



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1921G BYPASS RATIO (-): 11.4  
UNIQUE ID NUMBER: 04F20PW201 PRESSURE RATIO  $\pi_{co}$  (-): 35.8  
COMBUSTOR: TALON X, Block-C  
ENGINE TYPE: TF RATED OUTPUT  $F_{oo}$  (kN): 100.3

### 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 $nvPM_{mass}$	11.6	4.03E+14	341
AS % OF CAEP/10 LIMIT	-	-	5.2
AS % OF CAEP/11 LIMIT (InP)	0.5	2.6	
AS % OF CAEP/11 LIMIT (NT)	2.1	5.9	

### 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	0.715	10.7	1.99E+14	
CLIMB OUT	85	2.2	0.590	5.6	1.75E+14	
APPROACH	30	4.0	0.211	0.2	1.50E+13	
IDLE	7	26.0	0.072	0.7	7.81E+13	
LTO TOTAL (kg, mg, number of particles)			270	840	2.91E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE $LTO/F_{oo}$ VALUES (mg/kN, particles/kN)				8.4	2.90E+14	-
MAX $EI$ VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				10.7	1.99E+14	265

\* 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	14.0	8.23E+14
CLIMB OUT	85	8.0	9.25E+14
APPROACH	30	0.3	6.72E+13
IDLE	7	1.3	7.01E+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-12249
2. Block C combustor
3. nvPM levels in accordance with Annex 16 Vol. II, Chapter 4, Appendix 7 and Appendix 8.
4. Data revised: nvPM  $EI_{mass\_SL}$  corrected