

TECHNICAL SPECIFICATIONS

**FOR THE SUPPLY OF
A 'MASK ALIGNER'
FOR
SCUOLA SUPERIORE SANT'ANNA**

**ALLEGATO "A" – LOTTO 4
PROCEDURA APERTA IN LOTTI PER LA FORNITURA DI
APPARECCHIATURE SCIENTIFICHE PER IL PROGETTO PIC**

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INTRODUCTION

This technical specifications summarize the main requirements for a Mask Aligner for lithography applications. The equipment will be installed inside the Clean Room of Tec iP Institute. It exposes the photoresist on the wafer and it transfers to it the mask pattern, performing good alignment to already existing structures.

1. Technical specifications: minimum requirements

1.1 Hardware configuration

- ❖ Chuck and mask holder set up for 6" Silicon wafer (7x7mask)
Upgradable to 8"wafer (9x9 mask)
- ❖ Front and back side manual alignment (TSA and BSA)

	TSA	BSA
alignment accuracy	≤ 1um	≤ 1um

- ❖ Microscope illumination has to be yellow filtered.
Objectives required: 5x, 10x
- ❖ Exposure in proximity, soft and hard contact, vacuum contact.
Structures resolution down to < 1um.
- ❖ Upgradable for assisted video alignment
- ❖ Exposure unit: - set for 350-500W lamps
 - lamp housing up to 1000W
 - range of wavelength 350-450 nm
 - 365nm i-line Bandwidth filter assembly
 - integrated light sensor for power delivery adjustment
 - lamp life time counter
 - UV light measuring instrument (365nm) to check and calibrate light sensor and light uniformity
- ❖ Automatic wedge compensation system in contact and without contact between mask and wafer (reference balls). Programmable alignment gap from 1 to 1000um, resolution 1um.
- ❖ Upgradable for bond alignment application

1.2 Process configuration

- ❖ First Mask alignment on wafer flat is a required application. For it and other applications top side microscopes movement should be capable of covering wafer surface as much as possible; and microscope objective separation has to be adjustable down to 10mm.
- ❖ UV light uniformity < 3.5 %
measured with a 365nm probe, over a 6"wafer, at a mean intensity of 40 mW/cm²

1.3 Conditions

- ❖ Conformity to CE standard and certification
- ❖ Availability of spare parts guaranteed for minimum 10 years
- ❖ Warranty 1 year
- ❖ Shipment and installation included to:
Scuola Superiore Sant'Anna (Tec iP Institute)
Via Giuseppe Moruzzi 1
56127 Pisa (Italy)

2. Technical specifications: evaluable features

2.1 Hardware configuration

- ❖ Reference for automatic wedge compensation on wafer exclusion zone
- ❖ Active vibration isolation system and machine base frame configuration for improved alignment performance
- ❖ Additional chuck and mask holder for smaller substrates
- ❖ Additional microscope objectives
- ❖ Software for assisted video alignment
- ❖ 405nm h-line bandwidth filter assembly

2.2 Condition

- ❖ Consumable spare parts kit for yearly maintenance
- ❖ One extra year warranty

3. Installation, acceptance, documents

3.1 Installation

Scuola Superiore Sant'Anna, by following the supplier directions, is in charge for: moving the crate from the track to the site, opening the package, tool positioning in the working area, connecting all the necessary facilities to the tool.

Supplier must check for the correct placement and connection, facilities presence, flow and pressure value. Execute the acceptance procedure, final and functionality test.

3.2 Acceptance

Installation and commissioning, followed by process start-up with demonstration of defined process specification must be performed onsite by the Supplier.

3.3 Documents

Supplier must:

1. Detail configuration of the equipment and list of parts and components
2. Deliver layout of installation and the list of the facilities required for a proper functioning of the tool.
3. Deliver process data
4. Deliver procedures for standard operations and maintenance.
5. Deliver safety instructions
6. CE conformity declaration
7. Describe after sales service and support solution.

The compliance of the equipment to the minimum requirements and evaluable features must be evident in the documentation (1-7).

4. Appendix

4.1 Summary table of minimum requirements

The compliance of the equipment to the minimum requirements must be evident in the documentation ([paragraph 3.3](#)).

Summary Specifications			
Parameter	Target Specs	Units	Note
chuck 6" Silicon wafer	yes		
mask holder 7x7	yes		
alignment accuracy TSA	≤1	um	
alignment accuracy BSA	≤ 1	um	
Alignment stage resolution	0,1	um	
First mask theta alignment on wafer flat	yes		
yellow filtered illumination	yes		
objectives	5x, 10x		
exposure mode	proximity, soft/hard/vacuum contact		
structure resolution	≤1	um	
lamp housing	up to 1000	W	
lamp power	350-500	W	
range of wavelenght	350-450	nm	
I line bandwidth filter assembly	365	nm	
light uniformity (over 6" wafer)	≤3.5%		
integrated light sensor	yes		
lamp life time counter	yes		
UV light measuring instrument (365nm)	yes		
WEC in contact and without (with reference balls)	yes		
Alignment gap range	1-1000	um	
Alignment gap resolution	1	um	
upgradable to 8" (9x9)	yes		
upgradable for assisted video alignment	yes		
upgradable for bond alignment	yes		
Anti vibration table	yes		
Conformity	CE mark		
Availability of spare parts	> 10	years	
Warranty	1	year	
Shipment and installation (except for hook up)	included		

4.2 Summary table of evaluable features

The compliance of the equipment to the technical specification assessable as improvements must be evident in the documentation ([paragraph 3.3](#)).

Summary Evaluable Features (quantitative evaluation)			
Item	Parameter	Evaluation system	Max points
Configuration			
A.1	Reference for automatic wedge compensation on wafer exclusion zone	If the parameter is absent = 0 If the parameter is present = max points	5
A.2	Active vibration isolation system and machine base frame configuration for improved alignment performance	If the parameter is absent = 0 If the parameter is present = max points	18
A.3	Additional chuck and mask holder for smaller substrates	If the parameter is absent = 0 If the parameter is present = max points	8
A.4	Additional microscope objectives	If the parameter is absent = 0 If the parameter is present = max points	6
A.5	Software for assisted video alignment	If the parameter is absent = 0 If the parameter is present = max points	3
A.6	405nm h-line bandwidth filter assembly	If the parameter is absent = 0 If the parameter is present = max points	6
Condition			
B.1	Consumable spare parts kit for yearly ordinary maintenance	If the parameter is absent = 0 If the parameter is present = max points	6
B.2	One extra year warranty	If the parameter is absent = 0 If the parameter is present = max points	8
MAX TECHNICAL POINTS			60