

**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.

**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 25/328](#); 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 1/02 . 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 1/0236 . . {Form or shape of the hologram when not registered to the substrate, e.g. trimming the hologram to alphanumeric 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 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 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 2001/0284 . . . {by moulding}
- G03H 2001/0288 . . . {by electroforming}
- G03H 2001/0292 . . . {by masking}
- G03H 2001/0296 . . . {Formation of the master hologram}
- 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 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 1/0443 . . {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 ( <a href="#">holographic microscope G03H 2001/005</a> )}
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 1/0465	. .	{Particular recording light; Beam shape or geometry ( <a href="#">G03H 1/06 takes precedence</a> )}
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 1/0476	. .	{Holographic printer ( <a href="#">G03H 1/268 takes precedence</a> )}
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 1/0486	. .	{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 1/0493	. .	{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 object wavefront are recorded}
G03H 2001/0497	. . .	{Dot matrix holograms}
G03H 1/06	. .	using incoherent light
G03H 1/08	. .	Synthesising holograms, {i.e. holograms synthesized from objects or objects from holograms} ( <a href="#">using electric digital computers G06F; G06T</a> )
G03H 1/0808	. . .	{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 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 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 1/0866 . . . {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 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 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 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 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 1/22 . . Processes or apparatus for obtaining an optical image from holograms ([G03H 1/26](#) - [G03H 1/34](#) take precedence)
- G03H 1/2202 . . {Reconstruction geometries or arrangements}
- G03H 1/2205 . . . {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 filled 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 1/2249	. . {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 1/2286	. . {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 1/2294	. . {Addressing the hologram to an active spatial light modulator}
G03H 2001/2297	. . . {using frame sequential, e.g. for reducing speckle noise}
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 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 takes precedence</a> )}
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 1/2645 . . {Multiplexing processes, e.g. aperture, shift, or wavefront multiplexing}
- G03H 1/265 . . . {Angle multiplexing; Multichannel holograms ([G03H 1/268](#) takes precedence)}
- 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 ([reference beam spatial modulation G03H 1/12](#))}
- G03H 1/268 . . {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 1/28 . . superimposed holograms only
- G03H 1/30 . . 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}
- 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 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 . . Alphanumeric
- 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

<b>G03H 2227/00</b>	<b>Mechanical components or mechanical aspects not otherwise provided for</b> (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 ( <a href="#">G03H 1/0476</a> , <a href="#">G03H 2001/2695</a> 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
<b>G03H 2230/00</b>	<b>Form or shape of the hologram when not registered to the substrate</b> (not used, see subgroups)
G03H 2230/10	• Micro-hologram not registered to the substrate
<b>G03H 2240/00</b>	<b>Hologram nature or properties</b> (not used, see subgroups)
G03H 2240/10	• Physical parameter modulated by the hologram ( <a href="#">G03H 2001/0224</a> takes precedence)
G03H 2240/11	• . . Phase only modulation ( <a href="#">G03H 1/0244</a> 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 ( <a href="#">G03H 1/0244</a> 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 ( <a href="#">G03H 2240/52</a> 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 ([G03H 2260/33 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