



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: GE90-115B BYPASS RATIO (-): 7.0  
UNIQUE ID NUMBER: 07P27GE240 PRESSURE RATIO  $\pi_{oo}$  (-): 43.2  
COMBUSTOR: DAC  
ENGINE TYPE: TF RATED OUTPUT  $F_{oo}$  (kN): 513.9

### 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 $nvPM_{mass}$	38.3	$6.72\text{E}+14$	619
AS % OF CAEP/10 LIMIT	-	-	18.5
AS % OF CAEP/11 LIMIT (InP)	11.0	16.1	
AS % OF CAEP/11 LIMIT (NT)	17.9	24.2	

### 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	4.594	16.2	$8.65\text{E}+13$	
CLIMB OUT	85	2.2	3.562	11.8	$1.14\text{E}+14$	
APPROACH	30	4.0	1.069	11.4	$2.50\text{E}+14$	
IDLE	7	26.0	0.339	4.8	$2.15\text{E}+14$	
LTO TOTAL (kg, mg, number of particles)			1449	14161	$2.49\text{E}+17$	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE $LTO/F_{oo}$ VALUES (mg/kN, particles/kN)				27.6	$4.84\text{E}+14$	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				16.2	$3.46\text{E}+14$	481

\* 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	19.0	$2.15\text{E}+14$
CLIMB OUT	85	14.6	$3.52\text{E}+14$
APPROACH	30	15.4	$1.03\text{E}+15$
IDLE	7	7.6	$1.25\text{E}+15$

### AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	97.5	97.9	HEAT OF COMBUSTION (MJ/kg)	43.12
TEMPERATURE (K)	278.6	293.0	HYDROGEN CONTENT (%mass)	13.97
HUMIDITY (kg water/kg dry air)	0.0035	0.0038	AROMATICS CONTENT (%vol)	15.4
			NAPHTHALENE CONTENT (%vol)	0.29
			SULPHUR CONTENT (ppm by mass)	14

MANUFACTURER: General Electric Company  
TEST ORGANIZATION: GE Aviation  
TEST LOCATION: PTO, Ohio, USA  
TEST DATES: 18/10/2022-21/10/2022

### REMARKS

1. Ref. GE Aviation Report R2021AE291/Rev. 1
2. Engine S/N 901-648/1 - 10/18/2022 thru 10/21/2022
3. The maximum  $EI_{num}$  occurs between 30% and 85%  $F_{oo}$