

HOW TO FIGHT PHONY TILE DE-BONDING DENIALS BASED ON 2017 RALPH MOON ARTICLE



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Instructor / Course Developer

Gary Rosen, Ph.D. gary@mold-free.org

State Licensed: Mold Assessor; Mold Remediator; &
State Licensed Building Contractor; FLA Independent
Adjuster; Ph.D. Biochemistry UCLA

Goals of Presentation

This presentation has two areas of focus



We describe what we consider improved (good) techniques for determining if hollow sounding tiles are the result of a recent water event.



We also include an analysis of Ralph Moon article Floor Tile Tapping: A Quantitative Analysis published in the IICRC Journal of Cleaning, Restoration & Inspection. Fall 2017.

Goals of Presentation

Regarding our Moon paper critique

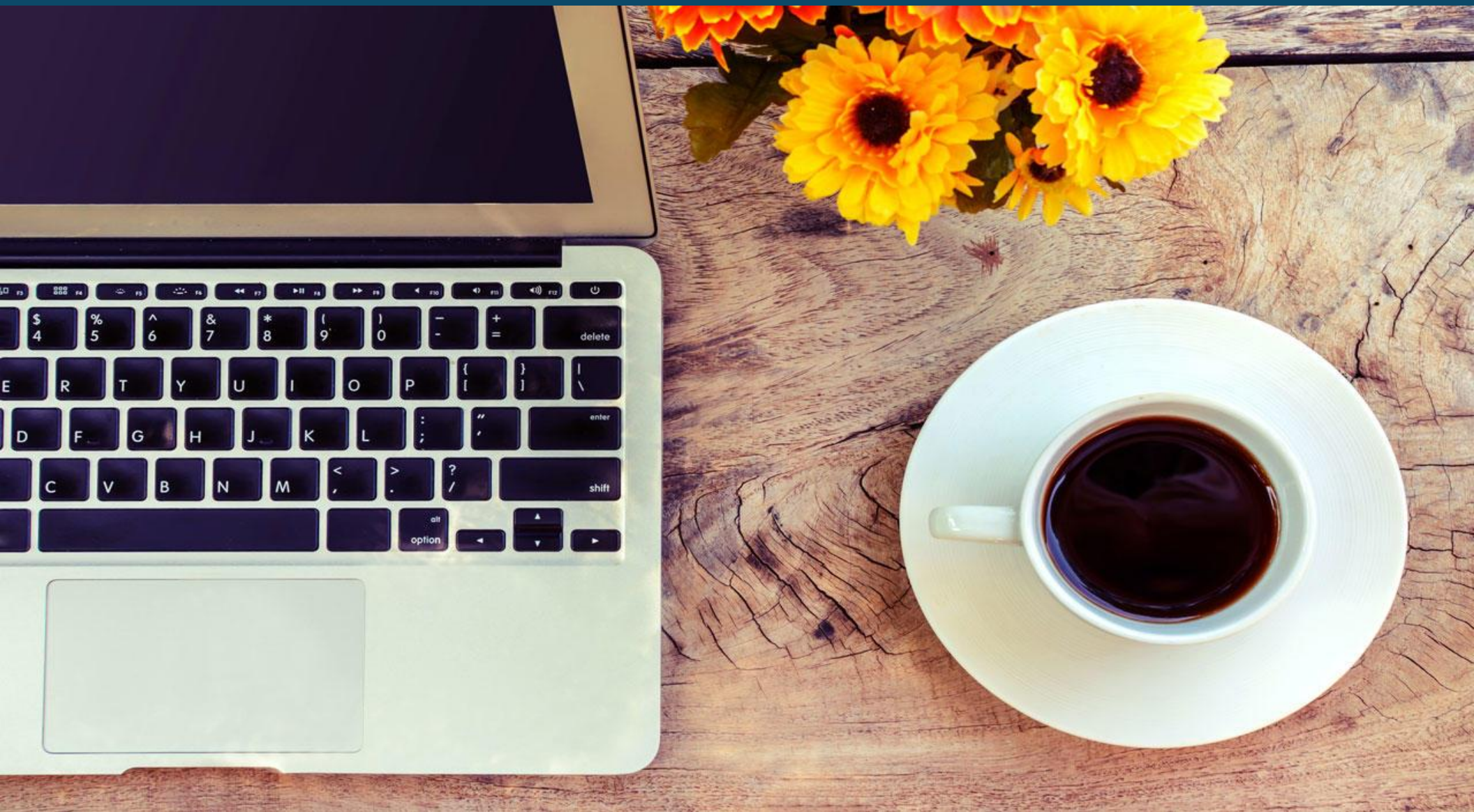


We discuss why their conclusions makes no sense for real world applications.



We focus on reviewing/ critiquing the Moon paper to help explain why the so-called experts have such a hard time proving or disproving tile de-bonding claims.

INTRODUCTION



Good vs Bad Advice Fighting Incorrect Tile De-Bonding Claims/Denials.

- A. Insureds and their representatives will argue that the insured needs a new floor because hollow-sounding tiles came loose (de-bonded) as a result of a leak.
- B. Carriers will argue that tiles that are properly installed do not come loose (de-bond) as a result of a water event.
 - What you want is good advice for distinguishing Case A from Case B.



Moon = Bad Advice On Testing Tile De-Bonding

- Fighting incorrect tile de-bonding claims/denials requires accurate and reliable mapping of hollow sounding tiles using tile tapping.
- Ralph Moon in his paper on detecting tile de-bonding published Fall 2017 in the IICRC Journal of Cleaning, Restoration & Inspection gives bad advice on detecting hollow sounding tiles with tapping.
- The article makes things complicated when they should not be. The article gives BAD ADVICE.



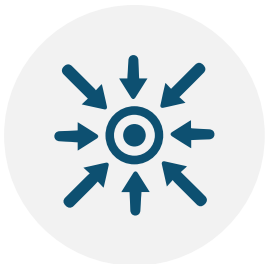
Good Advice On Testing Tile De-Bonding



Here we explain the optimum procedures (Good Advice) for detecting Tile De-Bonding using tapping ... not Moon's recommendation.



But there is much more to fighting incorrect tile de-bonding claims/denials than looking at different tools for tapping tiles which is the focus of the Moon article.



Specifically what we want to know ...

Much More to Fighting Incorrect claims/denials Than Tile Tapping Tools



Going beyond picking the optimum tool for tapping tileswhat we want to know about hollow sounding tile is:

1. Are the hollow sounding tiles newly de-bonded or is that how they were installed?
2. Is there a pattern to the hollow sounding tiles that shows that the hollow sounding tiles are more frequent in the water damage areas than in other tiled areas, hence related to the water event?

We Also Want to Know ...

- We also want to know in addition to the location of hollow sounding tiles ... about the water.



Is there water under the tile?



And if so to what extent?



And if there is water under the tile, does it correspond to the extent and location of the hollow sounding tiles?

- Without these questions answered as to the location and extent of water below tiles, one cannot attempt to “prove” causation... or disprove an incorrect tile de-bonding claim.

3 TYPES OF LEAKS



There Are Three Types of Leaks Above Tile/Stone



There are three types of leaks that we are concerned about here.

1. The first type of a leak is **from above the tile/stone** floor that did not seep under the tile/stone. For example a toilet overflow or roof leak.
 - No significant amount of water seeps through the grout and gets below the tile before dry-out.
 - This type of leak (from above the tile) **cannot** cause damage to the thin-set or mortar bed.

Leaks Below Slab Causing Tile/Marble to De-Bond?



2.) The second type of leak considered here is a leak from a broken pipe **below the slab.**

- Water spreads out and rises, wetting the thin-set or mortar bed. This can be long term and hidden for months or years.
- Carrier's experts state that once thin-set is set it cannot be damaged by water. And that may often or generally be true, but Plaintiffs attorneys will argue otherwise

Seeping Under Tile/Stone

3.) The third type of leak considered here is a leak from perhaps a kitchen pipe or uncaulked backsplash that allows water (as with the broken pipe under the slab) to **travel below the tile/stone floor.**



When there is no tile under kitchen cabinets, water can seep under the tile/marble flooring often for weeks or months.

Seeping Under Tile/Stone

In this very common example shown below, the sink had a slow leak over many months or years. Water seeped below the sink cabinet, under the marble and affected drywall embedded in the marble 30+ feet away.



Seeping Under Tile/Stone Causing De-bonding?



In this example, did the water under the stone damage the tile adhesion? There was no evidence that this was the case.



But it may be hard to prove one way or another.



Such claims are often contentious.



This one is clearly long term in nature but that is hard to prove with current technologies.

Water Under Tile Dries Slowly

- When there is water under tile, it will not be removed during a 3-4 day dry-out.
- Ceramic tile has a glazed surface which water does not permeate. Water under tile can only dry from grout lines and at the edges of rooms.
- If there is water under the tile, it can be detectable at least for weeks after dry-out.
- Hence the need for insureds to promptly notify their Carrier of a water event before or after emergency dry-out services.



We Want to Know in Respect to Tile/Marble De Bonding Concerns

We want to know if water is under the tile/stone and there are de-bonding concerns:

1. Is there actually water under the tile?
2. If so to what extent?
3. If there is water under the tile, does it correspond to the hollow sounding tiles?
4. And if no water is under the tile ... there is no support for any alleged de-bonding.



When There is Water Under The Tile Map The Location



Water under the tile should be mapped using an infrared camera by looking at the wetness of the tile/stone grout.



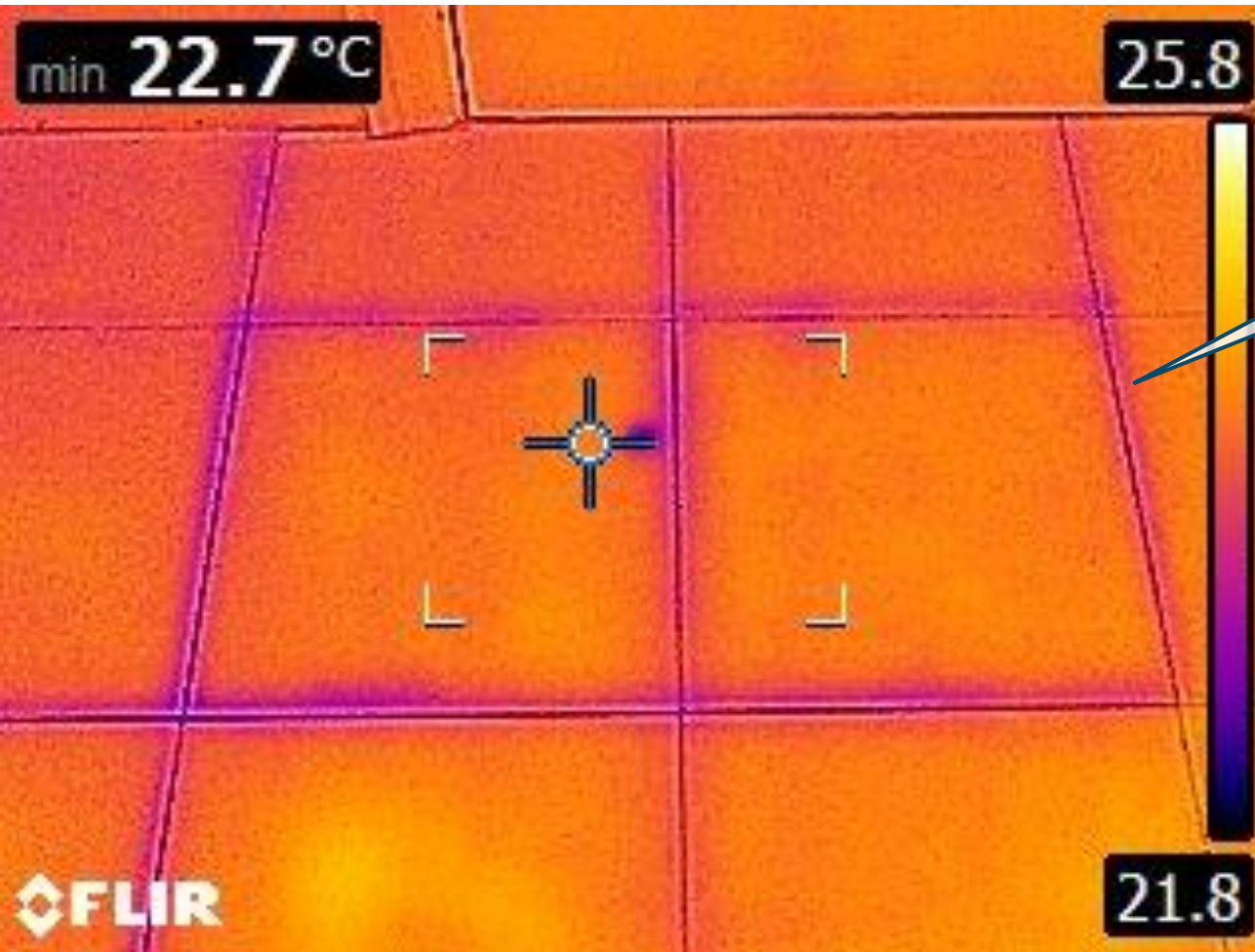
The map should be correlated with the map of hollow sounding tiles.



If there is no correlation between wet areas and hollow sounding tiles, we can presume that there is no de-bonding due to water.



Water Under Tile Map With FLIR



**Grout lines wet.
Blue color in FLIR
Ex8 pix**

Water under the tile should be mapped using an infrared camera by looking at the wetness (colder temperature/ blue color) of grout versus the tile which is glazed and does not transmit moisture.

Pinless Moisture Meters

- Note: Pinless (non-invasive) moisture meters, even the most sophisticated, are not designed to accurately and reliably detect moisture under tile/marble.



Survey with FLIR



To reliably detect moisture under tile/marble requires a good quality infrared camera to quickly scan tile/stone flooring grout for moisture.



Survey with FLIR



- Water location and extent under the tile should be mapped with IR camera.
- This map and the map of hollow tiles should be correlated with the pitch/slope of the floor and source of leak.
- Use a digital level and take pictures of the readings.

Correlate to Floor Pitch



Water location and extent under the tile should be mapped with IR camera.



This map and the map of hollow tiles should be correlated with the pitch of the floor and source of leak.



Correlate the extent and direction of water and hollow sounding tiles with flooring pitch. Water will not flow uphill.

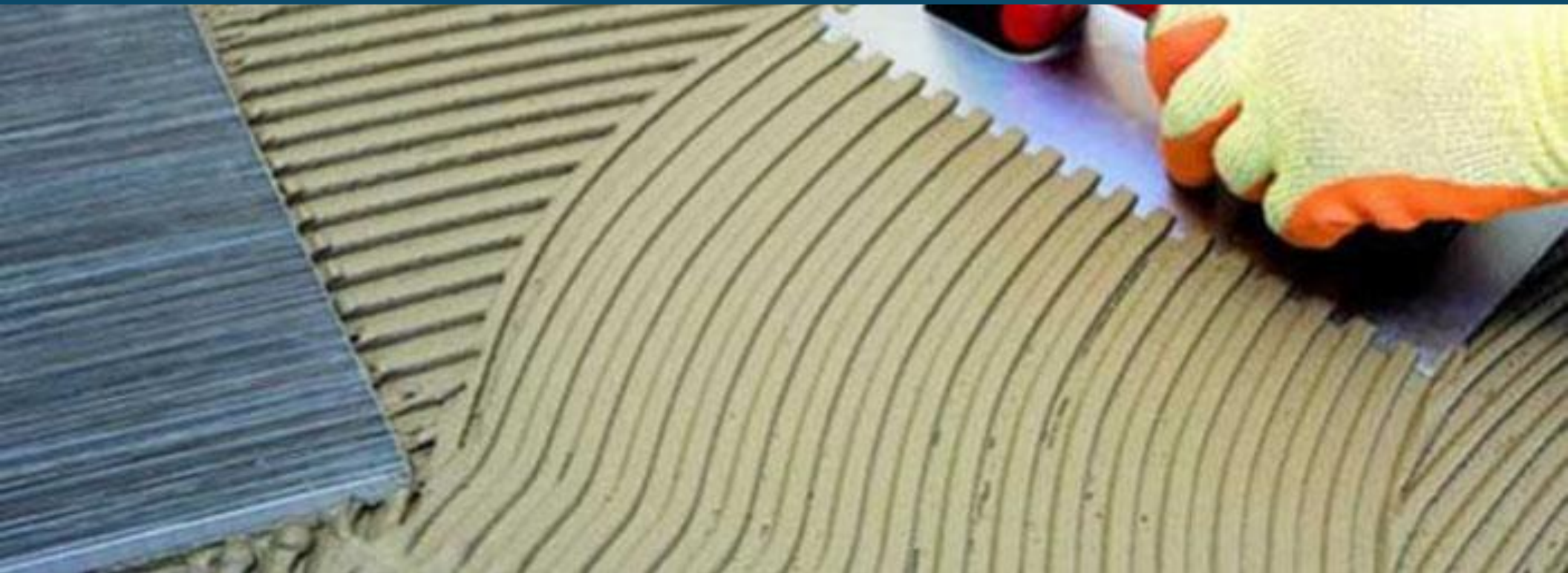


Tapping By Itself ...

- Tapping by itself can never answer the question as to whether a water event (where water gets under the tile/stone) has caused hollow sounding tiles.
- The extent and location of hollow sounding tiles must be correlated to the extent of water under the tile/marble.
- So one must not focus solely on tapping to find hollow sounding tiles, but also detecting and mapping the location and extent of water under the tile.
- Use a FLIR and check the grout for detectable moisture.
- Correlate the extent and direction of water and hollow sounding tiles with flooring pitch. Water will not flow uphill.



INTRODUCTION TO TILE BONDING / DE-BONDING



Overview

In our experience most alleged floor tile de-bonding from a water event is not really de-bonding.

Tiles therefore sound hollow (de-bonded) when tapped but have not been impacted by the water event... they are not de-bonded as a result of a water event.



During construction, floor tiles are often spot bonded and not fully bonded (no full bed of thin-set) in order to save the contractor time and money.

Spot Thin-set Example We Made



- Tile laid with spot thin-set.
- (Laid on a piece of clear acrylic sheeting to see the underside.)
- Tile when tapped between thin-set spots sounds de-bonded (hollow) but the tile is bonded.

80% Coverage Example We Made

- Non-spot thin-set application. Here approximately 80% thin-set coverage.
- (Laid on a piece of clear acrylic sheeting to see the underside.)
- Tile when tapped sounds solid. Not hollow.



Industry Standards

- Spot bonding results in tiles that sound hollow as installed. And for sure they will easily allow water to travel underneath the tile/marble floor.
- Spot bonding is not an approved procedure by Industry Standard.
- But spot bonding is very common in South Florida.
- Are we surprised?
- For residential dry area applications, tiles are supposed to have at least 80% thin-set contact with full support at all edges and corners.
- Tiles in wet areas should have at least 95% thin-set coverage.
- Areas of the tile that are unsupported are susceptible to damage if subjected to live loads.



Tile Tapping: Our House



We live in a relatively new home. Never had any floods.



Tile installed originally by the builder.



Many of the tiles sound hollow (sound de-bonded) by tapping. But these are not de-bonded. They were installed without a full bed of thin-set.



This is typical in S Florida.

Ralph Moon Article on Detecting De-bonded Tiles



- As one will see, the Ralph Moon article on detecting tile de-bonding makes no sense.
- They only consider 3 categories of bonding: bonded, non-bonded and de-bonded tiles.
- **They don't consider tiles that are bonded but can sound hollow by tapping because they were not installed with a full bed of thin-set.**
- In addition, their choice of the optimum tapping instrument makes no sense.

HIGHLIGHTS OF MOON PUBLICATION ON DETECTING DE-BONDED TILES



Ralph Moon Publication on Detecting De-bonded Floor Tiles

- Floor Tile Tapping: A Quantitative Analysis published in the IICRC Journal of Cleaning, Restoration & Inspection. Fall 2017.
- Authors: Don Nehrig, Nolan Wells, Robert Mulcahy & Ralph E. Moon ... all with GHD.
- None are tile contractors!
- All are insurance defense “so-called” experts.



Tapping Tools Studied



Sound frequency tap testing was conducted using a commercially available microphone, boom, computer software, and computer.

- They ruled out using subjective criteria ... having people attempt to discern the best way to test for de-bonded tiles using their hearing (ears).
- They instead set up a computerized system to capture and analyze the tapping sounds of different tapping tools.

Ruled Out Chains

- Many tile experts and building contractors drag metal chains over tile floors to pin point de-bonded (or not well bonded) tiles.
- But this popular method was ruled out because **it was not suitable for Moon's experimental set up.**

Per Moon: "Large and small metal chains and wooden dowels created extraneous frequencies and reverberation that resulted in a broad mixture of audible frequencies."



Did Not Study Different Thinset Patterns

- Moon's group were not able to set up experiments with different percentages of thin-set bonding areas (full set vs spot). Not sure why this would be.

Per Moon: "With the exception of simple bonding patterns, attempts to apply thinset in patterns of various bonding percentages beneath the tiles proved inconsistent and was not considered further."



Moon Defined: Bonded Tile

Bounded tile: Tiles that are bonded to properly prepared floor with thinset, cured, and elicit a “non-hollow” or “solid” sound.



Laid properly with no (or limited) areas that are not in contact with thin-set bonding agent.



But we know that many floor tiles are set with spot thin-set and are bonded **but yet sound hollow due to spot setting thin-set.**

Moon Defined: Non-Bonded Tile

Non-bonded tile: Tiles that are purpose fully laid with a partitioning material that prevents bonding of thinset to either the floor or the tile.



Laid on wax paper or other partitioning paper so that tile would not bond. Sounds like a dumb experiment (who puts wax paper down before tiling) but not so.



Tiling over ceramic tile that has not had the ceramic face abraded is just like laying tile on wax paper. Will not bond.

Moon Defined: De-Bonded Tile

Debonded tile: Tiles that were bonded but experienced physical movement or deterioration that caused a separation between the thinset and floor or tile.



Bonded but became de-bonded. Not quite clear how that was done in Moon's study.



They don't seem to have explained how they de-bonded tiles.

Moon: No Consideration of Bonded Tiles That Sound Hollow

- Moon has not considered the very common case where the tile/stone is laid using spot application of thin-set that will result in hollow sounds between spots but is not de-bonded.
- In the real world the challenge is to determine if tile was de-bonded due to near term water event or was it installed with spot thin-set and therefore appears de-bonded due to hollow sound but was not.



Tapping Instruments Studied Using Computer



A two-inch diameter stainless steel ring provided the most distinctive frequencies to distinguish bonded from non-bonded tiles.

- Moon conducted a tile tap survey using 18 different tools to determine the best audible and recorded sound frequencies using audio equipment.
- Based on their study the ring to the right worked best **under their lab testing conditions.**

Tapping Instruments Studied Using Computer



- But when someone goes out to a home to tap tiles to determine if they sound hollow or not, they are never working under the lab testing conditions in the Moon study with auditory equipment hooked up to a computer.
- They are using their ears!
- The Moon study has no application to the real world.



CONCLUSIONS

Bonded But Sound Hollow

- Moon defines bonded, de-bonded, and non-bonded tiles.
- But more often than not, tiles are bonded in such a way that they are securely and permanently bonded but sound hollow. (Due to spot thin-set application instead of full-bedding.)
- Moon did not consider this important situation (They should have talked to some tile installers or builders!)



Ruled Out Chains Faster. Costs Less.



Many tile experts and building contractors use metal chains to pin point de-bonded tiles.



In our and most contractor's experience chains work best.



The benefits are that large areas of floor tiles/stone can be tested at once.

Chain Dragging is Method of Choice



Chains Rule

- The Moon study ruled out chains because chains emit multiple frequencies and were not suitable for their custom experimental set up.
- That is a bad reason to rule out the excellent tried and true method of using chains.
- But using a computer to analyze the sound seems so professional and scientific.
- That's BAD ADVICE.



Chains Rule

- Moon defined an experimental procedure that ruled out the best and most accepted method for testing tiles for bonding. Why?
- The “problem” with chains is that you can cover an entire house floor in 5% of the time it takes to use a steel ring.
- Using a steel ring versus a chain is (IMO) self serving and used solely as a means to increase billing.



Steel Ring Limitations



Furthermore, because steel rings only contact a few millimeters of the tile surface, dozens of taps per tile are required to properly map the sounds from the tile. Hard to judge.



Tile installed originally by the builder are often secured using the spot thin-set procedure. Tiles are hollow in areas with no thin set.



So tiles sound hollow (sound de-bonded) by tapping. But these are not de-bonded. They were installed without a full bed of thin-set.

Starting With Bad Tile Tapping Techniques ...



- If you start with BAD tile tapping techniques that do not provide you a reliable and easy to use method for determining the location and extent of hollow sounding tiles...
- You will not be able to fight off incorrect tile de-bonding claims/denials.
- Resources (time and energy) should not be spent on an inefficient and ineffective tile tapping technique invented by Insurance Defense “Experts” because it replaces a person with a computer and appears more scientific... but does not work well.

Beyond Hollow Tile Mapping...

- There is much more to fighting incorrect tile de-bonding claims/denials than attempting to accurately map hollow tiles.
- Adequate focus must be applied to determining the extent and location of any trapped water under the tile ... and correlate to the location of hollow sounding tiles.



We've Discussed Techniques for Finding Trapped Moisture

- We've discussed techniques using infrared cameras for determining the location of trapped water.
- Correlate the location and extent of hollow sounding tiles to:



The extent and location of trapped moisture under tiles/stone.



To the pitch of the flooring with regard to the water source.

How to Fight Incorrect Tile De-Bonding Claims/Denials

Spending time and money tapping tiles inefficiently is simply going through the motions.

When assigning a tile de-bonding inspection to a so-called Forensic Expert make sure to tell them to correlate the tapping data to the location of the leak as well as to the location and extent of trapped water.

Anything else is a waste of money.