

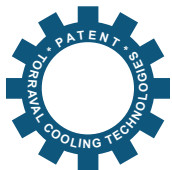


PAD-V
Sustainable adiabatic
system for liquid cooling
and gas condensing

TORRAVAL
cooling



STRENGTHENED... AND PATENTED: ADIABATIC ACCORDING TO TORRAVAL

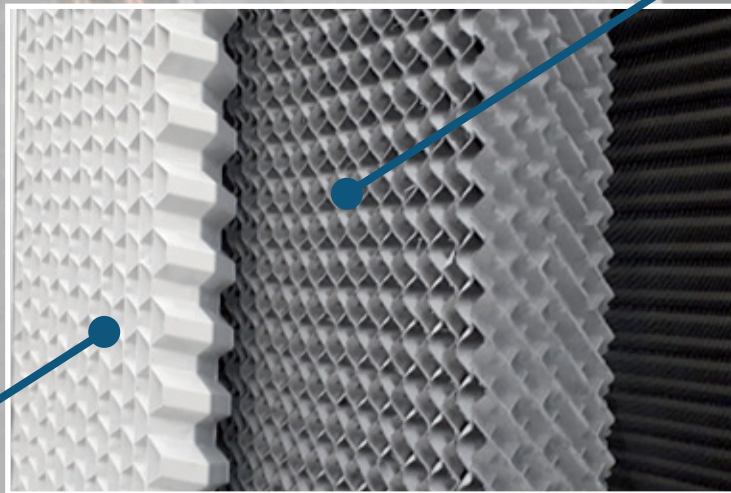


European patent
N° 2 206 980 B1

LIKE VELVET TO RETAIN WATER

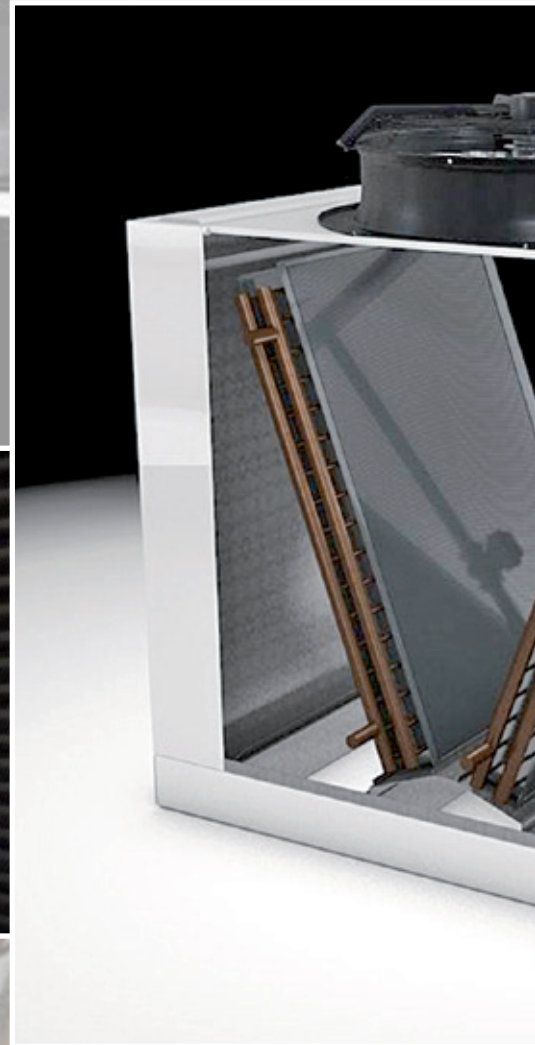
The *humidifying pack* for adiabatic operation stays damp for a long time, due to the “velvet effect” of the flocked PVC

- › Very short non-continuous wetting cycles: just a few seconds every 10-20 minutes instead of a constant “waterfall”
- › Real water savings, also thanks to recovery and recycling.
- › PVC pack and rayon fibre flocking (not organic-based) instead of the more common cellulose **to prevent bacterial proliferation.**



AIR INTAKE GRILLE

- › Filters the air, but **protects the adiabatic pack** from light and foreign matter.
- › Prevents water leaks, **ensuring a clean environment** around the machine.



Adiabatic operation in hot periods ...



- › The external air passes through the **humidifier pack**.
- › The adiabatically cooled air is conveyed to the finned coils: the **efficiency increases**.
- › Capable of working **at lower ambient temperatures**.
- › **No direct contact** between water and finned coils.

A SAFE, DURABLE AND SUSTAINABLE SYSTEM

SMART FAN ADJUSTMENT

- › The inverter on the motors **adjusts the speed of the fans** according to ambient temperature and thermal load.
- › In adiabatic mode, the motors slow down during the wetting cycles; **this prevents** drops of water being dragged outside.
- › The result: **electricity savings and a healthy environment.**

MAXIMUM FLEXIBILITY

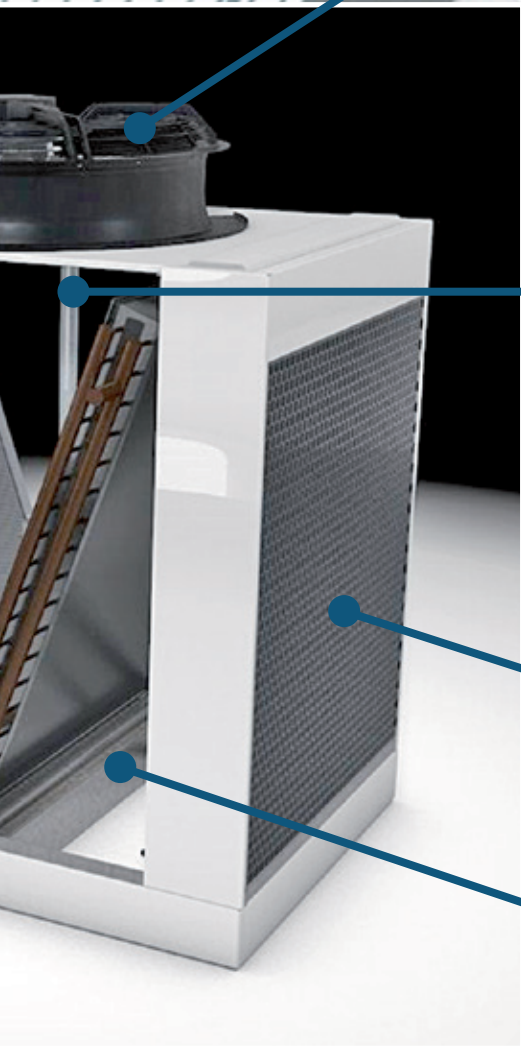
- › A **completely parameter controlled** system.
- › Depending on thermal load needs, external temperatures, and water and energy consumption objectives, **the system automatically adjusts** fan rotation speed, wetting cycles and adiabatic/dry modes.
- › **Very low water and electricity consumption.**

FLOCKED PVC ADIABATIC PACK

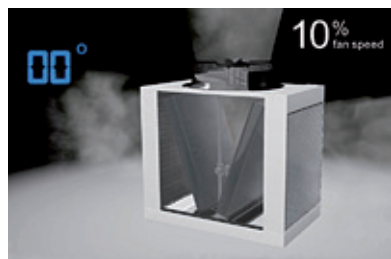
- › Material **does not deteriorate over time.**
- › **Self-extinguishing.**
- › **Recyclable** at end of life.

NO NEED FOR TREATED WATER

- › **Programmed daily change** of wetting water.
- › Parts in contact with water are made of material that does **not corrode** and is easy to clean.
- › The coils **are not in contact** with the wetting water.

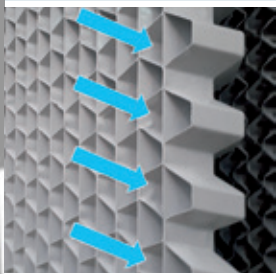


... Dry operation in cold weather



- › The external air is **aspirated and conveyed directly** to the coils.
- › **Humidification is deactivated**: no water in the circuit.
- › **Fan speed modulated** according to temperature.
- › Guaranteed **water and energy savings.**

OPTIMIZED HEAT EXCHANGE



AIR INTAKE GRILLE

It improves air distribution on the humidifier pack and avoids water leaks: **greater efficiency**, **less energy** consumed by the fans, **less water** for humidifying the air.



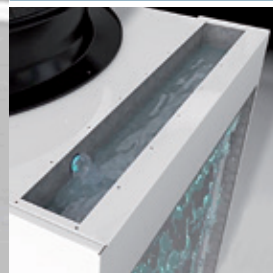
AIR DISTRIBUTION

Geometry and configuration of the V-shaped coils and central fans ensure **optimum performance with low load loss**.



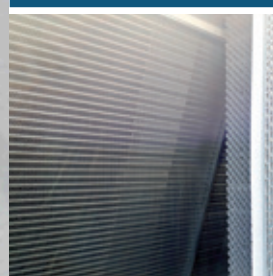
EC FANS

Electronic control fans compliant with the ErP 2011 "Eco- design" standard **for enhanced energy efficiency** with low noise levels.



WETTING

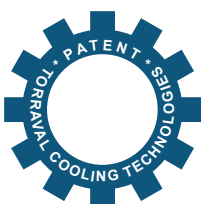
Very short cycles to humidify air in hot weather: **water consumption tailored to actual current need**.



COIL CHARACTERISTICS

Tube diameter, fin pitch, geometry and materials selected for **top performance**.

TORRAVAL's secret for slashing consumption



European patent
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Saving 1: the flocked PVC adiabatic pack is wetted to humidify the air **only when needed** and at intervals **from 10 to 20 minutes** (not continuously as occurs in other adiabatic packs).

Saving 2: once wet, the adiabatic pack **releases only the water necessary** to obtain an air temperature that will ensure the thermal performance (cooling) of the finned coil system. With other adiabatic packs, the quantity of water distributed on the pack is constant and independent of the condition of the air to be cooled.

Saving 3: the flocked PVC adiabatic pack just needs to be wet with non-pressurized water for a short time (about 15 seconds). In the most "extreme" wetting condition, with a wetting cycle every 10 minutes, the pump runs for just one and a half minutes every hour. A pump with 2 kW electric power thus consumes about 50 W/h: **the equivalent of a low-power light bulb!**

PERFORMANCE AND CONSUMPTION UNDER CONTROL



INDUSTRY 4.0

Four temperature probes to control the external temperature, the adiabatic section and the process fluid.

A PLC controls and automates the machine's operation.

The data can be sent to a remote control panel.



OPTIMIZED EFFICIENCY

Obtained thanks to the electronically controlled fans that **modulate speed** according to various parameters.



WATER MANAGEMENT

Purging and replenishment are managed by a PLC.



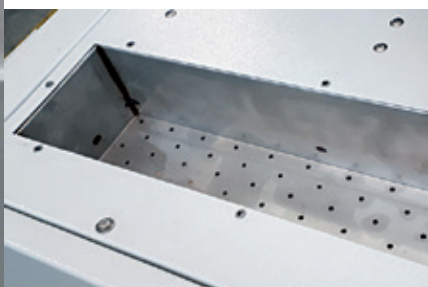
MITA CONNECT

The data collected by the PLC can be sent to the MITA Connect platform for **remote monitoring, record analysis and preventive maintenance**.

MAINTENANCE HAS NEVER BEEN SO SIMPLE



The air intake grilles and adiabatic pack are **easy to remove**.



The outer doors make it **easy to inspect** the inner components.

Further, to **minimize** maintenance, the parts in contact with water are uncorrodable: **AISI 304** stainless steel or **PVC**.

THE ADVANTAGES OF ADIABATIC COOLING WITH TORRAVAL'S EXPERIENCE

Examples of application of PAD-V



PRODUCTION OF PLASTIC



TRIGENERATION / COGENERATION



DATA CENTERS



HVAC



INDUSTRIAL REFRIGERATION



FOOD & BEVERAGE



HEAT TREATMENT



The experience of TORRAVAL Cooling Technologies with PAD-V and the other adiabatic systems ...



In plastic moulding systems

In power plants



For trigeneration and cogeneration

In dairies



In the power generation sector

Metal treatments

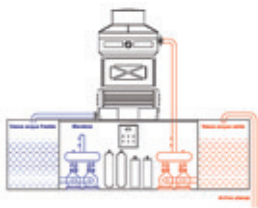


TORRAVAL COOLING TECHNOLOGIES YOUR PROCESS COOLING ADVISOR



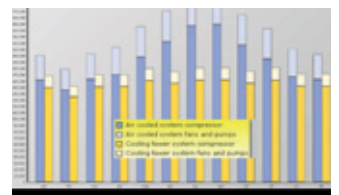
You can always be sure to select the right product for your system thanks to a consultancy approach: the PAD-V adiabatic system complements the vast range of TORRAVAL Cooling Technologies coolers.

Maximum adaptation to customer needs: customization possible for complex environments.



You can be sure of reducing complexity and nasty surprises: **integrated Plug & Play solutions.**

Optimized ROI thanks to **water and energy** saving in real operating conditions.

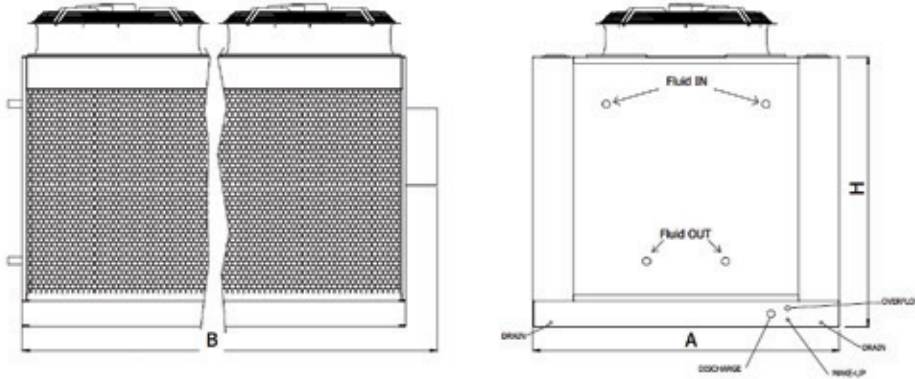


A choice that respects the environment: We look for solutions to reduce noise and consumption constantly throughout the life of the product. Pending certifications: ISO 14001 (environmental management) and EN 45001 (health and safety).

Since 1967, we have been **a serious and reliable partner.**

DIMENSIONS AND WEIGHT

Model	Dimensions (mm)			Weight (kg)	
	A	B	H	Shipping	Operating
PAD - V 1/4	2425	1880	2520	900	1084
PAD - V 1/5				940	1156
PAD - V 1/6				980	1260
PAD - V 2/4	2425	3460	2520	1568	1906
PAD - V 2/5				1660	2070
PAD - V 2/6				1765	2260
PAD - V 3/4	2425	5040	2520	2382	2892
PAD - V 3/5				2524	3138
PAD - V 3/6				2650	3390
PAD - V 4/4	2425	6620	2520	3038	3734
PAD - V 4/5				3218	4058
PAD - V 4/6				3430	4390



Model	EC fans							Wetting pump No / kW
	Number	Installed power (kW)	Power intake (kW)	Single fan sound emission (dbA)*	Single fan sound pressure at 1 m (dbA)	Single fan sound pressure at 10 m (dbA)	Single fan sound pressure at 20 m (dbA)	
PAD - V 1	1	6,0	5,3	85	78	55	48	1 x 1,1
PAD - V 2	2	6,0 x 2	5,3 x 2	85	78	55	48	1 x 1,1
PAD - V 3	3	6,0 x 3	5,3 x 3	85	78	55	48	1 x 1,5
PAD - V 4	4	6,0 x 4	5,3 x 4	85	78	55	48	1 x 1,5

FANS AND WETTING PUMP

* Calculated according to ISO 3744

HYDRAULIC CONNECTIONS

Model	Hydraulic connections				
	Battery input / output	Water delivery	Water discharge	Drainage	Overflow
PAD - V 1	2"	1/2"	2"	2 x 1/2"	1"
PAD - V 2	3"	3/4"	2"	2 x 3/4"	1"
PAD - V 3	4"	1"	2"	2 x 1"	1 1/4"
PAD - V 4	4"	1 1/4"	2"	2 x 1"	1 1/2"



TORRAVAL
cooling

MITA
group

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