

NIKON STEPPER SPECIFICATION

NSR 1505G7E



NSR 1505G7E SYSTEM CONFIGURATION

1. GENERAL

This system provides a 5:1 reduction of a reticle pattern onto a wafer through step-and -repeat operations with an G-line LAMP. It automatically performs reticle positioning and exposure focusing. The system also automatically performs pattern registration using the laser step alignment (LSA).

2. SYSTEM CONFIGURATION

2.1 Main Body

- (1) Reduction projection optical system
- (2) Illumination optical system
- (3) Auto Focus system
- (4) Reticle alignment system
- (5) Auto reticle blind system
- (6) Wafer alignment system
- (7) interferometer unit
- (8) X-Y stage
- (9) Wafer table(Hoder)
- (10) Wafer Loader
- (11) Reticle Loader
- (12) Environmental Chember

2.2 Control Rack

- (1) Stage controller
 - (2) Interferometer counter
 - (3) Wafer alignment counter
 - (4) Reticle controller
 - (5) Lens controoler(including automatic laser compensator)
 - (6) Wafer Loader controller
 - (7) Power supply
 - (8) Reticle loader controller
 - (9) Operation panel
 - (10) Minicomputer system
 - (11) CRT (also used as ITV monitor)
 - (12) ITV controller
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NSR 1505G7E UTILITY SPECIFICATION

Environmental chamber

Temperature in chamber	±0.1 °C (relative to any temperature setting between 20 °C and 25 °C)
Cleanliness	Class 1 for horizontal laminar flow system (0.1 um ULPA Filter)
Room temperature requirement	±3 °C of set temperature (free from sharp temperature change)
Noise from chamber	60 dB or less (at any points 1 m from chamber)

Hg. lamp heat exhaust

Exhaust volume	3 m ³ /min (max.)
Exhaust temperature	Within +5 °C of cooling water temperature

Power requirements AC200V ±20 Vac, 50 A(Max), 50/60 Hz

Air pressure

NSR main body	Vacuum : 300 mmhg or less, 50 l/min WR Vacuum : 300 mmhg or less, 30 l/min Dry air or N2 : 3kg/cm ² or more, 5 l/min(0.1 μm filter) (connected via 1/4" nylon tubes to regulator unit about 2mm above intake)
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Cooling water

NSR main body and chamber	Differential pressure 3kg/cm ² or more (proof pressure 5 kg/cm ²), 16-32c, 18 l/min (connected at 15A, pt1/2, including drain) Drain PT 1"
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Weight

NSR main body	Mechanical block: approx. 2400kg Control rack : approx. 500kg
Chamber	approx. 600kg

Floor conditions

Vibration	4Hz or less : 0.4gal or less 4Hz~25Hz : Proportion or less on log-log graph between 0.4gal(at 4Hz) and 8gal(at 25Hz) 25Hz~250Hz : 8gal or less
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ITEM			PERFORMANCE	REMARK
BASIC PERFORMANCE	LENS	RESOLUTION	Within $0.65\mu\text{m}$	
		LENS DISTORTION (Including Magnification error)	Within $\pm 80\text{nm}$	
		OPEN FLAME(MAX. EXPOSURE AREA)	15.08mm X 18.86mm $\varnothing 21.2\text{mm}$	
	FOCUS	AUTO FOCUS CALIBRATION REPEATABILITY	$3\sigma \leq 150\text{ nm}$	
	ILLUMINATION SYSTEM	LAMP POWER	700 mW/cm ²	
		LAMP UNIFORMITY	Within 2.0%	
		DOSE CONTROLL ACCURACY (Intergrated ExposureStability) 1) 50 mJ/cm ² 2) 300mJ/cm ²	1) Within $\pm 1.5\%$ 2) Within $\pm 1.5\%$	
		RETICLE BLIND	+0.4mm ~ +0.8mm	
	ALIGNMENT SYSTEM	RETICLE ROTATION ACCURACY	Absolute value Within $\pm 0.02\mu\text{m}$ Of target value Repeatability Within $0.02\mu\text{m}$	
		LSA OVERLAY ACCURACY	$ X +3\sigma \leq 0.13\mu\text{m}$	
	STAGE	STEPPING ACCURACY	NORMAL $\pm 0.08\mu\text{m}$ (3σ)	
		ORTHOGONALITY	Within $\pm 0.2\text{ sec}$	
		WAFER STAGE FLATNESS	Within $3\mu\text{m}$ / 150mm	
		CHIP LEVELING	Within $\pm 0.3\mu\text{m}$ / 20mm	
	LOADER	WAFER PREALIGNMENT2 REPEATABILITY	3σ Within $15\mu\text{m}$	PRE-Alignment 2
	OPERATION	THROUGHPUT (EGA 10 Point))	53 Wafer / hour	72shot