



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1215G BYPASS RATIO (-): 8.6
UNIQUE ID NUMBER: 01P22PW168 PRESSURE RATIO π_{co} (-): 29.4
COMBUSTOR: TALON X, Block-C
ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 67.7

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}	27.1	8.12E+14	672
AS % OF CAEP/10 LIMIT	-	-	8.2
AS % OF CAEP/11 LIMIT (InP)	0.8	4.3	
AS % OF CAEP/11 LIMIT (NT)	3.5	8.6	

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	0.551	19.4	2.87E+14	
CLIMB OUT	85	2.2	0.461	12.5	2.90E+14	
APPROACH	30	4.0	0.166	0.2	2.68E+13	
IDLE	7	26.0	0.065	1.0	1.40E+14	
LTO TOTAL (kg, mg, number of particles)			225	1317	3.95E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN)				19.5	5.84E+14	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				19.4	3.03E+14	522

* 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	24.2	1.01E+15
CLIMB OUT	85	16.6	1.19E+15
APPROACH	30	0.4	1.95E+14
IDLE	7	2.1	1.06E+15

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	101.2	102.6	HEAT OF COMBUSTION (MJ/kg)	43.14
TEMPERATURE (K)	276.5	293.2	HYDROGEN CONTENT (%mass)	13.78
HUMIDITY (kg water/kg dry air)	0.0011	0.0058	AROMATICS CONTENT (%vol)	18.4
			NAPHTHALENE CONTENT (%vol)	1.64
			SULPHUR CONTENT (ppm by mass)	495

MANUFACTURER: Pratt & Whitney
TEST ORGANIZATION: Pratt & Whitney
TEST LOCATION: East Hartford, CT
TEST DATES: 28/03/2019-01/04/2019

REMARKS

1. Data from certification report PWA-12121
2. Block C combustor
3. nvPM levels in accordance with Annex 16 Vol. II, Chapter 4, Appendix 7 and Appendix 8.