Microfluidics Vocabulary

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Content

Comments:

1) When referred to another document unmodified, unless otherwise stated.
2) For most if not all of the quantities defined here, the results of the measurement of that quantity depend on the measurement conditions.
3) We tried to recognise the origin of the definition which we copied and sometimes modified. If we made any mistake in this, please let us know.

General terms, relevant to microfluidics

Item	Explanation	Source
Biocompatibility	Refers to a special quality of some materials allowing them to come into contact biological materials without changing the materials' bioactivity[1].	All about fittings, IDEX lifescience, 2013
Biomarker	A biological molecule found in blood, other body fluids, or tissues that is a sign of a normal or abnormal process, or of a condition or disease. A biomarker may be used to see how well the body responds to a treatment for a disease or condition[2].	NCI Dictionary of Cancer Terms
Classification	Method of sorting into categories.	ISO 22935-1:2009 (used in ISO/IWA 23:2016)
End-users	Person or persons who will ultimately be using the system for its intended purpose.	[SOURCE: ISO/IEC 19770-5:2015(en), 3.13 (used in ISO/IWA 23:2016)
Hydrophilic	A property of material or molecule to transiently bond with water through a hydrogen bonding[3] [4].	Semi MS006: Guide for design and materials for interfacing microfluidic systems
Hydrophobic	A property of a surface or molecule that is repelled from a mass of water[5] [6].	Semi MS006: Guide for design and materials for interfacing microfluidic systems
Interested party and stakeholders	Person or organization that can affect, be affected by or perceive themselves to be affected by a decision or activity.	ISO 28007-1:2015, 3.6 (used in ISO/IWA 23:2016)
Interoperability	Characteristic of providing an intended function in coordination with other components, the characteristic of sharing information with other system	ISO 22902-1:2006, 3.1.42 (used in ISO/IWA 23:2016)

[1] Alternative: ISO 10993 is rejected.
[2] Alternative: ISO 16577:2016 is rejected.
[3] A hydrophilic surface is typically charged-polarized and can attract water to its surface to form a continuous film. Hydrophilic materials can also dissolve more readily in water.
[4] Alternative ISO 16559:2014 is rejected
[5] Water will typically bead or form discrete droplets on a hydrophobic material surface. This is characterized by a high contact angle measurement.
[6] Alternative ISO 16559:2014 is rejected.

	functions or components to provide additional functionality[7].	
Macroscale	Generally, dimensions of 0.1 millimetres or greater.	Semi MS003: Terminology for MEMS technology
Microscale	Generally, the scale of dimensions between 0.1 millimetres to 0.1 x 10-6 meters.	SEMI Draft Document 4213
Miniaturization	Making things on a smaller or miniature scale.	ISO/IWA 23:2016
Plug and play	Denoting or relating to software or devices that are intended to work perfectly when first used or connected, without reconfiguration or adjustment by the user and thereby enable automatic configuration.	ISO/IEC/IEEE 21451-4:2010, 3.1.31, modified (used in ISO/IWA 23:2016)
Wettability	Ability of a liquid (such as an adhesive) to spread on a specific solid surface	ISO 472:2013(en)

[7] Alternative ISO/IEC 30182:2017 is rejected

General terms in microfluidics

Item	Explanation	Source
Actuating resolution	The lowest variation of a physical parameter that can be actuated by a system.	
Centrifugal microfluidics	A sub category of microfluidics utilizing rotation of the cartridge; the fluid flow is mainly controlled by centrifugal-, Euler- and Coriolis- forces.	
Closed system	Systems that use in the cartridge preloaded manufacturer-specific reagents only[8].	
Digital microfluidics	A sub category of microfluidics where droplets are manipulated individually over a surface.	
Droplet microfluidics	A sub category of microfluidics utilizing droplets in a continues of interrupted flow.	
Lab-on-a-chip (LoC)	Highly integrated, microfluidic system providing analytical or diagnostic functions[9].	ISO 10991:2009(E/F): Micro process engineering — Vocabulary, Modified: removed note and replaced "laboratory" by "analytical or diagnostic"
Microfluidics	Handling of fluids in technical apparatus having internal dimensions in the range of micrometres up to a few millimetres.	ISO/IWA 23:2016 [SOURCE: BS EN ISO 10991:2009, 2.5]
Open System	A system that requires acquisition of reagents by the end-user. Such a system needs microfluidic connection(s).	
Resolution	Smallest change in a quantity being measured that causes a perceptible change in corresponding indication.	
Sensing resolution	The lowest variation of a physical parameter that can be detected by a sensor.	

[8] Alternative ISO 20186-1:2019 is rejected.

Flow related terms

Item	Explanation	Source
Actual flow	For the purpose of this standard, the output value of the master reference standard. Expressed in volume units over time units.	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Capillary force or Capillary action	Flowing of liquid inside microchannels without external actuators but only by adhesive force between liquid and channel material.	
Compliance of a fluidic system	The increase of a fluidic system's internal volume under the effect of pressure. Expressed in volume units per pressure units.	
Dead-volume	The portion of the internal volume of a system that is not part of a continuous flow-path. In this context dead signifies unmoving, stagnant, or un-swept. Expressed in volume quantities such as mm^3 or microliter.	Design Guideline for Microfluidic Side Connect
Fall time[10]	The time required for a flow to change from a specified high value to a specified low value. Typically, these values are 10% and 90% of the step height. Expressed in time units.	
Final steady state value[11]	The average value of the actual flow, after the effects of the input transient have expired to a value equal to or below the intrinsic drift and noise. Expressed in volume units over time units	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Hold-up volume	The volume of fluid that is required to fill a device before flow is observed at point of interest or at the outlet. Expressed in volume quantities such as mm^3 or microliter.	Semi MS003: Terminology for MEMS technology.
Hydrodynamic resistance[12]	Ratio of pressure drop over flow rate for a certain component or system. Expressed as pressure units over flow rate unites.	
Hydrostatic pressure	The pressure that is exerted by a fluid at rest at a given height within the fluid, due to the force of gravity. Expressed in pressure units.	
Internal volume[13]	Maximal total available volume comprised within a fluidic component, device or system under	

[10] Equivalent of the rise time.
[11] Ideally identical to the setpoint.
[12] Also known as flow resistivity
[13] Usage of the word "void" here is not recommend, while it suggests an empty space.

	normal atmospheric pressure; this is the total of dead volume and swept volume. Expressed in volume quantities such as mm^3 or microliter.	
Mass flow rate	The mass of fluid which passes per unit time. Expressed in mass units per time units.	
Micro pump	Miniaturized liquid or gas pumping equipment with capacity of lower than millilitre per minute flow rate[14].	
Minimal actuating pressure	Input pressure required to start moving a fluid through the fluidic component[15]. Expressed in pressure units.	
Pressure drop	Difference of pressure between two positions in the flow path. Expressed in pressure units[16]	
Reaction time	The interval of time between the set point step change the moment the flow has increased x% of is intended rise or x% of its intended fall. Typically x=10. Expressed in time units.	
Relative Flow stability, coefficient of variation	Standard deviation of the flow rate divided by the average flow rate. Expressed as a percentage.	
Response time [17]	The interval of time between the set point step change the moment the flow has increased x% of is intended rise or x% of its intended fall. Typically x=90. Expressed in time units.	
Rise time[18]	The time required for a flow to change from a specified low value to a specified high value. Typically, these values are 10% and 90% of the step height. Expressed in time units.	
Setting time[19]	Time elapsed from the application of an ideal step input to the time at which the output has entered and remained within a specified (error) band[20]. Expressed in time units.	

[14] The alternative ISO 10991:2009(E/F): Micro process engineering — Vocabulary is seen as to restrictive

[15] This refers to components inside a system such as internal membranes, etc., this does not take into account external components.

[16] The alternative ISO 12500-2:2007(en), 3.8 is to restrictive.

[17] The response time is the sum of reaction time and rise time.

[18] Equivalent of the fall time.

[19] The settling time includes the response time, plus the rise time and finally, the time needed to be within the specified error margin

[20] This needs definition of “specific band”.

Step response time	The time between the setpoint step change and when the actual flow first enters the specified band.	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Transient overshoot	The maximum change in actual flow minus the steady state change in actual flow, expressed as a percentage of the set point step change.	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Transient undershoot	The maximum amount that the actual flow passes the final steady state value, in the opposite direction of overshoot, expressed as a percentage of the set point step change.	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Set point	The desired value of the controlled flow after a stepchange.	
Specified (error) band	The region between ±5% of the final steady state value or 2% of full scale, whichever is greater.	Modified from: SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests
Swept volume	The portion of a volume that is part of the flow path. Expressed in volume units.	Based on "All about fittings, IDEX lifescience, 2013"
Volumetric flow rate	The volume of fluid which passes per unit time. Expressed in volume units per time units.	

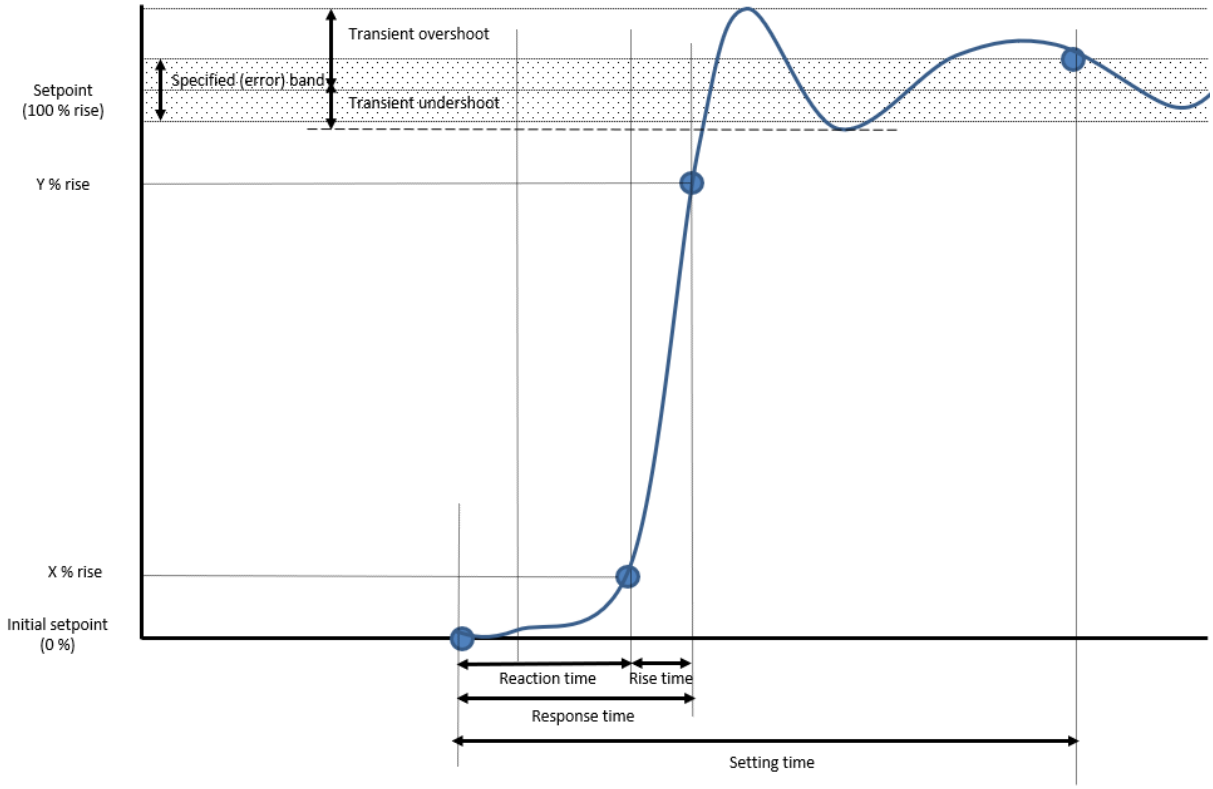

Figure 1: Schematic showing flow control terms related to a step change in flow

Interfacing related terms

Item	Explanation	Source
1st Level or direct connection	Connection through direct contact (without tubes).	
2nd Level or indirect connection	Indirect interconnections using tubes, syringes, O-rings, gaskets and so on (Chip to tube)	
Adhesive connection	Bonding a length of tubing to a port on the microfluidic device with epoxy or other suitable adhesive	
Connector	Component that allows one part of the set to be connected to another	ISO/IWA 23:2016(en)
Dynamic seal	Sealing device used between parts that have relative motion	ISO 5598:2008
Edge exclusion	Area on the edge of the top or bottom surface that should be excluded from certain features or is reserved for certain features or functions.	Design Guideline for Microfluidic Side Connect
Exclusion area	Area on the chip besides the mating area that is used to create a microfluidic connection.	
Ferrule	A metal, polymer or Elastomer ring, tube or cap,	

	(or a multiple arrangement thereof) placed at or fastened to the end of a tube, when pressed against a suitable mating surface with a threaded fitting, or other clamping device, will facilitate a fluid connection[21].	
Ferrule connection	Connection made using a ferrule.	
Flared/ flanged connection	Connection with the flattened surface of a tube pressed against the flat surface of a chip.	
Fluidic adapter	A physical connector that links a microfluidic component to another micro or macroscale fluidic device.	Semi MS003: Terminology for MEMS technology.
Free path connection	Introducing liquids into an open port on the microfluidic device with the use of an external delivery system such as a pipette.	
Gasket	Mechanical (typically elastomer) seal compressed between two components to prevent fluid leakage. May or may not grip and seal onto a tube.	Design Guideline for Microfluidic Side Connect
Gasket	A gasket is a mechanical seal that fills the space between two mating surfaces, generally to prevent leakage from or into the joined objects while under compression[22] [23].	
Interconnect	A device used to connect two things together	ISO/IWA 23:2016
Macro to Micro Sealing	Sealing that connects the micro regime with the macro regime.	Semi MS003: Terminology for MEMS technology.
Macrosealing	Sealing on components at the macroscale.	Semi MS003: Terminology for MEMS technology.
Macrosealing dimensions	Flow channel cross sections having an effective diameter of >100 micrometres.	Semi MS003: Terminology for MEMS technology.

[21] Contact between ferrule and the tube will be with the outside diameter (OD) of the tube. Fluid seal to mating device (chip) will occur at the face of the tube and/or ferrule perpendicular to the tube axis.
[22] Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. Gaskets are commonly produced by cutting from sheet materials, such as gasket paper, rubber, metal, cork, felt, neoprene, Polytetrafluoroethylene (otherwise known as PTFE) or a plastic polymer (such as polychlorotrifluoroethylene).
[23] Alternative ISO 23936-1:2009(en) is rejected while it is not specific enough.

Mating area or mating face	The area on the chip that is covered by the seal or gasket[24].	
Microfluidic connector	An arrangement of components that facilitate exchange of fluidics between devices[25].	
Microfluidic fanout	A transposer is a primitive design element that allows reconfigurable routing of any fluid from any of n input ports to any of n output ports without interrupting continuous flow.	
Microsealing	Sealing on components at the microscale.	Semi MS003: Terminology for MEMS technology.
Microsealing dimensions	Flow channel cross sections having an effective diameter of <25 micrometres; optionally flow channel cross sections having an effective diameter of 25 to 100 micrometres.	Semi MS003: Terminology for MEMS technology.
Multi-connector	Connector that houses a set of connections.	Design Guideline for Microfluidic Side Connect
Multi-seal	Seal or gasket that enables a leak-free interface to an array of ports.	Design Guideline for Microfluidic Side Connect
Nipple	A metal or polymer cylindrical or cone shaped device intended to provide an interference with the inside surface of elastomeric tube, facilitating a fluid connection.	
Nipple/barb connection	Connection having a soft wall tubing is stretched over a conical or cylindrical shaped device	
O-ring connection	An elastomer ring of circular cross-section compressed between two components to prevent fluid leakage. May or may not grip and seal onto a tube.	
Pitch	Mean distance between corresponding features in a regular array of features on a surface.	ISO 18115-2:2013, 5.106 (used in ISO/IWA 23:2016)
Port	Access point on a chip for fluidic contacts	
Port layout	A certain layout in the horizontal plane of a certain type of ports	
Port pitch	The distance between the centres of two	Design Guideline for

[24] Alternative: Area on the chip needed for the interface

[25] A seal and a connector can be one and the same component or a seal can be a separate component. Connectors provide an amount of compression onto the fluidic seals to retain the fluid within the system, or are a vehicle for housing a non-compression seal.

	adjacent ports.	Microfluidic Side Connect
Push-in connection	Connection where a tube is pushed into a recess to create interference fit.	
Seal	A seal is normally a sub-system of a connector comprising a component or components arranged at the end of a fluid path and when typically used with a connector will retain fluid within a microfluidics system.	Design Guideline for Microfluidic Side Connect
Side connect width	The length of the side of the chip where the side connector is to be placed.	Design Guideline for Microfluidic Side Connect
Side connection	Connection to the side surface of a device perpendicular to the top surface.	Design Guideline for Microfluidic Side Connect
Static seals	Seals that operate with non-moving surfaces.	Semi MS006: Guide for design and materials for interfacing microfluidic systems
Top connection	Connection to the top or bottom surface of a device on the x-y-plane.	Design Guideline for Microfluidic Side Connect

Modularity related terms

Item	**Explanation**	**Source**
(Sub)system	Set of interrelated or interacting elements	[SOURCE: ISO 9000:2005, 3.2.1]
Actuator	A device that performs mechanical work using electric energy, chemical energy or other energy forms.	Semi MS003: Terminology for MEMS technology.
Assembly	Combination of components and units that form a functional entity.	ISO 10795:2011(en) (modified)
Bubble chamber	Part of a bubble trap to give space for the bubble to be trapped.	
Bubble trap	A trap for bubbles[26].	
Building block	Component having a standard interface that fits with other building blocks to form a whole system[27].	

[26] Generally a construction to prevent air gabs or air bubbles to enter a microfluidic object.

[27] The building block is a single unit or product that can be assembled onto a fluidic circuit board (FCB) to create a functional system. Often the building block can also be used and tested independently. When the

Cartridge	A modular unit designed to be inserted into a larger piece of equipment. It integrates by assembly several microfluidic components like pumps, sensors, filters etc.	
Component	Set of materials, assembled according to defined and controlled processes, which cannot be disassembled without destroying its capability and which performs a simple function that can be evaluated against expected performance requirements	ISO 10795:2011(en)
Device	Component or assembly of components to perform a required function.	[SOURCE ISO 10209:2012(en), 2.30, modified] (used in ISO/IWA 23:2016)
Element	Part of microfluidic system with one main function[28].	
Filter	A filter is a microfluidic component designed to withhold or detain elements [sub-piece] from a fluid in order to purify the fluid for use further on in the system.	
Flow sensor	A device that detects or measures the motion of fluids.	Semi MS003: Terminology for MEMS technology, modified
Fluidic adapter	See under "Interfacing"	
Fluidic circuit board (FCB)	A fluidic device with microfluidic and with or without electrical routing and some functionality able to have building blocks connected to it to form a microfluidic (sub)system[29].	Design Guideline for Microfluidic Side Connect
Function	Intended effect of a system, subsystem, product, or component.	ISO 10795:2011(en) (modified)
Functional element	Part of a design that only performs one function[30].	
Integration	Process of physically and functionally combining lower-level functional elements (hardware or software) to obtain a particular functional	ISO 10795:2011, 1.117, modified (used in ISO/IWA

main function is a microfluidic operation a building block can also be referred to as microfluidic building block (MFBB)

[28] An element can be a component but can also be a completely integrated part on the system.

[29] Contrary to a cartridge, which is assembled in 3D and contained in a housing, a fluidic circuit board is assembled in 2D and is not contained in a housing. When a FCB is contained in a housing the whole is called a cartridge.

[30] A functional element is not a physical feature as physical parts of a microfluidic device always perform more than one function; for instance a mixer mixes and transport fluid. The term functional element is therefor only used in the design.

	configuration considered to be of a much higher-level entity[31].	23:2016)
Micro mixer	micro process component whose primary function is to mix fluid substances.	ISO 10991:2009(E/F)
Micro process module	micro process component with standardized component interfaces	ISO 10991:2009(E/F): Micro process engineering — Vocabulary
Microfluidic chip	A complex set of integrated fluidic components and their interconnections on a planar substrate, created by etching, imprinting, moulding etc.[32].	
Microfluidic chip holder	A reusable microfluidic interface.	
Microreactor	A device in which (bio)chemical reactions take place in a confinement with at least one lateral dimension below 1 mm.	Chemical Engineering and Chemical Process Technology - Volume III, 2010, modified
Optical window	An opening constructed in an integrated device that functions to admit optical signal to and from a microfluidic chip in the package.	
Reference point	The zero point in a 2 or 3-dimensional system. Distance values in relation to this point give an absolute value in x-, y- or z-direction.	Design Guideline for Microfluidic Side Connect
Trap	A trap is a microfluidic element designed to capture a specific element [sub-piece] (cell, protein, etc.) or bubble from a fluid in a precise location.	
Tube	A tube is a hollow cylinder for transporting a fluid either into or out of a microfluidic system, or between two microfluidic systems[33].	

[31] The technology relating to the establishment of fluidic, optical and/or electrical interconnections and appropriate housing for microfluidic components and subsystems. Microfluidic integration provides mechanical protection of the chip and at least interconnection of electrical / optical signals and / or fluids. It can also provide distribution of electrical energy (that is, power) for circuit function, and dissipation of heat generated by circuit function.

[32] If the chip is contained by a housing it is called a cartridge.

[33] A tube is physically external to the microfluidic system and has only one enclosed void along its whole length and with uniform wall thickness supplied in straight lengths or in coiled form.

Testing related terms

Item	Explanation	Source
Bond strength	Force per unit area required to break a bonded assembly with failure occurring in or near the adhesive/adherend interface[34].	ISO 29022:2013
Maximum operational pressure	The pressure applied to the device before burst or leakage to surrounding occurs. Expressed in pressure units.	
Burst pressure	The maximum pressure the device is able to withstand before burst, i.e. loses its physical integrity. Expressed in pressure units.	
Connection repeatability	The number of times a connector can be disconnected and connection without losing it functionality.	
Leak	Accidental escape from a process component of liquid and/or gaseous substance to atmosphere[35].	ISO 10418:2003, modified
Measured leakrate	The leak rate of a given system as measured using a specific set of operationally defined conditions and test media. Expressed in volume units over time units.	
Reliability	Capability of a device to function without a failure in all specified conditions.	ISO 16972:2010(en), 3.158 (used in ISO/IWA 23:2016)
Validation	Validation is the process of determining the degree to which a simulation model and its associated data are an accurate representation of the real world from the perspective of the intended uses of the model[36].	Systems Engineering Guide
Verification	Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.	ISO 14025:2006, 3.9 (used in ISO/IWA 23:2016)

[34] Another definition energy needed for crack elongation (Semi MS003: Terminology for MEMS technology) is regarded s less practical.
[35] There are two leak mechanisms: a mechanical passage and a material through which gas can diffuse or permeate. A leak may have both mechanisms operating in parallel.
[36] Alternative ISO 17665-1:2006 is rejected.

Vocabulary ISO 10991:2009(en) Micro process engineering

2	Basic terms of micro process engineering	
2.1	process engineering	carrying out of physical, chemical and biological processes in technical apparatus
2.2	micro process engineering	process engineering (2.1) in technical apparatus having internal dimensions in the range of micrometres to a few millimetres
2.3	reaction engineering	carrying out of chemical processes ("reactions") in technical apparatus
2.4	micro reaction engineering	reaction engineering (2.3) in technical apparatus having internal dimensions in the range of micrometres to a few millimetres
2.5	micro fluidics	See General Microfluidics section
2.6	micro system engineering/ micro system technology	combination of micro technologies such as micro electronics, micro sensorics, micro actorics and micro fluidics (2.5)
2.7	process intensification	irregular increase in the economic or ecologic efficiency of physical, biotechnological and especially chemical processes, and generation of new products or product qualities by means of process engineering (2.1)[37]
2.8	inherent safety	characteristic (intrinsic) feature of an apparatus or process of being free from unacceptable risk of harm[38]
2.9	scale-up	act of increasing the produced amount(s) of a production process act of increasing the produced amount(s) of a production process
2.10	numbering-up	parallel use of several identical micro process components (3.1)
2.11	equalling-up	act of increasing the number of identical microstructures inside a micro process component (3.1)
3	Terms related to components of micro process engineering	
3.1	micro process component	micro structured apparatus for continuous processes, having internal dimensions in the range of micrometres up to a few millimetres[39]
3.2	micro process module	micro process component (3.1) with standardized component interfaces
3.3	micro reactor	micro process component whose primary function is to perform chemical

[37] Micro process engineer-ing (2.2) is an important tool for process intensification.

[38] Micro process plants or components can offer inherent safety in respect to some physical properties or process parameters.

[39] Through the use of component interfaces (4.1.2), a micro process component can be combined with other micro process components to form a micro process plant.

		reactions
3.4	micro mixer	See General Modularity section
3.5	micro separator	micro process component (3.1) for the separation of mixtures of substances
3.6	micro heat exchanger	micro process component (3.1) whose primary function is to transfer heat[40]
3.7	micro residence time component	micro reactor (3.3) allowing for the setting of specified residence times
3.8	micro pump	micro structured (positive displacement) pump providing a flow of fluid, where appropriate under high pressure[41]
3.9	peripheral component	additional, necessary apparatus or infrastructure needed to run micro process components (3.1)
3.10	lab-on-a-chip	See General Microfluidics section
3.11	micro electrode	spheric, hemispheric, disk-shaped or wire-shaped electrode of dimensions in the range of the micro process component for the detection of current and potential signals in electrochemical systems
4	Terms related to interfacing of micro process engineering	
4.1	micro process interface	connection for the transfer of substance between micro process components resisting specified temperatures, pressures and chemical strain
4.11	internal interface	interface within a micro process component, where that micro process component is manufactured from several parts[42]
4.12	component interface	interface to combine one micro process component (3.1) with other, compatible micro process components, resulting in a micro process plant[43]
4.1.3	micro-macro interface	connection of a micro process component (3.1) or a micro process plant with the macro-technical environment[44]

[40] There are fluid-based and electricity-based micro heat exchange components.
[41] Low pulsation micro pumps are preferred in micro process engineering.
[42] Internal interfaces are only used by manufacturers of micro process components when that component is manufactured from several parts.
[43] Unlike internal interfaces (4.1.1), component interfaces are very important for the user applying micro process engineering (2.2).
[44] Accordingly, the connection of a micro process component to a nanotechnical component can be designated as a micro-nano interface.

List of missing or to be improved terms

Item	Explanation	Source	Status
Actuator			
Biosensor	A device that uses specific biochemical reactions mediated by isolated enzymes, immuno-systems, tissues, organelles or whole cells to detect chemical compounds usually by electrical, thermal or optical signals.	The IUPAC Compendium of Chemical Terminology, 2nd ed. (the "Gold Book"), last updated in 2014	
Chip			
Credit card			
Dead time	The interval of time between the set point step change and the start of the resulting observable response. Expressed in time units.	SEMI E17-0600 Guideline for Mass Flow Controller Transient Characterizations Tests	In discussion, the definition implies dependency on the accuracy of observation.
Edge connector			
Flow stability	Standard deviation of the flow rate[45]		In discussion, the footnote is confusing
Latency	The time interval between the initiation of a sent operation by a source task and the completion of the matching received operation by the target task. More generally, latency is the time delay between the moment an operation is initiated, and the moment it begins to take effect. Expressed in time units[46].	Elveflow, microfluidic reviews and tutorials	Not recommended, to vague about the end point of the interval.
Microscope slide			
Microtiter plate			
Non-specific binding	If the measurement of specific adsorption and/or chemical	SEMI Draft Document 4213	In discussion, this is not really a

[45] ????Number of points and time window the measurements were carried out. Depending on the application it will change. Other parameters such as standard stable conditions (e.g. temperature).
[46] In the context of microfluidics, it is the time interval between starting of flow actuator and the initiation of flow inside the microchannels.

	surface binding is the main purpose of the device (e.g. biosensors, electronic "nose"), materials in the fluid handling system leading to the detector must be designed to be compatible with the analytes[47]		definition.
Processing time	The processing time is the amount of time a system takes to process a given request[48]. Expressed in time units.	Elveflow, microfluidic reviews and tutorials	Too vague about the end time, not approved
Sensor			
System			

[47] (def. generically, the item being analysed or quantified). For example, a good design practice is to minimize reactivity and non-specific binding to maximize the fraction of analyte reaching the detector.
[48] It does not include the time it takes the order to get from the user to the system. In microfluidics, processing time is the time needed between the reaction of the microfluidic flow controller and the first move in the setup.