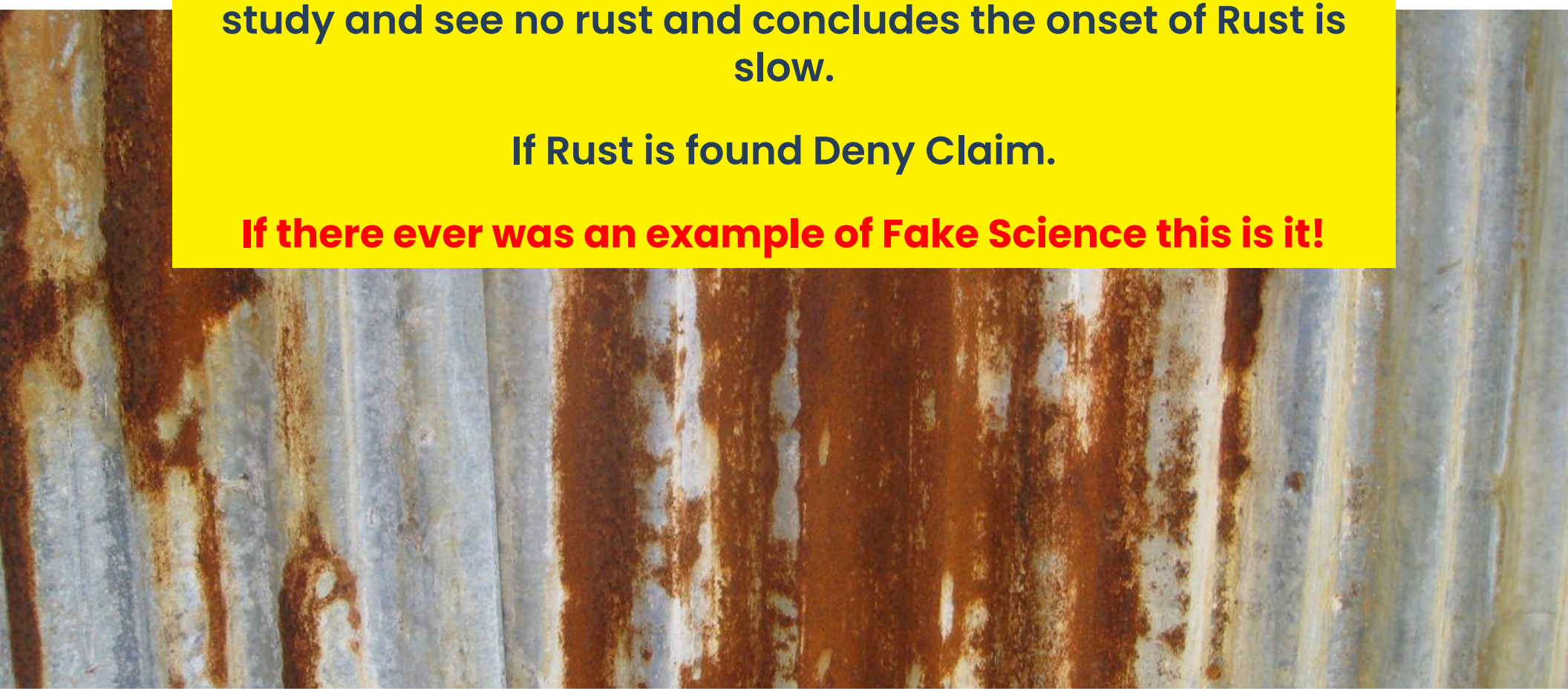
Conclusions

The study data shows that the onset of rust on the non-galvanized cut ends of metal corner bead is 13 days and metal framing track is 21 days (which is fast).

Then they paint the metal with Rust-Oleum repeat the study and see no rust and concludes the onset of Rust is slow.

If Rust is found Deny Claim.

If there ever was an example of Fake Science this is it!



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Fake Science

Doesn't anyone ever read these Fake Science reports by industry leading Forensic Engineers?

Apparently not.

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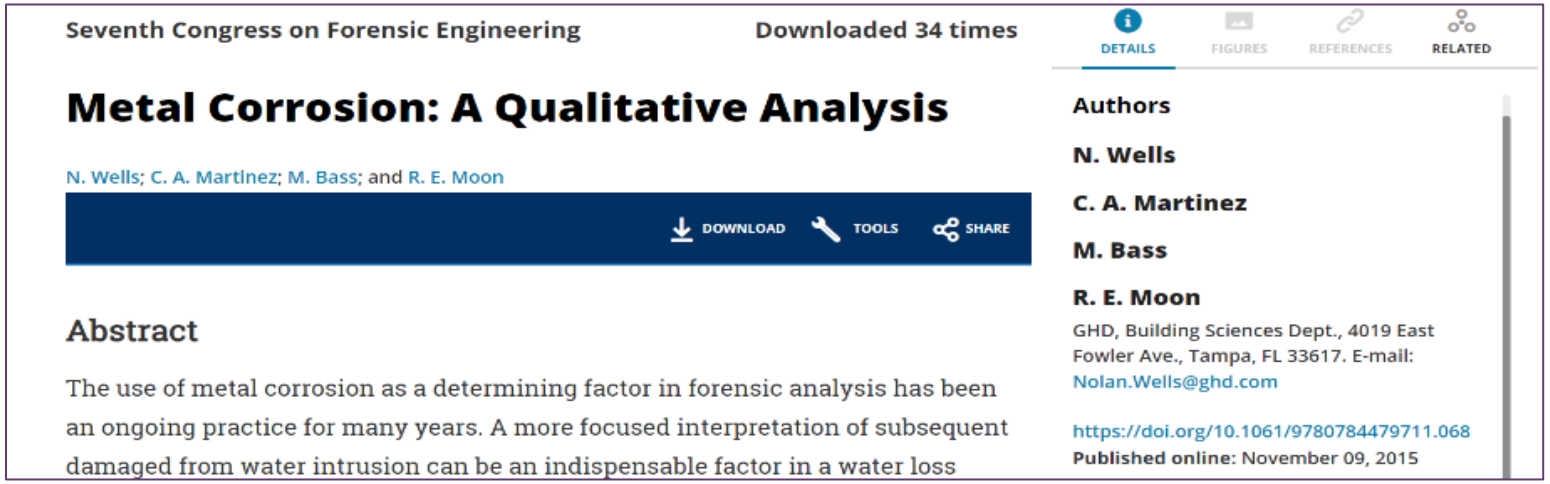
Peer-Reviewed. Fake Claim.

Per Moon on his John Doe Claim Analysis: "A **second peer-reviewed** study on the corrosion of galvanized …



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Abstract

The use of metal corrosion as a determining factor in forensic analysis has been an ongoing practice for many years. A more focused interpretation of subsequent damaged from water intrusion can be an indispensable factor in a water loss

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https://doi.org/10.1061/9780784479711.068

Published online: November 09, 2015

Moon refers to Wells et al 2015 presentation as "Peer-Reviewed".

Not. *Metal Corrosion: A Qualitative Analysis* is a write up of an oral presentation at an Engineering Conference.

Not Peer-Reviewed by any authoritative definition.

Paid for and written by GHD (defense experts.)

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Best Case Scenario

Wells et al., 2015: "Additionally, the corrosive contribution from organic matter and microbiological forms were not accounted for due to the design of the corrosion cabinet's artificial environment (Roberge, 2008)."

- The rate of rust from clean water in the specialized test chamber does not include corrosive contribution from organic matter and microbial forms which are present in every water loss.
- Organic matter and microbial forms are known to accelerate corrosion so that the **13 and 21 days for the onset of corrosion may over-estimate the time of rust onset compared to a *real world* environment where rust is likely to occur at a faster rate.**

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Conclusion

- Seriously folks. If I ever published an article whose conclusion so misrepresented the facts I would consider Seppuku.
- Ritual disembowelment.

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Appendix

N. Wells; C. A. Martinez; M. Bass; and R. E. Moon 2015
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