Understand the Importance of Dehumidification and Moisture Management in Your Home with Tim DeStasio

SPEAKERS
Kendra Seymour, Tim DeStasio

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Tim DeStasio
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So really, what we have is a house that leaks and we're taking on water, sort of like the boat in this picture. And what we're asking our HVAC system to do is to be that bucket, that person that is scooping water out of the boat. And really it's okay if the boat takes on a little bit of water, as long as you've got a pump or somebody with a bucket that can remove the water at the same rate that you're taking on water, you're not going to sink. But we'll come back to why houses sometimes can't keep up.

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Kendra Seymour
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Welcome to the HVAC plus D mini class series brought to you by Change the Air Foundation. This series is made possible thanks to the generosity of our sponsor, Santa Fe Dehumidifiers. We are deeply grateful for their support, which helps us continue raising awareness and providing free resources so that more families can breathe safe indoor air. A quick reminder, this 12 part mini class series offers a consumer friendly overview of common HVAC plus D topics. It is not a replacement for professional advice. You can watch the full series on our YouTube channel or by visiting ChangeTheAirFoundation.org, and clicking on our resources tab, welcome to episode seven. In this episode, we'll dive into everything you need to know about removing humidity from your home. We'll look at what causes indoor humidity issues and the solutions available. You'll learn the difference between relative humidity and dew point and why every homeowner or runner needs to be paying attention to these numbers. Finally, we'll compare the pros and cons of whole home dehumidifiers versus standalone units, and explore what to do if you need to add humidity to your home. A bit about our guest. Tim DeStasio is an HVAC contractor, consultant and trainer with over 25 years industry experience. He specializes in high performance home, HVAC design, and comfort moisture diagnosis. His consulting firm, Comfort Science Solutions is located in Southport, North Carolina, and serves clients nationwide.

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Kendra Seymour
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Tim, thank you so much for being here. I'm so excited for your presentation. And dehumidification, I think is one of the most important and overlooked parts of this whole thing. So I'm excited for you to kind of jump in.

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Tim DeStasio

02:26

Thank you for having me. I'm Tim DeStasio. I've been in the HVAC industry pretty much my entire adult life. I'm not going to bore you with the details. I've been a contractor, a trainer, HVAC designer on the residential side. Started off as a service technician and industrial technology, and then eventually got into owning my own business on the residential side and really focusing on high performance HVAC and home performance and building science. That's what really got me intrigued. And now I have a consulting company, and I just can't believe I get to do this fun stuff every day. So we'll talk a little bit more about my YouTube page and just some other ways that you can get a hold of me later on. But that's a little bit about me.

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Tim DeStasio

03:13

We'll jump right into the topic here, and that's why should we control humidity in the first place? The main reason is because we want to be healthy in our homes. Bacteria, mold and other things that make us sick can thrive when the humidity is over 60% relative humidity that can also lead to long term health problems, chronic health problems, things that don't go away, even if we get into a more healthy environment. So humidity is very, very important, especially in humid climates. Also high humidity and low humidity, or the swings between high and low humidity, can cause damage to buildings. And we'll talk a little bit more about that as well. One of the things that it causes is warped wood floors. I'm here on the North Carolina coast, and this is actually a picture from a recent consultation that I did, and the main reason why he called was because his hardwood floors kept warping, and it was because of high humidity. So we found out the reason, and we implemented a solution. Other things that are signs of humidity swings in your house, maybe if your door sticks in the summer, but it doesn't in winter or vice versa. That is the wood expanding and contracting when it starts absorbing the moisture in the air.

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Tim DeStasio

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So where does high humidity come from? Well, we're not meteorologists, but we sort of want to understand how houses get humid to begin with, and for that, we need a little bit of a lesson in weather, especially here in the United States, because it helps us to appreciate what we can do to make humidity better in our homes. The main reason where humidity comes from, why our houses get humid is because in the summertime, the air temperatures are warmer, and warm air can hold more moisture. And so that's just a typical psychrometrics, or just physics. That's just what happens when warm air, it has the ability, sort of like having a large sponge. A large sponge can hold a lot more moisture than a smaller sponge. Here in the United States, one of the main factors that drives the humidity in the summertime is the Gulf Stream, because that very warm water in the Gulf creates very warm ocean temperatures also in the Atlantic, and the Gulf Stream goes from the Gulf, it kind of hooks around Florida, and then it starts coming up the East Coast. And so that combination of very warm air and very warm water that wants to be able to evaporate into that air is a great combination for some really humid weather. And that's why we see some very long, extended, humid weather in the Gulf regions and the Gulf states like Louisiana, Florida, and up the East Coast, like where I live along the North Carolina coast. But even if you're inland, even if you're in the Upper

Midwest, if you're near a body of water when the sun is high in the sky during the heat of summer, it is going to warm that body of water up, and it takes a little while to get there. That's why we see the most humidity problems in late summer, because at that point, the sun has had time to heat up any kind of body of water, and then it starts to evaporate that water. That water is making the jump from liquid form to water vapor form, or gaseous form, and then that is the water vapor humidity that we have to deal with in our buildings. So even if you're not near the Gulf, you could be experiencing high humidity. And we'll talk about what parts of the country experience high humidity here very shortly. Warm water, when it evaporates, it turns into humidity. That's the humidity that we have to deal with in our buildings. And then, of course, in the summertime, we get thunderstorms, we get a lot of hurricanes, and that dumps a lot of bulk moisture onto the ground. And that bulk moisture sometimes seeps down into the water table, but it also tries to evaporate or wick up out of the ground, and then we have to deal with that kind of in the form of humidity in our crawl spaces and basements, and obviously that is going to also transmit into our houses. So storms, we don't get a lot of thunderstorms in the winter, but we do get them in the summer, and that just dumps a lot of moisture.

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Tim DeStasio

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So here's how that moisture makes our houses humid. This is just a typical line drawing of a house. We've got a vented attic, and then we've got either a crawl space or a basement. So there's a term that I'm sure your listeners have already become familiar with, if not they're going to it's called infiltration, and that is how air from the outside leaks into our homes through the gaps and seams that our homes have. And that air can leak in from the attic into the space that we live in. It can leak in from the crawl space in the basement, and it can also leak in directly from the outside, through windows and doors and other openings there, and so humid air is going to get into a home. We want to try to control that infiltration, because the more infiltration that is allowed to take place, or the looser that the home was constructed, the more humidity is going to make its way into the home, and that's humidity that we have to eventually remove. Now your HVAC system, if it's sized properly, if it's working properly, it is designed to not only cool your house in the summertime through air conditioning, but a byproduct of air conditioning is also dehumidification. We're cooling the air, and when we do that, we wring the moisture out of the air, sort of like squeezing a sponge. But when your HVAC runs, especially if the ducts are located in unconditioned, humid areas, they can also leak as well the condensate line that you're seeing here in this picture, if you walk around your house, no doubt you're probably going to see a little PVC pipe coming out of your house. Or if you have a basement, maybe you have a floor drain, you may have a PVC pipe that drains there. In the summertime, you're going to see water dripping out of that PVC pipe. And what that water is, what that condensation is, is the humidity in the air that your air conditioning has pulled out so the more humid it is, the more water that you're going to see the AC unit putting out. But if your ducts are in an unconditioned space and they leak, well, now we have a fan inside your air handler that is also driving or pulling moisture from the leaks in your ductwork, and that can also add to the humidity in your house. So duct leakage is a pretty big factor. Also, if you're ventilating the house, let's say you're bringing in fresh air. Maybe you have an ERV, maybe you run a lot of bath fans, or you cook a lot, and you run a kitchen fan. Anytime that we're ventilating, we're pulling air into the house, that air is coming from the outside or from other humid spaces, and so again, we're driving humidity into the house. So these are all things that the air conditioning system, or the HVAC system, has to deal with, and it can't always deal with that much humidity. In addition, we have people. We breathe humid air. When we cook, when we take showers, all that internally adds

water vapor into the house that the AC has to deal with. So really, what we have is a house that leaks and we're taking on water, sort of like the boat in this picture. And what we're asking our HVAC system to do is to be that bucket, that person that is scooping water out of the boat. And really it's okay if the boat takes on a little bit of water, as long as you've got a pump or somebody with a bucket that can remove the water at the same rate that you're taking on water, you're not going to sink. But we'll come back to why houses sometimes can't keep up and their HVAC systems struggle to keep up with humidity here in a little bit. So we're going to come back to that illustration in just a little bit here.

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Tim DeStasio

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We need to also discuss two types of talking about humidity, and that's relative humidity and dew point. You've probably heard both of these terms. If you have a weather app, you probably know what the relative humidity is outside, and if you look closely, you'll probably also see where it tells you what the dew point is. It's really important to understand the difference between these two, and I've gotten away from discussing humidity in terms of relative humidity. And here's the reason why. Relative humidity is a relationship between moisture and the temperature of the air. So the hotter the air is, the warmer the air is, the more moisture it can hold. So it's sort of like this glass that we have three glasses here. All three glasses are the same size. One glass is empty, the next one is half full, the other one's completely full. And when we're talking about relative humidity being 50%, we're meaning that the air is half filled with water vapor. When it's 100% relative humidity, we call that air saturated, it cannot take on any more moisture without that moisture falling in the form of rain. When we're talking about the air in our house, that moisture will fall in the form of condensation. That's a bad thing! But relative humidity, unfortunately, can that number can sway back and forth simply by changing the temperature of the air. So if your air is really, really warm in your house, 50% humidity may not be healthy anymore. So that's why I don't like using relative humidity, because it's relative. I have actually started using dew point, which is a, an absolute humidity measurement. We're measuring the actual amount of water in the air, and that's really, really important. So say, for example, I said, okay, well, this glass that I showed you in the picture is only half full. It's 50% humidity, and I'm going to pour this glass on your hardwood floor. Would you be very concerned? Well, if that glass is the size of a thimble, that may not be that big of a deal, but if that glass is five gallons large, I think you'd be very concerned that I'm pouring half of that container onto your floor. So we see that the amount of moisture matters more than the percentage of the moisture that fills the the container. So that's why I like using dew point in measuring moisture in the air, because dew point does not change with the air temperature. It's sort of like the dew point is how many ounces or pints of water are in the container. Does not matter how big the container is, it is the actual amount of water that's in the container. And that is a lot more consistent when we're dealing with humidity problems. So I like to look at both relative humidity and dew point, but I start, started to use dew point a lot more. So as a homeowner, you want to be able to pay attention to both the relative humidity but also the dew point in your air, because dew point is also the temperature that water vapor can condense into water droplets. Those water droplets can create a very hospitable environment for biological growth, and we want to avoid that. So again, dew point measures how much water is in the air. So what is a safe dew point?

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Tim DeStasio

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Well, here we have a map of the United States, and if you Google dew point map, you're going to see several websites that track this continuously. This is a typical summer day in the United States. And again, dew point is acturing, is measuring the actual moisture. So any surface that its temperature is below that number, that dew point, that temp, that surface, will condense moisture into little water droplets. Those water droplets can do damage. And again, they allow biological growth to thrive. So the safe line that we've established is 60 degrees dew point. That's what we want to try to stay under in our homes. So yes, relative humidity is important, and we'll get to that, but dew point is also very important. So if our dew point is under 60 degrees, there are not a lot of surfaces in the summertime in our homes that are below 60 degrees that we may condense moisture. The coldest surface in our homes in the summertime are our air conditioning vents. Everything else is usually room temperature. Room temperature may be anywhere between 70 to 75 degrees, typically whatever you set your thermostat to. So the only cold surface in the house that would be exposed to that air in the house are your air conditioning vents. And typically, air conditioning vents are going to be around 60 degrees. So we can see that 60 degrees is really the very upper limit of the dew point that we want to keep in our house. If our dew point is above 60 degrees and our air conditioning vents are below 60 degrees, we're going to start seeing condensation. Rust, maybe even biological growth around those air conditioning vents, and that's a problem. So really, if it's over 60 degree dew point outside, if we open up our dew point map or weather app and we see what the dew point is, if it's over 60 degrees dew point outside, then that humidity is going to try to get inside and left uncheck, then it will also be 60 degrees dew point in our house, so we start to think about humid weather coming when the dew point is over 60 degrees. Now let's take a look at this map. This map is probably sometime in July to September in the United States. We see on the eastern part of the country, in the orange and red areas, dew points that are well above 60 degrees in many areas. Take a look there in the southern tip of Louisiana, 79 degrees. We see it in the high 70s in Florida, right around that Gulf. That is extreme humidity outside, and that humidity is very difficult to deal with. And then we start looking at even areas, like where I'm at in North Carolina, 66, 70, 72 degrees. And even up in northern climates, in New York and Maine, we're seeing dew points in the 60s. Up there by the Great Lakes. We're seeing dew points in the high 60s in low 70s. So again, it's not so much your proximity to the Gulf. Look at Michigan, 72 degree dew point. There's a lot of bodies of water there that are warming up and that water is evaporating. So proximity to bodies of water really, really is important, but it's also the way that the weather works in our country. So notice there on the western part of the state, or in the center, where the mountains are in Colorado, we got dew points that are really, really low, 21 degrees. Why is that? It's because those mountains are blocking that humid air from the Gulf and there that those areas are being influenced more by the cold air from Canada. We go to the West Coast, and we have very reasonable dew points, 50 to 55 that's actually our target dew point for indoors. We want to be well below that 60 degree upper limit. 50 to 55 would be ideal. And it's already that outside, even if we get up there in the Pacific Northwest in Washington, we're seeing sort of high dew point, 61, 63 that's really at the very beginning of humid weather. But they really don't struggle with humidity on the western part of the country. It's really east of the Mississippi where we just have that influence from the Gulf, and we don't have mountains to block us. So what I'm getting is when you see, in the summertime your dew points above 60, your home is probably going to start needing some dehumidification. Now your air conditioning unit may be able to provide that dehumidification, but when we get above 70, it becomes very difficult to keep that humidity at bay indoors.

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Tim DeStasio

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What are safe humidity levels? Well, again, most people think about relative humidity in that percentage, and that's fine. Really, the safe when we think about relative humidity is between 40 and 60%. That's where the environment is least conducive for bacteria, viruses, fungus and other allergens, pollutants, biologicals to thrive. They don't like that 40 to 60 band. So if we can keep our homes between 40 and 60 year round, well then we're going to be a lot healthier. But I would also add that we need to keep our dew point under 60 degrees. And so when people ask me, well, what's the highest humidity that you would say is safe in the home? I would say 60% relative humidity, 60 degrees dew point, 60-60. Yeah, now occasionally it may spike if we get a thunderstorm. Humidity may spike to low 60s, but it should come right back down. It's those extended periods of time where it stays above 60% and 60 degrees that we start having problems.

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Tim DeStasio

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So how do we control indoor humidity? Well, let's first talk about bulk moisture. When we get rain, we need to shed that bulk water away from our home as effectively as possible. So obviously, having things like roof leaks are a problem. We also want to make sure there are homes have gutters and that those gutters are properly sized, properly pitched, properly designed. And the best way to do is just put on a raincoat during a really heavy rain, as long as it's not lightning outside, and walk around your house and see whether your gutters are able to handle the moisture. Those gutters should not be overflowing. They should be free and clear, and they should be sized and designed properly so that during a heavy rain they're able to still funnel that water to your downspouts. Your downspouts should not only terminate down at the ground, but also direct the water away from your house. The grading around your house should be directing the water away from the house. We want to shed that bulk moisture away from the house as effectively as possible. So being able to see how your house reacts to a storm or a lot of rain is really, really important. The next thing that we need want to think about is water vapor in gaseous form, air sealing the home. This is where the weatherization process takes place. A blower door test, I'm sure, is part of this learning process that that you'll be learning. Blower door test is going to reveal that infiltration number. It's going to reveal places where the home is is leaking in water vapor or humidity, and then we want to seal those leaks, as much as the accessibility to them allows us to. Things like sealing a crawl space. We talked about water trying to wick up out of the ground, and then that turns into a humid crawl space, which then transmits into the rest of the house. We can seal that crawl space with a thick mill vapor liner. Not only is it going to be a cleaner crawl space, the amount of bugs and other pests are going to be greatly reduced, but the humidity is going to be very reasonable, and that can go a very long way into making our house less humid. Then we also want to properly size the HVAC, and we have that water coming into a door, a boat taking on water analogy again. So imagine if you're out in the water and you're taking and you're taking on water, but fortunately, you have someone with a bucket, or maybe you have a little pump, and you're able to remove the water at the same rate that it's coming in. Well, you can eventually make it to shore, and there's really not much to worry about as far as your safety. But imagine if the person that's holding the bucket decides to only scoop out water 10 minutes out of every hour, your water, your boat is going to take on water, and you're not scooping it out and we your boat is going to fill up with water. That is pretty much what happens when your air conditioning unit is oversized. If your air conditioning unit is properly sized and your home is not excessively leaky, then your air conditioning unit sort of like that bucket, you are

removing moisture at the same rate that the moisture is coming into your house via infiltration and those other factors that we already talked about. But if your air conditioning system is oversized, it is not running constantly, and so it may be only running maybe 10 minutes out of every hour. Well, your house is taking on water vapor 60 minutes out of every hour, but your AC unit is only removing it 10 minutes out of every hour, and that is how oversized AC units allow homes to not be able to control their humidity. And so the properly. Size HVAC system. We want it during a really hot, humid day to run constantly, if all possible. The problem is we don't always get humidity when it's really, really hot outside. It can be mild outside and still be just as humid as if it would be if it was hot outside. And there's nothing we can do about that. We can't control the weather, and most AC units are just going to cycle on and off during that mild weather, and they're not able to keep up with the humidity. So that's why air conditioning systems, HVAC systems, need a little bit of supplemental help to be able to still remove that humidity, even when the outdoor temperatures aren't requiring us to run AC constantly. That's where a whole house dehumidifier comes in. And a whole house dehumidifier works separate from the air conditioning. It is going to sense humidity, and its sole job is to turn on when the indoor humidity is higher than what we have it set to.

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Tim DeStasio

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So there are two different types of humidifier choices that a consumer typically has to make, the whole house versus the portable. Now, the whole house dehumidifier is going to be more expensive. It's going to run upwards of four or $5,000 for a smaller one on up to several thousand more. It should be professionally installed. So that installation is going to cost you upwards of four to $5,000 but the advantage to it is that it is one central unit that you can connect ducts to, and those ducts can either connect back to your existing HVAC ducts, or you can run dedicated ducts to be able to pull humid air from the house and then distribute dry air back into the rooms of the house. So you only need one of those units, typically, for each floor of your house. That compare that to your big box store plug in dehumidifier. You're going to need several of those, usually one per room. They're going to take up space in that room. They're going to need to take up a wall outlet. You've got to either empty the pan that's going to fill up rather quickly, multiple times a day, or you're going to have to run some kind of drain tube outside or into a sink. And so now we start disrupting our way of life with the cheaper dehumidifier. Compared to a whole house dehumidifier like the Santa Fe brand. The portables fail sooner. They usually only last for a few years. A few years ago, there was a huge recall on a lot of the ones that were made, because they simply were not safe to use. And a whole house dehumidifier is going to come with a better warranty. For example, the Santa Fe Dehumidifiers that I install in my business, they come with a five year unit replacement warranty. So the manufacturer will actually ship you out a new unit if it fails within the first five years, and on year six, then they'll send you the part that has failed. The other advantage to a whole house dehumidifier is that they have a good filter inside them, sometimes even a MERV 13 air filter. So now you're improving the air quality, because you've got a MERV 13 that is catching a lot smaller particulates out of the air. You also have an option for bringing in fresh air from the outside. When we use a dehumidifier that mixes fresh air from the outside with the air in the home and treats that air before it delivers it to the home. We call that a ventilating dehumidifier, and that is a very effective way, especially in humid climates, to bring in some fresh air to dilute the stale air in your house. But not just dump a bunch of moisture or humid air into the house. It's going to treat that air first.

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Tim DeStasio

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So what do we look for when we're choosing a dehumidifier? I always suggest seeking a professional. Yes, I understand that the trend now is to do it yourself, and I get it. I talk about, unfortunately, we have a lot of contractors out here that are not doing professional work. So why would you pay professional prices if you're not going to get professional work, you shouldn't! But if you can find a good, solid professional that knows what they're doing, that is always going to be the better result for you. If that dehumidifier isn't big enough. So if you don't get the right size, if it's too small, it simply is not going to keep up on a humid day. If you get one that's too big, it's not going to be an efficient use of your energy. It's going to short cycle. So we sort of want the dehumidifier to run constantly on a humid day, just like we would want the air conditioning unit. Because when these units cycle on and off for the first few minutes that they cycle on, they're not removing any humidity. They're trying to stabilize. But if once they stay running, if we can get them to stay running, then they are very effective at removing moisture. We just don't want them to cycle on and off. And if you can find one that uses a MERV 13 filter, that is always a better choice. Now, as far as their installation, here, we have a typical diagram of a ventilating dehumidifier. So it can tap into the existing duct work. So we have a heat pump air handler here that pulls its return and then it goes through the air handler and then delivers cool air out of the supply. And all really what we're doing here is we're installing this dehumidifier to tap off of the return of the HVAC, and that's connected to the return of the dehumidifier. So we're just creating a parallel loop for the air to go and then we're taking that air, we're drying it, and we're delivering it back into the supply duct of the HVAC. And then the supply ducts will distribute that dry air throughout the house. The Santa Fe brand has a powerful enough blower that can overcome the pressure in the ducts and still be able to deliver that air in the ducts while the HVAC is running. Lesser brands are not able to do that. So that is the ideal setup. It's the least invasive setup, I think, because we're not having to cut new grills or registers in the house for your dehumidifier. We're tapping into what's already there. Now we talked about a ventilating dehumidifier. We could add an outside air duct that mixes a little bit of outside air with the air from the house, we treat it, we filter it, we dry it, and then we deliver it to the house. And so I always talk to my customers about considering a ventilating dehumidifier. Because yes, we know that our houses leak, and when they leak, they're pulling in air from who knows where, attics, crawl spaces, dirty areas of the house, but if we can control where we pull in our fresh air through, and then treat that air before we deliver it to the house. That's a whole lot better than leaving it up to chance.

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Tim DeStasio
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Dehumidifiers are a piece of mechanical equipment, just like an HVAC system, and they require maintenance. So they all have will have a filter in them. The filters are a lot of times special to that unit. They're not filters you can get from a big box store. So what I suggest is, when you get a dehumidifier, find out what filter goes with it, and buy a three pack or a six pack, and then you're you're good for a little while and always have one on hand. They're gonna, those dehumidifier filters are going to need to get replaced every one to six months, usually. If you want to know if your dehumidifier is performing well, you can simply measure how much condensation is coming out of it, so you can find that little pipe that comes out of your house, and you can measure how much, how many pints in an hour does it remove? You multiply that by 24 and you figure out how many pints per day. You can then compare that to the number that it says on the dehumidifier, what it should be operating at. So if we have a 98 pint per day dehumidifier, then we are looking for at least two thirds of that to come out. And the reason why we're not looking for all 98

pints per day is because that rating is given under a set of conditions in a lab that are simply not realistic in the real life. And so the government agencies that rate these dehumidifiers require them to test them in those lab conditions. Those lab conditions are not what we keep our houses at. So a typical dehumidifier should be able to move around two thirds at least of what its rated pints per day is. If you have a 98 pint dehumidifier, and it is only moving 20 pints per day on a very humid day, then your dehumidifier is probably not operating correctly. You need to get that looked at professionally.

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Tim DeStasio

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Humidification. We've talked a lot about dehumidification, but when the air is too dry, that can also be a problem. So low humidity is typically a problem in the winter. That's because it's so cold that the air cannot hold enough moisture. And so as we live in our houses, we are breathing and showering and cooking in our houses, and that's actually helping the humidity in the wintertime. The problem is, if our houses are leaky, that humidity that we're creating internally is just leaking out of the house. And so a lot of times we get respiratory problems. It's irritating. People wake up with nosebleeds when the air is too dry. The other thing that happens is that dry air can make us sick, and that is just because the dry air allows dust and other fine particulates to float around in the air longer, instead of just settling down on a table or the floor where they're going to get wiped up or vacuumed. And so when they float around the air longer, they stand more of a chance to get aspirated by us, and there are germs and other things that make us sick that piggyback on those particulates, and so that's why we don't want the humidity in our homes to be under 40%. Now, the best residential humidifiers are models that make steam, and that's simply because steam mixes with air a lot better than atomized water. See, misting dehumidifiers are a lot cheaper, but we are essentially spraying water droplets into the air, and we hope that they are going to mix with the air. What ends up happening, though, is over time, those water droplets create moisture problems inside the ducts, and then we have a whole nother set of problems. So steam models are best. It's best to have a professional install them, because there's a lot of ways that humidifier installation can go wrong. Follow very strictly the manufacturer's instructions. I personally have used the Aprilaire 800 models. They've been very effective. This particular model uses a canister that automatically fills up with a water line that you install, and they use the conductivity of water to actually evaporate the water and turn it into steam. It's a pretty cool process.

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Kendra Seymour

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Can I just jump in? Because another option too, and we have a mold sensitized population who who follows a lot of our stuff, that you can always opt for the stand alone ones, knowing you know that you need to contain them and clean them, but if it makes you nervous or budget's an issue, you know, you can, since it tends to be a winter or very seasonal specific, regional specific thing, there are standalone options too.

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Tim DeStasio

36:49

Yeah, and those, I think are a really good option. I end up a lot of times talking people out of getting a central humidifier just because it doesn't seem to make sense in their application. A lot of times there's not enough room to install a central humidifier. I don't particularly like installing them in attics because of the potential of them leaking water down below. So sometimes, yeah, just the house is not offering you good options for a central steam humidifier. So I agree 100%! But the central ones, they inject steam into the HVAC supply duct. They require the unit to be running. And so there are certain controls that need to be put in place so that we don't allow the humidifier to run if the fan is not running. And so these are things that installers and contractors tend to not do when they're not reading the manual. They don't think about those sort of things. And then one day, maybe the fan motor in your HVAC system goes bad, but the steam humidifier doesn't have any controls in place to tell it that there's no air flow. And then we're just dumping steam and not giving it a volume of air to mix with, and that's how we end up rotting out ducts and even, you know, creating some some biological growth in ducts. So they really have to be installed properly. The other thing to consider about when humidifying a home is window condensation, because the windows are going to be cold surfaces in the house, and condensation happens when humid air hits something cold. So we're creating humid air with the humidifier. The weather is creating something cold in the winter, in the window in the winter. So if you have single old single pane windows, they are probably right on the edge of sweating, as it is, even without a lot of humidity in the house, double pane windows or will allow you a little bit more protection. But if you're in a very cold climate where you're seeing consistent weather in the single digits, you probably are not going to be able to run the humidity in your house over around 30 to 35% and that typical temperature in the house is 70 degrees. We started doing a dew point calculation, and we realized that in cold climates, it's very hard to humidify the house and not have windows sweating unless we have really good windows. So two factors is the outdoor temperature and the quality of your windows are going to drive what that humidity set point is. We don't want these windows sweating, because that condensation is going to run down. It's going to collect at the bottom of the windows and rot out the windows, and that's a problem. So again, if you do decide to humidify your home the winter, keep an eye on your windows. If you start seeing a little bit of condensation or fog forming on the inside of the windows, just lower your setting just a little bit until that goes away. And that is the end of my side of the presentation.

KS

Kendra Seymour

39:52

I love it, Tim. This, this is so important. And you you touched on this. And I'll just add a little antidote. You know, in our home a few years. Ago, we had to install whole home dehumidifier, and it made world of a difference. But I have been tracking because of everything my family went through for years and years, like our relative humidity and things like that in our home. And I think one of the things that surprised me early on, after doing this for a number of years was in the spring and fall, I noticed our relative humidity was higher, and that surprised me, because I'm in hot, humid Virginia. And then I realized, oh, it's because the AC or whatever isn't running as much, because the temperature outside is it was fairly comfortable, and so there was nothing removing that moisture. And so, you know, people tend to think, well, I don't live in a place with a hot, humid summer, that is the obvious time we're thinking about dehumidification. But there are other times too, that it matters and it and so my relative humidity in the summer was always lower

than some of those transitional seasons for that reason. So something for people to think about. I thought I had it with me, I don't, but you can get, like, a $12 hygrometer online, and you can get one for each floor, and it's a good way to start thinking about, what is that relative humid? You can't feel it right. And the number on your thermostat, how accurate, in your opinion, is that, you know, on my thermostat there's a single number for my relative humidity? Is that accurate? Can you speak to that.

TD
Tim DeStasio
41:22
Depends on a thermostat. I've had a calibrate, I have a very good ecobee thermostat. I've had to calibrate mine. One thing that can throw them off is where the thermostat cable comes out of the wall. That wall cavity is probably going to be humid. It's going to communicate with attics and crawl spaces. And if that hole that where that wire comes through is not sealed, then the humidity sensor is right there, and it's going to pick up more of that reading than it is around the room. So good little trick is, you know, if you pop your thermostat off the wall, you have your sub base, where all the wires come in, just get a little bit of silicone and seal up that hole, if you can. Even if you pull the the sub base off with the screws, and you can silicone that and then put everything back, that may make things a little bit more accurate.

KS
Kendra Seymour
42:09
Yeah, no, that's helpful. Thank you. And this has been helpful. I want, I want people thinking about this in their homes, going forward, you know, thinking about the moisture in the air and what that can mean for their their home and their house. So this was incredibly helpful. If people had follow up questions, how could they get into contact with you?

TD
Tim DeStasio
42:28
They can certainly visit my website. It's comfortsciencesolutions.com. I'm on several social media pages. I have a YouTube page. It's Tim DeStasio HVAC. The content, there is more for HVAC professionals, but it certainly is relevant for anyone trying to learn this stuff for themselves. I have an entire playlist that's called psychrometric Saturday. And for an entire year, every Saturday I made a little three to eight minute video talking about temperature and humidity and psychrometrics and just in really easy to understand. So start at the beginning and work your way through. There's there's about a year's worth of content there. I'm on LinkedIn, it's Tim DeStasio. There is a space between the De and the S on LinkedIn if you find me. And my company is Comfort Science Solutions, and I am an HVAC designer. So if someone is trying to build a house and they want to make sure it's healthy, I can design the HVAC system and work with your contractor that's putting it in. If you have an existing home and you're having some problems, I have done even remote consultations, you may have to buy a few tools, but if you're willing to tackle that, we may be able to get some really good information so that we're pointing your local contractor who'll end up implementing the fixes in the right direction. And I'm also located in the Wilmington area of North Carolina, so obviously, here locally, I'm able to do on site visits as well, and I do contractor training. So I offer classes locally and virtually for contractors who just want to be in a better position to tackle these problems using building science and not guesswork or sleazy sales tactics.

KS

Kendra Seymour

44:17

Tim, that's why I love you, because it you approach this and like as an always a learner, and this is about building health and the home as a system. And I appreciate everything that you're doing to kind of drive the industry forward and and kind of change and elevate, you know, this piece that is so like, critical to our homes. Wherever you live in the US, chances are you have some sort of heating or cooling component, if not both. And this tends to be an area I think that people forget about. It's it can feel overwhelming, and it's often out of sight, out of mind, and it's just so important to our overall health. So thank you for everything that you're going to do. We're going to link to all of your links you gave in the show notes. For listeners, so you guys can find those easily. So thank you again. Tim, so much for being here. I really appreciate it.

TD

Tim DeStasio

45:05

Thank you for having me.

KS

Kendra Seymour

45:07

And for everyone listening. If you found this helpful and you don't want to miss another episode, head on over to ChangeTheAirFoundation.org, and sign up for our newsletter, because you're going to get notified first when these episodes drop. You can also head on over to our website and click on our resource tab, and there you'll see our mini class series, and you can go through one through 12. I recommend watching them in order, although it's not necessary. Sometimes you know you might be ready for different content material at a different time, and that's fine too. But two ways to find us. You can also find us on social media. Feel free to give us a like and follow why you're there. So thank you so much and have a great rest of your day.