

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

#### G03 PHOTOGRAPHY; CINEMATOGRAPHY; ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ELECTROGRAPHY; HOLOGRAPHY (NOTES omitted)

#### 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](#))

##### NOTE

In this subclass, the following terms or expressions are used with the meanings indicated :

- "photosensitive" means not only sensitive to electro- magnetic radiation but also to corpuscular radiation;
- "photosensitive compositions" covers photosensitive substances, e.g. quinonediazides, and, if applicable, binders or additives;
- "photosensitive materials" covers the photosensitive compositions, e.g. photoresists, the bases carrying them and, if applicable, auxiliary layers.

##### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
 

<a href="#">G03F 3/08</a>	covered by	<a href="#">H04N 1/46</a>
<a href="#">G03F 7/207</a>	covered by	<a href="#">G03F 7/20</a>
<a href="#">G03F 7/23</a>	covered by	<a href="#">G03F 7/22</a>
<a href="#">G03F 9/02</a>	covered by	<a href="#">G03F 9/00</a>
- In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

<b>1/00</b>	<b>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</b>	1/29	• . Rim PSM or outrigger PSM; Preparation thereof
		1/30	• . Alternating PSM, e.g. Levenson-Shibuya PSM; Preparation thereof
		1/32	• . Attenuating PSM [att-PSM], e.g. halftone PSM or PSM having semi-transparent phase shift portion;; Preparation thereof
		1/34	• . Phase-edge PSM, e.g. chromeless PSM; Preparation thereof
		1/36	• . Masks having proximity correction features; Preparation thereof, e.g. optical proximity correction [OPC] design processes
1/20	• . Masks or mask blanks for imaging by charged particle beam [CPB] radiation, e.g. by electron beam; Preparation thereof	1/38	• . Masks having auxiliary features, e.g. special coatings or marks for alignment or testing; Preparation thereof
1/22	• . Masks or mask blanks for imaging by radiation of 100nm or shorter wavelength, e.g. X-ray masks, extreme ultraviolet [EUV] masks; Preparation thereof	1/40	• . Electrostatic discharge [ESD] related features, e.g. antistatic coatings or a conductive metal layer around the periphery of the mask substrate
1/24	• . Reflection masks; Preparation thereof	1/42	• . Alignment or registration features, e.g. alignment marks on the mask substrates
1/26	• . Phase shift masks [PSM]; PSM blanks; Preparation thereof	1/44	• . Testing or measuring features, e.g. grid patterns, focus monitors, sawtooth scales or notched scales
1/28	• . with three or more diverse phases on the same PSM; Preparation thereof	1/46	• . Antireflective coatings
		1/48	• . Protective coatings

- 1/50 . Mask blanks not covered by  
[G03F 1/20](#) - [G03F 1/34](#); Preparation thereof
- 1/52 . Reflectors
- 1/54 . Absorbers, e.g. of opaque materials
- 1/56 . . Organic absorbers, e.g. of photo-resists
- 1/58 . . having two or more different absorber layers, e.g. stacked multilayer absorbers
- 1/60 . Substrates
- 1/62 . Pellicles, e.g. pellicle assemblies, e.g. having membrane on support frame; Preparation thereof
- 1/64 . . characterised by the frames, e.g. structure or material, including bonding means therefor
- 1/66 . Containers specially adapted for masks, mask blanks or pellicles; Preparation thereof
- 1/68 . Preparation processes not covered by groups  
[G03F 1/20](#) - [G03F 1/50](#)
- 1/70 . . Adapting basic layout or design of masks to lithographic process requirements, e.g., second iteration correction of mask patterns for imaging
- 1/72 . . Repair or correction of mask defects
- 1/74 . . . by charged particle beam [CPB], e.g. focused ion beam
- 1/76 . . Patterning of masks by imaging
- 1/78 . . . by charged particle beam [CPB], e.g. electron beam patterning of masks
- 1/80 . . Etching
- 1/82 . . Auxiliary processes, e.g. cleaning or inspecting
- 1/84 . . . Inspecting
- 1/86 . . . . by charged particle beam [CPB]
- 1/88 . prepared by photographic processes for production of originals simulating relief
- 1/90 . prepared by montage processes
- 1/92 . prepared from printing surfaces
- 3/00 Colour separation; Correction of tonal value**  
(photographic copying apparatus in general [G03B](#))
- 3/02 . by retouching
- 3/04 . by photographic means
- 3/06 . . by masking
- 3/10 . Checking the colour or tonal value of separation negatives or positives
- 3/101 . . {Colour or tonal value checking by non-photographic means or by means other than using non-impact printing methods or duplicating or marking methods covered by [B41M 5/00](#)}
- 3/102 . . {Lamination or delamination method or apparatus for colour proofing systems}
- 3/103 . . {using tonable photoresist or photopolymerisable systems}
- 3/105 . . {using electro photographic materials}
- 3/106 . . {using non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, other than silicon containing compounds}
- 3/107 . . {using silver halide photosensitive materials}
- 3/108 . . {using a non-impact printing method, e.g. ink jet, using duplicating or marking methods covered by [B41M 5/00](#), e.g. by ablation or by thermographic means}
- 5/00 Screening processes; Screens therefor** ({plates or light sensitive layers with incorporated screen [G03F 7/004](#)})
- 5/02 . by projection methods (cameras [G03B](#))
- 5/04 . . changing the screen effect
- 5/06 . . changing the diaphragm effect
- 5/08 . . using line screens
- 5/10 . . using cross-line screens
- 5/12 . . using other screens, e.g. granulated screen
- 5/14 . by contact methods
- 5/16 . . using grey half-tone screens
- 5/18 . . using colour half-tone screens
- 5/20 . using screens for gravure printing
- 5/22 . combining several screens; Elimination of moiré
- 5/24 . by multiple exposure, e.g. combined processes for line photo and screen
- 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](#))
- 7/0002 . {Lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping}
- 7/0005 . {Production of optical devices or components in so far as characterised by the lithographic processes or materials used therefor}
- 7/0007 . . {Filters, e.g. additive colour filters; Components for display devices}
- 7/001 . . {Phase modulating patterns, e.g. refractive index patterns}
- 7/0012 . {Processes making use of the tackiness of the photolithographic materials, e.g. for mounting; Packaging for photolithographic material; Packages obtained by processing photolithographic materials}
- 7/0015 . {Production of aperture devices, microporous systems or stamps}
- 7/0017 . {for the production of embossing, cutting or similar devices; for the production of casting means}
- 7/002 . {using materials containing microcapsules; Preparing or processing such materials, e.g. by pressure; Devices or apparatus specially designed therefor}
- 7/0022 . . {Devices or apparatus}
- 7/0025 . . . {characterised by means for coating the developer}
- 7/0027 . . . {characterised by pressure means}
- 7/003 . . . {characterised by storage means for the light sensitive material, e.g. cartridges}
- 7/0032 . . . {characterised by heat providing or glossing means}
- 7/0035 . {Multiple processes, e.g. applying a further resist layer on an already in a previously step, processed pattern or textured surface}
- 7/0037 . {Production of three-dimensional images}
- 7/004 . Photosensitive materials ([G03F 7/12](#), [G03F 7/14](#) take precedence)
- 7/0041 . . {providing an etching agent upon exposure ([G03F 7/075](#) takes precedence; photolytic halogen compounds [G03F 7/0295](#))}
- 7/0042 . . {with inorganic or organometallic light-sensitive compounds not otherwise provided for, e.g. inorganic resists ([G03F 7/075](#) takes precedence)}
- 7/0043 . . . {Chalcogenides; Silicon, germanium, arsenic or derivatives thereof; Metals, oxides or alloys thereof ([G03F 7/0044](#) takes precedence)}

- 7/0044 . . . {involving an interaction between the metallic and non-metallic component, e.g. photodope systems}
- 7/0045 . . {with organic non-macromolecular light-sensitive compounds not otherwise provided for, e.g. dissolution inhibitors}
- 7/0046 . . {with perfluoro compounds, e.g. for dry lithography ([G03F 7/0048 takes precedence](#))}
- 7/0047 . . {characterised by additives for obtaining a metallic or ceramic pattern, e.g. by firing}
- 7/0048 . . {characterised by the solvents or agents facilitating spreading, e.g. tensio-active agents}
- 7/008 . . Azides ([G03F 7/075 takes precedence](#))
- 7/0085 . . . {characterised by the non-macromolecular additives}
- 7/012 . . . Macromolecular azides; Macromolecular additives, e.g. binders {([G03F 7/0085 takes precedence](#))}
- 7/0125 . . . . {characterised by the polymeric binder or the macromolecular additives other than the macromolecular azides}
- 7/016 . . Diazonium salts or compounds ([G03F 7/075 takes precedence](#))
- 7/0163 . . . {Non ionic diazonium compounds, e.g. diazosulphonates; Precursors thereof, e.g. triazenes}
- 7/0166 . . . {characterised by the non-macromolecular additives}
- 7/021 . . . Macromolecular diazonium compounds; Macromolecular additives, e.g. binders {([G03F 7/0166 takes precedence](#))}
- 7/0212 . . . . {characterised by the polymeric binder or the macromolecular additives other than the diazo resins or the polymeric diazonium compounds}
- 7/0215 . . . . . {Natural gums; Proteins, e.g. gelatins; Macromolecular carbohydrates, e.g. cellulose; Polyvinyl alcohol and derivatives thereof, e.g. polyvinylacetals}
- 7/0217 . . . . . {Polyurethanes; Epoxy resins}
- 7/022 . . Quinonediazides ([G03F 7/075 takes precedence](#))
- 7/0223 . . . {Iminoquinonediazides; Para-quinonediazides}
- 7/0226 . . . {characterised by the non-macromolecular additives}
- 7/023 . . . Macromolecular quinonediazides; Macromolecular additives, e.g. binders {([G03F 7/0226 takes precedence](#))}
- 7/0233 . . . . {characterised by the polymeric binders or the macromolecular additives other than the macromolecular quinonediazides}
- 7/0236 . . . . . {Condensation products of carbonyl compounds and phenolic compounds, e.g. novolak resins}
- 7/025 . . Non-macromolecular photopolymerisable compounds having carbon-to-carbon triple bonds, e.g. acetylenic compounds ([G03F 7/075 takes precedence](#))
- 7/027 . . Non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, e.g. ethylenic compounds ([G03F 7/075 takes precedence](#))
- 7/0275 . . . {with dithiol or polysulfide compounds}
- 7/028 . . . with photosensitivity-increasing substances, e.g. photoinitiators
- 7/0285 . . . . {Silver salts, e.g. a latent silver salt image}
- 7/029 . . . . Inorganic compounds; Onium compounds; Organic compounds having hetero atoms other than oxygen, nitrogen or sulfur
- 7/0295 . . . . . {Photolytic halogen compounds}
- 7/031 . . . . Organic compounds not covered by group [G03F 7/029](#)
- 7/032 . . . with binders
- 7/0325 . . . . {the binders being polysaccharides, e.g. cellulose}
- 7/033 . . . . the binders being polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, e.g. vinyl polymers
- 7/035 . . . . the binders being polyurethanes
- 7/037 . . . . the binders being polyamides or polyimides
- 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](#))
- 7/0381 . . . {using a combination of a phenolic resin and a polyoxyethylene resin}
- 7/0382 . . . {the macromolecular compound being present in a chemically amplified negative photoresist composition}
- 7/0384 . . . {with ethylenic or acetylenic bands in the main chain of the photopolymer}
- 7/0385 . . . {using epoxidised novolak resin}
- 7/0387 . . . {Polyamides or polyimides}
- 7/0388 . . . {with ethylenic or acetylenic bands in the side chains of the photopolymer}
- 7/039 . . Macromolecular compounds which are photodegradable, e.g. positive electron resists ([G03F 7/075 takes precedence](#); macromolecular quinonediazides [G03F 7/023](#))
- 7/0392 . . . {the macromolecular compound being present in a chemically amplified positive photoresist composition}
- 7/0395 . . . . {the macromolecular compound having a backbone with alicyclic moieties}
- 7/0397 . . . . {the macromolecular compound having an alicyclic moiety in a side chain}
- 7/04 . . Chromates ([G03F 7/075 takes precedence](#))
- 7/06 . . Silver salts ([G03F 7/075 takes precedence](#))
- 7/063 . . . {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}
- 7/066 . . . . {Organic derivatives of bivalent sulfur, e.g. onium derivatives}
- 7/07 . . . used for diffusion transfer {([G03F 7/063 takes precedence](#))}
- 7/075 . . Silicon-containing compounds
- 7/0751 . . . {used as adhesion-promoting additives or as means to improve adhesion}
- 7/0752 . . . {in non photosensitive layers or as additives, e.g. for dry lithography}
- 7/0754 . . . {Non-macromolecular compounds containing silicon-to-silicon bonds ([G03F 7/0752 takes precedence](#))}
- 7/0755 . . . {Non-macromolecular compounds containing Si-O, Si-C or Si-N bonds ([G03F 7/0752 takes precedence](#))}

- 7/0757 . . . {Macromolecular compounds containing Si-O, Si-C or Si-N bonds ([G03F 7/0752 takes precedence](#))}
- 7/0758 . . . . {with silicon- containing groups in the side chains}
- 7/085 . . Photosensitive compositions characterised by adhesion-promoting non-macromolecular additives ([G03F 7/075 takes precedence](#))
- 7/09 . . characterised by structural details, e.g. supports, auxiliary layers ([supports for printing plates in general B41N](#))
- 7/091 . . . {characterised by antireflection means or light filtering or absorbing means, e.g. anti-halation, contrast enhancement}
- 7/092 . . . {characterised by backside coating or layers, by lubricating-slip layers or means, by oxygen barrier layers or by stripping-release layers or means}
- 7/093 . . . {characterised by antistatic means, e.g. for charge depletion}
- 7/094 . . . {Multilayer resist systems, e.g. planarising layers}
- 7/095 . . . having more than one photosensitive layer ([G03F 7/075 takes precedence](#))
- 7/0952 . . . . {comprising silver halide or silver salt based image forming systems, e.g. for camera speed exposure}
- 7/0955 . . . . {one of the photosensitive systems comprising a non-macromolecular photopolymerisable compound having carbon-to-carbon double bonds, e.g. ethylenic compounds}
- 7/0957 . . . . {with sensitive layers on both sides of the substrate}
- 7/105 . . . having substances, e.g. indicators, for forming visible images
- 7/11 . . . having cover layers or intermediate layers, e.g. subbing layers {([G03F 7/091 - G03F 7/093, B41N 3/03 take precedence](#))}
- 7/115 . . . having supports or layers with means for obtaining a screen effect or for obtaining better contact in vacuum printing
- 7/12 . Production of screen printing forms or similar printing forms, e.g. stencils
- 7/14 . Production of collotype printing forms
- 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](#))
- 7/161 . . {using a previously coated surface, e.g. by stamping or by transfer lamination}
- 7/162 . . {Coating on a rotating support, e.g. using a whirler or a spinner}
- 7/164 . . {using electric, electrostatic or magnetic means; powder coating}
- 7/165 . . {Monolayers, e.g. Langmuir-Blodgett}
- 7/167 . . {from the gas phase, by plasma deposition ([G03F 7/2035 takes precedence](#))}
- 7/168 . . {Finishing the coated layer, e.g. drying, baking, soaking}
- 7/18 . . Coating curved surfaces
- 7/20 . Exposure; Apparatus therefor ([photographic printing apparatus for making copies G03B 27/00](#))
- 7/2002 . . {with visible light or UV light, through an original having an opaque pattern on a transparent support, e.g. film printing, projection printing; by reflection of visible or UV light from an original such as a printed image}
- 7/2004 . . . {characterised by the use of a particular light source, e.g. fluorescent lamps or deep UV light}
- 7/2006 . . . . {using coherent light; using polarised light}
- 7/2008 . . . {characterised by the reflectors, diffusers, light or heat filtering means or anti-reflective means used}
- 7/201 . . . {characterised by an oblique exposure; characterised by the use of plural sources; characterised by the rotation of the optical device; characterised by a relative movement of the optical device, the light source, the sensitive system or the mask}
- 7/2012 . . . {using liquid photohardening compositions, e.g. for the production of reliefs such as flexographic plates or stamps}
- 7/2014 . . . {Contact or film exposure of light sensitive plates such as lithographic plates or circuit boards, e.g. in a vacuum frame}
- 7/2016 . . . . {Contact mask being integral part of the photosensitive element and subject to destructive removal during post-exposure processing}
- 7/2018 . . . . . {Masking pattern obtained by selective application of an ink or a toner, e.g. ink jet printing}
- 7/202 . . . . . {Masking pattern being obtained by thermal means, e.g. laser ablation}
- 7/2022 . . {Multi-step exposure, e.g. hybrid; backside exposure; blanket exposure, e.g. for image reversal; edge exposure, e.g. for edge bead removal; corrective exposure}
- 7/2024 . . . {of the already developed image}
- 7/2026 . . . {for the removal of unwanted material, e.g. image or background correction}
- 7/2028 . . . . {of an edge bead on wafers}
- 7/203 . . . {comprising an imagewise exposure to electromagnetic radiation or corpuscular radiation}
- 7/2032 . . . {Simultaneous exposure of the front side and the backside}
- 7/2035 . . {simultaneous coating and exposure; using a belt mask, e.g. endless}
- 7/2037 . . {Exposure with X-ray radiation or corpuscular radiation, through a mask with a pattern opaque to that radiation}
- 7/2039 . . . {X-ray radiation}
- 7/2041 . . {in the presence of a fluid, e.g. immersion; using fluid cooling means}
- 7/2043 . . . {with the production of a chemical active agent from a fluid, e.g. an etching agent; with material deposition from the fluid phase, e.g. contamination resists}
- 7/2045 . . {using originals with apertures, e.g. stencil exposure masks}
- 7/2047 . . . {Exposure with radiation other than visible light or UV light, e.g. shadow printing, proximity printing}
- 7/2049 . . {using a cantilever}



- 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](#))}
- 7/2053 . . . {using a laser ([ablative removal B41C](#))}
- 7/2055 . . . {for the production of printing plates; Exposure of liquid photohardening compositions}
- 7/2057 . . . {using an addressed light valve, e.g. a liquid crystal device}
- 7/2059 . . . {using a scanning corpuscular radiation beam, e.g. an electron beam}
- 7/2061 . . . {Electron scattering (proximity) correction or prevention methods}
- 7/2063 . . . {for the production of exposure masks or reticles}
- 7/2065 . . . {using corpuscular radiation other than electron beams}
- 7/213 . . Exposing with the same light pattern different positions of the same surface at the same time ([G03F 7/70 takes precedence](#))}
- 7/22 . . Exposing sequentially with the same light pattern different positions of the same surface ([G03F 7/70 takes precedence](#))}
- 7/24 . . Curved surfaces ([G03F 7/70 takes precedence](#))}
- 7/26 . Processing photosensitive materials; Apparatus therefor ([G03F 7/12 - G03F 7/24 take precedence](#))}
- 7/265 . . {Selective reaction with inorganic or organometallic reagents after image-wise exposure, e.g. silylation}
- 7/28 . . for obtaining powder images ([G03F 3/10 takes precedence](#))}
- 7/30 . . Imagewise removal using liquid means
- 7/3007 . . . {combined with electrical means, e.g. force fields}
- 7/3014 . . . {combined with ultrasonic means}
- 7/3021 . . . {from a wafer supported on a rotating chuck}
- 7/3028 . . . {characterised by means for on-wafer monitoring of the processing}
- 7/3035 . . . {from printing plates fixed on a cylinder or on a curved surface; from printing cylinders}
- 7/3042 . . . {from printing plates transported horizontally through the processing stations}
- 7/305 . . . {characterised by the brushing or rubbing means}
- 7/3057 . . . {characterised by the processing units other than the developing unit, e.g. washing units}
- 7/3064 . . . {characterised by the transport means or means for confining the different units, e.g. to avoid the overflow}
- 7/3071 . . . {Process control means, e.g. for replenishing}
- 7/3078 . . . {Processing different kinds of plates, e.g. negative and positive plates, in the same machine}
- 7/3085 . . . {from plates or webs transported vertically; from plates suspended or immersed vertically in the processing unit}
- 7/3092 . . . {Recovery of material; Waste processing}
- 7/32 . . . Liquid compositions therefor, e.g. developers
- 7/322 . . . {Aqueous alkaline compositions}
- 7/325 . . . {Non-aqueous compositions}
- 7/327 . . . . {Non-aqueous alkaline compositions, e.g. anhydrous quaternary ammonium salts}
- 7/34 . . Imagewise removal by selective transfer, e.g. peeling away
- 7/343 . . . {Lamination or delamination methods or apparatus for photolithographic photosensitive material}
- 7/346 . . . {using photosensitive materials other than non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds}
- 7/36 . . Imagewise removal not covered by groups [G03F 7/30 - G03F 7/34](#), e.g. using gas streams, using plasma
- 7/38 . . Treatment before imagewise removal, e.g. prebaking ([G03F 7/265 takes precedence](#))}
- 7/40 . . Treatment after imagewise removal, e.g. baking
- 7/405 . . . {Treatment with inorganic or organometallic reagents after imagewise removal}
- 7/42 . . Stripping or agents therefor
- NOTE**
- Stripping involving the use of a combination of means, e.g. plasma and radiation, is classified in group [G03F 7/42](#) only
- 7/421 . . . {using biological means only, e.g. enzymes}
- 7/422 . . . {using liquids only ([G03F 7/421 takes precedence](#))}
- 7/423 . . . . {containing mineral acids or salts thereof, containing mineral oxidizing substances, e.g. peroxy compounds}
- 7/425 . . . . {containing mineral alkaline compounds; containing organic basic compounds, e.g. quaternary ammonium compounds; containing heterocyclic basic compounds containing nitrogen}
- 7/426 . . . . {containing organic halogen compounds; containing organic sulfonic acids or salts thereof; containing sulfoxides}
- 7/427 . . . {using plasma means only}
- 7/428 . . . {using ultrasonic means only}
- 7/70 . {Microphotolithographic exposure; Apparatus therefor ([photo-masks G03F 1/00](#))}
- WARNING**
- Group [G03F 7/70](#) is incomplete pending reclassification of documents from group [G03F 7/70375](#).
- Groups [G03F 7/70375](#) and [G03F 7/70](#) should be considered in order to perform a complete search.
- 7/70008 . . {Production of exposure light, i.e. light sources}
- 7/70016 . . . {by discharge lamps}
- 7/70025 . . . {by lasers}
- 7/70033 . . . {by plasma extreme ultraviolet [EUV] sources}
- 7/70041 . . . {by pulsed sources, e.g. multiplexing, pulse duration, interval control or intensity control}
- 7/7005 . . . {by multiple sources, e.g. light-emitting diodes [LED] or light source arrays ([addressable array sources specially adapted to produce patterns without a mask G03F 7/70391](#))}
- 7/70058 . . {Mask illumination systems}

- 7/70066 . . . {Size and form of the illuminated area in the mask plane, e.g. reticle masking blades or blinds}
- 7/70075 . . . {Homogenization of illumination intensity in the mask plane by using an integrator, e.g. fly's eye lens, facet mirror or glass rod, by using a diffusing optical element or by beam deflection}
- 7/70083 . . . {Non-homogeneous intensity distribution in the mask plane}
- 7/70091 . . . {Illumination settings, i.e. intensity distribution in the pupil plane or angular distribution in the field plane; On-axis or off-axis settings, e.g. annular, dipole or quadrupole settings; Partial coherence control, i.e. sigma or numerical aperture [NA]}
- 7/701 . . . . {Off-axis setting using an aperture}
- 7/70108 . . . . {Off-axis setting using a light-guiding element, e.g. diffractive optical elements [DOEs] or light guides}
- 7/70116 . . . . {Off-axis setting using a programmable means, e.g. liquid crystal display [LCD], digital micromirror device [DMD] or pupil facets}
- 7/70125 . . . {Use of illumination settings tailored to particular mask patterns ([details of setting means G03F 7/70091](#))}
- 7/70133 . . . {Measurement of illumination distribution, in pupil plane or field plane}
- 7/70141 . . . {Illumination system adjustment, e.g. adjustments during exposure or alignment during assembly of illumination system}
- 7/7015 . . . {Details of optical elements}
- 7/70158 . . . . {Diffractive optical elements}
- 7/70166 . . . . {Capillary or channel elements, e.g. nested extreme ultraviolet [EUV] mirrors or shells, optical fibers or light guides}
- 7/70175 . . . . {Lamphouse reflector arrangements or collector mirrors, i.e. collecting light from solid angle upstream of the light source}
- 7/70183 . . . . {Zoom systems for adjusting beam diameter}
- 7/70191 . . . {Optical correction elements, filters or phase plates for controlling intensity, wavelength, polarisation, phase or the like}

**NOTE**

Wavelength or polarisation control is further classified in groups [G03F 7/70566](#), [G03F 7/70575](#)

- 7/702 . . . {Reflective illumination, i.e. reflective optical elements other than folding mirrors, e.g. extreme ultraviolet [EUV] illumination systems}
- 7/70208 . . . {Multiple illumination paths, e.g. radiation distribution devices, microlens illumination systems, multiplexers or demultiplexers for single or multiple projection systems}
- 7/70216 . . {Mask projection systems}
- 7/70225 . . . {Optical aspects of catadioptric systems, i.e. comprising reflective and refractive elements}

**NOTE**

Catadioptric systems are further classified in group [G02B 17/0892](#)

- 7/70233 . . . {Optical aspects of catoptric systems, i.e. comprising only reflective elements, e.g. extreme ultraviolet [EUV] projection systems}

**NOTE**

Further aspects of catoptric systems are classified in group [G02B 17/06](#)

- 7/70241 . . . {Optical aspects of refractive lens systems, i.e. comprising only refractive elements}

**NOTE**

Further aspects of refractive systems are classified in group [G02B 13/143](#)

- 7/7025 . . . {Size or form of projection system aperture, e.g. aperture stops, diaphragms or pupil obscuration; Control thereof}
- 7/70258 . . . {Projection system adjustments, e.g. adjustments during exposure or alignment during assembly of projection system}
- 7/70266 . . . . {Adaptive optics, e.g. deformable optical elements for wavefront control, e.g. for aberration adjustment or correction}
- 7/70275 . . . {Multiple projection paths, e.g. array of projection systems, microlens projection systems or tandem projection systems}
- 7/70283 . . . {Mask effects on the imaging process}
- 7/70291 . . . . {Addressable masks, e.g. spatial light modulators [SLMs], digital micro-mirror devices [DMDs] or liquid crystal display [LCD] patterning devices}
- 7/703 . . . {Non-planar pattern areas or non-planar masks, e.g. curved masks or substrates}
- 7/70308 . . . {Optical correction elements, filters or phase plates for manipulating imaging light, e.g. intensity, wavelength, polarisation, phase or image shift}

**NOTE**

Wavelength or polarisation control is further classified in groups [G03F 7/70566](#), [G03F 7/70575](#)

- 7/70316 . . . {Details of optical elements, e.g. of Bragg reflectors, extreme ultraviolet [EUV] multilayer or bilayer mirrors or diffractive optical elements}

**NOTES**

1. Particular optical materials are further classified in group [G03F 7/70958](#);
2. Multilayer reflectors for X-ray or EUV lithography are further classified in group [G21K 1/062](#)

- 7/70325 . . . {Resolution enhancement techniques not otherwise provided for, e.g. darkfield imaging, interfering beams, spatial frequency multiplication, nearfield lenses or solid immersion lenses}
- 7/70333 . . . . {Focus drilling, i.e. increase in depth of focus for exposure by modulating focus during exposure [FLEX]}

- 7/70341 . . . {Details of immersion lithography aspects, e.g. exposure media or control of immersion liquid supply ([chemical composition of immersion liquids G03F 7/2041](#))}
- 7/7035 . . . {Proximity or contact printers}
- 7/70358 . . . {Scanning exposure, i.e. relative movement of patterned beam and workpiece during imaging}
- 7/70366 . . . {Rotary scanning}
- 7/70375 . . {Multiphoton lithography or multiphoton photopolymerization; Imaging systems comprising means for converting one type of radiation into another type of radiation}

**WARNING**

Group [G03F 7/70375](#) is impacted by reclassification into group [G03F 7/70](#).

Groups [G03F 7/70375](#) and [G03F 7/70](#) should be considered in order to perform a complete search.

- 7/70383 . . {Direct write, i.e. pattern is written directly without the use of a mask by one or multiple beams ([maskless lithography using a programmable mask G03F 7/70291](#))}
- 7/70391 . . . {Addressable array sources specially adapted to produce patterns, e.g. addressable LED arrays}
- 7/704 . . . {Scanned exposure beam, e.g. raster-, rotary- and vector scanning ([mask projection exposure involving relative movement of patterned beam and workpiece during imaging G03F 7/70358](#))}
- 7/70408 . . {Interferometric lithography; Holographic lithography; Self-imaging lithography, e.g. utilizing the Talbot effect}
- 7/70416 . . {2.5D lithography}

**NOTE**

{Apparatus for photolithographical production of three-dimensional images are further classified in group [G03F 7/0037](#)}

**WARNING**

Group [G03F 7/70416](#) is impacted by reclassification into groups [B29C 64/00](#) - [B29C 64/40](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 7/70425 . . {Imaging strategies, e.g. for increasing throughput or resolution, printing product fields larger than the image field or compensating lithography- or non-lithography errors, e.g. proximity correction, mix-and-match, stitching or double patterning}
- 7/70433 . . . {Layout for increasing efficiency or for compensating imaging errors, e.g. layout of exposure fields for reducing focus errors; Use of mask features for increasing efficiency or for compensating imaging errors}
- 7/70441 . . . {Optical proximity correction [OPC]}
- 7/7045 . . . {Hybrid exposures, i.e. multiple exposures of the same area using different types of exposure apparatus, e.g. combining projection, proximity, direct write, interferometric, UV, x-ray or particle beam}

- 7/70458 . . . {Mix-and-match, i.e. multiple exposures of the same area using a similar type of exposure apparatus, e.g. multiple exposures using a UV apparatus}
- 7/70466 . . . {Multiple exposures, e.g. combination of fine and coarse exposures, double patterning or multiple exposures for printing a single feature ([stitching G03F 7/70475](#))}
- 7/70475 . . . {Stitching, i.e. connecting image fields to produce a device field, the field occupied by a device such as a memory chip, processor chip, CCD, flat panel display}
- 7/70483 . . {Information management; Active and passive control; Testing; Wafer monitoring, e.g. pattern monitoring}

**WARNING**

Group [G03F 7/70483](#) is impacted by reclassification into groups [G03F 7/70605](#), [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 7/70491 . . . {Information management, e.g. software; Active and passive control, e.g. details of controlling exposure processes or exposure tool monitoring processes}

**WARNING**

Group [G03F 7/70491](#) is impacted by reclassification into groups [G03F 7/70605](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 7/705 . . . . {Modelling or simulating from physical phenomena up to complete wafer processes or whole workflow in wafer productions}

**WARNING**

Group [G03F 7/705](#) is impacted by reclassification into groups [G03F 7/70504](#), [G03F 7/70605](#), [G03F 7/70653](#), [G03F 7/70681](#) - [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#), [G03F 7/706843](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70504 . . . . . {Optical system modelling, e.g. lens heating models}

**WARNING**

Group [G03F 7/70504](#) is incomplete pending reclassification of documents from group [G03F 7/705](#).

Groups [G03F 7/705](#) and [G03F 7/70504](#) should be considered in order to perform a complete search.

7/70508 . . . . . {Data handling in all parts of the microlithographic apparatus, e.g. handling pattern data for addressable masks or data transfer to or from different components within the exposure apparatus}

**WARNING**

Group [G03F 7/70508](#) is impacted by reclassification into groups [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#), [G03F 7/706837](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70516 . . . . . {Calibration of components of the microlithographic apparatus, e.g. light sources, addressable masks or detectors}

**WARNING**

Group [G03F 7/70516](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70525 . . . . . {Controlling normal operating mode, e.g. matching different apparatus, remote control or prediction of failure}

**WARNING**

Group [G03F 7/70525](#) is impacted by reclassification into groups [G03F 7/706835](#) - [G03F 7/706841](#).

Groups [G03F 7/70525](#) and [G03F 7/706835](#) - [G03F 7/706841](#) should be considered in order to perform a complete search.

7/70533 . . . . . {Controlling abnormal operating mode, e.g. taking account of waiting time, decision to rework or rework flow}

**WARNING**

Group [G03F 7/70533](#) is impacted by reclassification into groups [G03F 7/706835](#) - [G03F 7/706841](#).

Groups [G03F 7/70533](#) and [G03F 7/706835](#) - [G03F 7/706841](#) should be considered in order to perform a complete search.

7/70541 . . . . . {Tagging, i.e. hardware or software tagging of features or components, e.g. using tagging scripts or tagging identifier codes for identification of chips, shots or wafers}

7/7055 . . . . . {Exposure light control in all parts of the microlithographic apparatus, e.g. pulse length control or light interruption}

7/70558 . . . . . {Dose control, i.e. achievement of a desired dose}

7/70566 . . . . . {Polarisation control}

7/70575 . . . . . {Wavelength control, e.g. control of bandwidth, multiple wavelength, selection of wavelength or matching of optical components to wavelength}

7/70583 . . . . . {Speckle reduction, e.g. coherence control or amplitude/wavefront splitting}

7/70591 . . . . . {Testing optical components}

7/706 . . . . . {Aberration measurement}

7/70605 . . . . . {Workpiece metrology}

**WARNING**

Group [G03F 7/70605](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#) and [G03F 7/705](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70608 . . . . . {Monitoring the unpatterned workpiece, e.g. measuring thickness, reflectivity or effects of immersion liquid on resist}

**WARNING**

Group [G03F 7/70608](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70616 . . . . . {Monitoring the printed patterns}

**WARNING**

Group [G03F 7/70616](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70666](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.



7/70625 . . . . . {Dimensions, e.g. line width, critical dimension [CD], profile, sidewall angle or edge roughness}

#### **WARNING**

Group [G03F 7/70625](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70633 . . . . . {Overlay, i.e. relative alignment between patterns printed by separate exposures in different layers, or in the same layer in multiple exposures or stitching}

#### **WARNING**

Group [G03F 7/70633](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70641 . . . . . {Focus}

#### **WARNING**

Group [G03F 7/70641](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/7065 . . . . . {Defects, e.g. optical inspection of patterned layer for defects}

#### **WARNING**

Group [G03F 7/7065](#) is impacted by reclassification into groups [G03F 7/70653](#), [G03F 7/70655](#), [G03F 7/70681](#), [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70653 . . . . . {Metrology techniques}

#### **WARNING**

Group [G03F 7/70653](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/705](#), [G03F 7/70516](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#) and [G03F 7/7065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70655 . . . . . {Non-optical, e.g. atomic force microscope [AFM] or critical dimension scanning electron microscope [CD-SEM]}

#### **WARNING**

Group [G03F 7/70655](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70516](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#) and [G03F 7/7065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70658 . . . . . {Electrical testing}

#### **WARNING**

Group [G03F 7/70658](#) is impacted by reclassification into groups [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#), [G03F 7/706843](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70666 . . . . . {Aerial image, i.e. measuring the image of the patterned exposure light at the image plane of the projection system}

#### **WARNING**

Group [G03F 7/70666](#) is incomplete pending reclassification of documents from group [G03F 7/70616](#).

Group [G03F 7/70666](#) is also impacted by reclassification into groups [G03F 7/70681](#) and [G03F 7/706835](#) - [G03F 7/706841](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70675 . . . . . {Latent image, i.e. measuring the image of the exposed resist prior to development}

#### **WARNING**

Group [G03F 7/70675](#) is impacted by reclassification into groups [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#) and [G03F 7/706843](#) - [G03F 7/706851](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70681 . . . . . {Metrology strategies}

#### **WARNING**

Group [G03F 7/70681](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70508](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#) and [G03F 7/70666](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70683 . . . . . {Mark designs}

#### **WARNING**

Group [G03F 7/70683](#) is incomplete pending reclassification of documents from group [G03F 7/705](#).

Group [G03F 7/70683](#) is also impacted by reclassification into groups [G03F 7/706831](#), [G03F 7/706833](#), [G03F 7/706835](#) - [G03F 7/706841](#), [G03F 7/706843](#) and [G03F 7/706845](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706831 . . . . . {Recipe selection or optimisation, e.g. select or optimise recipe parameters such as wavelength, polarisation or illumination modes}

#### **WARNING**

Group [G03F 7/706831](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70508](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706833 . . . . . {Sampling plan selection or optimisation, e.g. select or optimise the number, order or locations of measurements taken per die, workpiece, lot or batch}

#### **WARNING**

Group [G03F 7/706833](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70508](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70658](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706835 . . . . . {Metrology information management or control}

#### **WARNING**

Groups [G03F 7/706835](#) and [G03F 7/706837](#) are incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70508](#), [G03F 7/70525](#), [G03F 7/70533](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70658](#), [G03F 7/70666](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706837 . . . . . {Data analysis, e.g. filtering, weighting, flyer removal, fingerprints or root cause analysis}

7/706839 . . . . . {Modelling, e.g. modelling scattering or solving inverse problems}

#### **WARNING**

Groups [G03F 7/706839](#) and [G03F 7/706841](#) are incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70525](#), [G03F 7/70533](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70658](#), [G03F 7/70666](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706841 . . . . . {Machine learning}

7/706843 . . . . {Metrology apparatus}

#### **WARNING**

Group [G03F 7/706843](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/705](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70658](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706845 . . . . {Calibration, e.g. tool-to-tool calibration, beam alignment, spot position or focus}

#### **WARNING**

Group [G03F 7/706845](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70491](#), [G03F 7/705](#), [G03F 7/70508](#), [G03F 7/70516](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#), [G03F 7/70658](#), [G03F 7/70675](#) and [G03F 7/70683](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706847 . . . . {Production of measurement radiation, e.g. synchrotron, free-electron laser, plasma source or higher harmonic generation [HHG]}

#### **WARNING**

Group [G03F 7/706847](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#) and [G03F 7/70675](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706849 . . . . {Irradiation branch, e.g. optical system details, illumination mode or polarisation control}

#### **WARNING**

Group [G03F 7/706849](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#) and [G03F 7/70675](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/706851 . . . . {Detection branch, e.g. detector arrangements, polarisation control, wavelength control or dark/bright field detection}

#### **WARNING**

Group [G03F 7/706851](#) is incomplete pending reclassification of documents from groups [G03F 7/70483](#), [G03F 7/70608](#), [G03F 7/70616](#), [G03F 7/70625](#), [G03F 7/70633](#), [G03F 7/70641](#), [G03F 7/7065](#) and [G03F 7/70675](#).

All groups listed in this Warning should be considered in order to perform a complete search.

7/70691 . . {Handling of masks or workpieces}

7/707 . . . {Chucks, e.g. chucking or un-chucking operations or structural details}

7/70708 . . . . {being electrostatic; Electrostatically deformable vacuum chucks}

7/70716 . . . {Stages}

7/70725 . . . . {control}

7/70733 . . . {Handling masks and workpieces, e.g. exchange of workpiece or mask, transport of workpiece or mask}

7/70741 . . . . {Handling masks outside exposure position, e.g. reticle libraries}

#### **NOTE**

Protective means, e.g. containers, for masks, blanks or pellicles, are further classified in group [G03F 1/66](#)

7/7075 . . . . {Handling workpieces outside exposure position, e.g. SMIF box}

7/70758 . . . {Drive means, e.g. actuators, motors for long- or short-stroke modules or fine or coarse driving}

7/70766 . . . {Reaction force control means, e.g. countermass}

7/70775 . . . {Position control, e.g. interferometers or encoders for determining the stage position}

7/70783 . . . {Handling stress or warp of chucks, masks or workpieces, e.g. to compensate for imaging errors or considerations related to warpage of masks or workpieces due to their own weight}

7/70791 . . . {Large workpieces, e.g. glass substrates for flat panel displays or solar panels}

7/708 . . {Construction of apparatus, e.g. environment aspects, hygiene aspects or materials}

7/70808 . . . {Construction details, e.g. housing, load-lock, seals or windows for passing light in or out of apparatus}

7/70816 . . . . {Bearings}

7/70825 . . . . {Mounting of individual elements, e.g. mounts, holders or supports (workpiece or mask holders [G03F 7/707](#))}

7/70833 . . . . {Mounting of optical systems, e.g. mounting of illumination system, projection system or stage systems on base-plate or ground}

7/70841 . . . . {Constructional issues related to vacuum environment, e.g. load-lock chamber}

7/7085	. . . {Detection arrangement, e.g. detectors of apparatus alignment possibly mounted on wafers, exposure dose, photo-cleaning flux, stray light, thermal load}	9/7015	. . . . {Reference, i.e. alignment of original or workpiece with respect to a reference not on the original or workpiece}
7/70858	. . . {Environment aspects, e.g. pressure of beam-path gas, temperature ( <a href="#">pollution aspects G03F 7/70916</a> )}	9/7019	. . . {Calibration}
7/70866	. . . . {of mask or workpiece}	9/7023	. . . {Aligning or positioning in direction perpendicular to substrate surface}
7/70875	. . . . {Temperature, e.g. temperature control of masks or workpieces via control of stage temperature}	9/7026	. . . . {Focusing}
7/70883	. . . . {of optical system}	9/703	. . . . {Gap setting, e.g. in proximity printer}
7/70891	. . . . {Temperature}	9/7034	. . . . {Leveling}
7/709	. . . . {Vibration, e.g. vibration detection, compensation, suppression or isolation}	9/7038	. . . {Alignment for proximity or contact printer ( <a href="#">proximity or contact printers per se G03F 7/7035</a> )}
7/70908	. . . {Hygiene, e.g. preventing apparatus pollution, mitigating effect of pollution or removing pollutants from apparatus}	9/7042	. . . {Alignment for lithographic apparatus using patterning methods other than those involving the exposure to radiation, e.g. by stamping or imprinting ( <a href="#">non-exposure lithographic processes per se G03F 7/0002</a> )}
7/70916	. . . . {Pollution mitigation, i.e. mitigating effect of contamination or debris, e.g. foil traps}	9/7046	. . . {Strategy, e.g. mark, sensor or wavelength selection}
7/70925	. . . . {Cleaning, i.e. actively freeing apparatus from pollutants, e.g. using plasma cleaning}	9/7049	. . {Technique, e.g. interferometric}
7/70933	. . . . {Purge, e.g. exchanging fluid or gas to remove pollutants}	9/7053	. . . {Non-optical, e.g. mechanical, capacitive, using an electron beam, acoustic or thermal waves}
7/70941	. . . . {Stray fields and charges, e.g. stray light, scattered light, flare, transmission loss}	9/7057	. . . . {Gas flow, e.g. for focusing, leveling or gap setting}
7/7095	. . . {Materials, e.g. materials for housing, stage or other support having particular properties, e.g. weight, strength, conductivity, thermal expansion coefficient}	9/7061	. . . . {Scanning probe microscopy, e.g. AFM, scanning tunneling microscopy}
7/70958	. . . . {Optical materials or coatings, e.g. with particular transmittance, reflectance or anti-reflection properties}	9/7065	. . {Production of alignment light, e.g. light source, control of coherence, polarization, pulse length, wavelength}
7/70966	. . . . . {Birefringence}	9/7069	. . {Alignment mark illumination, e.g. darkfield, dual focus}
7/70975	. . . {Assembly, maintenance, transport or storage of apparatus}	9/7073	. . {Alignment marks and their environment ( <a href="#">marks specific to masks G03F 1/42</a> ; <a href="#">marks specific to molds or stamps G03F 7/0002</a> ; <a href="#">overlay marks G03F 7/70633</a> ; <a href="#">marks applied to semiconductor devices H01L 23/544</a> )}
7/70983	. . . {Optical system protection, e.g. pellicles or removable covers for protection of mask}	9/7076	. . . {Mark details, e.g. phase grating mark, temporary mark}
7/70991	. . . {Connection with other apparatus, e.g. multiple exposure stations, particular arrangement of exposure apparatus and pre-exposure and/or post-exposure apparatus; Shared apparatus, e.g. having shared radiation source, shared mask or workpiece stage, shared base-plate; Utilities, e.g. cable, pipe or wireless arrangements for data, power, fluids or vacuum}	9/708	. . . {Mark formation}
9/00	<b>Registration or positioning of originals, masks, frames, photographic sheets or textured or patterned surfaces, e.g. automatically (<a href="#">G03F 7/22</a> takes precedence; preparation of photographic masks <a href="#">G03F 1/00</a>; within photographic printing apparatus for making copies <a href="#">G03B 27/00</a>)</b>	9/7084	. . . {Position of mark on substrate, i.e. position in (x, y, z) of mark, e.g. buried or resist covered mark, mark on rearside, at the substrate edge, in the circuit area, latent image mark, marks in plural levels}
2009/005	. {for microlithography}	9/7088	. . {Alignment mark detection, e.g. TTR, TTL, off-axis detection, array detector, video detection}
9/70	. {for microlithography ( <a href="#">measuring printed patterns for monitoring overlay G03F 7/70633</a> or focus <a href="#">G03F 7/70641</a> ; projection system adjustment <a href="#">G03F 7/70258</a> ; position control <a href="#">G03F 7/70775</a> )}	9/7092	. . {Signal processing}
9/7003	. . {Alignment type or strategy, e.g. leveling, global alignment}	9/7096	. . {Arrangement, mounting, housing, environment, cleaning or maintenance of apparatus}
9/7007	. . . {Alignment other than original with workpiece}		
9/7011	. . . . {Pre-exposure scan; original with original holder alignment; Prealignment, i.e. workpiece with workpiece holder}		