

MAXIMUM COMFORT AND CONTROL IN HEATING

Hot YOGA Requires Hot - Tranquil Thermal Conditions– 42C/105F

ASHRAE Standard 55, Thermal Conditions for Human Occupancy, defines the conditions required for occupant thermal comfort, which is generally described as a state of mind that is unaware of the thermal environment. However, hot Yoga environmental parameters are unique, and generally outside the range of robust design for human occupancy in the built environment, as well as the operating range of equipment designed for the conventional thermal environment. Yet, the standard for hot Yoga conditions is the same – the state of mind that is unaware of the thermal environment...and, therefore, focused on the practice of Yoga.

SSHHC defined the variables that must be addressed to ensure proper Hot Yoga environmental conditions regardless of the conditions unique to the Yoga studio physical characteristics, geographic location, class size, hours of operation, voltage, etc. With hundreds of successful studio designs around the world, SSHHC is very comfortable working with the owner, practitioner, design professionals, or other personnel connected to the operation, design, and ownership of the studio(s) in order to ensure healthful, safe, economic thermal environmental hot Yoga studio design.

Hot Yoga Environmental Characteristics

Key characteristics of Yoga environmental conditions:

1. Silent, Tranquil, Healthful environment.
2. Uniform floor, wall, and occupied space (floor to occupant vertical height – 5 to 7 feet, or approximately floor to 2 Meters) Operative Temperature.
3. Stable relative humidity year around – normally 50 to 60%.
4. Maintain dry, mold free floor covering conditions by maintaining floor temperature equal to or just above air temperature.
5. No drafts, distribution of bacteria, allergens, or other contaminants, or distracting air temperature stratification.
6. Air change adequate to maintain acceptable air quality during class.
7. Provision for air change between classes.
8. Environmental conditions meet specifications 100% of the time – no breakdowns, total reliability.
9. Lowest life cycle operating and ownership costs.

The **long wave infrared radiance** of ENERJOY is within the wavelength range validated by Yale University Pierce Laboratories to be 98% absorbed by human skin. The health benefits and relaxation experienced in the silent, non-allergenic, radiant environment ENERJOY provides is a hallmark of the ENERJOY hot Yoga environmental design experience.

Design and Operation Methodology and Overview

We encourage designers to take the ‘building as a system’ approach to Yoga studio design. For example, look at the studio as a thermos and recognize that losing any heat is costly and problematical. Adjacent tenants don’t want it in the summer, and while they will harvest it in winter, they will probably complain either way if heat is transferred from the studio to adjacent occupied space, particularly through the ceiling to the floor above. Studio air pressure is very high due to Yoga temperatures, which increases infiltration and exfiltration by an order of magnitude, so the objective is to develop a design whereby the movement of air is entirely controlled by the

studio. By controlling air change in relation to studio needs, relative humidity and air quality can be maintained with minimum operating cost.

It is important to know that winter air is very dry – especially in cold climates and higher altitudes, while summer air is often very humid, whether in Tokyo, Miami, or Detroit, or Montreal. As a result, leaky buildings have low relative humidity in the winter and very high relative humidity in the summer. In addition, sweating, aspirating Yoga and Yogi both aspirate moisture and radiate heat (150 Watts per person), so these inputs need to be managed in order to keep the proper Yoga environmental condition balance.

To minimize operating cost, the studio must be properly insulated on all six surfaces and air change managed precisely in relation to ever changing operating conditions in relation to studio needs. Proven, optimum environmental thermal conditions are provided with ENERJOY heating panels of appropriate watt density – usually at least one (1) 2 foot by 8 foot, 1000 Watt ENERJOY Heating panel for each 72 Square Foot area, approximately 6 feet by 12 feet, in order to provide recovery from nighttime setback to 90F or 36 C in about one 1-2 hours, with 8 to 9 foot ceilings. Higher ceilings are preferred to provide larger air cubage to provide sufficient ‘oxygen’ for the 60, 75, or 90 minutes of postures. Panel sizing increases by a percentage more or less equal to the cubage increase and is unique to each studio to ensuring desired yoga conditions.

When evaluating optimum operating conditions, it is important to remember that ENERJOY radiance warms air indirectly by heating objects, in studios the floor, walls, people and other objects, which reradiate and warm the air. Therefore the floor temperature is equal to or a few degrees above the air temperature. This ‘charging of the mass’ is the reason a radiantly heated environment stays warm for a longer time than a convectively heated environment, which loses heat due to stratification, increased air infiltration, and exfiltration . Surfaces are not warmed significantly during the period of high temperature operation.

An easy way to understand these principles is to consider the agricultural cycle in relation to the strongest and weakest sun power that occurs on the shortest and longest days of the year, December 21st and June 21st respectively in the US, while the planting season doesn’t start in northern areas until the middle of May or later, even though the sun is gaining in strength and re-warming the soil (relative to this geographic area of the earth) from December 21st, and the first frost doesn’t usually occur until October or later, although the sun is losing strength from June 21st on, but the heat stored in the earth continues to help maintain warm conditions as the heat gained over the spring and summer is gradually reradiated.

Similarly, a studio, with proper insulation and air management, will only lose about a degree F an hour or a degree C in a little over two hours, so that setback to 90F (36C) or so will probably not call for heat (effectively be ‘off’) until set up about an hour or two before the next Yoga session, except during extreme conditions. Also, student occupancy will add 1-2F (.5C+) depending upon class density. So, temperature micro management is both unnecessary and uneconomical, except in relation to determined variance from desired conditions. You make a radiant investment in the hot room ‘mass’, which is economic to maintain rather than ramping up and down for short periods of time.

Optimal Studio Design

Insulation minimizes thermal heat loss, but control of air change is essential to both reduce loss of heat and to manage relative humidity. Meanwhile, ENERJOY radiance provides uniform, silent, non-allergenic conditions, without impacting relative humidity or mechanically inducing air exchange. ENERJOY has no moving parts and does not require maintenance, and requires no useable space. ENERJOY is warranted for 5 years against manufacturing defects, with life of the building longevity, and the lowest life cycle owning and operating cost. For information exchange regarding the design of a particular space, it is important to contact SSHC at 860 399 5434, or through the web site info form: www.sshcinc.com.

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