

## G03F

**PHOTOMECHANICAL PRODUCTION OF TEXTURED OR PATTERNED SURFACES, e.g. FOR PRINTING, FOR PROCESSING OF SEMICONDUCTOR DEVICES; MATERIALS THEREFOR; ORIGINALS THEREFOR; APPARATUS SPECIALLY ADAPTED THEREFOR; (phototypographic composing devices [B41B](#); photosensitive materials or processes for photographic purposes [G03C](#); electrophotography, sensitive layers or processes therefor [G03G](#))**

### Definition statement

*This place covers:*

Photolithographic materials, processing these materials for producing textured or patterned surfaces, and apparatus for processing these materials.

### References

#### Limiting references

*This place does not cover:*

Phototypographic composing devices	<a href="#">B41B</a>
Apparatus or arrangements for taking, projecting or viewing photographs	<a href="#">G03B</a>
Photosensitive materials or processes for photographic purposes	<a href="#">G03C</a>
Electrophotography, sensitive layers or processes thereof	<a href="#">G03G</a>
Holographic processes and apparatus	<a href="#">G03H</a>
Reproduction of pictures or patterns by scanning and converting into electrical signals	<a href="#">H04N</a>

### Special rules of classification

The following IPC groups are not used in the internal ECLA classification system. Subject-matter covered by these groups is classified in the following ECLA groups:

**G03F3/08** covered by [H04N 1/46](#)

**G03F7/207** " [G03F 7/20](#)

**G03F7/23** " [G03F 7/22](#)

**G03F9/02** " [G03F 9/00](#)

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Photosensitive	Sensitive to electromagnetic radiation but also to corpuscular radiation
Photosensitive compositions	Photosensitive substances, e.g. quinonediazides, and, if applicable, binders or additives
Photosensitive materials	Photosensitive compositions, e.g. photoresists, the bases carrying them and, if applicable, auxiliary layers

## G03F 1/00

**Originals for photomechanical production of textured or patterned surfaces, e.g., masks, photo-masks, reticles; Mask blanks or pellicles therefor; Containers specially adapted therefor; Preparation thereof**

### Definition statement

*This place covers:*

Products modifying the pattern of radiation being transmitted through or reflected by said products (e.g. masks, photomasks, reticles), substrates therefor, auxiliary features (e.g. pellicles or auxiliary structures), process for their preparation, control and repair, containers for storage and/or transport of said products.

### References

#### Limiting references

*This place does not cover:*

Masking layers which are integral part of a photosensitive element and photosensitive as such	<a href="#">G03F 7/095</a>
Masking layers which are integral part of a photosensitive element provided they are not photosensitive as such	<a href="#">G03F 7/20</a>
Addressable masks, e.g. transmissive liquid crystal arrays or micromirror devices	<a href="#">G03F 7/20</a> , <a href="#">G02F 1/1335</a> , <a href="#">G02B 26/08</a>
Masks for photoablative processes	<a href="#">B23K 26/00</a>
Deposition masks	<a href="#">C23C 14/00</a>
Aperture plates for light beam shaping, e.g. diaphragms	<a href="#">G03B</a> , <a href="#">G02B</a>
Holographic devices to modify light pattern	<a href="#">G03H 1/00</a>
Shadow mask for CRT	<a href="#">H01J 29/00</a>
Shaping beams in charged particle lithography	<a href="#">H01J 37/317</a>
Etch masks in semiconductor manufacturing	<a href="#">H01L 21/027</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Stencil masks	<a href="#">B41N 1/00</a> , <a href="#">B24C 1/00</a> , <a href="#">H01J 37/00</a>
Transparent substrates	<a href="#">C03B</a> , <a href="#">C03C</a>
Phase plates (phase retarding optical elements)	<a href="#">G02B 5/00</a>
Mirrors, particularly UV and EUV	<a href="#">G02B 5/00</a> , <a href="#">G21K 1/00</a>
Phase masks for gratings	<a href="#">G02B 6/02</a>
Photographic masks, negatives	<a href="#">G03C</a>
Mask or circuit layout	<a href="#">G06F 17/50</a>
Inspection of patterns and materials	<a href="#">G06T</a> , <a href="#">G02N</a>
Membranes for X-Ray windows	<a href="#">H01J 33/00</a>

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Mask or photomask	Normally refers to 1:1 reproduction
Reticle	Normally involves (de)magnification - the terms mask and reticle are however often considered synonyms.
Pellicle	Protective cover placed at a distance from the surface of a reticle.
EUV (extreme ultra-violet)	Electromagnetic radiation in the 5-15 nm range (typically 13.4 nm)
SCALPEL	Scattering with angular limitation in projection electron beam lithography (characterized by the use of a membrane mask rather than a stencil mask)
PSM	Phase-shifting mask
AttPSM	Attenuated phase-shifting mask, aka half-tone PSM
AltPSM	Alternating phase-shifting mask, aka Levenson-Shibuya mask
Phase edge PSM	No absorber between phase shifting areas
OPC	Optical proximity correction
PPC	Process proximity correction

## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "mask", "photomask", "reticle" and "reticule"
- "AttPSM", "Half-tone PSM" and "Leaky chrome PSM"
- "Grey level" and "Half-tone"

## G03F 1/003

{the masking pattern being obtained by thermal means, e.g. by laser ablation (thermal transfer from a ribbon, e.g. [G03F 1/0023](#))}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Thermal transfer from a ribbon	<a href="#">G03F 1/0023</a>
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## G03F 1/0053

{Hybrid phase shift masks, i.e. combining plural types of phase-shifting pattern in a single common pattern}

## Definition statement

This place covers:

Hybrid masks combining a binary pattern with a phase-shifting pattern are only classified in the group corresponding to the phase shifting aspect, the binary pattern being considered a trivial feature in this context.

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Hybrid	The combination of plural types of phase-shifting pattern in a single common pattern; a mere structural, e.g. geometrical, association of masks with separate patterns is not considered hybrid
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## G03F 1/08

{Originals having inorganic imaging layers, e.g. chrome masks ([G03F 1/12](#) takes precedence; X-Ray absorbers [G03F 1/148](#))}

### References

#### Limiting references

This place does not cover:

Originals obtained by exposing silver halide-containing photosensitive materials	<a href="#">G03F 1/12</a>
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#### Informative references

Attention is drawn to the following places, which may be of interest for search:

X-Ray absorbers	<a href="#">G03F 1/148</a>
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## G03F 1/144

{Auxiliary patterns; Corrected patterns, e.g. proximity correction, grey level masks ([G03F 1/0046](#), [G03F 1/146](#), [G03F 9/00](#) take precedence)}

### References

#### Limiting references

This place does not cover:

Phase shift masks	<a href="#">G03F 1/0046</a>
Originals for X-Ray exposures, X-Ray masks	<a href="#">G03F 1/146</a>
Registration and positioning of masks	<a href="#">G03F 9/00</a>

## G03F 3/00

Colour separation; Correction of tonal value (photographic copying apparatus in general [G03B](#))

### Definition statement

This place covers:

Non numerical rendition of colours; non numerical colour proofing.

## References

### Limiting references

*This place does not cover:*

Producing decorative effects (e.g. by transfer pictures, decalcomanias, by pressing or stamping ornamental designs on surfaces)	<a href="#">B44C</a>
General purpose image data processing (e.g. numerical colour conversion)	<a href="#">G06T 1/00</a>
Numerical treatment of images	<a href="#">H04N 1/00</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Duplicating or marking methods; sheet materials for use therein	<a href="#">B41M 5/00</a>
Photographic copying apparatus in general	<a href="#">G03B</a>

## G03F 5/00

**Screening processes; Screens therefor {(plates or light sensitive layers with incorporated screen [G03F 7/004](#)}}**

### Definition statement

*This place covers:*

Creation of half-tone patterns from continuous tone images using photolithographic / photomechanical processes.

## References

### Limiting references

*This place does not cover:*

Plates or light sensitive layers with incorporated screen	<a href="#">G03F 7/004</a>
Screen printers, printing screens and processes in general	<a href="#">B41F 15/00</a> , <a href="#">G03F 7/12</a>
Photolith films, i.e. high contrast AgX photographic materials	<a href="#">G03C</a>
Digital treatment of continuous tone images in order to transform them into half-tone patterns	<a href="#">H04N 1/00</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Cameras	<a href="#">G03B</a>
Image treatment	<a href="#">G06T</a>

## G03F 7/00

**Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printing surfaces; Materials therefor, e.g. comprising photoresists; Apparatus specially adapted therefor (using photoresist structures for special production processes, see the relevant places, e.g. [B44C](#), [H01L](#), e.g. [H01L 21/00](#), [H05K](#))**

### Definition statement

*This place covers:*

Photolithographic production of textured or patterned surfaces, e.g. printing surfaces; materials therefor, e.g. comprising photoresists; apparatus specially adapted therefor (using photoresist structures for special production processes, see the relevant places, e.g. [B44C](#), [H01L](#), e.g. [H01L 21/00](#), [H05K](#)); imprint lithography.

### References

#### Limiting references

*This place does not cover:*

Structuring a surface by laser beam	<a href="#">B23K 26/00</a>
Stereolithographic processes and apparatus	<a href="#">B29C</a>
Printing plate preparation (e.g. by laser engraving)	<a href="#">B41C 1/00</a>
Duplicating or marking methods; Sheet materials for use therein (e.g. inkjet printing, ablative recording, thermography)	<a href="#">B41M 5/00</a>
Preparing for use and conserving printing surfaces (e.g. chemical or electrical treatment of aluminum support)	<a href="#">B41N 3/00</a>
Producing decorative effects (e.g. by transfer pictures, decalcomanias, by pressing or stamping ornamental designs on surfaces)	<a href="#">B44C</a>
Investigating or analyzing materials by use of optical means (e.g. pattern inspection)	<a href="#">G01N 21/00</a>
Apparatus for photographic purposes	<a href="#">G03B</a>
Photosensitive materials for photographic purposes (mainly silver halide containing system)	<a href="#">G03C</a>
Electrography, electrophotography, magnetography	<a href="#">G03G</a>
Holographic processes and apparatus using light	<a href="#">G03H 1/00</a>
General purpose image data processing (e.g. numerical colour conversion)	<a href="#">G06T 1/00</a>
Lithographic apparatus using electron beam	<a href="#">H01J 37/00</a>
Process or apparatus adapted for the manufacture or treatment of semiconductors (except for coating, exposure and development of photoresist)	<a href="#">H01L 21/00</a>
Numerical treatment of images	<a href="#">H04N 1/00</a>
Printed circuit boards	<a href="#">H05K</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Process for applying liquids	<a href="#">B05D 1/00</a>
Lithographic printing form preparation using heat	<a href="#">B41C 1/00</a> , <a href="#">B41M 5/00</a>
Printing form preparation by laser engraving	<a href="#">B41C 1/05</a>
Infrared sensitive printing plate	<a href="#">B41C 1/10</a> , <a href="#">B41M 5/40</a>
Inkjet printers, thermal printers	<a href="#">B41J</a>
Nanostructures	<a href="#">B82Y 30/00</a>
Inorganic glasses	<a href="#">C03C 3/00</a>
Polymerization processes using a photoinitiator system	<a href="#">C08F 2/50</a>
Addition polymers or copolymers, ethylenic monomers	<a href="#">C08F 220/00</a>
Condensation polymers of aldehydes or ketones with phenols only, e.g. novolak resins	<a href="#">C08G 8/00</a>
Polystyrenes	<a href="#">C08L 25/06</a>
Homopolymers or copolymers of compounds having one or more unsaturated aliphatic radicals, each having only one carbon-to-carbon double bond, and only one being terminated by only one carboxyl radical, or of salts, anhydrides, esters, amides, imides or nitriles thereof	<a href="#">C08L 33/00</a>
Epoxide compounds, epoxy resins	<a href="#">C08L 63/00</a>
Polyesters	<a href="#">C08L 67/00</a>
Polyurethanes	<a href="#">C08L 75/04</a>
Polyamides	<a href="#">C08L 77/00</a>
Polyimides	<a href="#">C08L 79/08</a>
Polysiloxanes	<a href="#">C08L 83/04</a>
Organic dyes / pigments	<a href="#">C09B</a>
Curable inks	<a href="#">C09D 11/10</a>
Adhesives	<a href="#">C09J</a>
Detergent compositions	<a href="#">C11D 1/00</a> , <a href="#">C11D 3/00</a>
Biological test and sensors	<a href="#">G01N 33/00</a>
Optical fibres, mirrors, lenses	<a href="#">G02B</a>
Colour filters (structures):	<a href="#">G02B 5/20</a>
Liquid crystal display	<a href="#">G02F 1/00</a>
Recording or reproducing by optical means, by modifying optical properties or the physical structure (holographic medium, optical disks, compact disks or CD, digital versatile disks or DVD)	<a href="#">G11B 7/00</a>
Cathode ray tubes, electron or ion beam tubes	<a href="#">H01J 31/00</a> , <a href="#">H01J 29/00</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Photolithography	(1) Printing: Lithography in which the image is photographically transferred to the printing surface; esp. a planographic printing process using plates prepared from photographic negatives, usually printed by offset methods. (2) Electronics: A photoetching process in which a photomask is used in transferring the pattern to the photoresist, used esp. in the making of integrated circuits.
Radiation	Energy radiated in the form of electromagnetic waves or particles
Photoresist	Radiation-sensitive material, whose solubility is altered by exposure to radiation.
Negative-tone resist	The resist film beneath the clear areas of the photomask undergoes a chemical change that renders it insoluble in the developing solution.
Positive tone resist	The resist film beneath the clear areas of the photomask undergoes a chemical change that renders it soluble in the developing solution.
Imprint Lithography	A technique that creates patterns by mechanical deformation of imprint resist and subsequent processes.

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used with the meaning indicated:*

ARC	Antireflective coating
BARC	Bottom antireflective coating
CAR	Chemically amplified resist
DUV	Deep UV (248 nm)
EUV	Soft X-ray (13 nm)
Flexographic plate	Relief or intaglio printing plate
I-line	365 nm
LCD	Liquid crystal display
LIGA	Lithography Electroplating Molding
LER	Line edge roughness
Lithographic printing plate	Planographic printing plate or offset printing plate
PAG	Photoacid generator
PAC	Photoactive compound
PEB	Post exposure bake
Photomask	Optical mask
Relief Printing	Letterpress, flexography
Resin	Polymeric compound
Serigraphy	Screen printing



## G03F 7/0002

{Lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping}

### Definition statement

*This place covers:*

Micro- and nanostructuring of surfaces based on transfer printing and imprinting processes, specially adapted as alternatives for photolithographic processes. It also includes use of cantilevers for depositing, mechanically removing or displacing material for the same purpose.

### References

#### Limiting references

*This place does not cover:*

Patterning of substrates with cantilevers, based on electrically induced processes	<a href="#">G03F 7/20</a>
Patternwise deposition of biomolecules	<a href="#">A61K 9/00</a> , <a href="#">B01J</a> , <a href="#">B01L/00</a>
Handling of individual nanostructures, atoms or molecular structures using cantilevers	<a href="#">B82B</a>
Embossing processes for optical data carriers (CD, DVD)	<a href="#">G11B 7/00</a>
Cantilevers or micropoint sources in e-beam lithography	<a href="#">H01J 37/00</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Embossing in general	<a href="#">B29C</a>
Printing processes for forming pattern structures of organic semiconductive material	<a href="#">H01L 51/0004</a>

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

SFIL	Step and Flash Imprint Lithography
NIL	Nanoimprint lithography
Dip-Pen nanolithography, aka DPN	Deposition from cantilever using fluid transfer

## G03F 7/0007

{Filters, e.g. additive colour filters; Components for display devices}

### Definition statement

*This place covers:*

Radiation-sensitive compositions for colour filters, black matrix, etc, and processes

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Colour filters (structures)	<a href="#">G02B 5/20</a>
Liquid crystal displays	<a href="#">G02F 1/00</a>

## G03F 7/001

{Phase modulating patterns, e.g. refractive index patterns}

### Definition statement

*This place covers:*

Radiation-sensitive compositions for holographic applications, and processes.

### References

#### Limiting references

*This place does not cover:*

Holographic processes and apparatus using light	<a href="#">G03H 1/00</a>
Recording or reproducing by optical means, by modifying optical properties or the physical structure (holographic medium, optical disks, compact disks or CD, digital versatile disks or DVD)	<a href="#">G11B 7/00</a>

## G03F 7/0037

{Production of three-dimensional images}

### Definition statement

*This place covers:*

Radiation-sensitive compositions for stereolithographic applications and processes.

## G03F 7/004

Photosensitive materials ([G03F 7/12](#), [G03F 7/14](#) take precedence)

### References

#### Limiting references

*This place does not cover:*

Production of screen printing forms or similar printing forms, e.g. stencils	<a href="#">G03F 7/12</a>
Production of collotype printing forms	<a href="#">G03F 7/14</a>

**G03F 7/0041**

{providing an etching agent upon exposure ([G03F 7/075](#) takes precedence; photolytic halogen compounds [G03F 7/0295](#))}

**References****Limiting references**

*This place does not cover:*

Photolytic halogen compounds	<a href="#">G03F 7/0295</a>
Silicon-containing compounds	<a href="#">G03F 7/075</a>

**G03F 7/0042**

{with inorganic or organometallic light-sensitive compounds not otherwise provided for, e.g. inorganic resists ([G03F 7/075](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/0043**

{Chalcogenides; Silicon, germanium, arsenic or derivatives thereof; Metals, oxides or alloys thereof ([G03F 7/0044](#) takes precedence)}

**Definition statement**

*This place covers:*

e.g. use of metal alkoxide compounds (sol-gel technology) in photosensitive materials.

**References****Limiting references**

*This place does not cover:*

Organometallic compounds involving an interaction between the metallic and non-metallic component, e.g. photodope systems	<a href="#">G03F 7/0044</a>
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**G03F 7/0045**

{with organic non-macromolecular light-sensitive compounds not otherwise provided for, e.g. dissolution inhibitors}

**Definition statement**

*This place covers:*

Photoacid generating compounds, photobase generating compounds; acid diffusion inhibiting compounds (i.e. quencher).

## References

### Limiting references

*This place does not cover:*

Diazonium compounds	<a href="#">G03F 7/016</a> , <a href="#">G03F 7/021</a>
Diazoquinone compounds	<a href="#">G03F 7/022</a> , <a href="#">G03F 7/023</a>

## G03F 7/0046

{with perfluoro compounds, e.g. for dry lithography ([G03F 7/0048](#) takes precedence)}

### Definition statement

*This place covers:*

Radiation-sensitive compositions containing fluorine-containing compounds in general

## References

### Limiting references

*This place does not cover:*

Photosensitive materials characterized by the solvents or agents facilitating spreading, e.g. surfactants	<a href="#">G03F 7/0048</a>
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## G03F 7/0047

{characterised by additives for obtaining a metallic or ceramic pattern, e.g. by firing}

### Definition statement

*This place covers:*

Radiation-sensitive compositions containing inorganic microparticles as additives.

## G03F 7/008

Azides ([G03F 7/075](#) takes precedence)

## References

### Limiting references

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/012**

**Macromolecular azides; Macromolecular additives, e.g. binders** {([G03F 7/0085](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Non-macromolecular azides characterized by the non-macromolecular additives	<a href="#">G03F 7/0085</a>
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**G03F 7/016**

**Diazonium salts or compounds** ([G03F 7/075](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/021**

**Macromolecular diazonium compounds; Macromolecular additives, e.g. binders** {([G03F 7/0166](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Non-macromolecular diazonium salts characterised by the non-macromolecular additive	<a href="#">G03F 7/0166</a>
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**G03F 7/022**

**Quinonediazides** ([G03F 7/075](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/023**

**Macromolecular quinonediazides; Macromolecular additives, e.g. binders**  
 {(G03F 7/0226 takes precedence)}

**References****Limiting references**

*This place does not cover:*

Quinonediazides characterised by the non-macromolecular additives	<a href="#">G03F 7/0226</a>
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**G03F 7/0236**

**{Condensation products of carbonyl compounds and phenolic compounds, e.g. novolak resins}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Condensation polymers of aldehydes or ketones with phenols only, e.g. novolak resins	<a href="#">G03F 7/0236</a>
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**G03F 7/025**

**Non-macromolecular photopolymerisable compounds having carbon-to-carbon triple bonds, e.g. acetylenic compounds (G03F 7/075 takes precedence)**

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/027**

**Non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, e.g. ethylenic compounds (G03F 7/075 takes precedence)**

**Definition statement**

*This place covers:*

Radiation-sensitive composition containing an addition polymerizable monomer having at least one ethylenically unsaturated double bond such as an acrylate or a methacrylate compound

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Macromolecular compounds obtained by reactions involving carbon-to carbon unsaturated bonds	<a href="#">C08F 220/00</a>
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**G03F 7/029**

**Inorganic compounds; Onium compounds; Organic compounds having hetero atoms other than oxygen, nitrogen or sulfur**

**Definition statement**

*This place covers:*

Inorganic photoinitiators or photosensitizers; Photoinitiators or photosensitizers containing other elements than carbon, hydrogen, oxygen, nitrogen and sulfur

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Polymerization processes using a photoinitiator system	<a href="#">C08F 2/50</a>
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**G03F 7/031**

**Organic compounds not covered by group [G03F 7/029](#)**

**Definition statement**

*This place covers:*

Photoinitiators or photosensitizers containing the following elements only: carbon, hydrogen, oxygen, nitrogen and sulfur.

**References****Limiting references**

*This place does not cover:*

Organic compound having hetero atoms other than oxygen, nitrogen or sulfur	<a href="#">G03F 7/029</a>
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**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Polymerization processes using a photoinitiator system	<a href="#">C08F 2/50</a>
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**G03F 7/033**

the binders being polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, e.g. vinyl polymers

**Definition statement**

*This place covers:*

Addition polymers as binders.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Addition polymers or copolymers	<a href="#">C08F 220/00</a>
Polystyrenes	<a href="#">C08L 25/06</a>
Compositions of homopolymers or copolymers of compounds having one or more unsaturated aliphatic radicals, each having only one carbon-to-carbon double bond, and only one being terminated by only one carboxyl radical, or of salts, anhydrides, esters, amides, imides or nitriles thereof	<a href="#">C08L 33/00</a>

**G03F 7/035**

the binders being polyurethanes

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Polyurethanes	<a href="#">C08L 75/04</a>
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**G03F 7/037**

the binders being polyamides or polyimides

**Definition statement**

*This place covers:*

e.g. polyamic acid, polybenzoxazoles, etc.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Polyamides	<a href="#">C08L 77/00</a>
Polyimides	<a href="#">C08L 79/08</a>



**G03F 7/038**

**Macromolecular compounds which are rendered insoluble or differentially wettable ([G03F 7/075](#) takes precedence; macromolecular azides [G03F 7/012](#); macromolecular diazonium compounds [G03F 7/021](#))**

**Definition statement**

*This place covers:*

Macromolecular photopolymerizable compounds; Non-macromolecular crosslinkable epoxy compounds are also classified in this subgroup.

**References****Limiting references**

*This place does not cover:*

Macromolecular azide compounds	<a href="#">G03F 7/012</a>
Macromolecular diazonium compounds	<a href="#">G03F 7/021</a>
The macromolecular compound being present in a chemically amplified negative photoresist composition	<a href="#">G03F 7/0382</a>
Epoxidized novolak resins	<a href="#">G03F 7/0385</a>
Silicon-containing compounds	<a href="#">G03F 7/075</a>

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Epoxide compounds, epoxy resins	<a href="#">C08L 63/00</a>
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**G03F 7/0385**

**{using epoxydisednovolak resin}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Epoxy resins	<a href="#">C08L 63/00</a>
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**G03F 7/0387**

**{Polyamides or polyimides}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Polyamides	<a href="#">C08L 77/00</a>
Polyimides	<a href="#">C08L 79/08</a>

**G03F 7/039**

Macromolecular compounds which are photodegradable, e.g. positive electron resists ([G03F 7/075](#) takes precedence; macromolecular quinonediazides [G03F 7/023](#))

**Definition statement**

*This place covers:*

Macromolecular and non-macromolecular photodegradable compounds.

**References****Limiting references**

*This place does not cover:*

Macromolecular quinonediazides	<a href="#">G03F 7/023</a>
The macromolecular compound being present in a chemically amplified positive photoresist composition	<a href="#">G03F 7/0392</a>
Silicon-containing compounds	<a href="#">G03F 7/075</a>

**G03F 7/04**

Chromates ([G03F 7/075](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/06**

Silver salts ([G03F 7/075](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/07**

used for diffusion transfer {(G03F 7/063 takes precedence)}

**References****Limiting references**

*This place does not cover:*

Additives in silver salts systems; additives or means to improve the lithographic properties; processing solutions characterised by such additives; treatment after development or transfer, e.g. finishing, washing; correction or deletion fluids	<a href="#">G03F 7/063</a>
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**G03F 7/0754**

{Non-macromolecular compounds containing silicon-to-silicon bonds (G03F 7/0752 takes precedence)}

**Definition statement**

*This place covers:*

Macromolecular compounds containing silicon-to-silicon bonds are also classified in this subgroup.

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds in non photosensitive layers or as additives	<a href="#">G03F 7/0752</a>
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**G03F 7/0755**

{Non-macromolecular compounds containing Si-O, Si-C or Si-N bonds (G03F 7/0752 takes precedence)}

**References****Limiting references**

*This place does not cover:*

Silicon-containing compounds in non photosensitive layers or as additives	<a href="#">G03F 7/0752</a>
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**G03F 7/0757**

{Macromolecular compounds containing Si-O, Si-C or Si-N bonds (G03F 7/0752 takes precedence)}

**Definition statement**

*This place covers:*

Polymerized siloxanes or polysiloxanes (silicones), polysilazanes, etc.

## References

### Limiting references

*This place does not cover:*

Silicon-containing compounds in non photosensitive layers or as additives	<a href="#">G03F 7/0752</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Polysiloxanes	<a href="#">C08L 83/04</a>
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## G03F 7/085

**Photosensitive compositions characterised by adhesion-promoting non-macromolecular additives ([G03F 7/075](#) takes precedence)**

### Definition statement

*This place covers:*

Adhesion-promoting macromolecular additives are also classified in this subgroup

## References

### Limiting references

*This place does not cover:*

Silicon-containing compounds used as adhesion-promoting additives	<a href="#">G03F 7/0751</a>
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## G03F 7/09

**characterised by structural details, e.g. supports, auxiliary layers (supports for printing plates in general [B41N](#))**

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Supports for printing plates in general	<a href="#">B41N</a>
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## G03F 7/091

**{characterised by antireflection means or light filtering or absorbing means, e.g. anti-halation, contrast enhancement}**

### Definition statement

*This place covers:*

Antireflective compositions for bottom antireflective coating, top antireflective coating, etc.

**G03F 7/095**

having more than one photosensitive layer ([G03F 7/075](#) takes precedence)

**Definition statement**

*This place covers:*

Versatile radiation-sensitive compositions (i.e. positive-negative tone) are also classified in this subgroup.

**References****Limiting references**

*This place does not cover:*

Photosensitive layers containing silicon-containing compounds	<a href="#">G03F 7/075</a>
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**G03F 7/11**

having cover layers or intermediate layers, e.g. subbing layers  
{([G03F 7/091](#) - [G03F 7/093](#), [B41N 3/03](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

Antireflective coatings	<a href="#">G03F 7/091</a>
Electroconductive coatings	<a href="#">G03F 7/093</a>
Preparing for use and conserving printing surfaces	<a href="#">B41N 3/03</a>

**G03F 7/16**

Coating processes; Apparatus therefor (applying coatings to base materials in general [B05](#); applying photosensitive compositions to base for photographic purposes [G03C 1/74](#))

**Definition statement**

*This place covers:*

Processes for coating a substrate. Specific treatments of the substrate before coating are also classified in this subgroup.

**References****Limiting references**

*This place does not cover:*

Applying coatings to base materials in general	<a href="#">B05D</a>
Preparing for use and conserving printing surfaces	<a href="#">B41N 3/00</a>
Applying photosensitive compositions to base for photographic purposes	<a href="#">G03C 1/74</a>

**G03F 7/167**

{from the gas phase, by plasma deposition ([G03F 7/2035](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Simultaneous coating and exposure	<a href="#">G03F 7/2035</a>
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**G03F 7/168**

{Finishing the coated layer, e.g. drying, baking, soaking}

**Definition statement**

*This place covers:*

Edge bead removal is also classified in this subgroup.

**G03F 7/20**

**Exposure; Apparatus therefor (photographic printing apparatus for making copies [G03B 27/00](#))**

**References****Limiting references**

*This place does not cover:*

Photographic printing apparatus for making copies	<a href="#">G03B 27/00</a>
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**G03F 7/2041**

{in the presence of a fluid, e.g. immersion; using fluid cooling means}

**Definition statement**

*This place covers:*

Radiation-sensitive composition for immersion lithography, fluids used in immersion lithography.

**G03F 7/2049**

{using a cantilever}

**Definition statement**

*This place covers:*

e.g. Atomic force microscopy, scanning tunnel exposure techniques.

**G03F 7/2051**

{Exposure without an original mask, e.g. using a programmed deflection of a point source, by scanning, by drawing with a light beam, using an addressed light or corpuscular source ([G03F 7/70](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Apparatus for microlithography	<a href="#">G03F 2007/2067</a>
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**G03F 7/2053**

{using a laser (ablative removal [B41C](#))}

**Definition statement**

*This place covers:*

Multiphoton lithography is classified in this subgroup

**References****Limiting references**

*This place does not cover:*

Ablative removal of materials	<a href="#">B41C</a>
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**G03F 2007/2067**

{Apparatus for microlithography}

**Definition statement**

*This place covers:*

Apparatus using light for transferring patterns to a photosensitive material, the patterns having features in the micrometer range or smaller.

**Relationships with other classification places**

Components of the microlithographic apparatus covered by specific subclasses (e.g. laser light sources, masks, interferometers, encoders etc.):

- if relevant for the microlithographic apparatus (e.g. through their particular interaction with other components of the apparatus) are also classified in [G03F 2007/2067](#);
- if relevant only per se are generally not classified in [G03F 2007/2067](#), but in their specific group (see table below).

Fluid bearings	<a href="#">F16C 32/06</a>
Interferometers	<a href="#">G01B 9/02</a>
Encoders	<a href="#">G01D 5/00</a>
Tools for optical wafer pattern monitoring	<a href="#">G01B 11/02</a> , <a href="#">G01B 9/04</a>

Mounts for optical elements	<a href="#">G02B 7/00</a>
Optical design aspect details of projection optical systems	<a href="#">G02B 13/00</a> , <a href="#">G02B 17/00</a>
Optical devices or arrangements using movable or deformable optical elements for controlling the intensity, colour, phase, polarisation or direction of light, e.g. addressable masks	<a href="#">G02B 26/00</a>
Masks, tools for mask inspection	<a href="#">G03F 1/00</a>
Alignment scopes	<a href="#">G03F 9/00</a>
Tools for defect inspection	<a href="#">G06T 7/0004</a> , <a href="#">G01N 21/956</a>
Discharge lamps	<a href="#">H01J 61/00</a>
Lasers	<a href="#">H01S 3/00</a>
Semiconductor lasers	<a href="#">H01S 5/00</a>
Laser plasma sources	<a href="#">H05G 2/00</a>
HOLDERS for wafer processing apparatus	<a href="#">H01L 21/683</a> , <a href="#">H01L 21/687</a>
Wafer stages for workpiece processing apparatus	<a href="#">H01L 21/682</a>
Load-lock chambers for wafer processing apparatus	<b>H01L21/00S2Z9</b>
Motors (e.g. linear)	<a href="#">H02K 41/00</a>

## References

### Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Apparatus for processing a wafer in a plurality of work-stations including at least one lithography station	<b>H01L21/00S2Z10L</b>
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### Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning methods involving radiation or fluid flow	<a href="#">B08B 7/00</a> , <a href="#">B08B 5/00</a>
Temperature control of mirrors	<a href="#">G02B 7/181</a>
Lamp housings for photographic printing apparatus	<a href="#">G03B 27/54</a>

Further, where appropriate, places relevant for search are indicated in the titles for the subgroups belonging to [G03F 2007/2067](#).

## Special rules of classification

When appropriate, subgroups should be combined when classifying a document (invention information and additional information):

Example: a document concerning a microlithographic apparatus comprising means for reducing vibrations when operating a deformable mirror of the projection optics should be classified in both **G03F7/20T16G2** (projection optical system comprising adaptive optics) and **G03F7/20T26G6** (vibration).



Example: a document concerns a wafer stage for a microlithographic apparatus. The embodiment merely mentions that the stage can also be applied to an immersion exposure apparatus. Since no special adaptations are made to the stage to make it suitable for immersion lithography, the document should only be classified in **G03F7/20T24F** (stage).

Subgroups [G03F 2007/2067](#) - **G03F7/20T26** will be transferred to [G03F 7/70](#) and subgroups thereof from 01/12/2011 onwards.

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

EUV	Extreme ultraviolet; electromagnetic radiation in the 5 - 15 nm range (typically 13.4 nm)
LED	Light-emitting diode
REMA	Reticle-masking; means for delimiting the illuminated field on the mask. Positioned in the vicinity of the mask or in a plane conjugate with the mask plane.
NA	Numerical aperture
LCD	Liquid crystal display
DMD	Digital micromirror device
FLEX	Focus latitude extended exposure; method for increasing depth of focus involving imaging the mask pattern at different positions in the optical axis direction
CCD	Charge-coupled device
CD	Critical dimension
SMIF	Standard mechanical interface

## G03F 7/213

**Exposing with the same light pattern different positions of the same surface at the same time** {([G03F 7/70](#) takes precedence)}

### References

#### Limiting references

*This place does not cover:*

Apparatus for microlithography	<a href="#">G03F 2007/2067</a>
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## G03F 7/22

**Exposing sequentially with the same light pattern different positions of the same surface** {([G03F 7/70](#) takes precedence)}

### References

#### Limiting references

*This place does not cover:*

Apparatus for microlithography	<a href="#">G03F 2007/2067</a>
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**G03F 7/24**

Curved surfaces {([G03F 7/70](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Apparatus for microlithography	<a href="#">G03F 2007/2067</a>
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**G03F 7/26**

Processing photosensitive materials; Apparatus therefor  
([G03F 7/12](#) - [G03F 7/24](#) take precedence)

**Definition statement**

*This place covers:*

Various techniques of purification of radiation-sensitive materials are also classified in this subgroup.

**References****Limiting references**

*This place does not cover:*

Coating processes, apparatus thereof	<a href="#">G03F 7/16</a>
Exposure, apparatus thereof	<a href="#">G03F 7/20</a> - <a href="#">G03F 7/24</a>

**G03F 7/265**

{Selective reaction with inorganic or organometallic reagents after image-wise exposure, e.g. silylation}

**Definition statement**

*This place covers:*

Selective reaction with a reagent taking place before development. Selective reactions with organic reagents are also classified in this subgroup.

**G03F 7/28**

for obtaining powder images ([G03F 3/10](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

Checking the colour or tonal value of separation negatives or positives, using tonable photoresist or photopolymerizable systems	<a href="#">G03F 3/103</a>
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**G03F 7/3035**

{from printing plates fixed on a cylinder or on a curved surface; from printing cylinders}

**Definition statement**

*This place covers:*

On press development is also included in this subgroup.

**G03F 7/32**

**Liquid compositions therefor, e.g. developers**

**References****Limiting references**

*This place does not cover:*

Gumming or finishing solutions for printing plates	<a href="#">B41N 3/08</a>
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**G03F 7/36**

**Imagewise removal not covered by groups [G03F 7/30](#) - [G03F 7/34](#), e.g. using gas streams, using plasma**

**Definition statement**

*This place covers:*

e.g. thermal development, development using gas streams, using plasma, photoembossing.

**References****Limiting references**

*This place does not cover:*

Imagewise removal using liquid means	<a href="#">G03F 7/30</a>
Imagewise removal by selective transfer, e.g. peeling away	<a href="#">G03F 7/34</a>
Etching (semiconductor technology)	<a href="#">H01L 21/00</a>

**G03F 7/38**

**Treatment before imagewise removal, e.g. prebaking {([G03F 7/265](#) takes precedence)}**

**Definition statement**

*This place covers:*

Treatments such as post exposure bake

## References

### Limiting references

*This place does not cover:*

Selective reaction with organic, inorganic or organometallic reagents before imagewise removal	<a href="#">G03F 7/265</a>
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## G03F 7/40

Treatment after imagewise removal, e.g. baking

### Definition statement

*This place covers:*

Treatments such as post-development bake, thermal flow, pattern profile improvement.

## G03F 7/405

{Treatment with inorganic or organometallic reagents after imagewise removal}

### Definition statement

*This place covers:*

Treatments with organic reagents after imagewise removal are also classified in this subgroup.

## G03F 7/42

Stripping or agents therefor

### Definition statement

*This place covers:*

Stripping involving the use of a combination of means, e.g. plasma and radiation.

## G03F 7/422

{using liquids only ([G03F 7/421](#) takes precedence)}

## References

### Limiting references

*This place does not cover:*

Using biological means only, e.g. enzymes	<a href="#">G03F 7/421</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Detergent compositions	<a href="#">C11D 1/00</a> , <a href="#">C11D 3/00</a>
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**G03F 7/423**

{containing mineral acids or salts thereof, containing mineral oxidizing substances, e.g. peroxy compounds}

**Definition statement**

*This place covers:*

Stripping agents containing organic oxidizing substances are also classified in this subgroup.

**G03F 7/426**

{containing organic halogen compounds; containing organic sulfonic acids or salts thereof; containing sulfoxides}

**Definition statement**

*This place covers:*

Stripping agents containing carboxylic acids or salts thereof are also classified in this subgroup.

**G03F 7/427**

{using plasma means only}

**Definition statement**

*This place covers:*

Stripping treatments using plasma, gaz or supercritical fluids.

**G03F 9/00**

Registration or positioning of originals, masks, frames, photographic sheets or textured or patterned surfaces, e.g. automatically ([G03F 7/22](#) takes precedence; preparation of photographic masks [G03F 1/00](#); within photographic printing apparatus for making copies [G03B 27/00](#))

**Definition statement**

*This place covers:*

Positioning and alignment of originals, i.e. mask or reticle with the target substrate to be exposed by actinic radiation. Positioning and alignment of a radiation beam with respect to the target in direct-write lithographic processes. Alignment marks on mask and target. Devices for carrying out the positioning and alignment.

**References****Limiting references**

*This place does not cover:*

Positioning in the preparation of photographic masks	<a href="#">G03F 1/00</a>
Positioning in exposing sequentially with the same light pattern different positions of the same surface	<a href="#">G03F 7/22</a>
Positioning of printing elements	<a href="#">B41F</a> , <a href="#">B41N</a>
Positioning within photographic printing apparatus for making copies	<a href="#">G03B 27/00</a>

Positioning ion beams for patterning purposes	<a href="#">H01J 37/00</a>
Overlay of successive layers in a multilayer patterned semiconductor or solid state device	<a href="#">H01L</a>

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

Detection of the position of an object on a substrate	<a href="#">G01B</a>
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## **G03F 9/70**

{for microlithography (measuring printed patterns for monitoring overlay [G03F 7/70633](#) or focus [G03F 7/70641](#); projection system adjustment [G03F 7/70258](#); position control [G03F 7/70775](#))}

### **Definition statement**

*This place covers:*

Aligning an original with a workpiece in a lithographic apparatus. Alignment marks for originals or workpieces. Devices for carrying out the aligning.

### **References**

#### **Limiting references**

*This place does not cover:*

Illumination system adjustment, alignment during assembly of illumination system and regular adjustment	<b>G03F7/20T14</b>
Beam registration in direct write photolithography	<b>G03F7/20T18</b>
Projection system adjustment, alignment during assembly of projection system and regular adjustment	<a href="#">G03F 7/70258</a>
Measuring printed patterns for overlay control	<a href="#">G03F 7/70633</a>
Measuring printed patterns for focus control	<a href="#">G03F 7/70641</a>
Positioning device and position control in a lithographic apparatus	<a href="#">G03F 7/70775</a>
Alignment of original or workpiece in charged particle beam lithography	<b>H01J37/317B27</b>

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

Photomasks	<a href="#">G03F 1/00</a>
Alignment marks specific to photomasks	<a href="#">G03F 1/14</a>
Lithographic processes using patterning methods other than those involving exposure to radiation, e.g. by imprinting or transfer printing	<a href="#">G03F 7/0002</a>
Apparatus for microlithography	<a href="#">G03F 2007/2067</a>

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Lithography	micro- and nanoprojection, proximity or contact photolithography; micro- and nanoimprint or transfer printing lithography
Original	e.g. reticle, photomask, addressable mask, imprint mold, stamp
Workpiece	target substrate to be patterned via lithography
Aligning	includes aligning in the substrate plane (i.e. aligning as such) and perpendicularly to the substrate plane (i.e. focussing or gap setting)