Glossary

The following descriptions and definitions will help to explain the technical terms used in this Handbook to describe filter media. Some terms particular to filtration equipment are also included.

Abrasion
The wearing away of a material by contact with a hard surface or by the impact of hard particles.

Absolute
A word implying the complete removal of all suspended solid from a fluid, but in fact referring to filters with very high capture efficiency.

Absorption
The entrapment of a particle or a gas within ('ab-') the body of a filtering material – therefore only strictly applicable to liquids, but also used of entrapment within the depth of a thick filter medium.

Activated (carbon)
The energizing of the surface of (usually granular) carbon to render it capable of efficient removal of, for example, odours from a gas, or colour from a liquid, by adsorption.

Adsorption
The entrapment of a particle or a gas by adhesion to ('ad-') the surface of a solid filtering material, which thus needs to be finely granular or fibrous to present the highest possible surface area per unit volume.

Aerosol
A dispersion of solid particles of colloidal dimensions in a gas (although also used of similar dispersions of liquid droplets).

Bag
A filter element consisting of a relatively long cylindrical shape, open at one end, closed at the other (where it is fitted to a supporting frame), which may have a seam along its length and/or closing one end – or may be seamless. The bag may

fit over or inside a metal cage to provide support for the medium. (See also candle, pocket, sleeve)

Baghouse

A somewhat old-fashioned, though still widely used, term for large dust collection filters, employing changeable bags for the collection. Not so widely used now that the separating element can be a pocket or, increasingly, a cartridge. (See also fabric filter)

Bar screen

A filter medium created from a set of bars (each usually of wedge-shaped cross-section) arranged parallel one to another, with the set either flat, or curved, or in the form of a cylinder.

Basket

Filter medium in basket shape, i.e. cylindrical, with its diameter roughly the same as its length, often self-supporting, made from mesh or perforated sheet, and installed either in a strainer housing or in a centrifuge.

Belt

A filter medium, mostly used for harvesting solids from liquid suspension, in the form of a long continuous strip running around a set of rollers, and usually moving from a feed zone, through a filtering zone, possibly through a cake washing zone, and to a cake removal zone, after which the belt returns through a cleaning zone to the start. May run together with an impervious belt that squeezes the cake to improve dewatering.

Beta factor, ratio

Ratio of the number of particles greater than a defined size in a fluid upstream of a filter to the number downstream. Removal efficiency may then be represented by: $100(\beta - 1)/\beta$.

Blinding

The progressive blockage of a filter medium as its pores fill with trapped particles that cannot be removed by back flushing. Blinding may result in the medium's having to be discarded, or it may be possible to clean the medium physically or chemically to make it suitable for reuse.

Bolting cloth

A fine woven wire fabric, used for (usually dry) sieving.

Bonded, bonding

When fine fibres or filaments are held together in a mass, they are bonded – by their own features, or by thermal fusion at the points of contact, or by an adhesive. Bonding does not usually include sintering, but it should.

Bubble point
The pressure at which a bubble of gas or liquid appears downstream of a piece of filter medium, which is immersed in a standard fluid.

Bursting strength
A measure of the medium's ability to resist a potential bursting force when pressure is applied to one side of a piece of the medium, restrained around its periphery.

Cabin filter
Any filter used to clean the air inside a vehicle cabin (automobile, tractor, aircraft, etc.), either from impurities entering from outside (especially diesel fume and pollen) or in re-circulating systems.

Cage
An array of wire, rod or coarse mesh, usually cylindrical in shape, used to support flexible filter media such as bags or sleeves.

Cake filtration
When the surface of a filter is covered by a single layer of particles, newly deposited particles add to that layer and form a cake above the surface. This cake then effectively acts as the filter medium. (See also depth filtration, precoat, surface filtration)

Cake release
Once a cake of collected solids has formed on a filter medium, it must be removed as completely as possible. The ability of a medium to release a cake easily is an important feature of its filtration performance. (See also heel)

Calender, calendering
One of the methods of finishing the filter medium, and especially its surface, by passing the material between a pair of calendering rollers (usually heated). This will consolidate the material, and may flatten and/or emboss the surface(s).

Candle
A cylindrical filter element, long in relation to its diameter, sealed at one end and open at the other. Usually used of rigid media (such as ceramic), and frequently used to refer to multiple elements housed in a single filter vessel. (See also bag, pocket, sleeve)

Capsule
A small, usually self-supporting filter element, shaped like a lens, with filter media as both upper and lower surfaces. May be mounted as a set, one above the other, on a central supporting core.

Also used to describe a small self-contained filter unit, employed in laboratory, medical and pharmaceutical applications, formed usually of a piece of filter

medium sealed into a casing fitted with inlet and outlet fluid connections; usually discarded when 'full'.

Capture
The entrapment of a particle or droplet out of suspension in a fluid, by a filter medium.

Cartridge
A fairly general term for a filter element that is cylindrical in shape, relatively rigid in construction, and made in several different ways from a wide range of materials. The most common form is closed at one end, with a supporting device at the other, open end.

Cassette
See Panel.

Cellulose
The main component of wood, and hence of paper. Natural cellulose can be mechanically or chemically broken down into fine fibres, which may then be wet laid as a continuous material. Cellulose can be dissolved in a complex liquid solvent, and then extrusion spun to produce artificial (regenerated) cellulose, rayon (or viscose), which can be made into other materials for filtration use.

Centrifugal filter
A centrifuge in which the separation of solids from liquids is achieved through a filter medium, which will be basically cylindrical in shape, with the filtrate draining outwards from the centre, under the centrifugal force.

Centrifuge
A device for achieving mechanical separations of liquid/liquid or liquid/solid mixtures under the accelerated gravitational force achieved by rapid rotation. The separation can be affected by sedimentation (driven by differences in density) or filtration.

Ceramic
An inorganic material that has been fired to high temperature. It is thus able to resist moderately high temperatures in use. (The term does not usually encompass carbon or glass.)

CIP, clean in place
A system for cleaning any item of equipment that does not need the equipment to be dismantled, even partially. The cleaning will normally be done by a cleaning solution, followed by steam sterilization where necessary. The filter and its medium that are to be cleaned in this way must be capable of resisting the cleaning action and temperatures of the CIP system. They must also be designed so as not to leave any dead spots unreachable by the cleaning fluid.

Clarifying, clarification
A term used to denote the removal from a gas or a liquid of a small amount of suspended impurity. Such separation is normally required to be highly efficient, and low in energy demand.

Cleaning
The cleaning of a gas refers to its clarification; cleaning otherwise refers to the process by which collected material can be removed from a filter. (See also CIP)

Cloth
The use of 'cloth', as in 'filter cloth', is now a touch archaic, referring to when most filtration was done through woven textile media. The word 'fabric' is used in this Handbook, to cover both woven and non-woven materials.

Coalescing
The process by which finely divided liquid droplets dispersed in another liquid are made to merge together into larger droplets, and then a continuous layer.

Coating
A layer of one material applied to the surface of another. Used in filtration to relate specifically to surface treatment of a filter medium, which renders that surface more suitable for use: less easily abraded, more ready to release collected cake.

Collecting, collection
A fairly general term referring to the capture of suspended material by a filter medium, in the various ways that this is achieved. Collection efficiency is a more specific term, relating to the thoroughness with which the medium achieves its required separation. Also applies to the settling down of extruded filaments and fibres onto a flat (and usually moving) surface.

Colloid, colloidal particle
A word originally coined to describe those materials in solution that would not pass through a dialysis membrane, now generally used of very finely divided solids in suspension or semi-solution. A colloidal suspension would not be expected to settle over a long period of time. (See also aerosol)

Combination filter, media
A filter, or its associated medium, that carries out the double duty of filtration and some chemical activity, usually deodorizing or decolourizing.

Composite
Refers to a filter medium that is made of two or more layers of different material – differing by pore size, or chemical nature of the material. A membrane is nearly always a composite material, with a fine surface layer supported on a substrate of coarser material. (See also lamination)

Concentration polarization
The creation of a layer close to a filter medium's surface (especially for membranes) where the solute species is concentrated, hence reducing the liquid flux.

Copolymer
A polymer formed from more than one monomer, either in the same chain or with one cross-linking chains of the other.

Core
A central support, usually cylindrical in shape, and made from sheet metal, metal rods or extruded plastics, on which a variety of materials can be mounted to form a cartridge. (See also cage)

Corrosion
Unwanted chemical attack on a material resulting in material loss, usually into solution, but corrosion by gases is by no means uncommon.

Cotton
Natural fibres from the seed of the cotton plant. Long staple fibres are from 2.5 to 6.5 cm in length, medium staple 1.3 to 3.3 cm, and short staple 1 to 2.5 cm.

Crepe
Crepe paper has a wrinkled finish, which provides some elastic stretch to the material.

Crimp
An intentional kink impressed into a fibre or filament to increase its bulking properties. Wire may also be crimped, especially on a regular pattern, to hold the crossing wires firmly in place after weaving.

Cross-flow (filtration)
Operation of a filter with the suspension being filtered flowing across the medium surface, rather than through the medium. This helps to keep the surface free of accumulated solid by the scouring action of the fluid. (See also dead-end, through-flow)

Cross (machine) direction
The direction in a continuous roll of material that is at right angles to the flow of the roll – termed 'warp' in a woven fabric. (See also machine direction)

Dead-end
Operation of a filter with the feed flowing effectively at right angles to the medium surface, so that all of the fluid passes through the medium. (See also cross-flow, through-flow)

Decitex
A unit of thread, yarn or filament size measurement, equal to 10 tex (NB not 0.1 tex).

Deep bed (filter)
Operation of a filter with a deep bed of granular material as its medium, usually with the fluid flowing downwards. This is normally cleaned by flow reversal, washing the dirt upwards and out of the vessel containing the bed (of sand, anthracite, coke, etc).

Demisting
The removal from suspension of very fine liquid droplets in a gas.

Denier
A measure of the size of a thread, yarn or filament, given by the weight in grams of 9000 m of the material (and dependent upon the material's density). (See also tex)

Depth filtration
Filtration of suspended solids within the thickness of the filter medium, rather than at its surface. The entrapped solid must then be blown or washed out of the medium, if the latter is to be re-used. (See also surface filtration)

Dialysis
A separation process relying on the diffusion of one component (or more) through the pores of a semi-permeable membrane, the driving force being the concentration gradient across the membrane (usually with pure solvent on one side).

Diffusion
The movement of ions or molecules through the material of a medium under the influence of a concentration gradient.

Dirt-holding capacity
The ability of a filter medium to hold the material removed from suspension without becoming blocked, i.e. without an unacceptable increase in pressure drop across the filter. The higher the dirt-holding capacity for a given dust load, the longer the time interval between cleaning or replacement.

Disc
A piece of filter medium cut (or stamped) out in the form of a circle, for insertion in a suitable holder. May also be used of two circular pieces of medium, sealed together around their periphery and to a central feed or offtake system. Also refers to the use of flat circular pieces of metal (or plastic) stacked one above the other to provide a filtering surface at the gaps between their outside edges. (See also capsule, lenticular)

Dispersion
A mixture of solid particles or liquid droplets in a continuous liquid or gaseous phase, usually implying a uniform distribution.

Droplet
A small particle of liquid.

Dry laid
Fibres or filaments produced in the air (or an inert gas) and settled onto a collecting surface, usually in random orientation, are said to be dry laid. (See also wet laid)

Dust
A fine dispersion of solid particles in a gas is called a dust, although there are no precise dimensional limits below which the solid must be. Many dusts are dangerous (either by inhalation or as an explosion risk) and gas cleaning is the corresponding process solution.

Edge filter
A filter element fabricated from a number of machined or stamped components, such that the edges of the components together create the filter medium – such as an array of discs, or of rings, or of bars, or of wire, or of ribbon spirally wound.

Electret
A fibre made in such a way that it has an intrinsic electrostatic charge, and can thus be used to capture particles more effectively if they too carry a charge.

(Filter) element
A single item of filtering medium, in any one of a number of shapes or structures, designed to fit in a (usually standardized) housing, from which it is removable for cleaning (or disposal). May be a cartridge, bag, pocket, etc.

Electrodialysis
Dialysis under the additional driving force of an electric potential between two electrodes.

Equivalent pore size
The calculated effective pore size of a piece of porous material as a result of one of a number of test methods.

Expanded metal
Sheet metal mechanically expanded into a regular diamond-shaped mesh.

Extrusion
The forcing of a molten substance through machined holes, under controlled pressure, to produce continuous forms, shaped according to the cross-section of

the holes. In the case of filter media, this mainly refers to the use of spinnerets to produce fine filaments or fibres of thermopolymers.

Fabric
A continuous piece of material made from fibrous or filamentous substances, by weaving or knitting, or as a non-woven material made by felting or some similar process.

Fabric filter
A term used to cover all those large filter installations, used for the cleaning of exhaust and process gases, comprising multiple elements in a single housing, which elements can be bags, pockets, cartridges, etc. (See also baghouse)

Felt
A mass of natural or synthetic fibre, laid down usually in a random fashion, and then carded to give some orientation to the fibres. Usually made in a multitude of thin webs. Natural fibres have sufficient mutual adhesion to provide strength to the felt, but synthetic fibres usually require further processing of the felt to give it the required tensile strength.

Fibre
A piece of natural or synthetic material, which has a small diameter (measured in hundredths of a millimetre, if not in micrometres), and is very long in relation to its diameter. Among natural fibres, cellulose from softwood trees is the shortest, and some wools are the longest.

Fibrillated, fibrillation
The processing of fibrous, filamentous or flat sheet material to create a very fine structure of open area and microfibrous protrusions, to give an effectively much smaller diameter material. Also refers to the microstructure of natural fibre that enables it bond naturally in felts.

Fibrous
Any material that is made up of fibres, natural or synthetic.

Filament
A very long, effectively continuous, single strand of any material. Among natural materials, only silk exists as a filament, but synthetic materials can be spun into filaments whose length is governed only by the size of the molten polymer reservoir.

Filter
In the present context, a filter is the mechanical device that achieves the required separation by filtration, and that holds the filter medium.

Filter aid
A granular solid added to a filter feed solution to bulk out the suspension and make it more easily filterable. The filter aid of course then contaminates the separated solids, so can only be used for situations where the solids are a waste material, or where the filter aid can easily be removed in a subsequent process. (See also precoat)

Filter medium
The porous material in a filter that does the actual filtering.

Filtrate
The fluid leaving a filter, after removal of suspended material. (See also permeate)

Finishing process
Refers to those processes applied to medium material after its basic structure has been formed, to consolidate it or to modify its surface, such as calendering, coating, singeing.

Flash spun
Material made as for meltblown, but from a mixture of solvent and polymer, so as to produce finer fibres.

Foam
A dispersion of gas bubbles throughout a liquid. If the liquid then sets solid, a very light material is produced, but one of little use to filtration, because the pores do not interconnect. If, however, the foam is reticulated by a chemical or thermal process that breaks down the bubble walls then a useful filter medium can be created. (See also reticulated)

Fouling
The gradual deterioration of a membrane filter's performance, because of the deposition on the surface and within the pores of fine, sometimes slimy materials.

Glass
A synthetic semi-solid material, which can be melted and spun into fibres that make a very good medium for papers for filtration.

Harvesting
The recovery of solid materials from suspension in a fluid, where the recovered solid is valuable, and is the purpose of the filtration.

Heel
A layer of cake that is necessarily left on the surface of a filter medium after the bulk of the cake has been removed, usually because the removal mechanism would damage the medium if it got too close. (See also cake)

Hollow fibre
Filter medium produced in the form of minute tubes, which are bundled together to allow sufficient filter area to be built into a sensibly sized filter.

(Filter) housing
That part of a filter that provides the containment for the process fluid, and which holds the filter medium securely.

Hydroentanglement
The consolidation of a felt by the passage through it of fine jets of water at high speed.

Hydrophilic
Used of filter media through which water flows easily (i.e. the medium surface is easily wetted).

Hydrophobic
Used of filter media through which water does not flow easily (i.e. the medium surface is not wetted).

Impermeable
Cannot be penetrated by any fluid, particle, or molecular or ionic species.

Ion exchange
The transfer of ionic species between solution in a liquid and attachment to a suitably formed resin. A mixed bed (of anion and cation exchange resins) can remove all ions from water.

Knitted, knitting
A knitted fabric is produced by the interlocking of a series of loops made from one or more yarns, with each row of loops caught into the preceding row. Loops running lengthwise are called wales, those running crosswise courses.

Lamination, laminated
Layers of material, laid one on top of another, and then usually bonded together. The most common is a coarse substrate, to which a fine coating layer is laminated.

(Filter) leaf
A filter leaf is formed by fixing two (normally rigid) pieces of filter medium close together (but not touching), and sealing their periphery. Two or more leaves are then mounted one above the other and sealed into a central collecting tube. The whole assembly is placed in a vessel full of slurry under pressure, the filtrate goes into the space between the pieces of media, and then into the central tube. The leaves may be held horizontally or vertically (with cake removal easier in the vertically mounted case).

Lenticular
Lens-shaped, and only convex in form. Used of filter capsules, and such devices when mounted as a stack in a cylindrical housing.

Looped wedge wire
One form of wire format used in wedge wire screens.

Machine direction
A direction in a roll material-making machine that is parallel to the flow of the material (the warp in a weaving loom). (See also cross (machine) direction)

Macrofiltration
A term increasingly being used for all filtration processes down to about 5μm (the start of microfiltration).

Mean pore size
The average diameter of all the pores passing through a filter medium, used the same as effective pore size.

Media migration
See Shedding.

Meltblown
Polymeric filaments, extruded from a spinneret, are broken up by jets of air, and laid down on a moving belt as a mass of fibres. The fibres may also be laid down on a moving core as a cartridge element.

Membrane
Originally implying a thin, microporous or semi-permeable plastic sheet, now applied to any media that are capable of removing particles to below 0.1 μm, whether they be organic or inorganic, flexible or rigid.

Mesh
A geometrically regular material, used for precise sieving, made from wire or plastic filaments by weaving to carefully controlled dimensions.

Metal edge filter
An edge filter where the components are made of metal, a common usage in the automotive sector.

Microfibre
A general term covering the very fine fibres and filaments made by extrusion processes.

Microfiltration
A term defining a range of filtration processes, which cover the size range 5 μm down to 0.1 μm (between macrofiltration and ultrafiltration).

Molecular sieve
A material with extremely fine pores, capable of the adsorption of molecular species, such as water.

Monofilament
A single filament used as the yarn to weave fabrics or meshes.

Moulded
In this context, refers to the formation of media into shapes by moulding – the resultant format may be held in shape by a bonding resin, or by thermal treatment.

Multifilament
A yarn made of a number of filaments, twisted as required.

Nanofiltration
A filtration region fairly recently separated between reverse osmosis and ultrafiltration, both in size of species separated, and in operating pressure.

Napping
A finishing process for fabrics that raises short fibres above the surface of the medium

Natural (fibres, filaments)
Materials derived from animal or vegetable sources: cellulose, cotton, silk and wool in filtration terms, although flax/linen, jute and other fibres are used.

Needlefelt
A felt that has been stabilized and strengthened by needling.

Needling
The processing of felts (and some other non-woven materials) by rapid puncturing of the material with a set of barbed needles.

Non-woven
Any textile fabric made by methods other than weaving and knitting.

Osmosis
The passage of a solvent (usually water) from a dilute solution to a more concentrated solution through a semi-permeable membrane, the driving force being the difference in osmotic pressure across the membrane.

Panel
A flat pad of filter media, held in a simple frame, that may be square or rectangular in shape. Used mainly for air conditioning applications, and sometimes called a cassette.

Paper
A medium made by wet laying of cellulose or glass fibres.

Particle
A small granule of solid material, the basic component of dusts or other suspensions.

Pathogen
Any body capable of transferring disease to humans. Especially bacteria and viruses.

Penetration
The passage of a particle or droplet through a filter medium. The degree of penetration measures the efficiency of the filter.

Perforated, perforation
Usually means sheet material (metal or plastic) in which holes are machined, by drilling or punching. Used for coarse filtration.

Permeable, permeability
Open to the passage of specific components of a mixture. Permeability is a measure of the degree of openness.

Permeate
The clear liquid passing through a membrane, either by diffusion through the body of the material, or passage through continuous pores. (See also filtrate)

Permeation
Processes that operate by separation at a barrier, usually referring to the microscopic scale.

Pervaporation
A membrane separation process for one liquid from another, by passage of one component as vapour through the membrane, with a vacuum maintained on the downstream side.

Plain weave
The simplest form of weaving: over one yarn, then under one, for the entire material.

Plastic
Specifically, any deformable material, but used generically of all synthetic polymeric materials.

(Filter) plate
May refer to a component of a plate-and-frame filter press, which holds the filter medium and the formed cake, or may be an equivalent word to 'leaf', i.e. a rigid structure made from sheets of filter media, sealed at their periphery.

Pleat, pleated
A fold in a piece of filter medium, usually occurring in series, to make a concertina effect, then mounted flat, as in a panel, or made into a cylinder, as part of a filter cartridge. The effect of pleating is greatly to increase the filter area within a given vessel volume.

Pocket
A form of bag, which has a flat oval cross-section (rather than circular), and a rectangular external shape. Often used mounted side by side with others in a panel frame for air conditioning use.

Polishing
A final filtration stage, to remove traces of suspended material left in the fluid by previous processing.

Polymer
One of a wide range of synthetic materials, formed by condensing monomers into long-chain molecules.

Pore
A singe hole passing through a filter medium, by which the fluid crosses it, and which is small enough in diameter not to let pass any material above a certain size, dictated by the pore diameter.

Porous, porosity
Any material through which fluid will flow under pressure. The porosity is a measure of the freedom of this flow.

Precoat
Granular or other particulate material fed into a filter to create the initial cake upon which the main filtration then takes place. (See also filter aid, cake filtration)

Prefilter
A term for the first filter in a series of filtration stages, which is actually no different from the same duty performed on its own. Often used of the filter needed ahead of a membrane process, used to prevent ingress of coarse material that would block the flow channels rather than the medium itself.

Pressure filter
Any filter needing the imposition of a positive pressure upstream, as distinct from gravity- or vacuum-driven filters.

Pyrogen
Any of a group of materials that, upon ingestion by an animal, cause a rise in body temperature.

Rapid sand filter
A deep-bed filter with down flow of fluid at a relatively fast rate, cleaned by backflushing, which expands the bed of sand to release the captured solids.

Recovery
A general term referring to the removal of suspended solids (usually) from a liquid; it implies that the solids are wanted, not wastes.

Resin, resin bonded
An adhesive used to bond together the particles or fibres of a filter medium. May be added as a solid in the medium formation stage, or injected as a liquid, in either case being set at higher temperatures.

Retention
Used in a similar way to 'capture' to refer to the entrapment or the holding back of suspended material by a filter medium.

Reticulated (foams)
Foams that are impermeable as made can be rendered permeable by chemical or thermal methods that erode the cell walls to create pores through the material - the process is reticulation.

Reverse osmosis
The first of the membrane processes, developed mainly for the desalination of brackish and salt water, this uses a membrane under high pressure to allow water to move through, and to hold back any dissolved material in a feed solution. The membrane is impermeable to ionic and most molecular species in solution. The applied pressure must be higher than the natural osmotic pressure of the solution.

Ribbon
A continuous strip of material wound flat in the form of a spiral, so that its outer edges may be used as a filter medium.

Rigidity
The stiffness of a filter medium material, as descriptive of one of its essential mechanical properties.

Rigidized media
Term used to describe a range of polymeric media formed by moulding into shapes resembling bags or pockets, but essentially rigid in their final form.

Ring stacks
A series of flat rings, with suitable indented spacers, stacked one above the other around a central core, so that the outer edges form a filter medium.

Rollgoods
Any material produced (and sold) in rolls, for conversion to suitably shaped filter medium; includes woven and non-woven materials.

Roving
A yarn treatment process, which imparts a slight twist to the yarn as well as compressing it.

Rupture strength
A mechanical property of a medium material, determined by standard tests. Used as equivalent to bursting strength and tensile strength.

Sand
A coarsely granular natural material, used commonly in deep-bed filters.

Satin weave
A complex weave pattern, designed to give a flat surface to at least one side of the material.

Screen
A woven or perforated medium, for relatively coarse separations, usually made with some precision as to the shape and size of the openings.

Screening
A filtration process employing coarse media, possibly for separation of a mixture of solid particles by particle size, or for prefiltration, wet or dry.

Scrim
A strong simple woven material, with yarns well separated, used within a felt to give it tensile strength.

Seam, seamless
The place(s) at which materials are joined to make non-flat media structures. The seam is a region where the porosity of the medium may be very different from the bulk of the medium, so possibly creating a weakness – hence the search for seamless construction of bags, etc.

Semi-permeable
Literally, permeable to some components of a mixture or solution, and not to others. All filter media can be thus described, but the term largely relates to membranes.

Shedding
The loss of particles of the filter medium to the downstream, clean fluid. This is obviously a feature to be avoided, and resistance to shedding becomes an important material parameter. (Also known as media migration.)

(Filter) sheet
A relatively stiff piece of filter medium, usually in the form of a rectangle, and wet laid like paper. Used for depth filtration.

Sieve
Usually refers to the device that holds a screen, and enables screening of solid particles to occur.

Sieve bend
A coarse, but high-flux filter, made from parallel wedge-wire bars, positioned across the direction of liquid flow, which is tangential to the filter surface.

Sifting
The process of separating solid particles by particle size, usually in the dry state.

Silk
A natural material, produced as a very long filament, which has to be untangled.

Singeing
The treatment of a material surface by a flame or contact with a very hot surface, to cause partial melting of the material, and hence to change the surface porosity.

Sintered, sintering
The bonding of powders, fibres or meshes by heating under pressure, to fuse the material at the points of contact. Originally used of metals and ceramics, but now also applied to polymeric materials.

Sleeve
A piece of filter medium formed as an open ended cylinder, which is slid over a cage or core to form a replaceable filter element.

Sliver
A loose, soft, untwisted rope-like strand of textile fibre, having a roughly uniform thickness. It is produced by the carding process, which separates raw fibres to prepare them for spinning.

Slow sand filter
A deep-bed filter, with downward flow at low velocity, with biological action also in the top layer, which is cut off to clean the filter.

Softening temperature
The temperature at which a complex material begins to melt, such that points of contact fuse together.

Solution
A uniform mixture of soluble materials in a solvent, which cannot be separated in a normal filter, but can with suitable membranes.

Spinneret
The working head of an extrusion process, in which a set of fine holes are machined (or a set of fine nozzles fitted), from which a molten material can be extruded under pressure as continuous filaments.

Spinning
A term with two quite different meanings in the present context: the production of yarn from a bundle of fibres, or the production of extruded filaments.

Spiral wound
The winding of a yarn, wire or filament on a core in a spiral fashion, such that successive layers overlie previous layers at an angle. Also refers to the formation of membrane media by setting up several layers of medium and spacers, which are then wound round a central core, so forming a spiral.

Spool wound
The winding of a yarn, wire or filament on a core in any regular fashion, to create a filter element (includes spiral wound).

Spun, spunbonded
The extrusion of molten polymeric materials as filament (melt spun), which filaments are then laid down on a moving belt, and further processed to ensure adequate bonding of the mass of filaments. The filaments may also be laid down on a rotating core to form a cartridge element.

Stability
A number of physical properties of a material that relate to its maintenance in use of its initial performance and design characteristics.

Stack
An array of a set of identical components – discs, rings, capsules – one above the other around a central former of some kind.

Staple (fibre)
Originally used of the naturally occurring fibres, now used of any fibre of the same sort of length (i.e. a few centimetres).

Strainer, straining
A coarse filter, often using a mesh or perforated plate screen as medium, and usually employed to strain out of a liquid flow any 'rogue' large particles, ahead of some other process unit where such particles would be harmful in some way.

Surface filter
A filter that operates entirely by the retention of suspended material on the surface of the medium. This mechanism is rarely found in practice, because all media are actually finite in thickness, and a small part of the retained solid penetrates into that thickness. Membranes come the closest to being exemplars of surface filtration. (See also depth filter)

Suspension
A fluid carrying particulate solids or liquid droplets, as a separate phase, dispersed uniformly throughout the fluid.

Synthetic (fibres, filaments)
Artificial, as opposed to occurring naturally. Usually refers to polymeric materials.

Tangential flow
Equivalent term to 'cross-flow'.

Tex
Unit for the measurement of fibre or filament fineness. Expressed as the weight in grams of 1000 m of the material (and so is dependent upon the material density). (See also denier)

Textile
Any natural or synthetic fibre or filament, or yarn, suitable for making up into fabric or cloth, including the made up materials as well. Covers woven, knitted and non-woven fabrics, as well as threads, cords, ropes, braids, lace, embroidery, and nets. Paper is not considered to be a textile, although some non-woven materials are made from fibres in the same way as paper.

Thermally bonded
The adhesion of fibres, powders, etc., by heating under pressure, so that softening occurs and the material fuses together at the points of contact.

Through-flow
Another term for the flow of fluid through the medium. (See also cross-flow, dead-end)

Track-etching
A process for the creation of membranes, involving irradiation of a polymer film, to create the initial pores, followed by chemical etching to enlarge the pores to the required size.

Tubular
In this context refers to media that are in the form of long rigid tubes of diameters in the region of 1 cm, with a fairly thin wall of filter medium.

Twill weave
A weaving process that produces the characteristic diagonal appearance to the fabric: over two, under one, staggered at each repeat along the warp.

Ultrafiltration
A membrane filtration process that deals with large molecules or colloidal materials; lying between microfiltration and nanofiltration in both degree of fineness of filtration and operating pressure.

Vacuum filter
A filter operated by vacuum as the driving force.

Voidage
The empty space within a filter medium; related to porosity.

Warp
The strands, whether yarn or filament, of a woven material, which run the length of the loom. (For materials that are not woven, but which come from a machine in a similar way, the term 'machine direction' may be used.) (See also weft)

Weave
The pattern by which the warp and weft yarns lie over and under one another.

Web
A thin array of fibres or filaments laid down in the first stage of production of a non-woven material. It may have a directional orientation, or a completely random structure.

Wedge wire
Wire whose cross-section is not round but pressed into a wedge shape.

Weft
The strands, whether yarn or filament, of a woven material, which run across the width of the loom. (The corresponding term to 'machine direction' is 'cross machine') (See also warp)

Wet laid
Wet laying involves the dispersion of relatively short fibres in water, followed by the distribution of the slurry over a porous belt of some kind, such that the water drains away, leaving the wet-laid fibres on the belt. (See also dry laid, paper)

Wet strength
The tensile strength of a fabric or paper when it is completely wet.

Wettability
The ability of a material to be wetted by water (or, in principle, any solvent), and so to allow water to flow though it in a porous form. (See also hydrophilic, hydrophobic)

Wire, wire wound
In addition to its use as a filament in woven meshes, wire can be wound round a core, usually in spiral fashion, to provide a filter element.

Wool
Natural fibres from animal coats, mainly sheep. Fine wool fibre ranges from 4 to 7.5 cm in length, coarse can be up to 35 cm.

Woven
Any material made on a loom from warp and weft threads, normally crossing at right angles.

Yarn, yarn wound
A continuous strand of fibres or filaments grouped or twisted together, and used to make woven fabrics. Can also be wound onto a cylindrical core or former to make a yarn-wound filter element.

Yield
Yield strength and yield point are mechanical properties of materials and may be important in defining the material performance.

Zeta potential
An electrostatic charge on a material that increases its particle retention performance.

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