

AquaRain Water Filter System...MADE IN AMERICA.

There IS a difference!

What is the difference between the AquaRain System and the British Berkefeld?

The British Berkefeld water filter is a system that relies on ceramic technology originally developed in England over 100 years ago. Recently, Fairey Industrial Ceramics, manufacturers of the British Berkefeld water filter system, licensed use of the name "Doulton" for use in their line of small consumer ceramic cartridges. The slip-cast method of production currently used by Fairey is well suited for lower performance, cost competitive industrial ceramics, but may lack the consistency and reliability needed for truly safe household water filtration. Their large, room-sized kilns have a tremendous volume capacity, and for sheer quantity and low cost, they cannot be beat.

CERAMICS: The American-made ceramics used in the AquaRain system are produced in very small batches and are individually tested twice before leaving the factory. The patented extrusion process used to produce the AquaRain ceramic results in an extremely uniform product. (Side by side the visual differences are great...the British ceramic appears bumpy, white, soft chalk-like; while the AquaRain filter is smooth, hard and uniform.) The use of small, computerized kilns insures the unsurpassed consistency and reliability found in the American-made AquaRain ceramic. The ability to accurately measure a filter's remaining wall thickness and thereby safely determine when the filter has reached the end of its useful life is another major difference between the two filter systems. The AquaRain system provides a simple measuring gauge to determine the thickness of the ceramic wall. Over time, the cleaning of the ceramics will cause the ceramic wall to become thinner. The end-of-life-gauge provided with the AquaRain takes the guesswork out of when to replace the element. Literature included with the British Berkefeld unit specifies that the ceramic elements should be replaced at six-month intervals, although salespersons for the imported unit will sometimes tell their customers that they can use their elements until they crack. This can be very dangerous. Since the wall thickness has a great effect on the performance of the filter, elements thin enough to crack are simply unsafe.

CARBON: Granulated activated carbon (GAC) is indeed a mighty product for adsorbing impurities found in water. It is said that one teaspoon of granulated activated carbon has the adsorptive area equal to the entire surface of a football field! Pesticides, chemicals, chlorine, MTBE, as well as other contaminants too numerous to name, can be adsorbed by GAC. The AquaRain water filter system incorporates pure coconut shell carbon that has been proven to have superior performance over the bituminous coal based carbon used within the Doulton ceramics in the British Berkefeld unit. The reliability, long lasting nature, and efficacy of a coconut shell carbon has been found to be superior to a coal base carbon.

SILVER: Metallic silver has been added to the Doulton ceramics used in the British unit to combat "mitosis" or the growth of bacteria through their ceramic walls. This precaution is necessary as the holes of their ceramic pore structure are large enough for bacteria to grow in. The AquaRain ceramic pores are far too small for bacteria growth, alleviating the need for silver within the ceramic. However, all filters with GAC filter beds should use silver to inhibit bacteria growth within the damp environment found there. The AquaRain system incorporates a small amount of metallic silver where it belongs, within the GAC filter bed.

PORE SIZE OF CERAMICS: The "absolute" micron rating of the ceramic found in the imported British Berkefeld water system, as stated in their published specification sheets, is .9 micron. The "nominal" rating of the Doulton ceramic is listed as .5 - .8 micron.

What is the story of micron ratings?

There is a great deal of confusion regarding "absolute" micron ratings. Just how much of a reduction efficiency should be considered adequate for an "absolute" rating? Is 99.9% (3 log) sufficient, or would 99.9999% (6 log) be more appropriate, since it matches our American EPA bacteria requirement? Should

a filter be rated by its ability to remove particulates of a certain size, or should it be challenged with live organisms of a similar size? Should a filter be tested only when it is new, or should the ratings be based on its end of life performance? Unfortunately, the fact is, there is no industry or government standard for “absolute” filtration efficiency.

The ceramic filters used in the AquaRain Gravity Water Filter have been extensively tested against live organisms using fully used and expended end-of-life elements. We believe this form of testing to be the most stringent, since it tests the filters in a manner similar to the way they would actually be used under worst-case conditions. When tested against the .5-.6 micron organism *Klebsiella terrigena*, the EXPENDED ceramic elements demonstrated a 6.6 log reduction (they achieved 8.9 log reduction when new). The EPA requires a minimum 6-log reduction (99.9999%) from NEW elements, which was greatly exceeded with used elements under extreme pressures of up to 90 psi, well above normal test pressures. At the very low pressure of ½ psi found in our gravity system, the efficiency would be far greater still. Our ceramics have also been tested against the much smaller Health Industry Manufacturing Association’s test organism, *Brevundimonas diminuta*, and achieved a 99.9999% reduction (6 log). Since this organism is .2-.3 micron, should we claim this as our “absolute” rating? Here is where it really gets confusing. In another test, expended ceramic elements were challenged with MS2 colophage virus and achieved a 99.999997% (7.7 log) reduction against this organism that is less than .1 micron. Could we now be considered “absolute” at less than .1 micron? The British Berkefeld literature states filtration rates of .2 - .9 microns depending upon efficacy levels achieved. (95% - 99% safety levels) Thus, this issue can be quite confusing to determine the actual filtration achieved by the British unit. The bottom line is that the filter elements used in the AquaRain system out perform all other ceramic filter elements available. Since there is no standard for “absolute,” YOU will have to decide what level of protection you want for yourself and your family.

FILTRATION RATE: The filtration rate between the AquaRain and the British Berkefeld is another area of difference. It is true that water will filter faster through the British Berkefeld than through the AquaRain system. Unfortunately, dealers of the British system represented this as a negative feature of the AquaRain. Of course, this claim does not make any sense! Since the pore size of the British ceramic used in the imported product is larger than the AquaRain ceramic, water will indeed filter faster, but also allow more contaminants through! Additionally, as water passes through the bed of granulated activated carbon, the contact time is longer in the American made ceramic, which is essential for adsorbing contaminants from the water. The bottom line is that the AquaRain system can produce far more *high quality* water a day than a family possibly may ever need. So the question is...what is more important, quantities of lower quality water or the ultimate quality of the AquaRain process?

LONGEVITY: The overall life of a ceramic filter is directly determined by its cleaning. When the flow rate through the wall of a ceramic becomes objectionably slow, the surface is lightly cleaned to restore full flow. The British ceramics used in the Berkefeld system are soft, chalky and wear away quickly when cleaned. Additionally, they are asymmetric and non-concentric, preventing the measurement of the remaining ceramic wall following a cleaning. There is no way to know when the filter cartridges are worn out! To combat this deficiency, the British system includes instructions to replace the ceramics every 6 months.

The American-made ceramics used in the AquaRain system have been manufactured to be very hard with a tight and controlled pore structure. This has been accomplished through careful formulation, a patented extrusion process, and precise firing in small, computerized kilns. These ceramics will accept up to 200 gentle cleanings and potentially last for several years. For unprecedented longevity and the lowest operating cost of ANY filter system available, the AquaRain is the answer!

STAINLESS STEEL HOUSING: Our stainless steel housing is seamless and smooth edged, being formed from single sections of #304 (18-8) heavy stainless steel sheet. We have also incorporated a “Splash Guard” system to insure safe daily operation and convenient carry handles. Our system holds three gallons of water, allowing for fewer fillings for maximum production, and has a simple and reliable

lever-action faucet. The British Berkefeld uses a less expensive process of rolling & welding and may have leaks or voids where bacteria can be trapped. The British system also has no overflow safeguards, no handles, and a “tap” or faucet that is difficult to use.

USEPA PURIFIER STANDARDS: The following is a very important outline that addresses some of the differences between the AquaRain water filter system and the imported British Berkefeld unit, along with a short general description of the EPA testing requirements for water filters.

The United States Environmental Protection Agency (USEPA) has established a testing methodology (protocol) for water filters (purifiers) which establishes minimum levels of performance for removal (reduction) of the three classes of pathogenic organisms, protozoa (cysts), bacteria, and virus. This testing procedure with associated required minimum performance levels is known as the “*USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers.*” These testing procedures, which are performed by independent laboratories, must follow the testing “protocol” established by the USEPA, which establishes the conditions for conducting the various tests with the three classes of organisms (such as number of gallons of test water, test water ph levels...etc.) The “standard” establishes the minimum levels of reduction performance for each class of organism along with which particular organism is to be used for testing in that class. When a microbiological water filter has demonstrated the ability to inactivate or remove at least the minimum required level of the mandated organism for a particular class, using the USEPA established testing protocol, the manufacturer may then claim that their filter meets the USEPA standard for that class. When a filter manufacturer meets the removal standard for all three classes of organisms, it can claim the overall title of Microbiological Water “Purifier” for that water treatment device.

CYSTS: Even though the Doulton Super Sterasyl ceramic “candles” used in the British Berkefeld gravity water filter have not been tested in strict accordance with the USEPA guidelines, we believe that they will probably meet the minimum standards for cyst removal *only when they are in NEW condition.* Since there is no safe method for determining when these “candles” have stopped meeting at least the minimum USEPA performance level, you cannot be certain that you are protected except with relatively new “candles.” Doulton (the manufacturer of the ceramics used in the British Berkefeld unit) attempts to compensate for this exposure to failure by recommending replacement of their Super Sterasyl filter elements after six months of use.

The ceramic elements used in the AquaRain system have fully met the USEPA requirements for cyst removal, demonstrating full compliance not only when they are new, *but also at the measured end-of-life.* This assures the user that the filters are safe to use throughout their *entire life* and that you can know with confidence that they are still fully effective when it is time to replace them.

BACTERIA: There is a MAJOR difference between the filters found in the British Berkefeld unit and the AquaRain water filters in this challenging area. First, we will examine the performance of the AquaRain against the bacteria class of organisms.

The filter elements incorporated in the AquaRain filter system have exceeded the USEPA removal requirements for the mandated test organism, *Klebsiella terrigena*, having been tested by reputable independent laboratories using the established USEPA testing protocol. As with the Cyst test results above, the elements have demonstrated full compliance with USEPA standards for bacteria removal, *even when abraded down to minimum end-of-life wall thickness.* These “end-of-life” test ceramics were even exposed to field water from natural outdoor sources, so they would more closely approximate a customer's expended elements ready for disposal. The end-of-life testing regime, while not mandated by the USEPA (which allows the submission of new components), assures the user that our filter elements high level of performance will be maintained throughout the entire useable and measurable life of the filter element.

The simple truth is, the Doulton Super Sterasyl ceramic “candles” used in the British Berkefeld gravity water filter do not meet the minimum standards set by the USEPA for bacteria removal. The USEPA standard for bacteria is removal of >99.9999% (6 log) of *Klebsiella terrigena* with a new filter element

tested in accordance with the USEPA methodology and procedures in an independent laboratory. Both the factory literature for the British Berkefeld gravity water filter and the Doulton factory literature for the Super Sterasyl ceramic filters extol a removal efficiency of only >99.99% for *Klebsiella terrigena*. This falls far short of the >99.9999% removal as mandated by the USEPA testing standards. The bottom line is that the imported British system does not and cannot meet the USEPA standards for bacteria removal by a water filter. In fact we can find NO OTHER GRAVITY WATER FILTER THAT CLAIMS TO MEET THIS USEPA STANDARD!

VIRUS: No pressure free, chemical free gravity water filter has ever passed this testing standard... *YET*. AquaRain is committed to meeting the challenges of producing a ceramic gravity water purifier that meets the fullest extent of the USEPA testing protocol AND doing so with *expended end-of-life elements!* Preliminary testing with MS-2 Bacteriophage virus has given great encouragement and specific direction to our engineers towards the development of a patentable product that will truly be an earthshaking breakthrough in ceramic water filtration technology. Until that day comes for official water *purifier* status, we can confidently say the AquaRain Water Filter System:

**“Exceeds EPA Purifier Standards for
Bacteria and Protozoa Removal”**

The bottom line is that the AquaRain Gravity Water Filter meets the fullest extent of the USEPA water purifier standards for removal of cysts and bacteria, and does so even when the elements have reached their end of life. It is not surprising that our American Made system is the only one that meets our own country’s challenging American Standards!

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There IS a difference!**

What is the difference between the Katadyn and the AquaRain?

The Katadyn TRK Gravity Water Filter is a very good filter and the ceramics are top notch. The Ceradyn ceramic filter elements used in the TRK have an end-of-life gauge similar to ours and are of similar hardness and overall quality. There are several important differences however. Here are a few...

The AquaRain ceramics have a smaller pore size than the Ceradyn and a correspondingly higher performance in removing smaller pathogens. The Ceradyn elements are filled with a silvered quartz gravel which will not improve the water quality in any way, while the AquaRain elements are filled with a high quality silvered granulated carbon made from coconut shell that demonstrates a superior performance in reducing pesticides, various chemicals, chlorine (if present), halogens, pesticides, tastes and odors. Katadyn has recently introduced the Superdyn cartridge, which is filled with a bituminous (coal) carbon filling. Bituminous carbons do not typically have the VOC reduction performance of coconut shell carbon, as used in the AquaRain Gravity Water Filter System.

The rugged yet attractive AquaRain housing is constructed of heavy duty 18-8 stainless steel while the Katadyn TRK is made of more difficult to sanitize plastic.

Lastly, the imported Katadyn system uses only three ceramic elements and *costs FAR more* than our AquaRain Model 400 with four high quality ceramic elements in a stainless steel housing.

Will the filter elements designed for the AquaRain System fit into the housings and replace the British Berkefeld and Katadyn filter cartridges?

Yes, the elements may be used as high performance replacement cartridges for both of these gravity water filter systems. The elements mount in the housings in the same manner as the original filter cartridges.

GRAVITY NATURAL WATER FILTERS & PURIFIERS
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