# Triflow Concepts

## Water Filter System with Katadyn Inside

### Product Data Sheet

### TF321 & TFE500 Cartridge

The Triflow TF321 & TFE500 cartridge embodies Katadyn's manufacturing and water treatment technology to provide the optimum combination for good tasting, healthy water. This universal cartridge is provided as the basis for the range of Triflow water treatment systems. Alternatives are available, however, for special requirements or installations.

It has four key elements:

- Katadyn Ceramic micro-filtration
- Bacteriostatic silver
- Carbon block matrix
- Zeolite -ion exchange

## "Katadyn inside"

The outer shell of the TF321 cartridge is a high quality, micro-porous ceramic media which traps out, not only silt and debris, but pathogenic bacteria and protozoan cysts.

The ceramic is manufactured at Katadyn's modern factory in Wallisellen, Switzerland, where carefully selected raw materials are subjected to a precisely controlled manufacturing process to produce the high quality ceramic filter media.

Katadyn's experience in this field of technology is second to none. they have been involved with water treatment since 1928 and their products, as befits the Swiss reputation, are renowned for their consistency and reliability. There are many manufacturers of ceramic water filters around the world but few, if any, manufacture to the same fine-pore-structure consistency and exacting levels of quality control.

When dealing with pathogenic micro-organisms, quality is paramount and only the best will do!

## Bacteriostatic Silver

Katadyn's ceramic is impregnated with silver during the manufacturing process.

Silver is a bactericide. It has been known for centuries that silver is an appropriate material for water containers. The Romans used to store their drinking water in silver vessels. It is only over the last hundred years or so that the microbiology of water has been understood and that the effectiveness of disinfectants has been assessed.

The bactericidal action of silver is called the "oligodynamic" effect from the Greek "oligos" meaning small and "dynamis" meaning action. In fact Katadyn's name was derived from the German word Katalytisch, meaning catalytic and oligodynamic.

The silver ions released from the ceramic in very low concentrations attack the DNA and enzymes in the bacteria which prevents their reproduction.

When added to the ceramic, the silver acts bacteriostatically, that is it inhibits the growth of bacteria in the ceramic.

## Carbon Block

The activated carbon, within the core of the Katadyn ceramic, is manufactured by extruding a mixture of granular activated carbon and polyethylene powder at an elevated temperature so that the activated carbon particles bind together to form a tight matrix.

The carbon block manufacturing process is precisely controlled to ensure that the pore structure is consistent so that water flows uniformly through it. The bituminous coal based activated carbon used is carefully selected and graded to give the optimum adsorption properties for domestic applications.

Water passes through the ceramic wall and then through the carbon block. As it does, organic contaminants in the water diffuse into the structure of the carbon granules and are adsorbed. Chlorine is also effectively removed but by conversion to the chloride ion by reaction at the carbon surface.

The TF321 is sized so that it will treat a normal domestic drinking water application for at least six months.

## Zeolite

A pulverised synthetic zeolite or inorganic cation exchange material is intermixed with the activated carbon prior to its extrusion.

The zeolite has the capability to remove heavy metals with a high specificity for lead.

## Conclusion

Thus the composite TF321 & TFE500 cartridge has the capability in one small unit, to remove

- Pathogenic bacteria
- Cysts
- Turbidity
- Chlorine
- Organics
- Heavy metals
- Taste
- Odour
- Colour

And it leaves the essential minerals, such as calcium and magnesium, unaffected.

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## Filter operating conditions

| | | |
|---|---|---|
| FLOW RATE* | USG/minute at 60psig<br>Litres/minute at 4 bar | 0.3<br>1.2 |
| CAPACITY | (50% tested capacity for lead in accordance with NSF 53) | 3500 litres<br>900 gallons |
| CARTRIDGE CHANGE FREQUENCY | (regardless of water usage) | maximum<br>6 months |
| TEMPERATURE | Minimum<br>Maximum | 5°C<br>38°C |
| PRESSURE | Minimum<br>Maximum | 25psig (1.7 bar)<br>75psig (5 bar) |

* The flow rate through the cartridge is limited by the fine porosity of the ceramic. Although essential to the functionality of the ceramic as a filter, it also effectively limits the flow for optimum adsorption conditions of the activated carbon.

## Accreditations

Performance verification
The performance of any water treatment system will vary depending upon the water quality before treatment as well as the temperature, flow rate and other prevailing conditions. But it is essential that performance verification for products is provided in order to support performance claims and provide the end-user with comparative data for an informed choice when differentiating between products.

The Filter Performance capability chart below provides a summary of just a few of the numerous tests that have been conducted internationally on the Triflow Concepts water filter system with Katadyn inside, and components.

Quality Assurance
Of equal importance to the verification of performance claims, is the guarantee that the consistency and reliability of the manufacturing process, from raw materials to packaging, are rigorously managed.

## Filter Performance Capability

| Parameter | Contaminant | Method/ Laboratory | Challenge Conditions | Results |
|---|---|---|---|---|
| Suspended Matter | Particulate reduction | Tested in accordance with NSF42 | 0.5 to 1 microns | Class 1 99.99% |
| | Turbidity | Tested in accordance with NSF53 | 16 to 20 NTU (EPA MCL 1.0 NTU) | 0.1 NTU |
| Microbiological *Cyst reduction* | PTI fine test dust | Tested in accordance with NSF53 | 3 to 4 microns (NSF53 requires 99.95%) | >99.9% |
| | Cryptosporidium parvum | Tested with live oocysts by WRc | Challenged with $1x10^4$ to $1x10^5$ oocysts/litre | 100% |
| Microbiological *Bacteria reduction* | Escherichia coli | Ministerio de Salud, Buenos Aires, Argentina | 28,500 cells/ml | 100% |
| | Vibrio cholerae | Laborotorio Clinico, Lima, Peru | 700,000 cells/ml | 100% |
| | Salmonella typhi | US Testing Co. Hoboken, New Jersey, USA | 9,400,000 cells/ml | 100% |
| | Pseudomonas aeruginosa | Centrilab BV Soest, Holland | 50,000 cells/ml | 100% |
| | Aeromonas hydrophila | USEPA/University of Michigan, Ann Arbour, Michigan, USA | 1,000,000 cells/ml | 100% |
| | Yersinia enterocolita | Dept of Industry, Labour and Human Relations, wisconsin, USA | 100,000 cells/ml | 100% |
| | Streptococcus faecalis | Institute Pasteur, Lille, France | 11,000 cells/ml | 100% |
| Inorganic Chemicals | Chlorine | Tested in accordance with NSF42 | reduction from 2mg/1 free available chlorine for 1200 gallons | 99% |
| | Lead | Tested in accordance with NSF53 | reduction from 150µg/1 lead for 1800 gallons | >96% |
| Materials suitability | Total of 106 potentially extractable chemicals | Tested in accordance with NSF53 | Deionised water with 0.5 mg/l chlorine | Full compliance |