Radiant Mythology

22 Myths about Radiant Floor Heating and Cooling

WARNING

This article has unwound some wound up personalities so if you only think in black and white, believe straight lines are natural and have no sense of haha then you are far too serious to read this text.

For more myths visit: http://www.healthyheating.com/Radiant_Mythology/Radiant_Mythology.htm

Myth #1 - Modern Radiant Heating and Cooling

Contrary to popular opinions, radiant is not new, modern, futuristic nor high tech. The Romans used radiant heating with their hypocaust and the traditional Korean home is radiant heated with 'ondol'. Anyone studying the humanities of cave dwellers knows radiant cooling kept them alive in hot climates and today's Bangkok airport has millions of square feet of cooled floors conditioning travelers. One of the largest developments in North America to use radiant heating on a large scale came from developer William J. Levitt. A website excerpt, "Levittown, Pennsylvania was the largest planned community constructed by a single builder in the United States. By the time it was completed in 1958, the development occupied over 5500 acres in lower Bucks County and included churches, schools, swimming pools, shopping centers and 17,311 single-family homes. To its 70,000-plus residents, Levittown represented the American Dream of homeownership."[1] Almost a 100 years before radiant heated Levittown, comes this from the Civil War News..."As he prepared for his Shenandoah Valley Campaign, Sheridan assembled the makings of what would be the largest field hospital of the Civil War. Immediately following the … Battle at Winchester, a 500-tent hospital was constructed (and in) …operation for three months as what is now referred to as an evacuation hospital. The tents featured a unique radiant floor heating system, which proved invaluable in the cold fall and early winter months of 1864." In relative terms if you stretch the modern pitch long enough you could call controls and variation in European piping systems developed back in the early 60's as modern but calling radiant new? Radiant Modern? Radiant Futuristic? Hardly! Learn more about the History of Radiant Cooling and Heating.

Myth #2 – Everyone Knows Heat Rises

This is probably one of the most misunderstood and often incorrectly stated 'facts'. Let's get it right. Not all heat rises. Heat is a form of energy and in a gas or liquid may stratify because of temperature based buoyancy relative to the surround mass, but radiant energy travels in any direction from hot to cold; if heat rises then we would all have to stand on top of the sun to stay warm and put heat lamps on the floor. It is important to distinguish between homes heated and cooled with forced air and those conditioned with radiant because the air in a radiant heated and cooled home is only warm or cool because the surfaces are warm or cool and it doesn't matter if the surface being conditioned is on the ceiling, wall or floor. The biggest radiant cooled and heated surface is the one humanity walks on everyday….its called earth. The biggest radiator known to humankind is called the sun and the biggest absorber of earth's radiant energy is the cool dark night sky. Hot air may rise relative to cooler air but radiant energy does not…

Myth #3 - Radiant Floor Heating Emits Harmful Rays

The outer surface of the sun may be around 11,000°F; however, a properly designed radiant floor heating system operates in and around the same temperature as the temperature of your skin, which in a healthy human, "varies parabolically from 83 deg F. (28.2 C) at an ambient temperature of 49 deg F. (9.5 C) to 98 deg F. (37.2 C) at an ambient temperature of 95 deg F (35

[1] http://server1.fandm.edu/levittown/default.html

C)."[2] Even a poorly designed system would never reach temperatures hot enough to emit harmful rays. You will get as many harmful heat rays from the radiant system as you will get from standing next to your coffee pot.

Myth #4 - Radiant Floor Heating Causes Varicose Veins

This statement falls back to the late 60's in Europe and existed up until standards were developed in the 70's to limit the temperature of heated floors. A study by Dr. Vin, and Dr. Scala in the late 70's later concluded that low temperature floor systems were not a factor in venous diseases.[3] Thank goodness for standards like ANSI/ASHRAE 55-2004, Thermal Environmental Conditions for Human Occupancy - the minimum to maximum range is 66 deg F in cooling to 84 deg F in heating. Now all we have to do is get people to toe the line as it were…

Myth #5 - Radiant Heating Is Slow

Why is it, the internet has done a fine job of spreading, "radiant system take too long to heat" yet no one talks about the instant feeling of heat when you open the blinds on a sunny day or the lack of heat when a cloud covers up the sun? There is a big difference between the time it takes to heat up the building mass (thermal lag) and the response time (thermal performance) of radiant transfer, which is instantaneous. The thermal lag factor has a lot to do with the building efficiency and the type of radiant floor systems. Some of the modern radiant floor assemblies have very short lag times and today's control systems in a radiant based HVAC system can easily handle fluctuations in outdoor temperatures. Next time you hear this tall tale just ask the person spreading the news if that fancy radiant heat lamp in their bathroom takes forever to work or is it just for decoration.

Myth #6 - Radiant Heating Systems Are Susceptible to Freezing

Whilst it true that stagnant water can freeze below 32 deg F, one has to ask, which home would freeze up first…one where the building mass is heated (radiant) or one where the air is heated (furnace)? The reality is the potable water systems would freeze first in a home heated with air. The radiant heated home would eventually fall to the same demise but only after considerable time has elapsed. In the case of the radiant system, if it were designed properly, the water would keep moving so long as there was power available. This would further delay the time of freeze up. One should also ask what circumstances would have to exist for a radiant system to freeze to begin with? Often it's related to failures in the building systems. Poor or no insulation and vapor barrier at the building perimeter (trimmer and header joist) are the common omissions. If the home is in a remote area susceptible to fuel and power outages, or if the pipes are heating a driveway, patio or walkway then antifreeze would be required. Other than these conditions, if a home is properly constructed, water is all that is required. By the way would it surprise you that the very person saying radiant system take too long to heat up and cool down is the same person advising not to use radiant because it might freeze? Go figure.

Myth #7 – Radiant Heating is 10%, 20%, 30% even 100% More Efficient Than Air

If you ever hear anyone make this claim without quantifying it – keep your eyes on your fries. It is not possible to discuss mechanical efficiency without discussing building efficiency. Case in point: In Canada, the R-2000 Housing Program defines the specifications, construction and testing of highly efficient homes which have negligible heat losses even in -60 deg F Artic regions. In some facilities constructed to these standards overheating in mid winter can be a problem as lights, office equipment and people contribute in excess of what the building needs to maintain a reasonable temperature. There is

[2] Dr. K.R. Koehler, College Physics for Students of Biology and Chemistry, University of Cincinnati
[3] http://www.cochebat.org/

virtually no economic reason to invest in the mechanical efficiencies of a hydronic radiant system or any other high efficient system for that matter when there is zero load. Take also the case of a home heated with an uninsulated radiant heated slab bearing over conductive soils like moist clay with a high water table. No amount of mechanical efficiency is going to compensate for the constant drain of energy to heat the aquifer. Somewhere between the efficiencies of an R-2000 home and the inefficiencies of an aircraft hangar is today's modern home and though there are some fuel and electrical savings, it is important to be realistic about returns on investment. If conscientious mechanical designer's were paid on the alpha-omega of operating and capital costs for a home, they would first advise you to invest in the building enclosure (insulation, glazing and caulking) which consume nothing, have no moving parts and will last indefinitely. Secondly, they would advise using low temperature radiant heating and high temperature radiant cooling in your energy efficient home, which contributes to total environmental quality for the least operating cost. At the end of the day, radiant is an enabler…it enables boilers, chillers, heat pumps and solar system etc. to achieve their maximum rated factory efficiency.

Myth #8 - Efficient Homes Heated with Warm Floors

This is an oxymoron. The more efficient the home the less warm the floors need to be. Around 24 Btu/hr/sf [standard construction] the floor temperature at design conditions will be around 82 deg F, or in the range of feeling comfortably warm to neutral. An efficient home with less than 10 Btu/hr/sf load needs floor temperatures less than 75 deg F that will feel neutral yet ironically still providing space heating. To experience "warm floors" in an efficient home the area of heated floor has to be reduced which drives up the load per square foot and thus the need for higher design surface temperatures …which is a completely acceptable solution to enjoy the benefits of floor heating in an efficient home.

Myth #9 – Radiant Floor Heating Causes Hardwood Floor Cracking

Temperature does not 'dry out' moisture - it only changes the capacity 'to hold' moisture. For example let's take the relative humidity of your home. If we raise the air temperature the relative humidity goes down but the quantity of moisture still exists - it doesn't disappear unless it has been condensed and drained or evaporated and vented or absorbed out of the air by some other means. If we add more moisture so the relative humidity returns, then reduce the air temperature the relative humidity goes up. Building materials like wood are hygroscopic and anisotropic which means humidity influences their dimensional stability more so than temperature.[4] The facts, 100% of all hardwood flooring problems in homes heated exclusively with forced hot air didn't have radiant floor heating to blame. Lots more here on hardwood floors and radiant heating.

Myth #10 Radiant Cooling Causes Condensation

Radiant cooling works just fine thank you. Radiant cooling creates the same experience you get when you walk into an underground garage on a hot summer day or into the frozen food section at the super market. The temperature of the concrete or glass in relation to your skin is lower so your body releases its heat to the cooler surface - thus the reason you feel cool…the only way to prevent losing your heat to a cooler surface in the summer time is to wear a winter coat…does this make sense? We didn't think so. So now you know that radiant cooling works because you have experienced it a thousand times before just like the cave dwellers of years past…you just never thought about it.

For those of you that worry about condensation…regardless of the HVAC system, moisture must be controlled for biological concerns (bacteria, viruses, mites and molds), for hydrolysis and the control of VOC emissions (formaldehydes, phthalates, terpenes etc.), for the dimensional stability of hygroscopic materials (woods) and for occupant respiratory and thermal comfort; moisture must be regulated for these greater priorities making the condensation on radiant cooling panels a moot

[4] Understanding Psychrometrics, by D.P. Gatley, An ASHRAE Publication

point. Just remember that 100% of all condensation problems in buildings conditioned exclusively with air did not have radiant cooling panels to blame (go figure). Learn more about radiant cooling in the summer without condensation.

Myth #11 Radiant Heating Causes Pink or Yellow Floors

This goes back almost 15 or 20 years ago when people thought it was smart to run their systems really hot…funny thing was if you had a forced air furnace or poor quality linoleum you may have also had discoloration…often times it was UV damage and had nothing to do with the radiant system.[5]

Myth #12 The Basement Will Heat The WHOLE House.

Occasionally one still comes across a project where a decision is made to heat the basement floor only with the premise that it will heat not only the basement but also the main floor. Logic being that if one does not insulate the main floor the radiant energy from the basement will heat the main floor and in turn it will heat the main floor above. But let's say you need to have a main floor running at 85 deg F to provide a 28 Btu/hr/sf load - just imagine how hot the basement floor would have to be to heat the main floor up to 85 deg F! At that point let's just say get out your sunglasses, slip on your slippers, throw a little kitty litter on the basement floor and pretend you're at the beach…

Myth #13 Use a Water Heater Instead of a Boiler.

A water heater is not a boiler and a boiler is not a water heater. Here's the facts…at 60,000 btu/hr of output, a robust manly type boiler can easily heat 6 USgpm from 160 deg F to 180 deg F (20 deg F difference) but it wimps in barely capable of heating 1.5 USgpm from 40 deg F to 120 deg F. (80 deg F difference). Did you also know that if you actually wanted to heat 6 USgpm from 40 deg F to 120 deg F it would take almost 240,000 Btu/hr output? That's 4 times as much! You can have 6 USgpm for a short period of time for your fancy shower or tub with a 60,000 Btu/hr water heater but you have to be able to store the demand. That's why water heaters have storage tanks and boilers don't.

Instantaneous waters heaters used in space heating introduce their own fair share of challenges which relate to circulator sizing. Many of the types of water heaters rated for residential spacing heating require circulators normally associated with small commercial projects because of the heat exchanger design. It's not uncommon to require a circulator three to four times the horsepower to move the water through the heater – **this is not trivial stuff** - at 4 gpm we're talking boiler pressure drops of 1 psi vs the instantaneous water heater at 13 psi! One really must have a mathematical grasp of heat transfer and fluid flow theory to apply a water heater to a space heating application…more often than not people using water heaters without doing the math end up purchasing discomfort reminded monthly in the form of high utility bills.

Myth #14 If You Use Radiant You Have to Increase Your Slab Thickness

Radiant tubes used for residential applications are a nominal 3/8 to 5/8 in diameter. The U.S. (ACI) and Canadian concrete codes (CSA) restrict tube diameters to less than 1/3 the slab thickness. Even if you have a 3" slab you will still be under the minimum recommended value. In 99% of all projects, it just isn't necessary to use bigger pipes. See Myth #15.

[5] Society of Plastics Engineers (SPE), ANTEC 85,86 et al

Myth # 15 The Bigger the Pipe The More Heat You Will Get.

Contrary to popular urban legend…bigger pipe does not mean more heat. The only significant thing pipe diameter influences in radiant heating is the hydraulics…or the amount of differential pressure it takes to move the water. Think about this principle - heat always goes from hot to cold – always. So a heated pipe transfers its energy to a cold surface. So far so good? Lets now compare two pipe diameters…one pipe is big – really big! Let's say tongue in cheek - 3 ft across – yep just imagine 36 inches in diameter – stretch out your arms. Ridiculous but hey if it's big you get more heat right? The other pipe is small – let's say ½"…the width of your pinky. Got it? 36" vs. ½" Ok…lets assume the room temperature is a nice 70 deg F. Now let's assume the water in the 3 ft diameter pipe is 70 deg F as well, but lets put 100 deg F water in the ½" pipe. Which pipe do you think will puts out more heat? If there is no temperature difference there is no heat transfer…70 deg F water temperature in the 36 inch pipe minus 70 deg F air temperature = zero - zip - notta…no heat transfer. However our little ½" pipe at 100 deg F minus 70 deg F = 30 Deg F difference. Since hot wants to go to cold…that little pinky sized pipe will transfer more heat under these conditions than the big honkin' pipe. Now I get that if you stick 100 deg F in the big pipe you'll transfer more heat than the little pipe, but let me remind you that any surface area differential between a 3/8" and ½" pipe or ½" and 5/8" and so on is of academic interest and any difference that exists can be compensate by an equally small adjustment in temperature. With pipe used for heating and cooling slabs, diameter is not the prime motivating factor…temperature differences is what motivates energy to move.

Now for the other half of the story…part of the heat transfer equation is velocity or the how fast the fluid flows measured in feet per second or fps. When the fluid in the pipes drops below 2 fps it sets off a chain of less than desirable events. The slower the flow the greater the chance that any solids in solution will settle out and accumulate in the worst places - likely leading to blockage. In addition, air has a funny habit of separating at low speeds and when you get enough air accumulating in one spot it can prevent fluid flow, which is called an air lock. Lastly, when the flow begins to slow down to less 1.5 fps the heat transfer rate starts to go way down which has to be compensated for by higher temperatures, which means less thermal efficiency.[6] It gets worse, low load, low velocity systems often end up using circulators which are forced to run their motors in an over load position because there isn't enough resistance. Motors, which run in an over load postion, have very poor wire to water efficiency. So low velocity usually means less overall efficiency rather then better efficiency.

99.99% of the time that someone uses 7/8" or 3/4" pipe in a residential application they have not done the math and this means the flow velocity is excessively low as is the differential pressure required to move the water. Hot water heating systems are called hydronic but in fact they are "hydraulic" systems where controlling pressure means controlling flow and when we can control the flow we have authority over the heat.

This is why anyone using anything bigger than 3/8, 1/2 (or in worst-case 5/8") pipe in most residential slabs had better have a good technical reason based on fluid hydraulics; otherwise the client is being ripped off. For a general discussion on this topic visit our Infloor Radiant Design Guide.

Myth #16 If You Zone With Circulators Instead of Zone Valves You'll Never Lose All Your Heat.

Have you ever heard of the term "equafinality"? It means all roads lead to Rome…or there are many ways to skin a cat (have you ever said that to a cat lover during a sales call? Not very smart!)…anyways for every argument for using zone circulators there is an equal and opposite argument for using zone valves. My experience is; those who have had problems with zone valves have been using low cost unreliable valves that are difficult if not impossible to manually operate if they fail – (which low cost unreliable valves do by the way). The argument goes like this…if you have five zones and each zone has a circulator then if one or more circulators fail you still have flow through the other zones. What they forget to mention in this argument

[6] ASHRAE Handbook, Effects of Flow Velocity on Heat Transfer

is that it is only true if it is piped in a certain way called direct return but is not true when piped in a primary/secondary method. If they have a system piped in primary/secondary and the primary or secondary circulator fails it is no different from a zone valve failing…in other words - if you can't move water through the boiler you can't get the heat into the house. The only time the argument for zoned circulators works is when it is piped in a direct return method but this creates its own challenges. If you use zone valves and one or more valves fail, you can if you've used a better product (which by the way is almost the same price as a cheaper product), manually open the valves or install valves that open automatically if they fail. What is true - is if the primary circulator fails then regardless if the zone valves work there will be no flow. Now here's the thing…a really good contractor designing and installing a radiant heating system can build in redundancy without adding significant expense so that if something does fail…you can still have heat everywhere…we call this "designing for failure" and teach it in our courses. This topic is worthy of several pages of debate and no doubt has raised the fur on many backs! Our own design philosophy is if the flow rate is less than 3 USgpm – use high quality control valves (which are not the same as low cost zone valves!). In-between 3 and 9 USgpm it's a toss up – you have to evaluate the hydraulics and redundancy factors…over 9 USgpm use circulators. For a general discussion on control valves vs. zone valves go here: http://www.healthyheating.com/Page%2055/Page_55_h_heating_eq_valves.htm

Myth #17 You Need To Have a Furnace for Air Movement for Indoor Air Quality

I remember the first time I heard this stale tale – some poor lass and lad had just spent hours listening to a so-called IAQ expert who impregnated them with this and other tales from the crypt.

Here it is…the facts…your sitting at home and underneath you in the mechanical room is your old furnace which unbeknownst to you - has a cracked heat exchanger[7] and is circulating deadly combustion gases around your house or perhaps it's radon gases from your basement or a million other household contaminants like volatile organic chemicals …got it? Now ask your self this million-dollar question… "Are you going to have better IAQ because your contaminated air is moving around the house making everyone sick or dead?"

Please - please - please listen carefully –air movement from a furnace is not – I repeat – is not a requirement for indoor air quality or for indoor comfort quality (ICQ)! In fact the only time excessive air movement is considered a bonus is when it's oven hot and your sweating your face off and the nice breeze provides evaporative cooling…(which is how you can have poor IAQ and good ICQ at the same time)….in all other cases excessive draft is considered uncomfortable.[8] Really talented radiant based HVAC designers and installers without using furnaces can employ heat recovery ventilators or a combination of fans to exhaust the bad air[9] and bring in the fresh air just like a slow moving creek…calm, steady, silent - unnoticeable. Anything else is an amateur job.

One more thing…many so called "experts" will argue that with radiant you need two systems; one dedicated for heating and another dedicated for ventilation and they will say this in such a way to represent it as a negative; and yet when you talk to real ventilation specialist such as ASHRAE Fellow, Dr. Stan Mumma from Penn State University, they will advise that a dedicated ventilation system is the preferred choice.

Myth #18 Radiant Heated Pools, Ponds, and Gardens

One of my favorite radiant heating myths is radiant heated pools, gardens or waterbeds. In order for radiant energy to work, it has to be in the absence of mass between the emitter and absorber. In other words your feet in contact with a warm surface are not being heated with radiant…they are being heated by conduction. However anything not in contact with the floor, if

[7] Combustion Gases in Your Home, Things You Should Know About Combustion Spillage, Canada Mortgage and Housing Corporation
[8] ANSI/ASHRAE Standard 55- Thermal Environmental Conditions for Human Occupancy
[9] What You Should Know About Combustion Appliances and Indoor Air Pollution, American Lung Association, the U.S. Consumer Product Safety Commission, and the U.S. Environmental Protection Agency

it's at a lower temperature, is heated with radiant. Think about it…without the vacuum between the sun and us what would happen to our pretty little heads? What would happen if you grabbed onto the heat lamp with your manicured fingers…rested your toes in the fire instead of near the fire? Radiant travels through space and just because a surface or mass has tubes in it does not make it a radiant heating system. When concrete pools, water beds, root zone heating, or sub soil frost prevention systems etc., have embedded pipes; it's not automatically a radiant system. Let us just say anyone who splashes this mythunderstanding is on thin ice…close but no cigar.

Myth #19 You Don't Have to Spend Money On Light Weight Concretes or Gypsum Poured Floors – You Can Use Sand. (…or pick another favorite and silly substitute)

From a heating and cooling plant efficiency (exergy) perspective; when you embed pipes in a floor you want to use the lowest possible fluid temperature for heating and the highest temperature for cooling, with the right amount of pipe to give you the most thermally consistent and comfortable floor surface that you can possibly get. This means everything around and above the pipes needs to promote heat transfer not restrict it. Now what I want you to do right now is go into your memory bank and recall a time when you were back at the beach…it was oh so hot you couldn't walk on the sand but if you dug your feet in a few inches the sand was cool. Do you remember? Why do you think the sand was cooler just below the surface? It is because sand is not a great conductor - it is the last thing you want around the heating tubes in your floor. Save the sand for the kitty liter box and fork out the dough for the proper stuff. Here's a place to learn more about the principles of energy, efficiency, entropy, exergy and efficacy.

Myth #20 You Don't Need To Buy Pipes With Oxygen Barriers When You Can Use Chemicals to Control Corrosion

I've learned a lot in my years as a radiant fanatic and this myth took me a few years in the beginning to purge from my grey matter. Lets have a basic chemistry lesson…water plus oxygen plus iron or steel = rust. To prevent rust you have to get rid of one of the three elements. In a hot water heating system we'll not likely be getting rid of the water – I hope you agree with me on that one…it's possible to get rid of the steel or iron…but the last time I checked commodity prices on stainless steel, copper and titanium were through the roof! So the logical choice is prevent or eliminate oxygen. You can do this with chemicals or you can do it with the proper assembly of proper equipment. Controlling and preventing corrosion with chemicals is like adaptive comfort. The conditions have to exist for the potential discomfort to develop and you have to go through the discomfort to adapt to your environment. That is completely different from inoculating against discomfort with good architectural and mechanical designs. Like wise its good practice to preventing corrosion from occurring in the first place. So what has this got to do with oxygen barriers on pipes? Radiant heating systems using plastic pipes without an oxygen barrier is like owning a great big lung that just happens to be laid out in the floor. Oxygen will permeate through the pipe walls and eventually cause corrosion of iron and steel components. To prevent this contamination, pipe manufactures provide a protective layer like a very robust version of the wrap used to keep food fresh. This tough barrier stops the oxygen from migrating. In fact, in Canada and in Europe there are standards referenced in their building codes, which regulate oxygen permeation. A few in the industry will try to save money on the pipe but the pipe represents the least cost component in the system. On the average 2400 sf home, good designers can find over a $1000 of waste in oversized equipment without having to cheapen up the system. Again in my experience, those that sell radiant pipes and promote chemical control over using barriered pipe, often times are in the chemical business…a coincidence…perhaps - but it's kind of like asking the barber if you need a haircut.

Myth #21 Floors Are Damaged By Temperatures Over 85 Deg F

You won't get any argument from me that temperature influences the integrity of building materials…but lets be real here…the wood sitting underneath a black asphalt roof gets to what temperature on hot sunny Florida day? Try 125 deg F. What about a tile or hardwood floor laying there nice and pretty in the solarium or greenhouse? More than 85 deg F? You Bet! The number '85' is always quoted in floor covering literature but I'm suggesting it came from the radiant manufactures literature which specified 85 deg F as the maximum floor surface temperature based not on damage but on comfort research done several years back. I could be wrong but I am declaring 85 deg F as a damaging temperature to floor coverings as a myth until proven otherwise. Forgive me if I'm wrong.

Myth #22 You don't Need Expensive Rigid High Density Slab Insulation When You Can Use Reflective Bubble Insulation.

Next to the Nigerian Bank Scams (you know the one where some guys dear and dead royalness left them billion of dollars in a trust account and they desperately need your bank account number to transfer the money out) well anyways next to the bank scam the bubble foil insulation story has been the longest running myth in the HVAC industry first rearing its head in my career over two decades ago. Read these quotes from four different manufactures in the November 2003 issue of Energy Design Update[10] and decide for yourself if you think bubble foil is the product you want under your heated concrete…"…apologies to anyone confused by the statement", "This was an oversight on our part", "we realized it was erroneous" , "apologize for the misconstrued quote". If there is any doubt still in your mind - here's an excerpt from a Canadian research project[11]… "The bubble-pack insulation had a low insulating value compared to the polyurethane panels and the XPS board. The cost-benefit was the poorest of all insulating materials tested." Finally… " in 2004, the Federal Trade Commission distributed letters to several companies in the reflective insulation and radiant barrier industries alerting them that they are reviewing marketing materials on the industry to see whether they comply with the requirements of the FTC's Rule for Labeling and Advertising of Home Insulation … and alerting them to the penalties for violations of the rule..(to their credit, my words) the Reflective Insulation Manufacturers Association says it was in full support of this action taken by the FTC and began its own efforts to address the problem…non-member companies that were in clear violation were contacted as well."[12] At our office we only specify high density extruded insulation for underslab applications and we've never had to apologize for this decision…go figure.

So there you have it from both sides of the border…22 of my favorite radiant myths. Now about that late second cousin, King Whatshisname from Nigeria and his frozen billion-dollar bank account…can you help me out?

About the author:

Robert Bean, R.E.T., P.L.(Eng.), is a Registered Engineering Technologist in the discipline of building construction engineering and a Professional Licensee in HVAC engineering. He can be reached at info@healthyheating.com.

For more myths visit: http://www.healthyheating.com/Radiant_Mythology/Radiant_Mythology.htm

[10] November 2003, Energy Design Update
[11] October 2004 Technical Series, Comparison of Under- Floor Insulation Systems Research Highlight, CMHC
[12] Excerpt from RIMA Press Release, 2005