



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: BR700-730B2-14 BYPASS RATIO (-): 5.4
UNIQUE ID NUMBER: 06P26RR149 PRESSURE RATIO π_{c0} (-): 35.5
COMBUSTOR: Advanced Rich Burn
ENGINE TYPE: MTF RATED OUTPUT F_{00} (kN): 81.7

REGULATORY DATA

CHARACTERISTIC VALUES:	LTO_{mass}/F_{00} (mg/kN)	LTO_{num}/F_{00} (particles/kN)	NVPM MASS CONCENTRATION ($\mu\text{g}/\text{m}^3$)
LTO/ F_{00} AND MAX nvPM _{mass}	277.9	4.83E+15	558
AS % OF CAEP/10 LIMIT	-	-	7.6
AS % OF CAEP/11 LIMIT (InP)	9.6	27.6	
AS % OF CAEP/11 LIMIT (NT)	40.5	58.2	

MEASURED DATA

MODE	POWER SETTING (% F_{00})	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	0.787	51.2	2.96E+14	
CLIMB OUT	85	2.2	0.646	95.0	7.18E+14	
APPROACH	30	4.0	0.213	76.4	1.98E+15	
IDLE	7	26.0	0.081	38.0	1.18E+15	
LTO TOTAL (kg, mg, number of particles)			296	18491	3.21E+17	-
NUMBER OF ENGINES				2	2	2
NUMBER OF TESTS				4	4	4
AVERAGE LTO/ F_{00} VALUES (mg/kN, particles/kN)				226.5	3.94E+15	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				170.7	2.64E+15	476

* 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_{00})	CORRECTED EMISSIONS INDICES	
		EI _{mass_SL} (mg/kg)	EI _{num_SL} (particles/kg)
TAKE-OFF	100	55.9	4.23E+14
CLIMB OUT	85	105.0	1.07E+15
APPROACH	30	91.2	3.76E+15
IDLE	7	46.1	2.35E+15

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	100.4	101.8	HEAT OF COMBUSTION (MJ/kg)	43.18
TEMPERATURE (K)	288.4	299.7	HYDROGEN CONTENT (%mass)	13.69
HUMIDITY (kg water/kg dry air)	0.0074	0.0088	AROMATICS CONTENT (%vol)	17.5
			NAPHTHALENE CONTENT (%vol)	0.27
			SULPHUR CONTENT (ppm by mass)	35

MANUFACTURER: Rolls-Royce Deutschland
TEST ORGANIZATION: Rolls-Royce Deutschland
TEST LOCATION: Dahlewitz
TEST DATES: 05/09/2021-09/09/2021

REMARKS

1. nvPM Emission Compliance with two engines tested. Report EDNS 01000922596
2. The maximum EI_{mass} occurs between 30% and 85% F_{00}
3. The maximum EI_{num} occurs between 30% and 85% F_{00}