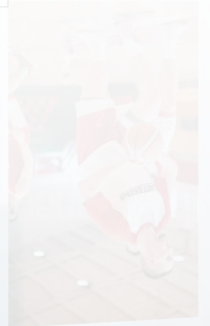


# Indirect Direct Evaporative Cooling (IDEC)

Breathe healthy with clean-cool-fresh air



# Indirect Direct Evaporative Cooling

## A proven method for increasing health and productivity in medium and large industrial and commercial spaces

Providing comfort to people in medium and large spaces like an industrial shed or a commercial building can be tricky. The most commonly selected options, till now, have been either Air-conditioning or Direct Evaporative Cooling.

Air-conditioning is an extremely energy intensive option and also uses recirculated air. This leads to a drop in Indoor Air Quality and poses a health risk to the occupants of a building.

Direct Evaporative Cooling, even though is economical and works on 100% fresh air, fails to provide the required level of comfort to the occupants of a building during peak summer and on humid days.

With DAMA, a heat exchanger optimized for Indirect Evaporative Cooling, at its core, HMX Indirect Direct Evaporative Cooling (IDEC) is an ideal solution for applications where large spaces like manufacturing units or shopping malls have to be cooled at an affordable cost and without compromising on the health of the occupants.

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

It strikes a perfect balance between comfort and productivity of occupants on one hand and power consumption on the other, making it a widely accepted solution.

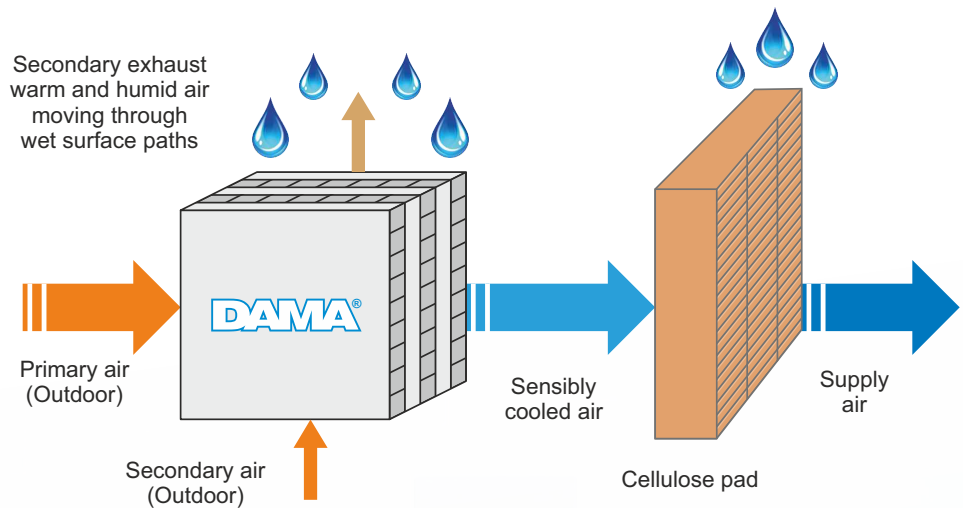


Figure 1: IEC + DEC

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

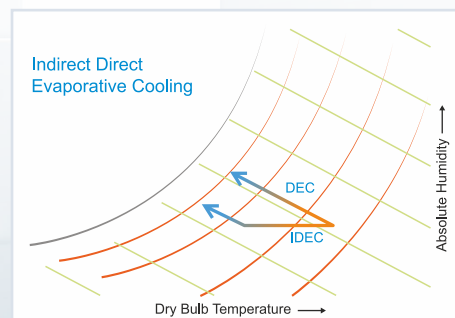


Figure 2: Psychrometric chart of IDEC



Environment-friendly technology,  
uses 100% outdoor air



Well suited for most  
geographies of the world

## Build around proven DAMA technology

### DAMA: optimised for the indirect Evaporative Cooling (IEC)

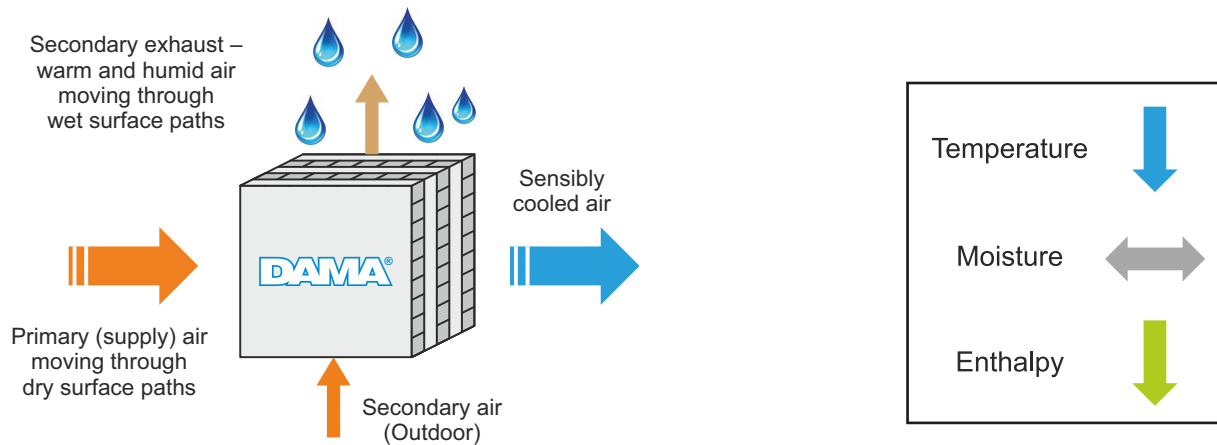


Figure 3: DAMA

DAMA is a building block for energy efficient cooling systems that provide comfort and 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 **optimized for sensible cooling**



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

## Schematic of IDEC

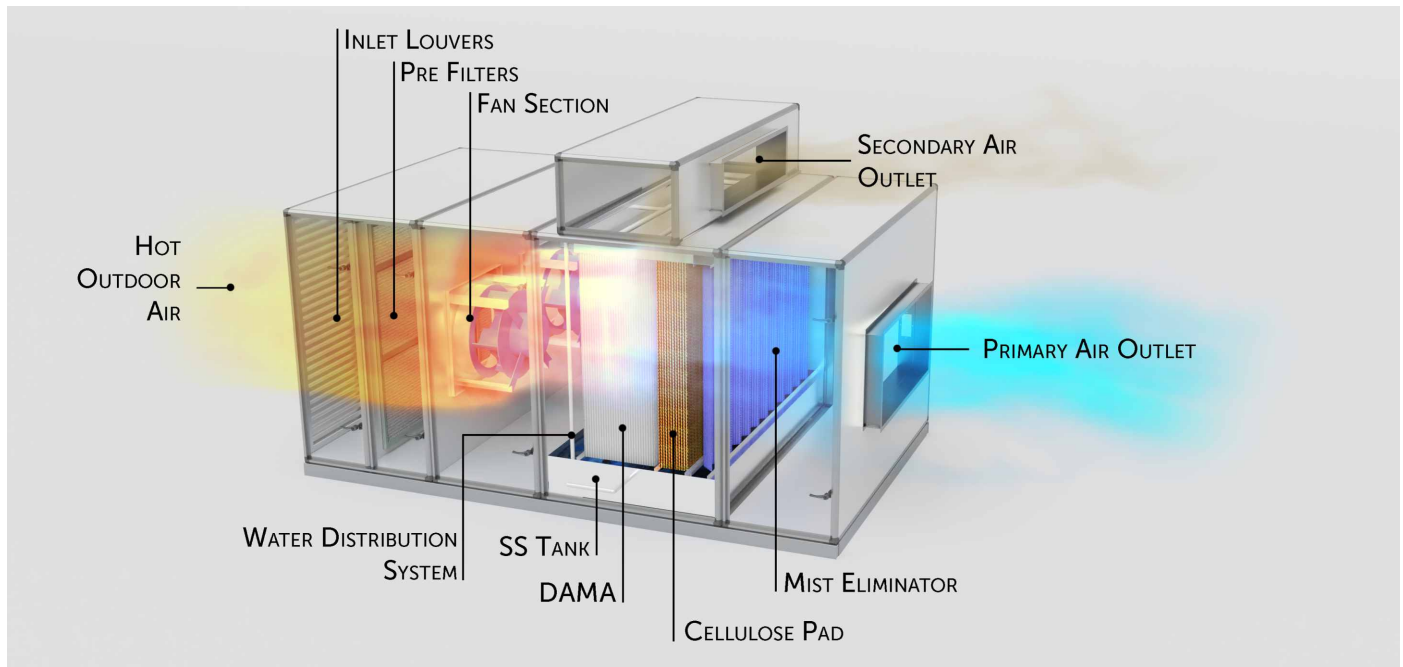


Figure 4

## Temperature drop chart for 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)°C	Relative Humidity (RH)								
	5%	10%	15%	20%	30%	40%	50%	60%	70%
24	4	5	7	8	11	14	16	18	20
26	5	6	8	10	13	15	17	20	21
28	5	7	9	11	14	17	19	21	23
30	6	8	10	12	15	18	21	23	25
32	7	9	11	13	17	20	22	25	27
34	8	10	13	15	18	21	24	27	29
36	9	11	14	16	20	23	26	28	31
38	10	12	15	17	21	25	28	30	NA
40	10	13	16	18	23	NA	NA	NA	NA
42	11	14	17	20	24	NA	NA	NA	NA
44	12	15	18	21	NA	NA	NA	NA	NA
46	13	16	20	NA	NA	NA	NA	NA	NA
48	14	18	NA	NA	NA	NA	NA	NA	NA
50	15	19	NA	NA	NA	NA	NA	NA	NA

## What makes HMX a trusted brand?



**10+ countries** with installations



**550+ happy customers** worldwide



**20 million sq ft** area cooled



**100 million cfm** installed across the globe



## Get the 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



Capacities available – starting from 500 CFM to 2,00,000 CFM

## IDEC is extensively used in a wide variety of settings



- Automobile and ancillary
- Engineering & capital goods
- Food & beverages
- FMCG
- Pharmaceutical
- Print & packaging
- Textile
- Tyre



- Banquet halls & auditoriums
- Commercial kitchens
- Educational institutes
- Healthcare
- Hospitality
- Indoor sport arenas
- Malls
- Offices
- Religious establishments

## Some valued customers

**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. HMX's low carbon technologies are suitable for several applications and locations across the globe.

Manufactured by:



**A.T.E. ENTERPRISES PRIVATE LIMITED**

(Business Unit: **HMX**)

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