



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-N3  
UNIQUE ID NUMBER: 02P23RR135  
COMBUSTOR: Phase5 Tiled  
ENGINE TYPE: TF

BYPASS RATIO: 8.9  
PRESSURE RATIO ( $\pi_{co}$ ): 48.8  
RATED THRUST ( $F_{oo}$ ) (kN): 358.1

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>oo</sub> (g/kN) or SN	0.0	8.3	77.7	16.4
AS % OF ORIGINAL LIMIT	0.0	7.0	56.5	98.2
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			70.6	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			74.3	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			80.5	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			88.6	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### DATA STATUS

- PRE-REGULATION  
x CERTIFICATION  
- REVISED (SEE REMARKS)

### TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES  
x DEDICATED ENGINES TO PRODUCTION STANDARD  
- OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
(ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)

- OUT OF PRODUCTION (DATE: - )  
- OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER	TIME	FUEL FLOW	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
	SETTING (%F <sub>oo</sub> )	(minutes)	(kg/s)	HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	2.802	0.00	0.44	64.41	7.6
CLIMB OUT	85	2.2	2.274	0.00	0.43	46.59	10.0
APPROACH	30	4.0	0.732	0.00	0.54	14.74	10.0
IDLE	7	26.0	0.267	0.00	6.08	6.17	1.8
LTO TOTAL FUEL (kg) or EMISSIONS (g)			1010	0	2807	26725	-
NUMBER OF ENGINES				6	6	6	6
NUMBER OF TESTS				14	14	14	14
AVERAGE D <sub>p</sub> /F <sub>oo</sub> (g/kN) or AVERAGE SN (MAX)				0.0	7.8	74.6	14.7
SIGMA (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0.0	1.3	0.9	2.0
RANGE (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0.0	6.54-9.43	73.24-75.47	11.4-16.7

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW)  
STAGE BLEED 0 (% CORE FLOW)

AT - POWER SETTINGS  
AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	98.9-102.1
TEMPERATURE (K)	280.4-303.5
ABS HUMIDITY (kg/kg)	0.00308-0.01917

### FUEL

SPEC	
H/C	1.92
AROM (%)	16.89

MANUFACTURER: Rolls-Royce plc  
TEST ORGANIZATION: Rolls-Royce plc  
TEST LOCATION: Derby  
TEST DATES: 24/09/2009-28/08/2019

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

### REMARKS

- Representative of Trent 1000-TEN engines
- EDNS01000935986

Compliance with Fuel Venting requirements:

x ('x' if complies, 'PR' if pre-regulation, '- ' if information is not available)