

Aeronautical Climatological summaries – Ben Gurion Airport

Coordinates of station: 32°00' N, 34°54' E, 50 metres above MSL.

Ben Gurion Airport is situated in the central coastal plain of Israel, at a linear distance of about 16 kilometres from the coast, 18 kilometers from Tel Aviv and 32 kilometers from Jerusalem. Its climate is of the Mediterranean type, with a warm and dry summer and a cool and rainy winter – the major part of the annual precipitation occurs in the cold period of the year.

The following paragraphs present a summary of various climatic parameters in Ben Gurion Airport: wind, low level clouds, visibility, temperature, significant weather phenomena (drizzle, rain, showers, hail and thunderstorms) and frequencies of tail wind and side wind components on the runways.

The summary is based on the tables of the climatic parameters. The tables were calculated according to the Metar and Synop reports for a 10 year period (1999-2009). The basic units and the range of the values were based on the guidelines of the World Meteorological Organization (WMO) or the Synop code.

Wind

In summer there is regular diurnal run of winds and it is mostly based on the sea and land breezes and the permanent prevailing synoptic system (the Persian Gulf trough that is related to the Indian Monsoon). During the latter half of the night and the early morning hours light southeasterly to southerly winds prevail. The wind veers to a southwesterly to westerly direction during the morning reaching a speed of up to 10 knots at early noon time. Wind veering continues in the afternoon becoming westerly to northwesterly with an increasing velocity (10-15 knots). In the late afternoon hours and early evening the winds have a northwesterly to northerly direction and their speed decreases. The winds continue to subside in the early night and have various directions. In the transitional seasons the wind regime is also determined by a diurnal pattern in a large number of days, yet it could also be influenced by various synoptic systems passing the area. In spring the wind shifts from an easterly - southeasterly direction in

the morning to a westerly – northwesterly direction at noon and in the afternoon. Wind velocity is rather high reaching 15-20 knots at these hours.

In autumn the easterly – southeasterly component is more dominant than in the summer or spring and it prevails until late morning hours. However the wind veering occurs in the autumn too during the day, with a shift to a northwesterly direction at noon.

In winter there is a tendency for southeasterly to southerly winds at night and early morning and westerly winds at noon. However the wind regime is much less permanent than in other seasons. Winds are influenced by the synoptic systems that dominant the area, occasionally resulting in significant velocities.

Low level clouds

Most of the year the frequency of low clouds is small and usually does not exceed 6% of the daily observations. However in certain periods of the year low clouds can be more significant.

Low level base clouds are mostly common in spring and early summer especially in the early morning. From May to July significant amounts of clouds with a base of less than 600 meters are recorded in 15% -20% of the observations and in 25% -30% of the observations for lesser amounts of clouds. These months also record the highest incidence of lower level cloudiness. Clouds with a base of less than 300 meters are recorded in 5% -8% of the observations mainly at 03Z.

In the latter part of the summer and in the autumn (August to November) the incidence of low level clouds decreases, but it is still noticeable that they tend to occur during the night and morning and are less frequent in the rest of the day. In the first part of the winter (December and January) the total frequency of low level clouds is low (3% -7%) and they are distributed more evenly along the day.

The characteristics of low clouds in February is quite similar to those of the spring months - increasing frequency during the night and morning (8% -15%), and much less frequent during the rest of the day.

Visibility

Most of the year the frequency of low visibility is small and usually does not exceed 5% of the daily observations with regard to a limit of 5000 meters, and a visibility of less than 800 m is obtained in less than 1% of observations. Visibility limitations of up to 8000 m are more frequent and their incidence is 15% of the observations along the year.

In certain periods of the year the occurrence of low visibility can be more significant. Visibility limitations below 5000 m are mostly common in spring, and are recorded in 10% -12% of the observations in the early morning hours during the period of March to June. Significant visibility limitations (less than 800 m) are much less frequent (1% -2% of the observations in spring). At higher thresholds (visibility of up to 8000 m), the frequency in the spring mornings is high, reaching 30% -40% of observations.

In summer (July-August) there is a sharp decrease in the frequency of visibility limitations below 5000 m, but the incidence of visibility up to 8000 m increases, reaching (40% -45% of observations).

In autumn (September-October) the incidence of low visibility decreases, but the occurrence of the phenomena continues to be more frequent at night and in the morning compared to other hours of the day.

In latter part of autumn and the first part of winter (November-January) low visibility is distributed more evenly along the day, but the total prevalence is low. It is especially noticeable in November when visibility below 5000 meters is obtained in only 1% of the observations.

In February the frequency of low visibility increases at night with 6%-8% of the observations having a visibility below 5000 meters until the morning. The frequency of low visibility is much smaller during the rest of the day.

Temperature

In the summer months, July and August, the average daily maximum temperature is close to 33°C. In more than 90% of the observations from noon to the afternoon temperatures exceed 30°C. The average daily minimum temperature during the summer is 23-24°C, but night and early morning temperatures above 25°C are frequently recorded.

Temperatures of 35-40°C are recorded in summer afternoon in 2%-3% of the observations, especially in July. Temperatures above 40°C do not prevail in summer. Such extreme values can occur from April to June during heat wave events with a frequency of 0.5% of the observations.

During the winter months, January and February, the average daily minimum temperature is about 9°C. In 30%-40% of the observations during the night and early morning temperatures of 5-10°C are measured. Lower temperatures of 0-5°C are recorded in only 1%-3% of the observations. The average daily maximum temperature during the winter is 18-19°C, and in most of the afternoon observations the temperatures range from 15°C to 20°C. In approximately 20% of the midday observations temperatures of 20-25°C are measured, and there is a small proportion (2% -4%) of higher temperatures (25-30°C).

Significant weather phenomena

Phenomena related to precipitation (drizzle, rain, showers, hail and thunderstorms) occur almost exclusively during the period of October to May and occur most frequently in December, January and February. Precipitation is usually associated with depressions located in the Eastern Mediterranean or with the passage of fronts. Continuous rain of the warm front type is rare, and most of the rainfall occurs after the passage of cold fronts. Sometimes the rains are accompanied by hail and thunderstorms. Rainy periods usually last no more than three to five days.

Tail wind and side wind components

The tail wind and side wind components were calculated from the surface wind data with regard to the runways at Ben Gurion Airport: runways 12/30, 03/21 and 08/26. The velocity threshold is 10 knots.

In summer side winds are frequent from noon to afternoon hours in runway 03/21 due to the dominance of the westerly to northwesterly winds. In almost half of the observations the side winds have a velocity of more than 10 knots (mostly up to 15 knots) in that runway, whereas in the other runways the side winds are much less frequent. The side winds decrease in runway 03/21 in the early evening yet they rise to 10% in runway 08/26. At night, as winds subside, there are no significant tail winds and side winds.

In autumn (September-October), too, significant side winds in runway 03/21 are frequent from noon to afternoon hours. They are also quite frequent (more than 15% of observations) in runway 08/26 including the evening hours. At night and morning significant tail winds and side winds are much less frequent.

From November to March the diurnal pattern is much less noticeable especially in winter. In November at noon and the afternoon about 20% of the observations have significant side winds in runway 03/21 and 7-10% of observations with regard to the other runways. At night the frequencies decrease but significant side winds or tail wind can occur.

In winter mornings significant side winds are infrequent, yet significant tail winds in runway 12/30 occur in 15% of the observations. At noon and early afternoon 10-15% of the observations have significant side winds in all runways. From the evening until early morning significant side winds occur in all runways in 3-6% of the observations. At the end of the winter and early spring time (February-March) the diurnal pattern becomes more dominant with 20-25% of the afternoon observations experiencing significant side winds in runway 03/21 and in runway 12/30. In other parts of the days they are less frequent. In runway 08/26 significant side winds occur in 8-10% of the observations from morning until the afternoon.

In spring, as the westerly to northwesterly winds become prominent, more than 40% of the afternoon observations have significant side winds in runway 03/21 and 20% of the evening observations. In runway 08/26 there are significant side winds in 11-13% of the afternoon and evening observations. At night and morning there are no significant tail winds and side winds.