

Outdoor dew-point statistics used in *The Control Volume*.

Station, source, window, method and lineage for the assumed outdoor dew point of 24 °C.

DOCUMENT

TN-01 · supports Research Note 01, model version 1.1

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SCIENTIFIC REVIEW

Every figure, source and method on this site is checked by Max, Indoor Sciences' AI verification model, and reviewed by a member of the scientific team before publication. Each report names the reviewer responsible for it.

1 · Purpose

The model fixes the outdoor dew point at 24 °C and states that this value is drawn from the Dubai International station record for June to September (median 23.1 °C, 95th percentile 28.0 °C). This note sets out where those numbers come from and how they were computed, so that a consultant or project team can reproduce them.

2 · Station

ITEM	VALUE
Station	Dubai International
WMO identifier	41194
ICAO identifier	OMDB

3 · Data source and conventions

ITEM	CONVENTION
Data period	1 January 1995 to 31 December 2024. Thirty complete calendar years, the same for every station.
Dataset	Meteostat hourly bulk data (decimal-resolution temperature and dew point), compiled from the NOAA NCEI Integrated Surface Database. Retrieved 31 Aug 2026 (41194) and 4 Sep 2026 (the other stations). Licence CC BY 4.0, with attribution to Meteostat.
Observations used	Every hour with a valid dew point. No gap filling and no interpolation. Timestamps in UTC.
"Share of hours above X"	Strictly greater than X (for example > 22.0 °C), counted over all valid hours pooled across the period.
Percentiles	Nearest-rank, over all valid hours in the window.
"June to September"	All hours in June, July, August and September, pooled.
Rounding	Dew points to 0.1 °C. Shares to 0.1 percentage point in the technical note. Prose may round to a fraction ("one hour in four") only when the exact value is within ± 1.5 points of that fraction.
Dew point formula	Magnus, Alduchov and Eskridge (1996) coefficients: 17.625, 243.04 °C, 610.94 Pa.

Sensitivity of the Dubai International share of hours above 22 °C:

- The same station in NOAA ISD-Lite, which rounds dew point to whole degrees, gives 23.4 % (> 22) and 26.7 % ($\geq$ 22) for Dubai International. The difference comes from the rounding in each source, not from the location.
- Weighting every calendar month equally instead of pooling all hours gives 24.8 %.
- Single years at Dubai International range from 18.9 % to 31.9 %.

The statistics below should therefore be quoted with their source named, as they are on the research page.

4 · Window and sample

ITEM	VALUE
Months	June, July, August, September (inclusive), every year from 1995 to 2024
Observations	All hourly observations in the window; no sub-sampling by hour of day
Sample size	n = 84,959 hours
Missing data	Hours with no dew-point value are excluded; no interpolation or infilling is applied

5 · Statistics and method

STATISTIC	VALUE	METHOD
Median dew point	23.1 °C	50th percentile, nearest rank, over all hours in the window
95th percentile dew point	28.0 °C	95th percentile, nearest rank, over all hours in the window
Hours with dew point above 24 °C	39.6 %	Count of hours with $T_{dp} > 24$ °C divided by n
Hours with dew point above 22 °C	59.2 %	Count of hours with $T_{dp} > 22$ °C divided by n

Percentiles are computed by rank over the pooled hourly values (no weighting by year, no seasonal averaging first). 24 °C lies between the median and the 95th percentile and is exceeded in 39.6 % of June–September hours. A cooled interior held at 24 °C therefore sits below the outdoor dew point for roughly four hours in ten across the season, which is the basis for the model's fixed outdoor value and for the wording of FAQ 4 on the research page.

6 · Use in the model

The model treats room pressure as direction only. When the room is depressurized relative to outdoors, the infiltration readout names the outdoor dew point of 24 °C as what arrives through leakage paths in the exposed face. The quantity of moisture moved depends on envelope leakage and is not computed; it must be measured on site.

7 · Figure carried on the home page

The home page states that "for one hour in four" the outdoor air in the coastal cities of the UAE, Dubai and Abu Dhabi among them, carries a dew point above 22 °C. Basis, same source and conventions as above, but **all hours of the year** rather than the June–September window:

STATISTIC	VALUE	WINDOW
Hours with dew point above 22 °C	25.0 %	All valid hourly observations, 1995–2024

Six stations, 1 January 1995 to 31 December 2024: share of all hours with outdoor dew point above 22.0 °C, and the June–September median and 95th percentile.

STATION	ICAO	WMO	VALID HOURS	COVERAGE	HOURS > 22 °C DEW POINT	JUN-SEP MEDIAN	JUN-SEP P95
Dubai International	OMDB	41194	254,554	96.8 %	25.0 %	23.1 °C	28.0 °C
Abu Dhabi International	OMAA	41217	255,982	97.3 %	24.0 %	23.0 °C	28.8 °C
Ras Al Khaimah International	OMRK	41184	248,830	94.6 %	21.9 %	22.2 °C	28.0 °C
Sharjah International	OMSJ	41196	253,568	96.4 %	20.9 %	22.1 °C	27.4 °C
Fujairah International (east coast)	OMFJ	41198	245,090	93.2 %	38.7 %	26.9 °C	29.9 °C
Al Ain International (inland)	OMAL	41218	251,598	95.7 %	7.2 %	17.2 °C	25.1 °C

Dubai Al Maktoum (OMDW, WMO 41216) is excluded. Its record is almost empty from 2001 to 2007 (69.3 % coverage), and the missing years would weight what remains.

"One hour in four" is used only where the exact share is within ± 1.5 points of 25 %: Dubai International (25.0 %) and Abu Dhabi International (24.0 %), the two cities the home page names. Sharjah (20.9 %) is one hour in five, not one in four, and inland Al Ain (7.2 %) is fewer than one hour in ten, which is why the home page says "the coastal cities of the UAE, Dubai and Abu Dhabi among them" and not "the UAE".

The page carries only the rounded phrase "one hour in four"; the percentages above are the computed basis and are not to be quoted more precisely than stated here.

8 · References

- Meteostat. *Hourly bulk data*, stations 41194, 41217, 41196, 41184, 41198, 41218.
<https://bulk.meteostat.net/v2/hourly/{WMO}.csv.gz>, retrieved 31 Aug and 4 Sep 2026. CC BY 4.0.
- Smith, A., Lott, N. and Vose, R. (2011). The Integrated Surface Database: recent developments and partnerships. *Bulletin of the American Meteorological Society* 92(6), 704–708. (Underlying source; used for the ISD-Lite cross-check.)
- Alduchov, O. A. and Eskridge, R. E. (1996). Improved Magnus form approximation of saturation vapor pressure. *Journal of Applied Meteorology* 35(4), 601–609.

Indoor Sciences is the building-science consultancy of Saniservice LLC. This technical note accompanies Research Note 01 and is issued for consultants and project teams. Values are computed from a public station record and are not a substitute for site measurement.