

Pratt & Whitney Canada PT6A-27/A-28 Engine Emissions

Prepared by Nordic Seaplanes. Supporting data for the PM_{0.1} / soot (black carbon) emissions screening estimate for the De Havilland Canada DHC-6 Twin Otter, presented in the accompanying background note.

The DHC-6 Twin Otter operated by Nordic Seaplanes is fitted with two Pratt & Whitney Canada PT6A-27 turboprop engines. The table below reproduces the certified emissions data for this engine model, as published in the manufacturer's official emissions datasheet. This data is the sole input used to derive the PM_{0.1}/soot screening estimate presented in the accompanying background note; the calculation method (FOA3) and its limitations are described there in full.

Engine identification

Engine model	PT6A-27, A-28
Type	Turboprop
Rated horsepower	680 HP (standard day, static)
Pressure ratio	6.9
Data basis	Actual data, corrected for atmospheric conditions
Datasheet date	March 2, 2007

LTO cycle emissions (per engine)

Power setting (% rated)	Time in mode (min)	Fuel flow (kg/sec)	CO EI (g/kg fuel)	HC EI (g/kg fuel)	NO _x EI (g/kg fuel)	Smoke Number
Take-Off (100%)	0.7	0.0515	0.9	0	7.6	17
Climb (85%)	2.2	0.0455	1.0	0	7.3	—
Approach (30%)	4.0	0.0245	3.7	0.2	5.6	—
Taxi / Idle (7%)	26.0	0.0144	17.4	1.2	4.3	—

Total LTO cycle emissions (per engine, standard ICAO LTO cycle):

CO ₂ (kg)	H ₂ O (kg)	CO (g)	HC (g)	NO _x (g)
115.8	43.9	420.6	28.1	189.8

Note on particulate data

No PM (particulate matter) or soot mass index is reported on the datasheet. The PT6A-27/A-28 was certified before non-volatile PM (nvPM) mass and number reporting became a standard part of ICAO Annex 16 Volume II engine certification. The Smoke Number (SN = 17 at Take-Off) is the only combustion-particulate metric available on the manufacturer's datasheet, and is the basis for the PM_{0.1}/soot estimate derived in the accompanying background note (FOA3 correlation method).

Source

Pratt & Whitney Canada Inc., "Turbine Engine Emissions Data", engine model PT6A-27/A-28, datasheet dated March 2, 2007. Data reproduced here in table form for reference; the original manufacturer datasheet is proprietary to Pratt & Whitney Canada Inc. and is not distributed as a standalone file.