



CARLBEV
BEVERAGE FILTRATION FOR SOFT DRINKS AND FRUIT JUICE
PURITY THROUGH QUALITY™





INTRODUCTION

The production of soft drinks involves the filtering of both sugar syrup, the water used in the bottling process and fruit juices.

Sugar syrups

The source and degree of refinement or purity of the sugar supplied for syrup making will largely determine the treatment and filtration needed. The purity of the sugar solution is measured in ICUMSA or RBU units. A high ICUMSA or RBU reading (150 – 450) indicates a poor quality sugar which will require a considerable degree of processing. The internationally accepted standard for sugar syrup of 65° Brix is less than 50 ICUMSA. For high quality syrups, a simple one-stage filtration step will often suffice to produce the required standard. Usually this can be achieved using an all-cellulose depth filter sheet.



In some unrefined syrups however, there may also be a significant level of impurities and finished drink quality requirements will demand their selective removal, possibly combined with decolourisation of the syrup. Traditional decolourising/ICUMSA reduction treatment in such circumstances often involves the use of powdered activated carbon. One feature of this method is that, in addition to the particulate impurity, the activated carbon has also to be removed often using a support sheet pre-coated with kieselguhr in a filter press. For customers employing this method Carlson Filtration can offer the W2N support sheet. For syrups that have been decolourised using this method an additional polishing filtration step is often needed to produce bright, clear syrup.

The good news is that for some of these syrups where lower levels of decolourisation only is required it is often possible to achieve finished product colour and clarity requirements in a single step using an activated carbon impregnated filter sheet, eliminating the costly and inconvenient handling of powdered carbon. Carlson offers it's range of Carcarb sheets for this duty.





TWO STAGE FILTRATION

Most syrups are produced using either the hot or cold method. In the "cold" method relatively dilute syrups are mixed at ambient temperature in a supply tank, filtered under pump pressure and on to a holding tank. Syrup of high concentration or Brix, will be produced by the hot process at 80 degrees C or higher, filtered and cooled as quickly as possible to avoid any bacterial growth. As the condition of the sugar will determine the degree of decolourisation and filtration needed, it is important to decide at the outset whether activated carbon treatment and any filter aid such as kieselguhr, will be necessary. This will allow the relevant filtration equipment and correct filter sheets to be specified. Carlson's high performance W2N support sheet is specially designed for this type of application. W2N sheets offer two major benefits to the soft drinks manufacturer:

Cost minimisation

W2N sheets are manufactured from pure cellulose incorporating carefully chosen wet strength resins within the cellulose matrix. The sheets are highly durable and capable of multiple re-use.

Consistent quality of filtered solution

The pore size distribution of the sheet is carefully controlled so that there is even build up of the filter cake on the sheet. This ensures that filter capacity is maximised and that there is minimum risk of bleed through of even the finest of fines, whilst minimising the pressure drop through the filter.

Typically for this application, 0.5% weight/weight or more of kieselguhr is added to the syrup as a filter aid prior to batch filtration and 500 grams per square metre of filter plate area is applied as a pre-coat in treated water. Sugar syrup filtration flow rates vary according to conditions, e.g., viscosity and sugar quality etc. Flow rates as low as 300 litres per square metre per hour may be necessary with high concentrations of syrup containing activated carbon and kieselguhr. Conversely high quality, relatively dilute sugar syrup may be filtered at clarifying stage at 950 litres per square metre per hour.

The second or polishing/clarifying filtration stage of the sugar syrup is carried out using a filter sheet – typically XE20H or XE50H. It is perfectly possible for some applications that a third or sterile stage will be required. Carlson's XE675H or XE900H would be appropriate for this purpose.

LENTICULAR FILTRATION

The lenticular module concept offers a compact, self contained, liquid filtration solution utilising proven filter media technology. It is perfectly possible to use this technology using support or carbon or polishing filter media.

Carlson lenticular filters are essentially composed of Carlson depth filter media, supported on a polypropylene skeleton and supplied in modular form normally comprising 16 cells of either 12" (300mm) or 16" (400mm) diameter. They all offer the advantages of traditional filter sheet filtration but in a totally enclosed, sterile environment, thus eliminating product loss and external contamination. They are designed to fit industry standard housings incorporating 1, 2, 3 or 4 modules.



- For further information on this product please see our Carlent brochure



Fruit Juice

When processing fruit juice, dependant upon its nature, a similar two stage process will be used. The first (or roughing) stage will again be carried out using kieselguhr/W2N support sheets. The choice of filter sheet for the second (or polishing) stage is dependant on a number of factors:

- The type of juice to be treated.
- The method of processing used before bottling, canning or packing.
- The nature of the contaminants to be eliminated. These may be fine, almost colloidal hazes, or of a coarser or less slimy character.

For straight forward polishing filtration, Carlson's XE20H, XE90H or XE200H are ideal. The exact choice will depend on the degree of polish required. Again where aseptic or sterile filling is required, Carlson XE675H is ideal due to its excellent sterilising ability.

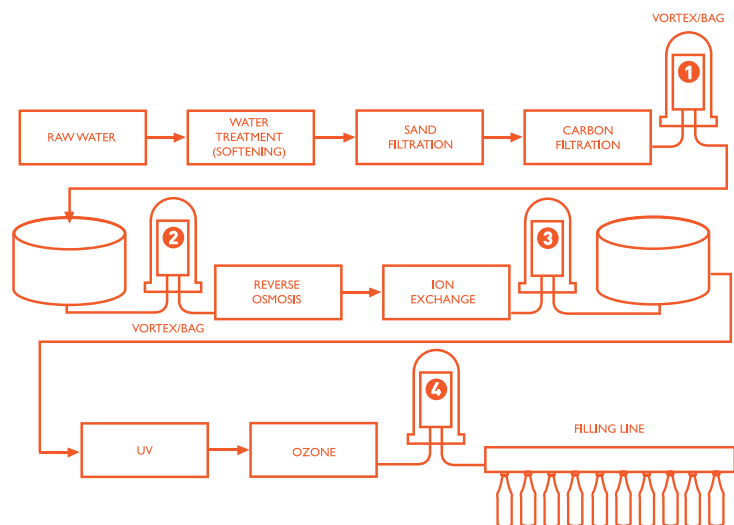
Filtration of process water

The water used in the production of soft drinks and/or diluted juices also needs filtration. The degree to which filtration is necessary will depend on the source of the water. It would be unusual for this filtration to be carried out using filter sheets or lenticulars – filter cartridges would be the filtration method of choice for most producers. Carlson's range of process and membrane filter cartridges covers the full breadth of the requirement. They are manufactured in controlled environments to obtain high quality, contaminant free filter elements which meet the requirements of the various international guidelines. Where appropriate integrity test certificates and validation guides can be provided.

Natural mineral water is an official designation and must:

- come from a specified underground source protected from any kind of pollution
- be stable in its chemical and physical composition
- satisfy microbiological criteria and be free of harmful bacteria
- receive no treatment **other than filtration** (to remove items such as sand particles) or carbonation
- be bottled at source with tamper evident seal

The degree to which filtration is necessary will be governed by the precise source(s) of the water. It may be that the use of only coarse wound/spun bonded cartridges is required. Bottled drinking water is often confused with natural mineral water but is the description given to water that may come from more than one source or not from a single underground source. It may even include the public water supply. Bottling companies may carry out filtration and treatment processes on the water to amend its constituents prior to distribution for sale.



- For further information on this product range please see our Carlcart brochure





CARBON TREATMENT

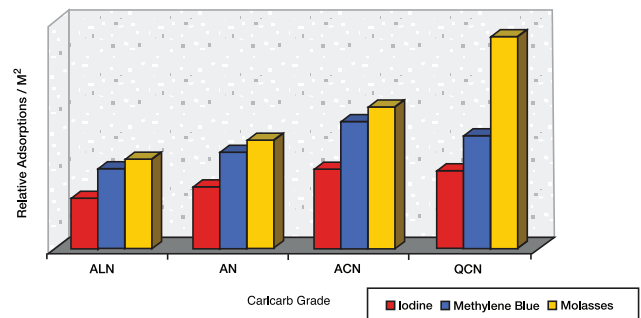
For certain types of high quality syrup, it is possible to achieve decolourisation by using a Carlson activated carbon impregnated sheet from the Carlc carb range, which has been specially designed for applications of this type.

The Carlc carb range not only decolourises but can also act as a polishing sheet. A low flow rate (typically around 350-380l/m²/hr) is necessary to achieve the required level of decolourising.

Benefits of using Carlc carb range of carbon sheets are:

- No need for use of loose activated carbon powder or granules meaning reduced health and fire risks associated with carbon dust
- No need for use of filters to remove activated carbon powder from the process fluid. After the initial flush there is minimal release of carbon fines. Carlson provides "backing papers" to trap even these fines
- No messy filter cake or risk of batch to batch contamination
- Reduced process time because of constant flow rate filtration and efficiency.
- No product re-works because of consistent performance
- Easier and cheaper disposal of spent filter materials – ie reduced costs in solvent recovery

The ability of the four activated carbon base structures to remove the three tracer impurities is shown for both 12 and 16 inch lenticular filter modules plus 40 and 60cm filter sheets. The weight of powdered activated carbon in the module is shown in kilogrammes, along with the depth filter sheet surface area in square meters.



	12" Module		16" Module		40cm sheet		60cm sheet		Application	Structural pore Size	
	Kg PAC	M ²	Kg PAC	M ²	Kg PAC	M ²	Kg PAC	M ²		Medium	Large
AN	1.08	1.8	2.16	3.6	0.1	0.16	0.23	0.36	Decolourisation, Deodourisation	Medium	Large
ALN	0.9	1.8	1.8	3.6	0.08	0.16	0.18	0.36	Decolourisation, Deodourisation	Medium	Large
ACN	1.4	1.8	2.8	3.6	0.12	0.16	0.27	0.36	Decolourisation, Deodourisation	Medium	Large
QCN	1.4	1.8	2.8	3.6	0.12	0.16	0.27	0.36	Decolourisation, Deodourisation	Medium	Large

- For further information on this product please see our Carlc carb brochure





FILTRATION EQUIPMENT

New filter equipment

Carlson offers a comprehensive range of new filtration equipment, incorporating a full range of filter presses and plate and frame filters. The range includes plate and frame and sheet filters from 20x20cm to 120x120cm of varying lengths. Manual models and fully automatic closing systems are available.

Filter spares

Another important element of Carlson's support service is to supply spare parts for their filter range. These are categorised into:

- a. Consumable spares which include eyelet seals, in a host of materials including Nitrile, Silicon, Natural Rubber, EPDM, Butyl and Viton
- b. Servicing spares including pump spares, sight glasses, valve diaphragms and pressure gauges etc. Service kits for hydraulic filter press closing systems are also available.

RECONDITIONED FILTER EQUIPMENT

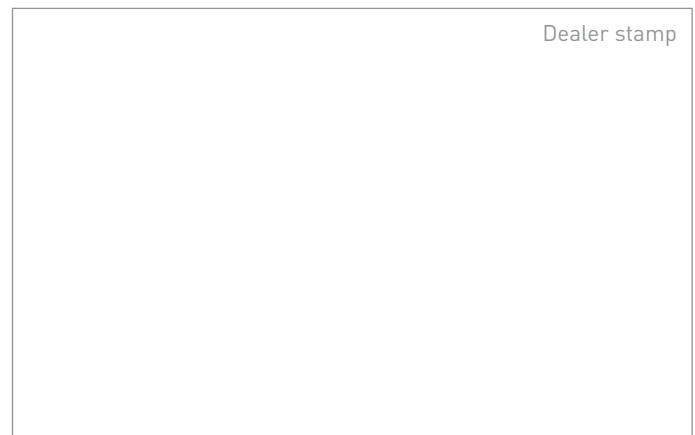
Carlson also offers reconditioned sheet and plate and frame filter presses. We have developed a wide ranging network of contacts in the filter press user community as well as amongst dealers in used factory equipment. On arrival back at Carlson's factory all filters are rebuilt to exacting standards and the customers specification to achieve an "as good as new" quality.

visit us at:
carlson.co.uk

COMPLEMENTARY FILTRATION

Bags and Housings

Carlson can also offer a comprehensive range of bags in felt, nylon monofilament, polypropylene and polyester for either new application or to retrofit to current installations. A full range of housings are also available to compliment this range.



Carlson Production Facility



Purity through quality™ since 1923

ISO 9001: 2008
Investors in People
DMF No 14255



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