

**PROFESSIONAL
 INSTALLS
 STATEWIDE +
 FREE QUOTES**

HEG CONDENSATION CONTROL SYSTEM

Air Circulation + Heat Recovery + Ventilation

Eradicate domestic condensation issues using air circulation + heat recovery + ventilation.



PROBLEM	Window condensation, wall condensation, musty smells in rooms, mould, dust mite allergies and poor air quality in domestic homes.
CAUSE	Humid air within the home from household activities, fluctuations in the ambient temperature of the air within the home throughout the day/night and insufficient ventilation. Household activities, such as cooking, breathing, drying and showering introduce moisture into the house. Warm air during the day or from heaters absorbs this moisture. Overnight, when temperatures drop, the air can no longer suspend the moisture, so it condenses onto cold surfaces, particularly single-glazed windows.
TREATMENT	<ol style="list-style-type: none"> 1. Reduce the amount of moisture within household air (humidity), and 2. Raise the ambient temperature of the air within the house.
APPLICABLE SOLUTIONS	<ol style="list-style-type: none"> 1. HEG Condensation Control System (which is a combination of the ducted roof heat recovery/ventilation module and inter-room air transfer module). Duct from 1 to 8 rooms. 2. Insulation – either ceiling and/or underfloor depending on the house style/construction.
METHOD	The ducted HEG Condensation Control System (see figure, below) introduces dry, filtered air into the house from the roof cavity to dilute the moist air of the house. The ducted inter-room air transfer and solar "roof heat" recovery modules work together to introduce or distribute warmth throughout the house very efficiently to raise the ambient temperature. A good layer of ceiling insulation also lifts the ambient temperature. Air becomes less humid, and remaining water vapour is suspended in the air (not on the windows!) as warmer air can hold a greater percentage of moisture compared to cool air.

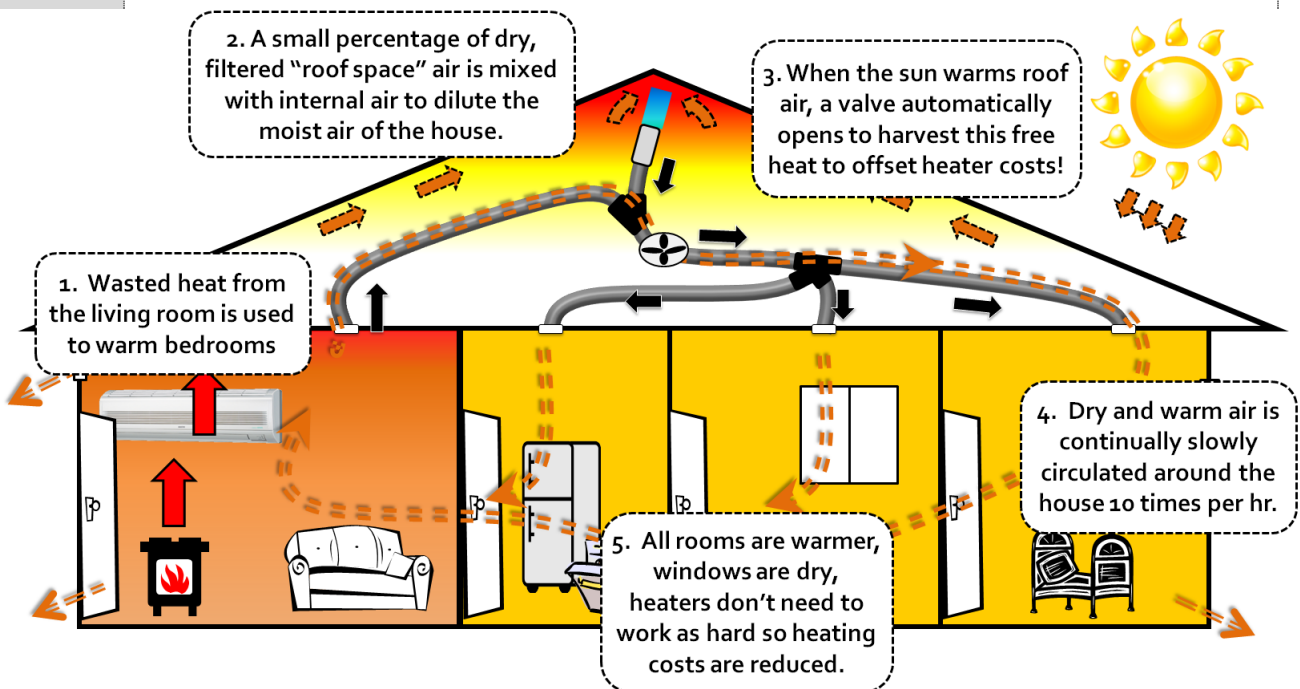


Figure 1. HEG Condensation Control System: Circulation + Heat Recovery + Ventilation

What causes condensation in homes?

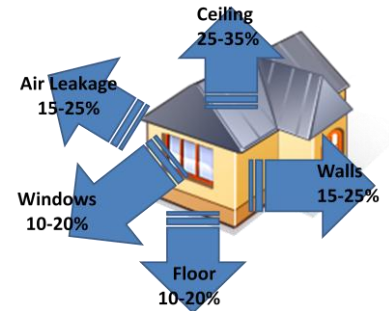
1. **Humidity** (moisture in the air)
2. Lack of adequate **ventilation**
3. Fluctuating room **temperatures** throughout the day, or big temperature variations in different parts of the house.

Condensation is caused when air that contains a lot of water vapour is cooled, and thus converts the vapour into water droplets, typically on windows and walls. As air cools, it is unable to support as many water molecules in a vapour state, which means they convert into a liquid. This is why condensation often coincides with the coldest part of the day - typically between midnight and 6am - when outside temperatures are at their lowest and internal heating is switched off or at its lowest setting.

How does the air become humid in the first place? Well, when the air is warmest, such as when a heater is on or sun heats the house, it absorbs water molecules from common household activities, such as drying clothes, showering and cooking! Additionally, some combustion-style heaters (such as flue-less gas heaters) add a lot of moisture into the air.

Lack of ventilation means that moisture within the air builds up because it is not being diluted by dry "outside" air. Adequate insulation is required to ensure that the recovered heat stays in the house for longer. As the diagram shows (source: Sustainability Victoria – Benefits of Insulation), insulation is required to stop a lot of Winter-time heat losses.

Figure 2. Winter Heat Losses



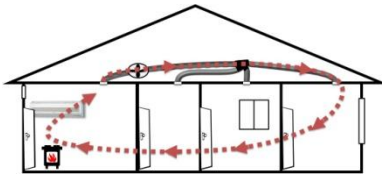
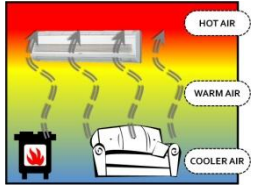
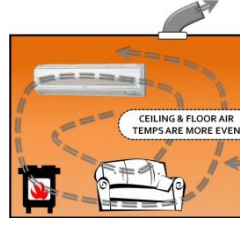

How do you fix condensation issues?

To eradicate condensation and condensation-related issues within a house, a solution needs to:

1. **Make the air drier** by providing adequate ventilation for the house.
2. **Increase the ambient temperature** of the house, particularly the air within the house, by recovering solar-gain heat from the roof space, better distribute heat from traditional heaters and keep any existing heat in the house by ensuring the house is insulated properly.

Home Efficiency Group uses the **HEG Condensation Control System** coupled with suitable insulation to eradicate condensation. This is a tried and tested way to effectively improve the comfort and health of your home, with the bonus of being able to substantially reduce your heating-related costs. The HEG Condensation Control System relies on two combined modules to achieve optimal condensation-fighting performance. These modules are:

1. **Ducted Inter-room Air Transfer System.** This system circulates air in a continuous loop from your living room heater to the far rooms of the house, and then back to the living room again. The hot air at ceiling level (that normally just goes to waste) is used to increase the ambient temperature of the entire house. This cycle breaks down the usual heat bands that tend to form below the ceiling area, making the floor and ceiling temperatures similar rather than an 8 to 15 degree difference.

Inter-Room Air Circulation	BEFORE AIR CIRCULATION	AFTER AIR CIRCULATION	SUITABLE HEATERS
			
Continuous air loop warms the house, gathering heat from living room heaters & solar gain via windows to warm up to 8 rooms.	Distinct layers of heat form. Top layers of heat are wasted, escaping through the ceiling.	Room becomes warmer as it uses the heat usually "hiding" at ceiling level	Most heaters are suitable. Heat pumps can distribute cool air in summer.

2. **Solar Roof Heat Recovery & Ventilation.** [See figure 1, overleaf] This system will take dry air from your roof space and, via a filter, ventilate it into the liveable parts of the house. This will displace the stale, moisture-laden air in the house, which takes away one of the building blocks of condensation! The stale air escapes from the house via vents, gaps around windows & doors and other naturally-occurring leakage points. To raise the ambient temperature, the system capitalises on the fact that the air in your roof space gets a lot warmer than the outside air temperature due to solar gain. Using thermostats, air valves, fan controllers and configurable settings, the digital system automatically pre-warms your house using free heat OR circulated living room heat OR a combination of the both. The pump is only 160W on full capacity, but usually only uses 1.5¢ per hour to operate on average. The system well insulated & uses subtle air inlets and outlets.

These systems have a rapid return on investment, often 14-20 months, as they:

- make your existing heater more efficient,
- reduce your reliance on secondary heaters in the bathroom and bedrooms, or floor heating
- recover heat from the roof space on bright days, which pre-heats your house and offsets thermostatically controlled heaters,
- eradicates severe condensation, and
- greatly improves the air quality of the house.

