

**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 moiré 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.

**Guidance heading:****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. conoscopic, 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](#) }

#### Guidance heading:

**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 holobjects ([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 holobject
- 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 holobject 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 constraints 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

<a href="#">G03H 2001/0482</a>	...	Interference based printer
<a href="#">G03H 2001/0484</a>	...	Arranged to produce three-dimensional fringe pattern
<a href="#">G03H 2001/0486</a>	..	{ Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations }
<a href="#">G03H 2001/0489</a>	...	by using phase stabilized beam
<a href="#">G03H 2001/0491</a>	...	by monitoring the hologram formation, e.g. via a feed-back loop
<a href="#">G03H 2001/0493</a>	..	{ Special holograms not otherwise provided for, e.g. conoscopic, referenceless holography }
<a href="#">G03H 2001/0495</a>	...	Polarisation preserving holography where amplitude, phase and polarisation state of the original objet wavefront are recorded
<a href="#">G03H 2001/0497</a>	...	Dot matrix holograms
<a href="#">G03H 2001/08</a>	..	Synthesising holograms, { i.e. holograms synthesized from objects or objects from holograms } (using electric digital computers <a href="#">G06F</a> ; <a href="#">G06T</a> )
<a href="#">G03H 2001/0808</a>	...	{ Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific }
<a href="#">G03H 2001/0816</a>	....	Iterative algorithms
<a href="#">G03H 2001/0825</a>	....	Numerical processing in hologram space, e.g. combination of the CGH [computer generated hologram] with a numerical optical element
<a href="#">G03H 2001/0833</a>	....	Look up table
<a href="#">G03H 2001/0841</a>	...	{ Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding }
<a href="#">G03H 2001/085</a>	....	Kinoform, i.e. phase only encoding wherein the computed field is processed into a distribution of phase differences
<a href="#">G03H 2001/0858</a>	....	Cell encoding wherein each computed values is represented by at least two pixels of the modulator, e.g. detour phase coding
<a href="#">G03H 2001/0866</a>	...	{ Digital holographic imaging, i.e. synthesizing holobjects from holograms }
<a href="#">G03H 2001/0875</a>	....	Solving phase ambiguity, e.g. phase unwrapping
<a href="#">G03H 2001/0883</a>	....	Reconstruction aspect, e.g. numerical focusing
<a href="#">G03H 2001/18</a>	..	Particular processing of hologram record carriers, e.g. for obtaining blazed holograms { (photographic processing in general <a href="#">G03C</a> , <a href="#">G03D</a> ) }
<a href="#">G03H 2001/182</a>	...	{ Post-exposure processing, e.g. latensification }
<a href="#">G03H 2001/183</a>	....	Erasing the holographic information
<a href="#">G03H 2001/184</a>	.....	Partially erasing
<a href="#">G03H 2001/185</a>	...	Applying a curing step
<a href="#">G03H 2001/186</a>	...	Swelling or shrinking the holographic record or compensation thereof e.g. for controlling the reconstructed wavelength ( <a href="#">G03H 2001/0033</a> , <a href="#">G03H 2250/44</a> take precedence)
<a href="#">G03H 2001/187</a>	...	Trimming process i.e. macroscopically patterning the hologram (shape of hologram <a href="#">G03H 1/0236</a> )
<a href="#">G03H 2001/188</a>	....	Demetallisation, i.e. removing the enhancing metallic layer (enhancement layer <a href="#">G03H 2250/36</a> )
<a href="#">G03H 2001/20</a>	..	Copying holograms by holographic { i.e. optical } means
<a href="#">G03H 2001/205</a>	...	Subdivided copy, e.g. scanning transfer
<a href="#">G03H 2001/207</a>	...	with modification of the nature of the hologram, e.g. changing from volume to surface relief or from reflection to transmission
<a href="#">G03H 2001/22</a>	.	Processes or apparatus for obtaining an optical image from holograms ( <a href="#">G03H 1/26</a> to <a href="#">G03H 1/34</a> 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 holobject, e.g. container filed with gel to reveal the 3D holobject
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 ( <a href="#">TIR recording G03H 1/0408</a> )
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 holobject
G03H 2001/2247	....	for testing the hologram or holobject
G03H 2001/2249	..	{ Holobject properties }
G03H 2001/2252	...	Location of the holobject
G03H 2001/2255	....	Holobject out of Fourier or hologram planes
G03H 2001/2257	....	Straddling the hologram
G03H 2001/226	....	Virtual or real
G03H 2001/2263	...	Multicoloured holobject
G03H 2001/2265	....	Achromatic holobject
G03H 2001/2268	....	Rainbow hologram
G03H 2001/2271	....	RGB holobject
G03H 2001/2273	...	Pseudo-dynamic holobject, e.g. due to angle multiplexing and viewer motion
G03H 2001/2276	...	Polarisation dependent holobject ( <a href="#">G03H 2001/0495 takes precedence</a> )
G03H 2001/2278	...	Orthoscopic or pseudoscopic
G03H 2001/2281	...	Particular depth of field
G03H 2001/2284	...	Superimposing the holobject with other visual information
G03H 2001/2286	..	{ Particular reconstruction light ( <a href="#">G03H 1/24 takes precedence</a> ) ; 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 ( <a href="#">G03H 1/30</a> 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 holobjects 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 ( <a href="#">reference beam spatial modulation G03H 1/12</a> )
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 ( <a href="#">holographic printers G03H 1/0476</a> )
G03H 2001/30	..	discrete holograms only
G03H 2001/303	...	Interleaved sub-holograms, e.g. three RGB sub-holograms having interleaved pixels for reconstructing coloured holobject
G03H 2001/306	...	Tiled identical sub-holograms

### Guidance heading:

#### **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 ( <a href="#">SLM per se G03H 2001/0224</a> )
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](#))

#### Guidance heading:

#### **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 ( <a href="#">downstream optical component G03H 1/2205</a> )
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
<b>G03H 2224/00</b>	<b>Writing means other than actinic light wave</b> ( <a href="#">not used, see subgroups</a> )
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 ( <a href="#">infra red source G03H 2222/16</a> )
<b>G03H 2225/00</b>	<b>Active addressable light modulator</b> ( <a href="#">not used, see subgroups</a> )
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 holobject 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