Indirect Direct Evaporative Cooling (IDEC)

Breathe healthy with clean-cool-fresh air

HMX Indirect Direct Evaporative Cooling (IDEC)

A proven method for enhancing health and productivity in large industrial and commercial spaces

Bringing in outside air into workspaces and play spaces is necessary as it is the most effective way to flush out airborne contaminants. These contaminants could arise from manufacturing processes, but could also derive from the fittings in the space itself, or could just as well be biological contaminants such as bacteria or viruses or related to respiration and perspiration. Outside air also enhances productivity, if it is at a comfortable temperature.

But bringing in outside air always has an energy cost – particularly when the ambient temperatures are warm. Conventional cooling technologies such as air-conditioning are extremely energy intensive – and especially so when used to cool spaces like manufacturing or sports arenas where air recirculation is not advisable. Non-refrigerant based Direct Evaporative Cooling (DEC) is more economical, but does not provide the required level of comfort.

HMX Indirect Direct Evaporative Cooling (IDEC) is an ideal solution in such cases.

It combines Indirect Evaporative Cooling (IEC) with an adiabatic or DEC module to provide clean-cool-fresh air with:

- **Up to 120% overall wet bulb efficiency**
- **Up to 60% less power consumption compared to an air-conditioning system**
- **Up to 40% less moisture addition in supply air as compared to DEC alone**

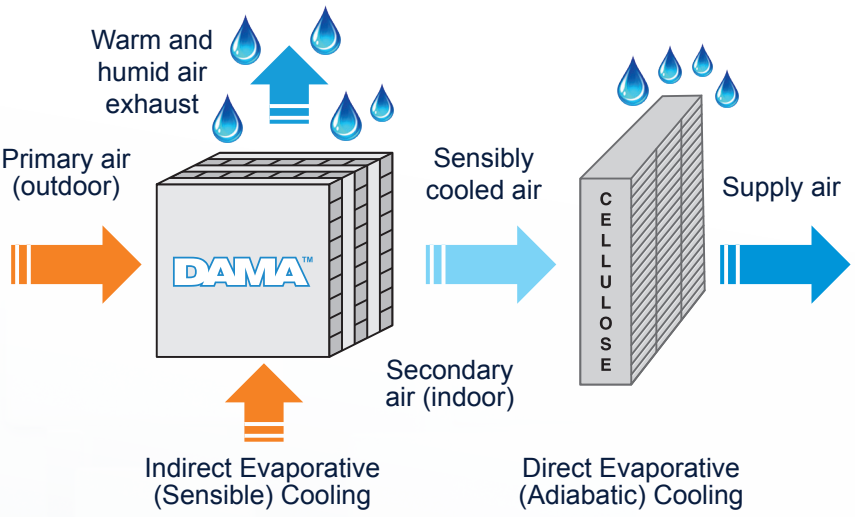


Figure 1 : IEC + DEC

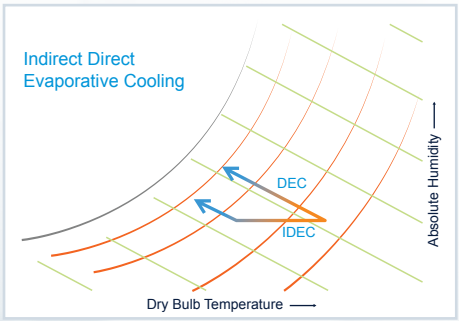


Figure 2 : Psychrometric chart of IDEC

Environment-friendly technology, uses 100% outdoor air

Well suited for most geographies of the world

Built around renowned DAMA technology

DAMA, optimized for Indirect Evaporative Cooling (IEC)

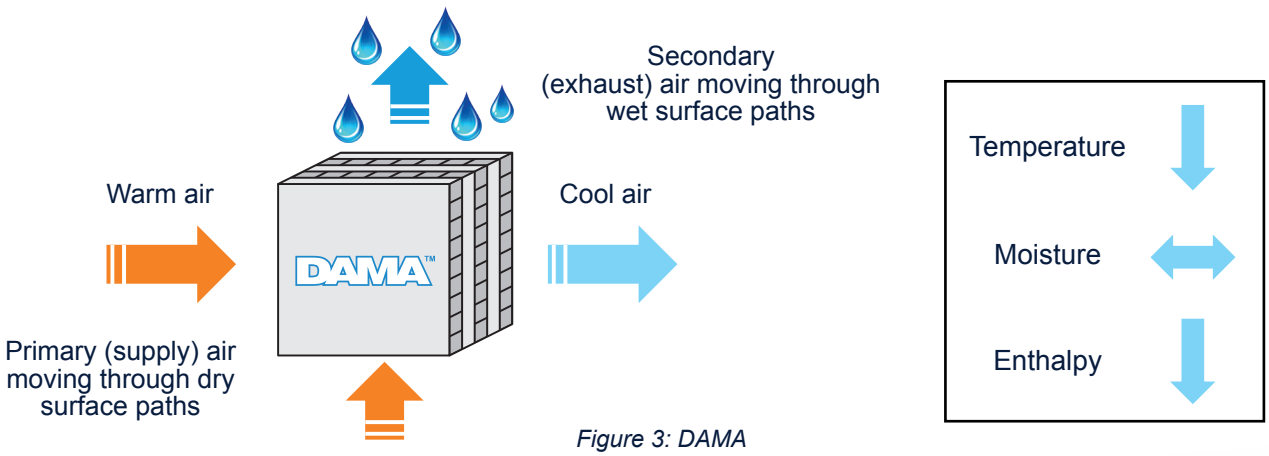


Figure 3: DAMA

DAMA is a building block for energy efficient cooling systems that provide comfort, high air quality *and* are eco-friendly. DAMA is a high efficiency, plate-type polymeric heat exchanger, which is optimized for Indirect Evaporative Cooling (IEC).

The primary air stream flows through DAMA's dry channels. A secondary air stream flows through the wet channels of the DAMA. The primary (supply) air stream exchanges heat through the thin separating wall with a thin film of water on the wet side. The heat rejected by the primary air enables evaporation of the thin water film, and in the process, the primary air is cooled without the addition of moisture. The secondary (exhaust) air stream is in direct contact with the water film and becomes very humid. It is therefore exhausted. Thus IEC of the primary (supply) air in the DAMA is purely a sensible cooling process.

What sets DAMA apart from similar heat exchangers?

DAMA is the result of 20+ years of research and engineering put together to provide **high performance cooling with proven reliability.**

The DAMA design, including integral counter-flow water distribution, ensures **low fouling and consistent performance over many years of use.**

Robotic manufacturing ensures **high reliability and low leakage** between air streams.

DAMA is **modular in design and scalable.** It has been proven in systems from 500 cfm to 172,000 cfm capacity.

DAMA performance has been **type-tested by Underwriters Laboratories (UL).**

HMX's unique DAMA technology has been **granted patents** in the US, Australia and India.

DAMA is **optimized for sensible cooling.**

Schematic of HMX Indirect Direct Evaporative Cooling system

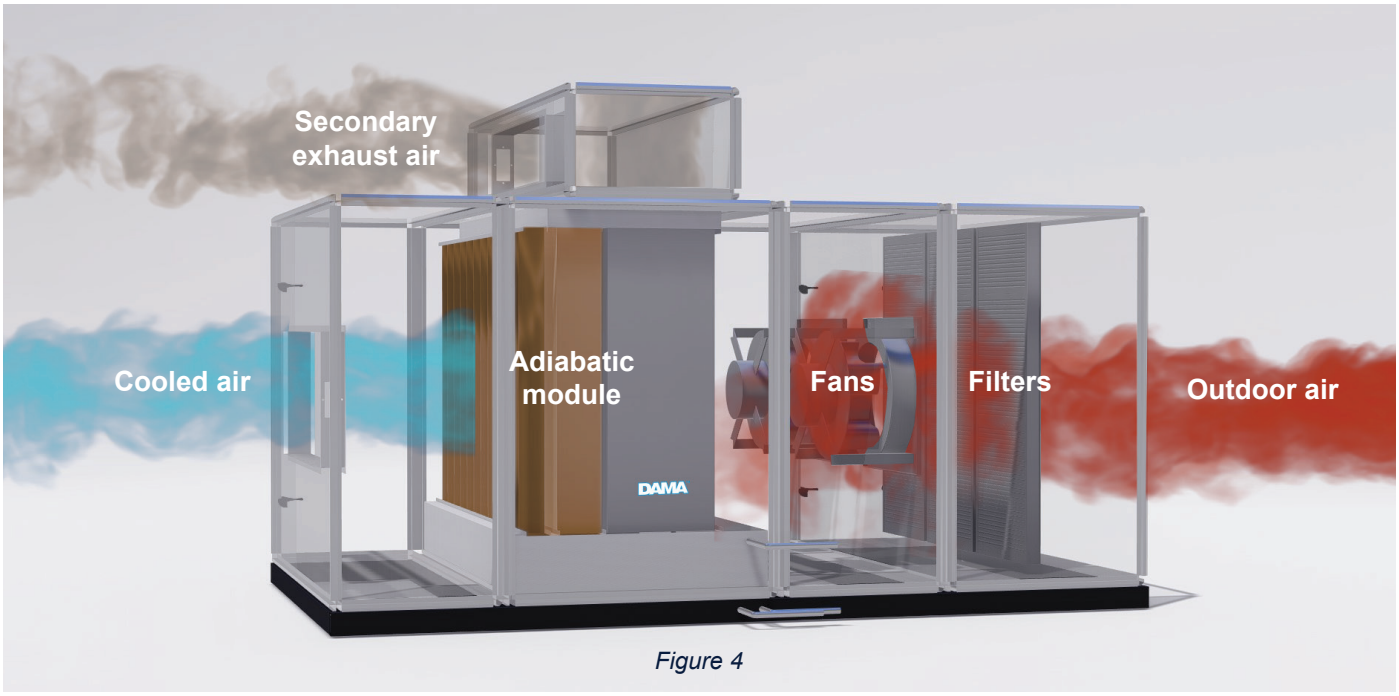


Figure 4

Temperature drop chart for HMX IDEC

The reduction in temperature possible will depend on both the prevailing Dry Bulb Temperature (DBT) and the Relative Humidity (RH). The table below shows the temperature at the IDEC unit outlet for various combinations of DBT and RH.

Ambient Temp. (Dry Bulb) (˚F)	5%	10%	15%	20%	30%	40%	50%
75	39	42	45	47	52	56	60
79	40	44	47	49	55	59	63
82	42	45	48	51	57	62	66
86	43	47	50	54	60	65	69
90	45	49	52	56	62	68	72
93	46	51	55	58	65	70	75
97	48	52	56	60	67	73	78
100	49	54	59	63	70	76	82
104	51	56	61	65	73	79	85
108	52	58	63	67	75	82	88
111	54	60	65	70	78	85	91

What makes HMX a trusted brand?

10+ countries with installations

550+ happy customers worldwide

14 million sq ft area cooled

70 million cfm installed across the globe

Get the HMX IDEC advantage

Cool and filtered outdoor air with low moisture content helps maintain excellent indoor air quality (IAQ)

Upgrade over conventional direct evaporative coolers

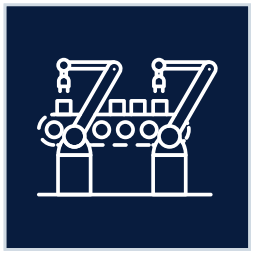
Energy efficient alternative to air-conditioning

Best in class comfort for suitable climates

World class product with robust construction and smart controls with options of receiving real time monitoring reports through IoT

Custom made capacities available – starting from 500 cfm to 172,000 cfm

HMX IDEC is extensively used in a wide variety of settings



Manufacturing

Departmental stores

Indoor sports arenas

Warehouses

Workshops

Recognition

- **Finalist for the Global Cooling Prize (2021)**
- **2021 IFC TechEmerge Sustainable Cooling Latin America grant awardees**

Some valued customers

ABB	Coca-Cola	amazon
SIEMENS	GE	BOSCH
Toyota Kirloskar	CATERPILLAR®	NISSAN

HMX – a part of the A.T.E. Group – designs and manufactures energy efficient, environment-friendly cooling and solar thermal solutions for industrial and commercial applications. The low carbon technologies are suitable for several applications and for most geographical locations across the globe.

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people & the planet

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