



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW1519G BYPASS RATIO (-): 11.6
UNIQUE ID NUMBER: 01P20PW186 PRESSURE RATIO π_{co} (-): 32.3
COMBUSTOR: TALON X, Block-C
ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 88.0

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 $nvPM_{mass}$ | 6.7 | 3.86E+14 | 190 |
| AS % OF CAEP/10 LIMIT | - | - | 2.7 |
| AS % OF CAEP/11 LIMIT (InP) | 0.3 | 2.3 | |
| AS % OF CAEP/11 LIMIT (NT) | 1.0 | 5.0 | |

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 | 0.623 | 6.3 | 1.77E+14 | |
| CLIMB OUT | 85 | 2.2 | 0.520 | 2.5 | 1.18E+14 | |
| APPROACH | 30 | 4.0 | 0.191 | 0.1 | 1.82E+13 | |
| IDLE | 7 | 26.0 | 0.067 | 0.8 | 1.04E+14 | |
| LTO TOTAL (kg, mg, number of particles) | | | 246 | 425 | 2.44E+16 | - |
| NUMBER OF ENGINES | | | | 1 | 1 | 1 |
| NUMBER OF TESTS | | | | 3 | 3 | 3 |
| AVERAGE LTO/F_{oo} VALUES (mg/kN, particles/kN) | | | | 4.8 | 2.78E+14 | - |
| MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$) | | | | 6.3 | 1.77E+14 | 147 |

* 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 | 8.8 | 8.99E+14 |
| CLIMB OUT | 85 | 4.0 | 7.73E+14 |
| APPROACH | 30 | 0.2 | 8.66E+13 |
| IDLE | 7 | 0.9 | 8.42E+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, Canada
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.

** DATA SUPERSEDED **

SEE FOLLOWING UID FOR REVISED DATA:

04P20PW199