



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1524G BYPASS RATIO (-): 11.1  
UNIQUE ID NUMBER: 04P20PW196 PRESSURE RATIO  $\pi_{co}$  (-): 38.7  
COMBUSTOR: TALON X, Block-C  
ENGINE TYPE: TF RATED OUTPUT  $F_{oo}$  (kN): 108.5

### 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 $nvPM_{mass}$	15.3	$4.06\text{E}+14$	424
AS % OF CAEP/10 LIMIT	-	-	6.7
AS % OF CAEP/11 LIMIT (InP)	0.7	2.8	
AS % OF CAEP/11 LIMIT (NT)	3.0	6.6	

### 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	0.788	12.9	$1.88\text{E}+14$	
CLIMB OUT	85	2.2	0.649	8.1	$1.90\text{E}+14$	
APPROACH	30	4.0	0.229	0.2	$1.37\text{E}+13$	
IDLE	7	26.0	0.076	0.5	$7.10\text{E}+13$	
LTO TOTAL (kg, mg, number of particles)			292	1190	$3.17\text{E}+16$	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE $LTO/F_{oo}$ VALUES (mg/kN, particles/kN)				11.0	$2.92\text{E}+14$	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				12.9	$2.02\text{E}+14$	330

\* 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	16.2	$6.99\text{E}+14$
CLIMB OUT	85	10.9	$9.00\text{E}+14$
APPROACH	30	0.3	$5.92\text{E}+13$
IDLE	7	0.9	$6.07\text{E}+14$

### AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	102.0	103.3	HEAT OF COMBUSTION (MJ/kg)	43.21
TEMPERATURE (K)	272.0	278.1	HYDROGEN CONTENT (%mass)	13.98
HUMIDITY (kg water/kg dry air)	0.0012	0.0022	AROMATICS CONTENT (%vol)	18.1
			NAPHTHALENE CONTENT (%vol)	0.78
			SULPHUR CONTENT (ppm by mass)	553

MANUFACTURER: Pratt & Whitney  
TEST ORGANIZATION: Pratt & Whitney  
TEST LOCATION: Mirabel Aerospace Centre - Quebec  
TEST DATES: 25/03/2018-26/03/2018

### REMARKS

1. Data from certification report PWA-12245-02
2. Block C combustor
3. nvPM levels in accordance with Annex 16 Vol. II, Chapter 4, Appendix 7 and Appendix 8.
4. PW1524G-3 has equivalent rated thrust levels and pressure ratios as PW1524G
5. PW1524G-3 has equivalent ICAO nvPM emissions data as the PW1524G
6. Data revised: nvPM  $EI_{mass\_SL}$  corrected