

 SAP listed

 Suitable for all dwellings

 WRAS Approved

 High efficiency

 No maintenance

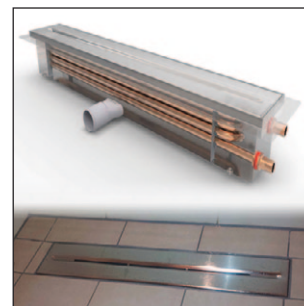
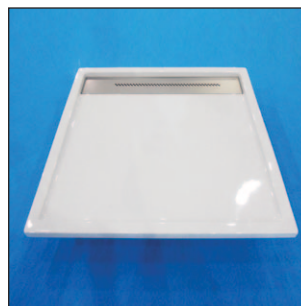
 Easy installation

 Low cost

RECUP

Energy Solutions Ltd

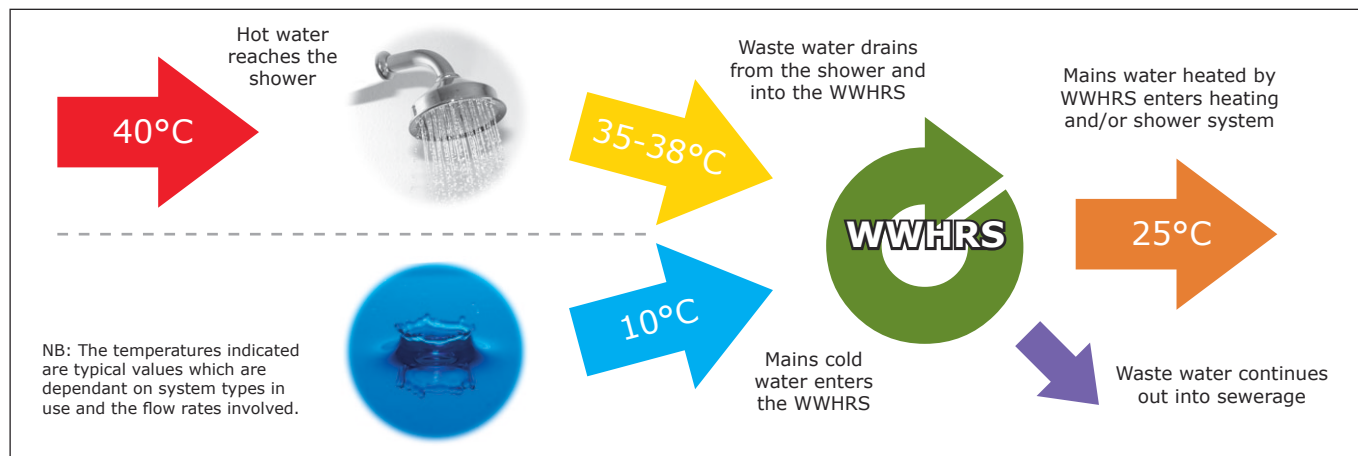
www.recoupenergysolutions.co.uk



Specialists in Waste Water Heat Recovery

What is WWHRS?

WWHRS is the abbreviation of Waste Water Heat Recovery System. In the simplest terms a system or technology that uses the remaining heat from shower waste water to increase the heat of cold mains water coming into the system. Less energy is then used to heat the mains water to the required temperature.



'Best New Product' winners - Barratt Development plc Supplier Excellence Award

Why use WWHRS?

WWHRS has been proven to provide a vital role in saving energy within both commercial and domestic properties. Compared to central heating that has many energy saving technologies in place, hot water has been an area where it has proven difficult to make significant improvements.

National & Regional House Builders

Recoup's WWHRS provides the perfect solution in any new build dwelling. The systems help to achieve code cheaply and easily... even if that extra boost is needed after construction has commenced. The systems provide...

- Incredibly high SAP points for low cost
- A must from 2010 Part L & Code 3 onwards
- Allows omission of expensive, problematic measures
- Easy to design into houses & apartments
- Quick install with no commissioning
- No planned maintenance
- No moving or mechanical parts
- No end-user interaction
- Virtually undetectable once installed
- A major reduction in load for any centralised plant

More information on SAP can be found on [page 11](#) with considerations for modelling in SAP on [page 12](#).

Housing Associations, Housing Stock Managers and Home owners

When looking to make houses more energy efficient WWHRS can be used gain the benefits of in existing properties, with...

- A variety of systems to suit nearly all applications
- Short ROI
- Instant and understandable savings
- Helping reduce bills in one of the most used areas of the home - hot water
- Perfect partner combined with boiler, bathroom and/or kitchen upgrades
- Simple, cost effective and no interaction or planned maintenance
- Can be used with any energy source

Commercial & Leisure Buildings

Recoup's range of WWHRS can also make a dramatic impact on the energy saved from shower use within large buildings. Examples are...

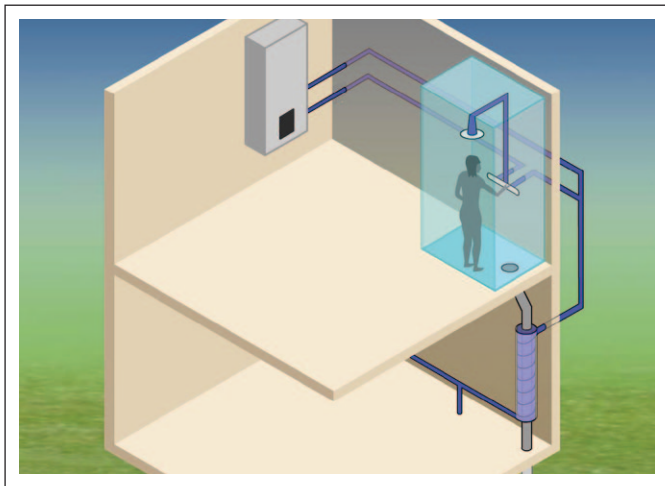
- Offices where people cycle and run before or during their working day, shower use can be very high
- Hotels, where there is always a high use of hot water through showering every day of the year
- Student accommodation where all inclusive bills means saving where possible is a must
- Leisure and sports clubs with high traffic and constant shower use, WWHRS helps with capacity and costs

We work with M&E designers and consultants helping to advise how our WWHRS can benefit their buildings both through code and also through use. Contact us for advice, support or meeting requests.

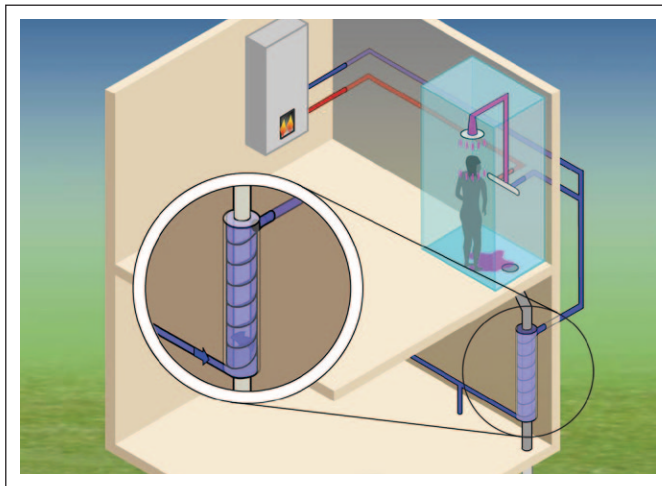


How it works

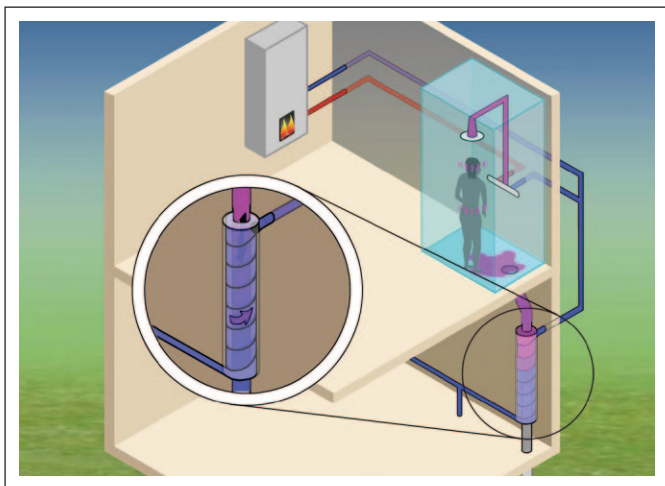
This illustration shows very simply how shower waste water heat recovery works. All products follow a similar process to this, full animations can be found in the [website how-it-works section](#).



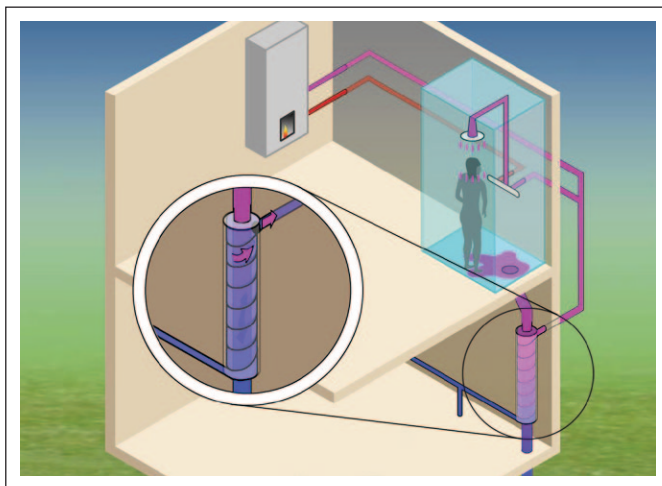
1. Entering and turning on the shower starts the system. Hot water from the boiler/cylinder mixes with cold mains water through the mixer tap leaving the shower at around 40°C.



2. Hot water goes down the drain and enters into the WWHRs. From shower head to drain the hot water drops a few degrees in temperature (between 35 to 38°C).



3. The hot drain water either clings to the side of the patented pipe exchanger or drips on to the patented coiled copper exchangers of the WWHRs. The cold feed passes through the exchanger running alongside the hot water.



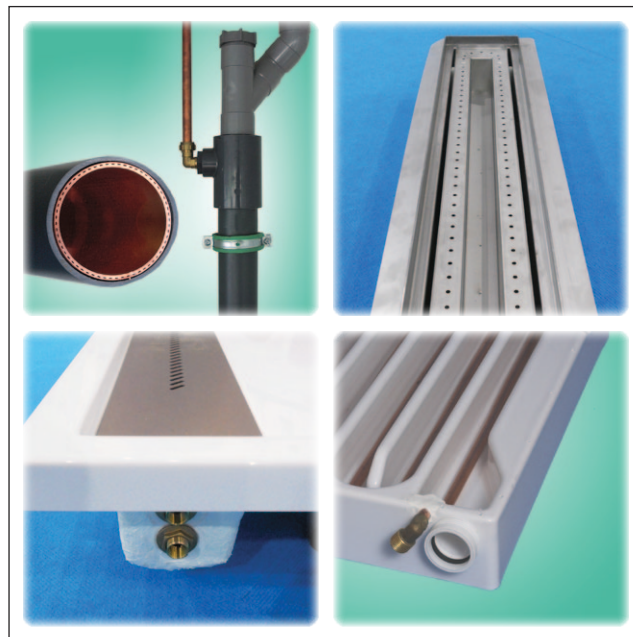
4. Heat transfer from the outgoing hot to the incoming cold allows a temperature increase of around 15 degrees. The pre-heated cold feed from the WWHRs then feeds back to the shower mixer and/or the boiler/cylinder.

Product introduction

We are delighted to present our product portfolio on the following pages. We have listened to our clients requirements to develop and engineer high performing, high quality systems for every application, from residential to commercial. You will find both vertical and horizontal systems as part of our range, allowing for single and multi-levelled buildings. We would be happy to advise you on all aspects of our WWHRs so you can ensure your project gains the optimum benefit from using a Recoup system.

Specification Considerations

It is important to ensure the correct product type is considered for each project. In turn which system is specified and how it installed has implications when modelling in SAP as shown on [pages 10 to 12](#). Using the application key below the product pages will indicate suitable project types that the product can be applied to. Please contact us if you are unsure which system is best suited for your project or which will provide you with the greatest results.



Product application key

Each Recoup WWHR are suitable for some but not all building applications. The symbols below will be used against each product type to illustrate the building application that the system is suitable for.



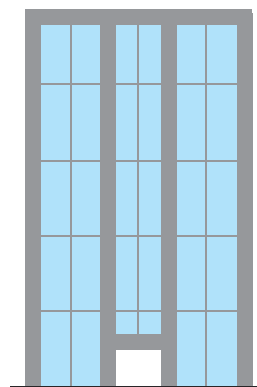
Houses



Bungalows or
Ground Floor



Apartments



Commercial properties
(Offices / Leisure clubs)

Our most popular waste water heat recovery system due to it’s efficiency of up to 67%, low price and superb all round performance. Providing incredible pounds to points ratio in SAP, the double walled (EN1717) Copper heat exchanger is mechanically pulled together giving consistent production. Ideal for new build applications, this product is sure to deliver results, whatever your criteria. Our unique PVC outer provides unrivaled benefits, including cost reduction, manufacturing consistency, theft deterrent and a lower product weight.

General Information

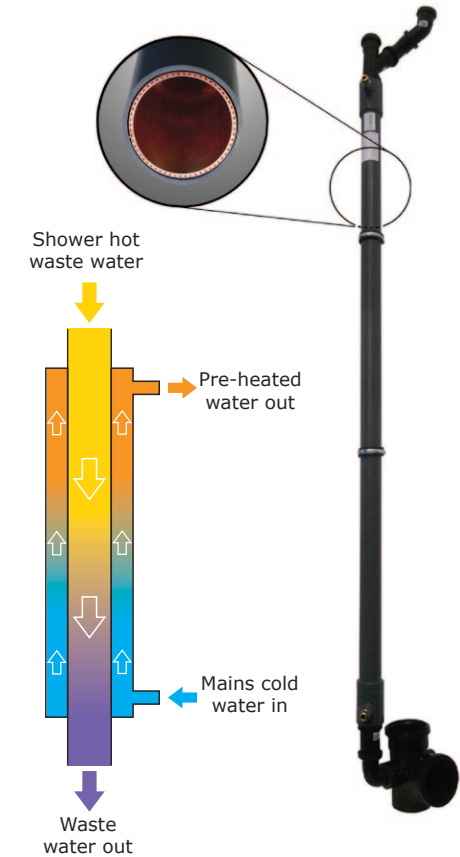
Description	Value	Unit
Overall length (Height) required for installation	2400	mm
Outside diameter of external tube	50	mm
Material - Internal tube	Copper	
Material - External tube	PVC	
Shower flow rate range	5 - 12.5	Litres/min
Max. Mains water inlet pressure	10	bar
Min. Mains water inlet pressure	1	bar
Max. Mains water working temp	85	°C
Mains water connection	15	mm
Waste water connection	50	mm
Weight	7.9	kg
Water volume - mains water	0.3	Litres

Performance & Efficiency

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Efficiency (Recovered energy kWh)		
	System A	System B	System C
9.0	64.2% (12.1)	49.4% (9.3)	55.5% (10.4)
9.2	63.7% (12.3)		
11.0	61.5% (14.1)	48.4% (11.1)	52.6% (12.1)
12.5	60.0% (15.7)		

Pressure drop on main water circuit

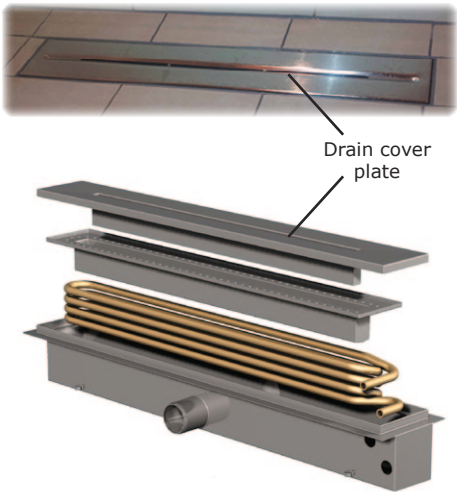
Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Pressure Drop (bar)		
	System A	System B	System C
9.2	0.34	<0.21	
12.5	0.45	<0.27	



For walk-in showers, ground floor properties and specific access requirements, the Recoup Drain+ with efficiencies of up to 55% provides an excellent WWHRS solution. Finished in stainless steel and easily accessible, this horizontal exchanger is a must have system for self build & renovation wet rooms, leisure clubs and nursing homes.

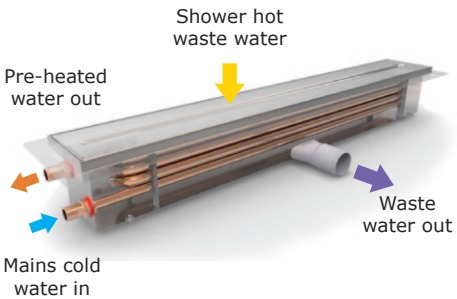
General Information

Description	Value	Unit
Minimum depth required for installation	120	mm
Overall width required for installation	960	mm
Material - Heat exchanger	Copper	
required for installation	5 - 12.5	Litres/min
Max. Mains water inlet pressure	10	bar
Min. Mains water inlet pressure	1	bar
Max. Mains water working temp	85	°C
Mains water connection	15	mm
Waste water connection	50	mm
Weight	5.45	kg
Water volume - mains water	0.72	Litres



Performance & Efficiency

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Efficiency (Recovered energy kWh)		
	System A	System B	System C
9.0	49.6% (9.3)	38.9% (7.3)	44.5% (8.4)
9.2	49.1% (12.3)		
11.0	48.2% (14.1)	38.6% (8.9)	42.8% (9.6)
12.5	47.7% (15.7)		



Pressure drop on main water circuit

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Pressure Drop (bar)		
	System A	System B	System C
5.5	0.14	<0.08	
7.5	0.20	<0.12	
9.2	0.24	<0.14	
12.5	0.40	<0.24	



The Recoup Tray+ WWHRS provides efficiencies of up to 50% and is the perfect solution for bungalows, apartments or ground floor en-suites along with commercial properties and leisure clubs. A horizontal exchanger that is easily installed into a variety of environments and easily accessible once in place. Achieving code in city apartments without renewable products is notoriously difficult; this shower heat recovery system with its two tray sizes (900mm x 900mm & 1200mm x 900mm) is the answer that doesn't heavily impact upon budgets.

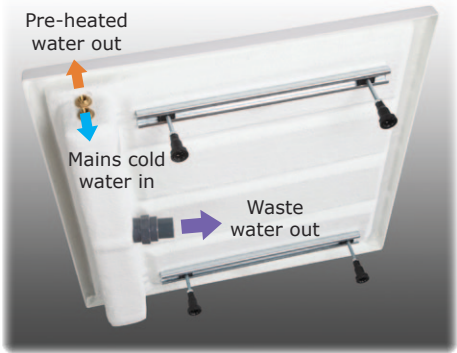
General Information

Description	Value	Unit
Minimum depth required for installation	150	mm
Overall width required for installation	900	mm
Material - Heat exchanger	Copper	
required for installation	5 - 12.5	Litres/min
Max. Mains water inlet pressure	10	bar
Min. Mains water inlet pressure	1	bar
Max. Mains water working temp	85	°C
Mains water connection	3/8	inch
Waste water connection	40	mm
Weight	2.7	kg
Water volume - mains water	0.67	Litres



Performance & Efficiency

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Efficiency (Recovered energy kWh)		
	System A	System B	System C
9.0	46.3% (8.7)	36.5% (6.9)	41.9% (7.9)
9.2	45.8% (8.8)		
11.0	45.4% (10.3)	36.5% (8.4)	40.6% (9.3)
12.5	45.2% (11.8)		



Pressure drop on main water circuit

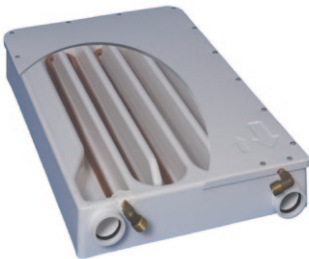
Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Pressure Drop (bar)		
	System A	System B	System C
9.2	0.31	<0.19	
12.5	0.50	<0.30	



The Recoup Retrofit+ WWHRS is easy to install and easy on the pocket! As its name suggests, it is ideal for retro-fitting into all residential applications, either under baths or raised shower cubicles. A very cost effective compact, horizontal heat exchanger that achieves efficiencies of up to 22%. It also has the added benefit of adding towards the silver standard for Scottish Housing Association homes.

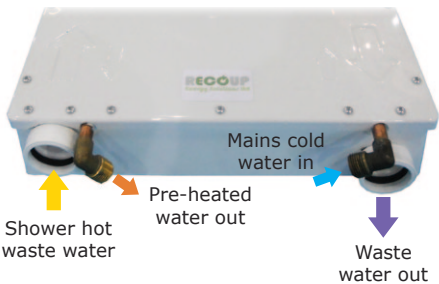
General Information

Description	Value	Unit
Minimum depth required for installation	85	mm
Overall width required for installation	630/375	mm
Material - Heat exchanger	Copper	
required for installation	5 - 12.5	Litres/min
Max. Mains water inlet pressure	16	bar
Min. Mains water inlet pressure	1	bar
Max. Mains water working temp	80	°C
Mains water connection	15	mm
Waste water connection	40	mm
Weight	2	kg
Water volume - mains water	0.27	Litres



Performance & Efficiency

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Efficiency (Recovered energy kWh)		
	System A	System B	System C
9.0	19.9% (3.75)	17.1% (3.22)	19.1% (3.60)
9.2	19.7% (3.79)		
11.0	18.4% (4.23)	16.2% (3.72)	17.6% (4.05)
12.5	17.7% (4.63)		



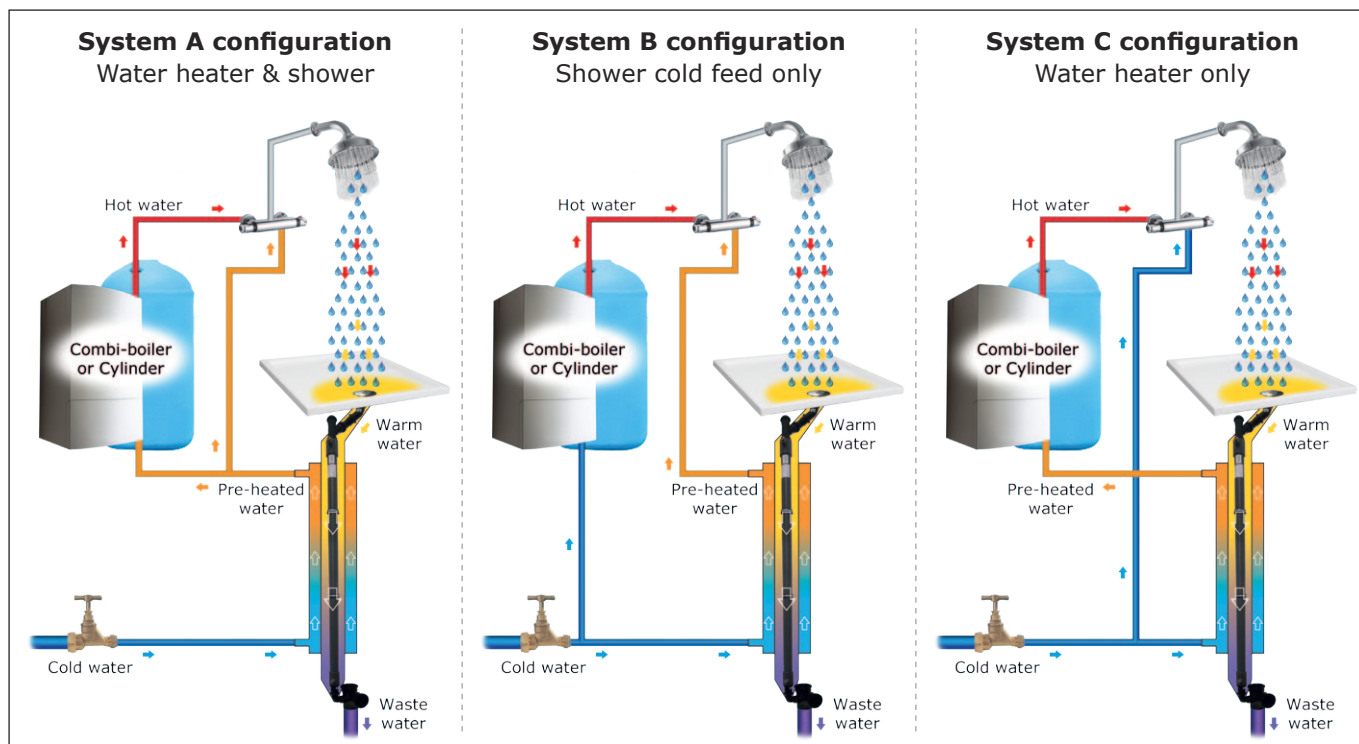
Pressure drop on main water circuit

Shower Flow Rate @ 40°C (Litres/min)	Pipe+HE Pressure Drop (bar)		
	System A	System B	System C
5.5	0.14	<0.08	
7.5	0.20	<0.12	
9.2	0.24	<0.14	
12.5	0.36	<0.21	



Installation Requirements

- The Domestic Hot Water (DHW) heater must be a mains pressure system and be able to accept pre-heated cold water.
- The system must create a 'cycle' of water
- Can be installed under a bath with a shower over
- The pre-heated water supplies the mains cold feed to the shower and/or either the Domestic Hot Water (DHW) heater
- The DHW heater could be an unvented hot water cylinder, combination boiler or mains fed thermal store
- Heat Interface Unit (HIU) on a district heating scheme
- Currently not recognised in SAP when used with an electric shower



What is SAP?

The Standard Assessment Procedure (SAP) is one of the National Calculation Methodologies for the energy rating of a dwelling. It is used to demonstrate compliance with building regulations - Part L (England and Wales), Section 6 (Scotland) and Part F (Northern Ireland) - and to provide energy ratings for a new dwelling.

The third version of SAP has now been released (April 2014) and is known as SAP 2012, with two previous versions still also in operation (SAP 2005 & SAP 2009), as planning permission for a dwelling may have been obtained when these versions were current, so will be built to these requirements.

PCDB and Appendix Q

The Product Characteristic Database (PCDB) holds the product performance data for individual products that have had their energy performance validated, so their impact on the building's energy performance can be calculated. If a new technology is introduced once a version of SAP has been released, it is first added to SAP appendix Q, and then normally transferred to the PCDB at the next release of SAP.

For Recoup WWHRS products, information for SAP 2005 is within appendix Q, and for 2009 and 2012 it can be found within the [PCDB website](#).

There are TWO key aspects of the data held on the PCDB that go into the SAP calculation, these are the Product efficiency AND Utilisation factor. The utilisation factor (the closer to 1, the better) takes into account energy needed at the start of showering to get up to temperature and the energy left in the system when the shower is switched off. Therefore, both should be considered when selecting a product.

Where WWHRS scores

WWHRS scores within building regulations Part L (L1A) and with Code for Sustainable Homes (ENE1) in lowering the dwellings emission rate. The current plan is for CFSH to be phased out and key elements combined with building regulations.

For the client of the SAP assessor, the commercial impact of their proposed solution is obviously key. Waste Water Heat Recovery System attached to a shower is actually one of, if not the best £ for point product within SAP, so the SAP assessor can be confident they are providing both a practical and commercial solution to their client. Scores can vary depending on house type, installation method and no. of showers/baths in a property but you can be sure of achieving between 3% & 9% uplift (commonly around 5 to 6%) for an incredibly low cost for both product and installation.

NOTE: Key changes from SAP 2009 to SAP 2012 for WWHRS

- The average flow rate for a shower used within the calculations has increased from 9 Litres/min to 11 litres/min
- The above will result in a different listed efficiency for each WWHRS product, as efficiencies change with different flow rates. However, as more water would be used per shower, overall results will be similar.
- The occupants shower to bath ratio has been increased, meaning showers will have a higher frequency than previous.

Key considerations when modelling in SAP

NB: Please refer to our specification considerations on [page 5](#) and installation diagrams on [page 10](#) before modelling.

All house types are different, but the following considerations will help maximise impact within SAP and ensure there are no technical issues for the builder.

SAP Considerations

1. A system attached to room with only a shower will always score more than when attached to a room with a shower and a bath.
2. In a house with first floor showers, depending on room locations and shower flow rates, two showers can be connected to one Recoup Pipe+ HE (Means both showers are installed in the System A configuration, but commercial cost is minimised).
3. If two systems need to be installed, only one system can be 'System A', and the other must be 'System B'.
 - a) This is because only one system can be attached to the water heater, so efficiencies are not affected.
 - b) For maximum SAP impact have 'System A' installation to room with only a shower and 'System B' to the bathroom.
4. For dwellings requiring 3 or more (A dwelling does not have to have a WWHRS on all showers, it depends on the SAP impact needed), there are a number of potential installation variations and we would be happy to work through these with you.
5. SAP prefers the distance from the shower waste to the top of the WWHRS where possible to be kept to a maximum of 3 meters where possible.

IMPORTANT

A house with 2 showers on the first floor has potentially 6 different installation possibilities. All have different impacts in SAP as well as requiring installation and product cost consideration. Therefore, we have experience of working with SAP assessors and house builders collectively to provide spread sheets for these different installation possibilities per house type, so impact in SAP for all can be easily assessed.

Technical Considerations for the SAP assessor

1. The type of dwelling and the shower location within that dwelling (Use the product application key to ensure correct product specification, see pages 5-9).
2. Vertical systems – A double wall exchanger – The Recoup Pipe+ HE has a double walled exchanger, which means your client will not have to install a trap below the product (Required for single wall exchangers), which can increase installation height and cause access issues.

SAP Modelling Assistance

Contact us for modelling advice for your specific project and requirements.

E: info@recoupenenergysolutions.co.uk T: 01379 844010

Q. What does WWHRS stand for?

A. Waste Water Heat Recovery Systems (attached to showers).

Q. Is Waste Water Heat Recovery SAP listed?

A. Yes, it is listed on the PCDB in both SAP 2009 & 2012 and achieves 3 - 9% reductions, typically 6 or 7%.

Q. Do they work with baths and showers?

A. They are designed to work with showers as the incoming cold feed is pre-heated before it refills the system or flows through the shower. Bath water will drain through the WWHRS if connected to the same drain as the shower, but will not gain any savings.

Q. Can WWHRS work with a combi or a cylinder?

A. WWHRS works with both; it can also work with a HIU with centralised plant.

Q. Are the Recoup units WRAS Approved?

A. Yes, all systems are WRAS Approved.

Q. What about legionella risks?

A. Recoup have had a risk assessment carried out by Legionella Control which was summarised as low risk. Full guidance is sent out with our systems and is available by contacting us.

Q. Can Recoup's WWHRS be used on the ground floor?

A. We have horizontal systems specifically designed for use on the ground floor or apartments

Q. Can WWHRS be used with an electric shower?

A. It is not recognised in SAP currently, as electric showers would need to be manually adjusted when pre-heated water is fed into it. No electric showers available can regulate both temperature and flow rate as a mixer shower can, therefore the primary reaction would be an increased flow rate, not energy savings. In theory it would have benefits, but variables mean testing, calculations and accreditations are not possible at this point.

Q. What are single and double wall exchangers?

A. Every WWHRS has an exchanger, usually made of copper. A double walled exchanger is essentially two pipes joined to each other creating a double barrier between the waste and potable water. A double wall meets EN-1717 meaning a trap does not have to be installed AFTER the system to meet water regulations. Single walled exchangers pass UK water regulations as long as a trap is installed AFTER the unit.

N.B. Single walled exchangers are problematic on vertical pipe systems due to increased height requirements, noise from falling water, blockage issues and access.

Q. What maintenance is required?

A. Our WWHRS require no planned maintenance at all. They should be treated like your normal drainage pipe, with periodic cleaning and hair removal from the horizontal versions. Access is very easy for these systems.

Q. What specialist installation requirements are there?

A. None. Our WWHRS require standard plumbing skills only as they are completely passive. Attention should be paid to the correct installation method (A, B or C), to ensure SAP compliance and optimised energy savings.

Q. What makes Recoup's WWHRS different?

A. We have spent lots of time developing and engineering our systems to ensure a diverse portfolio with high efficiencies and durable, high quality and consistent properties whilst maintaining a keen and commercially-friendly cost. We use a PVC outer on our vertical pipe system which means lower cost, light weight, less copper, standard downpipe aesthetics and complete consistency in manufacture. Our horizontal systems represent real value, easy access, simple installation and high class finish.



info@recoupenergysolutions.co.uk
01379 844010

KIWA Efficiency & WRAS Certification

All our Waste Water Heat Recovery Systems are material & mechanical tested by KIWA and WRAS Approved.

Legionella Guidance

Recoup WWHRs have been risk assessed by Legionella Control and are deemed low risk.

Documents, Certificates & Information

More information on testing, approvals and certification can be found in the [technical data certification on our website](#)

'Best New Product' winners - Barratt Development plc Supplier Excellence Award

Please feel contact us for any further information you require

Recoup Energy Solutions Ltd, PO Box 365, Eye, IP22 9BH

www.recoupenergysolutions.co.uk