

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SEPARATING; MIXING

#### B01 PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

#### B01L CHEMICAL OR PHYSICAL LABORATORY APPARATUS FOR GENERAL USE

##### NOTE

This subclass covers only laboratory apparatus which is either applicable solely to laboratory purposes or which, by reason of its simple construction and adaptability, is such as would not be suitable for industrial use.

##### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:  
- [B01L 3/14](#) covered by [B01L 3/50](#)
- {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

<b>1/00</b>	<b>Enclosures; Chambers</b> (provided with manipulation devices or glove boxes <a href="#">B25J 21/00</a> )	3/0234	. . . . {Repeating pipettes, i.e. for dispensing multiple doses from a single charge}
1/02	. Air-pressure chambers; Air-locks therefor	3/0237	. . . . {Details of electronic control, e.g. relating to user interface}
1/025	. . {Environmental chambers (incubators for culturing cells <a href="#">C12M 41/14</a> ; test chambers for weather resistance <a href="#">G01N 17/002</a> )}	3/0241	. . {Drop counters; Drop formers (making arrays for combinatorial libraries <a href="#">B01J 19/0046</a> ; automation of dispensing for analysis <a href="#">G01N 35/10</a> )}
1/04	. Dust-free rooms or enclosures	3/0244	. . . {using pins}
1/50	. {for storing hazardous materials in the laboratory, e.g. cupboards, waste containers (sample containers <a href="#">B01L 3/50</a> )}	3/0248	. . . . {Prongs, quill pen type dispenser}
1/52	. {Transportable laboratories; Field kits}	3/0251	. . . . {Pin and ring type or pin in tube type dispenser}
<b>3/00</b>	<b>Containers or dishes for laboratory use, e.g. laboratory glassware; Droppers</b>	3/0255	. . . . {characterized by the form or material of the pin tip}
	<b><u>NOTE</u></b>	3/0258	. . . {using stamps}
	Petri dishes for enzymology or microbiology are classified in group <a href="#">C12M 1/22</a> .	3/0262	. . . {using touch-off at substrate or container}
		3/0265	. . . {using valves to interrupt or meter fluid flow, e.g. using solenoids or metering valves}
3/02	. Burettes; Pipettes	3/0268	. . . {using pulse dispensing or spraying, eg. inkjet type, piezo actuated ejection of droplets from capillaries}
3/0203	. . {Burettes, i.e. for withdrawing and redistributing liquids through different conduits}	3/0272	. . . {Dropper bottles}
3/0206	. . . {of the plunger pump type}	3/0275	. . {Interchangeable or disposable dispensing tips}
3/021	. . {Pipettes, i.e. with only one conduit for withdrawing and redistributing liquids}	3/0279	. . . {co-operating with positive ejection means}
3/0213	. . . {Accessories for glass pipettes; Gun-type pipettes, e.g. safety devices, pumps}	3/0282	. . {mounted within a receptacle (wash bottles <a href="#">B01L 3/10</a> )}
3/0217	. . . {of the plunger pump type (medical syringes <a href="#">A61M</a> )}	3/0286	. . {Ergonomic aspects, e.g. form or arrangement of controls}
3/022	. . . . {Capillary pipettes, i.e. having very small bore ( <a href="#">B01L 3/0224</a> - <a href="#">B01L 3/0237</a> take precedence)}	3/0289	. . {Apparatus for withdrawing or distributing predetermined quantities of fluid ( <a href="#">B01L 3/02</a> takes precedence; sample taking <a href="#">G01N 1/00</a> ; sample taking within automatic analysers <a href="#">G01N 35/00</a> ; volume measuring in general <a href="#">G01F</a> )}
3/0224	. . . . {having mechanical means to set stroke length, e.g. movable stops ( <a href="#">B01L 3/0231</a> , <a href="#">B01L 3/0234</a> take precedence)}	3/0293	. . . {for liquids}
3/0227	. . . . {Details of motor drive means ( <a href="#">B01L 3/0231</a> , <a href="#">B01L 3/0234</a> take precedence)}	3/0296	. . . . {from piercable tubing, e.g. in extracorporeal blood sampling}
3/0231	. . . . {having several coaxial pistons}	3/04	. Crucibles
		3/06	. Crystallising dishes

- 3/08 . . . . . Flasks
- 3/10 . . . . . Wash bottles
- 3/12 . . . . . Gas jars or cylinders
- 3/16 . . . . . Retorts
- 3/18 . . . . . Spatulas
- 3/50 . . . . . {Containers for the purpose of retaining a material to be analysed, e.g. test tubes (devices for taking samples of blood [A61B 5/15](#))}
- 3/502 . . . . . {with fluid transport, e.g. in multi-compartment structures (centrifugal-type cuvettes [G01N 21/07](#); analysis by separation into components [G01N 30/00](#); automatic analysers [G01N 35/00](#))}
- 3/5021 . . . . . {Test tubes specially adapted for centrifugation purposes (centrifuges [B04B 5/04](#))}
- 3/50215 . . . . . {using a float to separate phases}
- 3/5023 . . . . . {with a sample being transported to, and subsequently stored in an absorbent for analysis}
- 3/5025 . . . . . {for parallel transport of multiple samples}
- 3/50255 . . . . . {Multi-well filtration}
- 3/5027 . . . . . {by integrated microfluidic structures, i.e. dimensions of channels and chambers are such that surface tension forces are important, e.g. lab-on-a-chip ([B01L 3/5023](#) takes precedence; micromixers [B01F 33/30](#); microreactors for synthesis [B01J 19/0093](#); microcapillary devices in general [B81B 1/00](#))}
- 3/502707 . . . . . {characterised by the manufacture of the container or its components (by shaping or joining plastic parts [B29C 59/00](#), [B29C 65/00](#); by laminating [B32B 37/00](#); manufacture of microstructural devices in general [B81C](#))}
- 3/502715 . . . . . {characterised by interfacing components, e.g. fluidic, electrical, optical or mechanical interfaces}
- 3/502723 . . . . . {characterised by venting arrangements}
- 3/50273 . . . . . {characterised by the means or forces applied to move the fluids (micropumps [F04B 19/006](#), of the membrane type [F04B 43/043](#))}
- 3/502738 . . . . . {characterised by integrated valves (microvalves [F16K 99/0001](#))}
- 3/502746 . . . . . {characterised by the means for controlling flow resistance, e.g. flow controllers, baffles ([B01L 3/502738](#) takes precedence)}
- 3/502753 . . . . . {characterised by bulk separation arrangements on lab-on-a-chip devices, e.g. for filtration or centrifugation (separation in general [B01D](#); microapparatus for analysis using electrophoresis [G01N 27/44791](#); sample preparation [G01N 1/28](#))}
- 3/502761 . . . . . {specially adapted for handling suspended solids or molecules independently from the bulk fluid flow, e.g. for trapping or sorting beads, for physically stretching molecules (investigating characteristics of particles [G01N 15/00](#))}
- 3/502769 . . . . . {characterised by multiphase flow arrangements}
- 3/502776 . . . . . {specially adapted for focusing or laminating flows}
- 3/502784 . . . . . {specially adapted for droplet or plug flow, e.g. digital microfluidics (automatic analysis using a stream of discrete samples in a tube system [G01N 35/08](#))}
- 3/502792 . . . . . {for moving individual droplets on a plate, e.g. by locally altering surface tension}
- 3/5029 . . . . . {using swabs}
- 3/505 . . . . . {flexible containers not provided for above}
- 3/5055 . . . . . {Hinged, e.g. opposable surfaces}
- 3/508 . . . . . {rigid containers not provided for above}
- 3/5082 . . . . . {Test tubes *per se*}
- 3/50825 . . . . . {Closing or opening means, corks, bungs (closures for containers [B65D](#); means for removing stoppers [B67B 7/02](#))}
- 3/5085 . . . . . {for multiple samples, e.g. microtitration plates}
- 3/50851 . . . . . {specially adapted for heating or cooling samples (laboratory heating apparatus [B01L 7/00](#); incubators [C12M](#))}
- 3/50853 . . . . . {with covers or lids}
- 3/50855 . . . . . {using modular assemblies of strips or of individual wells}
- 3/50857 . . . . . {using arrays or bundles of open capillaries for holding samples}
- 3/5088 . . . . . {confining liquids at a location by surface tension, e.g. virtual wells on plates, wires ([B01L 3/50857](#) takes precedence)}
- 3/52 . . . . . {Containers specially adapted for storing or dispensing a reagent ([B01L 3/02](#) takes precedence; containers for medical or pharmaceutical purposes [A61J 1/00](#); containers in general [B65D](#); storing or dispensing test elements [G01N 33/4875](#); automated reagent dispensing [G01N 35/1002](#))}
- 3/523 . . . . . {with means for closing or opening}
- 3/527 . . . . . {for a plurality of reagents}
- 3/54 . . . . . {Labware with identification means (identification of carriers, materials or components in automatic analysers [G01N 35/00732](#))}
- 3/545 . . . . . {for laboratory containers}
- 3/5453 . . . . . {for test tubes}
- 3/5457 . . . . . {for container closures}
- 3/56 . . . . . {Labware specially adapted for transferring fluids}
- 3/561 . . . . . {Tubes; Conduits (in general [F16L](#))}
- 3/563 . . . . . {Joints or fittings (in general [F16L](#)); Separable fluid transfer means to transfer fluids between at least two containers, e.g. connectors}
- 3/5635 . . . . . {connecting two containers face to face, e.g. comprising a filter}
- 3/565 . . . . . {Seals (in general [F16L](#))}
- 3/567 . . . . . {Valves, taps or stop-cocks (in combination with burettes [B01L 3/0203](#); in general [F16K](#))}
- 3/569 . . . . . {Glassware}
- 5/00** . . . . . **Gas handling apparatus** (gas jars or cylinders [B01L 3/12](#); cold traps or cold baffles [B01D 8/00](#))
- 5/02 . . . . . Gas collection apparatus, e.g. by bubbling under water (for sampling [G01N 1/22](#))
- 5/04 . . . . . Gas washing apparatus, e.g. by bubbling
- 7/00** . . . . . **Heating or cooling apparatus** (autoclaves [B01J 3/04](#)); **Heat insulating devices**
- 7/02 . . . . . Water baths; Sand baths; Air baths
- 7/04 . . . . . Heat insulating devices, e.g. jackets for flasks
- 7/50 . . . . . {Cryostats}

- 7/52 . {with provision for submitting samples to a predetermined sequence of different temperatures, e.g. for treating nucleic acid samples ([amplification or hybridisation processes per se C12Q 1/68; controlling sequential reactions for synthesis B01J 19/0046](#))}
- 7/525 . . {with physical movement of samples between temperature zones}
- 7/5255 . . . {by moving sample containers}
- 7/54 . {using spatial temperature gradients}
- 9/00 Supporting devices; Holding devices**
- 9/02 . Laboratory benches or tables; Fittings therefor
- 9/04 . Retort stands; Retort clamps
- 9/06 . Test-tube stands; Test-tube holders
- 9/065 . . {specially adapted for capillary tubes}
- 9/50 . {Clamping means, tongs ([in general F16B 2/06](#))}
- 9/52 . {Supports specially adapted for flat sample carriers, e.g. for plates, slides, chips}
- 9/523 . . {for multisample carriers, e.g. used for microtitration plates}
- 9/527 . . {for microfluidic devices, e.g. used for lab-on-a-chip}
- 9/54 . {Supports specially adapted for pipettes and burettes ([automated pipetting stations G01N 35/10](#))}
- 9/543 . . {for disposable pipette tips, e.g. racks or cassettes}
- 9/547 . . {for dispensing pins}
- 9/56 . {Means for indicating position of a recipient or sample in an array}
- 13/00 {Cleaning or rinsing apparatus}**
- 13/02 . {for receptacle or instruments}
- 99/00 Subject matter not provided for in other groups of this subclass**
- 2200/00 Solutions for specific problems relating to chemical or physical laboratory apparatus**
- 2200/02 . Adapting objects or devices to another
- 2200/021 . . Adjust spacings in an array of wells, pipettes or holders, format transfer between arrays of different size or geometry
- 2200/022 . . . Variable spacings
- 2200/023 . . adapted for different sizes of tubes, tips or container
- 2200/025 . . Align devices or objects to ensure defined positions relative to each other
- 2200/026 . . Fluid interfacing between devices or objects, e.g. connectors, inlet details
- 2200/027 . . . for microfluidic devices
- 2200/028 . . Modular arrangements
- 2200/04 . Exchange or ejection of cartridges, containers or reservoirs
- 2200/06 . Fluid handling related problems
- 2200/0605 . . Metering of fluids
- 2200/061 . . Counting droplets
- 2200/0615 . . Loss of fluid by dripping
- 2200/0621 . . Control of the sequence of chambers filled or emptied
- 2200/0626 . . using levitated droplets
- 2200/0631 . . Purification arrangements, e.g. solid phase extraction [SPE]
- 2200/0636 . . Focussing flows, e.g. to laminate flows
- 2200/0642 . . Filling fluids into wells by specific techniques
- 2200/0647 . . Handling flowable solids, e.g. microscopic beads, cells, particles
- 2200/0652 . . . Sorting or classification of particles or molecules
- 2200/0657 . . . Pipetting powder
- 2200/0663 . . . Stretching or orienting elongated molecules or particles
- 2200/0668 . . . Trapping microscopic beads
- 2200/0673 . . Handling of plugs of fluid surrounded by immiscible fluid
- 2200/0678 . . Facilitating or initiating evaporation
- 2200/0684 . . Venting, avoiding backpressure, avoid gas bubbles
- 2200/0689 . . Sealing
- 2200/0694 . . Creating chemical gradients in a fluid
- 2200/08 . Ergonomic or safety aspects of handling devices
- 2200/082 . . Handling hazardous material
- 2200/085 . . Protection against injuring the user
- 2200/087 . . Ergonomic aspects
- 2200/10 . Integrating sample preparation and analysis in single entity, e.g. lab-on-a-chip concept
- 2200/12 . Specific details about manufacturing devices
- 2200/14 . Process control and prevention of errors
- 2200/141 . . Preventing contamination, tampering
- 2200/142 . . Preventing evaporation
- 2200/143 . . Quality control, feedback systems
- 2200/145 . . . Detecting door closure
- 2200/146 . . . Employing pressure sensors
- 2200/147 . . . Employing temperature sensors
- 2200/148 . . Specific details about calibrations
- 2200/16 . Reagents, handling or storing thereof
- 2200/18 . Transport of container or devices
- 2200/185 . . Long distance transport, e.g. mailing
- 2300/00 Additional constructional details**
- 2300/02 . Identification, exchange or storage of information
- 2300/021 . . Identification, e.g. bar codes
- 2300/022 . . . Transponder chips
- 2300/023 . . Sending and receiving of information, e.g. using bluetooth
- 2300/024 . . Storing results with means integrated into the container
- 2300/025 . . Displaying results or values with integrated means
- 2300/026 . . . Drum counters
- 2300/027 . . . Digital display, e.g. LCD, LED
- 2300/028 . . . Graduation
- 2300/04 . Closures and closing means
- 2300/041 . . Connecting closures to device or container
- 2300/042 . . . Caps; Plugs
- 2300/043 . . . Hinged closures
- 2300/044 . . . pierceable, e.g. films, membranes
- 2300/045 . . . whereby the whole cover is slidable
- 2300/046 . . Function or devices integrated in the closure
- 2300/047 . . . Additional chamber, reservoir
- 2300/048 . . . enabling gas exchange, e.g. vents
- 2300/049 . . . Valves integrated in closure
- 2300/06 . Auxiliary integrated devices, integrated components
- 2300/0609 . . Holders integrated in container to position an object
- 2300/0618 . . . for removable separation walls
- 2300/0627 . . Sensor or part of a sensor is integrated
- 2300/0636 . . . Integrated biosensor, microarrays

- 2300/0645 . . . Electrodes
- 2300/0654 . . . Lenses; Optical fibres
- 2300/0663 . . . Whole sensors
- 2300/0672 . . Integrated piercing tool
- 2300/0681 . . Filter
- 2300/069 . . Absorbents; Gels to retain a fluid
- 2300/08 . . Geometry, shape and general structure
- 2300/0803 . . Disc shape
- 2300/0806 . . . Standardised forms, e.g. compact disc [CD] format
- 2300/0809 . . rectangular shaped
- 2300/0812 . . . Bands; Tapes
- 2300/0816 . . . Cards, e.g. flat sample carriers usually with flow in two horizontal directions
- 2300/0819 . . . Microarrays; Biochips
- 2300/0822 . . . Slides
- 2300/0825 . . . Test strips
- 2300/0829 . . . Multi-well plates; Microtitration plates
- 2300/0832 . . cylindrical, tube shaped
- 2300/0835 . . . Ampoules
- 2300/0838 . . . Capillaries
- 2300/0841 . . . Drums
- 2300/0845 . . . Filaments, strings, fibres, i.e. not hollow
- 2300/0848 . . Specific forms of parts of containers
- 2300/0851 . . . Bottom walls
- 2300/0854 . . . Double walls
- 2300/0858 . . . Side walls
- 2300/0861 . . Configuration of multiple channels and/or chambers in a single devices
- 2300/0864 . . . comprising only one inlet and multiple receiving wells, e.g. for separation, splitting
- 2300/0867 . . . Multiple inlets and one sample wells, e.g. mixing, dilution
- 2300/087 . . . Multiple sequential chambers
- 2300/0874 . . . Three dimensional network
- 2300/0877 . . . Flow chambers
- 2300/088 . . . Channel loops
- 2300/0883 . . . Serpentine channels
- 2300/0887 . . Laminated structure
- 2300/089 . . Virtual walls for guiding liquids
- 2300/0893 . . having a very large number of wells, microfabricated wells
- 2300/0896 . . Nanoscaled
- 2300/10 . . Means to control humidity and/or other gases
- 2300/105 . . using desiccants
- 2300/12 . . Specific details about materials
- 2300/123 . . Flexible; Elastomeric
- 2300/126 . . Paper
- 2300/14 . . Means for pressure control
- 2300/16 . . Surface properties and coatings
- 2300/161 . . Control and use of surface tension forces, e.g. hydrophobic, hydrophilic
- 2300/163 . . . Biocompatibility
- 2300/165 . . . Specific details about hydrophobic, oleophobic surfaces
- 2300/166 . . . . Suprahydrophobic; Ultraphobic; Lotus-effect
- 2300/168 . . Specific optical properties, e.g. reflective coatings
- 2300/18 . . Means for temperature control
- 2300/1805 . . Conductive heating, heat from thermostatted solids is conducted to receptacles, e.g. heating plates, blocks
- 2300/1811 . . . using electromagnetic induction heating
- 2300/1816 . . . using induction heating
- 2300/1822 . . . using Peltier elements
- 2300/1827 . . . using resistive heater
- 2300/1833 . . using electrical currents in the sample itself
- 2300/1838 . . using fluid heat transfer medium
- 2300/1844 . . . using fans
- 2300/185 . . . using a liquid as fluid
- 2300/1855 . . using phase changes in a medium
- 2300/1861 . . using radiation
- 2300/1866 . . . Microwaves
- 2300/1872 . . . Infrared light
- 2300/1877 . . using chemical reactions
- 2300/1883 . . using thermal insulation
- 2300/1888 . . Pipettes or dispensers with temperature control
- 2300/1894 . . Cooling means; Cryo cooling
- 2400/00 Moving or stopping fluids**
- 2400/02 . . Drop detachment mechanisms of single droplets from nozzles or pins
- 2400/021 . . non contact spotting by inertia, i.e. abrupt deceleration of the nozzle or pin
- 2400/022 . . droplet contacts the surface of the receptacle
- 2400/024 . . . touch-off at the side wall of the receptacle
- 2400/025 . . . tapping tip on substrate
- 2400/027 . . electrostatic forces between substrate and tip
- 2400/028 . . Pin is moved through a ring which is filled with a fluid
- 2400/04 . . Moving fluids with specific forces or mechanical means
- 2400/0403 . . . specific forces
- 2400/0406 . . . capillary forces
- 2400/0409 . . . centrifugal forces
- 2400/0412 . . . . using additionally coriolis forces
- 2400/0415 . . . electrical forces, e.g. electrokinetic
- 2400/0418 . . . . electro-osmotic flow [EOF]
- 2400/0421 . . . . electrophoretic flow
- 2400/0424 . . . . Dielectrophoretic forces
- 2400/0427 . . . . Electrowetting
- 2400/043 . . . magnetic forces
- 2400/0433 . . . vibrational forces
- 2400/0436 . . . . acoustic forces, e.g. surface acoustic waves [SAW]
- 2400/0439 . . . . ultrasonic vibrations, vibrating piezo elements
- 2400/0442 . . . thermal energy, e.g. vaporisation, bubble jet
- 2400/0445 . . . . Natural or forced convection
- 2400/0448 . . . . Marangoni flow; Thermocapillary effect
- 2400/0451 . . . . Thermophoresis; Thermodiffusion; Soret-effect
- 2400/0454 . . . radiation pressure, optical tweezers
- 2400/0457 . . . passive flow or gravitation
- 2400/046 . . . Chemical or electrochemical formation of bubbles
- 2400/0463 . . . Hydrodynamic forces, venturi nozzles
- 2400/0466 . . . Evaporation to induce underpressure
- 2400/0469 . . . Buoyancy
- 2400/0472 . . . Diffusion
- 2400/0475 . . specific mechanical means and fluid pressure
- 2400/0478 . . . pistons
- 2400/0481 . . . squeezing of channels or chambers
- 2400/0484 . . . Cantilevers
- 2400/0487 . . . fluid pressure, pneumatics

## B01L

- 2400/049 . . . . vacuum
- 2400/0493 . . Specific techniques used
- 2400/0496 . . . Travelling waves, e.g. in combination with electrical or acoustic forces
- 2400/06 . Valves, specific forms thereof
- 2400/0605 . . check valves
- 2400/0611 . . . duck bill valves
- 2400/0616 . . . Ball valves
- 2400/0622 . . distribution valves, valves having multiple inlets and/or outlets, e.g. metering valves, multi-way valves
- 2400/0627 . . Molecular gates forcing or inhibiting diffusion
- 2400/0633 . . with moving parts
- 2400/0638 . . . membrane valves, flap valves
- 2400/0644 . . . rotary valves
- 2400/065 . . . sliding valves
- 2400/0655 . . . pinch valves
- 2400/0661 . . . shape memory polymer valves
- 2400/0666 . . . Solenoid valves
- 2400/0672 . . . Swellable plugs
- 2400/0677 . . phase change valves; Meltable, freezing, dissolvable plugs; Destructible barriers
- 2400/0683 . . . mechanically breaking a wall or membrane within a channel or chamber
- 2400/0688 . . surface tension valves, capillary stop, capillary break
- 2400/0694 . . vents used to stop and induce flow, backpressure valves
- 2400/08 . Regulating or influencing the flow resistance
- 2400/082 . . Active control of flow resistance, e.g. flow controllers
- 2400/084 . . Passive control of flow resistance
- 2400/086 . . . using baffles or other fixed flow obstructions
- 2400/088 . . . by specific surface properties