



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1124G1-JM BYPASS RATIO (-): 12.7
UNIQUE ID NUMBER: 01P22PW159 PRESSURE RATIO π_{co} (-): 28.8
COMBUSTOR: TALON X, Block-D
ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 107.8

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}	30.6	1.25E+15	812
AS % OF CAEP/10 LIMIT	-	-	12.7
AS % OF CAEP/11 LIMIT (InP)	1.3	8.6	
AS % OF CAEP/11 LIMIT (NT)	6.1	20.2	

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	0.710	23.7	4.11E+14	
CLIMB OUT	85	2.2	0.600	14.8	3.14E+14	
APPROACH	30	4.0	0.210	0.2	3.28E+13	
IDLE	7	26.0	0.080	3.9	4.64E+14	
LTO TOTAL (kg, mg, number of particles)			284	2375	9.68E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				4	4	4
AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN)				22.0	8.97E+14	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				23.7	4.64E+14	631

* 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	30.1	1.58E+15
CLIMB OUT	85	19.6	1.51E+15
APPROACH	30	0.6	4.36E+14
IDLE	7	8.7	6.41E+15

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	101.5	102.2	HEAT OF COMBUSTION (MJ/kg)	43.32
TEMPERATURE (K)	279.6	300.8	HYDROGEN CONTENT (%mass)	13.89
HUMIDITY (kg water/kg dry air)	0.0036	0.0120	AROMATICS CONTENT (%vol)	16.5
			NAPHTHALENE CONTENT (%vol)	0.74
			SULPHUR CONTENT (ppm by mass)	228

MANUFACTURER: Pratt & Whitney
TEST ORGANIZATION: Pratt & Whitney
TEST LOCATION: W. Palm Beach, FL
TEST DATES: 18/01/2020-21/01/2020

REMARKS

1. Data from certification report PWA-12090
2. 1 engine tested
3. TALON-X, Block-D combustor
4. Certification in accordance with ICAO Annex 16 Vol. II., Part III, Chapter 4.