



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: BR700-725A1-12 BYPASS RATIO (-): 4.4  
UNIQUE ID NUMBER: 01P11BR016 PRESSURE RATIO  $\pi_{co}$  (-): 26.2  
COMBUSTOR: Z-ring  
ENGINE TYPE: MTF RATED OUTPUT  $F_{oo}$  (kN): 75.7

### 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 <sub>mass</sub>	498.8	6.72E+15	1152
AS % OF CAEP/10 LIMIT	-	-	15.0
AS % OF CAEP/11 LIMIT (InP)	16.5	37.0	
AS % OF CAEP/11 LIMIT (NT)	68.5	76.5	

### MEASURED DATA

MODE	POWER SETTING (% $F_{oo}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK nvPM <sub>mass</sub> ( $\mu\text{g}/\text{m}^3$ )
				EI <sub>mass</sub> (mg/kg)	EI <sub>num</sub> (particles/kg)	
TAKE-OFF	100	0.7	0.789	216.7	1.13E+15	
CLIMB OUT	85	2.2	0.650	227.3	1.65E+15	
APPROACH	30	4.0	0.221	20.8	1.09E+15	
IDLE	7	26.0	0.085	22.4	1.34E+15	
LTO TOTAL (kg, mg, number of particles)			304	30765	4.15E+17	-
NUMBER OF ENGINES				2	2	2
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ $F_{oo}$ VALUES (mg/kN, particles/kN)				406.4	5.48E+15	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				231.8	2.35E+15	982

\* 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 <sub>mass_SL</sub> (mg/kg)	EI <sub>num_SL</sub> (particles/kg)
TAKE-OFF	100	236.9	1.72E+15
CLIMB OUT	85	251.6	2.63E+15
APPROACH	30	26.7	2.58E+15
IDLE	7	29.7	3.39E+15

### AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	99.0	99.8	HEAT OF COMBUSTION (MJ/kg)	43.29
TEMPERATURE (K)	291.8	296.9	HYDROGEN CONTENT (%mass)	13.85
HUMIDITY (kg water/kg dry air)	0.0051	0.0077	AROMATICS CONTENT (%vol)	16.9
			NAPHTHALENE CONTENT (%vol)	0.47
			SULPHUR CONTENT (ppm by mass)	11

MANUFACTURER: Rolls-Royce Deutschland  
TEST ORGANIZATION: Rolls-Royce Deutschland  
TEST LOCATION: Dahlewitz  
TEST DATES: 12/05/2016-13/05/2016

### REMARKS

1. Certification Report EDNS01000426081 Issue 4
2. The maximum EI<sub>mass</sub> occurs between 30% and 85%  $F_{oo}$
3. The maximum EI<sub>num</sub> occurs between 30% and 85%  $F_{oo}$
4. Corrected peak EI number value (fuel correction) since EEDB v30