



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1428GA-JM BYPASS RATIO (-): 12.1
UNIQUE ID NUMBER: 01P22PW171 PRESSURE RATIO π_{co} (-): 33.3
COMBUSTOR: TALON X, Block-C
ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 132.4

REGULATORY DATA

CHARACTERISTIC VALUES:	LTO_{mass}/F_{oo} (mg/kN)	LTO_{num}/F_{oo} (particles/kN)	NVPM MASS CONCENTRATION ($\mu\text{g}/\text{m}^3$)
LTO/ F_{oo} AND MAX nvPM _{mass}	96.3	2.57E+15	2488
AS % OF CAEP/10 LIMIT	-	-	43.2
AS % OF CAEP/11 LIMIT (InP)	5.3	21.8	
AS % OF CAEP/11 LIMIT (NT)	28.7	61.2	

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK nvPM _{mass} ($\mu\text{g}/\text{m}^3$)
				EI _{mass} (mg/kg)	EI _{num} (particles/kg)	
TAKE-OFF	100	0.7	0.870	80.6	8.99E+14	
CLIMB OUT	85	2.2	0.720	49.1	8.65E+14	
APPROACH	30	4.0	0.250	6.8	4.01E+14	
IDLE	7	26.0	0.090	8.2	7.55E+14	
LTO TOTAL (kg, mg, number of particles)			332	9174	2.45E+17	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN)				69.3	1.85E+15	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				80.6	9.62E+14	1933

* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% F_{oo})	CORRECTED EMISSIONS INDICES	
		EI _{mass_SL} (mg/kg)	EI _{num_SL} (particles/kg)
TAKE-OFF	100	98.0	2.98E+15
CLIMB OUT	85	63.1	3.57E+15
APPROACH	30	9.8	3.15E+15
IDLE	7	16.6	7.44E+15

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	100.8	103.0	HEAT OF COMBUSTION (MJ/kg)	43.27
TEMPERATURE (K)	266.7	277.2	HYDROGEN CONTENT (%mass)	13.84
HUMIDITY (kg water/kg dry air)	0.0004	0.0017	AROMATICS CONTENT (%vol)	15.3
			NAPHTHALENE CONTENT (%vol)	1.87
			SULPHUR CONTENT (ppm by mass)	705

MANUFACTURER: Pratt & Whitney
TEST ORGANIZATION: Pratt & Whitney
TEST LOCATION: East Hartford, CT
TEST DATES: 02/03/2017-04/03/2017

REMARKS

1. Data from certification report PWA-11701
2. 1 engine tested
3. TALON-X, Block-C* combustor
4. Certification in accordance with ICAO Annex 16 Vol. II., Part III, Chapter 2.
5. nvPM levels in accordance with ICAO Annex 16 Vol. II, Part III, Chapter 4 and Appendices 7 and 8.(CAEP/10)