

Answers

about CARBONIT®

Drinking Water Filters





Contents on Page

Answers about CARBONIT® filters 3

Drinking water regulations	3
Why filter.....	4
Limit values.....	4
Pot filters.....	5
Bacterial build-up	6
Made in Germany.....	6
Pharmaceutical residues	7
Certificates.....	7
"ANSI/NSF".....	8
Chemicals	8
Replacement interval.....	9
Lime	9
Minerals.....	10
Vitalisation/Energisation	10
Filter replacement	10
Safety.....	10
Recycling.....	11
Heavy metals.....	11
Nitrate	12
Clear tea	12
Which model.....	13
IMPORTANT! Non-pressurised boiler.....	13
Central filter installations	13
Water softener installation.....	14
Simple hook-up.....	14
Physical lime treatment.....	14
Which type of cartridge.....	15
What's so special about CARBONIT® filters?	15
Innovation Prize	16
More contaminant retention with other filters.....	16
Better filtering of lead & copper with other filters.....	17
Chemical additives for better performance.....	17
Tested safety	18
Product quality	18
Electrical conductance / ohmic value	19

General information 20 about CARBONIT® and the Monoblock filter cartridges

Expert appraisal certificates & testing results 21 concerning performance capability (selection)

Data Sheets on CARBONIT® products 26 Technical Data on standard drinking water filters

Checklist 35 for the utilisation of CARBONIT® Drinking Water Filters

Answers

about CARBONIT® Water Filters

Not every water is the same as every other water - and the opinions people have about water quality and water filters are as varied as the questions that we are asked about them. We have been encouraged to compile the most common questions and the most appropriate answers to them, and now, at customer request and with customer support, we present them to you here...



*Drinking
Water
Regulations*

Drinking Water Regulations (TrinkwV)

The revised Drinking Water Regulations (TrinkwV 2001) went into effect in Germany on 1 January 2003. This marked the first time that a drinking water regulation took into consideration the fact that pollutants can find their way into drinking water between the time it leaves the waterworks and the time it arrives at the extraction point. Limit values were established in earlier regulations and compliance with them was checked at the waterworks. Checks continue to be made at the waterworks under the new TrinkwV; the difference is that now these checks have been extended to include household testing. Measurements are made thereby of those substances which are not able to come into contact with the drinking water before it passes through water mains and (in particular) building pipe systems. All limit values must be maintained at those tapping points which serve as extraction points for drinking water. This means that each building owner and owner of a building installation shares responsibility for the quality of the drinking water. If the drinking water is intended for public use or if unusual potential hazards are present (e.g. hospitals, doctor's surgeries), then additional provisions are to be complied with.

The new TrinkwV makes a distinction for that reason in connection with the definition of limit values between "Chemical parameters whose concentration as a rule does not increase in the distribution network, including the building installation (*Chemical Parameters, Part 1*)" and "Chemical parameters whose concentration could increase in the distribution network, including the building installation (*Chemical Parameters, Part 2*)". These include, among other things, all heavy metals!

Why filter?

"But drinking water is one of the best foodstuffs there is! Why does it still need to be filtered?"

These reports are generally based on the investigations carried out at waterworks. The quality of the water that you receive from the faucet at home is not only dependent in particular on the pipes in the building, but also on the water mains that supply them. House water pipes made of lead continue to be used in some buildings. This metal can then appear in various concentrations in the drinking water. It is unlikely in such cases that the applicable limit values can be maintained. It is also true that plumbing fixtures and equipment - particularly components lacking the DVGW testing certificate - can contain lead at forbidden high levels.

With a filter from CARBONIT®, you, too, can also influence the quality of the water coming out of your faucet, if for example the landlord does not intend to replace existing pipe systems or has not yet begun with this replacement or if uncertainty exists with regard to the plumbing fixtures that have been installed.

Limit values (I)

"But we already have very strict regulations governing drinking water in Germany. Must I really filter my drinking water, even when the limit values are being complied with?"

We are not talking about a "must-do" situation here, but if you are of the opinion that your drinking water should go beyond the required values in exhibiting the best purity possible, then you have reached a well-thought-out decision with CARBONIT®.

And if you have ever asked yourself what a limit value actually is...: examples include the following specifications for "the levels of constituents in drinking water which are harmless to health":

Extract from German Drinking Water Regulations

Element	max. content	Element	max. content
Iron	0.2 mg/l	Nickel	0.02 mg/l
Copper	2.0 mg/l	Lead	0.01 mg/l
Aluminium	0.2 mg/l	Vinyl chloride	0.0005 mg/l

It is evident that not only maximum purity and thus maximum safety are achieved in these areas through the use of CARBONIT® Drinking Water Filters, but that in addition such things as unpleasant discolourations of the drinking water or the staining of bathroom fixtures (e.g. in the presence of water containing

iron or copper) can be reduced or even completely avoided.

Even the new Drinking Water Regulations are not able to take into consideration more than just a fraction of all the possible pollutants in drinking water. This means that other **recognised pollutants** are also to be found in drinking water **for which no limit values have however been established**. Included among these undesirable substances, for example, are:

- **Pharmaceutical residues**
- **Polar pesticides** (which can have hormone-like effects)
- **Asbestos fibres**

No one can at present determine on the basis of solid evidence exactly which quantities of these substances represent health hazards and how the substances interact with one another. It is clear, however, that these substances are not drinking water components to be found in nature.

Limit values are determined in animal experiments and extrapolated for adult humans – the values are thus more of theoretical than of practical use.

Here an extract from the Brockhaus Encyclopaedia, 24-volume edition:

"[...] The **procedure for establishing limit values is just as controversial as many of the limit values themselves**, e.g. because scientists have different estimations of the harmfulness of certain pollutants and limit values tend to represent politically negotiated compromises between that which is required by various considerations of ecology and health (toxicology), of technical feasibility, of financial acceptability and of economic and political justifiability (to include the international sphere). [...]"

It is thus probably more readily comprehensible that the limit value for lead contained in the TrinkwV of 2001 is only intended to be reduced in stages from the previous level of 40 µg to 10 µg by the year 2013: The German federal government itself lacks the funds for rehabilitating its own buildings (source: Ministry of the Environment). The long transition period here eases the financial commitment involved.

"What is the difference between a so-called 'pot filter' and a CARBONIT®filter?"

Pot filters are intended to improve the taste and odour of the water. These gravitation systems usually consist of an ion exchanger for decarbonisation (with limited capacity) and a small proportion of silvered activated carbon packing. The ion

Do the new Drinking Water Regulations take into account all harmful substances?

*Limit values (II)
How are these limit values determined?*

Pot filter





Bacterial build-up

exchangers replace calcium and magnesium ions, e.g. with hydrogen ions. The pH value of the filtrate is thereby altered, and thus is no longer in compliance with the TrinkwV of 2001. pH-neutral potassium ions are therefore already in use "as exchangers" in some appliances.

All **CARBONIT®** Premium Drinking Water Filters are designed for reducing pollutants and naturally also for improving the taste and odour of the water. Here the filter has guaranteed characteristics, but still no reduction of calcium or magnesium content takes place through the activated carbon.

"Can the filters lead to bacterial build-up in the water?"

No. Bacterial build-up **can not occur.** Tests with extremely high bacterial concentrations (several million placed before the filter) **certify the extraordinarily high performance** of the (NFP Premium) filter ["zero" test bacteria (E. Coli and Enterococcus faecalis) made it through]. The NFP Premium filter cartridge has successfully passed a number of additional hygiene tests; this filter was tested for retention of the following (the retention rate was always >99.9%):

Bacteria (*Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Enterobacter cloacae*, *Pseudomonas aeruginosa*, *Bacillus subtilis*)

Micro-organisms (*Entamoeba coli*, *Giardia lamblia*, *Cryptosporidium parvum*, *Hymenolepis nana*, *Schistosoma mansoni*, *Ascaris suum*)

Funguses/yeasts (*Candida albicans*, *Rhodotorula mucilaginosa*, *Saccharomyces cerevisiae*)

The **IFP Puro** and **NFP Clario** filter cartridge types are also outstanding choices for achieving **hygienically irreproachable filtered water**. These cartridges were originally designed to meet especially high requirements – e.g. medical applications - but they are now also being offered for private users as a result of the great demand that has arisen. Please observe in this connection the six-month filter replacement intervals required by statute and the operating instructions for the devices.

Where are the filter cartridges manufactured?"

CARBONIT® is a company based in Germany in the state of Saxony-Anhalt. The process for manufacturing the filter cartridges is internationally patented.

Activated carbon is a carefully processed renewable raw material resource. Even the ancient Romans used activated carbon for preserving wine; nowadays waterworks everywhere are still using this material. Activated carbon also provides emergency

Made in
Germany

medical therapies against poisoning or diarrhoea illnesses; The special CARBONIT® knowledge lies in the quality-monitored and careful selection of this natural vegetable product as well as in its internationally patented later processing to produce baked (sintered) block filters.

High-performance filters for universal application are created without chemical additives (e.g. silver) and with complete batch tracking.

"It is claimed that pharmaceutical residues and polar pesticides with possible hormonal effects may also be found in drinking water. Can CARBONIT® filters remove such things?"

Many of the pharmaceutical and polar pesticide residues which to our knowledge are the ones most commonly being discussed have been tested in an extensive study and none of these were detectable in the filtered water. You will find the list of substances tested in the Data Sheet.

"Have CARBONIT® filters been tested by an independent institute?"

Yes. The filter performance **confirmed in the expert appraisal certificates** can be found in the product brochures. The filters have been tested by the following, among others

- TÜV-Umwelt Berlin (lead, copper)
- Universität Bielefeld (bacteria & pathogenic parasites)
- HS Magdeburg (agricultural pesticides, chloroform, chlorine, ozone)
- Hygieneinstitut des Ruhrgebietes (bacteria and viruses)
- TU Berlin (polar pesticides, pharmaceutical residues, hormones, steroids)
- KIWA (hygienic characteristics of the NFP Clario membrane)
- VITO (hygienic characteristics of the IFP Puro membrane)
- NSF (membrane of the IFP Puro: parts made of ANSI/NSF 53)
- LGA Bayern (Monoblock: food safety)

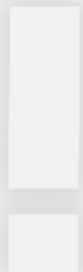
Some of these expert appraisal certificates are **reprinted in abridged form on pages 21-25** of this brochure.

CARBONIT® however also insists on high quality standards in the housings. As a result, our filter housing is not only in compliance with the KTW recommendations¹ but also with the DVGW W2702 Worksheet².

1) KTW Recommendation = Health-related evaluation of plastic substances

Pharmaceutical residues

Certificates





„ANSI/NSF“

and other non-metallic materials under the auspices of the law governing foodstuffs and commodities [Lebensmittel- und Bedarfsgegenständegesetz (LMBG)] for drinking water.

2) DVGW W270 = The increase of micro-organisms on materials for the drinking water sector.

"Why haven't the filters been tested by an accredited American institutes in accordance with ANSI/NSF?"

When selecting the testing institutions, CARBONIT® took into account the fact that the problems with drinking water impurities which might occur in Europe are also considered by these institutions to be the investigative standard. E. Coli, enterococci and Clostridium perfringens are listed in the Drinking Water Regulations as important indicator bacteria for describing hygienic drinking water quality. (Note: in accordance with §5 Para. 1 of the Drinking Water Regulations, pathogenic agents are not permitted to be present in the water in concentrations which arouse concern about injury to human health. The established value of "zero" is to be understood in the sense of "not detectable".) No application has been made to date for certification in accordance with the ANSI/NSF Standard 53 because **no investigations** with living micro-organisms under the auspices of this Standard for either **E. coli bacteria** or Enterococcus faecalis have yet been made available.

The **membrane in the IFP Puro filter cartridge**, on the other hand, has **successfully undergone testing** in accordance with **ANSI/NSF 53**. The background to this is the focus on the North American market of the manufacturer of the membrane, "Prime Water International NV", for which reason a test tailored to American water conditions was obligatory. Recognition and application of foreign accreditations to European standards are out of the question.

"Are chemicals utilised in the filtering process?"

No chemicals are used in CARBONIT® filters.

"Then why don't the filters lead to bacterial build-up?"

The pores of the filter are so fine that bacteria such as Escherichia coli or even enterococci cannot grow through the filter element (within a six-month period). We filter at the levels of microfiltration. The use of chemicals for disinfection purposes (e.g. silver) therefore be redundant, and it is furthermore not required.

Chemistry

"Why is the filter to be replaced after 6 months?"

There are two reasons for this. On the one hand, there are only a few cases of drinking water chlorination (or other disinfection methods) in Europe. This leads to a situation whereby any **bacteria possibly** present in the water **can grow and multiply without hindrance**. Filters made of activated carbon in particular offer micro-organisms a favourable area for growth on their outer surfaces. Consequently, a change of filter should take place every six months for **hygienic reasons**.

Furthermore, filter replacement after six months is advisable in accordance with DIN 1988, Section VIII.: „[...] For hygienic reasons, replacement (with a new filter element) is required no less frequently than every six months.(...) The reasoning for this is, among other things, that a **bacteria build-up** could form over time on the **rear side of the filter**; this would then find its way back into the pipe system (reverse suction with leakages) and pollute the unfiltered water. In order to prevent this, replacement every six months is prescribed.

"Can the filters get rid of the lime as well?"

Yes, the filters remove the lime particles from the water, together with all other particles down to the specified filter fineness (e.g. $<0.45\ \mu\text{m}$ for the NFP Premium or $0.15\ \mu\text{m}$ for the IFP Puro/NFP Clario). The lime that is in solution, that is to say the minerals, remains in the water. Lime is made up mainly of calcium and magnesium - which are minerals. The term "in solution" is used here to mean the same as when sugar is dissolved in water. Not all deposits on electrical devices will be prevented in water that has been put through CARBONIT® filters, but they will as a rule be considerably reduced in magnitude and their consistency will be altered - the deposits are considerably softer.

If the lime (i.e. calcium and magnesium) is also to be removed from the water then this can be performed by using an auxiliary cation exchanger, such as with the DUO Kalk unit. (...)

Bellima® is exceptionally suitable for smaller applications, e.g. as a substitute jug filter. The small fan-like "water papers" are suspended in the water during the brewing of tea or coffee, for example, and **reduce the hardness of the water**. Tea and coffee are thereby optimised in both flavour and appearance. Please use Bellima® only in conjunction with CARBONIT®-filtered drinking water. (www.bellima.de)

Replacement interval

Lime



*Minerals**Activation/
energisation**Filter
replacement**Safety***"Do the filters get rid of the minerals as well?"**

No. The minerals (in solution) remain in the water.

"One hears more and more these days about the possibility of "activating" the water. Doesn't that make filters superfluous? Does CARBONIT® offer such systems as well?"

We regard water activation as a possible supplement to filtering: first remove the unwanted substance-based impairments by means of a CARBONIT®-filter and then treat or introduce the so-called "fine-material" oscillations. CARBONIT® has great competence in the manufacture of filter systems - other firms distinguish themselves through equally great expertise in the manufacture of devices for water activation. CARBONIT® works together with these firms in a co-operative competency network. Consequently, we recommend selected producers of devices for vitalisation; for the mode of action utilised in these devices, consult the respective manufacturer or one of our professional dealers, such as an H₂O water shop.

"How long does a filter last? When must a filter be replaced?"

The filter can be counted on to clean over 10,000 litres (NFP Premium) or 5,000 litres (IFP Puro/NFP Clario) of water; these figures have been tested and confirmed by the institutions mentioned above. You should replace the filter after **6 months** in accordance with the drinking water DIN 1988, Section VIII - no matter whether you have already filtered 10,000 litres (NFP Premium) or 5,000 litres (IFP Puro/NFP Clario). If you should happen to use more than 10,000 litres (NFP Premium) or 5,000 litres (IFP Puro/NFP Clario) over a six-month period, then this will be clearly reflected in the considerable **reduction of water flow**. The filter cartridge should be replaced earlier in such cases.

"The filter handles 10,000 litres (NFP Premium) or 5,000 litres (IFP Puro/NFP Clario); that's far more than I would ever use in six months. Why doesn't CARBONIT® produce filters for fewer litres?"

The filter elements manufactured by CARBONIT® involve filters which have been modified to conform to international and commercial norms and which are produced in large quantities for private households and business operations. Because it is always the

same filter type which is used, it is possible to keep production costs low. It is for that reason that we have standardised filters with high litre performance - and you have an inexpensive filter with a high performance spectrum available to you. And you can always be sure that you will not overtax the filter.

"What should I do with a used filter?"

You can dispose of the filter along with other **household refuse without any problem** or **return it to the dealer** when you purchase a new filter after six months have elapsed. The dealer will pass it on to CARBONIT®. CARBONIT® subjects the used filter to an orderly **recycling** process.

Recycling

"Is it possible to reduce the content of heavy metals in drinking water by allowing the water to run down the drain for a while, to the point where I can dispense with a filter, even when there is a considerable heavy metal content in the water?"

No single, comprehensive answer is possible for this question. The number of litres of water you need to allow to run off depends upon many considerations: such as, for example, the

Heavy metals

Designation	The following was measured at the waterworks at Berlin-Jungfernheide	Peak values found in various investigations of Berlin water obtained from household faucets	Values measured in these households following installation of a CARBONIT® filter
Minerals			
Calcium	121 mg/l	125 mg/l	125 mg/l
Magnesium	12.1 mg/l	11.5 mg/l	11.5 mg/l
Potassium	7.8 mg/l	8.0 mg/l	8.0 mg/l
Fluoride	0.18 mg/l	0.18 mg/l	0.18 mg/l
Nitrate	3.2 mg/l	5 mg/l	5 mg/l
Nitrite	none detected	none detected	none detected
Sodium	49 mg/l	51 mg/l	51 mg/l
Heavy Metals			
Copper	none detected	9.8 mg/l	0.1 mg/l
Lead	none detected	0.47 mg/l	none detected
Zinc	none detected	14 mg/l	< 0.5 mg/l
Nickel	none detected	0.55 mg/l	none detected
Cadmium	none detected	0.01 mg/l	none detected



floor on which you live in your building, where the section of pipeline is located which is responsible for the higher **heavy metal content**, what the habits of your fellow tenants are, etc. It is also true that you cannot reduce the amount of substances which might already be contained in the drinking water when it leaves the waterworks simply by running more water, (e.g.: pharmaceutical residues). In addition, it is certainly **not a sign of environmental conscientiousness** to simply send a lot of water down the drain. Also, even with very brief stagnation periods, water absorbs more lead than the limit value permits.

In all the analysis results shown here (page 11), the respective limit values are complied with at the waterworks. In the households, on the other hand, **values in excess** of the limit values were found.

Nitrate

"My drinking water contains nitrate and nitrite in concentrations that I would like to see reduced. Which model series is available from CARBONIT® which could help me do this?"

The problem of nitrate and nitrite in drinking water has fortunately receded in recent years. In many cases, the load values resulting from foodstuffs (e.g. salads, sausage products) are considerably greater and controllable only to a limited extent. Recommendable systems for nitrate reduction exist for the house entry point or for specific extraction points. Information can be obtained from, among others, the professional consultants for water conditioning in the ibus network (www.ibus-netzwerk.de) or at the H₂O water shops (www.wasserladen.de).

Clear Tea

"When I was still using a jug filter, my tea was completely clear! Why isn't this also the case with CARBONIT® filters?"

The clouding of tea is chiefly caused by minerals in the water such as calcium and magnesium. Pot filters often contain a cation exchanger in the filter cartridge. The **minerals** calcium and magnesium **are removed** by the cation exchanger **and replaced** with a different substance.

One simple and effective **solution is Bellima®**: always use the little "water paper" whenever you are brewing tea. It is not just the result which is convincing: Bellima® is inexpensive and is manufactured from renewable resources. The de-hardening papers can even be put in compost heaps after use.

This solution is particularly appropriate in combination with the devices of the SANUNO and VARIO series. In the Duo Kalk

device, a regenerative cation-exchanger cartridge removes the lime directly in the unit (before it reaches the activated carbon filter).

"Which filter from CARBONIT® should I take in order to have the best possible filtering result?"

For drinking water needs (e.g., in the kitchen), CARBONIT® always installs filters with a filtration fineness of <math>< 0.45 \mu\text{m}</math> (NFP Premium) or $0.15 \mu\text{m}$ (IFP Puro/NFP Clario). The water quality is thus always the same, no matter which filter housing is used. The different housings offer different levels of easy usage, and they can, depending on the prevailing conditions, **all** be used. Decide for yourself which level of **ease of usage** you prefer. You can obtain a good overview of the different CARBONIT® filters and the areas of utilisation associated with them from the Table on the last page of this brochure.

"I have a depressurised storage water heater. Which filter from CARBONIT® can I then use?"

Under no circumstances should you use a SANUNO, because the **warm water storage tank** could suffer damage (see also the product description). A DUO Classic or a Vario would be the most suitable for this situation. Due to the special water circulation associated with depressurised storage water heaters, even the water that flows into the warm water storage tank will wind up being filtered when the DUO or the Vario Universal is used. (*Beware: bacteria can form in these storage tanks after filtering through reverse bacteria build-up on the fixture side!*)

Similarly, do not connect a SANUNO to a spray hose fitting!

"Wouldn't it be better to filter all the water in the house through a central installation, so that filtered water would be available everywhere?"

Yes, it is true that with a central water treatment installation - such as with a QUADRO filter installation from CARBONIT® - all of the water would be treated before it entered the household pipeline system. And this would indeed lead to a **visible improvement** in water quality. The problem is that the heavy metals which can enter the water from the walls of household pipes themselves cannot be treated using a central installation. Consequently, we recommend the installation of an **additional filter in the kitchen** where there is centralised water treatment. This will ensure that any possible copper or lead given off by the house installation will be considerably reduced.

Which model

IMPORTANT!!!

Central filter installations



Water softener installation

"I already have a central water treatment installation - a water softener. Why should I filter my water as well?"

If the water is also to be "softened", then a combination of other devices with CARBONIT® filters is the ideal solution.

Water softener installations reduce the hardness of the water - meaning the levels it contains of dissolved calcium and magnesium. In exchange, sodium (the natural component of our table salt), is introduced into the drinking water. CARBONIT® filters are in turn not designed to reduce the dissolved minerals in the water; instead, the filters are useful against a multitude of other substances.

Simple connection

"Is it complicated to connect a CARBONIT® filter to the water supply lines?"

You can install the appliances of the SANUNO, Vario and Duo series yourself in just a few steps. The only requirement is that the appliances be installed between the 3/8" corner valve and the armature mounted on the sink. The SANUNO (table top model) is in fact connected only to the spray regulator on the armature. If you would like to be able to alternate easily between filtered and unfiltered water in your kitchen, appliances with a small separate water faucet are available for selection - or you simply replace your existing plumbing fixture with our easy-to-use 3-way armature. §12 Par. 2 AVB WasserV requires that the QUADRO model series, which is installed at the house entry point (downstream from the water clock), be installed by a professional installation company.

However, no unusual tools are required. All systems are supplied ready-to-install, already fitted with filter cartridges.

Chemical-free lime treatment

"Do alternative lime treatment processes also exist which do the job and which are to be recommended?"

Numerous possibilities exist for chemical-free lime treatment in cases where no ion exchanger is desired for lime treatment. Not all of these processes fulfil expectations – some explanation approaches cannot be tested against recognised scientific criteria.

"When is it better to use an NFP Premium filter cartridge and when should I install an IFP Puro/NFP Clario?"

As a rule, both of these filter cartridge options involve very high-performance products. A capillary membrane (IFP Puro/NFP Clario) is however not able to reduce chemical constituents. Its focus lies primarily with the special retention of particles (e.g. sediments, micro-organisms). The "only activated carbon cartridge" (NFP Premium) has, in addition to an attractive price, a filtration capacity for removing chemical substances that is twice as great.

An additional important difference is the **necessary pipeline pressure**. While it is true that a filter cartridge of the NFP Premium type will also clean the water at low pressure, it doesn't deliver the filtered water in the same convenient a fashion that an IFP Puro or an NFP Clario would. This means that anyone who has **low pipeline pressure** should install for practical reasons either the **IFP Puro or the NFP Clario**.

The **NFP Premium** is included in the following CARBONIT® filter systems as standard equipment:

- **SANUNO** Classic
- **VARIO** Classic
- **DUO** Classic, Comfort, Kalk, Special

The **IFP Puro/NFP Clario** is included in the following CARBONIT® filter systems as standard equipment:

- **SANUNO** Comfort
- **VARIO** Comfort & Universal
- **DUO** Clario

IMPORTANT: You can **choose either NFP Premium or IFP Puro/NFP Clario** when purchasing a **replacement filter cartridge**, because the **cartridges are standardised** and therefore fit in all conventional housings. Please be aware however of the fact that no substitution is possible when purchasing the initial filter system equipment setup.

"There are so many different activated carbon block filters from so many different manufacturers. Why should I purchase one from CARBONIT®, after all?"

Filters made by CARBONIT® are not afraid of any price or performance comparison. It can be said, in reference to filter performance, that the **NFP Premium** and the **IFP Puro/NFP Clario**

NFP Premium or IFP Puro or NFP Clario?

Why CARBONIT® filters, after all?



Innovation Prize

from CARBONIT® are the only activated carbon block filters which:

- have been proven to filter out **pharmaceutical residues** (see filter cartridge Data Sheets)
- have been proven to filter out **polar pesticides** (with presumed hormone-like effect - see filter cartridge Data Sheets)
- **securely** and continuously reduce even **very high concentrations of copper and lead**
- while at the same time safely holding back bacteria such as E. coli and Enterococcus faecalis. (In addition, the filter has also been tested for the filtering out of many other micro-organisms).

And as far as price goes ... let us know if you find a less expensive filter which offers similar performance.

"Has CARBONIT® ever received any official recognition for its outstanding products?"



ALL ANZEH T Ü E DIE MÄRKTE VON MORGEN

Innovationspreis
Sachsen-Anhalt **2002**

Yes, and it is a source of special pride for us. In 1997, CARBONIT® Filbertechnik GmbH received for the first time the Innovation Prize awarded by the Saxony-Anhalt Ministry for Economics and Technology.

In 2002, CARBONIT® **received the Innovation Prize for the second time.** The award was

given in recognition of the combination of hollow fibre membrane and active carbon block.

More contaminant retention with other filters

"When I read the tables showing the substances held back by the filters made by other manufacturers, I find many more listed than are claimed for CARBONIT® filters. What is the reason for that?"

Every manufacturer focuses on specific problem situations. This could be a reason for differences in specifications.

An additional reason is that some manufacturers also list substances which are **projections made based on the „Chloroform“** parameter. Reference is made to general experience for this projection. If tests were thus made for chloroform, then statements can also be made based on projections for the following substances (examples):

benzole, O-xylol, toluol, ethyl benzole, p-dichlorobenzene, trichloroethene, carbon tetrachloride, dichloromethane, monochlorobenzole, atrazine, lindane, 1,2-dichloropropane, 2,4-D, simazine and many other substances.

CARBONIT® will however continue to **restrict itself** in the future **to presenting the substances which have been measured directly**, even when a projection can be made on the basis of experience. The retention of chloroform with **CARBONIT®** products (NFP Premium and IFP Puro/NFP Clario) is, by the way, >99.9%.

"When I compare the percentage retention rates between CARBONIT® and other filters, I find that there are others which can filter out more, particularly in the case of lead and copper. Is this true?"

CARBONIT® bases its self-presentation in terms of contaminant retention on the statements contained in the expert appraisal certificates, which means that **the listed amount always reflects the worst figure from the entire investigative series throughout the entire litre performance**. The important thing to remember is the significance of "%": "out of one hundred". Neither an interpretation nor even a comparison is possible on the basis of these percentage data, unless the filters were investigated in accordance with the same test. An example can be given to make this clearer: **American filters** are often tested for lead retention with **water which contains approximately 150 µg of that substance**. If the filtered water still contains around 6 µg or less of lead, then the filter has a retention quota of >96%.

The TÜV test for **CARBONIT®** Filters was however carried out with water that **contained up to 2,000 µg of lead**. The retention rate achieved for this was >90%. In a later test with **water that contained up to 600 µg of lead**, the **filtered water exhibited no sign of the substance** (detection limit = 10 µg). Accordingly, the tested filters have a retention rate of >97%. All the same, it is the "worse" value of >90% that is listed.

"I have heard that activated carbon block filters can contain chemical additives in order to improve the effectiveness of the filter. Does this apply to any of the CARBONIT® filters?"

No, the block filters contain **no chemical additives** for the purpose of improving performance capability. This is also not necessary, because the performance spectrum of the activated carbons used is extremely high.

Such additives, on the other hand, **are used in many American activated carbon block filters**. This can lead to the **release** of other substances - in many cases **zinc** - particularly when an

Higher filter performance for lead and copper with other filters

Chemical additives for better performance

Safety-tested



ion exchanger is implemented in the block filter **for the purpose of filtering out lead.**

CARBONIT® consistently dispenses with such additives.

"Safety-tested in accordance with German Food Law' – what does that mean?"

All of the components of the CARBONIT® NFP and WFP filter cartridges (activated carbon, end caps, fleece, gaskets, etc.) are subjected to continuous checking and are monitored in accordance with chemical, sensory and hygienic criteria. **They are in compliance with the strict statutory requirements of German food laws.**

Positive lists regulate the limit value of each component that could migrate into the water under the abbreviation SML (Specific Migration Limits). In accordance with the European KTW recommendations for cold water and the DVGW Worksheet W

270, assurance is given that no toxicologically harmful substances whatsoever are released by the cartridge materials into the filtrate nor that these materials offer any fertile ground for the spread of micro-organisms. They thus clearly go beyond the FDA allowances, which concern themselves only with the raw material in the pre-processing stages.

The earlier standards and testing procedures for synthetic materials in contact with drinking water, which had previously been regulated at the national level, are being made uniform across Europe (EAS-CPDW). **CARBONIT® is already orienting itself to the anticipated specifications and limit values** in connection with the selection of synthetic materials.

The equipment fittings are also selected in accordance with DIN 50930 T6 and only certified hoses are used. The stability of the housing is monitored in accordance with European standards (DIN 19 632) and is in compliance with the generally accepted rules of technology.

Product quality

"What is the importance of product quality and lasting environmental orientation?"

The family operation in Saxony-Anhalt is certified not only in accordance with ISO 9001 (Quality) but also **in accordance with ISO 14001 (Environment)**. Our entire attention is focussed on the careful handling of water as a valuable



resource. Environmentally harmful materials have no chance with us, neither in packaging nor in the development and manufacture of our products.

"What is the importance of electrical conductance and the so-called ohmic value of the water?"

The electrical conductance ($\mu\text{S}/\text{cm}$ or microsiemens) describes the total amount of substances in solution in the water (TDS or total dissolved substances). These include alkali and alkaline earth ions, chloride, sulphate, bicarbonate, etc.

The ohmic value (Ω) refers to the electrical resistance of a water; it is the reciprocal value of the electrical conductance.

Example: Steam-distilled water holds only a small amount of substances in solution and for that reason is a very poor conductor of electricity, while the electrical resistance is very high ($10 \mu\text{S}/\text{cm}$ or $100,000 \Omega$).

*Electrical
conductance or
ohmic value*

We hope that we have also been able to answer to your satisfaction any questions you might have had when you began to read this brochure. We would be happy to receive any suggestions and additional information you might have to offer. Please forward them to

CARBONIT® Filtertechnik GmbH – Re: FAQ
Industriestr. 2 · 29410 Salzwedel OT Dambeck · Germany

Premium Drinking Water Filters

from CARBONIT®

General Information

The CARBONIT® Filbertechnik GmbH, a subsidiary of WESTA-Holding, a German company, manufactures innovative filter elements in accordance with the specifications of an international patent.

It doesn't matter which filter you decide on - **all** of our **models contain** the **CARBONIT® Monoblock**, the proven high-performance filter.

A multitude of special filter variations are available for special requirements (well water, swimming pools, medical technology). Please consult your professional dealer for the best solution to your needs. **Our standard models (see page 35) are optimally configured** to suit the needs of most households in Europe - for this we offer a function guarantee.

We recommend **filter replacement for all models after 6 months' time** (following the guidelines in DIN 1988, Section VIII). If the water flow should fall noticeably within this six month period, then this indicates an above-average presence of particles in the water. This means that the load stresses on the filter will be greater, and it may become blocked more rapidly as a result.

As a general rule, our **CARBONIT® NFP Premium filter cartridges** are intended for use with **up to 10,000 litres** of water within a six-month period. When for example two filters are used, as with the DUO Classic, the litre output is increased to 2 times 10,000 litres (within a six month period). The litre quantities listed here are reduced by half when an IFP Puro/NFP Clario is utilised. The litre output and flow rate of the QUADRO model series depend upon prevailing conditions and upon the filter cartridges used (WFP Select is standard). Here, too, the rule applies that filter cartridges are to be replaced after 6 months.

On the **following pages** you will find selected **expert appraisal certificates** from independent institutes concerning particular performance parameters of the CARBONIT® Monoblock filter cartridges. The copper and lead measurements were made with real pipe systems, the bacteriological investigations with living bacteria.

CARBONIT®
Monoblock
Filter NFP Premium





Prüfzeugnis

Leistungsvermögen der CARBONIT-Filterpatrone NFP 2,0 / NFP Premium

Es wird im Rahmen einer Plausibilitätsprüfung gemäß unten genannter Prüfkriterien den von der CARBONIT Filtertechnik GmbH bis zum Januar 2002 veranlassten Untersuchungen zum Leistungsvermögen der Produkte NFP 2,0 bzw. NFP Premium bestätigt, dass die Ergebnisse verlässlich und hinreichend übertragbar auf den realen Einsatz der Filterpatrone dieses Typs sind.

Auszug aus dem Gutachten
„Hygienisch - mikrobiologische Untersuchungen mit dem
Filterelement Carbonit Monoblock® NFP 2,0“
der Universität Bielefeld, Fakultät für Biologie,
vom April 1999, Tabelle Seite 3

Bakteriologische Sicherheit und Rückhaltevermögen
der Patrone NFP 2,0 (NFP Premium)

Ergebnisse der bakteriologischen Untersuchung einer NFP 2,0 über 6 Monate von Prof. Dr. Mannesmann an der Universität Bielefeld.

Bakterielle Belastung: alle 2 Wochen

Wasserdurchfluß: 2 Tage Stillstand, am 3. Tag wird Filter genutzt

Belastungsversuch mit einer NFP 2,0 (NFP Premium)

Datum	Filtereingang		Filterausgang	
	E. coli, KBE/ml	Enterococcus faecalis, KBE/ml	E. coli, KBE/ml	Enterococcus faecalis, KBE/ml
07.10.98	513.000	247.000	0	0
21.10.98	1.440.000	117.000	0	0
04.11.98	1.100.000	1.700.000	0	0
18.11.98	2.430.000	650.000	0	0
04.12.98	1.460.000	377.000	0	0
17.12.98	1.080.000	350.000	0	0
06.01.99	190.000	410.000	0	0
19.01.99	963.000	317.000	0	0
04.02.99	850.000	263.000	0	0
18.02.99	3.000.000	280.000	0	0
04.03.99	817.000	130.000	0	0
18.03.99	1.600.000	563.000	0	0
30.03.99	410.000	363.000	0	0

Ergebnis:

Die NFP 2,0 hat sich hinsichtlich der Testkeime als **bakterienundurchlässig** erwiesen.

TÜV Umwelt Berlin-Brandenburg GmbH
 Niederlassung Berlin, Schmalenbachstraße 11, 12057 Berlin

Untersuchungsbericht Nr: 6-99/053

Reduktion der Kupferkonzentration in Trinkwassersystemen durch den Einsatz von CARBONIT®-Filtern des Typs „CARBONIT®-MONOBLOCK“

...

7. Auswertung der Meßergebnisse

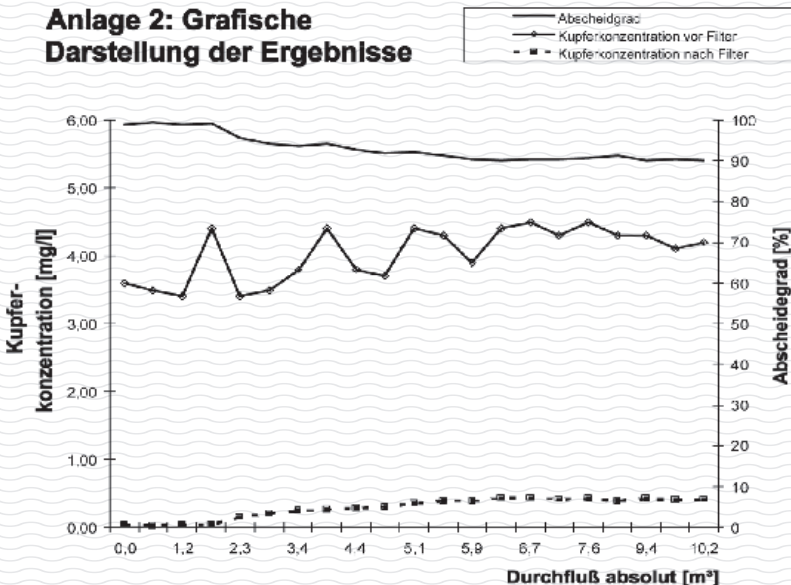
In der **Anlage 2** sind die Ergebnisse der Analysen der Stagnationsbeprobungen, also der Beprobungen, die morgens nach mindestens 12-stündiger Standzeit vorgenommen wurden, dargestellt. Im **Rohwasser** (Probenahmestelle **vor** dem Filter) wurden Konzentrationen an Kupfer zwischen 3,4 und 4,5 mg/l gemessen. Im **Reinwasser** (Probenahmestelle **nach** dem Filter) ergaben sich Kupferkonzentrationen von 0,02 (Beginn des Versuches) bis 0,43 mg/l (gegen Ende des Versuches). Es ist somit ein Abscheidegrad zwischen 90 % und 99 % festgestellt worden. Die im Rahmen dieser Untersuchung durch das Filter geflossene Wassermenge betrug 10,2 m³. Die Durchflußgeschwindigkeit hat sich auf eine Größenordnung von ca. 0,6 l/m reduziert. Dieser Wert wurde bereits bei einer absoluten Menge von ca. 7 m³ erreicht.

8. Zusammenfassung

Das getestete Filtersystem CARBONIT® Monoblock weist unter den beschriebenen Versuchsbedingungen über eine Standzeit von ca. 10 m³ folgende Eigenschaften auf:

- **Wirkungsgrad der Kupferreduktion > 90 %** (Abscheidegrad)
- Reduktion der Kupferkonzentrationen auf Werte unterhalb des Grenzwertes der TVO
- bzw. Reinigung von Trinkwasser, daß durch Kupfer hoch belastetet ist, auf entsprechend toxikologisch unbedenkliche Werte.

Anlage 2: Grafische Darstellung der Ergebnisse



Kurzbeschreibung

In der vorliegenden Arbeit wurden die von der Firma *Carbonit® Filtertechnik GmbH* produzierten Filtersysteme für den häuslichen Gebrauch exemplarisch bezüglich ihres Rückhaltevermögens für einige ausgewählte organische Rückstände getestet. Das Spektrum der zu untersuchenden Verbindungen wurde in weiterer Absprache mit der Firma *Carbonit®* festgelegt und umfasst steroide Hormone, polare Arzneimittelrückstände und polare Pestizide bzw. einer Pestizidmetaboliten.

Für die Untersuchungen wurden folgende Verbindungen exemplarisch ausgewählt:

- Caramazepin (Antiepileptikum), Clofibrinsäure (Blutlipidsenkter), Diclofenac (Antirheumatikum/Analgetikum), Esciprol (Anticholinergikum/Antispasmodikum), Ketoprofen (Analgetikum) und Propylthiouracil (Augenheilmittel)
- die arzneithemmenden Steroidhormone: 17 β -Estradiol und Estryltestosteron
- die polaren, besonders umweltsensiblen Herbizide: Mocroprop, Dichlorprop, MCPA, 2,4-D und Bentazon, sowie der Metabolit p,p'-DDA, das polare Abbauprodukt des Insektizids p,p'-DDE.

Die Untersuchungen zum Rückhaltevermögen der oben genannten Verbindungen wurden in zwei Parallelversätzen (einer für die Starke und einer für die polaren Konzentrationen) durchgeführt. Die in den Versätzen diskutierten Konzentrationen lagen bei 0,1 bzw. 1 $\mu\text{g/L}$ je Einzelverbindung. Diese Konzentrationen orientieren sich ebenfalls an den bislang in Untersuchungen von Grund- bzw. Trinkwasserproben getinkelten Konzentrationen an polaren Arzneimittelrückständen, zum anderen an dem in der Trinkwasserverordnung für Pestizidrückstände festgelegten Grenzwert von 0,1 $\mu\text{g/L}$.

Die Untersuchungen im Labor bzw. in der Praxis zeigen, dass alle untersuchten Verbindungen, dies auch sehr polare Pestizid- und Arzneimittelrückstände, in dem von uns untersuchten praktischen Konzentrationen, von den getesteten *Carbonit®*-Abwehrfiltern über den gesamten Versuchsraum (1. evenest der Filter) vollständig zurückgehalten wurden.

Auswahl	Rückhaltevermögen des Filters Versatz selektiv bis Versuchsende (mechanische Blockierung des Filters)	Verbindungsclassen	
Carbamazepin	> 99,9 %	Polare Arzneimittelrückstände	
Clofibrinsäure	> 99,9 %		
Diclofenac	> 99,5 bis > 99,9 %		
Esciprol	> 99,9 %		
Ketoprofen	> 99,9 %		
Propylthiouracil	> 99,9 %		
17 β -Estradiol	> 99 %		Steroidhormone
Estryltestosteron	> 99 %		
Bentazon	> 99,9 %		Polare Pestizidrückstände
2,4-D	> 99,9 %		
Dichlorprop	> 99,9 %		
MCPA	> 99,9 %		
Mocroprop p,p'-DDA	> 99,9 % > 99,5 bis > 99,9 %		



Institut für Lebensmittelchemie der
Technischen Universität Berlin

Gutachten

**Versuche zur Entfernung von
Arzneimittelrückständen, steroiden
Hormonen und polaren Pestizidrück-
ständen aus dotiertem Trinkwasser mit
Carbonit®-Wasserfiltern**

Auftragsgeber: Carbonit® Filtertechnik GmbH

Auftragnehmer: Prof. Dr. Hans-Jürgen Stan
Bereitet durch: Dr. Thomas Heberer, Achim Klopfer & Gudrun Fricke,
AG-Wasseranalytik am Institut für Lebensmittelchemie der Technischen
Universität Berlin, Sekr. TIB 4/3-1, Guslaw-Meyer Allee 25, 13355 Berlin

Arbeitsgruppe Wasseranalytik: Tel.: 314 72 786; Fax: 314 72 823; www.wasseranalytik.de

Reduktion der Bleikonzentration in Trinkwassersystemen
„CARBONIT-MONOBLOCK“

Projekt-Nr.: 6-00/180

Berichtsdatum: 01.11.2000

- Seite 2 von 9 -



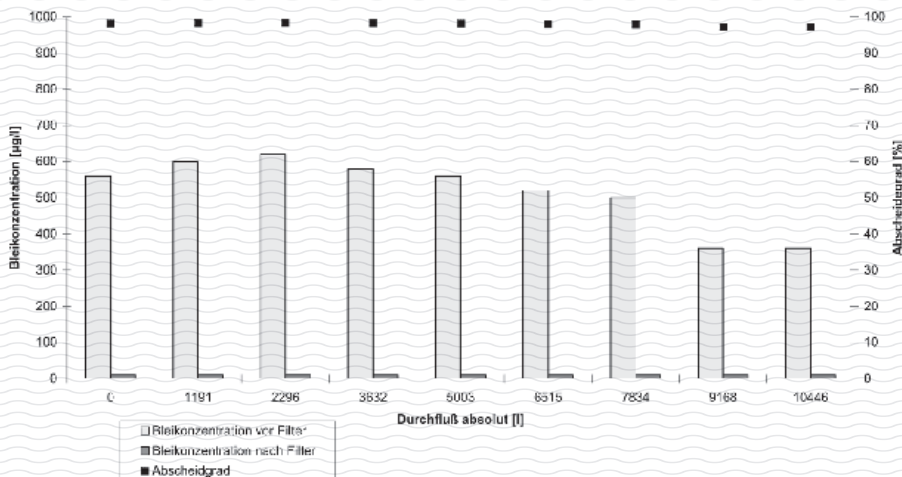
Ergebnisse

Das im Versuch getestete Filtersystem Carbonit Monoblock weist unter den bewußt gewählten extremen Bedingungen eine gute Reinigungsleistung in Bezug auf die Bleireduktion auf. Es ist in der Lage, die unter den gewählten Versuchsbedingungen auftretenden hohen Bleigehalte im Stagnations- und Tageswasser in Konzentrationsbereiche abzusenken, die deutlich unterhalb des Grenzwertes der Trinkwasserverordnung - 40 µg/l - liegen.

Versuchsreihe 3: Bleigehalt in den Stagnationsproben									
Lauf Nr.	Typ	Datum Uhrzeit	Durchfluß absolut	Proben Bez.	Bleikonzentration vor Filter	Proben Bez.	Bleikonzentration nach Filter		Abscheidgrad
					[µg/l]		[µg/l]	< x [%]	
1	Stag	10.08.2000 12:15	0	S1 V	560	S1 N	< 10		98,2
2	Stag	11.08.2000 07:35	1191	S2 V	600	S2 N	< 10		98,3
3	Stag	12.08.2000 12:00	2296	S3 V	620	S3 N	< 10		98,4
4	Stag	13.08.2000 11:45	3632	S4 V	580	S4 N	< 10		98,3
5	Stag	14.08.2000 07:40	5005	S5 V	560	S5 N	< 10		98,2
6	Stag	15.08.2000 07:50	6615	S6 V	620	S6 N	< 10		98,1
7	Stag	16.08.2000 08:10	7834	S7 V	500	S7 N	< 10		98,0
8	Stag	17.08.2000 07:55	9168	S8 V	360	S8 N	< 10		97,2
9	Stag	18.08.2000 07:35	10446	S9 V	360	S9 N	< 10		97,2

3 von 7, 12.02.2001, 19:10, 00-180.XLS, AuswertungStagnation

Versuchsreihe 3: Bleigehalt in den Stagnationsproben



The Filter Cartridges of the NFP Series are ideally suited for filtering out potentially harmful substances in water systems.

NFP Select (previously NFP 22)

It is in situations where **large quantities of water** are needed that the **NFP Select Filter Cartridge** suggests itself as a possible solution, as for example in **central filtering systems in the house entry area** or as a high-performance filter for protecting appliances. By using the NFP Select filter cartridge, you minimise any chlorine content, organic contaminants and calcium and rust particles.

Service life: maximum of 6 months, less when water flow becomes considerably reduced

Filter fineness: Ca. 10 µm, **Flow:** Ca. 22 liters per minute

Temperature: for technical reasons, only for use with cold water, protect from freezing

NFP Premium (previously NFP 2,0)

We recommend the use of the **NFP Premium Drinking Water Cartridge** for removing buildups of such substances in domestic pipe lines as **lead and copper**. This filter cartridge is utilised in all **CARBONIT® Drinking Water Filters**, due to its high performance capability in the face of possible drinking water contaminants and the **excellence of its hygienic characteristics**.

Service life: The filter cartridge must be replaced **after 6 months** (in accordance with DIN 1988). As a basic rule, 10,000 liters of water can be filtered within a six-month period. Earlier replacement can however be necessary when the water flow becomes noticeably reduced.

Earlier replacement is not the result of any deficiency in the filter used, but rather a sign of the increased presence of fine particles in unfiltered water.

Filter fineness: Ca. 0.45 µm, **Flow:** ca. 2 liters per minute (depending on water pressure)

Temperature: For technical reasons, only for use with cold water, protect from freezing

CARBONIT® Monoblock NFP Premium Filter Cartridges are contained as standard equipment in the following drinking water equipment:

SANUNO · VARIO · DUO

Summary versions of **the most important testimonials** and a **large amount of other information** can be found under www.carbonit.com



Contaminant retention by the NFP Premium

Parameters	Certif. Authorities	
Lead ¹	TÜV Environm.	over 90%*
Copper ¹		
Bacteria Escherichia coli ² , Enterococcus faecalis ² , Staphylococcus aureus, Staphylococcus haemolyticus, Enterobacter cloacae, Pseudom. aeruginosa, Bacillus subtilis	GFT / University of Bielefeld	
Mikroorganisms Entam. coli, Giardia Lambila, Cryptosporidium parvum, Hymenolepis nana, Schistosoma mansoni, Ascaris suum		
Fungi/yeasts Candida albicans, Rhodotorula mucilaginosa, Saccharomyces cerevisiae		
Chlorine ¹	titi Magdeburg GmbH / HS Magdeburg	over 99%*
Chloroform (CKW) ¹		
Lindane ¹		
DDT ¹		
Atrazine ¹		
Medical residues ¹ Clotbrinsäure, Carbamazepin, Ibuprofen, Diclofenac, Ketoprofen, Propiphenazon	Technical University of Berlin	
Polar pesticides ¹ Bentazone, 2,4 D, MCPA, p,p'-DDA, Dichlorprop., Mecoprop.		

1) Test with load during 6-month period of use

2) Test with load for filter capacity of 10,000 liters

*) The exact retention values are shown in the certificates which can be read and downloaded at www.carbonit.com.

Monoblock Filter Cartridge IFP Puro

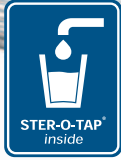
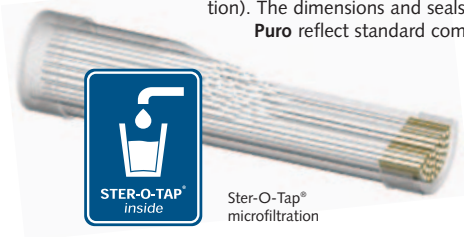


The IFP Puro combines the special characteristics of a sintered CARBONIT® Monoblock with a microfiltration capability of 0.15 µm by means of the internal Ster-O-Tap® capillary membrane.

Even the heavy buildups which can accumulate in the organism are removed and stored in reliable fashion.

IFP Puro Technical Data

The filter cartridges of the IFP Puro model are ideal in situations with low pipeline pressure and make it possible to limit bacterial loads. The Ster-O-Tap® capillary membrane has been tested in accordance with ANSI/NSF Standard 53 (Cyst and Turbidity Reduction). The dimensions and seals of the IFP Puro reflect standard commercial norms.



Ster-O-Tap®
microfiltration

Service life: The filter cartridge must be replaced **after 6 months** (in accordance with DIN 1988). As a basic rule, 5,000 liters of water can be filtered within this six-month period. Earlier replacement could however become necessary in cases where the water flow becomes noticeably reduced. **Earlier replacement is not the result of any deficiency in the filter used**, but rather a sign of the increased presence of fine particles in unfiltered water.

Filter fineness: Ca. 0.15 µm

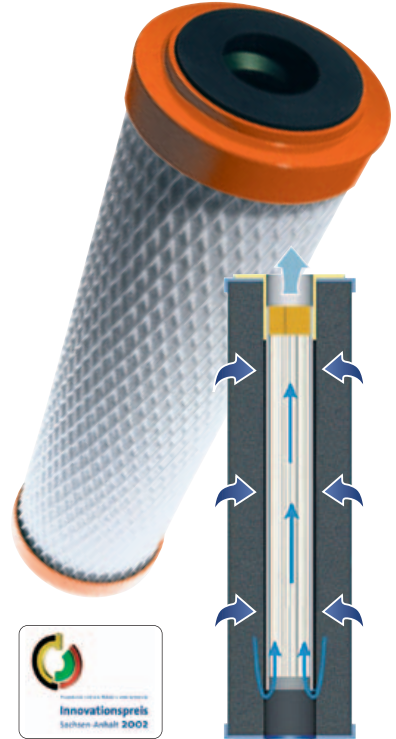
Flow: Ca. **6-8 liters per minute** (depending on filter housing used and on line pressure)

Temperature: For technical reasons, only for use with cold water, protect from freezing

CARBONIT® Monoblock IFP Puro Filter Cartridges will fit in the following drinking water equipment:

SANUNO · VARIO · DUO

Summary versions of the **most important testimonials** and a **large amount of other information** can be found under www.carbonit.com



Contaminant retention by the IFP Puro filter cartridge

Parameter	Retention
Lead	over 90%
Copper	
Bacteria E. coli, Ent. faecalis, Staphyl. aureus, Staphyl. haemolyticus, Enterobacter cloacae, Pseudom. aeruginosa, Bacillus subtilis	over 98%
Mikroorganismen Entam. coli, Giardia Lamblia, Ascaris suum, Cryptospor. parvum, Schistosoma mansoni	
Funghi/Yeast Candida albicans, Rhod. mucilaginosa, Sacch. cerevisiae	
Chlorine	
Chloroform (CKW)	
Lindane	
DDT	
Atrazine	
Medical residues Clotrimic acid, Carbamazepine, Ibuprofen, Diclofenac, Ketoprofen, Propiphenazone	
Polar Pesticides Bentazone, 2,4 D, MCPA, p,p'-DDA, Dichlorprop., Mecoprop.	

Note: Different independent certificates were provided acknowledging the hygienic quality and high filtration capacity of the CARBONIT® Monoblock IFP Premium filter cartridge. These were reconfirmed by the TÜV Berlin-Brandenburg. Furthermore the cartridge was labelled 'Safety-tested in accordance with German Food Law' by the LGA.
Production method and resources of the IFP Premium correspond in the activated carbon part with those of the IFP Puro.

Monoblock Filter Cartridge NFP Clario



The NFP Clario combines the special characteristics of a sintered CARBONIT® Monoblock with X-Flow microfiltration helically wound capillary membranes with a pore size of 0.15 µm.

Even the heavy build-ups which can accumulate in the organism are reduced and stored in reliable fashion. Integrated air release and innovative anti-blocking technology provide easy handling and a long service life. The filtered water still contains dissolved minerals.

NFP Clario Technical Data

The filter cartridges of the NFP Clario model are ideal in situations with low pipeline pressure and make it possible to limit bacterial loads.

The X-Flow hollow fibre membrane has been tested in accordance with American ANSI/NSF Standard 61 as well as with European regulations.

The carbon block is TÜV approved for its outstanding capacity and rated food-quality by the LGA. The dimensions and seals of the NFP Clario comply with international standards.

Service life: The filter cartridge must be replaced **after 6 months** (in accordance with DIN 1988). As a basic rule, 5,000 liters of water can be filtered within this six-month period. Earlier replacement could however become necessary in cases where the water flow becomes noticeably reduced. **Earlier replacement is not the result of any deficiency in the filter used**, but rather a sign of the increased presence of fine particles in unfiltered water.

Filter fineness: Ca. 0.15 µm

Flow: Ca. **6-8 liters per minute** (depending on filter housing used and on line pressure)

Temperature: Only for use with cold water, protect from freezing



Contaminant retention by the NFP Clario filter cartridge

Parameter	Retention
Lead	over 90%
Copper	
Bacteria E. coli, Ent. faecalis, Staphyl. aureus, Staphyl. haemolyticus, Enterobacter cloacae, Pseudom. aeruginosa, Bacillus subtilis	over 98%
Mikroorganisms Entam. coli, Giardia Lambdia, Ascaris suum, Cryptospor. parvum, Schistosoma mansoni	
Funghi/Yeast Candida albicans, Rhod. mucilaginosa, Sacch. cerevisiae	
Chlorine	
Chloroform (CKW)	
Lindane	
DDT	
Atrazine	
Medical residues Clofbrinic acid, Carbamazepine, Ibuprofen, Diclofenac, Ketoprofen, Propiphenazone	
Polar Pesticides Bentazone, 2,4 D, MCPA, p,p'-DDA, Dichlorprop., Mecoprop.	

CARBONIT® Monoblock NFP Clario Filter Cartridges will fit in the following drinking water equipment:

SANUNO · VARIO · DUO

Summary versions of **the most important testimonials** and a **large amount of other information** can be found under www.carbonit.com

Note: Different independent certificates were provided acknowledging the hygienic quality and high filtration capacity of the CARBONIT® Monoblock NFP Clario filter cartridge. These were reconfirmed by the TÜV Berlin-Brandenburg. Furthermore the cartridge was labelled 'Safety-tested in accordance with German Food Law' by the LGA.
Production method and resources of the NFP Premium correspond in the activated carbon part with those of the NFP Clario.

Our most popular drinking water filter:

Inexpensive, quickly installed, handy, **flexible** and naturally with 100% CARBONIT[®] quality. Just screw it **on to the faucet** using the special per-lator – and it's ready.

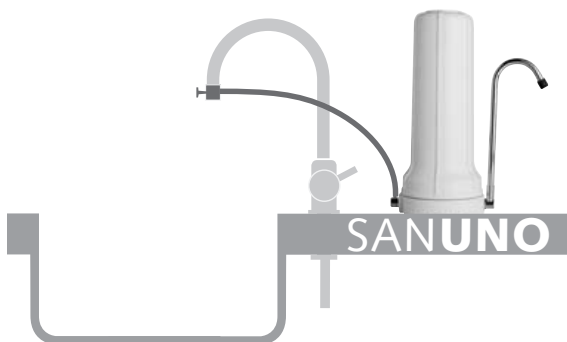
Areas of application

Water filtration in the kitchen for obtaining filtered drinking water, usable even with high concentration levels of lead and copper.

Very suitable for the preparation of beverages, water for cooking, etc.

Technical Data

- Model:** Device for installation on the water faucet at the basin with special deflector valve making it simple to switch back and forth between filtered and unfiltered water. The housing is made out of PP.
- Filter used:** CARBONIT[®] Monoblock NFP Premium[®] (SANUNO Classic) or NFP Clario (SANUNO Comfort)
- Output:** Ca. 120 liters per hour or ca. 400 liters per hour (NFP Clario) at a water pressure of 4 bar and a water temperature of 10°C (50°F). For the removal of contaminants, see filter cartridge data sheets for NFP Premium NFP Clario.
- Dimensions:** Filter unit without connections (W x H x D): 120 x 290 x 122 mm (4.7" x 11.4" x 4.8"). Length of connection hose: ca. 90 cm (27.6"). Special deflector valve with M 22 x 1 inner threading. Adapter for water faucets with inner threading enclosed.
- Weight:** Complete dry ca. 1.3 kg (2.9 lbs), complete wet ca. 2.1 kg (4.6 lbs).
- Temperature:** For technical reasons, only for use with cold water, protect from freezing.



Important Note!

Do not use behind a depressurized storage water heater!
Do not attach to a spray hose armature!
Operate only with cold water!

Scope of supply

Complete filter device with connection hose and special deflector valve with adapter for internal thread.

A CARBONIT[®] Monoblock NFP Premium filter cartridge (SANUNO Classic) or NFP Clario filter cartridge (SANUNO Comfort) is included.

Prices according to current price list.

The flexible drinking water filter offering ease of operation at an affordable price:

Simple installation, either with a special faucet which is both small and elegant or **CARBONIT[®] quality** for all of the tap water coming out of your faucet you have already been using. The hardware is kept out of sight **under the basin**.

Areas of application

Water filtration in the kitchen for yielding filtered drinking water, usable even with high concentration levels of lead and copper.

Very suitable for the preparation of beverages, water for cooking, etc.

Technical Data

- Model:** Device for installation under the basin between a corner valve and the existing water faucet. Separate, elegant water faucet for providing filtered water (VARIO Classic and VARIO Comfort). The VARIO Universal is installed between the corner valve and the existing faucet fixture.
- Filter used:** CARBONIT[®] Monoblock NFP Premium or NFP Clario
- Output:** Ca. 120 liters per hour (NFP Premium) or 400 liters per hour (NFP Clario) at a water pressure of 4 bar and a water temperature of 10°C (50°F). See filter cartridge data sheets for NFP and NFP Clario for the removal of contaminants.
- Dimensions:** Filter unit without connections (W x H x D): 123 x 310 x 115 mm (4.8" x 12" x 4.5"). Length of flexible hoses: 2 pieces, each ca. 80 cm (31.5") (Classic, Comfort, Universal), 1 piece ca. 30 cm (11.8") (Classic, Comfort).
- Weight:** Complete, dry ca. 2.4 kg (5.3 lbs), complete, wet ca. 3.5 kg (7.7 lbs).
- Temperature:** Utilization only with cold water; protect against freezing.



Also suitable for operation in front of a depressurized storage water heater!
Operate only with cold water!

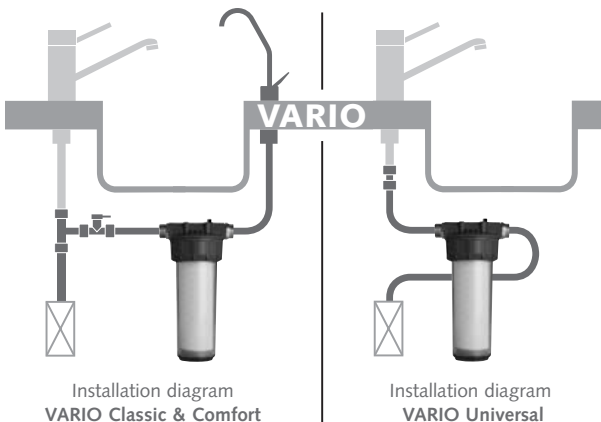
Scope of supply

Complete filter device with comprehensive installation material:

VARIO Classic: T-piece, shut-off globe valve, three pieces of stainless steel flexible hose, threaded joint, wall bracket, water faucet, seals. A **CARBONIT[®] Monoblock NFP Premium** filter cartridge is included.

VARIO Comfort: as with VARIO Classic, but with rapid coupler on the filter housing. A **CARBONIT[®] Monoblock NFP Clario** filter cartridge is included.

VARIO Universal: shut-off globe valve, two pieces of stainless steel flexible hose, threaded joint, wall bracket, rapid coupler, seals. A **CARBONIT[®] Monoblock NFP Clario** filter cartridge is included.



Prices according to current price list.

The user-friendly drinking water filter - **the way you like it**.
Choose between **DUO Classic, DUO Clario and DUO Comfort**:

The **DUO Classic and the DUO Clario** are placed between the angle globe valve and the fittings which are already installed – and then **all your cold water is filtered**.

The **DUO Comfort** corresponds in its layout to the DUO Classic, except that you **also** receive a small and elegant **water tap**, which then allows you to **choose between filtered and unfiltered water**.

Areas of application

Water filtration in the kitchen for generating cleaned drinking water, for use even in the presence of high concentrations of lead and copper.
Highly suitable for the preparation of beverages, cooking water, etc.

Technical Data

Model: Unit for installation under the sink. DUO Classic and the DUO Clario are installed between the angle globe valve and the fittings which are already installed. DUO Comfort has a separate small water tap. The device block and the coupling ring consists of polymethylene oxide, the see-through casing is made of grilamid.

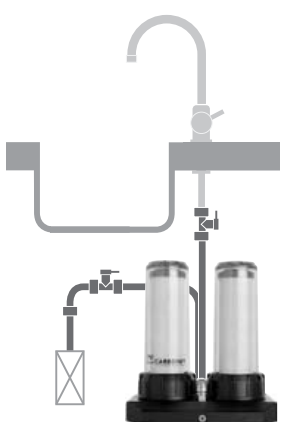
Filter used: 2 x CARBONIT® Monoblock NFP Premium or 2x NFP Clario (DUO Clario) filter cartridges

Output: Ca. 300 liters per hour (DUO Classic or DUO Comfort) or ca. 800 liters per hour (DUO Clario) with a water pressure of 4 bar and a water temperature of 10°C. For removal of contaminants, see sheets for NFP Premium NFP Clario.

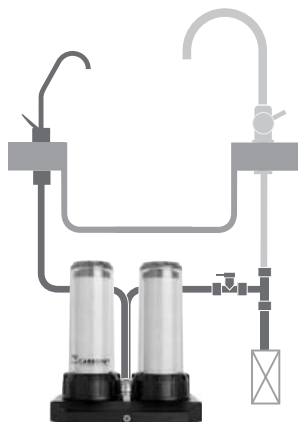
Dimensions: Filter unit without connections (W x H x D): 28 x 30 x 15 cm; Length of the hoses: 2 pieces, each ca. 80 cm, DUO Comfort contains in addition 1 flexible hose of ca. 30 cm as well as a small water tap.

Weight: Complete dry weight ca. 4.5 kg; complete wet weight ca. 6.5 kg.

Temperature: For technical reasons, only for use with cold water, protect from freezing.



DUO Classic/Clario installation diagram



DUO Comfort installation diagram

Scope of delivery

Complete filter unit with extensive installation material (T-piece, globe shut-off valve, flexible hoses, threaded joints, rapid couplings, gaskets; the DUO Comfort device contains a water tap). Two CARBONIT® Monoblock NFP Premium (DUO Classic or DUO Comfort) or NFP Clario filter cartridges (DUO Clario) are included.

Prices according to current price list.

Precisely **in tune with your tastes** and your needs.
Choose between **DUO Kalk** and **DUO Spezial**:

Areas of application

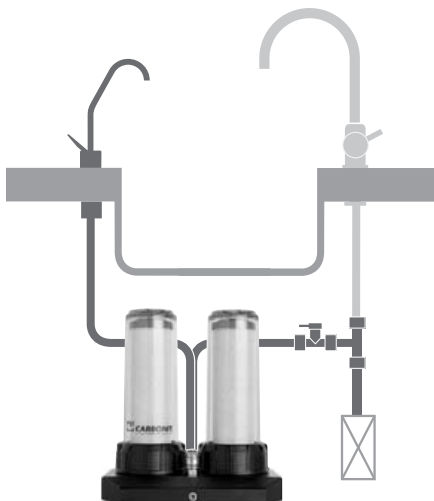
Water filtration in the kitchen for generating cleaned drinking water, Highly suitable for the preparation of beverages, cooking water, etc.

DUO Kalk is utilised when an **additional reduction of water hardness** is desired.

DUO Spezial is for use where the water has **very high levels of contaminants**.

Technical Data

- Model:** Unit for installation under the basin. Both devices include a separate water tap. The device block and the coupling ring consists of polymethylene oxide, the see-through casing is made of grilamid.
- Filter used:** CARBONIT® Monoblock NFP Premium filter cartridge; **DUO Kalk** with additional lime filter cartridge (cation exchanger), **DUO Spezial** with additional prefiltration cartridge (fine filtration cartridge).
- Output:** Ca. 120 liter per hour at a water pressure of 4 bar and a water temperature of 10°C. For removal of contaminants, see the Data Sheet for filter cartridges.
- Dimensions :** Filter unit without connections (W x H x D): 28 x 30 x 15 cm; Length of the flexible hoses: 2 pieces, each ca. 80 cm; 1 flexible hose of ca. 30 cm and a small water tap.
- Weight:** Complete dry weight ca. 4.5 kg; complete wet weight ca. 6.5 kg.
- Temperature:** For technical reasons, only for use with cold water, protect from freezing.



Scope of delivery

Complete filter unit with extensive installation material (T-piece, globe shut-off valve, flexible hoses, threaded joints, rapid couplings, gaskets, water tap).

The **DUO Kalk** unit contains a cation exchanger cartridge; the **DUO Spezial** contains a prefiltration cartridge. One CARBONIT® Monoblock NFP Premium filter cartridge is included with both units.

Prices according to current price list.

Central filter installation for high water outputs. The attractiveness of the design also makes it **unconcealed installation possible**.

Areas of application

Central filter installation for the whole house. Provides **good water and protection of the pipe lines from the very beginning**. The filters used remove in particular chlorine, organic compounds and particles.

Technical Data

Model: Device for installation in the central water pipe after the water meter. The device block is made of polymethelene oxide, the filter cylinder of stainless steel.

QUADRO 60 **QUADRO 120**

Filter used: 4 x CARBONIT® WFP* 4 x CARBONIT® WFP-L*
 *Type Premium, Protect, Select or Spezial

Output: With water pressure of 4 bar:
 up to 4 m³ per hour up to 6 m³ per hour

Dimensions: Filter unit (W x H x D):
 31 x 58 x 24 cm 31 x 98 x 24 cm

Note: Open space above and below the filter is necessary for filter replacement:
 ca. 28 cm each ca. 50 cm each

Weight: Dry weight ca. 16 kg; dry weight ca. 25 kg,
 wet ca. 24 kg wet ca. 40 kg

Temperature: For technical reasons, only for use with cold water, protect from freezing.



Scope of delivery

Complete filter unit with wall bracket and manometers. The standard devices have an 1" thread. One option is to have the devices supplied with 2 pieces of flexible hose, each ca. 80 cm. long; then the connection is 3/4".

Please specify **when ordering** whether the water is to flow through the device **from the left or from the right**.

The cartridges are not included! Please specify cartridge type when ordering. CARBONIT WFP(L)-Types: Premium, Protect, Select, Spezial

Prices according to current price list.

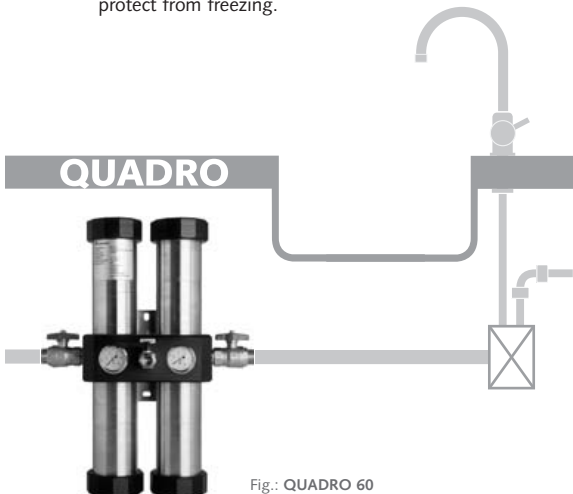


Fig.: QUADRO 60

At home on every continent – the travel filter **GO travel** and **GO travel long** from CARBONIT®. **Handy and practical**, it only takes up a small amount of space and even fits into one's hand luggage.

Areas of application

Water filtration, flexible and mobile, for the generation of clean drinking water. Very well suited for the preparation of beverages, water for brushing one's teeth, water for cooking, etc. The **standardized connection** can be screwed onto nearly all commercially-available water taps; an adapter is included for internal threading. Additional adapters for differing threads can be found online verwendbar.

GO travel – for „trips of normal duration“, the filter cartridge is usable for up to 4 weeks

GO travel long – for the longer trips (the filter cartridge is usable for up to 8 weeks) or for being fitted into a small kitchen (stationary application – up to 3 months filter cartridge duration)



Technical data

Model: Device for mobile use on water taps by means of M 22 thread connections. Housing made of polyethylene, metal parts of chrome-plated brass. **You can choose between filtered and unfiltered water by means of an easy rotation of the entire housing at the water tap – the device does not have to be screwed off for this.**

Filter used: For usage under the most severe hygienic conditions, a patented germ barrier is integrated on the filter outlet.

GO travel – RFP Premium D

GO travel long – RFP Premium D-L

Output: The filter cartridges reduce the level of copper, lead, chlorine, organic contaminants and removes particles. They keep bacteria at bay. The water pressure at 4 bar amounts to...

GO travel – ca. 40 l/h

GO travel long – ca. 60 l/h

Dimensions: Filter unit (W x H x D): 12 x 11 x 75 cm/ 12 x 15 x 75 cm

Weight: Complete dry: ca. 230/350 g, complete wet: ca. 350/450 g

Temperature: For technical reasons, only usage with cold water is permitted; protect from freezing.

IMPORTANT:

Do not use behind a depressurized storage water heater!

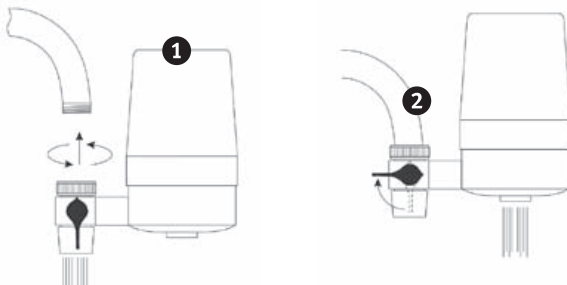
Due to hygienic reasons, the filters should always be changed after 4 weeks.

After returning from your travels, dispose of the used filter element and allow the housing to dry.

Scope of delivery

Complete filtration device with standardized hook-up connections. One CARBONIT® Monoblock Premium D or RFP Premium D-L filter cartridge is included in the device.

Instructions as well as the adapter M22/M24 are included in the packaging.



Prices according to current price list.

Further technical details under:
www.carbonit.com -> My filter

Checklist

for the utilisation of CARBONIT® drinking water filters



carbonit® Complete filtration system	The filter should clean the water of ...			Technical Data			
	Lead, copper, pharmaceutical residues, (hormone-like) polar pesticides	Bacteria, micro-organisms	Chlorine, particles, turbidity, so-called agricultural pesticides, organic impurities	Litre performance in litres per minute	Place of utilisation	Filter cartridge type (start-up equipment)	Usage time of the filter cartridges / maximum in months
SANUNO Classic	++	+	++	2	Kitchen	NFP Premium	6
SANUNO Comfort	+	++	++	7	Kitchen	NFP Clario	6
VARIO Classic	++	+	++	2	Kitchen	NFP Premium	6
VARIO Comfort, VARIO Universal	+	++	++	7	Kitchen	NFP Clario	6
DUO Classic, DUO Comfort	++	+	++	5	Kitchen	NFP Premium	6
DUO Clario	+	++	++	10	Kitchen	NFP Clario	6
DUO Kalk, DUO Special	++	+	++	2	Kitchen	NFP Premium	6
QUADRO 60	o	-	++	60	Domestic water inlet	WFP Select	6
QUADRO 120	o	-	++	90		WFP Select L	6
GO travel	++	++	++	0.6	Travel/water faucet	RFP Premium D	1

Explanation of symbols: ++ = very good o = with limitations - = no

Simple. Safe. Practical. Good.

CARBONIT® Filters in your kitchen.



CARBONIT® SANUNO tabletop filters:
inexpensive, flexible, quick-installation.

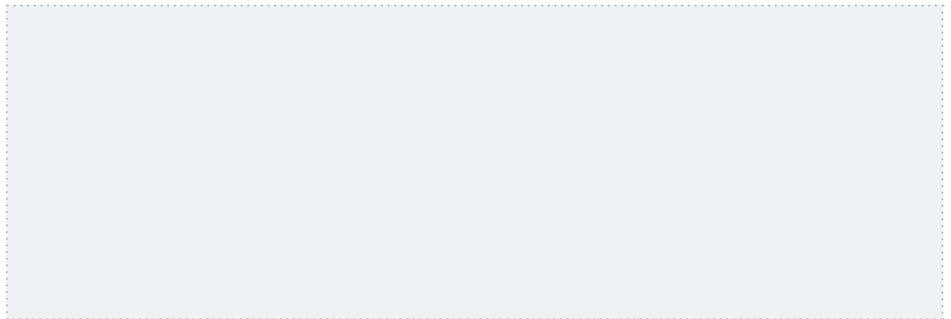
rechts: CARBONIT® VARIO concealed filters
with or without separate faucet: easy to use,
just the way you like it.



Water filters from CARBONIT®:

- specially tailored to European water conditions
- large filtration capacity, e.g. pharmaceutical residues, lead, copper
- extensive performance spectrum for the extraction of harmful substances
- low procurement and subsequent expenses
- can be combined with many vitalisers

Your competent professional dealer:



www.carbonit.com · www.wasserfilter.de

CARBONIT® Filtertechnik GmbH · Industriestraße 2 · 29410 Salzwedel OT Dambeck · Germany