



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: LEAP-1B25 BYPASS RATIO (-): 8.4
 UNIQUE ID NUMBER: 01P20CM135 PRESSURE RATIO π_{co} (-): 40.1
 COMBUSTOR: TAPS II
 ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 119.2

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} | 2.3 | 1.09E+14 | 85 |
| AS % OF CAEP/10 LIMIT | - | - | 1.4 |
| AS % OF CAEP/11 LIMIT (InP) | 0.1 | 0.8 | |
| AS % OF CAEP/11 LIMIT (NT) | 0.5 | 2.1 | |

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 | 0.960 | 0.0 | 2.71E+10 | |
| CLIMB OUT | 85 | 2.2 | 0.784 | 0.0 | 2.68E+10 | |
| APPROACH | 30 | 4.0 | 0.260 | 2.7 | 1.00E+14 | |
| IDLE | 7 | 26.0 | 0.091 | 0.2 | 2.17E+13 | |
| LTO TOTAL (kg, mg, number of particles) | | | 348 | 200 | 9.32E+15 | - |
| NUMBER OF ENGINES | | | | 1 | 1 | 1 |
| NUMBER OF TESTS | | | | 3 | 3 | 3 |
| AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN) | | | | 1.7 | 7.82E+13 | - |
| MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$) | | | | 3.8 | 1.17E+14 | 66 |

* 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 | 0.0 | 4.12E+10 |
| CLIMB OUT | 85 | 0.0 | 4.31E+10 |
| APPROACH | 30 | 4.1 | 6.75E+14 |
| IDLE | 7 | 0.5 | 4.15E+14 |

AMBIENT CONDITIONS

| | From | To | FUEL | |
|--------------------------------|--------|--------|-------------------------------|-------|
| BAROMETER (kPa) | 98.0 | 98.2 | HEAT OF COMBUSTION (MJ/kg) | 43.27 |
| TEMPERATURE (K) | 290.6 | 296.5 | HYDROGEN CONTENT (%mass) | 13.84 |
| HUMIDITY (kg water/kg dry air) | 0.0048 | 0.0079 | AROMATICS CONTENT (%vol) | 14.8 |
| | | | NAPHTHALENE CONTENT (%vol) | 1.97 |
| | | | SULPHUR CONTENT (ppm by mass) | 840 |

MANUFACTURER: CFM International
 TEST ORGANIZATION: CFM International
 TEST LOCATION: PTO, Ohio
 TEST DATES: 08/03/2016-09/03/2016

REMARKS

1. Certification Report CRL-2201b/Rev. 5
2. Engine S/N 602-109/1