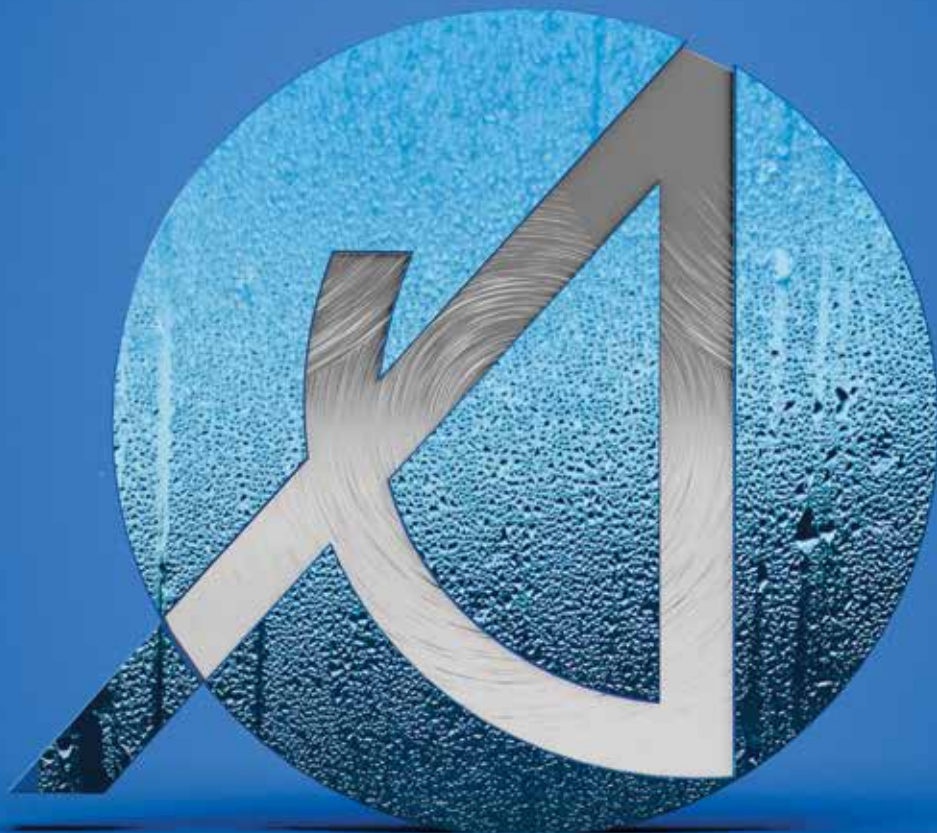




...a green way to heat water



Aquaskid®
Plug&Play System

ADSUM
engineering

Thermoskid®
Plug&Play System

2018

www.adsumsrl.com

Adsum Srl is a Italian company headquartered in the pre-Roman town Ascoli Piceno (Marche), Italy. The company was established in 2012. A group of engineers saw an opportunity to work together to introduce innovative concepts and technology to promote energy efficiency and environmentally friendly products in what had been considered an old and established industry. Adsum's mission is to create innovative thermo-hydraulic systems dedicated to the management of hot water and steam. Adsum's values include the belief that together with high ethical standards essential business, enabling us to establish long term mutually beneficial business relationships. Innovation is what allows us to be unique.

GREEN ENGINEERING
or sustainable engineering

Combines energy savings with functional design. The products are integrated with the environment, easy to use, customizable to client's needs and integrate different technologies.

Adsum's focus on two markets where our patented ecological heating systems offer substantial advantages: Client receptive establishments (tourist resorts, camping sites, hotels, and sport centres) need to cater to peaks of high demands day after day, while being cost effective, using minimal space and being eco-friendly.

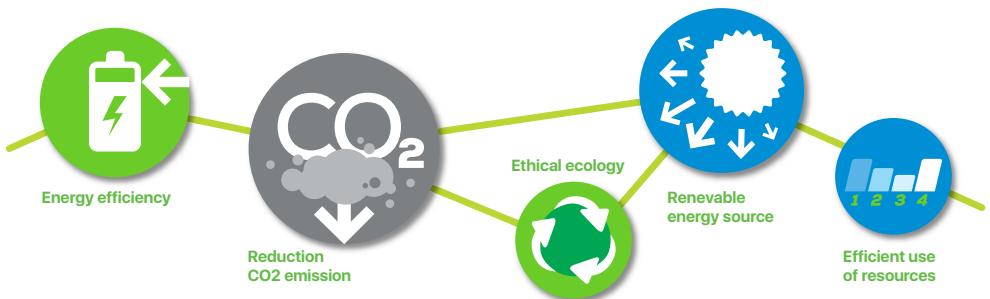
We have developed two products line:

Aquaskid[®] and Thermoskid[®] to meet these requirements. The process industry (food and beverage, pharmaceutical) requires solutions that work uninterrupted 24 hours a day to very precise parameters in demanding environments. Our product lines Aquaskid[®] V/A and Aquaskid[®] A/A meets these demands. In addition, the same underlying competences allow us to create tailored solutions for other large industrial plants.

PLUG&PLAY READY SKIDS

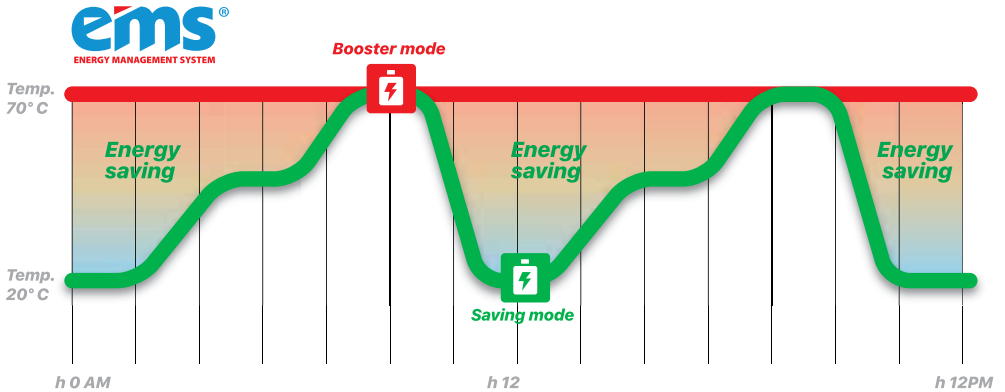
Adsum's products are all characterized by their functional architecture and eco-friendly features. They are all Plug&Play ready, stand-alone units with small foot prints (s.c. Skids or system in a box).

Producing skids allow us to assemble, test, certify and guarantee that the complete solution is fully working at our manufacturing plant before installing it at our clients' location. The installation becomes a simple plug and play operation; connect the water and the electricity and turn on the switch. This contrasts to the traditional projects which have to be assembled by a combination of suppliers at the client's location. Apart from creating and managing a small building site there is no one single firm being responsible for the final working result.



SMART TECHNOLOGY
Energy and more

Adsum's systems are highly energy-efficient thanks to a new and original concept of energy management, patented under the name EMS[®] (Energy Management System), that allows our units to heat water only when required.



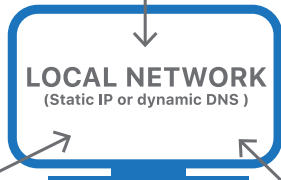
This has allowed us to minimize the consumption of primary energy and the accumulation of hot water at the same time as streamlining the design of our units.

Being able to build one single, complete and integrated system, at our factory has allowed us to make the operation of the units simple and intuitive. This is further facilitated by our electronic user interface.

New enabling technologies allows our company to interconnect the main components of the production system (people, machines, raw materials, finished products, customer). With Adsum's Monitoring and Tele-Management services, the user can check the status of the machine and change its working parameters. The application of Internet of Things (IoT) has allowed us to extend the user interface remotely, so that our units can be controlled by a PC or a Smartphone.



LAN
(wifi accessory)



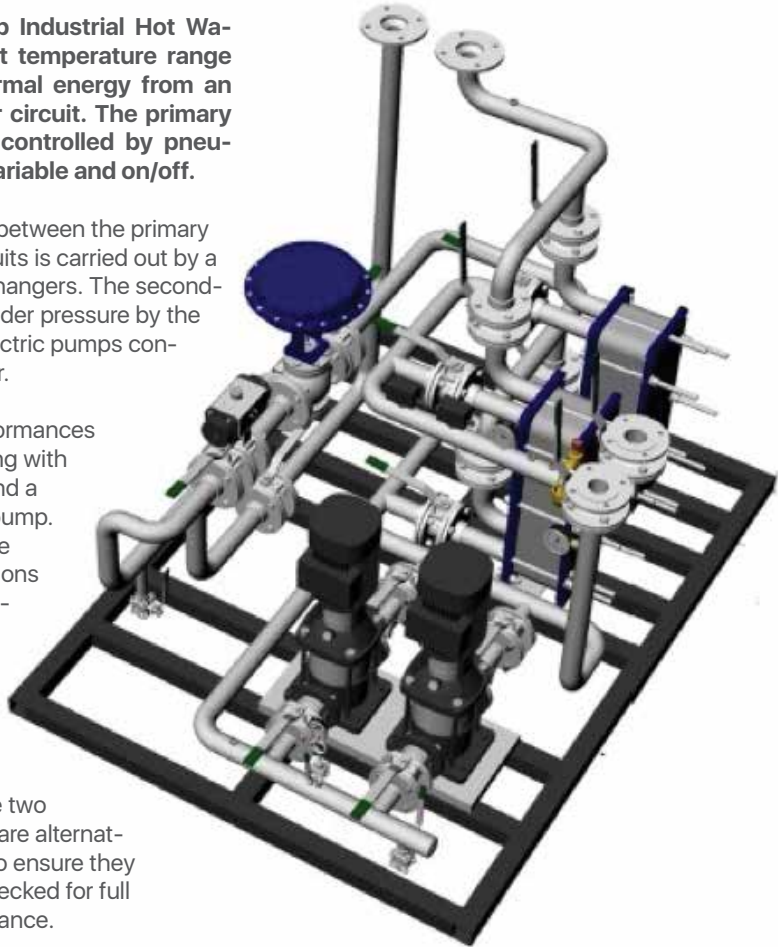
PFIZER

The Skid heats up Industrial Hot Water to a tightly set temperature range by extracting thermal energy from an external hot water circuit. The primary heating circuit is controlled by pneumatic controller, variable and on/off.

- The heat transfer between the primary and secondary circuits is carried out by a two-plate heat-exchangers. The secondary circuit is kept under pressure by the two vertical-axis electric pumps controlled by an inverter.

- The reported performances is based on operating with a heat exchanger and a circulation electro-pump. In order to guarantee continuity of operations even in case maintenance or faults the unit is designed with two parallel circuits with all components being duplicated. Set to automatic mode the two pumps and circuits are alternated every 24 hours to ensure they are continuously checked for full operational performance.

- All the equipment is monitored and controlled by PLC installed inside a dedicated panel. The PLC is enabled for remote control through a special communication interface.



BRISTOL-MYERS SQUIBB STEAM

The unit produces hot water for a closed heating circuit. Hot water is produced by a tube-bundled heat exchanger powered by industrial steam.

- The steam supply line is protected upstream by a safety valve.
- The incoming steam is regulated by a pneumatic valve, the steam interception is guaranteed by a pneumatic valve (on/off). The condensation discharge is handled by two Venturi drains, one being the back-up to the other.
- The temperature of hot water is maintained at a fixed level, changeable via the control panel.
- Two pumps, one being the back-up to the other, continuously recirculate hot water in the system. The flow rate is modulated according to the thermal load. The thermal load is detected by a system consisting of a flow meter and temperature probes placed on the inlet and outlet pipes.
- The unit is controlled by a PLC.

HC 1000



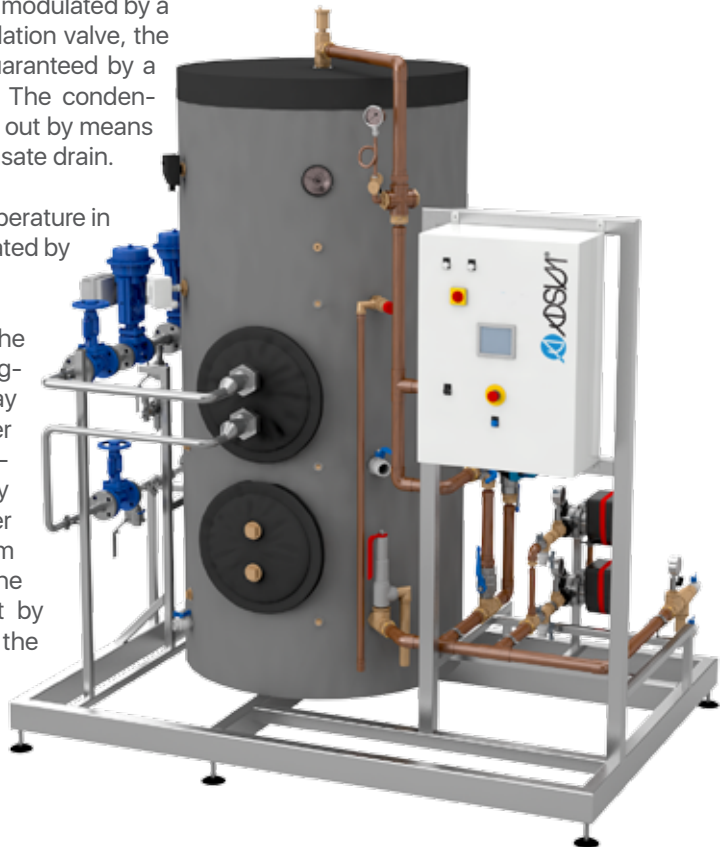
BRISTOL-MYERS SQUIBB LHW

The system produces industrial hot water

- Hot water is produced by a storage heat exchanger powered by industrial steam.
- The incoming steam is regulated by a pneumatic valve, the steam interception is guaranteed by a pneumatic valve (on/off). The condensation discharge is handled by two Venturi drains, one being the back-up to the other.
- The incoming steam is modulated by a specific pneumatic regulation valve, the steam interception is guaranteed by a pneumatic valve on/off. The condensate discharge is carried out by means of a Venturi type condensate drain.
- The water storage temperature in the storage tank is regulated by turning the steam valve.
- The temperature of the outgoing hot water is regulated by a three-way valve which mixes water coming from the heat exchanger with the supply and recycled hot water and water coming from the water network. The Set-Point can be set by the operator panel on the system through the PLC.
- Two electronic circuit-

slators, one of reserve back-up to the other, circulate the hot water in the system. The operating times of the circuit-slators are selectable from the operator panel, set by the operator.

- To avoid potential bacterial growth, an automatic and routine program of thermal sanitization (anti-Legionella) allows the recirculation of water at 80°C hot water for a time of two hours periods.
- The unit is controlled by a PLC.



UNILEVER

The skid is designed to supply pressurized hot water to feed two benches of washing nozzles, one with drinking water and the other with water containing calcium chloride.

- The water is heated by withdrawing thermal energy from an external steam ring.
- The unit operates with two separate and independent water circuits, each equipped with a heat exchanger and a pump. One of the two lines is made of materials suitable for operation with water containing calcium chloride.
- The outgoing water's temperature is measured by checking the output from the heat exchangers and is controlled by regulating the 2-way pneumatic steam valves.
- The outlet from the heat exchangers is controlled by condensate float drain valves.
- The secondary circuits of water are kept under pressure by inverter controlled pumps, with the help of pressure transmitters.

Rapid 40



FIC

Aquaskid® Rapid V/A produces hot water using thermal energy from an external steam circuit.

- The heat transfer between the primary and secondary circuits takes place thanks to a brazed plate heat exchanger (stainless steel).
- The temperature of the water supply is measured through the sensor at the heat exchanger and is regulated by the 2-way control valve. The valve is pneumatically operated.

- The outlet from the heat exchangers is controlled by condensate float drain valves.
- There is a fixed-point flow regulator on the secondary circuit that guarantees the flow rate within the specified range.
- On the water side the unit is predisposed for Cleaning In Place (CIP - used for cleaning of process equipment), there is an input manometer and a predisposition for the connection of a second outlet manometer.

Rapid VA 120



CHEMI

Aquaskid® Rapid V/A produces industrial hot water using thermal energy from the external steam circuit. The primary heating circuit is controlled by pneumatic valves.

- All the equipment is monitored and controlled by a PLC.
- The heat transfer between the primary and secondary circuits takes place through an inspectable plate heat exchanger.
- The delivery temperature management is carried out by adjusting the 2-way control valve on the steam side after opening the on/off valve, with both valves being operated by a pneumatic circuit.
- The condensate at the exchanger outlet is started at the return circuit by means of

a mechanical relaunch pump that uses a steam discharge as a motor fluid.

- There are two by-pass branches on the secondary circuit: the first is a 2-way electrically controlled valve for the mixing of the hot water output, on the second branch an electronic circulator carry out the continuous circulation of water on the exchanger. The presence of these two connections between the delivery and the return allows the unit to obtain a stable hot water delivery temperature even with very variable flow rates.

- The electronic circulator and the 2-way by-pass valve are alternatively activated depending on the flow rate of hot water on the secondary circuit. The electronic circulator is active at low sampling rates on the secondary while at high flow rates, measured at the entrance of Aquaskid® Rapid V/A, the by-pass valve is opened.

Rapid VA 350



MAJOR PROJECTS

OCRIM: MILLS IN JAZAN, ASHA, KAHRJ AND MEDINAH BUHLER: JAZAN

The conditioning of the MCC and the CR will be done through a hydronic system derived from the refrigeration unit on the roof. The heat transfer fluid will be pumped through pipes vertical arriving at various levels, fueling the various equipment installed.

The purpose of Skid roof will exchange heat and adjust the water temperature to the air washers. There will also be one skid for the circulation of the heat transfer fluid to the equipment installed in the MCC ROOMS and CONTROL ROOM.

Adsum Skids positioned on the roof, separates the primary closed circuit from the secondary circuits of the two chillers providing cooling water to the washers. They will be equipped with valves, control equipment and filtration, motorized three-way regulating valve and heat exchanger plates.







...a green way to heat water.

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