

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 subclass/group covers:

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

References relevant to classification in this subclass

This subclass/group does not cover:

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

Special rules of classification within this group

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:

[G03F 3/08](#) covered by [H04N 1/46](#)

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

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

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

Glossary of terms

In this subclass/group, 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 the 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 subclass/group 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 relevant to classification in this group

This subclass/group does not cover:

Masks for photoablative processes	B23K 26/00
Deposition masks	C23C 14/00
Aperture plates for light beam	G03B , G02B

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

Informative references

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

Stencil masks	B41N 1/00 , B24C 1/00 , H01J 37/00
Transparent substrates	C03B , C03C
Phase plates (phase retarding optical elements)	G02B 5/00
Mirrors, particularly UV and EUV	G02B 5/00 , G21K 1/00
Phase masks for gratings	G02B 6/02
Photographic masks, negatives	G03C
Inspection of patterns and materials	G06T , G02N
Mask or circuit layout	G06F 17/50

Membranes for X-Ray windows	H01J 33/00
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Glossary of terms

In this subclass/group, 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 "mask", "photomask", "reticle" and

"reticule" are often used as synonyms.

In patent documents the following words and expressions "AttPSM", "Half-tone PSM" and "Leaky chrome PSM" are often used as synonyms.

In patent documents the following words and expressions "Grey level" and "Half-tone" are often used as synonyms.

G03F 1/003

[N: The masking pattern being obtained by thermal means, e.g. laser ablation (thermal transfer from a ribbon, e.g. G03F1/0023)]

Informative references

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

Thermal transfer from a ribbon	G03F 1/0023
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G03F 1/0053

[N: Hybrid phase shift masks, i.e. combining plural types of phase-shifting pattern in a single common pattern]

Definition statement

This subclass/group 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 subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subgroup, 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 (G03F1/12 takes precedence; [N: X-Ray absorbers G03F1/148])

References relevant to classification in this subgroup

This subclass/group does not cover:

Originals obtained by exposing silver halide-containing photosensitive materials	G03F 1/12
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Informative references

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

X-Ray absorbers	G03F 1/148
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G03F 1/144

[N: Auxiliary patterns; Corrected patterns, e.g. proximity correction, grey level masks (G03F1/0046, G03F1/146, G03F9/00 take precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Phase shift masks	G03F 1/0046
Originals for X-Ray exposures, X-Ray masks	G03F 1/146
Registration and positioning of masks	G03F 9/00

G03F 3/00

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

Definition statement

This subclass/group covers:

Non numerical rendition of colours; non numerical colour proofing.

References relevant to classification in this group

This subclass/group does not cover:

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

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	B41M 5/00
Photographic copying apparatus in general	G03B

G03F 5/00

Screening processes; Screens therefor [N: (plates or light sensitive layers with incorporated screen G03F7/004)]

Definition statement

This subclass/group covers:

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

References relevant to classification in this group

This subclass/group does not cover:

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

Informative references

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

Image treatment	G06T
Cameras	G03B

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. H01L21/00, H05K)

Definition statement

This subclass/group 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 relevant to classification in this group

This subclass/group does not cover:

Structuring a surface by laser beam	B23K 26/00
Stereolithographic processes and apparatus	B29C

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

Numerical treatment of images	H04N 1/00
Printed circuit boards	H05K

Informative references

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

Process for applying liquids	B05D 1/00
Lithographic printing form preparation using heat	B41C 1/00 , B41M 5/00
Infrared sensitive printing plate	B41C 1/10 , B41M 5/40
Inkjet printers, thermal printers	B41J
Printing form preparation by laser engraving	B41C 1/05
Nanostructures	B82Y 30/00
Inorganic glasses	C03C 3/00
Detergent compositions	C11D 1/00 , C11D 3/00
Polymerization processes using a photoinitiator system	C08F 2/50
Addition polymers or copolymers, ethylenic monomers	C08F 220/00
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	C08L 33/00
Polystyrenes	C08L 25/06
Polyurethanes	C08L 75/04

Polyesters	C08L 67/00
Polyamides	C08L 77/00
Polyimides	C08L 79/08
Polysiloxanes	C08L 83/04
Epoxide compounds, epoxy resins	C08L 63/00
Condensation polymers of aldehydes or ketones with phenols only, e.g. novolak resins	C08G 8/00
Organic dyes / pigments	C09B
Curable inks	C09D 11/10
Adhesives	C09J
Biological test and sensors	G01N 33/00
Colour filters (structures):	G02B 5/20
Optical fibres, mirrors, lenses	G02B
Liquid crystal display	G02F 1/00
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)	G11B 7/00
Cathode ray tubes, electron or ion beam tubes	H01J 31/00 , H01J 29/00

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Photolithography	(1) Printing: Lithography in which the
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	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 this group, the following terms or expressions are 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

[N: Lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping]

Definition statement

This subclass/group 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 relevant to classification in this subgroup

This subclass/group does not cover:

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

Informative references

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

Embossing in general	B29C
Printing processes for forming pattern structures of organic semiconductive material	H01L 51/0004

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subgroup, 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

[N: Filters, e.g. additive colour filters; Components for display devices]

Definition statement

This subclass/group covers:

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

Informative references

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

Colour filters (structures)	G02B 5/20
Liquid crystal displays	G02F 1/00

G03F 7/001

[N: Phase modulating patterns, e.g. refractive index patterns]

Definition statement

This subclass/group covers:

Radiation-sensitive compositions for holographic applications, and processes.

References relevant to classification in this subgroup

This subclass/group does not cover:

Holographic processes and apparatus using light	G03H 1/00
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)	G11B 7/00

G03F 7/0037

[N: Production of three-dimensional images]

Definition statement

This subclass/group covers:

Radiation-sensitive compositions for stereolithographic applications and processes.

G03F 7/004

Photosensitive materials (G03F7/12, G03F7/14 take precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Production of screen printing forms or similar printing forms, e.g. stencils	G03F 7/12
Production of collotype printing forms	G03F 7/14

G03F 7/0041

[N: providing an etching agent upon exposure] (G03F7/075 takes precedence; photolytic halogen compounds G03F7/0295)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
Photolytic halogen compounds	G03F 7/0295

G03F 7/0042

[N: with inorganic or organometallic light-sensitive compounds not otherwise provided for, e.g. inorganic resists (G03F7/075 takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/0043

[N: Chalcogenides; Silicon, germanium, arsenic or derivatives thereof; Metals, oxides or alloys thereof (G03F7/0044 takes precedence)]

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Organometallic compounds involving an interaction between the metallic and non-metallic component, e.g. photodope systems	G03F 7/0044
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G03F 7/0045

[N: with organic non-macromolecular light-sensitive compounds not otherwise provided for, e.g. dissolution inhibitors]

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Diazonium compounds	G03F 7/016 , G03F 7/021
Diazoquinone compounds	G03F 7/022 , G03F 7/023

G03F 7/0046

[N: with perfluoro compounds, e.g. for dry lithography (G03F7/0048 takes precedence)]

Definition statement

This subclass/group covers:

Radiation-sensitive compositions containing fluorine-containing compounds in general

References relevant to classification in this subgroup

This subclass/group does not cover:

Photosensitive materials characterized by the solvents or agents facilitating spreading, e.g. surfactants	G03F 7/0048
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G03F 7/0047

[N: characterised by additives for obtaining a metallic or ceramic pattern, e.g. by firing]

Definition statement

This subclass/group covers:

Radiation-sensitive compositions containing inorganic microparticles as additives.

G03F 7/008

Azides (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/012

Macromolecular azides; Macromolecular additives, e.g.

binders [N: (G03F7/0085 takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Non-macromolecular azides characterized by the non-macromolecular additives	G03F 7/0085
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G03F 7/016

Diazonium salts or compounds (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/021

Macromolecular diazonium compounds; Macromolecular additives; e.g. binders [N: G03F7/0166 takes precedence]

References relevant to classification in this subgroup

This subclass/group does not cover:

Non-macromolecular diazonium salts characterised by the non-macromolecular additive	G03F 7/0166
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G03F 7/022

Quinonediazides (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/023

Macromolecular quinonediazides; Macromolecular additives, e.g. binders [N: (G03F7/0226 takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Quinonediazides characterised by the non-macromolecular additives	G03F 7/0226
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G03F 7/0236

[N: Condensation products of carbonyl compounds and phenolic compounds, e.g. novolak resins]

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	C08G 08/00
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G03F 7/025

Non-macromolecular photopolymerisable compounds having carbon-to-carbon triple bonds, e.g. acetylenic compounds (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/027

Non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, e.g. ethylenic compounds (G03F7/075 takes precedence)

Definition statement

This subclass/group 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 relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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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	C08F 220/00
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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 subclass/group covers:

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

Informative references

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

Polymerization processes using a photoinitiator system	C08F 2/50
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G03F 7/031

Organic compounds not covered by group G03F7/029

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Organic compound having hetero atoms other than oxygen, nitrogen or sulfur	G03F 7/029
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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	C08F 2/50
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G03F 7/033

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

Definition statement

This subclass/group covers:

Addition polymers as binders.

Informative references

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

Addition polymers or copolymers	C08F 220/00
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	C08L 33/00

nitriles thereof	
Polystyrenes	C08L 25/06

G03F 7/035

the binders being polyurethanes

Informative references

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

Polyurethanes	C08L 75/04
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G03F 7/037

the binders being polyamides or polyimides

Definition statement

This subclass/group covers:

e.g. polyamic acid, polybenzoxazoles, etc.

Informative references

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

Polyamides	C08L 77/00
Polyimides	C08L 79/08

G03F 7/038

Macromolecular compounds which are rendered insoluble or differentially wettable (G03F7/075 takes precedence; macromolecular azides G03F7/012; macromolecular diazonium compounds G03F7/021)

Definition statement

This subclass/group covers:

Macromolecular photopolymerizable compounds; Non-macromolecular

crosslinkable epoxy compounds are also classified in this subgroup.

References relevant to classification in this subgroup

This subclass/group does not cover:

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

Informative references

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

Epoxide compounds, epoxy resins	C08L 63/00
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G03F 7/0385

[N: Using epoxydized novolak resin]

Informative references

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

Epoxy resins	C08L 63/00
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G03F 7/0387

[N: Polyamides or polyimides]

Informative references

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

Polyamides	C08L 77/00
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Polyimides	C08L 79/08
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G03F 7/039

Macromolecular compounds which are photodegradable, e.g. positive electron resists (G03F7/075 takes precedence; macromolecular quinonediazides G03F7/023)

Definition statement

This subclass/group covers:

Macromolecular and non-macromolecular photodegradable compounds.

References relevant to classification in this subgroup

This subclass/group does not cover:

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

G03F 7/04

Chromates (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/06

Silver salts (G03F7/075 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds	G03F 7/075
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G03F 7/07

used for diffusion transfer [N: (G03F7/063 takes precedence)]

References relevant to classification in this subgroup

This subclass/group 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	G03F 7/063
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G03F 7/0754

[N: Non-macromolecular compounds containing silicon-to-silicon bonds (G03F7/0752 takes precedence)]

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds in non photosensitive layers or as additives	G03F 7/0752
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G03F 7/0755

[N: Non-macromolecular compounds containing Si-O, Si-C or Si-N bonds (G03F7/0752 takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds in non photosensitive layers or as additives	G03F 7/0752
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G03F 7/0757

[N: Macromolecular compounds containing Si-O, Si-C or Si-N bonds (G03F7/0752 takes precedence)]

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds in non photosensitive layers or as additives	G03F 7/0752
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Informative references

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

Polysiloxanes	C08L 83/04
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G03F 7/085

Photosensitive compositions characterised by adhesion-promoting non-macromolecular additives (G03F7/0752 takes precedence)

Definition statement

This subclass/group covers:

Adhesion-promoting macromolecular additives are also classified in this subgroup

References relevant to classification in this subgroup

This subclass/group does not cover:

Silicon-containing compounds used as adhesion-promoting additives	G03F 7/0751
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G03F 7/09

Characterised by structural details, e.g. supports, auxiliary layers (supports for printing plates in general B41N)

Informative references

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

Supports for printing plates in general	B41N
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G03F 7/091

[N: characterised by antireflection means or light filtering or absorbing means, e.g. anti-halation, contrast enhancement]

Definition statement

This subclass/group covers:

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

G03F 7/095

having more than one photosensitive layer (G03F7/0752 takes precedence)

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Photosensitive layers containing silicon-containing compounds	G03F 7/075
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G03F 7/11

having cover layers or intermediate layers, e.g. subbing layers
[N: (G03F7/091 to G03F7/093, B41N3/03 take precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Preparing for use and conserving printing surfaces	B41N 3/03
Antireflective coatings	G03F 7/091
Electroconductive coatings	G03F 7/093

G03F 7/16

Coating processes; Apparatus therefor (applying coatings to base materials in general B05; applying photosensitive compositions to base for photographic purposes G03C1/74)

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Applying coatings to base materials in general	B05D
Preparing for use and conserving printing surfaces	B41N 3/00
Applying photosensitive compositions to base for photographic purposes	G03C 1/74

G03F 7/167

[N: From the gas phase, by plasma deposition (G03F7/2035

takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Simultaneous coating and exposure	G03F 7/2035
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G03F 7/168

[N: Finishing the coated layer, e.g. drying, baking, soaking]

Definition statement

This subclass/group covers:

Edge bead removal is also classified in this subgroup.

G03F 7/20

Exposure; Apparatus therefor (photographic printing apparatus for making copies G03B27/00)

References relevant to classification in this subgroup

This subclass/group does not cover:

Photographic printing apparatus for making copies	G03B 27/00
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G03F 7/2041

[N: in the presence of a fluid, e.g. immersion; using fluid cooling means]

Definition statement

This subclass/group covers:

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

G03F 7/2049

[N: Using a cantilever]

Definition statement

This subclass/group covers:

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

G03F 7/2051

[N: 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 (G03F7/20T takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Apparatus for microlithography	G03F 7/20T
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G03F 7/2053

[N: Using a laser (ablative removal B41C)]

Definition statement

This subclass/group covers:

Multiphoton lithography is classified in this subgroup

References relevant to classification in this subgroup

This subclass/group does not cover:

Ablative removal of materials	B41C
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G03F 7/20T

[N: Apparatus for microlithography]

Definition statement

This subclass/group covers:

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

Relationship between large subject matter areas

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 7/20T](#);
- if relevant only per se are generally not classified in [G03F 7/20T](#), but in their specific group (see table below).

Fluid bearings	F16C 32/06
Interferometers	G01B 9/02
Encoders	G01D 5/00
Tools for optical wafer pattern monitoring	G01B 11/02 , G01B 9/04
Mounts for optical elements	G02B 7/00
Optical design aspect details of projection optical systems	G02B 13/00 , G02B 17/00
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	G02B 26/00
Masks, tools for mask inspection	G03F 1/00
Alignment scopes	G03F 9/00
Tools for defect inspection	G06T 7/0004 , G01N 21/956
Discharge lamps	H01J 61/00
Lasers	H01S 3/00
Semiconductor lasers	H01S 5/00
Laser plasma sources	H05G 2/00
HOLDERS for wafer processing apparatus	H01L 21/683 , H01L 21/687

Wafer stages for workpiece processing apparatus	H01L 21/682
Load-lock chambers for wafer processing apparatus	H01L 21/00S2Z9
Motors (e.g. linear)	H02K 41/00

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject-matter of this subgroup 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	H01L 21/00S2Z10L
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Informative references

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

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

Further, where appropriate, places relevant for search are indicated in the titles for the subgroups belonging to [G03F 7/20T](#).

Special rules of classification within this group

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 [G03F 7/20T16G2](#) (projection

optical system comprising adaptive optics) and [G03F 7/20T26G6](#) (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 [G03F 7/20T24F](#) (stage).

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

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subgroup, 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 [N: G03F7/20T takes precedence]

References relevant to classification in this subgroup

This subclass/group does not cover:

Apparatus for microlithography	G03F 7/20T
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G03F 7/22

Exposing sequentially with the same light pattern different positions of the same surface [N: G03F7/20T takes precedence]

References relevant to classification in this subgroup

This subclass/group does not cover:

Apparatus for microlithography	G03F 7/20T
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G03F 7/24

Curved surfaces [N: G03F7/20T takes precedence]

References relevant to classification in this subgroup

This subclass/group does not cover:

Apparatus for microlithography	G03F 7/20T
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G03F 7/26

Processing photosensitive materials; Apparatus therefor (G03F7/12 to G03F7/24 take precedence)

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Coating processes, apparatus thereof	G03F 7/16
Exposure, apparatus thereof	G03F 7/20 to G03F 7/24

G03F 7/265

[N: Selective reaction with inorganic or organometallic reagents after image-wise exposure, e.g. silylation]

Definition statement

This subclass/group covers:

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

G03F 7/28

Processing photosensitive materials for obtaining powder images (G03F3/10 takes precedence)

References relevant to classification in this subgroup

This subclass/group does not cover:

Checking the colour or tonal value of separation negatives or positives, using tonable photoresist or photopolymerizable systems	G03F 3/103
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G03F 7/3035

[N: from printing plates fixed on a cylinder or on a curved surface; from printing cylinders]

Definition statement

This subclass/group covers:

On press development is also included in this subgroup.

G03F 7/32

Liquid compositions therefor, e.g. developers

References relevant to classification in this subgroup

This subclass/group does not cover:

Gumming or finishing solutions for printing plates	B41N 3/08
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G03F 7/36

Imagewise removal not covered by groups G03F7/30 to G03F7/34, e.g. using gas streams, using plasma

Definition statement

This subclass/group covers:

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

References relevant to classification in this subgroup

This subclass/group does not cover:

Imagewise removal using liquid means	G03F 7/30
Imagewise removal by selective transfer, e.g. peeling away	G03F 7/34
Etching (semiconductor technology)	H01L 21/00

G03F 7/38

Treatment before imagewise removal, e.g. prebaking [N: (G03F7/265 takes precedence)]

Definition statement

This subclass/group covers:

Treatments such as post exposure bake

References relevant to classification in this subgroup

This subclass/group does not cover:

Selective reaction with organic, inorganic or organometallic reagents before imagewise removal	G03F 7/265
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G03F 7/40

Treatment after imagewise removal, e.g. baking

Definition statement

This subclass/group covers:

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

G03F 7/405

[N: Treatment with inorganic or organometallic reagents after imagewise removal]

Definition statement

This subclass/group covers:

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

G03F 7/42

Stripping or agents therefor [N: Stripping involving the use of a combination of means, e.g. plasma and radiation, is classified in group G03F7/42 only]

Definition statement

This subclass/group covers:

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

G03F 7/422

[N: Using liquids only (G03F7/421 takes precedence)]

References relevant to classification in this subgroup

This subclass/group does not cover:

Using biological means only, e.g. enzymes	G03F 7/421
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Informative references

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

Detergent compositions	C11D 1/00 , C11D 3/00
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G03F 7/423

[N: containing mineral acids or salts thereof, containing mineral oxidizing substances, e.g. peroxy compounds]

Definition statement

This subclass/group covers:

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

G03F 7/426

[N: containing organic halogen compounds; containing organic sulfonic acids or salts thereof; containing sulfoxides]

Definition statement

This subclass/group covers:

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

G03F 7/427

[N: using plasma means only]

Definition statement

This subclass/group 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 (G03F7/22 takes precedence; preparation of photographic masks G03F1/00; within photographic printing apparatus for making copies G03B27/00)

Definition statement

This subclass/group 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 relevant to classification in this group

This subclass/group does not cover:

Positioning of printing elements	B41F , B41N
Positioning within photographic printing apparatus for making copies	G03B 27/00
Positioning in the preparation of photographic masks	G03F 1/00
Positioning in exposing sequentially with the same light pattern different positions of the same surface	G03F 7/22
Positioning ion beams for patterning purposes	H01J 37/00
Overlay of successive layers in a multilayer patterned semiconductor or solid state device	H01L

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	G01B
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G03F 9/00T

[N: For microlithography (monitoring exposed area for alignment control G03F7/20T22; positioning devices G03F7/20T24)

Definition statement

This subclass/group covers:

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

References relevant to classification in this group

This subclass/group does not cover:

Measuring printed patterns for overlay control	G03F 7/20T22
Measuring printed patterns for focus control	G03F 7/20T22
Positioning device and position control in a lithographic apparatus	G03F 7/20T24
Alignment of original or workpiece in charged particle beam lithography	H01J 37/317B27
Beam registration in direct write photolithography	G03F 7/20T18
Illumination system adjustment, alignment during assembly of illumination system and regular adjustment	G03F 7/20T14
Projection system adjustment, alignment during assembly of projection system and regular adjustment	G03F 7/20T16

Informative references

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

Alignment marks specific to photomasks	G03F 1/14
Photomasks	G03F 1/00
Lithographic processes using patterning methods other than those involving exposure to radiation, e.g. by imprinting or transfer printing	G03F 7/0002
Apparatus for microlithography	G03F 7/20T

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Lithography	micro- and nano- projection, proximity or contact photolithography; micro- and nano- imprint 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)