



ETHERMA^o
EFFICIENT. ELECTRIC. HEATING.

Warm your
WORKPLACE
Not the earth

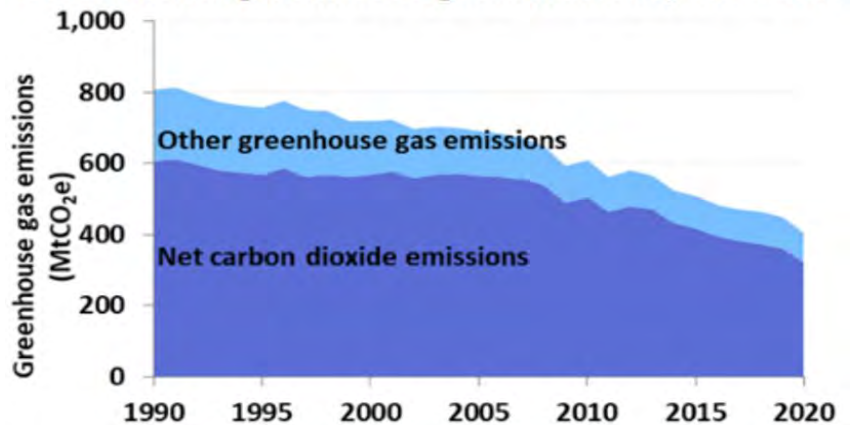
The MEGA-TREND ENERGY TRANSITION

ARC and ETHERMA are here to help

Need to act?
We have the solution

The energy transition is actively underway, driven by escalating concerns about global warming and political imperatives. According to the British Energy Society Strategy, "by 2030, 95% of British electricity could be low carbon, and by 2035, we will have decarbonized our electricity system." A key component of this transition is the reduction of CO₂ emissions from fossil fuels. In the realm of sustainability, ETHERMA has been a pioneer since the 1980s. When paired with environmentally friendly electricity, electric ETHERMA heating systems contribute significantly to lowering CO₂ emissions.

UK territorial greenhouse gas emissions, 1990-2020



The UK's CO₂ emissions have fallen 38% since 1990. The largest factor driving emission reductions has been a cleaner electricity mix based on gas and renewables instead of coal. The next largest driver is reduced fuel consumption by business and industry. (Source: Carbon Brief)

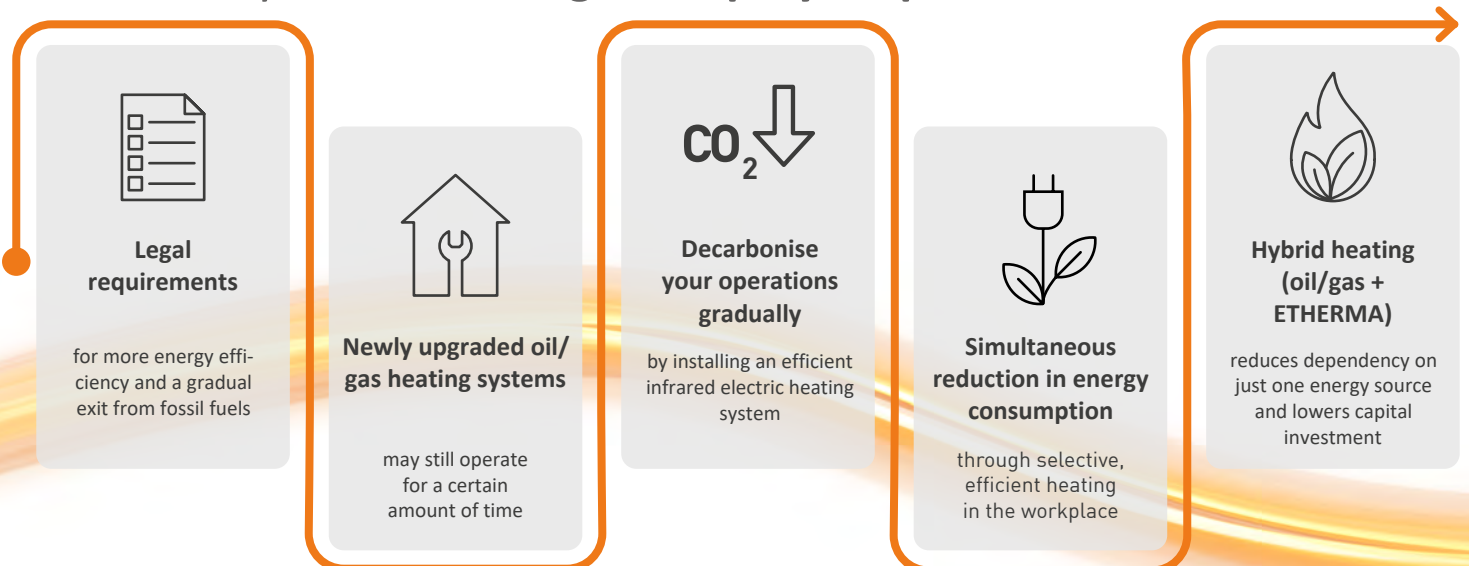
Required by law: minimum temperatures at the workplace.

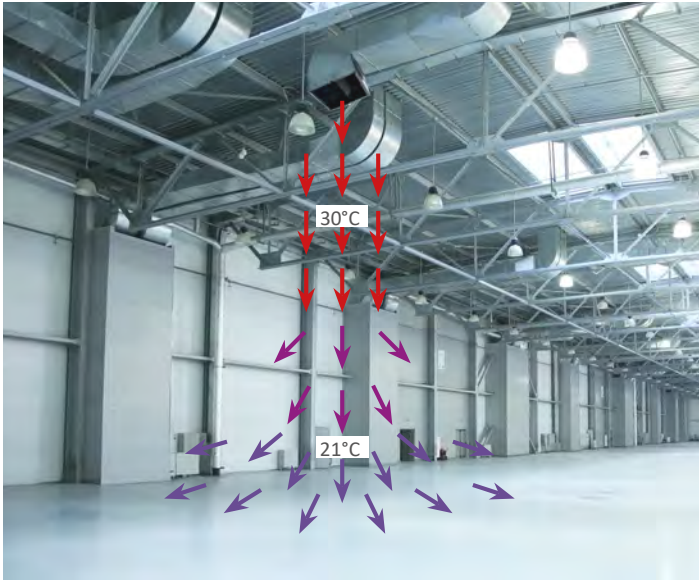
Mandatory regulations dictate minimum workplace temperatures. In the UK, recommended comfort criteria for working environments fall within the range of 16-19 degrees for light work and 19-21 degrees for sedentary work. If achieving these temperatures isn't feasible with the current heating system, additional measures must be implemented.

ETHERMA's infrared heating systems represent the optimal solution, especially when combined with on-site solar energy generation.

By incorporating ETHERMA heating systems and environmentally friendly electricity, you can enhance the share of renewable energies in the overall system, even as you continue to use your existing heating system for the time being.

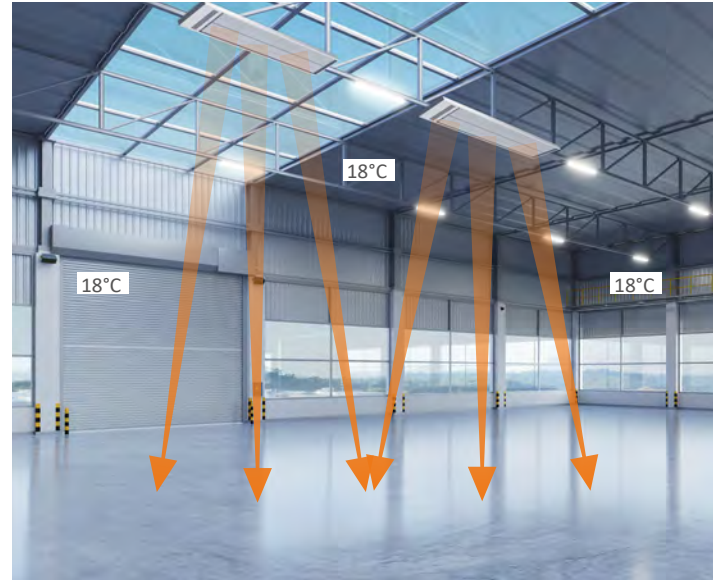
Move away from oil and gas, step by step





GAS CONVECTION HEATING

High energy consumption due to heat loss between the factory ceiling and the floor



INFRARED HEATING

Lowering the workplace room temperature by 2°C - 3°C.

Heat more precisely and efficiently using infrared heating

With our infrared heating you can comply with all regulations while reducing the room air temperature and costs. Your employees feel completely comfortable thanks to the direct warming our infrared heating provides.

Noticeably more comfortable

Conventional heating in industrial spaces typically relies on convection. Hot air is blown from the ceiling or wall to achieve comfortable warmth near the floor. Due to heat loss to the floor, the temperature must be significantly higher, resulting in increased costs. Additionally, there is the circulation of dust and bacteria. Infrared heat differs: when infrared rays hit solid matter (e.g. bodies or walls), they are immediately heated. This leads to an immediate, pleasant feeling of warmth, comparable to a sunny winter day; if clouds cover the sun, you feel cold. As soon as the sun comes out, it feels warm, even though the air temperature has not changed.

Scientifically proven

The experiment conducted by Bedford and Liese affirms that when the walls are warm, individuals experience the same level of comfort despite a lower room temperature. The subjectively perceived temperature is 2°C to 3°C higher than the actual temperature. Consequently, the room temperature can be decreased without compromising the sense of comfort. Each degree reduction in room temperature results in energy savings of

approximately 6%. Therefore, infrared heating has the potential to achieve up to 18% in energy consumption savings, solely by creating a warmer perceived environment.

Extra efficient

The precise heating impact of infrared enables workplaces in industrial spaces and offices to be heated in a more targeted way compared to convection heating systems. This is especially beneficial in industrial settings where cold draughts through open shutter doors can impede a comfortable working atmosphere. Infrared heating addresses this issue as the indoor climate is not reliant on warm air but is established through heat radiation, which is not affected by draughts.

Versatile and beneficial

Thanks to selective infrared heat, you can warm up your workplace to the level you find comfortable. And only when people are present. Additional advantages: fast heating-up time, low investment costs, no maintenance, no plant room, no fuel storage and no complex and unsightly pipework.

The benefits of ETHERMA



Save up to 18% energy through lowered room temperature



More comfort at every workstation



The same level of comfort even with open doors or shutter doors



Guaranteed supply



Reduction of CO₂ footprint

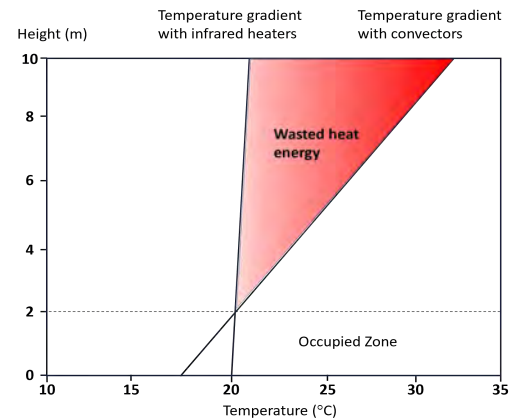


Comfortable HEAT ZONES in every industrial space Thanks to infrared heating

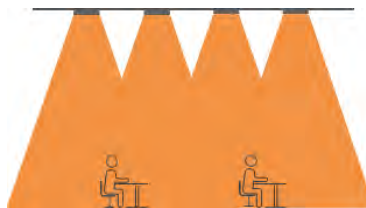
Inefficient heating in industrial spaces is a thing of the past

Heating the entire volume of a high-ceilinged, large industrial space with warm air is neither effective nor economical, as most of the energy consumed is used to overheat the space above the 'occupied zone'.

The temperature gradient is very low for infrared heaters, approximately $0.3^{\circ}\text{C}/\text{m}$. In contrast, warm air heating or heating with conventional radiators causes significantly greater temperature differences of $2.5^{\circ}\text{C}/\text{m}$ and $1.7^{\circ}\text{C}/\text{m}$ respectively.



Our infrared heating provides the perfect solution through ambient, spot, supplementary or zone heating. This form of heating allows you to heat only the necessary areas to the required temperature, ensuring your employees are always comfortable.

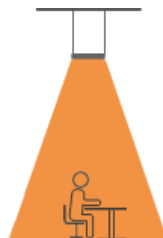


Ambient/Total heating

- > Infrared heaters warm people first, then the air is heated indirectly
- > The operative temperature, being the temperature a person senses, is higher than the actual air temperature
- > Infrared heating allows a reduction in air temperature of a couple of degrees = energy saving

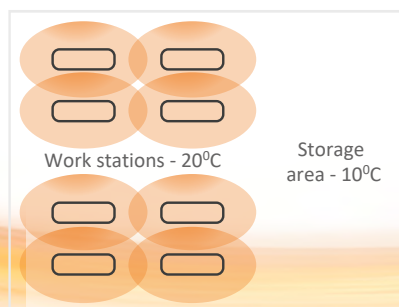
Supplementary/Hybrid heating

- > As an addition to other heating systems and when expanding an existing system
- > Infrared heaters are often a more efficient, flexible, less disruptive and inexpensive solution



Spot heating

- > For workstations in high spaces
- > Focus the heat on a single workstation
- > Level of heating can be increased when needed



Zone heating

- > Different work activities require different temperatures
- > Infrared allows the building to be divided into different temperature zones
- > Results in lower heating costs and better thermal comfort

In these spaces, ETHERMA ensures comfortable warmth

Case study

Lorry maintenance workshop ambient heating solution

ETHERMA EZ medium-wave infrared heaters with a surface temperature of 290°C are used here to provide an ambient heating solution in this newly built (well insulated) maintenance workshop.

A total of 42 x EZ-2400 medium-wave infrared heaters were installed 7m above floor level to heat the 1,150m² workshop to 15°C. The workshop was treated as a single heating zone controlled by a programmable thermostat.

The dispatch desk, which is only occupied for short periods of time (max. 10 mins), was heated using a short-wave ETHERMA EXO Basic controlled by a motion sensor.



Case study

Garage workshop spot heating solution

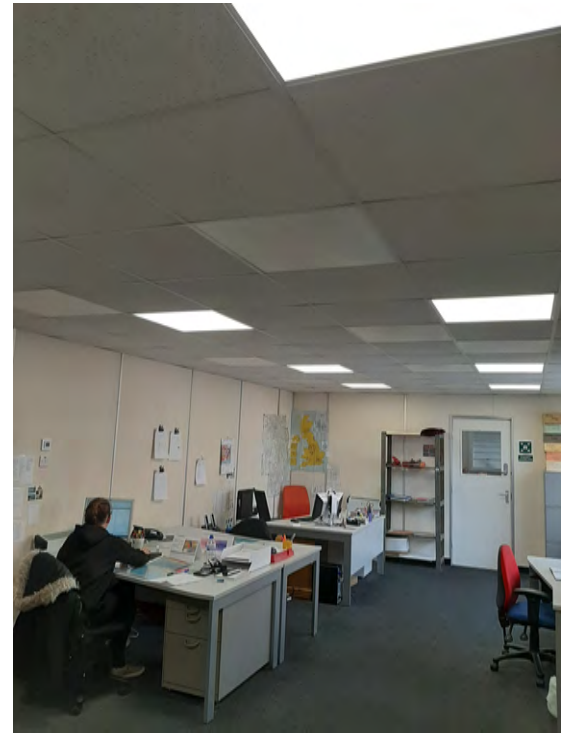
The garage workshop was a poorly insulated commercial building heated by a single 24 kW oil fired warm air blower. This was ineffective due to the high ceiling and frequently-used shutter doors.

Each vehicle ramp was spot heated using ETHERMA EIH-3000 industrial infrared heater to directly warm the mechanics as they work on the vehicles. These heaters have an element temperature of 650°C, making them more effective in drafty environments with a lower air temperature. The heaters are individually controlled by a manual time delay switch set at 2 hours. A programmable thermostat was also used to switch off the heating circuits outside working hours, or if the ambient temperature was over 15°C.

The Diagnostics Workstations are heated with short-wave infrared heaters individually controlled by electronic timers giving the user 20 minutes of heating before switching off automatically.



It pays off:
90% LESS
heating load



Practical example: Switching from convection to infrared and ambient to spot heating in an old industrial building

The solution

By using a range of ETHERMA's ingenious infrared products, each with a different infrared wavelength, the various heating requirements could be accommodated.

In the factory, spot heating was used over the workstations. The EZ-2000 medium-wave infrared heaters were controlled by motion sensors.

In the offices, long-wave infrared panels were installed within the suspended ceiling grid. This seamless installation ensured the optimum distribution of heating throughout the office, avoided cold spots and kept the walls and floor space free.

Count on ARC to deliver energy efficiency, significant cost savings and a reduced carbon footprint.

Key project data

- > Building structure: single skin breeze block walls and corrugated sheet roof with no insulation
- > Configuration: two offices, a main production area and a staff room
- > Existing heating: offices and staff room - 2 kW electric convector heaters supplemented with portable oil-filled radiators, factory area - 23 year old 146.6 kW oil boiler and a warm air blower
- > Problem: existing heating system was proving to be ineffective and increasingly costly to maintain

Results

- > Total of 158.6 kW of convection heating was replaced with 15.45 kW of infrared heating
- > 90% reduction in the heating load reduced the weekly heating cost by £332
- > Annual carbon footprint reduced by 13.17 tonnes

Additional savings potential through solar power

Adding a photovoltaic system makes your heating even more efficient and sustainable. Please contact us for more information.



Everything for the industrial space: INDUSTRIAL HEATERS

by ETHERMA



ETHERMA EIH industrial heater

Benefits of this product

- > Total, zone or spot heating
- > Hygienic room climate
- > Good warmth distribution
- > Robust design
- > Adjustable angle
- > Also for covered outdoor areas

CE

Installation height	Spot heating: 2.5m - 4m Total heating: 2.4m - 35m
Output	3,000 W - 6,000 W
Max. surface temperature	650°C
Protection class	IP 44
Wall installation	✓
Ceiling installation	✓
Fixed connection	✓

ETHERMA EEZ industrial heater

Benefits of this product

- > Total, zone or spot heating
- > Hygienic room climate
- > Surface structure optimises radiation
- > Also for covered outdoor areas

CE

Installation height	Spot heating: 2.3m - 3.2m Total heating: 3.8m - 35m
Output	800 W - 3,600 W
Max. surface temperature	320°C
Protection class	IP 44
Wall installation	✓*
Ceiling installation	✓
Fixed connection	✓

ETHERMA EXO® BASIC infrared heater

Benefits of this product

- > Zone heating
- > Hygienic room climate
- > Robust design
- > Sleek design
- > Also for outdoor use

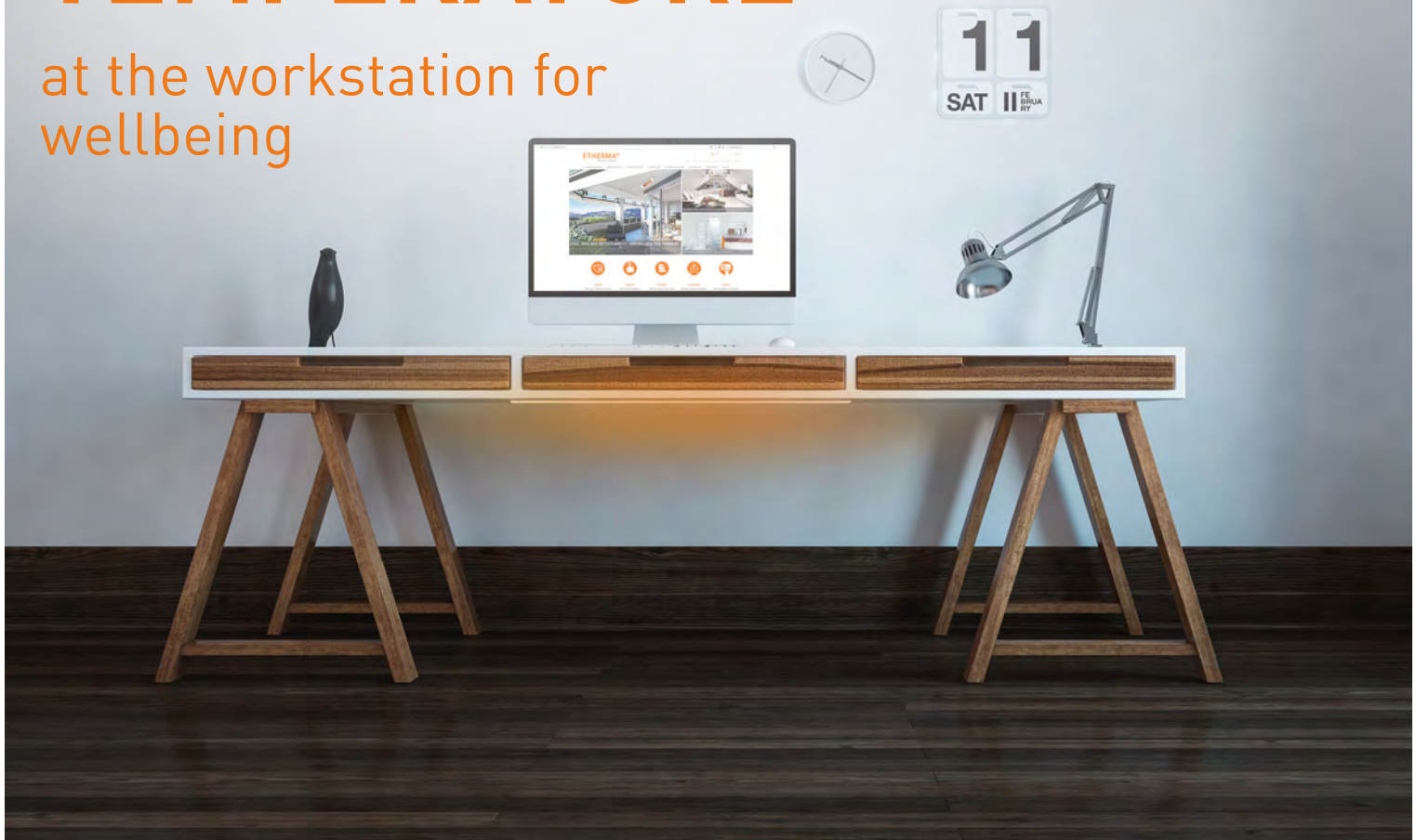
CE

Installation height	1.8m - 2.5m
Output	1,800 W
Max. surface temperature	800°C
Protection class	IP 65
Wall installation	✓
Ceiling installation	✓
Fixed connection	✓

*Requires separate accessory

THE RIGHT TEMPERATURE

at the workstation for wellbeing



A warm recommendation: infrared panels by ETHERMA.

Microclimates are crucial to wellbeing at work

A microclimate is the totality of all environmental influences in a room that affects the heat exchange between people and the environment.

In addition to humidity and ventilation, the room temperature is THE decisive criterion. If the workplace is at a comfortable temperature, the body does not have to make any effort to maintain its normal temperature of approximately 37°C.

This is where ETHERMA heating systems come in. They provide more customised and efficient heating than conventional convection heaters, which unnecessarily heat up the entire room and also stir up dust particles and bacteria.

Regulate heat individually instead of wasting energy

ETHERMA offers the right heating systems for more comfort and cosiness, not only for industrial spaces but also for offices and other rooms. In open-plan offices, receptions or exhibition rooms it is impossible to maintain a constant, comfortable temperature which suits all employees.

With the efficient LAVA® infrared heating panels from ETHERMA, temperatures at various workplaces can be easily adjusted individually.

This is an unbeatable advantage in times of flexible work when not all employees are always present. Additionally, the general room temperature can be lowered, saving energy and costs.

More comfort and efficiency, even in the home office

Our practical LAVA® infrared heating panels also ensure the selective and cost-conscious use of energy when working from home.

It is unnecessary to keep all rooms in the entire house at a specific temperature, for example continuously heating a study room that is not used every day to 21°C.

With ETHERMA infrared heaters you can experience pleasant infrared heat within a few minutes and only when you are actually at your workdesk.

In these offices, ETHERMA ensures comfortable warmth

Case study

Proactive Learning - office zone heating solution

Proactive moved into a refurbished industrial unit which was divided into separate storage and office areas. The open-plan office area was heated by two wall mounted gas-powered warm air blowers. The heaters proved to be noisy and ineffective as the warm air rose to the high ceiling.

With an infrared heating system, different zones within the same room can have different temperatures. It was therefore possible to divide the office area into three separate heating zones and maintain a different comfort level in each zone. Each zone was thermostatically regulated and controlled/programmed through an app based system.

Medium-wave infrared heaters were used to create a comfortable environment with separate heating zones. The heaters were suspended at 2.8m above the floor and positioned to ensure the occupants felt the infrared rays coming from at least two directions to increase their comfort level.



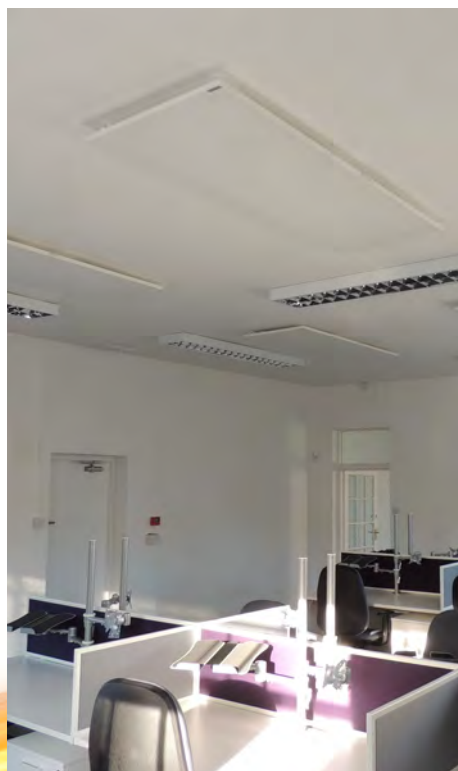
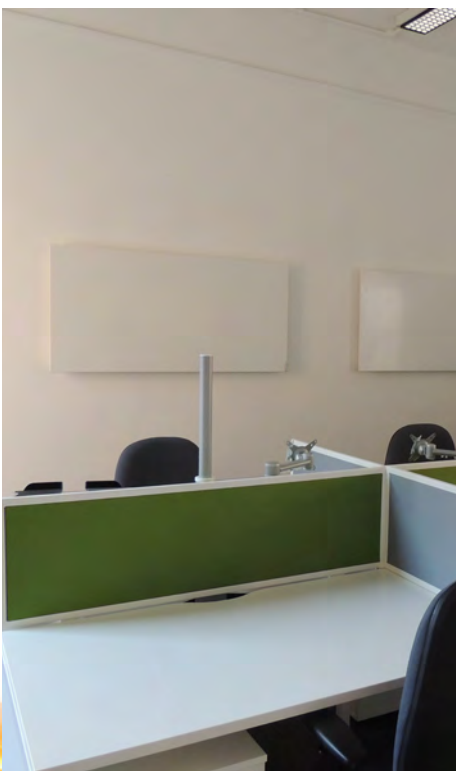
Case study

Pocock, Rutherford & Co - office ambient heating solution

As a condition of a multi-year lease, the new tenant asked the landlord to replace the old convection heaters and night storage heaters with future-oriented, efficient heating.

A solution with more heating comfort and lower operating costs was required. The new heating system also had to be flexible in terms of installation location to leave more space for desks, filing cabinets and shelves.

The old heaters were replaced by LAVA® STEEL and LAVA® BASIC-DM infrared heating panels. Each room is treated as a separate zone and controlled by a programmable thermostat. The tenant also benefits from the long service life and does not need to worry about annual maintenance or service costs.



Savings potential through **LOWERING** the room temperature



Study confirms: **30% less total energy requirement**

The **benefits** of ETHERMA



Low running costs:
£0.02/hour per desk



Targeted and
efficient heating for
office desks

Thermal comfort, easily within reach

A numerical study showed that the total energy requirement for an eight-person office in an older building can be reduced by 30% by lowering the target room temperature from 22°C to 18°C – while at the same time using individual LAVA® Desk infrared heaters. In addition, according to a study by the TU Dresden,

thermal comfort was achieved with an infrared heater with a max. heat output of 80W per desk – despite the reduced room temperature. The operating cost was just £0.02/hour per workstation.

Targeted and efficient office desk heating

Potential savings depending on building type and office size

Version	Savings potential per day**
Two-person office, old building, radiator under the window, ventilation via window and outside air vents	4.24 kWh
Two-person office, new building as per EnEv09, radiator under the window, window ventilation at intervals	1.48 kWh
Eight-person office, old building, radiator under the window, ventilation via window and outside air vents	11.90 kWh

*Assumption: October-April heating period, 22 heating days per month, one-shift operation, eight hour heating time per shift, test conditions: climatic chamber with a room temperature of 18 °C

**Pure savings potential by lowering the target temperature of conventional heating and including additional LAVA® DESK heaters

Heating quickly and individually: LAVA® PANELS

for the office and home office



LAVA® DESK 2.0

The practical table infrared heater

Benefits of this product

- > Customised and comfortable microclimate at the desk
- > Optional timer function and three-step regulation
- > No moving parts, i.e. absolutely silent
- > Straightforward installation
- > Maintenance-free
- > Made in Austria

LAVA® BASIC-DM

Infrared heating for ceilings and walls

Benefits of this product

- > Very low investment costs
- > Simple and flexible installation on the ceiling and wall, without any demolition work
- > Needs-based heating
- > Hardly any heat loss and maximum radiation
- > Modern, frameless design
- > Ideal for allergy sufferers (no dust turbulence)
- > Maintenance-free
- > Made in Austria

LAVA® STAND

The mobile infrared heater

Benefits of this product

- > Flexible positioning
- > Integrated electronic control on the device
- > Targeted heat radiation
- > Modern, frameless design
- > Integrated fold-out stand
- > Carrying handle on the device for easy transport
- > Maintenance-free
- > Made in Austria

	CE	GS CE	CE
Device/ installation depth	15mm	22/52mm	22mm
Output	80 W	350 W - 1,500 W	300 W, 450 W
Surface temperature	max. 70°C	max. 120°C	max. 95°C
Wall installation	✓	✓	Optional wall installation set
Ceiling installation	Installation on underside of desk	✓	-
Connection	Plug	Fixed connection	Plug



LAVA[®] DESK
TABLE INFRARED HEATER
Customised heat for every workstation



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