

European Aviation Safety Agency

Definitions and abbreviations used in Certification Specifications for products, parts and appliances

CS-Definitions

Amendment 1
14 December 2007

CS-Definitions

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CS—Definitions

Definitions and abbreviations used in Certification Specifications for products, parts and appliances

PREAMBLE

- 1 General Definitions
- 2 Abbreviations and symbols

CS-Definitions

CS-Definitions**PREAMBLE**

CS-Definitions Amendment 1

The following is a list of definitions affected by this amendment.

1. General Definitions

- | | |
|---|--|
| • Aircraft-Supplied Data | Created (NPA 04/2005) |
| • Aircraft-Supplied Electrical Power | Created (NPA 04/2005) |
| • Alternate Mode (Engine related definition) | Created (NPA 04/2005) |
| • Back-up Mode (Engine related definition) | Created (NPA 04/2005) |
| • Back-up System | Created (NPA 04/2005) |
| • Control Mode (Engine related definition) | Created (NPA 04/2005) |
| • Covered Fault | Created (NPA 04/2005) |
| • Electronic Engine Control System (EECS) | Created (NPA 04/2005) |
| • Engine Control System | Created (NPA 04/2005) |
| • Fault (or) Failure | Created (NPA 04/2005) |
| • Fault (or) Failure Accommodation | Created (NPA 04/2005) |
| • Full-up Configuration (Engine related definition) | Created (NPA 04/2005) |
| • Primary Mode (Engine related definition) | Created (NPA 04/2005) |
| • Primary System | Created (NPA 04/2005) |
| • Programmable Logic Device (PLD) | Created (NPA 04/2005) |
| • Propeller | Amended to align with CS-P definition of "Propeller System" introduced by NPA 05/2005. |
| • Reversible Pitch Propeller | Created (NPA 05/2005) |
| • Uncovered Fault | Created (NPA 04/2005) |
| • Variable Pitch Propeller | Amended (NPA 05/2005) |

CS-Definitions**1. General Definitions**

'Aerodynamic coefficients' means non-dimensional coefficients for aerodynamic forces and moments.

'Aeroplane' means an engine-driven fixed-wing aircraft heavier than air, that is supported in flight by the dynamic reaction of the air against its wings.

'Airborne' means entirely supported by aerodynamic forces.

'Aircraft' means a machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

'Aircraft-Supplied Data' means all data which is supplied by or via aircraft systems and is used by the Engine/Propeller Control System.

[Amdt. No.:Def/1]

'Aircraft-Supplied Electrical Power' means any electrical power which is supplied by or via aircraft systems and is used by the Engine/Propeller Control System.

[Amdt. No.:Def/1]

'Airframe' means the fuselage, booms, nacelles, cowlings, fairings, aerofoil surfaces (including rotors but excluding propellers and rotating aerofoils of engines), and landing gear of an aircraft and their accessories and controls.

'Alternate Mode' (Engine related definition) means any Control Mode, including Back-up Modes that are not the Primary Mode used for controlling the Engine.

[Amdt. No.:Def/1]

'Atmosphere, International Standard' means the atmosphere defined in ICAO Document 7488/2. For the purposes of Certification Specifications the following is acceptable:

- a. The air is a perfect dry gas;
- b. The temperature at sea-level is 15°C;
- c. The pressure at sea-level is 1.013250×10^5 Pa (29.92 in Hg) (1013.2 mbar);
- d. The temperature gradient from sea-level to the altitude at which the temperature becomes -56.5°C is 3.25°C per 500 m ($1.98^\circ\text{C}/1\ 000$ ft);
- e. The density at sea level ρ_0 , under the above conditions is $1.2250\ \text{kg/m}^3$ ($0.002378\ \text{slugs/ft}^3$); for the density at altitudes up to 15 000 m (50 000 ft) see Table 1.

ρ is the density appropriate to the altitude and ρ/ρ_0 the relative density is indicated by σ .

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TABLE 1

RELATIVE PRESSURES AND DENSITIES – S.I. UNITS

Air density at sea-level (barometer 1.013250×10^3 Pa
temp 15°C) is 1.2250 kg/m^3

| Altitude (Pressure Basis) m | Relative Pressures (I.C.A.O.) | Relative Densities Associated with Conditions Stated | | | | |
|--------------------------------------|-------------------------------------|--|---------------------|--------------------------------------|--|-------------------|
| | | International Standard (I.C.A.O.) | Tropical Maximum | Temperature and Arctic Maximum | Tropical and Temperature Minimum | Arctic Minimum |
| 0 | 1.000 | 1.000 | 0.906 | 0.951 | 1.138 | 1.291 |
| 500 | 0.942 | 0.953 | 0.862 | 0.905 | 1.072 | 1.190 |
| 1 000 | 0.887 | 0.907 | 0.820 | 0.862 | 1.010 | 1.097 |
| 1 500 | 0.835 | 0.864 | 0.780 | 0.820 | 0.955 | 0.011 |
| 2 000 | 0.785 | 0.822 | 0.741 | 0.779 | 0.908 | 0.949 |
| 2 500 | 0.737 | 0.781 | 0.703 | 0.740 | 0.862 | 0.892 |
| 3 000 | 0.692 | 0.742 | 0.668 | 0.703 | 0.818 | 0.837 |
| 3 500 | 0.649 | 0.705 | 0.633 | 0.667 | 0.776 | 0.792 |
| 4 000 | 0.608 | 0.669 | 0.600 | 0.632 | 0.735 | 0.750 |
| 4 500 | 0.570 | 0.634 | 0.568 | 0.599 | 0.696 | 0.709 |
| 5 000 | 0.533 | 0.601 | 0.538 | 0.568 | 0.659 | 0.670 |
| 5 500 | 0.498 | 0.569 | 0.509 | 0.537 | 0.623 | 0.633 |
| 6 000 | 0.466 | 0.539 | 0.481 | 0.508 | 0.589 | 0.597 |
| 6 500 | 0.435 | 0.509 | 0.454 | 0.480 | 0.556 | 0.563 |
| 7 000 | 0.405 | 0.481 | 0.428 | 0.453 | 0.525 | 0.531 |
| 7 500 | 0.378 | 0.454 | 0.404 | 0.428 | 0.495 | 0.500 |
| 8 000 | 0.351 | 0.429 | 0.380 | 0.403 | 0.466 | 0.470 |
| 8 500 | 0.327 | 0.404 | 0.358 | 0.380 | 0.439 | 0.442 |
| 9 000 | 0.303 | 0.381 | 0.337 | 0.357 | 0.412 | 0.415 |
| 9 500 | 0.282 | 0.358 | 0.316 | 0.336 | 0.388 | 0.389 |
| 10 000 | 0.261 | 0.337 | 0.297 | 0.316 | 0.364 | 0.365 |
| 10 500 | 0.242 | 0.317 | 0.279 | 0.296 | 0.341 | 0.341 |
| 11 000 | 0.223 | 0.297 | 0.261 | 0.276 | 0.317 | |
| 11 500 | 0.206 | 0.275 | 0.244 | 0.255 | 0.293 | |
| 12 000 | 0.191 | 0.254 | 0.229 | 0.236 | 0.271 | |
| 12 500 | 0.176 | 0.235 | 0.214 | 0.218 | 0.250 | |
| 13 000 | 0.163 | 0.217 | 0.201 | 0.201 | 0.231 | |
| 13 500 | 0.151 | 0.200 | 0.186 | | 0.214 | |
| 14 000 | 0.139 | 0.185 | 0.172 | | 0.197 | |
| 14 500 | 0.129 | 0.171 | 0.159 | | 0.182 | |
| 15 000 | 0.119 | 0.158 | 0.147 | | 0.169 | |

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TABLE 1

RELATIVE PRESSURES AND DENSITIES – NON S-I- UNITS

Air density at sea-level (barometer 29.92 in (1013.2 mbar) temp 15°C) is
0.002378 slugs/ft³

| Altitude (Pressure Basis) ft | Relative Pressures (I.C.A.O.) | Relative Densities Associated with Conditions Stated | | | | |
|---------------------------------------|-------------------------------------|--|---------------------|------------------------------------|--------------------------------------|-------------------|
| | | International Standard (I.C.A.O.) | Tropical Maximum | Temperate and Arctic Maximum | Tropical and Temperate Minimum | Arctic Minimum |
| 0 | 1.000 | 1.000 | 0.906 | 0.951 | 1.138 | 1.291 |
| 1 000 | 0.964 | 0.971 | 0.879 | 0.923 | 1.098 | 1.229 |
| 2 000 | 0.930 | 0.943 | 0.853 | 0.896 | 1.058 | 1.169 |
| 3 000 | 0.896 | 0.915 | 0.827 | 0.869 | 1.020 | 1.112 |
| 4 000 | 0.864 | 0.888 | 0.802 | 0.843 | 0.983 | 1.058 |
| 5 000 | 0.832 | 0.862 | 0.778 | 0.818 | 0.953 | 1.007 |
| 6 000 | 0.801 | 0.836 | 0.754 | 0.793 | 0.923 | 0.970 |
| 7 000 | 0.772 | 0.811 | 0.731 | 0.769 | 0.895 | 0.934 |
| 8 000 | 0.743 | 0.786 | 0.708 | 0.745 | 0.868 | 0.899 |
| 10 000 | 0.688 | 0.738 | 0.664 | 0.699 | 0.814 | 0.832 |
| 12 000 | 0.636 | 0.693 | 0.623 | 0.656 | 0.763 | 0.779 |
| 14 000 | 0.587 | 0.650 | 0.583 | 0.615 | 0.714 | 0.728 |
| 16 000 | 0.542 | 0.609 | 0.545 | 0.575 | 0.668 | 0.680 |
| 18 000 | 0.499 | 0.570 | 0.509 | 0.538 | 0.624 | 0.634 |
| 20 000 | 0.460 | 0.533 | 0.475 | 0.502 | 0.583 | 0.590 |
| 22 000 | 0.422 | 0.498 | 0.443 | 0.469 | 0.543 | 0.550 |
| 24 000 | 0.388 | 0.464 | 0.413 | 0.437 | 0.504 | 0.511 |
| 26 000 | 0.355 | 0.432 | 0.384 | 0.407 | 0.470 | 0.474 |
| 28 000 | 0.325 | 0.403 | 0.357 | 0.378 | 0.437 | 0.440 |
| 30 000 | 0.297 | 0.374 | 0.331 | 0.351 | 0.405 | 0.407 |
| 32 000 | 0.271 | 0.347 | 0.306 | 0.326 | 0.375 | 0.377 |
| 33 000 | 0.259 | 0.334 | 0.295 | 0.313 | 0.361 | 0.362 |
| 34 000 | 0.247 | 0.322 | 0.283 | 0.302 | 0.347 | 0.348 |
| 35 000 | 0.235 | 0.310 | 0.273 | 0.290 | 0.334 | |
| 36 000 | 0.224 | 0.298 | 0.262 | 0.277 | 0.318 | |
| 37 000 | 0.214 | 0.284 | 0.252 | 0.264 | 0.303 | |
| 38 000 | 0.204 | 0.271 | 0.242 | 0.252 | 0.289 | |
| 39 000 | 0.194 | 0.258 | 0.232 | 0.240 | 0.275 | |
| 40 000 | 0.185 | 0.246 | 0.223 | 0.229 | 0.263 | |
| 41 000 | 0.176 | 0.235 | 0.214 | 0.218 | 0.250 | |
| 42 000 | 0.168 | 0.224 | 0.206 | 0.208 | 0.238 | |
| 44 000 | 0.153 | 0.203 | 0.189 | | 0.217 | |
| 46 000 | 0.139 | 0.185 | 0.171 | | 0.197 | |
| 48 000 | 0.126 | 0.168 | 0.156 | | 0.179 | |
| 50 000 | 0.114 | 0.152 | 0.141 | | 0.162 | |

CS-Definitions

'Autorotation' means a rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.

'Auxiliary Power Unit (APU)' means any gas turbine-powered unit delivering rotating shaft power, compressor air, or both which is not intended for direct propulsion of an aircraft.

'Auxiliary rotor' means a rotor that principally serves to counteract the effect of the main rotor torque on a rotorcraft and/or to manoeuvre the rotorcraft about one or more of its three principal axes.

'Back-up Mode' (Engine related definition) means the Control Mode of the back-up system.

[Amdt. No.:Def/1]

'Back-up System' means a part of the Engine/Propeller Control System where the operating characteristics or capabilities of the Engine/Propeller control are sufficiently different from the Primary System that the operating characteristics or capabilities of the aircraft, crew workload, or what constitutes appropriate crew procedures may be significantly impacted or changed.

[Amdt. No.:Def/1]

'Brake Horsepower' means the power delivered at the main output shaft of an aircraft engine.

'Calibrated airspeed' means indicated airspeed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.

'Category' as used with respect to;

Category A, with respect to rotorcraft, means a multi-engined rotorcraft designed with engine and system isolation features specified in CS-27 / CS-29 and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off in the event of engine failure.

Category B, with respect to rotorcraft, means a single-engine or multi-engine rotorcraft which does not meet Category A standards. Category B rotorcraft have no guaranteed capability to continue safe flight in the event of an engine failure, and unscheduled landing is assumed.

'Charge Cooling' (piston engines) means the percentage degree of charge cooling, quantitatively expressed as:

$$\left(\frac{t_2 - t_3}{t_2 - t_1} \right) \times 100$$

where:

t_1 is the temperature of the air entering the charge cooler coolant radiator in the power-plant,

t_2 is the temperature of the charge without cooling, and

t_3 is the temperature of the charge with cooling.

'Civil Aircraft' means any aircraft on the civil register of a State, other than those which that State treats as being in the service of the State, either permanently or temporarily.

'Clearway' means, for turbine engine powered aeroplanes certificated after August 29, 1959, an area beyond the runway, not less than 152 m (500 ft) wide, centrally located about the extended centreline of the runway, and under the control of the airport authorities. The clearway is expressed in terms of a clearway plane, extending from the end of the runway with an upward slope not exceeding 1.25%, above which no object or terrain protrudes. However, threshold lights may protrude above the plane if their height above the end of the runway is 0.66 m (26 ins) or less and if they are located to each side of the runway.

CS-Definitions

'Climates, Standard'

This sub-paragraph defines three standard climates – Temperate, Tropical and Arctic – by stating the envelope conditions applicable to each. The conditions thus represented are acceptable as giving suitable design criteria for aeroplanes intended for operation in such regions. They are drawn up on the basis of conditions unlikely to be exceeded more often than on one day per year except that they do not cover the extremes of temperature occasionally reached in tropical deserts or in Siberia in winter.

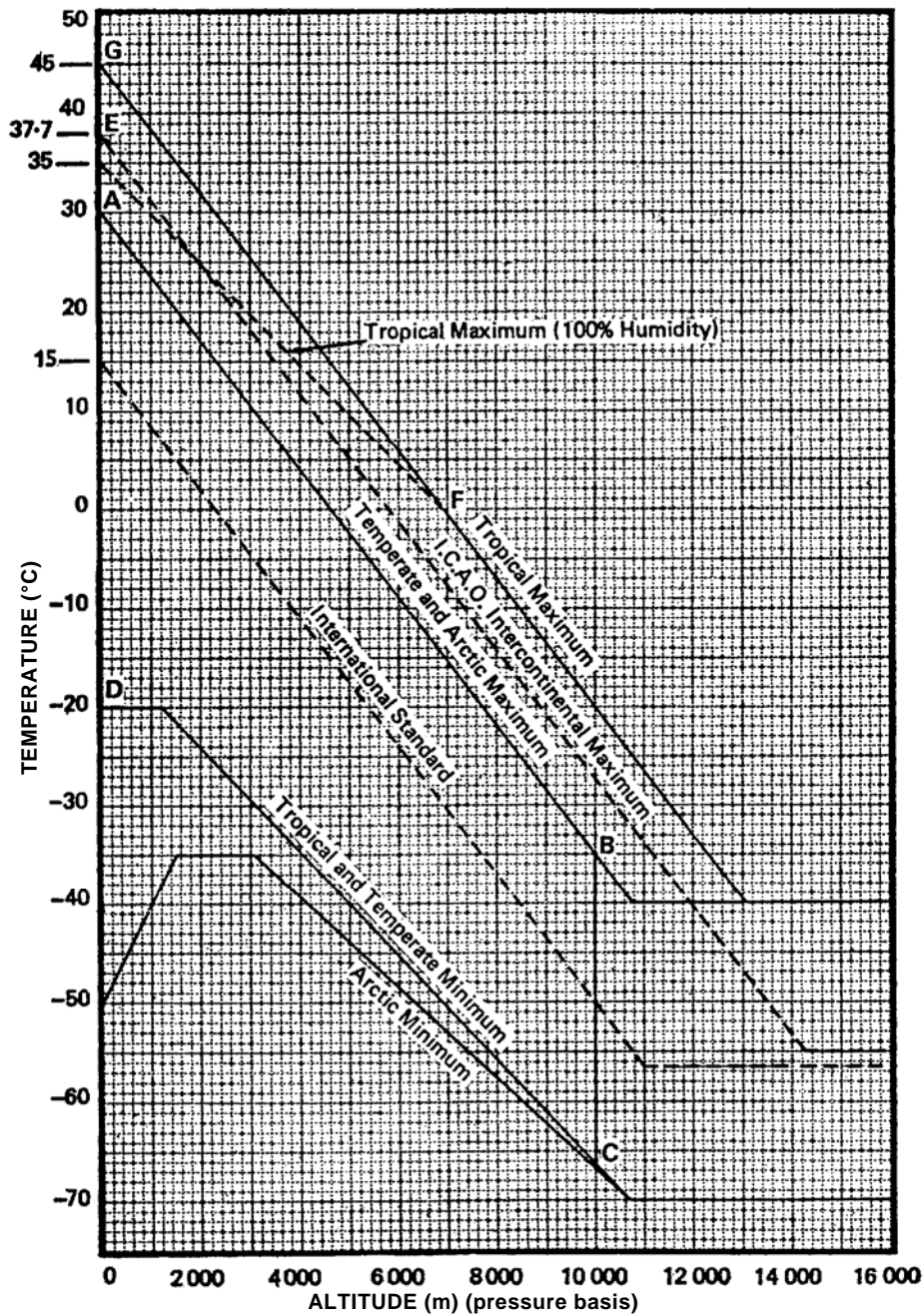
CS-Definitions

The Temperate, Tropical and Arctic climates are defined by:

- a. The temperature envelopes enclosed by the appropriate maximum and minimum temperature lines of Figure 1, from zero metres (feet) to the selected height (e.g. the temperatures appropriate to 0 – 10 000 m (0 – 30 000 ft)) in the standard Temperate climate are those within the envelope A, B, C, D, in Figure 1;
- b. Every point included in these envelopes being associated with a relative humidity range of 20% to 100%; except that in the conditions represented by the area E, F, G in Figure 1 the relative humidities shall be assumed to vary from 100% maximum and 20% minimum respectively at the line EF to the value appropriate to the height at the line GF. The value of relative humidity on the line GF shall be taken to vary linearly from 100% maximum and 20% minimum at F to some lower values at G (given here as 10% maximum and 2% minimum);
- c. Every point included in these envelopes being associated with the International standard pressure (ICAO) appropriate to the height, as shown in Table 1;
- d. Every point included in these envelopes being associated with the density corresponding to the temperature, pressure and humidity; extreme values are given in Table 1.

These conditions do not cover variation of pressure from the International standard. This shall be allowed for by assuming a variation of pressure 5% above and below the International standard pressure (ICAO) associated with the International standard temperature (ICAO).

CS-Definitions



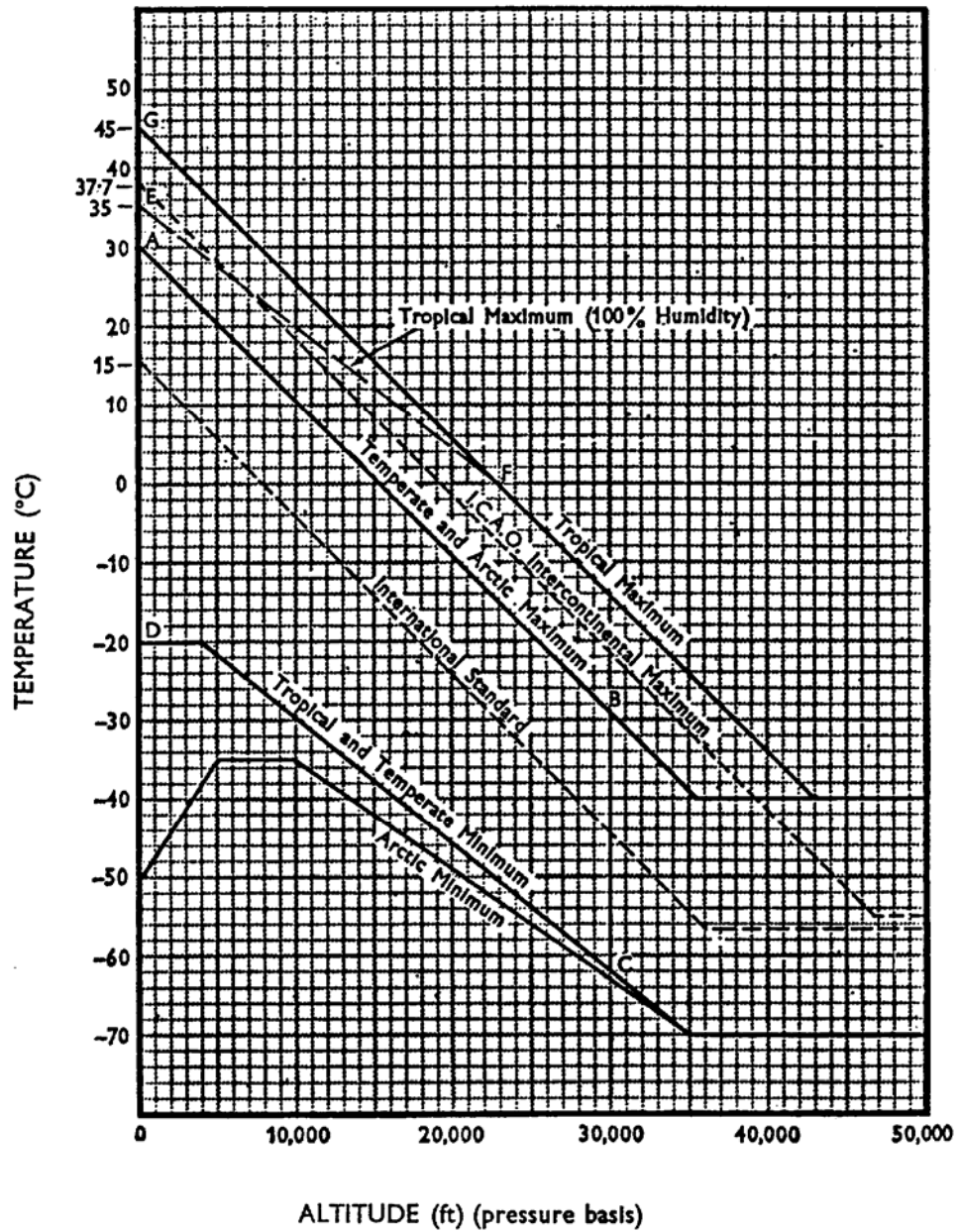
STANDARD CLIMATES – S.I. UNITS

Figure 1a

This diagram gives envelope conditions for design purposes; it does not constitute an accurate representation of any particular climate.

The line BC has no significance other than as illustrating the text.

CS-Definitions



STANDARD CLIMATES – NON S.I. UNITS

Figure 1b

This diagram gives envelope conditions for design purposes; it does not constitute an accurate representation of any particular climate.

The line BC has no significance other than as illustrating the text.

CS-Definitions

Climatic conditions:

- a. The standard climatic conditions are intended primarily for use in designing aircraft structure and equipment which should remain airworthy when subjected to the appropriate conditions.
- b. Aircraft performance will vary considerably within the defined climates. It is not intended that any one stated performance should be achievable throughout the whole envelope of conditions but rather that sufficient performance data should be scheduled for an operator to determine the performance which will be achieved in particular conditions.
- c. The climatic conditions given are conditions of the free atmosphere. The temperatures achieved in an aircraft in these atmospheric conditions may be considerably higher. In the absence of precise information as to the surface finish, ventilation and type of engine, etc., the following maximum ambient temperatures should be assumed:

| | Temperate and Arctic | Tropical |
|--|----------------------|----------|
| i. in the interior of an aircraft; | 45°C | 60°C |
| ii. for portions of the outer covering liable to be in the sun and parts attached directly to such covering; | 55°C | 80°C |
| iii. in an engine compartment for parts not attached directly to the engine. | 100°C | 100°C |

Parts connected to the engine may attain higher temperatures.

‘Continuous OEI Power and/or Thrust’ means the power and/or thrust identified in the performance data for use after take-off when a power-unit has failed or been shut down, during periods of unrestricted duration.

‘Continuous OEI Power and/or Thrust Rating’ means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, when running at the specified conditions and within the appropriate acceptance limitations.

‘Control Mode’ (Engine related definition) means each defined operational state of the Engine Control System where satisfactory Engine control can be exercised by the crew.

[Amdt. No.:Def/1]

‘Covered Fault’ means a Fault which is detected and accommodated.

[Amdt. No.:Def/1]

‘Critical Engine’ means the engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

‘Detent’ means a mechanical arrangement which indicates, by feel, a given position of an operating control. Once the operating control is placed in this position the detent will hold the lever there and an additional-to-normal force will be required to move the operating control away from the position.

‘Electronic Engine Control System’ (EECS) means an Engine Control System in which the primary functions are provided using electronics. It includes all the components (e.g. electrical, electronic, hydromechanical and pneumatic) necessary for the control of the Engine and may incorporate other control functions where desired.

[Amdt. No.:Def/1]

‘Engine’ means an engine used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for the functioning and control, but excludes the propeller.

CS-Definitions

'Engine Control System' means any system or device which is part of the Engine Type design, which controls, limits or monitors Engine operation and is necessary for continued airworthiness of the Engine.

[Amdt. No.:Def/1]

'Equivalent airspeed' means the calibrated airspeed of an aircraft corrected for adiabatic compressible flow for the particular altitude. Equivalent airspeed is equal to calibrated airspeed in standard atmosphere at sea level.

'Exhaust Gas Temperature' means the average temperature of the exhaust gas stream.

'External load' means a load that is carried, towed or extends, outside the aircraft fuselage.

'External load attaching means' means the structural components used to attach an external load to an aircraft, including external-load containers, the backup structure at the attachment points, and any quick-release device used to jettison the external load.

'Fault (or) Failure' means an occurrence which affects the operation of a component, part, or element such that it can no longer function as intended.

[Amdt. No.:Def/1]

'Fault (or) Failure Accommodation' means the capability to mitigate, either wholly or in part, the effects of a Fault or Failure.

[Amdt. No.:Def/1]

'Final take-off speed' means the speed of the aeroplane that exists at the end of the take-off path in the en-route configuration with one engine inoperative.

'Fireproof.' With respect to materials, components and equipment, means the capability to withstand the application of heat by a flame, for a period of 15 minutes without any failure that would create a hazard to the aircraft. The flame will have the following characteristics:

Temperature 1100°C ± 80°C

Heat Flux Density 116 KW/m² ± 10 KW/m²

For materials this is considered to be equivalent to the capability of withstanding a fire at least as well as steel or titanium in dimensions appropriate for the purposes for which they are used.

'Fire-resistant.' With respect to materials, components and equipment, means the capability to withstand the application of heat by a flame, as defined for 'Fireproof', for a period of 5 minutes without any failure that would create a hazard to the aircraft.

For materials this may be considered to be equivalent to the capability of withstanding a fire at least as well as aluminium alloy in dimensions appropriate for the purposes for which they are used.

'Fixed Pitch Propeller' means a propeller, the pitch of which cannot be changed, except by processes constituting a workshop operation.

'Flame resistant' means not susceptible to combustion to the point of propagating a flame, beyond safe limits, after the ignition source is removed.

'Flammable', with respect to a fluid or gas, means susceptible to igniting readily or exploding.

'Flap extended speed' means the highest speed permissible with wing-flaps in a prescribed extended position.

'Flash resistant' means not susceptible to burning violently when ignited.

CS-Definitions

'Full-up Configuration' (Engine related definition) means an EECS that has no known Faults or Failures present.

[Amdt. No.:Def/1]

'Gyroplane' means a rotorcraft the rotors of which are not engine driven except for initial starting, but are made to rotate by action of the air when the rotorcraft is moving, and the means of propulsion of which, consisting usually of conventional propellers, is independent of the rotor system.

'Harness' means the equipment, consisting of two shoulder straps and a lap belt, which is provided to restrain a member of the flight crew against inertia loads occurring in emergency conditions.

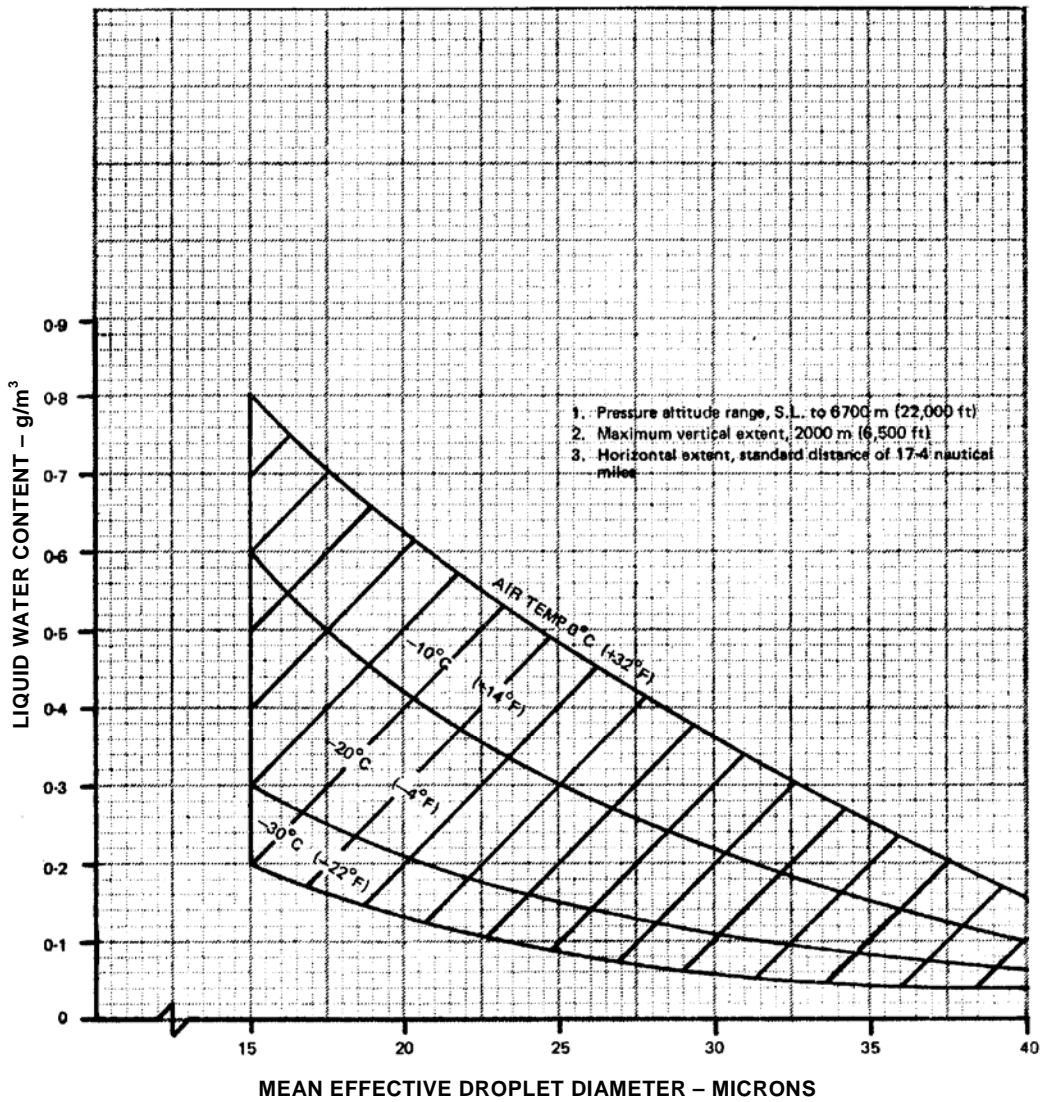
'Helicopter' means a rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.

'Heliport' means an area of land, water, or structure used or intended to be used for the landing and take-off of helicopters.

'Icing Atmospheric Conditions'. The definitions of atmospheric conditions are given in this subparagraph and Figures 2 to 7:

- a. **'Continuous Maximum Icing'**. The maximum continuous intensity of atmospheric icing conditions (continuous maximum icing) is defined by the variables of the cloud liquid water content, the mean effective diameter of the cloud droplets, the ambient air temperature, and the inter-relationship of these three variables as shown in Figure 2. The limiting icing envelope in terms of altitude and temperature is given in Figure 3. The inter-relationship of cloud liquid water content with droplet diameter and altitude is determined from Figure 2 and Figure 3. The cloud liquid water content for continuous maximum icing conditions of a horizontal extent, other than 17.4 n miles, is determined by the value of liquid water content of Figure 2, multiplied by the appropriate factor from Figure 4.
- b. **'Intermittent Maximum Icing'**. The intermittent maximum intensity of atmospheric icing conditions (intermittent maximum icing) is defined by the variables of the cloud liquid water content, the mean effective diameter of the cloud droplets, the ambient air temperature, and the inter-relationship of these three variables as shown in Figure 5. The limiting icing envelope in terms of altitude and temperature is given in Figure 6. The inter-relationship of cloud liquid water content with droplet diameter and altitude is determined from Figure 5 and Figure 6. The cloud liquid water content for intermittent maximum icing conditions of a horizontal extent, other than 2.6 n miles, is determined by the value of cloud liquid water content of Figure 5 multiplied by the appropriate factor in Figure 7 .

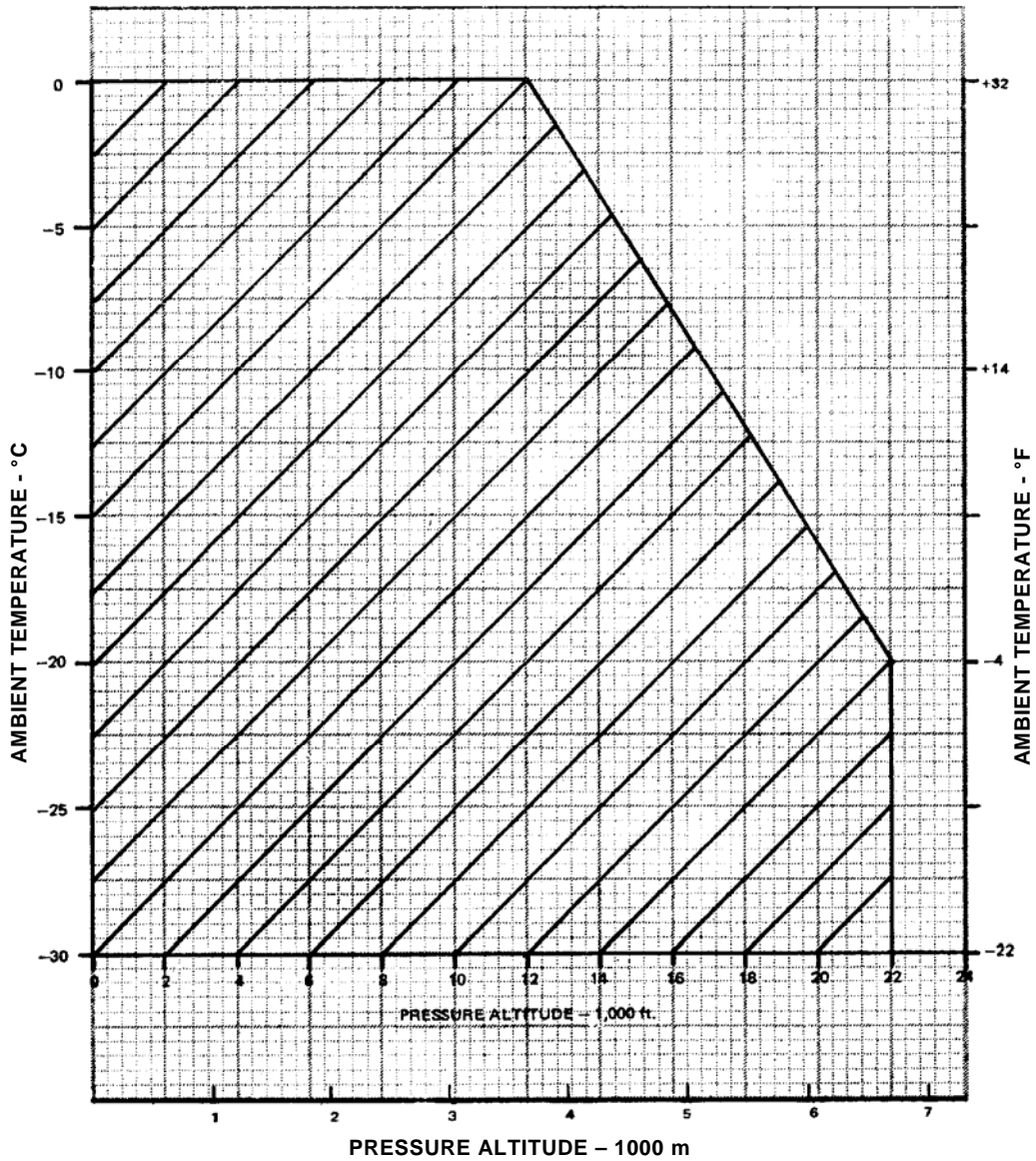
CS-Definitions



CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 LIQUID WATER CONTENT VS MEAN EFFECTIVE DROP DIAMETER
 Figure 2

Source of data – NACA TN No. 1855, Class III-M, Continuous Maximum.

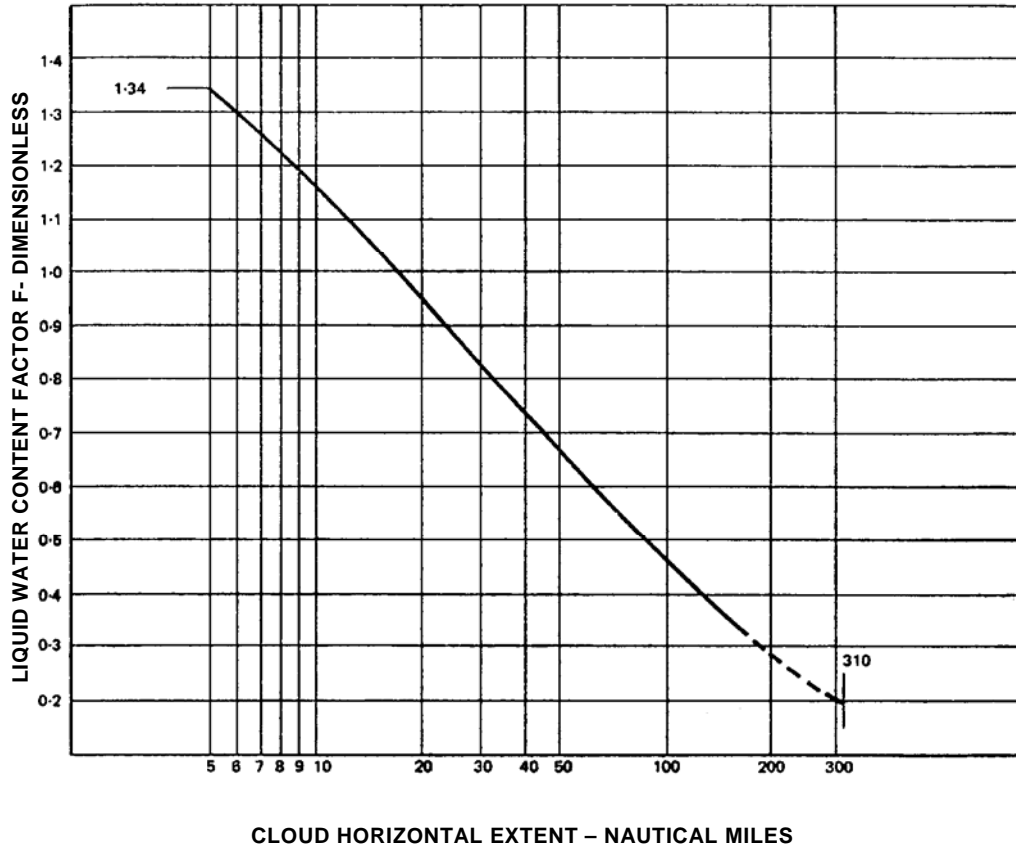
CS-Definitions



CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
AMBIENT TEMPERATURE VS PRESSURE ALTITUDE
Figure 3

Source of data – NACA TN No. 2569.

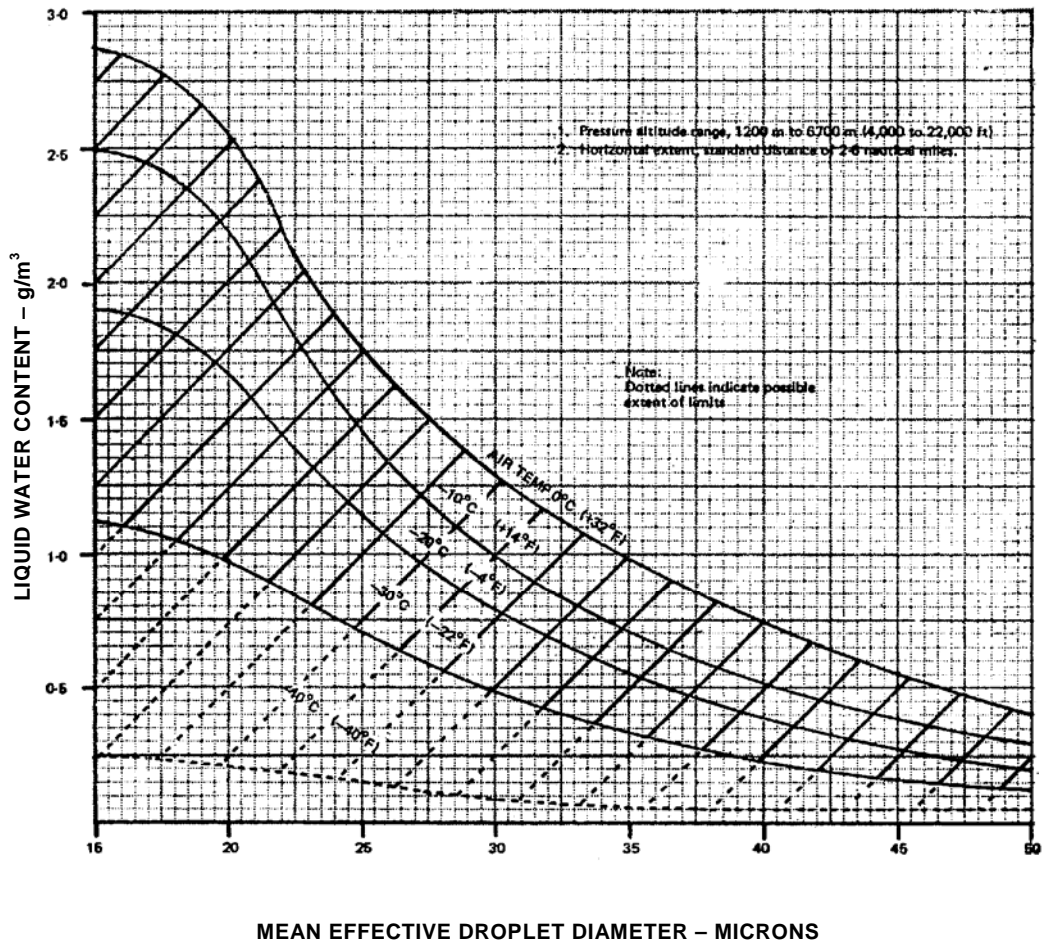
CS-Definitions



CONTINUOUS MAXIMUM (STRATIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
LIQUID WATER CONTENT FACTOR VS CLOUD HORIZONTAL DISTANCE
Figure 4

Source of data – NACA TN No. 2738.

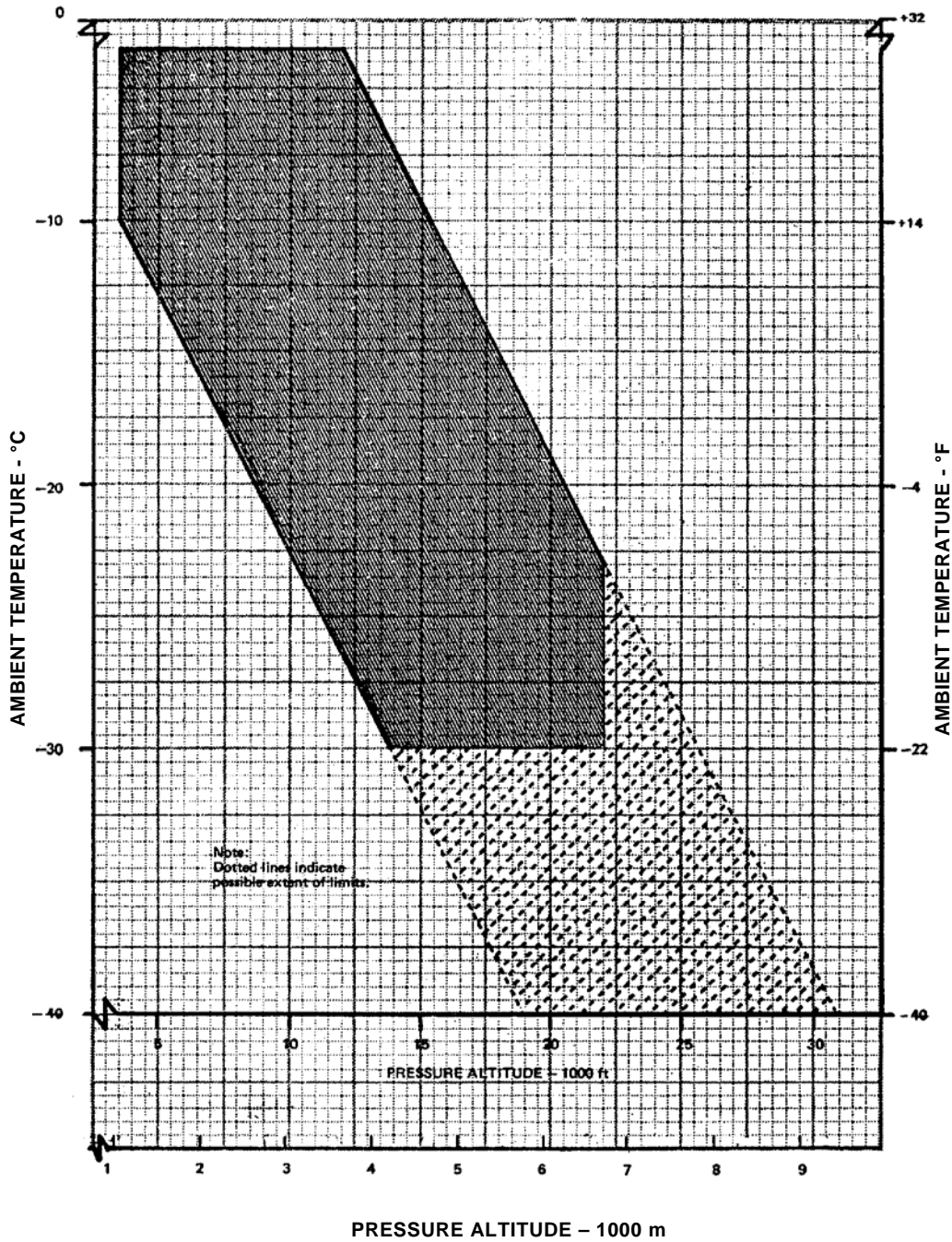
CS-Definitions



INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 LIQUID WATER CONTENT VS MEAN EFFECTIVE DROP DIAMETER
 Figure 5

Source of data – NACA TN N. 1855, Class II-M, Intermittent Maximum

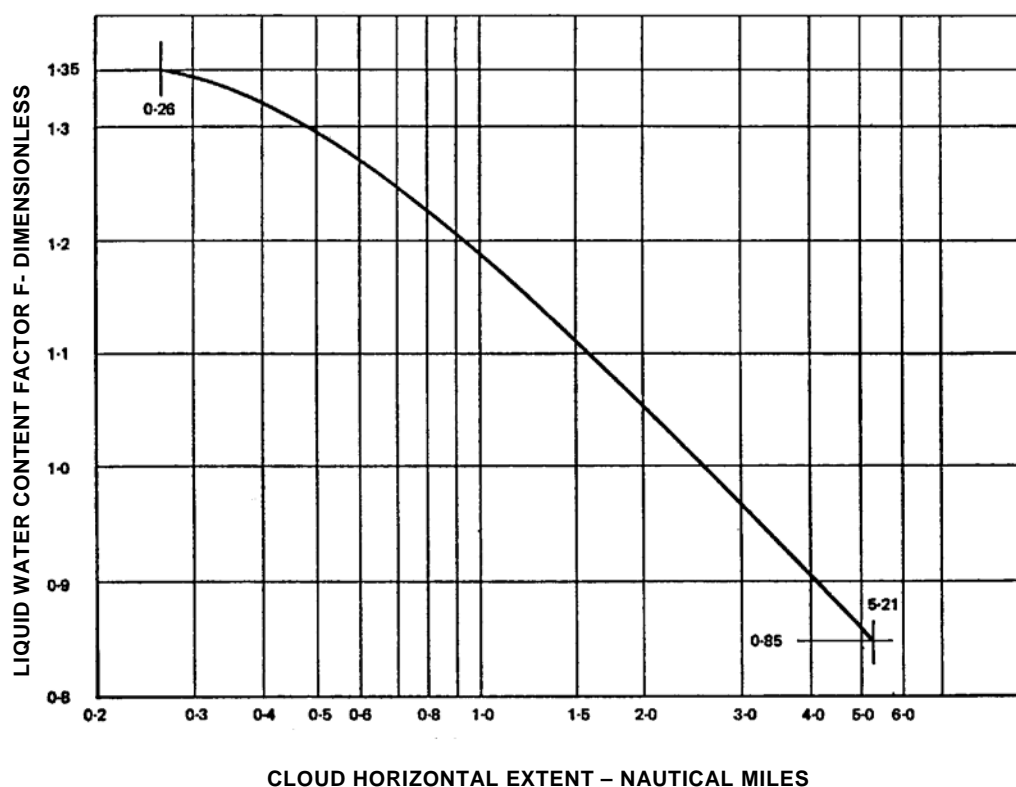
CS-Definitions



INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
ATMOSPHERIC ICING CONDITIONS
AMBIENT TEMPERATURE VS PRESSURE ALTITUDE
Figure 6

Source of data – NACA TN No. 2569.

CS-Definitions



INTERMITTENT MAXIMUM (CUMULIFORM CLOUDS)
 ATMOSPHERIC ICING CONDITIONS
 VARIATION OF LIQUID WATER CONTENT FACTOR WITH
 CLOUD HORIZONTAL EXTENT
 Figure 7

Source of data – NACA TN No. 2738.

'IFR conditions' means weather conditions below the minimum for flight under visual flight rules.

'Indicated airspeed' means the speed of an aircraft as shown on its pitot static airspeed indicator calibrated to reflect standard atmosphere adiabatic compressible flow at sea level uncorrected for airspeed system errors.

'Instrument' means a device using an internal mechanism to show visually or aurally the attitude, altitude, or operation of an aircraft or aircraft part. It includes electronic devices for automatically controlling an aircraft in flight.

'Landing gear extended speed' means the maximum speed at which an aircraft can be safely flown with the landing gear extended.

'Landing gear operating speed' means the maximum speed at which the landing gear can be safely extended or retracted.

'Large aeroplane' means an aeroplane of more than 5 700 kg (12 500 pounds) maximum certificated take-off weight. The category 'Large Aeroplane' does not include the commuter aeroplane category (For commuter aeroplane category, see CS 23.1 and CS 23.3).

'Load factor' means the ratio of a specified load to the total weight of the aircraft. The specified load is expressed in terms of any of the following: aerodynamic forces, inertia forces, or ground or water reactions.

CS-Definitions

'Mach number' means the ratio of true air speed to the speed of sound.

'Main rotor(s)' means the rotor or rotors that supply the principal lift to a rotorcraft.

'Maximum Continuous Power and/or Thrust' means the power and/or thrust identified in the performance data for use during periods of unrestricted duration.

'Maximum Continuous Power and/or Thrust Rating' means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.

'Maximum Engine Over-speed' means the maximum rotational speed of a mechanically independent main rotating system of an engine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Engine Over-torque' means (applicable only to turbo-propeller and turbo-shaft engines incorporating free power-turbines) the maximum torque of the free power-turbine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Exhaust Gas Over-temperature' means (turbine engines) the maximum engine exhaust gas temperature, inadvertent use of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause). This is not to be confused with maximum temperatures established for use during starting operations.

'Maximum Power-turbine Over-speed' means (applicable only to free power-turbine engines for helicopters) the maximum rotational speed of the free power-turbine, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the engine from service or maintenance action (other than to correct the cause).

'Maximum Power-turbine Speed for Autorotation' (applicable only to free power-turbine engines for helicopters) means the maximum rotational speed of the power-turbine permitted during autorotation for periods of unrestricted duration.

'Maximum Governed Rotational Speed' (variable pitch (governing) propellers) means the maximum rotational speed as determined by the setting of the propeller governor or control mechanism.

'Maximum Permissible Rotational Speed' (fixed, adjustable or variable (non-governing) pitch propellers) means the maximum propeller rotational speed permitted in normal or likely emergency operation.

'Maximum Propeller Overspeed' (20 second) means the maximum propeller rotational speed, inadvertent occurrence of which for periods of up to 20 seconds, has been agreed not to require rejection of the propeller from service or maintenance action (other than to correct the cause).

'Minimum Governed Rotational Speed' (variable pitch (governing) propellers) means the minimum rotational speed as determined by the setting of the propeller governor or control mechanism .

'Minimum Take-off Crankshaft Rotational Speed' (piston engines) means the minimum crankshaft rotational speed permissible for use with the maximum take-off manifold pressure.

'Normal operating differential pressure' means the pressure differential between the cabin pressure and the outside ambient pressure, including the tolerances of the normal pressure regulating system.

'Pitch Setting' means the propeller blade setting determined by the blade angle, measured in a manner and at a radius declared by the manufacturer and specified in the appropriate Manual.

'Powered sailplane' means an aircraft, equipped with one or more engines having, with engine(s) inoperative, the characteristics of a sailplane.

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'Primary Mode' (Engine related definition) means the mode that is intended to be used for controlling the Engine under normal operation. This is often referred to as the 'normal mode'.

[Amdt. No.:Def/1]

'Primary System' means the part of the Engine/Propeller Control System used for controlling the Engine/Propeller under normal operation.

[Amdt. No.:Def/1]

'Programmable Logic Device' (PLD) means an electronic component that is altered to perform an installation specific function. PLDs include, but are not limited to, Programmable Array Logic components (PAL), General Array Logic components (GAL), Field Programmable Gate Array (FPGA) components, and Erasable Programmable Logic Devices (EPLD).

[Amdt. No.:Def/1]

'Propeller' means a complete propeller including all parts attached to and rotating with the hub and blades, and any equipment defined in the Propeller type design required for the control and operation of the propeller.

'Protective breathing equipment' means breathing equipment for protection against smoke, fumes and other harmful gases.

'Rated 30-Second OEI Power' means, with respect to rotorcraft turbine engines, the approved one-engine-inoperative brake horsepower developed under static conditions at specified altitudes and temperatures within the operating limitations established for the engine, for continuation of the one-flight operation after the failure or shutdown of one engine in multi-engine rotorcraft, for up to three periods of use no longer than 30 seconds each in any one flight, and followed by mandatory inspection and prescribed maintenance action.

'Rated 2-Minute OEI Power' means, with respect to rotorcraft turbine engines, the approved one-engine-inoperative brake horsepower developed under static conditions at specified altitudes and temperatures within the operating limitations established for the engine, for continuation of the one-flight operation after the failure or shutdown of one engine in multi-engine rotorcraft, for up to three periods of use no longer than 2 minutes each in any one flight, and followed by mandatory inspection and prescribed maintenance action.

'Reference landing speed' means the speed of the aeroplane, in a specified landing configuration, at the point where it descends through the landing screen height in the determination of the landing distance for manual landings.

'Reversible Pitch Propeller' means a Propeller in which blade angle can be changed by the flight crew to produce reverse thrust.

[Amdt. No.:Def/1]

'Rotational Direction of Equipment' means the direction of rotation as observed when looking at the drive face of the equipment (usually described as 'clockwise' or 'anti-clockwise').

'Rotorcraft' means a heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors.

'Rotorcraft-load combination' means the combination of a rotorcraft and an external-load, including the external load attaching means. Rotorcraft-load combinations are designated as Class A, Class B, Class C and Class D as follows:

- a. **Class A rotorcraft-load combination** means one in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.
- b. **Class B rotorcraft-load combination** means one in which the external load is jettisonable and is lifted free of land or water during the rotorcraft operation.

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- c. **Class C rotorcraft-load combination** means one in which the external load is jettisonable and remains in contact with land or water during the rotorcraft operation.
- d. **Class D rotorcraft-load combination** means one in which the external load is other than a Class A, B or C and has been specifically approved for that operation.

'Safety catch' means a mechanism which locks an operating control in a given position. It engages automatically whenever the operating control is put into that position but has to be manually taken out of engagement in order to move the operating control away from that position.

'Sailplane' means a heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its fixed lifting surfaces, the free flight of which does not depend on an engine.

'Stopway' means an area beyond the take-off runway, no less wide than the runway and centred upon the extended centreline of the runway, able to support the aeroplane during an abortive take-off, without causing structural damage to the aeroplane, and designated by the airport authorities for use in decelerating the aeroplane during an abortive take-off.

'Supplemental oxygen' means the additional oxygen required to protect each occupant against the adverse effects of excessive cabin altitude and to maintain acceptable physiological conditions.

'Take-off Power and/or Thrust' means the output shaft power and/or thrust identified in the performance data for use during take-off, discontinued approach and baulked landing:

- a. for piston engines, it is limited in use to a continuous period of not more than 5 minutes;
- b. for turbine engines installed in aeroplanes and helicopters, limited in use to a continuous period of not more than 5 minutes; and
- c. for turbine engines installed in aeroplanes only (when specifically requested), limited in use to a continuous period of not more than 10 minutes in the event of a power-unit having failed or been shut down.

'Take-off Power and/or Thrust Rating' means the minimum test bed acceptance power and/or thrust as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.

'Take-off safety speed' means a referenced airspeed obtained after lift-off at which the required one-engine-inoperative climb performance can be achieved.

'True airspeed' means the airspeed of an aircraft relative to undisturbed air. True airspeed is equal to equivalent airspeed multiplied by $(\rho_0/\rho)^{1/2}$.

'Uncovered Fault' means a Fault or Failure for which either no detection mechanism exists or, if detected, no accommodation exists.

[Amdt. No.:Def/1]

'Variable Pitch Propeller' means a Propeller, the Pitch Setting of which changes or can be changed, when the Propeller is rotating. This includes:

- a. A non-governing Propeller, the Pitch Setting of which is directly under the control of the flight crew (controllable pitch propeller).
- b. A governing Propeller, the Pitch Setting of which is controlled by a governor or other automatic means which may be either integral with the Propeller or a separately mounted equipment and which may or may not be controlled by the flight crew (constant speed Propeller).

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- c. A governing Propeller, the Pitch Setting of which may be controlled by a combination of the methods of a. and b.

[Amdt. No.:Def/1]

'2½-Minute OEI Power and/or Thrust' means the power and/or thrust identified in the performance data for use when a power-unit has failed or been shut down during take-off, bailed landing or prior to a discontinued approach and limited in use for a continuous period of not more than 2½ minutes.

The 2½ minute period for use of 2½-Minute OEI Power and/or Thrust is additional to the 5 minute or 10 minute period at take-off power and/or thrust (see above.) and may be added to the take-off limitation at any point in time.

'2½-Minute OEI Power and/or Thrust Rating' means the minimum test bed acceptance power and/or thrust, as stated in the engine type certificate data sheet, of series and newly overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.

'30-Minute OEI Power' (applicable to multi-engined helicopters only) means the power identified in the performance data for use after take-off when an engine has failed or been shut down, and limited in scheduled use for a total period of not more than 30 minutes in any one flight.

'30-Minute OEI Power Rating' (applicable to multi-engined helicopters only) means the minimum test bed acceptance power, as stated in the engine type certificate data sheet, of series and overhauled engines when running at the specified conditions and within the appropriate acceptance limitations.

CS-Definitions**2 Abbreviations and symbols**

'**APU**' means auxiliary power unit.

'**BTPS**' means body temperature, pressure, saturated, i.e. 37°C, ambient pressure and saturated with water vapour at 47 mmHg partial pressure.

'**BTPD**' means body temperature, pressure, dry, i.e. 37°C, ambient pressure and no water vapour.

'**CAS**' means calibrated airspeed.

'**EAS**' means equivalent airspeed.

'**IAS**' means indicated airspeed.

'**ICAO**' means International Civil Aviation Organisation.

'**IFR**' means instrument flight rules.

'**ILS**' means instrument landing system.

'**M**' means mach number.

'**MIL Spec**' means USA Military Specification.

'**NTPD**' means normal temperature, pressure, dry, i.e. 21°C, 760 mmHg and no water vapour.

'**NPA**' means Notice of Proposed Amendment

'**OEI**' means one engine inoperative.

'**rpm**' means revolutions per minute.

'**STPD**' means standard temperature, pressure, dry, i.e. 0°C, 760 mmHg and no water vapour.

'**TAS**' means true airspeed.

'**ETSO**' means European Technical Standard Order.

'**TDP**' with respect to rotorcraft means take-off decision point.

'**V_A**' means design manoeuvring speed.

'**V_B**' means design speed for maximum gust intensity.

'**V_C**' means design cruising speed.

'**V_D/M_D**' means design diving speed.

'**V_{DF}/M_{DF}**' means demonstrated flight diving speed.

'**V_{EF}**' means the speed at which the critical engine is assumed to fail during take-off.

'**V_F**' means design flap speed.

'**V_{F1}**' means the design flap speed for procedure flight conditions.

'**V_{FC}/M_{FC}**' means maximum speed for stability characteristics.

'**V_{FE}**' means maximum flap extended speed.

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'**V_{FTO}**' means final take-off speed.

'**VFR**' means visual flight rules.

'**V_H**' means maximum speed in level flight with maximum continuous power.

'**VHF**' means very high frequency.

'**V_{LE}**' means maximum landing gear extended speed.

'**V_{LO}**' means maximum landing gear operating speed.

'**V_{LOF}**' means lift-off speed.

'**V_{MC}**' means minimum control speed with the critical engine inoperative.

'**V_{MCA}**' means the minimum control speed, take-off climb.

'**V_{MCG}**' means the minimum control speed, on or near ground.

'**V_{MCL}**' means the minimum control speed, approach and landing.

'**V_{MO}/M_{MO}**' means maximum operating limit speed.

'**V_{MU}**' means minimum unstick speed.

'**V_{NE}**' means never-exceed speed.

'**V_R**' means rotation speed.

'**V_{RA}**' means rough airspeed.

'**V_{REF}**' means reference landing speed.

'**V_S**' means the stall speed or the minimum steady flight speed at which the aeroplane is controllable.

'**V_{SO}**' means the stall speed or the minimum steady flight speed in the landing configuration.

'**V_{SR}**' means reference stall speed.

'**V_{SR0}**' means reference stall speed in the landing configuration.

'**V_{SR1}**' means reference stall speed in a specific configuration.

'**V_{SW}**' means speed at which onset of natural or artificial stall warning occurs.

'**V_{S1}**' means the stall speed or the minimum steady flight speed obtained in a specified configuration.

'**V_{S1g}**' means the one-g stall speed at which the aeroplane can develop a lift force (normal to the flight path) equal to its weight.

'**V_T**' means threshold speed.

'**V_{Tmax}**' means maximum threshold speed.

'**V_{TOSS}**' means take-off safety speed for Category A rotorcraft.

'**V_Y**' means speed for best rate of climb.

CS-Definitions

'**V₁**' means the maximum speed in the take-off at which the pilot must take the first action (e.g. apply brakes, reduce thrust, deploy speed brakes) to stop the aeroplane within the accelerate-stop distance. V_1 also means the minimum speed in the take-off, following a failure of the critical engine at V_{EF} , at which the pilot can continue the take-off and achieve the required height above the take-off surface within the take-off distance.

'**V₂**' means take-off safety speed.

'**V_{2min}**' means minimum take-off safety speed.

'**V₃**' means steady initial climb speed with all engines operating.

CS-Definitions

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