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Reference atmospheres for aerospace use

ADDENDUM 2 : Air humidity in the Northern Hemisphere

Addendum 2 to International Standard ISO 5878-1982 was developed by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, and was circulated to the member bodies in April 1982.

It has been approved by the member bodies of the following countries:

Australia	Egypt, Arab Rep. of	South Africa, Rep. of
Austria	France	Spain
Belgium	Germany, F.R	Sweden
Brazil	Ireland	United Kingdom
Canada	Italy	USA
China	Netherlands	USSR
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No member body expressed disapproval of the document.

0 Introduction

The moisture content of air is very small, about 4 % by mass being the maximum. Nevertheless it has a strong influence upon the earth's biosphere, on meteorological processes and also upon the operation of aircraft. A knowledge of the distribution and variations of this important meteorological quantity is required for the design and operation of aerospace vehicles.

Water in the atmosphere is found in three states, as vapour, liquid and solid. Water vapour is of greatest interest in the present context, although the other states of water are important for aviation, for example as in clouds and fog, with the consequent poor visibility, icing, and so on.

The moisture content of the atmosphere decreases rapidly with increasing height, the main mass of water being contained in the atmospheric boundary layer. On average over the Northern Hemisphere, 60 % of the total water content is in the lowest 2 km of the atmosphere, and 99 % in the lowest 10 km.

This International Standard gives values of the humidity at heights up to 10 km above sea level, the region for which reasonably reliable radiosonde data are available.

To satisfy most potential users, the humidity of the atmosphere is expressed in three measures, namely

- humidity mixing ratio, r;
- vapour pressure (partial pressure), e';
- dew-point temperature, t_d.

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