

**CPC****COOPERATIVE PATENT CLASSIFICATION****G01T**

**MEASUREMENT OF NUCLEAR OR X-RADIATION** (radiation analysis of materials, mass spectrometry [G01N](#); counters per se [G06M](#), [H03K](#); electric discharge tubes for analysing radiation or particles [H01J 40/00](#), [H01J 47/00](#), [H01J 49/00](#))

**NOTES**

1. This subclass covers the measurement of X-radiation, gamma radiation, corpuscular radiation, cosmic radiation or neutron radiation.
2. Attention is drawn to the Notes following the title of class [G01](#).

**G01T 1/00**

**Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation** ([G01T 3/00](#), [G01T 5/00](#) take precedence)

[G01T 1/003](#)

- {Scintillation (flow) cells}

[G01T 1/006](#)

- {Total absorption calorimeters; Shower detectors}

[G01T 1/02](#)

- Dosimeters ([G01T 1/15](#) takes precedence, measuring exposure time to X-rays [H05G 1/28](#))

[G01T 1/023](#)

- • {Scintillation dose-rate meters}

[G01T 1/026](#)

- • {Semiconductor dose-rate meters}

[G01T 1/04](#)

- • Chemical dosimeters ([G01T 1/06](#), [G01T 1/08](#) take precedence)

[G01T 1/06](#)

- • Glass dosimeters {using colour change; including plastic dosimeters}

[G01T 1/08](#)

- • Photographic dosimeters (sensitive materials, processing thereof [G03C](#); {photometry [G01J 1/52](#)})

[G01T 1/10](#)

- • Luminescent dosimeters

[G01T 1/105](#)

- • • Read-out devices ([G01T 1/115](#) takes precedence)

[G01T 1/11](#)

- • • Thermo-luminescent dosimeters {(thermo-luminescent compositions [C09K 11/00](#))}

[G01T 1/115](#)

- • • • Read-out devices

[G01T 1/12](#)

- • Calorimetric dosimeters

[G01T 1/14](#)

- • Electrostatic dosimeters (construction of ionisation chambers [H01J 47/02](#); {electrometers [G01R 5/28](#)})

[G01T 1/142](#)

- • • Charging devices; Read-out devices

[G01T 1/15](#)

- Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit (pulse rate meters in general [G01R 23/02](#))

[G01T 1/16](#)

- Measuring radiation intensity ([G01T 1/29](#) takes precedence; {self-powered detectors [G01T 3/006](#); using an ionisation chamber filled with a liquid or solid, e.g. frozen liquid, dielectric [G01T 3/008](#)})

[G01T 1/1603](#)

- • {with a combination of at least two different types of detector (see provisionally also [G01T 1/16](#))}

[G01T 1/1606](#)

- • {with other specified detectors not provided for in the other sub-groups of [G01T 1/16](#) (see provisionally also [G01T 1/16](#))}

[G01T 1/161](#)

- • Application in the field of nuclear medicine, e.g. in vivo counting {(apparatus for radiation diagnosis [A61B 6/00](#))}

G01T 1/1611	. . .	{using both transmission and emission sources sequentially (SPECT imaging <a href="#">G01T 1/1642</a> ; PET imaging <a href="#">G01T 1/2985</a> ; detecting hidden objects, e.g. weapons, explosives <a href="#">G01V 5/0008</a> )}
G01T 1/1612	. . . .	{with scintillation detectors ( <a href="#">G01T 1/20</a> takes precedence)}
G01T 1/1614	. . . .	{with semiconductor detectors ( <a href="#">G01T 1/24</a> takes precedence)}
G01T 1/1615	. . .	{using both transmission and emission sources simultaneously (SPECT imaging <a href="#">G01T 1/1642</a> ; PET imaging <a href="#">G01T 1/2985</a> ; detecting hidden objects, e.g. weapons, explosives <a href="#">G01V 5/0008</a> )}
G01T 1/1617	. . . .	{with scintillation detectors ( <a href="#">G01T 1/20</a> takes precedence)}
G01T 1/1618	. . . .	{with semiconductor detectors ( <a href="#">G01T 1/24</a> takes precedence)}
G01T 1/163	. . .	Whole body counters {(hand or feet contamination measurement <a href="#">G01T 1/167</a> ; lung, brain, thyroid, kidney or the like counting <a href="#">G01T 1/16</a> )}
G01T 1/1635	. . . .	{involving relative movement between detector and subject; scanning beds (profile scanning <a href="#">G01T 1/166</a> ; positioning patients, tiltable tables for radiation diagnosis <a href="#">A61B 6/04</a> )}
G01T 1/164	. . .	Scintigraphy (radioisotopes <a href="#">G21G 4/00</a> ; tracers <a href="#">G21H 5/00</a> ; {measurement of spatial distribution <a href="#">G01T 1/2914</a> ; apparatus for radiation diagnosis in different planes <a href="#">A61B 6/02</a> )}
G01T 1/1641	. . . .	{Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras}
G01T 1/1642	. . . . .	{using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras}
G01T 1/1644	. . . . .	{using an array of optically separate scintillation elements permitting direct location of scintillations ( <a href="#">G01T 1/1645</a> takes precedence)}
G01T 1/1645	. . . . .	{using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter}
G01T 1/1647	. . . . .	{Processing of scintigraphic data (not related to a particular imaging system <a href="#">G01T 1/2992</a> )}
G01T 1/1648	. . . . .	{Ancillary equipment for scintillation cameras e.g. reference markers, devices for removing motion artifacts, calibration devices (adapted for flow studies <a href="#">G01T 1/1647</a> )}
G01T 1/166	. . . .	involving relative movement between detector and subject {(scanners in general without using scintigraphy <a href="#">G01T 1/2964</a> )}
G01T 1/1663	. . . . .	{Processing methods of scan data, e.g. involving contrast enhancement, background reduction, smoothing, motion correction, dual radio-isotope scanning, computer processing (for measuring spatial distribution of radiation <a href="#">G01T 1/2992</a> ; general purpose image data processing <a href="#">G06T 1/00</a> ; computerized tomography <a href="#">G06T 11/003</a> ); Ancillary equipment (colour printers <a href="#">G01T 1/1666</a> )}
G01T 1/1666	. . . . .	{adapted for printing different symbols or colours according to the intensity or energy level of the detected radioactivity (depth discrimination in colour <a href="#">G01T 1/2985</a> )}
G01T 1/167	. .	Measuring radioactive content of objects, e.g. contamination (whole body counters <a href="#">G01T 1/163</a> )

- G01T 1/169
  - • Exploration, location of contaminated surface areas (prospecting by the use of nuclear radiation e.g. of natural or induced radioactivity [G01V 5/00](#) ) {in situ measurement, e.g. floor contamination monitor (directional detectors [G01T 1/2907](#))}
- G01T 1/17
  - • Circuit arrangements not adapted to a particular type of detector {(pulse-selection circuits [H03K](#), [G01R](#))}
- G01T 1/171
  - • • {Compensation of dead-time counting losses (see provisionally also [G01T 1/17](#))}
- G01T 1/172
  - • • with coincidence circuit arrangements ([G01T 1/178](#) takes precedence; {combination of detectors, see [G01T 1/1603](#), [G01T 1/30](#), [G01T 1/361](#)})
- G01T 1/175
  - • • Power supply circuits (power supply circuits per se [H02J](#); converters [H02M](#))
- G01T 1/178
  - • • for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain water
- G01T 1/18
  - • with counting-tube arrangements, e.g. with Geiger counters (tubes [H01J 47/08](#); {with alarm provision [G01T 7/125](#)})
- G01T 1/185
  - • with ionisation chamber arrangements (construction of ionisation chambers [H01J 47/02](#); {gas analysis by ionisation [G01N 27/66](#); measuring pressure [G01L 9/00](#); leak detection [G01M 3/00](#); tele-measurements [G08C](#)})
- G01T 1/20
  - • with scintillation detectors
- G01T 1/2002
  - • • {Optical details, e.g. reflecting or diffusing layers}
- G01T 1/2004
  - • • {Scintilloscopes (fluoroscopes [G21K 4/00](#); radiation diagnosis [A61B 6/00](#))}
- G01T 1/2006
  - • • {using a combination of a scintillator and photodetector which measures the means radiation intensity}
- G01T 1/2008
  - • • {using a combination of different types of scintillation detectors, e.g. phoswich}
- WARNING**

Pending reclassification, for subject-matter regarding phoswich see also [G01T 1/20](#)
- G01T 1/201
  - • • {using scintillating fibres}
- WARNING**

Not complete, see also [G01T 1/2992](#)
- G01T 1/2012
  - • • {using stimuable phosphors, e.g. stimuable phosphor sheets}
- WARNING**

This group and subgroups are not complete pending reclassification; see also group [G01T 1/2992](#)
- G01T 1/2014
  - • • • {Reading out of stimuable sheets, e.g. latent image}
- G01T 1/2016
  - • • • {Erasing of stimuable sheets, e.g. with light, heat or the like}
- G01T 1/2018
  - • • {Scintillation-photodiode combination}
- G01T 1/202
  - • • the detector being a crystal
- G01T 1/2023
  - • • • {Selection of materials (see provisionally also [G01T 1/202](#))}
- G01T 1/2026
  - • • • {Well-type detectors (see provisionally also [G01T 1/202](#))}

- G01T 1/203 . . . the detector being made of plastics
- G01T 1/2033 . . . . {Selection of materials (see provisionally also [G01T 1/203](#))}
- G01T 1/2036 . . . . {Well-type detectors (see provisionally also [G01T 1/203](#))}
- G01T 1/204 . . . the detector being a liquid
- G01T 1/2042 . . . . {Composition for liquid scintillation systems}
- G01T 1/2045 . . . . . {Liquid scintillation quench systems}
- G01T 1/2047 . . . . . {Sample preparation}
- G01T 1/205 . . . the detector being a gas
- G01T 1/208 . . . Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
- G01T 1/22 . . with Cerenkov detectors
- G01T 1/24 . . with semiconductor detectors ([semiconductor devices per se H01L 31/00](#))
- G01T 1/241 . . . {Electrode arrangements, e.g. continuous or parallel strips or the like (constructional or manufacturing details [H01L 31/00](#))}
- G01T 1/242 . . . {Stacked detectors, e.g. for depth information (constructional or manufacturing details [H01L 25/00](#))}
- G01T 1/243 . . . {Modular detectors, e.g. arrays formed from self contained units (constructional or manufacturing details [H01L 25/00](#))}
- G01T 1/244 . . . {Auxiliary details, e.g. casings, cooling, damping or insulation against damage by e.g. heat, pressure or the like}
- G01T 1/245 . . . {using memory cells}
- G01T 1/246 . . . {utilizing latent read-out, e.g. charge stored and read-out later}
- G01T 1/247 . . . {Detector read-out circuitry (for processing gain or off-set correction [H04N](#))}
- G01T 1/248 . . . {Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate}
- G01T 1/249 . . . {specially adapted for use in SPECT or PET (SPECT imaging [G01T 1/1642](#); PET imaging [G01T 1/2985](#); detecting hidden objects, e.g. weapons, explosives [G01V 5/0008](#))}
- G01T 1/26 . . with resistance detectors {(photoresistors [H01L 31/00](#))}
- G01T 1/28 . . with secondary-emission detectors ([secondary-electron-emitting electrodes in general H01J 1/32](#) ) {optionally combined with scintillation counters (secondary emission tubes [H01J 43/00](#))}
- G01T 1/29 . . Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation ([scintigraphy G01T 1/164](#); [mass-spectrometers H01J 49/025](#))
- G01T 1/2907 . . {Angle determination; Directional detectors; Telescopes (prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity [G01V 5/00](#))}
- G01T 1/2914 . . {Measurement of spatial distribution of radiation}
- G01T 1/2921 . . . {Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras (using scintigraphy [G01T 1/1641](#))}
- G01T 1/2928 . . . . {using solid state detectors}
- G01T 1/2935 . . . . {using ionisation detectors}
- G01T 1/2942 . . . . {using autoradiographic methods}

- G01T 1/295 . . . . {using coded aperture devices e.g. Fresnel zone plates (handling of radiation of particles e.g. using diaphragms, collimators, diffraction [G21K 1/00](#))}
  - G01T 1/2957 . . . . {using channel multiplier arrays (channel multipliers [H01J 43/18](#); [G01T 1/1645](#) takes precedence)}
  - G01T 1/2964 . . . {Scanners (using scintigraphy [G01T 1/166](#))}
  - G01T 1/2971 . . . . {using solid state detectors}
  - G01T 1/2978 . . . {Hybrid imaging systems, e.g. using a position sensitive detector (camera) to determine the distribution in one direction and using mechanical movement of the detector or the subject in the other direction or using a camera to determine the distribution in two dimensions and using movement of the camera or the subject to increase the field of view ([G01T 1/2985](#) takes precedence)}
  - G01T 1/2985 . . . {In depth localisation e.g. using positron emitters; Tomographic imaging (longitudinal and transverse section imaging; apparatus for radiation diagnosis sequentially in different planes, stereoscopic radiation diagnosis); (using external radiation sources [A61B 6/02](#))}
  - G01T 1/2992 . . . {Radioisotope data or image processing not related to a particular imaging system; Off-line processing of pictures, e.g. rescanners (for measuring radiation intensity [G01T 1/1663](#); digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F 15/00](#); general purpose image data processing [G06T 1/00](#); computerized tomography [G06T 11/003](#))}
  - G01T 1/30 . Measuring half-life of a radioactive substance {(period meters for nuclear fission reactors [G21C 17/14](#))}
  - G01T 1/32 . Measuring polarisation of particles
  - G01T 1/34 . Measuring cross-section, e.g. absorption cross-section of particles
  - G01T 1/36 . Measuring spectral distribution of X-rays or of nuclear radiation {spectrometry (pulse selection circuits per se [H03K](#); investigation of materials by radiation diffraction [G01N 23/20](#); spectrometer tubes [H01J 49/00](#))}
  - G01T 1/361 . . {with a combination of detectors of different types, e.g. anti-Compton spectrometers (intensity measurement with a combination of detectors [G01T 1/1603](#); with coincidence circuit [G01T 1/172](#); see provisionally also [G01T 1/36](#))}
- NOTE**
- [G01T 1/361](#) takes precedence over [G01T 1/362](#)
- G01T 1/362 . . {with scintillation detectors (see provisionally also [G01T 1/36](#), [G01T 1/20](#))}
  - G01T 1/363 . . {with Cerenkov detectors}
  - G01T 1/365 . . {with ionisation detectors e.g. proportional counter (see provisionally also [G01T 1/36](#))}
  - G01T 1/366 . . {with semi-conductor detectors (see provisionally also [G01T 1/36](#))}
  - G01T 1/367 . . {with resistance detectors (see provisionally also [G01T 1/36](#))}
  - G01T 1/368 . . {with secondary-emission detectors (see provisionally [G01T 1/36](#))}
  - G01T 1/38 . . Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance ( $dE/dx$ ) {(constructional details of semiconductor detectors therefor [H01L 31/00](#))}

- G01T 1/40
  - . Stabilisation of spectrometers {(circuits specially adapted for scintillation detectors [G01T 1/208](#))}
- G01T 3/00**

**Measuring neutron radiation** ([G01T 5/00](#) takes precedence; {tubes therefor [H01J 47/12](#); circuits with such tubes [G01T 1/18](#); measuring short time intervals [G04F 10/00](#); measuring pulse characteristics [G01R 29/02](#); neutron choppers [G21K 1/04](#); polarimeters [G01T 1/32](#)})
- G01T 3/001
  - {Spectrometry}
- G01T 3/003
  - . {Recoil spectrometers (light-nuclei recoil ionisation tubes per se [H01J 47/1277](#))}
- G01T 3/005
  - . {Time-of-flight spectrometers (see provisionally also [G01T 3/00](#))}
- G01T 3/006
  - {using self-powered detectors (for neutrons as well as for Y- or X-rays) , e.g. using Compton-effect (Compton diodes) or photo-emission or a (n,B) nuclear reaction (photovoltaic semiconductors [H01L 31/00](#); photo-tubes [H01J 40/00](#); thermionic generators [H01J 45/00](#); radioisotopic generators [G21H 1/00](#), e.g. [G21H 1/02](#), [G21H 1/04](#))}
- G01T 3/008
  - {using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T 3/006](#) takes precedence)}
- G01T 3/02
  - by shielding other radiation
- G01T 3/04
  - using calorimetric devices
- G01T 3/06
  - with scintillation detectors
- G01T 3/065
  - . {Spectrometry}
- G01T 3/08
  - with semiconductor detectors (semiconductor detectors per se [H01L 31/00](#))
- G01T 3/085
  - . {Spectrometry}
- G01T 5/00**

**Recording of movements or tracks of particles** (spark chambers [H01J 47/00](#));  
**Processing or analysis of such tracks**
- G01T 5/002
  - {using a combination of several movement of track recording devices (detectors associated with recording chambers and only serving to trigger these chambers, see the appropriate groups of the chamber e.g. [G01T 5/04](#) - [G01T 5/08](#); see provisionally also [G01T 5/00](#) and other sub-groups)}
- G01T 5/004
  - {Non-electrical readout of multi-wire or parallel-plate chambers (non-electrical readout in such chambers per se [H01J 47/22](#))}
- G01T 5/006
  - . {by optical methods}
- G01T 5/008
  - . {by acoustical methods}
- G01T 5/02
  - Processing of tracks; Analysis of tracks
- G01T 5/04
  - Cloud chambers, e.g. Wilson chamber
- G01T 5/06
  - Bubble chambers
- G01T 5/08
  - Scintillation chambers (discharge tubes [H01J 40/00](#), [H01J 47/00](#); semiconductor devices [H01L](#))
- G01T 5/10
  - Plates or blocks in which tracks or nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica
- G01T 5/12
  - Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers (tubes per se [H01J 47/00](#))
- G01T 5/122
  - . {for readout of each individual wires; (readout in such chambers per se [H01J 47/16](#)); for processing the output signals}

G01T 5/125

- . . . {by using delay lines}

G01T 5/127

- . . . . {by using magnetostrictive delay lines}

**G01T 7/00****Details of radiation-measuring instruments**

G01T 7/005

- . {calibration techniques (stabilization of spectrometer [G01T 1/40](#))}

G01T 7/02

- . Collecting means for receiving or storing samples to be investigated {and possibly directly transporting the samples to the measuring arrangement; particularly for investigating radioactive fluids (sampling, preparing specimens for investigation in general [G01N 1/00](#), [G01N 1/02](#); shielded cells or rooms structurally combined with manipulative devices [G21F](#); measuring of chromatographically separated samples [G01N 30/00](#) to [G01N 30/96](#))}

G01T 7/04

- . . by filtration

G01T 7/06

- . . by electrostatic precipitation ([G01T 7/04](#) takes precedence)

G01T 7/08

- . Means for conveying samples received {(i.e. sample changers [G01N 35/00](#))}

G01T 7/10

- . . using turntables

G01T 7/12

- . Provision for actuation of an alarm

G01T 7/125

- . . {Alarm- or controlling circuits using ionisation chambers, proportional counters or Geiger-Mueller tubes, also functioning as UV detectors (measuring radiation intensity with counting tubes [G01T 1/18](#); measuring radiation intensity with ionisation chambers [G01T 1/185](#); fire alarms actuated by presence of radiation of particles, e.g. of infra-red radiation, of ions [G08B 17/11](#); flame monitoring in combustion devices [F23Q 7/00](#), [F23N](#); discharge tubes per se [H01J 47/00](#))}