

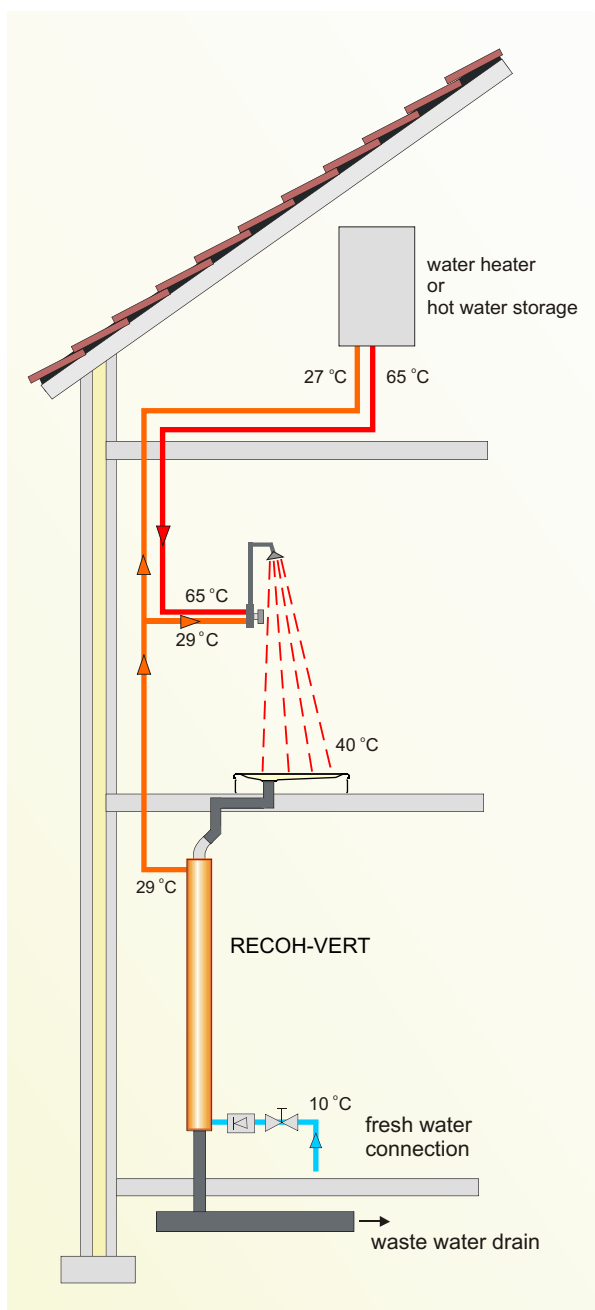
The 'RECOH-VERT'® heatexchanger

For heat recovery from waste water of a shower



Reducing energy consumption is a must nowadays, a matter of survival. Since houses are better insulated, energy consumption for space heating has been drastically reduced. On the other hand, hot water consumption has been increasing annually. People are taking more, longer showers. Using solar energy is a perfect way to reduce energy consumption.

The most efficient and economical way of reducing shower energy consumption is to recover energy from waste water. Savings of 50 to 70% can be achieved. If a small thermal solar energy system is used too, almost no energy is required.



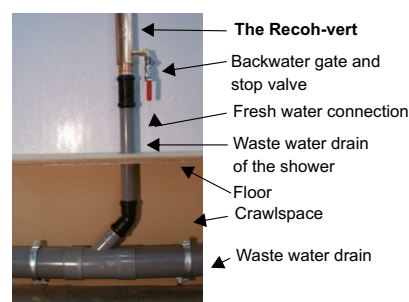
When you shower, much of the heat goes straight down the drain along with the waste water. Hei-tech has developed a heat exchanger, the 'Recoh-vert', which instantaneously pre-heats the cold water pipe to the shower and/or water heater. The 'Recoh-vert' has been successfully applied in the Netherlands for several years, particularly in a large number of newly built homes.

The 'Recoh-vert' is designed to reduce energy consumption for domestic hot water. The hot waste water of the shower passes the heat exchanger on its way down the drain. The heat is exchanged with the water from the water pipe en route to both the water heater and the shower.

The 'Recoh-vert' is 2.1 metres in length and has to be mounted in a vertical position. It is therefore only suitable for installation if the shower is on the first floor.

Due to its very high efficiency, the energy required for instant water heating or for hot water storage system will be reduced to only 40%.

It is also possible to just preheat the fresh water going directly to the shower. Efficiency will then be slightly lower.



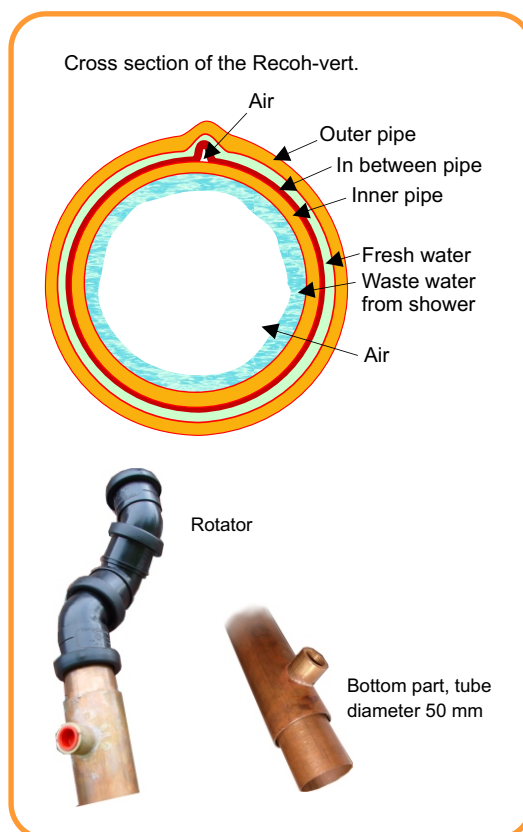
The 'Recoh-vert' is basically a double walled/pipe heat exchanger. The inner pipe, with a diameter of 50 mm, is the waste water drain pipe. The waste water clings to the inner surface of this pipe and flows downwards as a thin, high-velocity film. This allows good heat exchange to be achieved. The cold water mains that is to be preheated flows upwards through the annular space between both pipes.

As can be seen in the cross section, there is a third concentric pipe. This thin pipe provides an additional barrier between the waste water and the fresh water, which is compulsory in most countries.

The heat exchanger holds less than one litre. This means the heat exchanger starts working almost immediately after you start taking a shower.

As a result of the high velocity of the waste water streaming along the inside of the inner pipe no fouling occurs. This means that normally no cleaning is necessary. However, greasy water and shaving gel can foul the inner tube. Avoid causing this. Flush now and then with water and soap.

The 'Recoh-vert' is a straightforward, simple design which does not use pumps or controllers. It is completely made of copper which means it has a long working life.



The efficiency of the 'Recoh-vert' was measured by the Dutch KIWA/Gastec Certification and is 61% at a fresh water flow rate of 7.5 litres/minute. Due to this efficiency the pay-back time of the 'Recoh-vert' is therefore extremely short, only 3 to 5 years!

The Recoh-vert with a connection in the middle for rain dome shower heads.

A lot of rain dome shower heads are currently being installed in bathrooms. These have a much larger volume flow than ordinary showers.

If a rain dome shower head is used, a great deal of water has to pass through the heat exchanger. The loss of pressure can then become too high for a standard Recoh-vert.

The Recoh-vert with a connection in the middle was developed especially for these showers. The cold water flows through the heat exchanger in two directions which makes the loss of pressure much lower than in an ordinary heat exchanger. As a result of the connection in the middle, the heat exchanger's efficiency decreases slightly.

For larger rain dome shower heads other heat exchangers are available, based on the standard recoh-vert, for showers with a discharge up to 48 litres/minute. The waste water is then distributed to two heat exchangers lowering the loss of pressure and increasing efficiency.

All depending on the local mains water pressure.



The advantages.

- Small investment
- High energy savings.
- Short pay-back time.
- Easy to install.
- Maintenance free.
- Reliable.
- Long life time.
- No pumps or controllers.
- No electricity required.

The 'Recoh-vert' has been proven to be a very efficient way to fulfil the energy saving requirements of newly built houses in the Netherlands. The 'Recoh-vert' can also be used in hotels, retirement homes, swimming pools, in conjunction with professional dishwashers and in industrial applications.

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