

CPC**COOPERATIVE PATENT CLASSIFICATION****G03H**

HOLOGRAPHIC PROCESSES OR APPARATUS (holograms, e.g. point holograms, used as ordinary optical elements [G02B 5/32](#); producing stereoscopic or other three-dimensional effects [G02B 27/22](#); diffraction-grating systems [G02B 27/44](#); systems using moirè fringes [G02B 27/60](#); optical logic elements [G02F 3/00](#); stereo-photography [G03B 35/00](#); photosensitive materials or processes for photographic purposes G03C; { stereo-photographic or similar processes [G03C 9/00](#)}; apparatus for processing exposed photographic materials G03D; analogue computers performing mathematical operations with the aid of optical elements [G06E 3/00](#); authentication by radiation, of concealed information carried by holograms or diffraction gratings [G06K 19/16](#); holographic storage [G11B 7/0065](#), [G11C 13/04](#); { stereoscopic or other three dimensional effects in television systems [H04N 13/00](#)})

NOTE

This subclass covers means for producing a record of the phase and amplitude information of a wave-front, which information can be used to reconstruct the original wave-front, or means to reconstruct the original wave-front from a record containing the phase and amplitude information of the wave-front.

G03H 1/00

Holographic processes or apparatus using light, infra-red or ultra-violet waves for obtaining holograms or for obtaining an image from them; Details peculiar thereto

G03H 1/0005

- . { Adaptation of holography to specific applications (holographic optical element [G02B 5/32](#); holographic scanner [G02B 26/106](#); recognition using holographic mask [G06K 9/76](#); holographic memories [G11B 7/0065](#), [G11C 13/042](#))}

G03H 1/0011

- .. { for security or authentication (holograms on information-bearing cards [B42D 15/10D](#); testing papers with holograms [G07D 7/0013](#))}

G03H 1/02

- . Details { of features involved during the holographic process; Replication of holograms without interference recording}

G03H 1/0236

- .. { Form or shape of the hologram when not registered to the substrate, e.g. trimming the hologram to alphanumerical shape (substrates bearing a hologram [G03H 1/0272](#))}

G03H 1/024

- .. { Hologram nature or properties}

G03H 1/0244

- ... { Surface relief holograms (replicating hologram without interference recording [G03H 1/0276](#))}

G03H 1/0248

- ... { Volume holograms}

G03H 1/0252

- .. { Laminate comprising a hologram layer}

G03H 1/0256

- ... { having specific functional layer}

G03H 1/0272

- .. { Substrate bearing the hologram}

G03H 1/0276

- .. { Replicating a master hologram without interference recording (surface relief holograms [G03H 1/0244](#))}

G03H 1/028

- ... { by embossing}

- G03H 1/04 . Processes or apparatus for producing holograms ([G03H 1/26](#) takes precedence)
- G03H 1/0402 .. { Recording geometries or arrangements ([G03H 1/0443](#), [G03H 1/0476](#), [G03H 1/16](#) take precedence)}
- G03H 1/0404 ... { In-line recording arrangement}
- G03H 1/0406 ... { Image plane or focused image holograms, i.e. an image of the object or holobject is formed on, in or across the recording plane}
- G03H 1/0408 ... { Total internal reflection [TIR] holograms, e.g. edge lit or substrate mode holograms}
- G03H 1/041 ... { Optical element in the object space affecting the object beam, not otherwise provided for}
- G03H 1/0443 .. { Digital holography, i.e. recording holograms with digital recording means (**holobject computation** [G03H 1/0866](#))}
- G03H 1/0465 .. { Particular recording light; Beam shape or geometry ([G03H 1/06](#) takes precedence)}
- G03H 1/0476 .. { Holographic printer ([G03H 1/268](#) takes precedence)}
- G03H 1/0486 .. { Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations}
- G03H 1/0493 .. { Special holograms not otherwise provided for, e.g. conosopic, referenceless holography}
- G03H 1/06 .. using incoherent light
- G03H 1/08 .. Synthesising holograms, { i.e. holograms synthesized from objects or objects from holograms}(using electric digital computers [G06F](#); [G06T](#))
- G03H 1/0808 ... { Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific}
- G03H 1/0841 ... { Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding}
- G03H 1/0866 ... { Digital holographic imaging, i.e. synthesizing holobjects from holograms}
- G03H 1/0891 ... { Processes or apparatus adapted to convert digital holographic data into a hologram ([G03H 1/2294](#) takes precedence)}
- G03H 1/10 .. using modulated reference beam
- G03H 1/12 ... Spatial modulation, e.g. ghost imaging
- G03H 1/14 ... Temporal modulation, e.g. extending depth of field or phase compensation for object motion
- G03H 1/16 .. using Fourier transform ({[G03H 1/10](#)}, [G03H 1/12](#), [G03H 1/14](#) take precedence; analogue computers [G06G](#), e.g. [G06G 7/19](#))
- G03H 1/18 .. Particular processing of hologram record carriers, e.g. for obtaining blazed holograms {(photographic processing in general [G03C](#), [G03D](#))}
- G03H 1/181 ... { Pre-exposure processing, e.g. hypersensitisation}
- G03H 1/182 ... { Post-exposure processing, e.g. latensification}
- G03H 1/20 .. Copying holograms by holographic { i.e. optical} means
- G03H 1/202 ... { Contact copy when the reconstruction beam for the master H1 also serves as reference beam for the copy H2}
- G03H 1/22 . Processes or apparatus for obtaining an optical image from holograms ([G03H 1/26](#) to [G03H 1/34](#) take precedence)
- G03H 1/2202 .. { Reconstruction geometries or arrangements}
- G03H 1/2205 ... { using downstream optical component}

- G03H 1/2249 .. { Holobject properties}
- G03H 1/2286 .. { Particular reconstruction light ([G03H 1/24](#) takes precedence); Beam properties}
- G03H 1/2294 .. { Addressing the hologram to an active spatial light modulator}
- G03H 1/24 .. using white light {e.g. rainbow holograms}

- G03H 1/26 . Processes or apparatus specially adapted to produce multiple { sub-} holograms or to obtain images from them, e.g. multicolour technique
- G03H 1/2645 .. { Multiplexing processes, e.g. aperture, shift, or wavefront multiplexing}
- G03H 1/265 ... { Angle multiplexing; Multichannel holograms ([G03H 1/268](#) takes precedence)}
- G03H 1/268 .. { Holographic stereogram}
- G03H 1/28 .. superimposed holograms only
- G03H 1/30 .. discrete holograms only

- G03H 1/32 . Systems for obtaining speckle elimination
- G03H 1/34 . Systems for reducing the space-spatial bandwidth product

- G03H 3/00** **Holographic processes or apparatus using ultrasonic, sonic or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them ([G03H 1/22](#) takes precedence; { acoustic non-destructive testing using holographic methods [G01N 29/0663](#); seismology using acoustic vibrations [G01V 1/00](#); non-holographic methods for visualizing acoustic waves [G10K 15/00](#)})**

- G03H 5/00** **Holographic processes or apparatus using particles or using waves other than those covered by groups [G03H 1/00](#) or [G03H 3/00](#) for obtaining holograms; Processes or apparatus for obtaining an optical image from them ([G03H 1/22](#) takes precedence; construction of electron microscopes [H01J 37/26](#); { investigating or analysing materials by the use of microwaves [G01N 22/00](#), by the use of particles wave or X-rays [G01N 23/00](#), [G21K 7/00](#)})**

- G03H 2001/00** **Holographic processes or apparatus using light, infra-red or ultra-violet waves for obtaining holograms or for obtaining an image from them; Details peculiar thereto**

- G03H 2001/0005 . { Adaptation of holography to specific applications (holographic optical element [G02B 5/32](#); holographic scanner [G02B 26/106](#); recognition using holographic mask [G06K 9/76](#); holographic memories [G11B 7/0065](#), [G11C 13/042](#))}
- G03H 2001/0011 .. { for security or authentication (holograms on information-bearing cards [B42D 15/10D](#); testing papers with holograms [G07D 7/0013](#))}
- G03H 2001/0016 ... Covert holograms or holobjects requiring additional knowledge to be perceived, e.g. holobject reconstructed only under IR illumination ([micro-holograms \[G03H 2230/10\]\(#\)](#))
- G03H 2001/0022 Deciphering being performed with numerical or optical key, e.g. with the optical scrambler used during recording ([optical element in object beam \[G03H 1/041\]\(#\)](#))
- G03H 2001/0027 ... Being copy-protected against fraudulent replication, e.g. by layering a filter rejecting laser lines
- G03H 2001/0033 .. in hologrammetry for measuring or analysing

- G03H 2001/0038 . . . analogue or digital hologjects ([holographic interferometry G01B 9/021](#); [investigating particles G01N 15/0227](#))
- G03H 2001/0044 . . . holographic fringes deformations; holographic sensors ([holographic rain sensor in vehicles B60S 1/084](#))
- G03H 2001/005 . . . in microscopy, e.g. digital holographic microscope [DHM] ([microscopes G02B 21/00](#); [digital holography G03H 1/0866](#))
- G03H 2001/0055 . . . in advertising or decorative art
- G03H 2001/0061 . . . in haptic applications when the observer interacts with the hologject
- G03H 2001/0066 . . . for wavefront matching wherein the hologram is arranged to convert a predetermined wavefront into a comprehensive wave, e.g. associative memory ([recognition using holographic masks G06K 9/76](#))
- G03H 2001/0072 . . . for wavefront conjugation wherein the hologram generates a wavefront conjugating a predetermined object, e.g. null testing, positioning, comparative holography
- G03H 2001/0077 . . . for optical manipulation, e.g. holographic optical tweezers [HOT]
- G03H 2001/0083 . . . for restoring distorted objects, e.g. restoring objects through scattering media
- G03H 2001/0088 . . . for video-holography, i.e. integrating hologram acquisition, transmission and display
- G03H 2001/0094 . . . for patterning or machining using the hologject as input light distribution ([microlithography G03F 7/70283](#))

- G03H 2001/02 . . . Details { of features involved during the holographic process; Replication of holograms without interference recording}
- G03H 2001/0204 . . . Object characteristics ([corresponding details, see subgroups of G03H 2210/00](#))
- G03H 2001/0208 . . . Individual components other than the hologram
- G03H 2001/0212 . . . Light sources or light beam properties ([G03H 1/06](#), [G03H 1/24](#) take precedence; [corresponding details, see subgroups of G03H 2222/00](#))
- G03H 2001/0216 . . . Optical components ([G03H 2001/0224](#), [G03H 1/0256](#) take precedence; [corresponding details, see subgroups of G03H 2223/00](#))
- G03H 2001/022 . . . Writing means other than actinic light wave ([corresponding details, see subgroups of G03H 2224/00](#))
- G03H 2001/0224 . . . Active addressable light modulator, i.e. Spatial Light Modulator [SLM] ([corresponding details, see subgroups of G03H 2225/00](#))
- G03H 2001/0228 . . . Electro-optic or electronic components relating to digital holography ([G03H 2001/0224](#) takes precedence; [corresponding details, see subgroups of G03H 2226/00](#))
- G03H 2001/0232 . . . Mechanical components or mechanical aspects not otherwise provided for ([corresponding details, see subgroups of G03H 2227/00](#))
- G03H 2001/026 . . . Recording materials or recording processes ([G03H 2226/11](#) takes precedence; [corresponding details, see subgroups of G03H 2260/00](#))
- G03H 2001/0264 . . . Organic recording material
- G03H 2001/0268 . . . Inorganic recording material, e.g. photorefractive crystal [PRC]
- G03H 2001/0276 . . . { [Replicating a master hologram without interference recording \(surface relief holograms G03H 1/0244\)](#) }
- G03H 2001/0284 . . . by moulding
- G03H 2001/0288 . . . by electroforming
- G03H 2001/0292 . . . by masking
- G03H 2001/0296 . . . Formation of the master hologram

- G03H 2001/04 . Processes or apparatus for producing holograms ([G03H 1/26](#) takes precedence)
- G03H 2001/0402 .. { Recording geometries or arrangements ([G03H 1/0443](#), [G03H 1/0476](#), [G03H 1/16](#) take precedence)}
- G03H 2001/0413 ... for recording transmission holograms
- G03H 2001/0415 ... for recording reflection holograms
- G03H 2001/0417 for recording single beam Lippmann hologram wherein the object is illuminated by reference beam passing through the recording material
- G03H 2001/0419 ... for recording combined transmission and reflection holograms
- G03H 2001/0421 ... Parallax aspect
- G03H 2001/0423 Restricted parallax, e.g. horizontal parallax only holograms [HPO]
- G03H 2001/0426 Extended parallax, e.g. panoramic or 360deg. holograms
- G03H 2001/0428 ... Image holography, i.e. an image of the object or holobject is recorded ([G03H 1/0406](#) takes precedence; holographic microscope [G03H 2001/005](#))
- G03H 2001/043 ... Non planar recording surface, e.g. curved surface
- G03H 2001/0432 ... Constrained record wherein, during exposure, the recording means undergoes constrains substantially differing from those expected at reconstruction
- G03H 2001/0434 ... In situ recording when the hologram is recorded within the device used for reconstruction
- G03H 2001/0436 ... Holographic camera ([portable device G03H 2227/02](#))
- G03H 2001/0439 ... for recording Holographic Optical Element [HOE] (HOE per se [G02B 5/32](#))
- G03H 2001/0441 ... Formation of interference pattern, not otherwise provided for
- G03H 2001/0443 .. { Digital holography, i.e. recording holograms with digital recording means (holobject computation [G03H 1/0866](#))}
- G03H 2001/0445 ... Off-axis recording arrangement ([G03H 2001/0456](#) takes precedence)
- G03H 2001/0447 ... In-line recording arrangement
- G03H 2001/045 ... Fourier or lensless Fourier arrangement
- G03H 2001/0452 ... arranged to record an image of the object (holographic microscope [G03H 2001/005](#))
- G03H 2001/0454 ... Arrangement for recovering hologram complex amplitude
- G03H 2001/0456 Spatial heterodyne, i.e. filtering a Fourier transform of the off-axis record
- G03H 2001/0458 Temporal or spatial phase shifting, e.g. parallel phase shifting method
- G03H 2001/046 ... Synthetic aperture
- G03H 2001/0463 ... Frequency heterodyne, i.e. one beam is frequency shifted
- G03H 2001/0465 .. { Particular recording light; Beam shape or geometry ([G03H 1/06](#) takes precedence)}
- G03H 2001/0467 ... Gated recording using pulsed or low coherence light source, e.g. light in flight, first arriving light
- G03H 2001/0469 ... Object light being reflected by the object
- G03H 2001/0471 ... Object light being transmitted through the object, e.g. illumination through living cells
- G03H 2001/0473 ... Particular illumination angle between object or reference beams and hologram
- G03H 2001/0476 .. { Holographic printer ([G03H 1/268](#) takes precedence)}
- G03H 2001/0478 ... Serial printer i.e. point oriented processing
- G03H 2001/048 ... Parallel printer, i.e. a fringe pattern is reproduced

- G03H 2001/0482 . . . Interference based printer
- G03H 2001/0484 . . . Arranged to produce three-dimensional fringe pattern
- G03H 2001/0486 . . { Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations}
- G03H 2001/0489 . . . by using phase stabilized beam
- G03H 2001/0491 . . . by monitoring the hologram formation, e.g. via a feed-back loop
- G03H 2001/0493 . . { Special holograms not otherwise provided for, e.g. conoscopic, referenceless holography}
- G03H 2001/0495 . . . Polarisation preserving holography where amplitude, phase and polarisation state of the original objet wavefront are recorded
- G03H 2001/0497 . . . Dot matrix holograms
- G03H 2001/08 . . Synthesising holograms, { i.e. holograms synthesized from objects or objects from holograms}(using electric digital computers G06F; G06T)
- G03H 2001/0808 . . . { Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific}
- G03H 2001/0816 Iterative algorithms
- G03H 2001/0825 Numerical processing in hologram space, e.g. combination of the CGH [computer generated hologram] with a numerical optical element
- G03H 2001/0833 Look up table
- G03H 2001/0841 . . . { Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding}
- G03H 2001/085 Kinoform, i.e. phase only encoding wherein the computed field is processed into a distribution of phase differences
- G03H 2001/0858 Cell encoding wherein each computed values is represented by at least two pixels of the modulator, e.g. detour phase coding
- G03H 2001/0866 . . . { Digital holographic imaging, i.e. synthesizing holobjects from holograms}
- G03H 2001/0875 Solving phase ambiguity, e.g. phase unwrapping
- G03H 2001/0883 Reconstruction aspect, e.g. numerical focusing
- G03H 2001/18 . . Particular processing of hologram record carriers, e.g. for obtaining blazed holograms {(photographic processing in general G03C, G03D)}
- G03H 2001/182 . . . { Post-exposure processing, e.g. latensification}
- G03H 2001/183 Erasing the holographic information
- G03H 2001/184 Partially erasing
- G03H 2001/185 . . . Applying a curing step
- G03H 2001/186 . . . Swelling or shrinking the holographic record or compensation thereof e.g. for controlling the reconstructed wavelength (G03H 2001/0033, G03H 2250/44 take precedence)
- G03H 2001/187 . . . Trimming process i.e. macroscopically patterning the hologram (shape of hologram G03H 1/0236)
- G03H 2001/188 Demetallisation, i.e. removing the enhancing metallic layer (enhancement layer G03H 2250/36)
- G03H 2001/20 . . Copying holograms by holographic { i.e. optical} means
- G03H 2001/205 . . . Subdivided copy, e.g. scanning transfer
- G03H 2001/207 . . . with modification of the nature of the hologram, e.g. changing from volume to surface relief or from reflection to transmission
- G03H 2001/22 . . Processes or apparatus for obtaining an optical image from holograms (G03H 1/26 to

G03H 1/34 take precedence)

- G03H 2001/2202 .. { Reconstruction geometries or arrangements}
- G03H 2001/2205 ... { using downstream optical component}
- G03H 2001/2207 Spatial filter, e.g. for suppressing higher diffraction orders
- G03H 2001/221 Element having optical power, e.g. field lens
- G03H 2001/2213 Diffusing screen revealing the real hologram, e.g. container filled with gel to reveal the 3D hologram
- G03H 2001/2215 Plane screen
- G03H 2001/2218 being perpendicular to optical axis
- G03H 2001/2221 Screen having complex surface, e.g. a structured object
- G03H 2001/2223 ... Particular relationship between light source, hologram and observer
- G03H 2001/2226 Edge lit holograms ([TIR recording G03H 1/0408](#))
- G03H 2001/2228 adapted for reflection and transmission reconstruction
- G03H 2001/2231 Reflection reconstruction
- G03H 2001/2234 Transmission reconstruction
- G03H 2001/2236 ... Details of the viewing window
- G03H 2001/2239 Enlarging the viewing window
- G03H 2001/2242 Multiple viewing windows
- G03H 2001/2244 ... Means for detecting or recording the hologram
- G03H 2001/2247 for testing the hologram or hologram
- G03H 2001/2249 .. { Hologram properties}
- G03H 2001/2252 ... Location of the hologram
- G03H 2001/2255 Hologram out of Fourier or hologram planes
- G03H 2001/2257 Straddling the hologram
- G03H 2001/226 Virtual or real
- G03H 2001/2263 ... Multicoloured hologram
- G03H 2001/2265 Achromatic hologram
- G03H 2001/2268 Rainbow hologram
- G03H 2001/2271 RGB hologram
- G03H 2001/2273 ... Pseudo-dynamic hologram, e.g. due to angle multiplexing and viewer motion
- G03H 2001/2276 ... Polarisation dependent hologram ([G03H 2001/0495 takes precedence](#))
- G03H 2001/2278 ... Orthoscopic or pseudoscopic
- G03H 2001/2281 ... Particular depth of field
- G03H 2001/2284 ... Superimposing the hologram with other visual information
- G03H 2001/2286 .. { Particular reconstruction light ([G03H 1/24 takes precedence](#)); Beam properties}
- G03H 2001/2289 ... when reconstruction wavelength differs from recording wavelength
- G03H 2001/2292 ... Using scanning means
- G03H 2001/2294 .. { Addressing the hologram to an active spatial light modulator}
- G03H 2001/2297 ... using frame sequential, e.g. for reducing speckle noise
- G03H 2001/26 . Processes or apparatus specially adapted to produce multiple { sub-} holograms or to obtain images from them, e.g. multicolour technique

- G03H 2001/2605 . . . Arrangement of the sub-holograms, e.g. partial overlapping
- G03H 2001/261 in optical contact
- G03H 2001/2615 in physical contact, i.e. layered holograms
- G03H 2001/262 not in optical contact ([G03H 1/30](#) takes precedence)
- G03H 2001/2625 . . . Nature of the sub-holograms
- G03H 2001/263 Made of different recording materials
- G03H 2001/2635 Mixed volume and surface relief holograms
- G03H 2001/264 One hologram being a HOE
- G03H 2001/2645 . . . { Multiplexing processes, e.g. aperture, shift, or wavefront multiplexing}
- G03H 2001/2655 Time multiplexing, i.e. consecutive records wherein the period between records is pertinent per se
- G03H 2001/266 Wavelength multiplexing
- G03H 2001/2665 Coherence multiplexing wherein different holograms are perceived under coherent or incoherent illumination
- G03H 2001/267 Polarisation multiplexing
- G03H 2001/2675 Phase code multiplexing, wherein the sub-holograms are multiplexed according to spatial modulation of the reference beam ([reference beam spatial modulation G03H 1/12](#))
- G03H 2001/268 . . . { Holographic stereogram}
- G03H 2001/2685 One step recording process
- G03H 2001/269 Two and more than two steps recording process
- G03H 2001/2695 Dedicated printer ([holographic printers G03H 1/0476](#))
- G03H 2001/30 discrete holograms only
- G03H 2001/303 Interleaved sub-holograms, e.g. three RGB sub-holograms having interleaved pixels for reconstructing coloured hologram
- G03H 2001/306 Tiled identical sub-holograms

G03H 2210/00 **Object characteristics** ([not used, see subgroups](#))

- G03H 2210/10 . . . Modulation characteristics, e.g. amplitude, phase, polarisation
- G03H 2210/11 Amplitude modulating object
- G03H 2210/12 Phase modulating object, e.g. living cell
- G03H 2210/13 Coloured object
- G03H 2210/20 . . . 2D object
- G03H 2210/22 2D SLM object wherein the object beam is formed of the light modulated by the SLM ([SLM per se G03H 2001/0224](#))
- G03H 2210/30 . . . 3D object
- G03H 2210/32 3D+2D, i.e. composition of 3D and 2D sub-objects, e.g. scene in front of planar background
- G03H 2210/33 3D/2D, i.e. the object is formed of stratified 2D planes, e.g. tomographic data
- G03H 2210/36 Occluded features resolved due to parallax selectivity

- G03H 2210/40 . Synthetic representation, i.e. digital or optical object decomposition
- G03H 2210/42 .. from real object, e.g. using 3D scanner
- G03H 2210/44 .. Digital representation
- G03H 2210/441 ... Numerical processing applied to the object data other than numerical propagation ([synthesizing propagation G03H 1/0808](#))
- G03H 2210/45 .. Representation of the decomposed object
- G03H 2210/452 ... into points
- G03H 2210/454 ... into planes
- G03H 2210/46 .. for subsequent optical processing ([G03H 1/268 takes precedence](#))

- G03H 2210/50 . Nature of the object
- G03H 2210/52 .. Alphanumerical
- G03H 2210/53 .. Coded object not directly interpretable, e.g. encrypted object, barcode
- G03H 2210/54 .. For individualisation of product
- G03H 2210/55 .. Having particular size, e.g. irresolvable by the eye
- G03H 2210/56 .. Multiple objects, e.g. each in different environment
- G03H 2210/562 ... Holographic object, i.e. a combination of an object and holobject ([G03H 1/20 takes precedence](#))

- G03H 2210/62 . Moving object

- G03H 2210/63 . Environment affecting the recording, e.g. underwater ([G03H 2001/0432 takes precedence](#))

- G03H 2222/00** **Light sources or light beam properties** ([not used, see subgroups](#))

- G03H 2222/10 . Spectral composition
- G03H 2222/12 .. Single or narrow bandwidth source e.g. laser, light emitting diode [LED]
- G03H 2222/13 .. Multi-wavelengths wave with discontinuous wavelength ranges ([G03H 2222/18 takes precedence](#))
- G03H 2222/14 .. Broadband source, e.g. sun light
- G03H 2222/15 .. Ultra Violet [UV]
- G03H 2222/16 .. Infra Red [IR]
- G03H 2222/17 .. White light ([G03H 1/24 takes precedence](#))
- G03H 2222/18 ... RGB trichrome light

- G03H 2222/20 . Coherence of the light source
- G03H 2222/22 .. Spatial coherence
- G03H 2222/23 .. Temporal coherence
- G03H 2222/24 .. Low coherence light normally not allowing valuable record or reconstruction ([G03H 1/06 takes precedence](#))

- G03H 2222/31 . Polarised light

- G03H 2222/32 . Unpolarised light
- G03H 2222/33 . Pulsed light beam
- G03H 2222/34 . Multiple light sources
- G03H 2222/35 . Transverse intensity distribution of the light beam
- G03H 2222/36 . Scanning light beam
- G03H 2222/40 . Particular irradiation beam not otherwise provided for
- G03H 2222/42 .. Reference beam at recording stage
- G03H 2222/43 .. Object beam at recording stage
- G03H 2222/44 .. Beam irradiating the object at recording stage
- G03H 2222/45 .. Interference beam at recording stage, i.e. following combination of object and reference beams
- G03H 2222/46 .. Reconstruction beam at reconstruction stage
- G03H 2222/47 .. Evanescent wave
- G03H 2222/50 . Geometrical property of the irradiating beam
- G03H 2222/52 .. Divergent beam
- G03H 2222/53 .. Collimated beam
- G03H 2222/54 .. Convergent beam
- G03H 2222/55 .. Astigmatic beam having different focal planes ([anamorphic optical element G03H 2223/21](#))
- G03H 2222/56 .. Conjugated beam
- G03H 2223/00 **Optical components** (not used, see subgroups)**
- G03H 2223/12 . Amplitude mask, e.g. diaphragm, Louver filter
- G03H 2223/13 . Phase mask
- G03H 2223/14 . Diffuser, e.g. lens array, random phase mask
- G03H 2223/15 . Colour filter, e.g. interferential colour filter
- G03H 2223/16 . Optical waveguide, e.g. optical fibre, rod
- G03H 2223/17 . Element having optical power
- G03H 2223/18 . Prism
- G03H 2223/19 . Micro-optic array e.g. lens array
- G03H 2223/20 . Birefringent optical element, e.g. wave plate
- G03H 2223/21 . Anamorphic optical element e.g. cylindrical ([astigmatic beam G03H 2222/55](#))

- G03H 2223/22 . Polariser
- G03H 2223/23 . Diffractive element
- G03H 2223/24 . Reflector; Mirror
- G03H 2223/25 . Index matching material
- G03H 2223/26 . Means providing optical delay e.g. for path length matching
- G03H 2223/50 . Particular location or purpose of optical element ([downstream optical component G03H 1/2205](#))
- G03H 2223/52 .. Filtering the object information
- G03H 2223/53 .. Filtering the hologram information, i.e. the fringe pattern
- G03H 2223/54 .. Filtering the holobject information
- G03H 2223/55 .. Arranged at a Fourier plane

- G03H 2224/00** **Writing means other than actinic light wave** ([not used, see subgroups](#))
- G03H 2224/02 . Mechanical means, e.g. diamond tool
- G03H 2224/04 . Particle beam, e.g. e-beam
- G03H 2224/06 . Thermal or photo-thermal means ([infra red source G03H 2222/16](#))

- G03H 2225/00** **Active addressable light modulator** ([not used, see subgroups](#))
- G03H 2225/10 . Shape or geometry
- G03H 2225/11 .. 1D SLM
- G03H 2225/12 .. 2D SLM
- G03H 2225/13 .. 3D SLM

- G03H 2225/20 . Nature, e.g. e-beam addressed
- G03H 2225/21 .. Acousto-optic SLM [AO-SLM]
- G03H 2225/22 .. Electrically addressed SLM [EA-SLM]
- G03H 2225/23 .. Grating based SLM
- G03H 2225/24 .. Having movable pixels, e.g. micro-electromechanical systems [MEMS]
- G03H 2225/25 .. Optically addressed SLM [OA-SLM]

- G03H 2225/30 . Modulation
- G03H 2225/31 .. Amplitude only
- G03H 2225/32 .. Phase only
- G03H 2225/33 .. Complex modulation
- G03H 2225/34 ... Amplitude and phase coupled modulation
- G03H 2225/35 .. Colour modulation

- G03H 2225/36 . . . Polarisation
- G03H 2225/52 . . . Reflective modulator
- G03H 2225/55 . . . Having optical element registered to each pixel
- G03H 2225/60 . . . Multiple SLMs
- G03H 2225/61 . . . for multicolour processing

- G03H 2226/00** **Electro-optic or electronic components relating to digital holography (not used, see subgroups)**
- G03H 2226/02 . . . Computing or processing means, e.g. digital signal processor [DSP]
- G03H 2226/04 . . . Transmission or communication means, e.g. internet protocol
- G03H 2226/05 . . . Means for tracking the observer
- G03H 2226/11 . . . Electro-optic recording means, e.g. CCD, pyroelectric sensors
- G03H 2226/13 . . . Multiple recording means

- G03H 2227/00** **Mechanical components or mechanical aspects not otherwise provided for (not used, see subgroups)**
- G03H 2227/02 . . . Handheld portable device, e.g. holographic camera, mobile holographic display
- G03H 2227/03 . . . Means for moving one component ([G03H 1/0476](#), [G03H 2001/2695](#) take precedence)
- G03H 2227/04 . . . Production line for mass production
- G03H 2227/05 . . . Support holding the holographic record
- G03H 2227/06 . . . Support including light source

- G03H 2230/00** **Form or shape of the hologram when not registered to the substrate (not used, see subgroups)**
- G03H 2230/10 . . . Micro-hologram not registered to the substrate

- G03H 2240/00** **Hologram nature or properties (not used, see subgroups)**
- G03H 2240/10 . . . Physical parameter modulated by the hologram ([G03H 2001/0224](#) takes precedence)
- G03H 2240/11 . . . Phase only modulation ([G03H 1/0244](#) takes precedence)
- G03H 2240/12 . . . Amplitude only modulation
- G03H 2240/13 . . . Amplitude and phase complex modulation
- G03H 2240/15 . . . Polarisation modulation
- G03H 2240/20 . . . Details of physical variations exhibited in the hologram

- G03H 2240/21 . . . Optical density variations
- G03H 2240/22 Chromatic variations e.g. photochromic or electrochromic
- G03H 2240/23 . . . Optical length variations, e.g. bleached silver halide ([G03H 1/0244](#) takes precedence)
- G03H 2240/24 Index variations only
- G03H 2240/25 . . . Magnetic variations
- G03H 2240/26 . . . Structural variations, e.g. structure variations due to photoanchoring or conformation variations due to photo-isomerisation
- G03H 2240/40 . . . Dynamic of the variations
- G03H 2240/41 Binary
- G03H 2240/42 Discrete level
- G03H 2240/43 Continuous
- G03H 2240/50 . . Parameters or numerical values associated with holography, e.g. peel strength
- G03H 2240/51 . . . Intensity, power or luminance ([G03H 2240/52](#) takes precedence)
- G03H 2240/52 . . . Exposure parameters e.g. time, intensity
- G03H 2240/53 . . . Diffraction efficiency [DE]
- G03H 2240/54 . . . Refractive index
- G03H 2240/55 . . . Thickness
- G03H 2240/56 . . . Resolution
- G03H 2240/61 . . . SLM related parameters, e.g. pixel size
- G03H 2240/62 . . . Sampling aspect applied to sensor or display
- G03H 2250/00** . . **Laminate comprising a hologram layer** ([not used, see subgroups](#))
- G03H 2250/10 . . . arranged to be transferred onto a carrier body ([adhesive layer G03H 2250/35](#))
- G03H 2250/12 . . . Special arrangement of layers
- G03H 2250/14 . . . Forming layer onto which a surface relief hologram is formed ([G03H 2270/52](#) takes precedence)
- G03H 2250/32 . . . Antireflective layer
- G03H 2250/33 . . . Absorbing layer
- G03H 2250/34 . . . Colour layer
- G03H 2250/35 . . . Adhesive layer
- G03H 2250/36 . . . Conform enhancement layer
- G03H 2250/37 . . . Enclosing the photosensitive material
- G03H 2250/38 . . . Liquid crystal
- G03H 2250/39 . . . Protective layer

- G03H 2250/40 . Printed information overlapped with the hologram
- G03H 2250/41 . Polarisation active layer
- G03H 2250/42 . Reflective layer ([G03H 2250/36](#) takes precedence)
- G03H 2250/43 . One layer having dispersed particles (**S02H 260/33** takes precedence)
- G03H 2250/44 . Colour tuning layer

- G03H 2260/00** **Recording materials or recording processes** (not used, see subgroups)

- G03H 2260/10 . Dichromated gelatine or equivalents
- G03H 2260/12 . Photopolymer
- G03H 2260/14 . Photoresist
- G03H 2260/16 . Silver halide emulsion

- G03H 2260/30 . Details of photosensitive recording material not otherwise provided for
- G03H 2260/31 .. Ageing or resistance of the material ([G03H 2250/39](#) takes precedence)
- G03H 2260/32 .. Combining different recording materials ([G03H 2001/2615](#) takes precedence)
- G03H 2260/33 .. Having dispersed compound
- G03H 2260/34 .. Non uniform thickness
- G03H 2260/35 .. Rewritable material allowing several record and erase cycles
- G03H 2260/36 ... Dynamic material where the lifetime of the recorded pattern is quasi instantaneous, the hologram is simultaneously reconstructed

- G03H 2260/50 . Reactivity or recording processes ([writing means G03H 2001/0212, G03H 2001/022](#))
- G03H 2260/51 .. Photoanisotropic reactivity wherein polarized light induces material birefringence, e.g. azo-dye doped polymer
- G03H 2260/52 .. Photochromic reactivity wherein light induces a reversible transformation between two states having different absorption spectra
- G03H 2260/53 .. Photoconductor thermoplastic reactivity wherein light is transformed into an electrostatic then into a thickness distribution
- G03H 2260/54 .. Photorefractive reactivity wherein light induces photo-generation, redistribution and trapping of charges then a modification of refractive index, e.g. photorefractive polymer
- G03H 2260/61 .. Producing material deformation
- G03H 2260/62 .. Direct etching
- G03H 2260/63 .. Indirect etching, e.g. lithography ([photoresist G03H 2260/14](#))

- G03H 2270/00** **Substrate bearing the hologram** (not used, see subgroups)

- G03H 2270/10 . Composition
- G03H 2270/11 .. Crystal or glass ([G03H 2270/55](#) takes precedence)

- G03H 2270/12 .. Fibrous, e.g. paper, textile
- G03H 2270/13 .. Metallic
- G03H 2270/14 .. Plastic

- G03H 2270/20 . Shape
 - G03H 2270/21 .. Curved bearing surface
 - G03H 2270/22 .. Disc shaped
 - G03H 2270/23 .. Ribbon shaped, e.g. holographic foil
 - G03H 2270/24 .. Having particular size, e.g. microscopic

- G03H 2270/30 . Nature
 - G03H 2270/31 .. Flexible
 - G03H 2270/32 .. Transparent

- G03H 2270/52 . Integrated surface relief hologram without forming layer

- G03H 2270/53 . Recording material dispersed into porous substrate

- G03H 2270/54 . Recording material filed in recessed substrate

- G03H 2270/55 . being an optical element, e.g. spectacles