

ray magic



Thermal Wellbeing

MESSANO®
air-ray conditioning

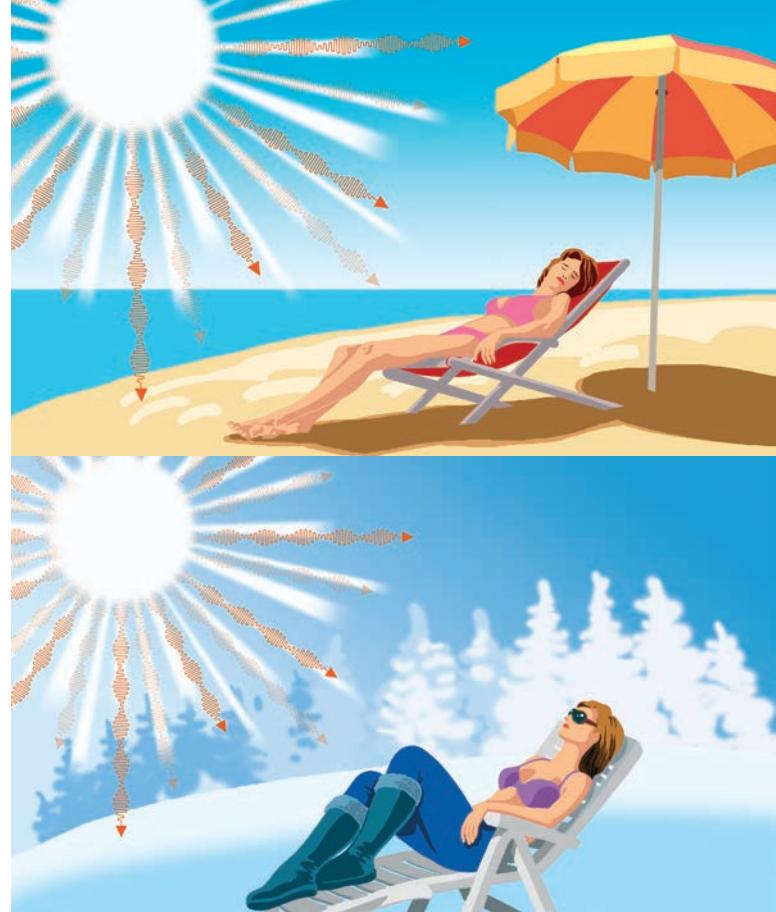
Understanding radiant heat

“Heat goes up and cold goes down” is a common belief about heat. But it’s false. All you need to do is stand in the sun to understand. Why?

The explanation lies in the confusion of terms. While it’s incorrect to say “heat goes up”, it is correct to say, “**hot air rises**”, which clarifies that the concept of heat is a broader concept which does not involve just the movement of air.

What we conventionally refer to as heat is nothing more than the internal energy (vibration) of the most fundamental state of physics. This vibration is expressed in the form of:

- electromagnetic waves (frequency)
- particles of matter (temperature)



Understanding radiant heat

“Heat goes up and cold goes down”

FALSE

“hot air rises”

TRUE

Heat in the form of electromagnetic waves (frequency)

In a rectilinear movement,
generating electromagnetic waves
(radio waves, infrared heat, light, UV, etc.)



Electromagnetic waves are emitted in all directions at 186,000 mile/s

Heat in the form of particles of matter (temperature)

In a circular movement,
generating the corpuscular vibration
of particles (heat of matter)

COOLER PARTICLES
vibrate less, taking
up less space
(greater density and weight)



WARMER PARTICLES
vibrate more, taking
up more space
(greater rarefaction and lightness)

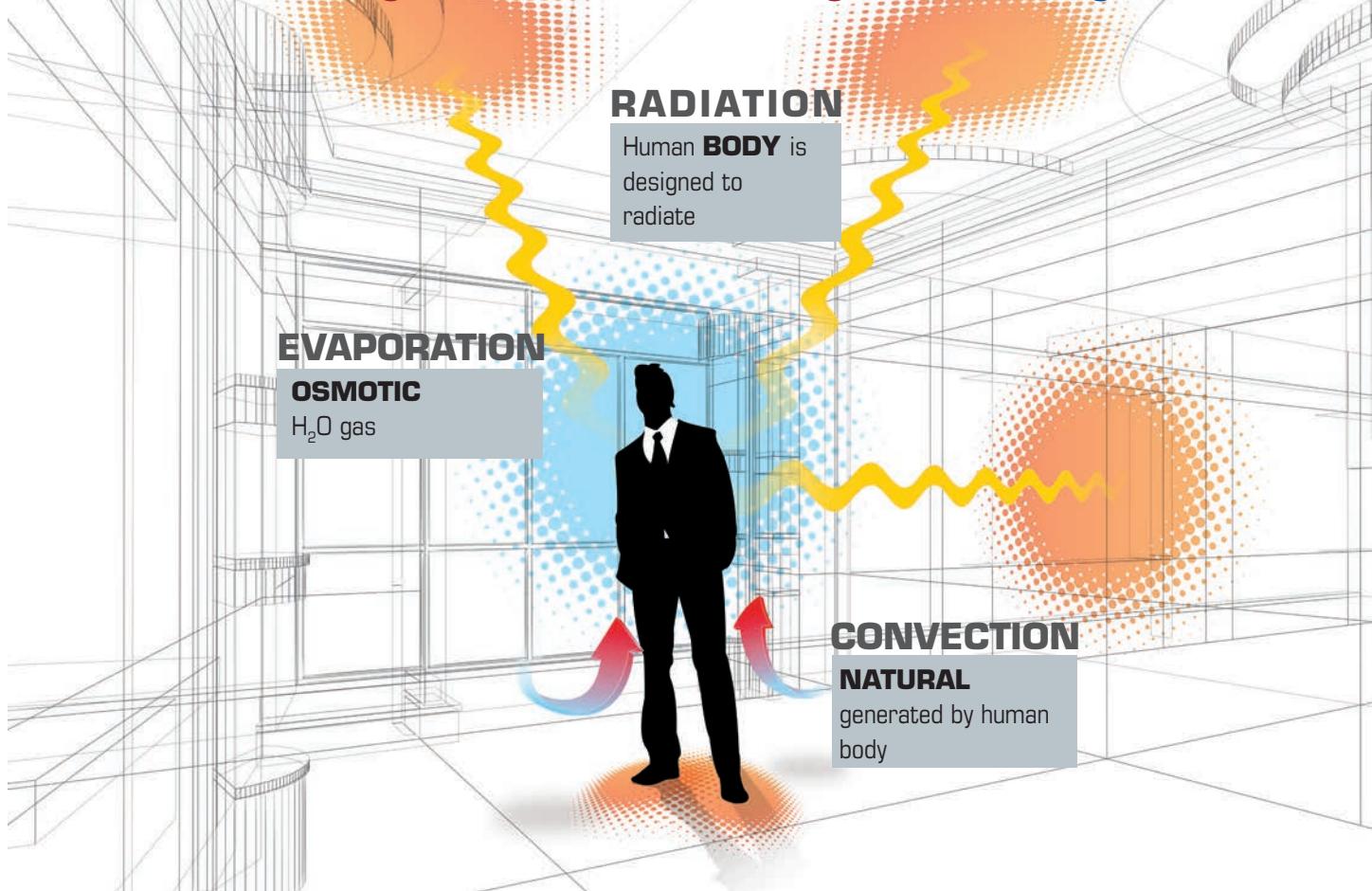


This is why air, which is fluid matter, rises if it is hot and falls if it is cold

These types of movement are not directly visible to the naked eye, but we perceive their effect as a sensation of warmth through special receptors all over our skin.

This fundamental vibration gives rise to three substantial and macroscopic methods of heat transmission:
RADIATION, CONVECTION and CONDUCTION.

Thermal wellbeing with radiant heating and cooling



TYPES OF HUMAN BODY THERMAL EXCHANGE	IDEAL THERMAL EXCHANGE PROPORTIONS	
	SUMMER	WINTER
RADIATION	45-50%	30-35%
NATURAL CONVECTION	15-20%	20-30%
OSMOTIC EVAPORATION	30-35%	40-50%

Thermal wellbeing is the achievement of the right balance between the different types of human body thermal exchange

To obtain these conditions:

- In the winter, walls, ceiling and floor should be about 5°F **warmer** than the room air
- In the summer, walls, ceiling and floor should be about 5°F **cooler** than the room air and relative humidity should be 55-60%

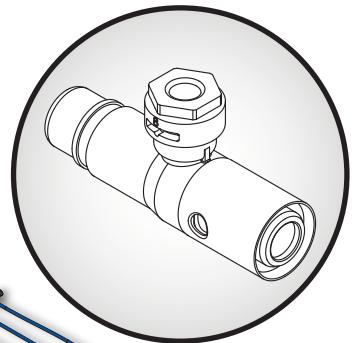
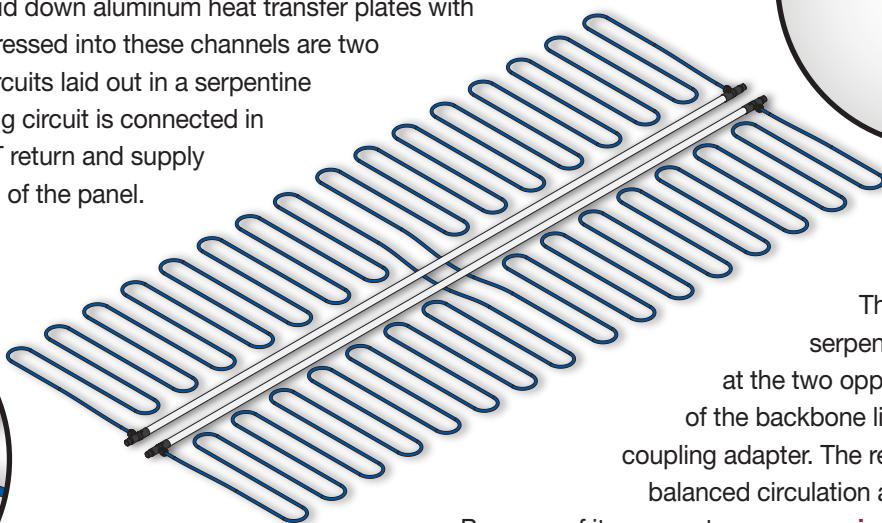
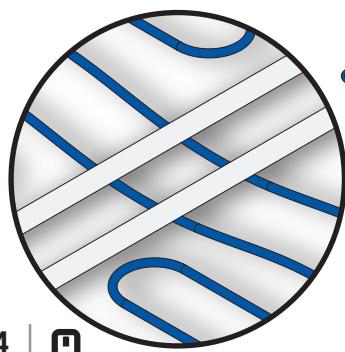
Only **messana air - ray conditioning** radiant **heating** and **cooling** systems can control the surrounding surfaces' temperature enabling the dissipation of our metabolic heat in the most comfortable and natural way: **by radiation**.



ray · magic

ray · magic, the radiant drywall

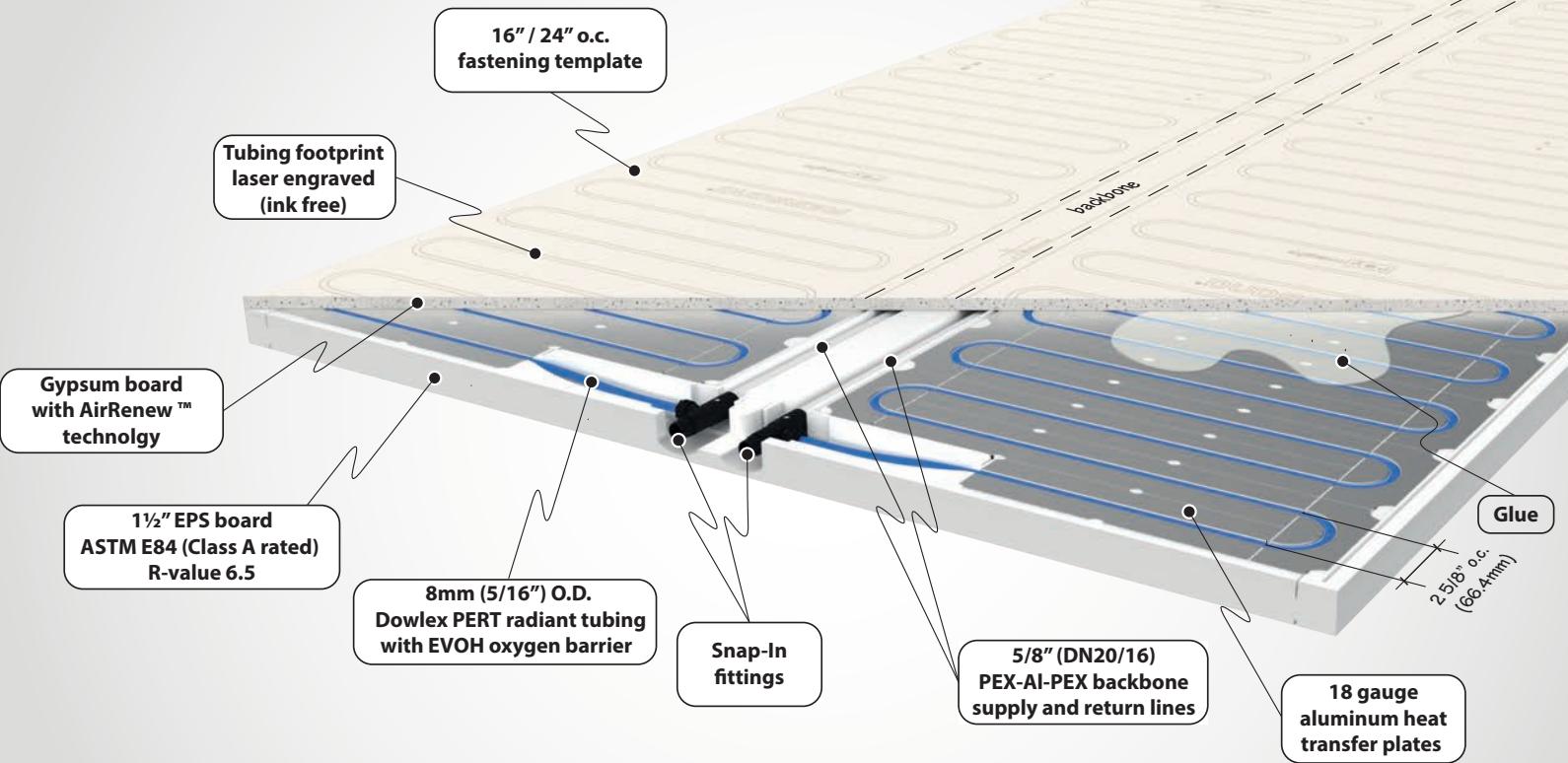
ray · magic is a prefabricated sandwich panel assembly consisting of a 1½" thick EPS board and a gypsum panel glued together. In between the two, over the pre-formed EPS board, are laid down aluminum heat transfer plates with specially shaped channels. Pressed into these channels are two symmetrical radiant tubing circuits laid out in a serpentine pattern (61ft long). Each tubing circuit is connected in parallel to 5/8" PERT-Al-PERT return and supply lines that run along the length of the panel.



Clever Layout

The connections of the serpentine tubing are made at the two opposite terminal fittings of the backbone lines with a three-way coupling adapter. The result is a system with balanced circulation and easy air removal.

Because of its symmetry, **ray · magic** can be connected at either end and in series, simplifying the installation process.

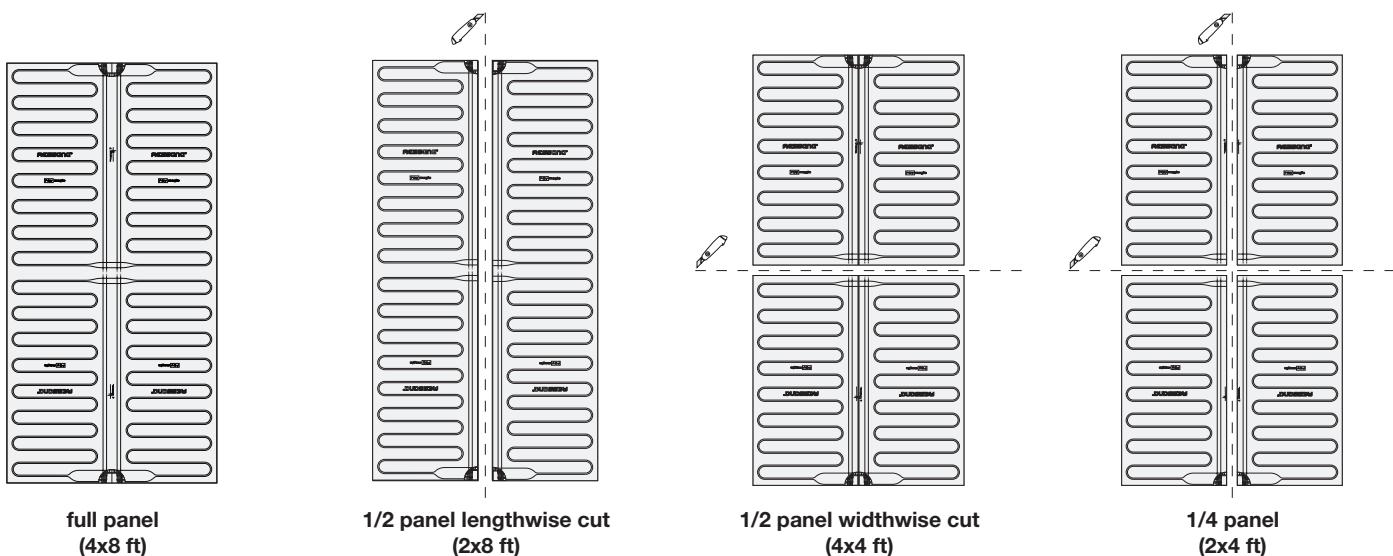


Anatomy of the ray · magic panel

THE RADIANT DRYWALL

One panel, four different sizes

ray · magic panel can be cut in half, lengthwise and widthwise, into sub-panels to better cover smaller areas and fulfill almost any building requirement. Cutting the panel is as simple as cutting drywall.



ray • magic technical specifications and thermal performances

ray • magic panel		1/2" STANDARD WITH AIR RENEW GYPSUM BOARD
Dimension (WxL)		4' x 8'
Thickness		2"
Weight (dry)		2.63 lbs/ft ²
Water content		0.49 gal (including backbone lines)
Radiant tubing		Dowlex PERT with EVOH oxygen barrier
Diameter		8 mm (5/16") o.d. - 5.5 mm (7/16") i.d.
Spacing		2 5/8"
Length		61 ft x circuit, two circuits per panel with 0.12 gal of water each
Heat output ^{†+}	typical	26.9 Btu/h/ft ²
	max	67.3 Btu/h/ft ²
Cooling output ^{‡+}	typical	22.3 Btu/h/ft ²
	max	34.8 Btu/h/ft ²
Effective radiant surface		~ 90%
Operating temperature		46 - 140 °F
Surface flame (ASTM E84)		Class A
Flame spread index		0
Smoke developed index		5

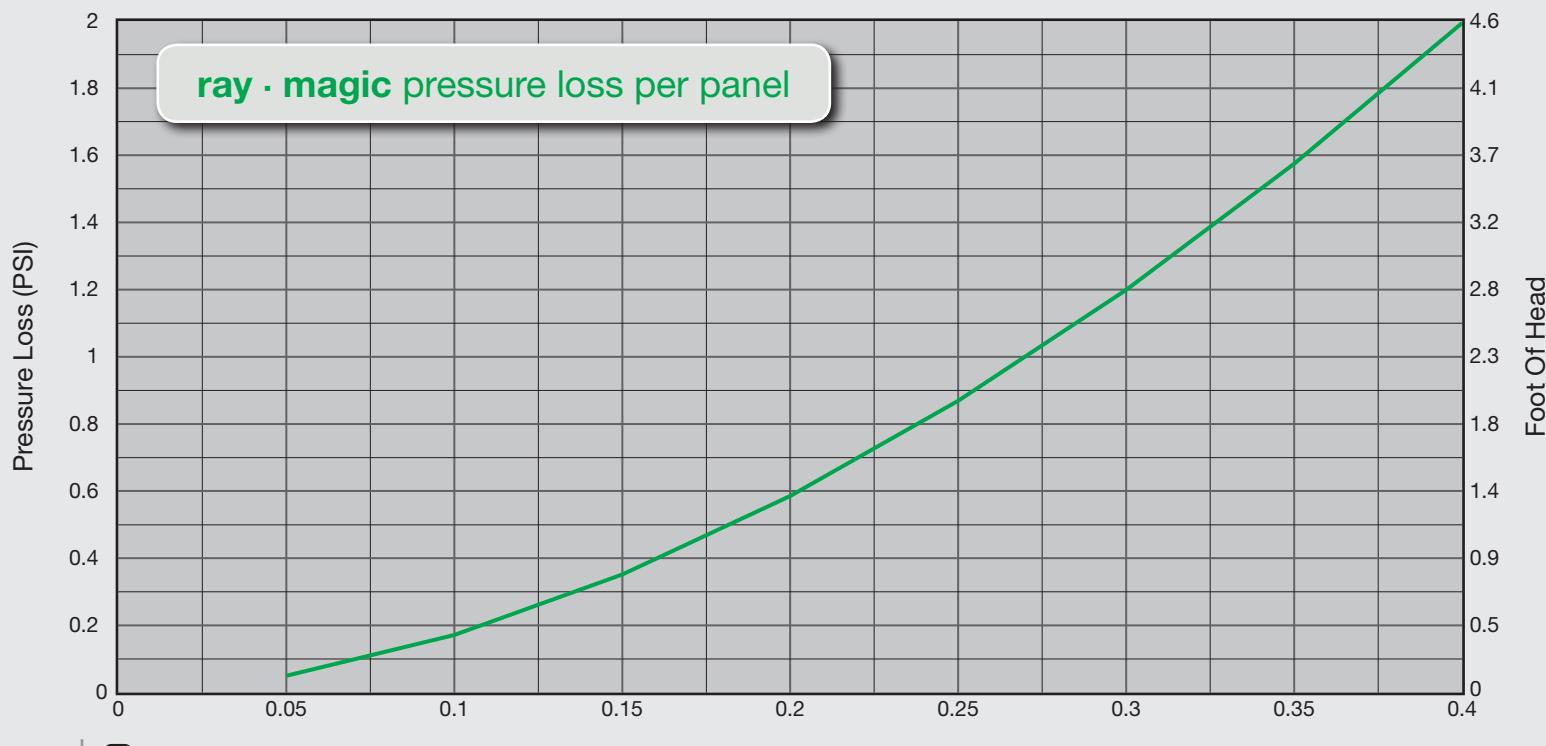
[†] Typical (100°F) / max (140°F) mean water temperature @ 70°F room air temperature. Tested in accordance with EN 14037

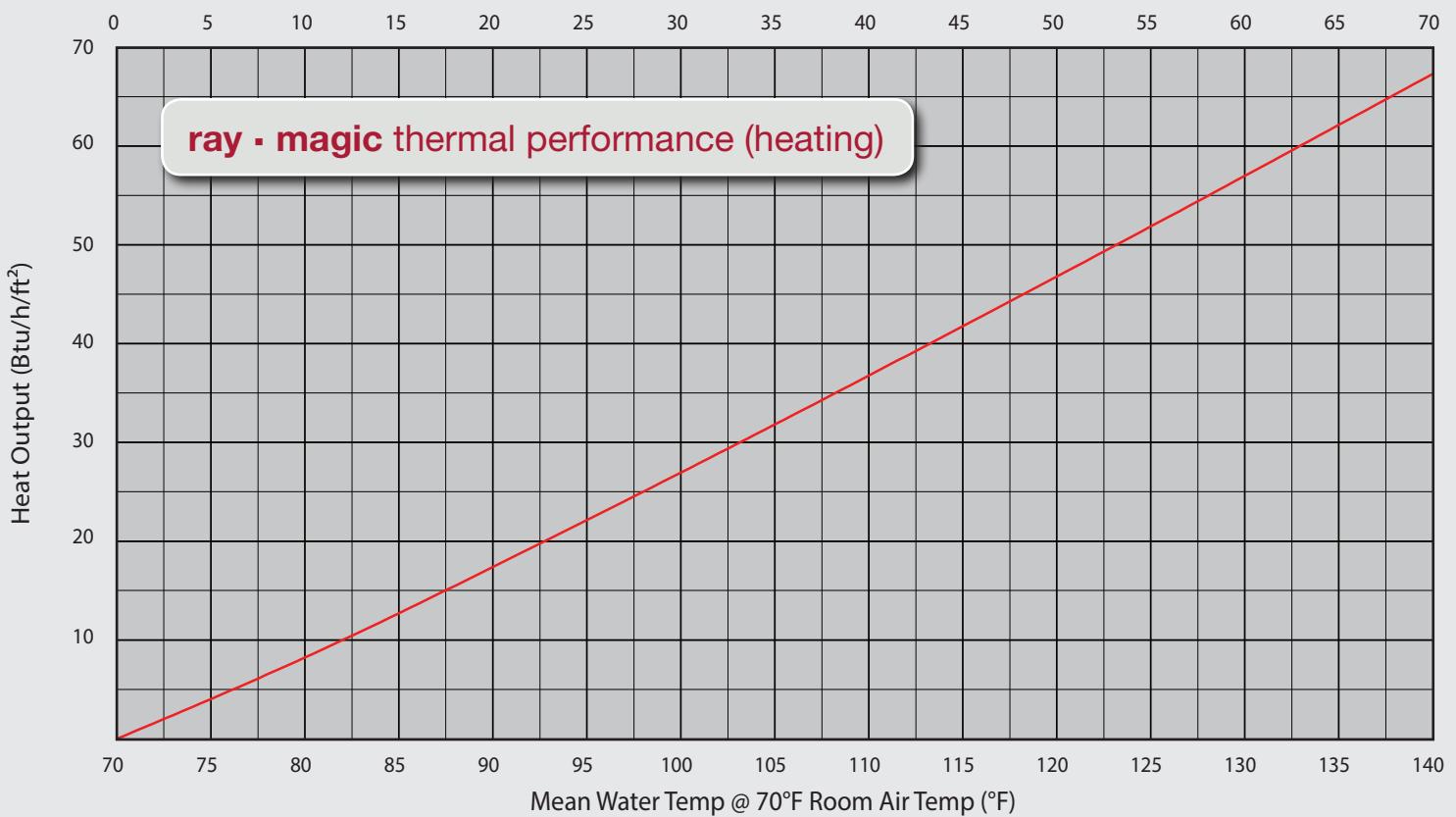
[‡] Typical (56°F) / max (46°F) mean water temperature @ 76°F room air temperature. Tested in accordance with EN 14240

* Data certified by third-party laboratory.

Effective radiant surface 90%

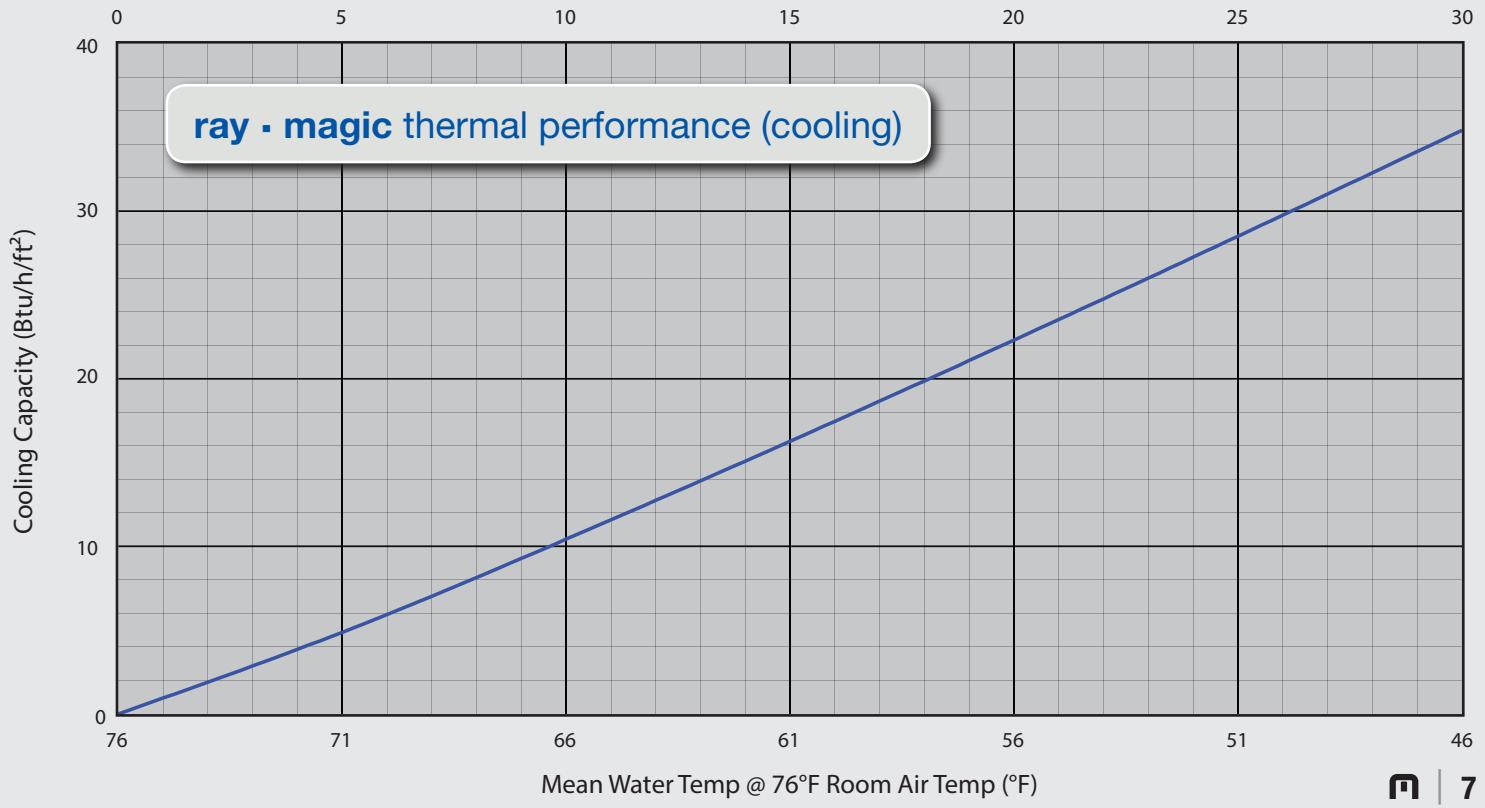
radiant tubing spacing 2 5/8"



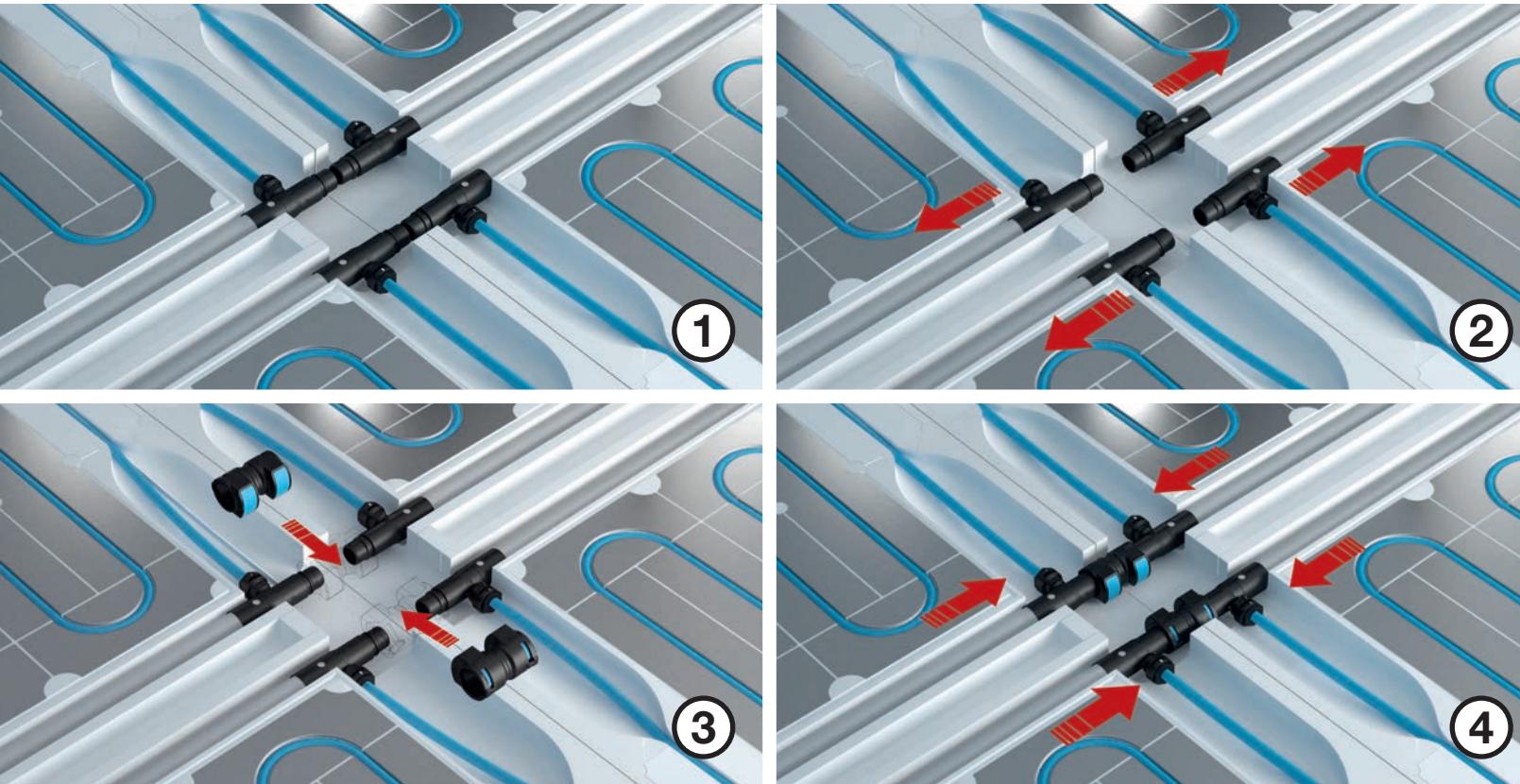
Mean Water Temp Minus Room Air Temp ΔT ($^{\circ}$ F)

Up to **67.3 Btu/h/ft 2** heating

Up to **34.8 Btu/h/ft 2** cooling

Room Air Temp Minus Mean Water Temp ΔT ($^{\circ}$ F)

Four easy steps to connect two panels with the coupling - magic



STEP 1

Install two **ray · magic** panels together aligning their return and supply line fittings

STEP 3

Insert the snap-in coupling between the two fittings

STEP 2

Slide out the return and supply lines to allow the positioning of the snap-in coupling

STEP 4

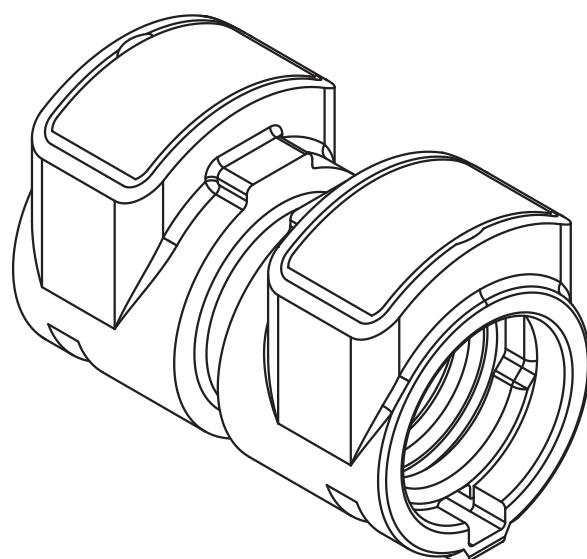
On both fittings snap in the coupling until it clicks

A revolutionary connection system

ray · magic features a revolutionary connection system (patent pending), that makes the installation of the radiant ceiling quick and simple.

The return and supply pipes are terminated, on both sides of the panel, with a snap-in fitting and are free to slide in and out approximately one inch. This allows the snap-in coupling fitting to be insert and eases the connection between two panels.

Without any significant loss of efficiency, up to **8 panels** (256ft² of radiant surface, typically more than 400ft² of ceiling) can easily be connected in series to a branch circuit connected to the main supply and return lines.



Tested 10 million times to 150 psi

Innovative joining technology

The **messana air · ray conditioning** connection system is based on a quick connect joining technology to make the plumbing of the radiant system simple, fast and cost effective.

We developed a complete pipeline system based on two different fitting technologies:

- snap-in (detachable joint, with push-button disconnect)
- fit-in (permanent joint)

messana air · ray conditioning fittings, pre-insulated 5/8" PEX-AI-PEX pipes (for the connection of the panels to the manifold) and the engineered plastic manifolds are all you need for the plumbing job. Chamfering tool and pipe cutter are the only tools required.

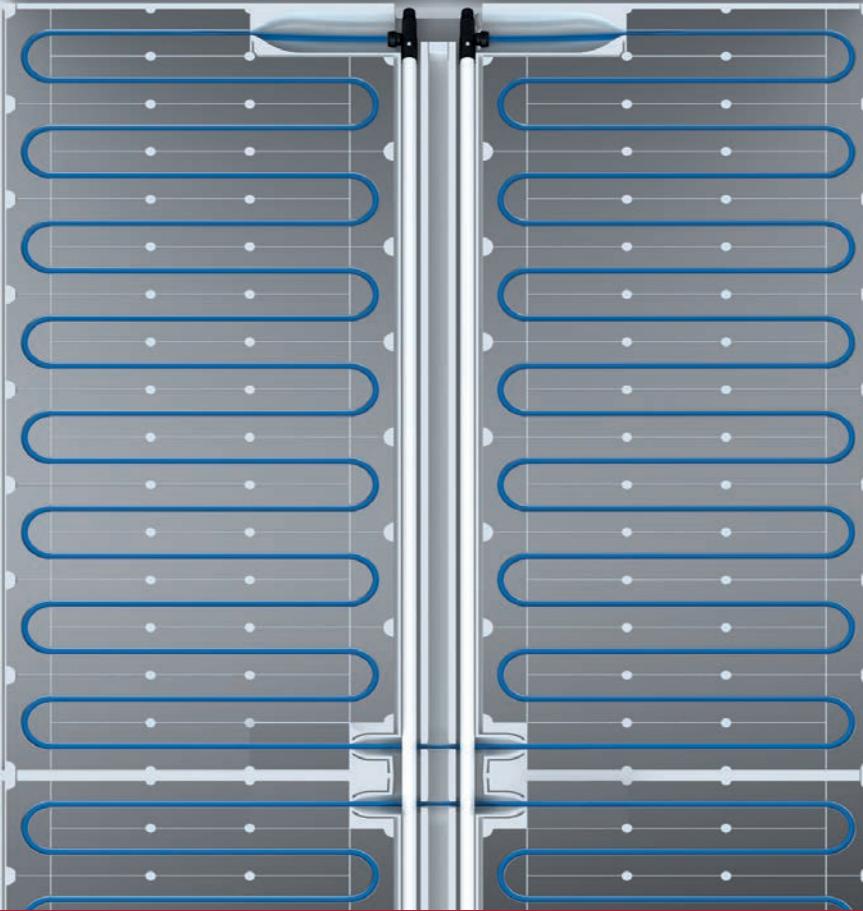


Innovative joining technology

10 year leak-free warranty



- Pre-insulated manifolds specifically designed for radiant cooling applications
- A complete range of fittings to make your plumbing job easier
- Made of advanced thermoplastic material (nylon reinforced with glass fiber)
- Pre-insulated PEX-AI-PEX pipes
- 100% leakproof installations, every time
- Dual o-ring sealing to provide a durable, high performance coupling
- No special tools are required



ray · magic, the radiant panel with backbone

Yes, **ray · magic** actually has a backbone, the secret behind its magic and its strength (patent pending).

Embedded 5/8" PERT-AI-PERT supply and return backbone lines run along its length and terminates at each end with a snap-in fitting. **ray · magic** panels can be connected together without any additional pipes, in a simple snap with the exclusive snap-in connection technology.

Snap! and the job is done.

The panels, the control system, temperature dehumidifiers: a complete

sense · magic, the thermostat and humidistat combo

sense · magic is an advanced thermostat and humidistat device equipped with two class A ($\pm 0.25^\circ \text{ F}$) PT100 sensors to constantly monitor both temperature and humidity of the room.

- Measure both dry bulb and operative temperatures
- Communicates to **control · magic** via TCP/IP protocol



bticino

sense · magic comes with Axolute BTicino wall plate in a very attractive design, with many different colors and materials to choose from. Find yours at www.bticino.us



control · magic, the brain of the system

Peace of mind is also important when it comes to comfort and **control · magic** electronic control unit goes one step beyond in this regard as well, because it is Ethernet, because it is powerful, because it is attractive and because it is based on the most sophisticated and highly tested control logic of air-ray conditioning.

control · magic is powered by a high performance processor to run complex comfort algorithm and is equipped with two Ethernet controllers (one for a private local network where all the other modules of the **air · ray conditioning** system are connected and one for a local LAN/internet to allow remote access).

control · magic offers simple and convenient zoning of space as well as simple effective occupant control.

the sensors and the neutral system with performance guaranteed

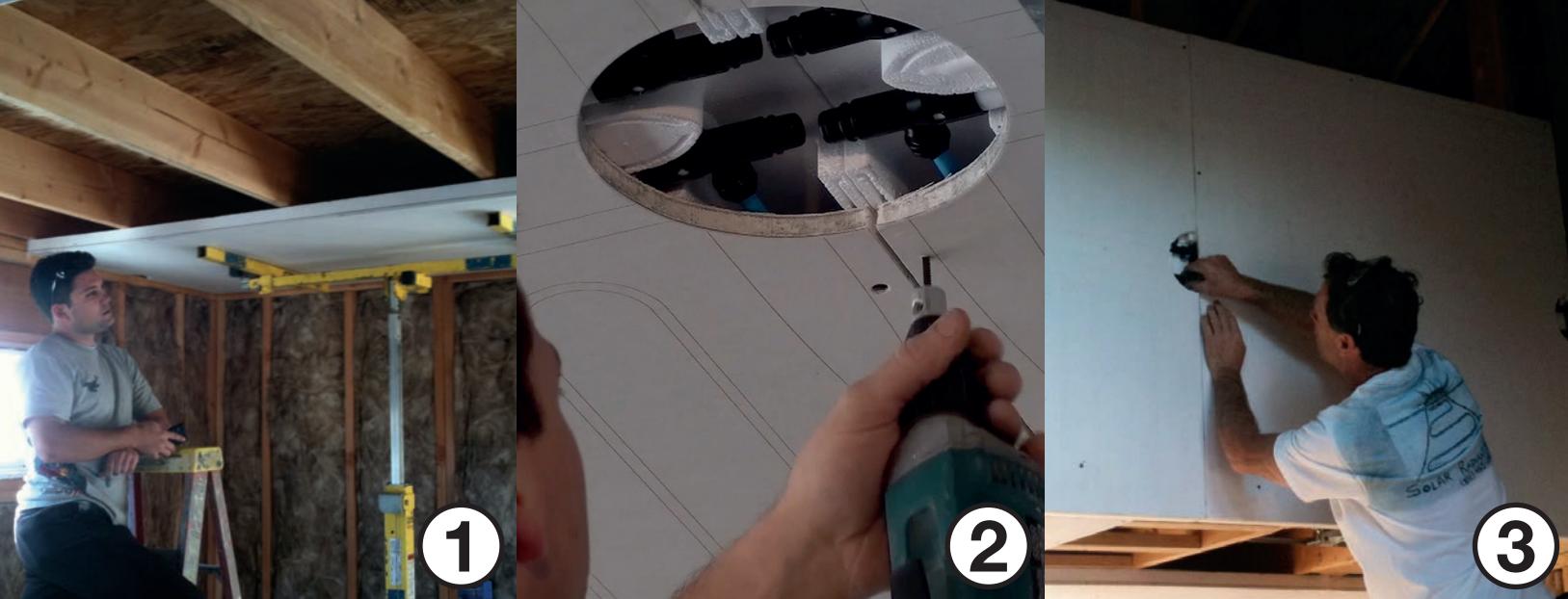
air · magic, neutral temperature dehumidifiers

air · magic is a line of neutral temperature dehumidifiers specifically designed for ray conditioning. High indoor air quality is the right level of humidity, cleanliness and neutral temperature without unpleasant drafts of air. The aesthetic and acoustic impact is extremely low, while offering energy savings that are unimaginable with a traditional air system.

- Dehumidification with recirculation function
- Dehumidification with Heat Recovery Ventilation function (with HRV optional module)



Extremely easy to install, as simple as hanging drywall



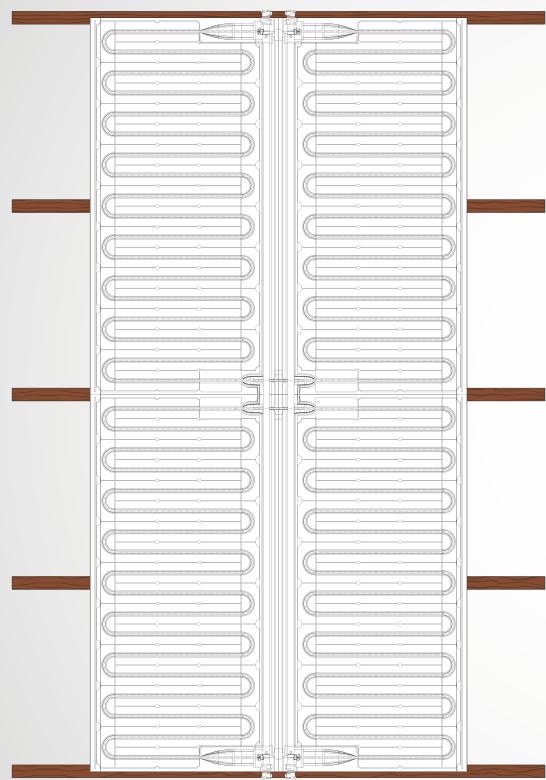
Extremely easy

ray · magic is extremely easy to install, as simple as hanging drywall.

It is installed directly to the framing in much the same way as traditional drywall, in 6 easy steps.

1. **Lifting and positioning** the panel
2. **Hanging** the panel to the ceiling joists (if needed can be cut in sub-modules with a drywall knife) using drywall fastening screws. With the piping footprint and the fastening template laser engraved on the drywall face, you will never hit a pipe!
3. **Connecting** panels together using the snap-in coupling. To favor this operation the drywall layer has a semi-circle opening in the fitting area
4. **Fastening** the semi-circle cut out (that is provided with the panel), to cover the fitting area and be ready for taping
5. **Taping and mudding** like standard drywall
6. **Painting**. Paint as standard drywall

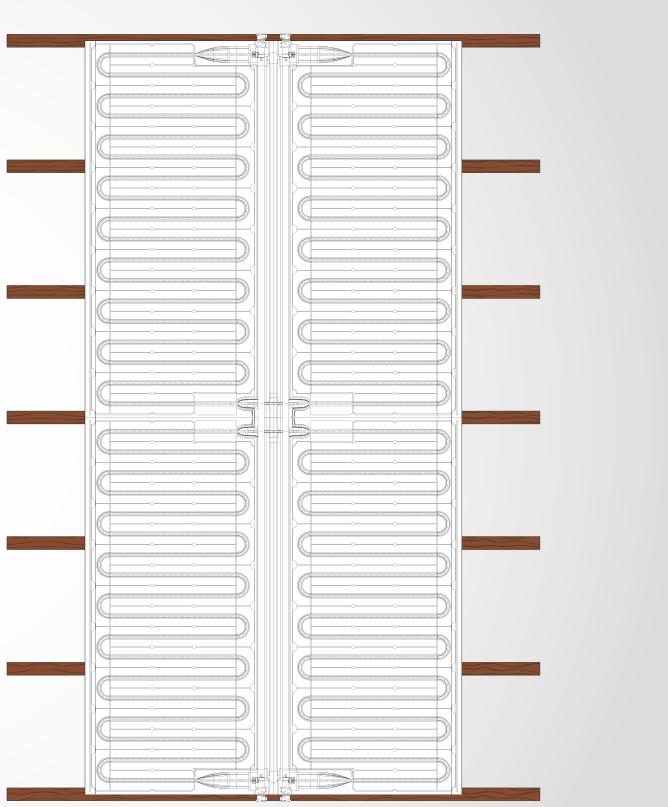
24" o.c. framing





to install as simple as hanging drywall

16" o.c. framing



ray · magic can be installed on ceilings and walls, on a 16" and 24" o.c. framing with drywall screws.

Because of its high efficiency, usually only 50-70% of the ceiling surface needs to be covered. For the remaining area 4x8 ft blank panels (EPS and drywall sandwich panel) are available to match the thickness of the **ray · magic** panel and provide a complete sound proofing system.

Blank panels can also be installed to accommodate recessed lights. Pendant lights can be installed drilling a hole for the electric cord directly through the **ray · magic** panel.

The **messana ray · magic** panel system is an effective way of **reducing labour costs** compared to both forced air and radiant floor systems. Its installation is simple and straight: the job is done in no time at all and it is completely safe.



YESTERDAY

Traditional job site

Obviously a radiant floor panel system needs to be installed before the flooring. Because the Pex tubing is typically laid down right after the installation of the panels, it is very possible to incur in tubing damage. The newly installed radiant floor has to hold up many other building processes and **extra care** in the construction site is required.

Some radiant panel manufacturers suggest temporarily covering the floor with mesonite panels or thin plywood, to protect it from spillage, debris and heavy foot traffic throughout construction.

- Radiant floor requires more complex panel layout
- Radiant tubing needs to be laid down
- Radiant floor has to hold up during different construction phases
- Tubing gets damaged during construction
- Temporary cover of the radiant floor during construction is recommended
- In the construction phases, radiant floor installation occurs at the wrong time, interfering with other critical work and delaying the schedule

Working in a building site with floors covered by pipes that limit movement and delay work is not cost effective.



TODAY
ray magic job site

ray · magic radiant systems are typically installed on the ceiling directly to the framing (and walls, if needed), leaving the floor of the job site completely free of pipes. This way, pipes are at reduced risk from damage throughout the construction.

ray · magic dry installation technology speeds up and improves the over-all installation of the radiant surface and combine heating and ceiling drywall in one.

- Easy to plan and design
- Fast and simple installation
- Radiant tubing is integrated in the panel
- Floor free of pipes, clean job site
- **ray · magic** is the drywall!
- Each panel can be cut in smaller modules of different sizes
- Complete air-ray conditioning solution

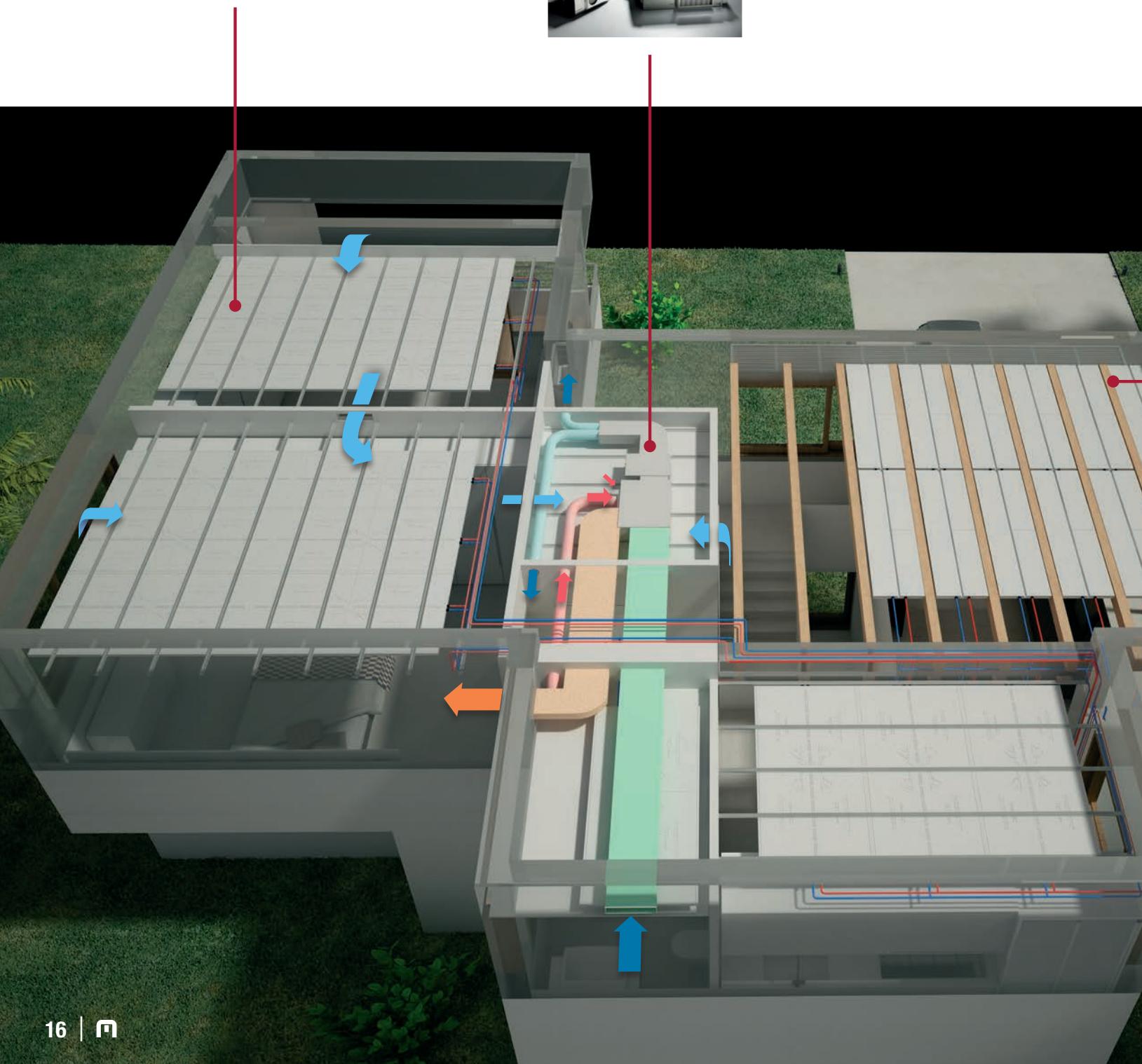
This is an obvious advantage for cost and time savings, and the job site is clean and tidy.

ray magic

ray · magic panels with Air Renew Indoor Air Quality gypsum boards offer a healthier living by taking VOCs out of the air and converting them into safe inert compounds



air · magic neutral temperature dehumidification system with heat recovery function to provide effective air ventilation



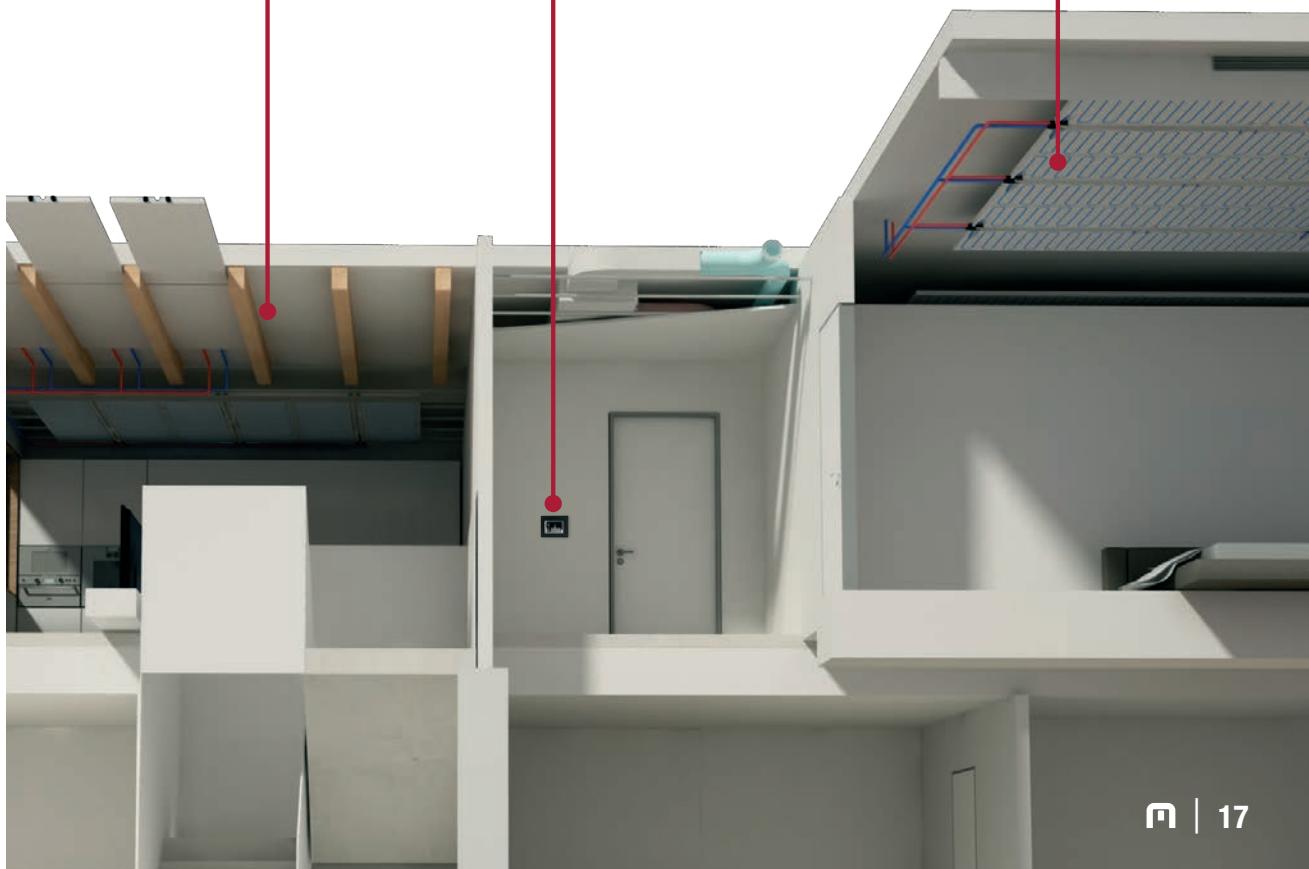
The house that **RADIATES** and **BREATHES..** just like you.



ray · magic ceiling panes provide an effective intake plenum

control · magic, simple and powerful, guarantees perfect climate control in any room

ray · magic beams panels fit between exposed ceiling beams

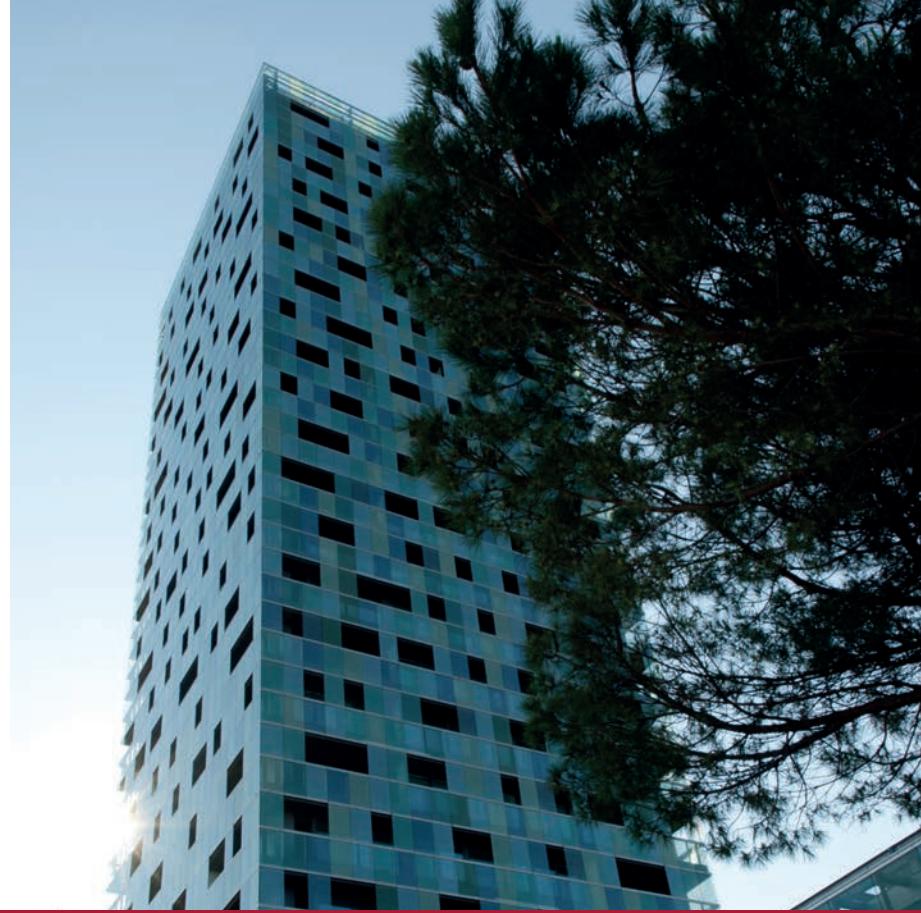


Great added value for new construction

ray · magic is the ideal solution for a wide variety of construction sectors, including residential, commercial, public, healthcare and education.

ray · magic system is energy efficient, helping to meet building regulations and increasing occupant comfort, which can help to improve productivity. Sound absorption panels can be used in order to meet specific acoustic requirements. Ceiling panels increase the amount of usable floor space and operate without significant air movement, contributing to less dust, pollutants and allergens suspended in the air, creating a healthier working environment.

messana air · ray conditioning system will save money every month. Lower energy costs and greater occupant comfort add resale value to the building.



Great added value for new construction

Ideal for retrofit



Ideal for retrofit

Extremely easy installation, incredible versatility and minimal invasiveness make the messana **ray · magic** system the perfect solution for remodeling.

It is very inexpensive and simple to lower a ceiling by $1\frac{1}{2}$ " to accommodate the radiant ceiling panel, by removing the old drywall and replace it with **ray · magic** panels. On the other hand, it is very difficult to raise a floor without having to alter doors, moldings or baseboards.

ray · magic panel is also light, perfect for installation in lofts that can only support limited added weight.

Thermography

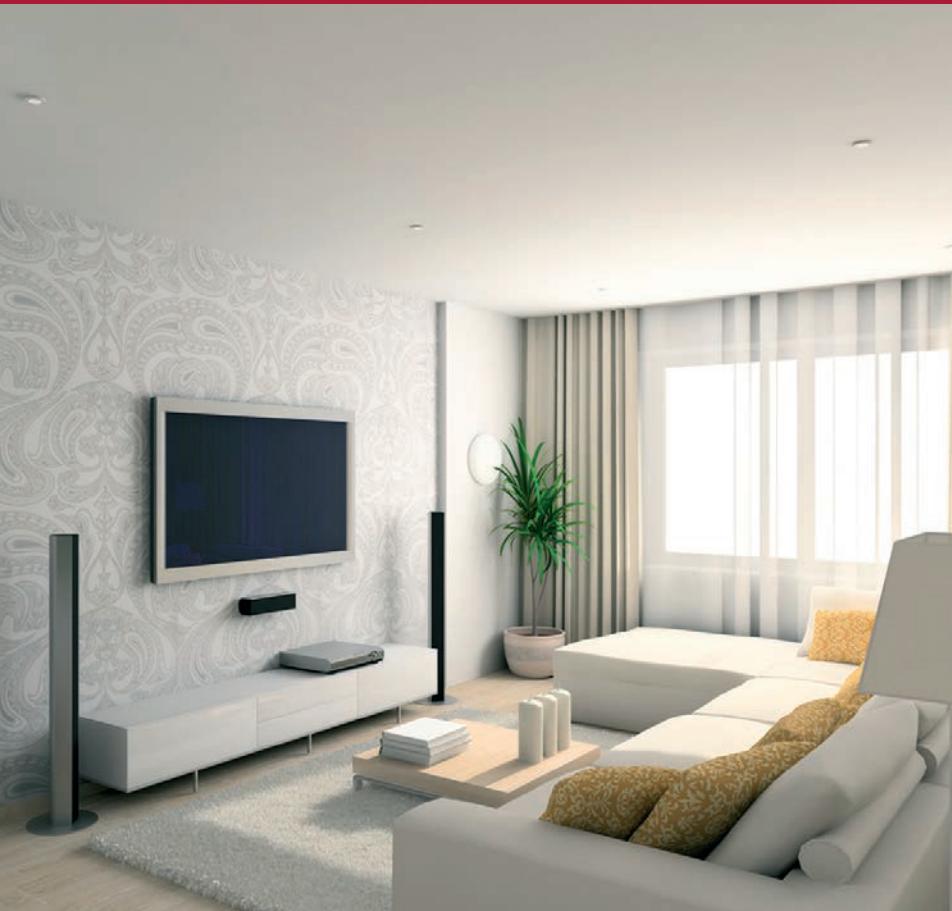
This picture, taken with an infrared camera, shows the series of seven **ray · magic** panels supplied at one end and capped off at the opposite end.

The image shows the **even distribution of heat** over the entire length of the circuit.



even distribution of heat

Architectural and interior design solutions with utmost **freedom**



**Architectural
and interior design
solutions with utmost
freedom**

A radiant ceiling is the solution that best meets architectural and interior design requirements.

It does not interfere with furniture and, given the versatility that the messana **ray · magic** system offers architects, it allows for endless possibilities of installation.

Without floor registers, radiators or baseboard heaters, there is only space for creativity.



More power, more space

Because of the high efficiency of the **ray · magic** gypsum panels not all of the ceiling needs to be covered and more useful space is available for recessed lighting, speakers, sprinklers, decorative beams and skylights.

Radiant heat is **silent and invisible**. You can not see thermal radiation (infrared), you can feel it, but you can not hear it: it is pure, uniform, widespread heat that is invisible, silent, clean for your home, as it does not move dust.

Radiant heat allows substantial energy savings, is clean for the environment, and allows best usage of renewable energy.

Silent and invisible

More power and more savings The perfect climate, right away



The perfect climate, right away

From the ceiling the heat radiates immediately, much faster than a radiant floor system, since it does not have to pass through the flooring, rugs, cabinets and furnishings such as beds, sofas and furniture, but instead expands instantly throughout the space, without barriers.

The responsiveness of **ray · magic** radiant ceilings panels makes them excellent for modern controls, placing energy where it is needed when it is needed, and achieving superior comfort and efficiency.

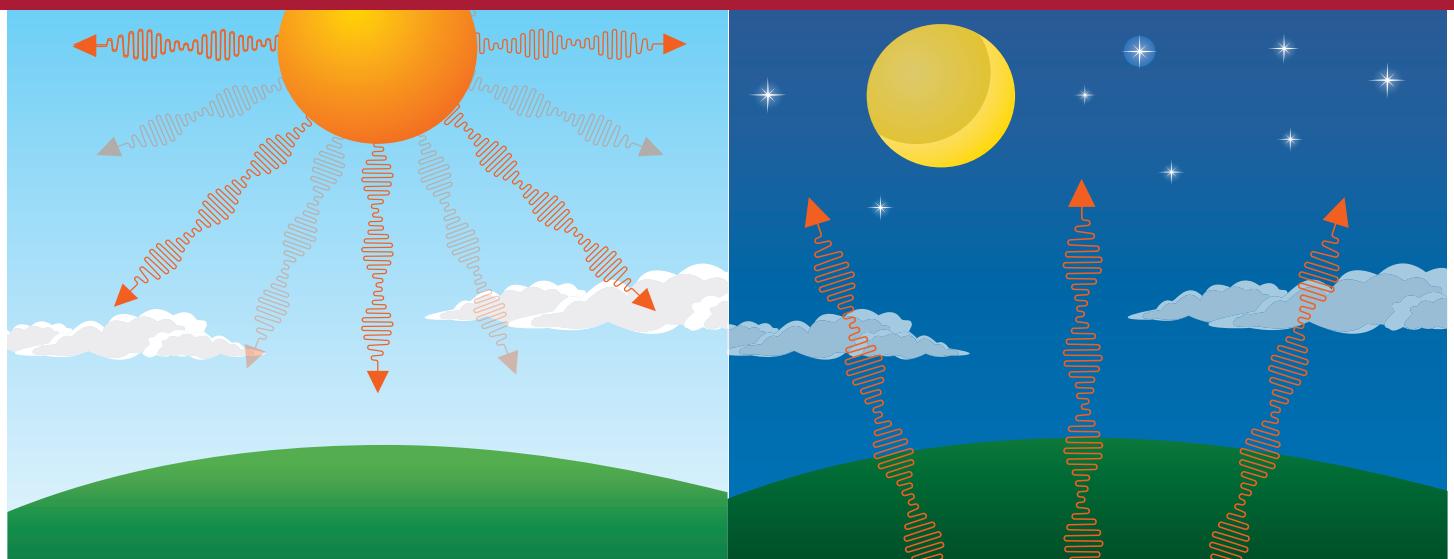
With the **messana air · ray conditioning** system, the climate in your home is always ideal. Every room, every space, has the perfect temperature, evenly and in balance with your body.



All the comfort that an intelligent home can offer

With the **messana air - ray conditioning** system, your wellbeing is a touch of a button away. This is the comfort that an intelligent home can offer. Using the **control - magic** unit, you can set the ideal temperature and create the right climate for your home, including the humidity level. And the system automatically turns on and off... It is as simple and convenient as can be. Even by remote control from your mobile! **Nothing could be easier...**

Nothing could be easier... Consistent wellbeing



Consistent wellbeing

Our skin (approximately 20 ft² for an average adult) has millions of receptors to detect temperature. Uniform thermal sensation is the first requirement for a system that must offer comfortable conditions. A radiant ceiling panel system is the solution that best meets this requirement, because it imitates exactly the way the earth is heated by day (solar radiation) and cooled at night (re-radiation towards the cool sky), with the difference that in a closed space, the radiant surface temperature is very close to the comfort temperature of the room, enhancing the feeling of a uniform, natural temperature.

“ray conditioning” the new era of climate control

The mission of **messana air · ray conditioning** is to make a technological contribution to favor the development of a new era in the HVAC industry promoting a new concept of thermal comfort based on ray conditioning.

In the air conditioning era, our concept of comfort has been distorted to perceive well-being as “the pleasant” feeling of cold air or warm air, typical sensation of traditional forced air systems. In the new ray conditioning era, comfort is a perfect balance of heat exchange between our body and the surrounding environment.

Indoor climate control is based upon active radiant surfaces and the thermal exchange is carried mainly by radiation: infrared radiation from the radiant panels (radiant heating) toward your body and heat radiation from your body toward the radiant ceiling panels (radiant cooling).

Ray conditioning is a hybrid radiant heating and cooling technology:

- Radiant cooling: the radiant ceiling drywall acts as a heat exchanger between the room and the cold water running through the panels. The ceiling absorbs heat from heat sources in a room and exchanges it with the chilled water circulating in the panels. The chilled water is then delivered to a chiller and re-cooled.
- Radiant heating: the warm surface of the radiant panels provide heat to the room

Traditional air conditioning is no competition to ray conditioning. Aesthetic appeal, acoustic insulation, comfort level and energy efficiency, are among its huge advantages.

Saving up to 50%
“ray conditioning”
is the green solution to forced air

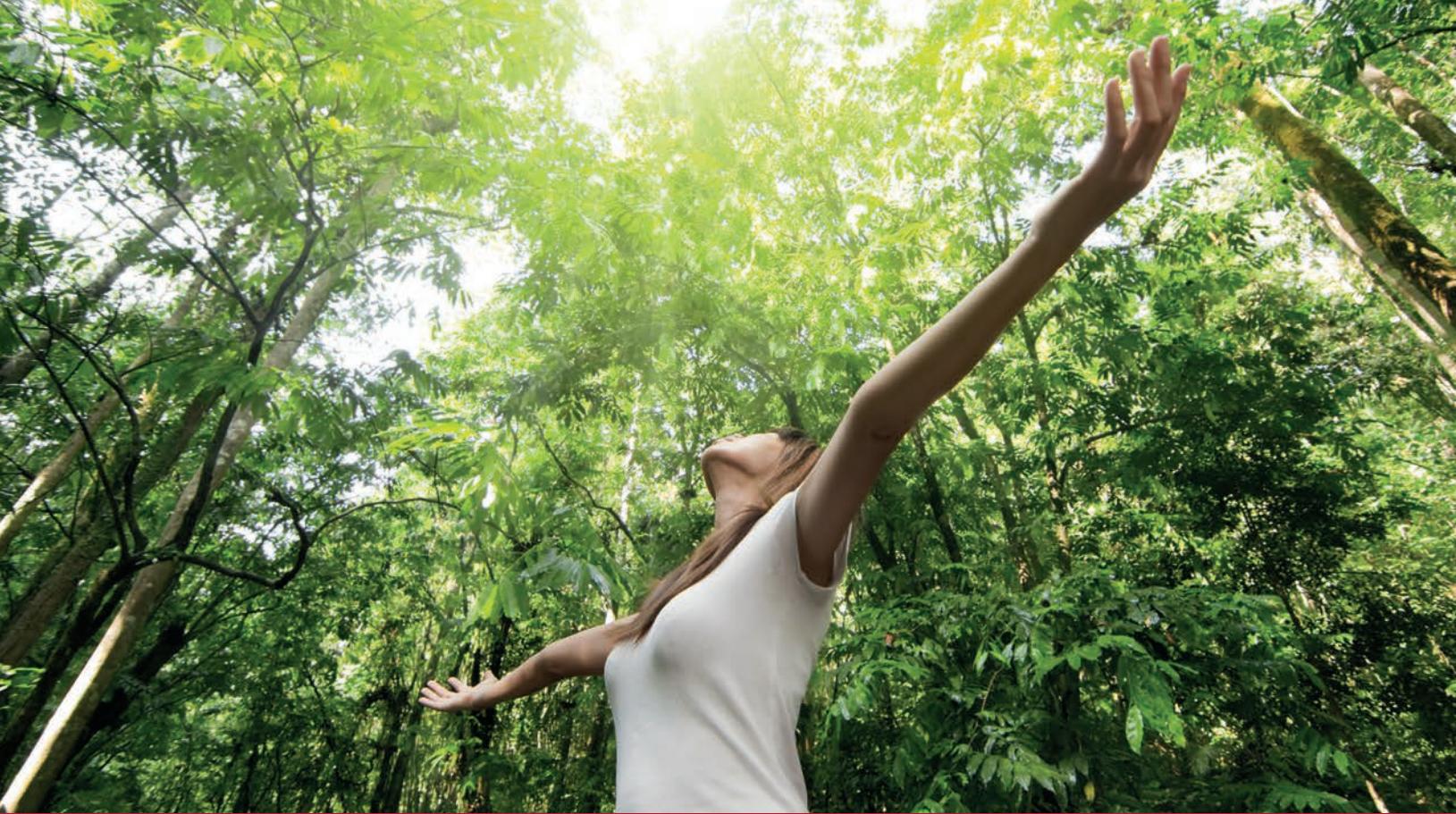
“ray conditioning” is the green solution to forced air

Choosing to live in a green home means choosing a lifestyle and a technology that combine well-being and energy saving at the highest levels. Only efficient technologies can be healthy, comfortable and also ecologically sound.

With the **messana air · ray conditioning** system, it is even easier to save energy and it is more cost effective too, up to 50%. Installation cost with an experienced contractor is generally 20-30% less than installing a conventional forced air system. Also operation and maintenance expenses are significantly reduced since there are no moving parts and filters.

Spaces may be zoned by the use of **control · magic**.





Green your home with **MESSANA**®

Potentially up to **17 LEED® points**

Green your home with **messana air - ray conditioning**

Messana Air-Ray Conditioning LLC is proud to be a member of the U.S. Green Building Council and help home builders achieve points toward LEED® for Homes Certification.

Up to 17 LEED® points in the sections of Energy and Atmosphere (EA) and Indoor Environmental Quality (EQ) can be earned with **messana air - ray conditioning** system.

We produce an environmentally friendly product to offer an efficient alternative to traditional heating and cooling systems (air conditioning) which are among the largest consumers of energy in North America.

Whenever possible, we encourage our clients to integrate **ray - magic** panel system with solar and geothermal technologies.

The materials that **ray - magic** panels are made from (gypsum and EPS) are 100% recyclable.

LEED® is intended to improve performance in matters such as energy efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.



ray · magic is green under any aspect

	Heating Efficiency	Cooling Efficiency	Indoor Air Quality	Heating Operation Cost	Cooling Operation Cost
ray · magic	✓	✓	✓	✓	✓
Radiant Floor	✓	✗	—	✓	—
Forced Air	✗	—	✗	✗	✗
Hydronic Radiators	—	n/a	✗	—	n/a
Electric Radiant Ceiling	✗	n/a	✓	✗	n/a
Electric Radiant Floor	✗	n/a	✓	✗	n/a

ray · magic ceiling panels are remarkably advantageous compared to other heating and cooling systems,

NO noise, NO ducts, NO draft, NO dust

ray · magic RADIANT COOLING (ray conditioning)

With a small pump energy is efficiently distributed throughout any room. Water is a better cooling transport agent than air and it takes much less energy to move water than air

With 1½" thick EPS panel, back losses are negligible

Can be combined with a wide variety of energy efficient sources, like air to water heat pump and geothermal heat pumps

Silent and invisible while functioning

Does not move dust because it functions mainly by radiation. Ideal for environments that require maximum hygiene and for people who suffer from allergies and respiratory problems

The entire surface is cooled with radiant air and creates the ideal climate for our physiology. Hydronic cooling is gentle, draft free and odorless

Maintenance free. Just routine periodic checks of the system will guarantee enduring performance and operation

Flexible with any type of structures can easily be integrated into any architectural design

Zoning can be simply implemented with zone valves. State-of-the art climate control system is also available (control magic)

FORCED AIR SYSTEM (air conditioning)

Air requires a much larger volume to transport the same amount of cool than water. A powerful fan blower is needed to move air, which means wasted energy

Inevitable heat loss from ducts and air leaks reduce the efficiency

Forced air chillers operate at lower temperatures, resulting in less efficiency and increased energy cost

Noisy and architecturally intrusive

Can favorize the growth and spread of microorganisms, move dust and can be unhealthy for our respiratory system. Not recommended for children and the elderly

Annoying drafts of cold air create uncomfortable areas

Filters need to be periodically changed. Ducts may require cleaning, fan motors to be oiled and belts to be replaced

Large ducts and registers are intrusive and difficult to hide

To zone a forced-air system, expensive controls and dampers are needed

ray magic

Design Flexibility	Noise Level	Installation Cost	Maintenance Cost	Retrofit Suitability	Layout Simplicity	Comfort
✓	✓	✓	✓	✓	✓	✓
✗	✓	✗	✓	✗	✗	✗
✗	✗	✓	✗	✗	✗	✗
✗	✓	✗	✓	✗	✓	✗
✓	✓	✗	✓	✓	✓	✓
✗	✓	✗	✓	✗	✗	✗

setting them apart as superior to any other climate control system.

Radiant ceiling is **better** than radiant floor, the facts speak for themselves!

ray · magic RADIANT CEILING

RADIANT FLOOR

It does not move dust because the heat source is from above and it is mainly radiant, however, thanks to the re-radiation, the floor is warm

It has a fast response time: the ceiling temperature has a response delay of about 1 minutes per °F

When cooling, it can reach up to 50 Btu/h/ft², condensation free if controlled by control magic and air magic

If damaged, it is very easy to repair, just like repairing drywall

Perfect for renovations and it is applied to a completely dry surface

Because it is located in the ceiling, there is no need to drop pipe connections down the walls. All the pipes are up and out of the way.

It runs on low temperature but it can be pushed up to 140°F when required by critical climate conditions

Easy to evaluate the exact heat output since the drywall resistiveness is known and there are no obstructions for the radiant heat

Can easily operate at surface temperatures up to 130°F without discomfort for the occupants

Without a doubt, it costs far less than radiant floor

It spreads dust when heating because the source is on the floor where dust deposits and on average 30-40% of the heat is delivered by convection

It is slow: the floor temperature has a 10-20 minute response delay per °F

When cooling, it does not exceed 10-20 Btu/h/ft²

If damaged, significant work in the floor is necessary

Very invasive to install. Raising a floor is much more complicated and expensive

Pipes run in the floor and during construction there are risks of damage, to the point that many manufacturers suggest temporary protecting the radiant floor

Typically, it runs on a higher water temperature but it is limited to a floor maximum temperature of 87.5°F

Heat output is difficult to estimate before flooring is chosen, and furniture layout is decided

Surface temperature needs to be lower than 87.5°F otherwise occupants complain of hot sweaty feet and can damage the flooring.

System design and tubing layout are more complicated and labor intensive



 **radiant**
architecture

by **MESSANA®**

Ideal climate and well-being with the “radiant-architecture”

“**radiant architecture**” is a new modern concept of climate control based on creating the appropriate balance between man and his architectural environment.

Ceiling, floor and walls of every room can create the ideal climate, allowing the occupants to dissipate their metabolic heat in the most natural way. How? Temperatures of the surrounding surfaces are set to the right value.

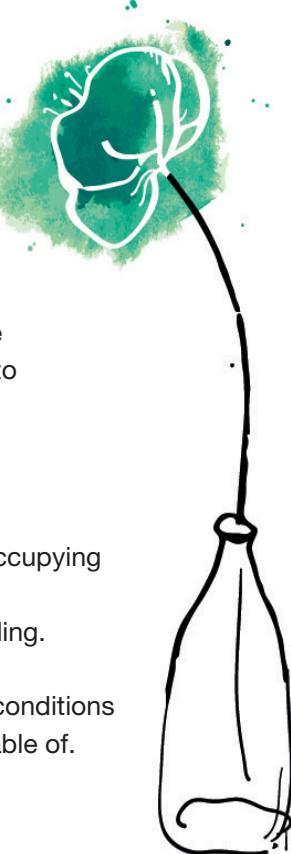
With **radiant architecture** surfaces play an active role and become the main objective of the climate control project, instead of the traditional forced air system.

Large amounts of thermal energy can be exchanged without any discomfort, simply putting anyone occupying the area in a state of “**radiating wellness**”.

This means energy efficiency, more savings, respect for the environment and added value to any building.

radiant architecture, where the active radiant surfaces become capable of creating optimal thermal conditions for comfort and well-being that air conditioning and systems based on thermal convection, are incapable of.

The architecture that puts people at the center of everything.



“radiating wellness”

balance between man and his architectural environment
new modern concept of climate control

The new alternative: “radiant architecture”

We were born to radiate, and for that to happen we need the surfaces surrounding us to be at their ideal temperature.

The majority of buildings constructed before the petroleum era and the invention of air conditioning, were characterized by substantial thermal masses that were able to grant comfort even without climate control devices.

As new construction technology led to buildings being lighter weight, it became necessary to cool them down. Air conditioning was the technological answer to the problem. However, cold air doesn't have the capability to effectively lower the temperature of surfaces. Air is rarefied matter and to transport energy it must be moved. This action disturbs the comfort level of the occupants.



“**ray conditioning**” is the solution, in fact radiation is the most fundamental form for the transmission of energy, it moves instantaneously and in all directions. This way large quantities of thermal energy can be exchanged without creating discomfort.

radiant architecture explains how to create **active radiant surfaces** that in addition to being construction elements, also have the capability to actively influence the process of thermal exchange between the human body and its surrounding environment, acquiring esthetic value, enhancing comfort levels, respecting our natural environment and saving energy.

Architects aware of these advantages can utilize **radiant architecture** to add value to any building. **radiant architecture** is an ecologically friendly climate control product that also enhances daily living by increasing our comfort level.

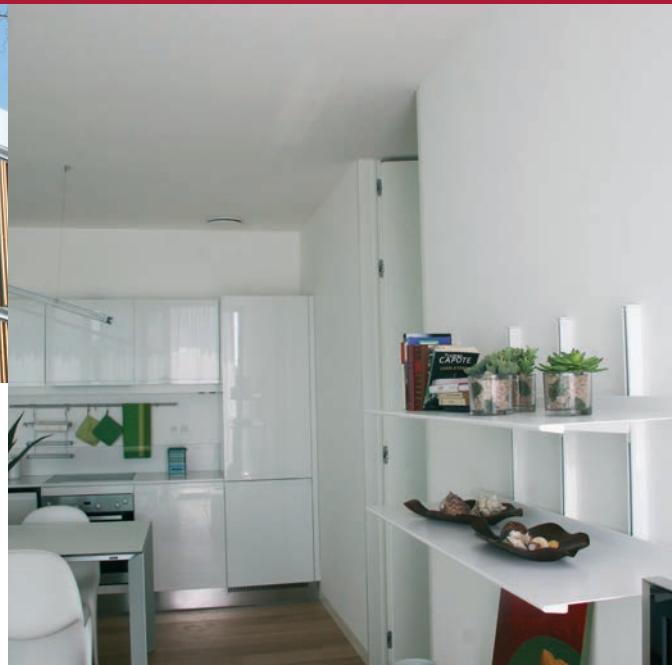
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Reference

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REMODELING

messana air · ray conditioning, technology for wellbeing

OECP (Optimized Energy & Comfort Performance) is the acronym for the logic that the **messana** system expresses and manages to ensure levels of comfort and energy savings never before achieved with known technologies. Technology is the expression of creativity and human intelligence to improve living conditions.

As technology advances, it becomes increasingly ecological and sustainable. Air conditioning is an important step in the creation of thermal comfort that improves living and working conditions indoors, but, by not respecting the physiological nature of the human body, it has always emphasized its own limits through various discomforts and disturbances, architectural invasiveness and high energy consumption.

Try **messana air · ray conditioning**: you will discover the perfect balance between your own wellbeing and that of the environment in which you live.

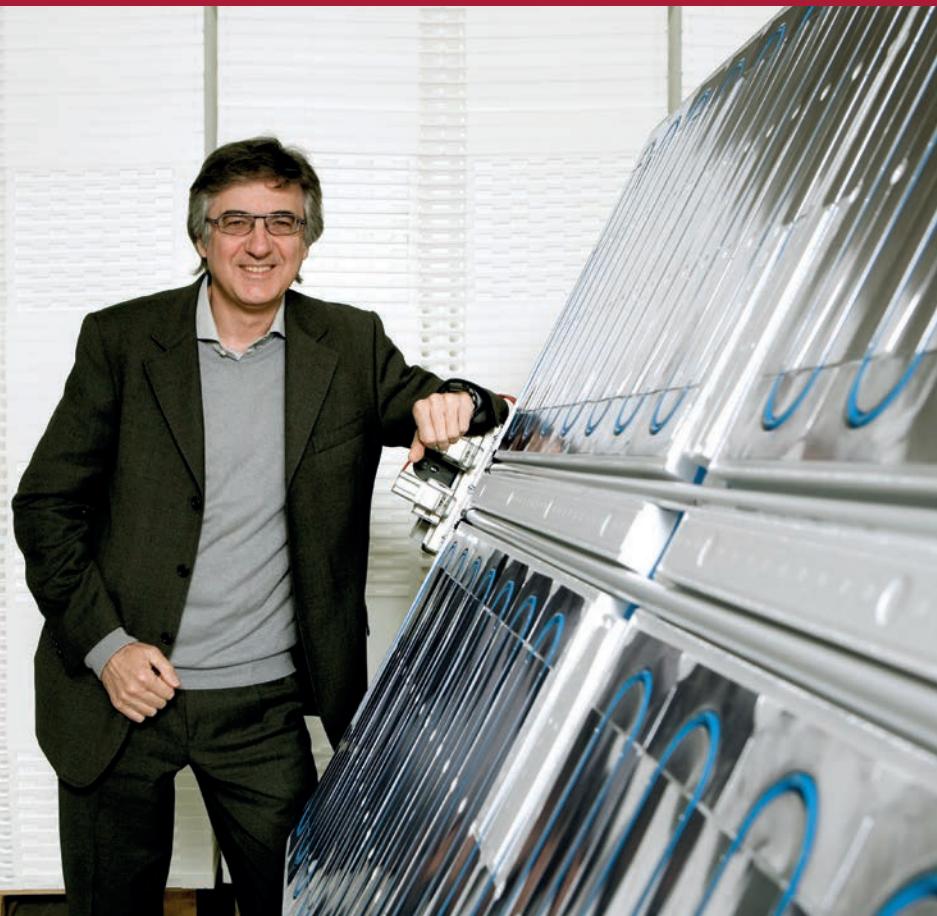
messana air · ray conditioning, technology for wellbeing

ROBERTO MESSANA

Founder and president of Messana Air-Ray Conditioning LLC, is recognized as the father of modern radiant ceiling heating and cooling: **ray conditioning**.

With his book “Understanding Comfort”, the result of over twenty years of research and experiments, he has established the scientific basis for the relationship between the physiology of the human body and its energy exchange with its surroundings to achieve ideal thermal balance comfort.

Having built more than ten thousands radiant ceiling and cooling systems, MESSANA has gained unique expertise, the best guarantee for its customers and a fundamental element in the **air · ray conditioning** technological development.



ray magic

ray magic



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