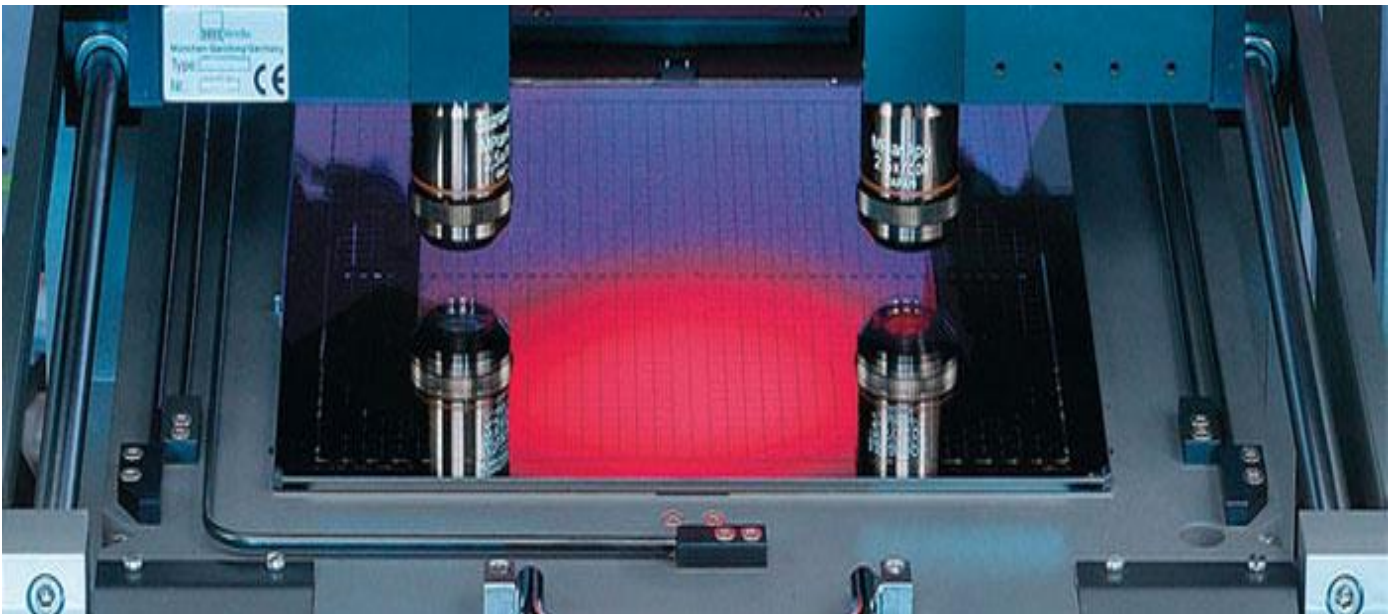


## Semiconductor, MEMS / NEMS Laboratory

### Mask Services

#### Overview

February 2014



### **PLUS FOUR MASK SERVICES**

Complementary to our equipment supply and related services in the field of semiconductor, MEMS / NEMS production and R&D, we provide a variety of *mask services*.

Besides mask making, in some cases it is reasonable to use our additional services.

All our standard mask- and optional services are based on specific requirements on all type of mask aligners currently offered and used on the worldwide market. Our portfolio is frequently tested and updated using market leading equipment.

#### *Our Mask Services – Overview*

Material:	Foil, Soda-Lime, Quartz, other materials up on customer specification
Absorber Material:	High resolution print on foil, chrome, iron oxide
Optical Mask Size:	9 inch – writing area 8 inch 7 inch – writing area 6 inch 5 inch – writing area 4 inch
Shadow Mask Size:	8 inch, 6 inch, 4 inch
File Format:	dxf, cif or gds2
Standard Services:	Printing of customer design on foil mask material Transfer of customer design on Soda-Lime and or Quartz based mask Fabrication of shadow mask
Optional Services:	Template Check, Design Check, Re-Design, Full Design

Mask Quality:

Category	Min feature size [µm]	CD tolerance [µm]	Defect density [per cm <sup>2</sup> ] in combination of defect size [µm]
7.1	10	±1	0,2 – 5
7.2	5	±0,5	0,2 – 3
7.3	2,5	±0,25	0,2 – 2
7.4	1	±0,1	0,2 – 1

*How to select mask material?*

The mask material depends on the requirements and the process. In the table below you find decision guidance.

		Sodalime	Quartz	Flexible Mask
<i>Material</i>	Optical properties	++	+++	+
	Surface properties, CTE	++	+++	-
	Chemical inertness for cleaning	+	+	--
<i>Functionalization</i>	Coating, available ARC	+++	+++	---
<i>Manufacturing</i>	Quality	++	+++	--
	Price	++	-	+++
<i>User Advantages</i>	Shelf life	++	++	-
	Reproducibility	++	+++	-
<i>Conclusion</i>		Multiples processing on reliable quality	For durable process on high level	For testing Less quality requirements Big structures

*Which type of service do You need?*

Our experts provide a broad range, see below and make your decision.

➤ **Template Check**

The customer sends the mask file in .dxf, .cif or .gds2 and selects the mask type and quality. After confirmation of the control plot, the mask will be fabricated within approx..two weeks can be shipped. Express delivery is possible.

➤ **Design Check**

The customer will send the design and a Specification of the planned process. The layout will be checked on structure defects and process-suited design. A failure list will be provided which includes position of defect in layout, type of defect and remark if needed. After rework and customer's final approval of the control plot, the mask will be sent for writing.

➤ **Re-Design or Full Design**

In collaboration with the customer, the design will be made and divided in different layers depending on the planned process flow. Also the alignment marks of the customer will be added. The design can be supplied as a .dxf, .cif or .gds2 mask file. After customer's final approval of the design, the mask will be fabricated.

**Test mask, Litho FAT, Masks for all processes like dry etching, etc. (34.177)**

**Chrome Mask - Highresolution masks:**

Item	Qty	Specification	Cat. No.
001	1	Cr-Mask	PF-SL125
002	1	Cr-Mask	PF-SL175
004	1	Cr-Mask	PF-SL225

**Flexible mask - film emulsion masks:**

Item	Qty	Specification	Cat. No.
006	1	F-Mask	PF-me-1012
007	1	F-Mask	PF-lo-1012
008	1	F-Mask	PF-hi-1012

**Basic package for photomasks relevant for customer process (34.189)**

Item	Qty	Specification	Substrate	Cat. No.
098	1	Photomasks 5x5 inch Master	100 mm	PF-ML125
099	1	Photomasks 7x7 inch Master	150 mm	PF-ML 175
100	1	Photomasks 9x9 inch Master	200 mm	PF-ML 225

**PLUS FOUR DISCLAIMER OF WARRANTY**

All information given in this brochure have been added to the best of our knowledge. However, we cannot issue any guarantee concerning the accuracy of the information.  
 We assume no liability for any hazard for staff, equipment, the processed devices or any environmental damages which might stem from the information given in this brochure. In order to minimize any risk to man or equipment, it is in the responsibility of every person working in the laboratory or production environment to inform herself / himself about the processes to be performed in the appropriate (technical) literature.