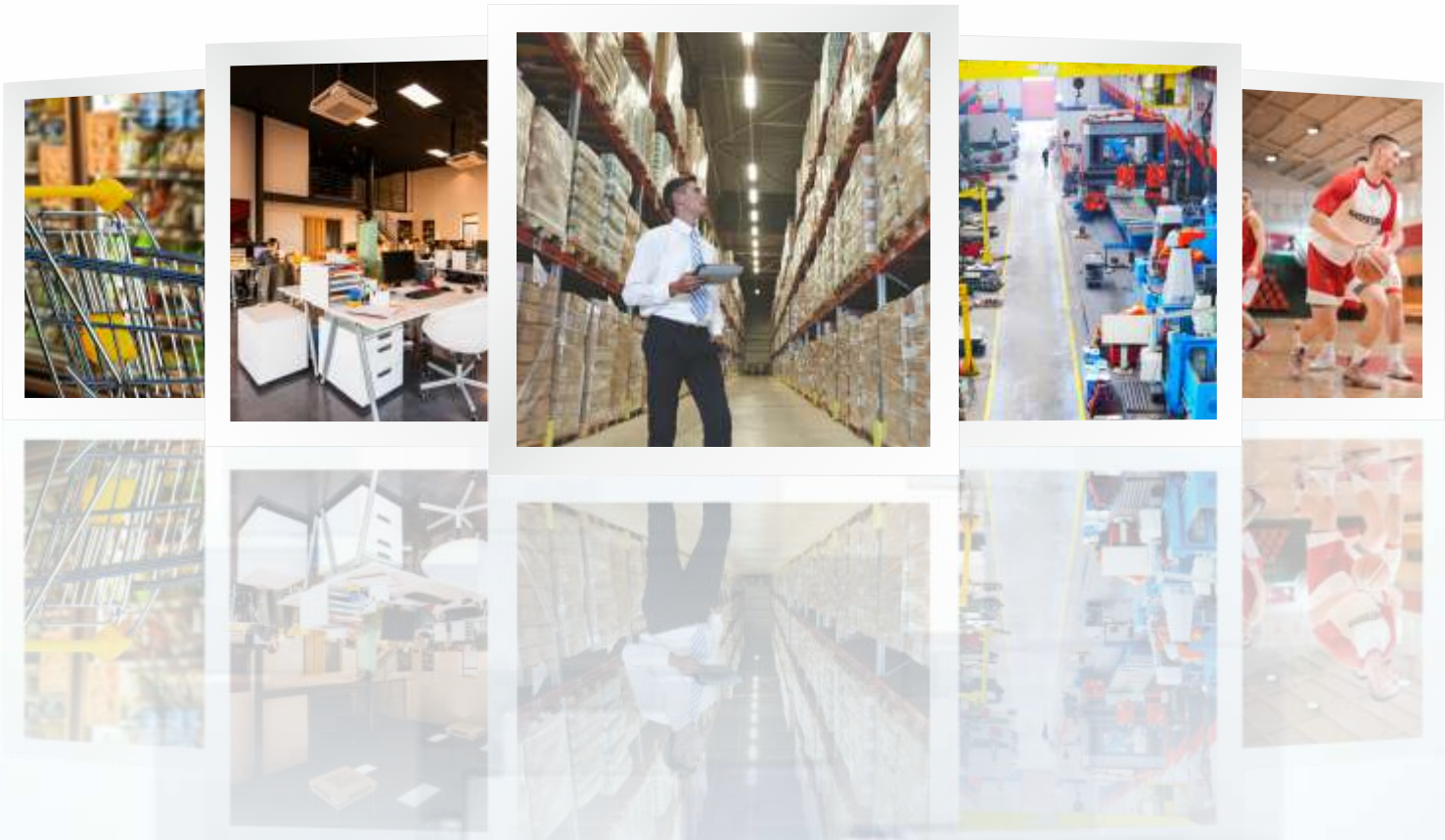
DAMA® IDECool® Pro

HMX's pioneering IDEC technology



Thoughtful, Sustainable
Cooling Solutions

DAMA® IDECool® Pro

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 (DEC).

Air-conditioning is an extremely energy intensive option and also uses recirculated air. This leads to a drop in Indoor Air Quality (IAQ) 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 optimised for Indirect Evaporative Cooling (IEC), at its core, DAMA® IDECool® Pro 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.

DAMA® IDECool® Pro 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.

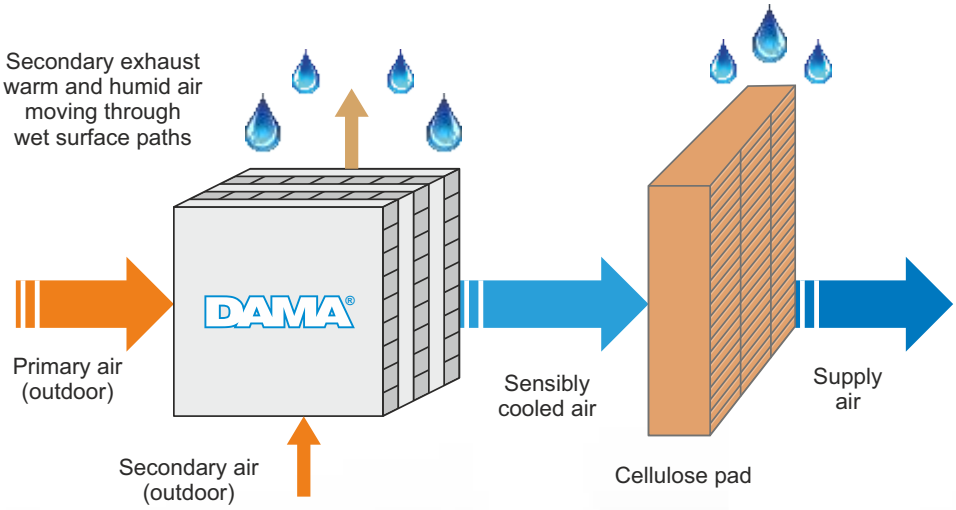


Figure 1: IEC + DEC

- **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**

Supply temperature for various ambient conditions

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 DAMA® IDECool® Pro unit outlet for various combinations of DBT and RH.

DBT °C ↓ / RH% →	10	15	20	25	30	35	40	45	50	55	60
32	9.3	11.3	13.3	15.1	16.8	18.3	19.8	21.1	22.4	23.6	24.8
34	10.3	12.5	14.5	16.4	18.2	19.8	21.3	22.8	24.1	25.4	26.5
36	11.3	13.6	15.8	17.8	19.6	21.3	22.9	24.4	25.8	27.1	28.3
38	12.3	14.8	17.0	19.1	21.1	22.9	24.5	26.1	27.5	28.8	30.1
40	13.3	16.0	18.4	20.5	22.5	24.4	26.1	27.7	29.2	30.6	NA
42	14.4	17.2	19.7	21.9	24.0	26.0	27.7	29.4	30.9	NA	NA
44	15.4	18.4	21.0	23.4	25.5	27.5	29.4	31.1	NA	NA	NA
46	16.5	19.6	22.3	24.8	27.0	29.1	31.0	NA	NA	NA	NA
48	17.5	20.8	23.7	26.3	28.6	30.7	NA	NA	NA	NA	NA

Above condition is based on internal test laboratory.

Built around renowned DAMA® technology

DAMA® optimised for Indirect Evaporative Cooling (IEC)

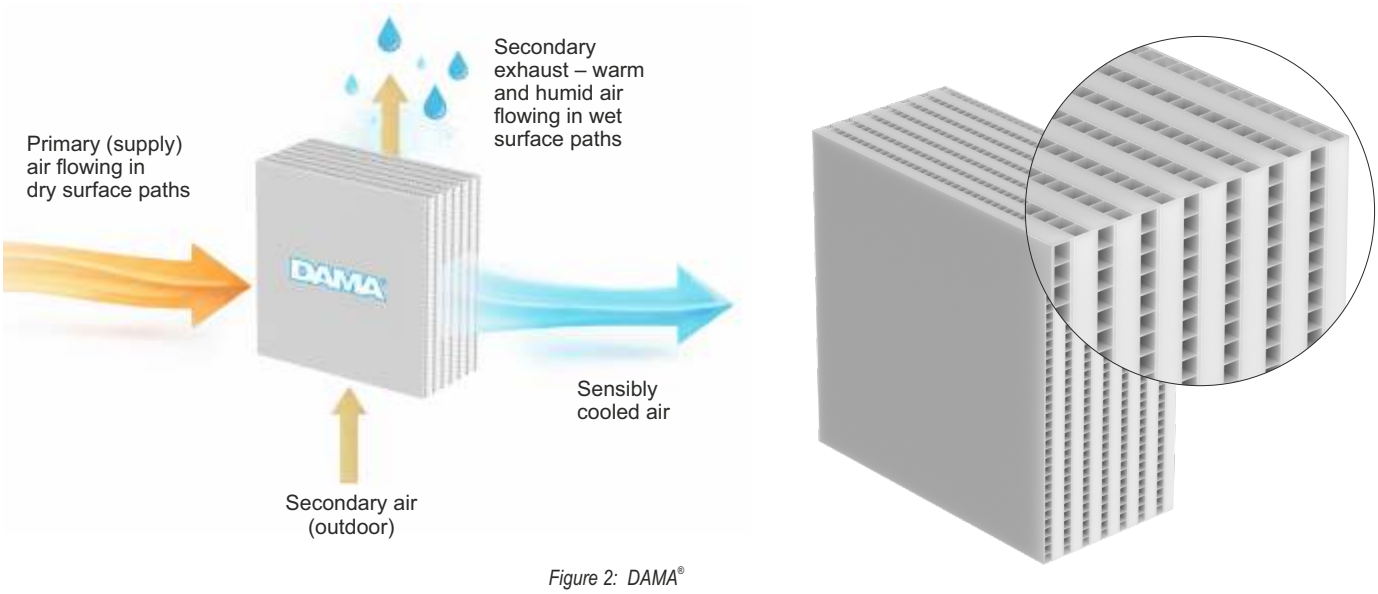


Figure 2: DAMA®

HMX's core technology is DAMA® (Dry Air Moist Air) - an advanced, crossflow plate-type heat exchanger optimised for Indirect Evaporative Cooling (IEC). Warm primary air passes through dry channels while secondary air flows through wet channels, separated by a thin wall that enables efficient heat transfer without moisture transfer. The primary air is cooled without added moisture, as evaporation occurs only on the wet side. This delivers highly-efficient sensible cooling, making DAMA® an energy-saving and eco-friendly solution for modern HVAC applications.

What sets DAMA® apart from similar heat exchangers?

DAMA® is **optimised for sensible cooling**

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**

DAMA®

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

DAMA® **performance has been type-tested by a reputed third party**

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

Certified as **Green Product** by the CII-Green Products and Services Council, in accordance with the standard of **GreenPro Ecolabel**

Schematic of DAMA® IDECool® Pro

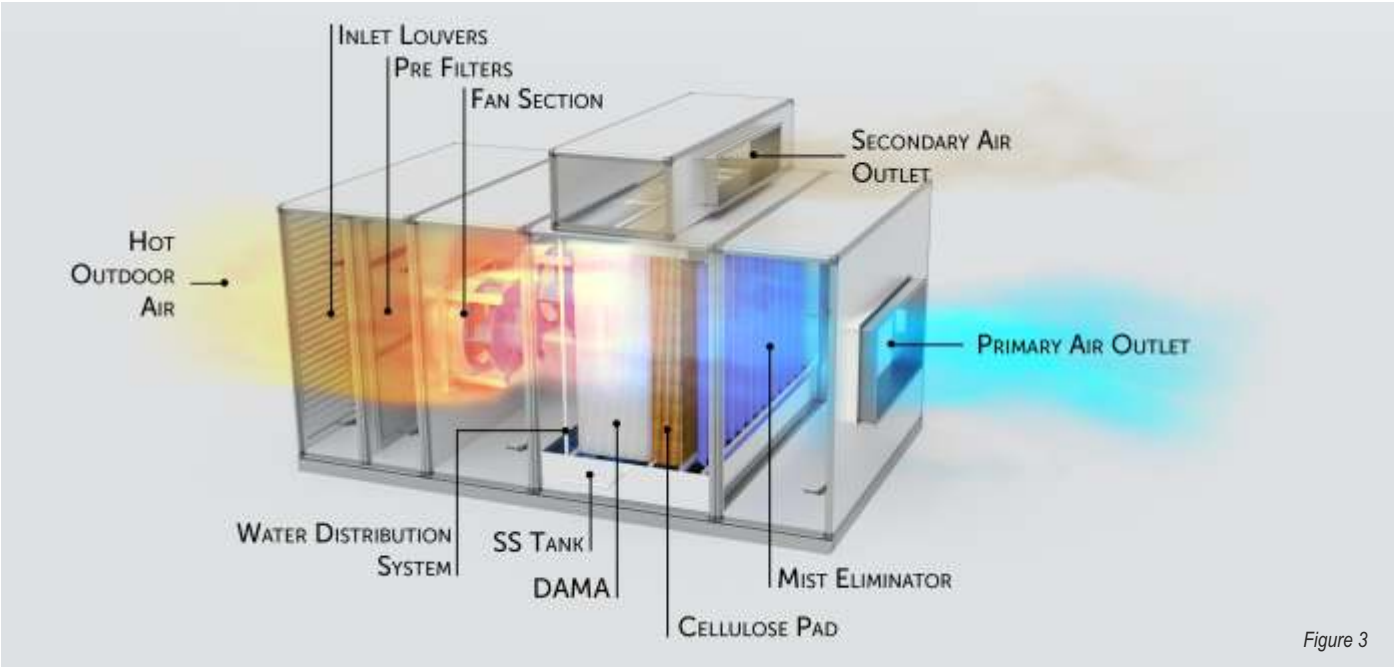
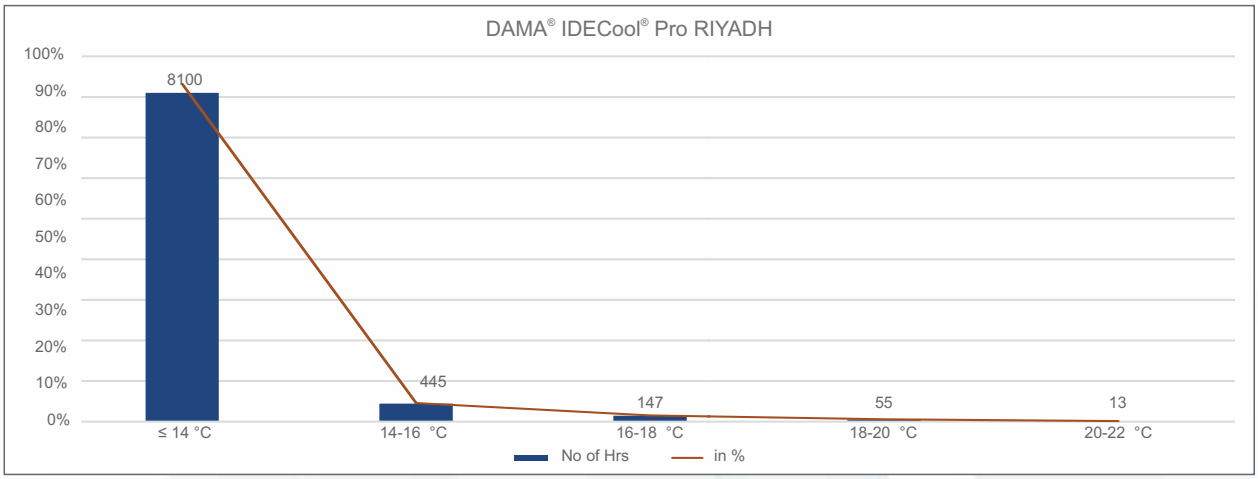
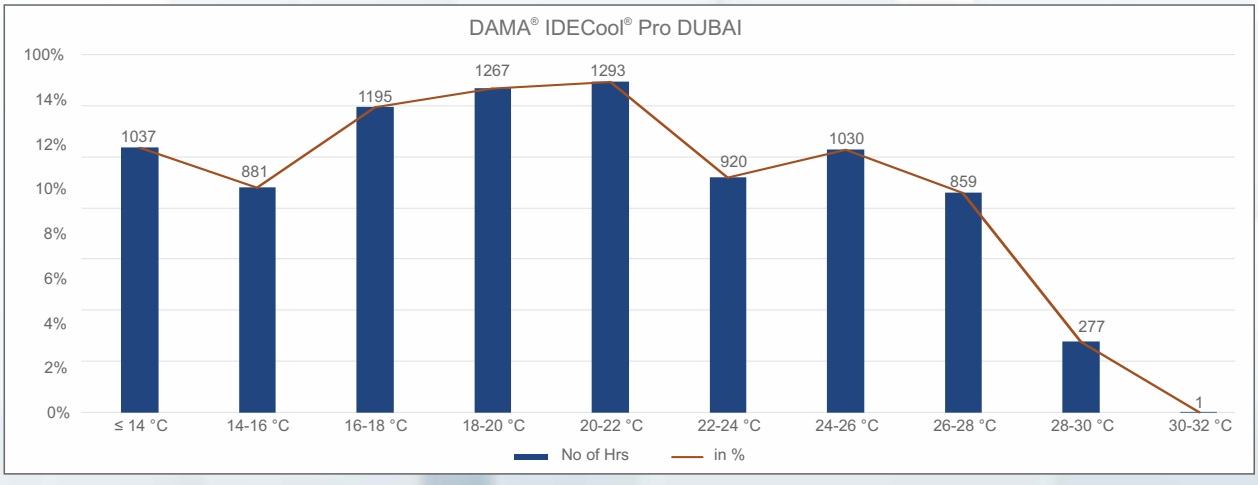


Figure 3

Temperature drop chart for DAMA® IDECool® Pro





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 DAMA® IDECool® Pro unit outlet for various combinations of DBT and RH.

Hot and dry climate - outlet temperature that DAMA® IDECool® Pro can reach												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AMBIENT - DBT ºC	28.1	31.2	35.1	35.1	43.3	45.2	46.0	45.6	43.8	39.2	33.2	28.2
AMBIENT - WBT ºC	14.1	15.2	15.1	15.1	18.0	18.8	19.3	19.7	18.9	17.6	16.0	14.5
Machine outlet - DBT ºC	10.5	11.0	10.0	10.0	12.0	14.5	13.0	14.0	13.0	12.5	11.5	11.0

Coastal climate (hot and humid) - outlet temperature that DAMA® IDECool® Pro can reach												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AMBIENT - DBT ºC	28.6	33.0	36.0	39.8	42.6	44.1	45.1	45.1	42.2	38.9	34.2	30.1
AMBIENT - WBT ºC	17.7	17.9	18.3	19.9	21.0	22.5	23.6	23.2	22.7	21.4	19.3	18.7
Machine outlet - DBT ºC	15.5	14.3	14.0	15.4	16.3	18.1	19.4	18.9	18.8	17.7	16.0	16.3

Basis – Ambient Weather Source:
ASHRAE climatic design conditions 2021 (ashrae-meteo.info)
Max DB and Co-incident WB condition considered.
Hot and dry - Riyadh (KSA), Hot and humid - Dubai (UAE)

What makes HMX a trusted brand?

12+ countries with installations

550+ happy customers worldwide

24+ million² ft. area cooled

120+ million CFM installed across the globe

Get the DAMA® IDECool® Pro 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

HMX

DAMA® IDECool® Pro is extensively used in a wide variety of applications

- Automobile and ancillary
- Engineering and capital goods
- Food and beverages
- Print and packaging
- Commercial kitchens
- Educational institutes
- Healthcare
- Hospitality
- Indoor sport arenas
- Malls
- Offices
- Religious establishments

Some valued customers

Google | المراعي Almarai | القدية Qiddiya
مجموعة كوت الغذائية Kout Food Group | ENGIE | Coca-Cola
الكويتية KUWAIT AIRWAYS | SAR الخطوط الحديدية السعودية SAUDI ARABIA RAILWAYS | amazon
SIEMENS | حديقة الملك سلمان King Salman Park | LANDMARK GROUP

HMX – a part of the A.T.E. Group – designs and manufactures energy-efficient, environment-friendly cooling solutions for industrial and commercial applications. HMX's low carbon technologies have been proven for several applications in locations across the globe.

Manufactured by:

ATE GROUP

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(Business Unit: **HMX**)
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partnering people & the planet

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