DOWNLOAD PDF FILTERS AND FILTRATION HANDBOOK

Chapter 1 : Handbook of Nonwoven Filter Media - PDF Free Download

Filters are used in most industries, especially the water, sewage, oil, gas, food and beverage, and pharmaceutical industries. The new edition of Filters and Filtration Handbook is an all-encompassing practical account of standard filtration equipment and its applications.

Existing state and local plumbing codes may require installation of this filtration system to be installed by a licenced contractor. Installation of the Filtration system should be located downstream of an available isolation valve. If you do not have one, it is recommended to install now to accommodate ease of any future filtration cartridge service and maintenance. Your Filtration system has a working pressure rated to a maximum of kpa psi. It is recommended to test your supply working pressure prior to installation and install an appropriate pressure limiting device if your supply pressure could exceed the above limit. Ensure that the location you choose will allow enough room below your filtration system unit to enable the unit to be dismantled and the filter cartridge to be replaced. We recommend installing the unit horizontally. If installing outside, we recommend also installing a suitable sunlight protective cover to prolong the life of the filtration housing. Alternatively, you could install your Triple Action Filtration System in a sheltered position. Using a screw driver and supplied screws, fit the mounting bracket to the top of the filter housing. Mark are remove the section of piping you need to remove by measuring the gap between the unions when pipes are fully inserted. Cut and deburr both upstream and downstream ends of the piping. Fit the filter housing in place between the open pipes and secure mounting bracket in place with appropriate anchors. You may find it easier to remove the long housing base and cartridge while performing this step. Insert the cartridge into the centre of the long housing base ensuring that the O-ring sits cleanly on the O-ring seat and attach this to the housing top by turning anti-clockwise. Tighten fully with the supplied housing ring spanner. Slowly open the water supply isolation valve and bleed any trapped air from the housing through the pressure relief valve button or screw on top of the unit , until only water is released. This may need to be performed a few times to allow all air to escape. Open all down stream taps or valves one at a time to purge any remaining air from your system. Maintenance The life of your filter cartridge will be determined by three factors: Residual sediments and other matter will eventually build up in your filter cartridge, causing water pressure drops. As such, cartridge life may vary between six and twelve months, subject to these conditions. Cartridge replacement is a fairly straightforward maintenance task. Before replacing the cartridge in your Triple Action Filtration System, ensure that the water supply, power to the pump and any diversion switches are turned off. Release any pressure build up within the housing by using a screwdriver to activate the pressure relief valve on top of the filter housing. Using the housing ring spanner that came with your filter, place the long housing base through the opening and raise the spanner until the ring is secure around the long housing base. Unscrew the long housing base with the wrench in a clockwise direction, then remove the used filter cartridge and clean the inside of both upper and lower housings. Be careful not to damage the black O-ring. Unwrap the new cartridge and insert it into the long housing base. Ensure that the O-ring sits cleanly on the O-ring seat. Attach this to the housing top by turning anti-clockwise. Open all downstream taps or valves one at a time to purge any remaining air from your system. Check for any leaks in the system. Seal or otherwise rectify these leaks if required.

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Chapter 2 : ABW filters - DegremontÂ®

Filters are used in most industries, especially the water, sewage, oil, gas, food and beverage, and pharmaceutical industries. The new edition of this established title is an all-encompassing practical account of standard filtration equipment and its applications.

Filtration and Separation 1B. Surface and Depth Filtration 1D. Paper and Fabrics 2D. Woven Wire and Screens 2E. Constructed Filter Cartridges 2F. Tipping Pan and Table Filters 3F. Rotary Drum Filters 3G. Rotary Disc Filters 3H. Horizontal Belt Filters 3I. Bulk Water Filters 4C. Drinking Water Filters 4D. Process Water Treatment 4E. Municipal and Industrial Wastewater Treatment 4F. Surface Treatment Chemicals 4H. Metal Working Fluids 4I. Indoor Air Quality 6C. Fume and Vapour Emissions 6D. Machine Air Intake Filters 6F. Vehicle Cabin Filters 6G. Compressed Air Filtration 6H. Sterile Air and Gas Filters 6J. Cyclones and Hydrocyclones 7E. Wet and Dry Scrubbers 7G. It did not have too promising a start: With Christopher now retired, the publishers have brought in a new author, tasked with producing a Handbook for the new millennium. Filtration is a curiously mixed process, with some very old technologies and some very new ones. Much that is old is also unchanged, but not all of it, while some of the new technology would hardly have been noticed for the First Edition. In this same spirit of thorough coverage, mention is made of physical separations by other means, mainly sedimentation. As well as emphasizing this main purpose of the book, the opportunity has been taken in this revised edition to restructure the book in terms of the section order, although most of the topics covered by previous editions are continued in this edition. Lancashire Harmsco Osmonics Inc. The title is, in fact, shorthand for the more cumbersome phrase: The whole of the phase separation spectrum is illustrated in Table 1. In principle, this book is only concerned with the second half of Table 1.

Chapter 3 : Filters and Filtration Handbook - Kenneth S Sutherland, George Chase - Google Books

The new edition of Filters and Filtration Handbook is an all-encompassing practical account of standard filtration equipment and its applications. Completely revised and rewritten, it is an essential book for the engineer working in a plant situation, who requires guidance and information on what's available and whether it's suitable for.

These applied loadings will vary depending on temperature. On the other hand, the granulometry of the material used has little effect on BOD removal. This fact is illustrated by table 7 and figure Table 7 shows that a 1. Similarly, the curves in figure 32 clearly indicate the impact made by dissolved BOD on nitrification declining physical-chemical treatment for average loading treatment. Click here to create your account in order to view the illustrations Figure This is the Biofor CN. We recommend removing a maximum of carbon upstream using a primary physical-chemical treatment. Ideally, the Biofor N should be preceded by a Biofor C stage or by a medium loading activated sludge treatment stage. Excess sludge production is characteristic of medium loading biological systems, allowing for enhanced suspended solids collection. These suspended solids are either returned to a point upstream from primary treatment or processed separately by sedimentation or floatation. It should be noted that the sedimentation and dewatering capacity of this sludge is far better than that of activated sludge. To this expenditure, we need to add the energy consumed by the periodic packing backwashes; this energy consumption is approximately 0. The Biofor DN design is similar to that of the aerated Biofor. However, the Biofor DN differs from the aerated Biofor in the following respects: The effective size of the supporting media used in denitrifcaiton is always higher than that used in other applications. This can be explained by the stickiness of the denitrification sludge and the need for aggressive scrubbing. Depending on its position in the treatment system, there are two types of Biofor DN figure 33 , used in combination with other Biofor units or with an activated sludge: The assimilable organic carbon required for denitrification purposes is supplied either by the readily biodegradable BOD in primary clarified water in the first case, or by an external source of carbon, usually methanol, in the second. Examples of systems using the Biofor DN applications and performances The application and dimensioning criteria applicable to both types of Biofor DN are markedly different table 8: The performance of denitrification and the final concentration level in nitrates will influence the load removed. The Biofor pre-DN is included in the system after primary clarification, with or without the addition of chemical reagents, and in combination with a Biofor N positioned downstream. The nitrates formed by nitrogen ammonia oxidation in the Biofor N are partially recycled upstream from the Biofor pre-DN and denitrified using the organic carbon contained in the settled water. Consequently, denitrification efficiency is directly related to: The Biofor pre-DN is of interest on a number of different counts: Figure 34 provides an illustration of the arrangement applicable to this system. The Biofor post-DN has to be positioned downstream from a nitrification stage, such as a Biofor N or low loading activated sludge stage. As nitrified water no longer contains any easily biodegradable organic carbon, an external input of carbon will be required methanol or equivalent. This reagent is combined with the water to be denitrified. This water is fed in through the floor of the reactor. It is compulsory for the amount of carbon used to be governed by the throughflow and by the nitrate-equivalent concentration in order to avoid any methanol excess and also any outflow COD and BOD deterioration. The following constitute the specific advantages associated with the Biofor post-DN application: The main drawback is the need to add a carbon substrate which, save in favourable conditions, will result in high running costs. Under very stringent discharge standards it is used for the final treatment of residual urban water and the treatment on residual industrial water. In some cases for certain, initially poorly biodegradable industrial effluent, Oxyblue can be implemented. The process associates the increase in biodegradability of effluent through the controlled contact of non-biodegradable organic material with ozone, combined with a Biofor biofiltration treatment process. It enables non-biodegradable organic pollutants and persistent micro-pollutants to be drastically reduced in wastewater. Ozone, the most powerful chemical oxidant used in water treatment, initiates and accelerates the breakdown of residual organic matter; it oxidates hard resistant COD. Biofiltration, integrating fixed biological cultures, then enables biodegradable COD, produced during the ozone treatment process, to be removed. Industrial reuse of wastewater and discharge of effluent Petrochina, Dagang, China Treatment capacity:

Chapter 4 : Sediment Filtration System |Rain Harvesting by Blue Mountain Co

The types of filtration discussed in the chapter are bulk water filtration, drinking water filters, and process water treatment. The treatment of wastewater has also been discussed. Industrial wastewater treatment has many features in common with the municipal process, but usually has an extra step to take care of the particular features of the.

Number Source Definition Bonding methods may include any of the following means or any combination thereof, including but not limited to: Thermally fusing the fibers or filaments to each other or to other meltable fibers of powders. Fusing fibers by first dissolving then resolidifying their surfaces. Creating physical entanglements or tufts among the fibers. Stitching the fibers or filaments in place. A nonwoven may be a structural component of a composite. Nonwoven structures may incorporate monofilaments or yarns. The fibers may be of natural or man-made origin. They may be staple or continuous filaments or be formed in situ. To distinguish wet laid nonwovens from wet laid papers, a material shall be regarded as a nonwoven: Here, fibers or filaments are bonded so that the average bond-to-bond distances are greater than 5 0 - 1 0 0 times the fiber diameter giving textile-like qualities of low bending and low in-plane stiffness. Structures formed by extruding one or more fiber-forming polymers in the form of a network or film. The film may then be uniaxially or biaxially oriented to fibrillate into a net-like structure. Both definitions exclude chemically digested vegetable fiber content. In effect a nonwoven is differentiated from paper if: Nonwovens are generally perceived as being formed by a dry form process where aerodynamics, mechanical devices, and spinnerettes are used to form the web. On the other hand, paper is formed from a water medium using a wet lay or paper machine process. This includes glass fiber paper media including glass microfiber paper , and wet laid substrates with high percentages of synthetic long fibers such as those of nylon and polyester. Wet laid media made from inorganic fibers such as carbon, ceramic, and metal might also satisfy the definition provided they meet the bulk requirement of less than. This exclusion eliminates certain types ot" wet laid long fiber media normally perceived as being nonwoven. Examples are cotton, wool, sisal, hemp, abaca, and certain forms of kenaf. Indeed these fibers have the historical significance of being the origins of nonwoven materials. There is a reviving interest in natural fibers for nonwoven webs, because they are biodegradable and relieve environmental concerns about their disposal. Some dry formed products do not necessarily satisfy the definitions of nonwoven. Examples are the absorbent webs and other products produced on an air laid machine. They generally have a minimal amount of long fibered synthetics depending on product design and application. The author understands the importance of having a distinction between nonwovens and paper. However, there is a great deal of gray area in the distinction. In addition, there is a great deal of cross lapping in the market place and in the technology of filter medium products. Many composite structures contain both nonwoven and paper components. Several filter medium manufacturers produce both nonwoven and paper media and do not differentiate their products by the nonwoven definition. Almost every nonwoven conference that includes sessions on nonwoven filter media will have discussions and presentations concerning paper media. Although, the title of this book is the Handbook of Nonwoven Filter Media, the author finds it awkward and difficult to present an adequate discussion of the topic without including paper structures. Therefore for purposes of this book the author accepts the definition of nonwoven as proposed by INDA Table 1. The glossary in their handbook defines filter medium as "The porous material in a filter that does the actual filtering. Examples of other types of separation media are as follows: Activated carbon is a common adsorbent used in filter media. In liquid filtration it is used to remove hydrocarbons and bad taste contaminants from drinking water. It is also used to remove toxic and obnoxious chemicals from air such as in gas masks and respirators. In military affairs adsorbents such as activated carbon are used to protect both military personnel and civilians from the toxic effects of chemical agents. Other adsorbent materials used in filter media include activated alumina, zeolites, ion exchange resins, and baking soda sodium bicarbonate. Adsorbent media are gaining widespread use in automotive cabin air filters where they are effective in removing vile odors and emission fumes. In recent years adsorbents have become a significant medium in HVAC heat, ventilation, air conditioning systems in the workplace and in the home. Nonwovens are often used with absorbent structures, to contain the absorbent material and to act as a transport layer for fluid to flow to the absorbent material. However, absorbent structures such as diaper fluff, hygienic pads, and wipes are not: On the other hand, some materials are selective. Polyolefins, although hydrophobic, have an affinity for oil and are often used to absorb oil from water. Polyolefin materials are often used to control oil spills at sea. Very often absorbency is an undesired quality in a filter medium. The tendency of cellulose media to absorb water tends to soften and weaken the filter structure and shorten filter life. In addition, the absorption of moisture causes fiber swelling and interference with filtration performance. This includes dispersed hydrocarbons from water, oil mists from air, moisture and vapor from air, and moisture from aviation fuel. The p h e n o m e n o n is a particulate filtration, in that it requires a matrix of fine fibers to trap the liquid particles and hold them on the fibers. An additional effect is required. Provision has to be provided fl r the transport of the entrapped liquid particles so that they can be removed from the media as a separate stream, either by a flotation or gravity settling mechanism. Although it can be argued that electrostatic media still: Electrets are dielectric materials that exhibit an 8 Handbook of Nonwoven Filter Media external electric field in the absence of an applied field. When used in air filtration applications, they can greatly increase initial filtration efficiency and reduce pressure drop. Electrostatic media has become an important entry into air filtration markets. Electrokinetic filtration is used in liquid applications. The medium is given a positive electronic charge that enables it to attract the mostly anionic particles in a polar fluid stream. In some cases the antimicrobial action is also intended to prevent the migration of biological microorganisms into the filtrate or filtered product. The antimicrobial agent can be applied to a medium as a finishing step or it can be incorporated into the fiber. A coffee filter is a good example. Hot water extracts the soluble coffee taste components from the coffee grinds supported in the coffee filter medium. The coffee rich water passes through the medium, however the grinds are retained. Teabag and tea filters act in a similar manner. Certain types of nonwoven media such as melt-blown and electrospun media are generally too thin and weak to provide for their own structural integrity. They require a stronger material such as a woven fabric, spunbond, needle punch felt, or cellulose web to provide mechanical strength for the application. Very often metal mesh materials are used for this purpose. In many applications membrane filters are supported by a nonwoven structure. Membrane filter media are not considered within the scope of this "Handbook", however the nonwoven support structures are within the scope. In many cases, a medium used to provide mechanical support to a filter medium also participates in the filtration process. Often the support layer is a prefilter layer for the more efficient filter medium it is supporting, resulting in a gradient density filter m e d i u m - a filter medium composed of two or more layers; each layer being successively more efficient than the previous layer. They are further discussed in Section 1. The fabric is a sheet-like structure produced in lengths long enough to be wound into rolls. Although the random fiber structure is the backbone of the web, it may contain other components that are part of the forming process including but not limited to particulate fillers clays, calcium, adsorptive powders, etc. It is implicit in the definition that the fibers and filaments be bonded in some form or fashion. The formed fabric may be bonded as it is formed. An example is the hydrogen bonding of cellulose fibers in webs tbrmed by the wet lay process. The downstream bonding process may include any of the following: The fabric may be exposed to other chemical and mechanical treatments to enhance its properties. Examples are coatings and finishes, flame retardants, antimicrobial agents, water repellents, dyes. Among the many types of filter media that are not within the scope of this book are: Such applications of nonwovens will be part of the scope of this handbook. In addition, nonwoven media are sometimes used as support structures for bed filters. These applications of nonwoven media will also be included. There are two major process groups for forming nonwovens; dry formed and wet laid. A simple distinction between the two groups is that in dry formed processes the webs are formed in an air medium, whereas in the wet lay process the webs are formed in water. There are five major dry formed processes: Air laid Dry laid carding operations Spunbonded Melt-blown Electrospun. Wet laid processes are similar to the processes for making paper, and the machines for producing wet laid webs, particularly filter paper, are referred to as paper machines. Highly porous filter papers and webs formed from long fibers require specially designed paper machines. They are often referred to as wet lay machines. The interesting thing about Table 1. Following are short descriptions of each process. More detailed descriptions will be found in Chapter 5. The fluff pulp is h a m m e r milled into individualized fibers, which are then air conveyed to a moving belt or forming wire to be formed into a fabric. Short cut or staple synthetic fibers such as polyester, polypropylene, Nylon, Rayon, etc.

Chapter 5 : Filters and Filtration Handbook - T. Christopher Dickenson - Google Books

Following over 3, sales of the third edition, the fourth edition of Filters & Filtration Handbook is again destined to become the leading reference manual for filtration and separation www.nxgvision.com handbook is an essential reference tool for engineers, designers technicians, plant operators and consultants as well as staff with responsibility for purchasing, planning, sales and marketing.

Separations Mechanical Filters Filters are used to separate a liquid-solid or gas-solid mixture. They are used in a wide range of applications, and in many fields, as described below. Types Of Filter Media Strainers And Filter Cloth General Information Filter cloth or paper consists of different types of fibers layered to create pores that allow liquid to flow through while collecting solid particles. These fibers may be synthetic, such as nylon or polyester, or natural, such as cotton or wool. Illustrated in the video below, as the slurry is filtered through the filter medium, solids accumulate on top of the filter medium to form a cake. Eventually, the cake formed performs the actual filtration while the filter medium merely supports the cake. If soft particles in the fluid block the filter medium, a filter aid can be used. A filter aid is a precoat of fine fibers on the filter medium and in the entering fluid which helps cake formation. Most filtration procedures that involve a cake can use a wash for maximum filtrate recovery. When a filter cake is washed, a liquid, usually water, is run through the cake to recover any remaining filtrate in the cake. Usually a maximum of four times the filtrate volume of wash liquid is used. Usage Examples A common surface filter used in industry is a strainer, or screen. In surface filters, a thin layer of dust precoat builds up on the filter at the start of the process. This precoat then acts as the primary filter medium. Strainers are mostly made of wire mesh and are usually used for sludges and slurries containing relatively large solids. Due to their simplicity and low cost, strainers are one of the most commonly used liquid- solid separation devices in industry. The strainers used to strain food when cooking are the simplest type in use. Strainers are also used often in pool filters. Sieves, the more general form of a strainer, can be used to separate larger solids from smaller solids. They can be used for the separation of sand, gravel and rocks. Tyler, Mentor, OH Cartridge Filters General Information Filter cartridges consist of rolls of filter media wound so that several layers of filter media cover each other. These wound cartridges, shown below on the left, are usually contained in a housing which may hold more than one cartridge at a time. The cartridge housing pictured below on the right is a single cartridge system. Pictures copyright Rosedale Products, Inc. When the cartridge is pleated, it functions as a surface filter, in which the filter media blocks the solid particles from flowing through. When the cartridge consists of wound layers of filter media, it operates as a depth filter, in which the many layers collect the solid particles as the slurry flows through it. Hybrid systems combine the best features of bag and cartridge systems. These systems have more surface area than standard bag filters and are easier to change than cartridge filters because the collected material stays inside the medium. The picture to the left is an example of pleated cartridges and to the right is an example of wound cartridges. Bag filters can also be made out of polypropylene needle felt. These polypropylene-based bag filters are commonly used in the food, beverage and pharmaceutical industries because they comply with food contact requirements. Bag filters are simple in design and inexpensive. They are often placed inside a housing, such as the one below on the right, and a slurry runs through them. Usage Examples Large filter bags are used to collect dust and other contaminants in metal factories, such as the one shown here. Filters such as these are used in the manufacture of iron and steel as well as cement, lime and clay. They are generally used for removing solid particulates but can be used effectively for filtering fluid materials. These plates are metal frames containing large sheets of filter cloth, usually polypropylene. These plates are squeezed together and the slurry is filtered through the press. The slurry deposits solids on the filter cloth as the filtrate leaves the press via discharge ports. The solids continue to deposit and eventually form a cake in the spaces between the filter plates. When operated as a batch process, filtering is paused to remove the filter cake when it has reached a maximum thickness. For continuous processes, the filter press can be modified to deposit the filter cake in drums or barrels, as shown below. This filter press has a standard capacity of cubic feet and can operate at up to psi. Filter presses are also used in the chemical, pharmaceutical

, and oil industries.

Chapter 6 : Dickinson - Filters and Filtration handbook

Filtration and flushing strategy 5 Filtration Handbook Filtration and flushing strategy Introduction The exacting tolerances in today's hy-draulic systems require tight control of.

Chapter 7 : Visual Encyclopedia of Chemical Engineering

This effort emphasizes the resolve of the authors to present a handbook dedicated to the training of those engaged in the important field of pharmaceutical liquid filtrations.

Chapter 8 : Filtration Technology : HYDAC

Filters and Filtration Handbook This page intentionally left blank Filters and Filtration Handbook Fifth Edition Ken Sutherland AMSTERDAM â€¢ BOSTON â€¢ HIEDELBERG â€¢ LONDON NEWYORK â€¢ OXFORD â€¢ PARIS â€¢ SAN DIEGO SAN FRANCISCO â€¢ SINGAPORE â€¢ SYDNEY â€¢ TOKYO Butterworth-Heinemann is an imprint of Elsevier.

Chapter 9 : Biological filters - biofilters - DegremontÂ®

The B+W filter manufacturing company was found-ed in Berlin in Â¡ by business partners Biermann and Weber. In Â¡ the merger with the Jos. Schnei-.