

# Application Bulletin

## Calgon Carbon Corporation's Capabilities in the Food Industry

### Company Profile

Calgon Carbon Corporation is a world leader in the production, supply and design of technologies, products and services for the purification, separation, and concentration of liquids and gases. Calgon Carbon Corporation, a pioneer in activated carbon adsorption technology for more than half a century, is the world's leading producer and marketer of activated carbon and associated services. Calgon Carbon Corporation produces a range of pulverized, pelletized, and granular activated carbons, including acid washed and impregnated products, for use in a wide range of liquid and vapor applications.



### Introduction

The removal of impurities such as color and odor from food liquids, syrups (e.g. sucrose, dextrose, glucose), organic acids (e.g. citric acids), amino acids, vitamins, beverage alcohols, and glycerin is vital to the production of a high quality stable product. Activated carbon is a particularly effective purifying medium, and granular activated carbons such as CPG<sup>®</sup> LF and CAL<sup>®</sup> have been specifically designed for this purpose.

Calgon Carbon Corporation offers a wide range of design, engineering, and reactivation services to the food industry. This applies not only for existing carbon users but also to those who wish to evaluate the potential conversion to granular activated carbon technology.

### Activated Carbon Products

Granular activated carbons manufactured by the company are used worldwide for food processes either in fixed or pulse bed systems. CPG LF and CAL are extensively used in the industry primarily because they have excellent adsorption capacities for a diverse range of organic compounds. Both are dense carbons with a high internal surface area produced under strictly controlled conditions by high temperature steam activation of selected grades of bituminous coals.

Calgon Carbon Corporation is the world's largest manufacturer of acid washed granular carbons. CPG LF is widely accepted as an industry standard in the sweetener industry. Calgon Carbon Corporation also offers a complete line of powdered carbons manufactured with a wide variety of adsorptive characteristics for use in many batch processes.

### Initial Evaluation

Based on fundamental data provided by the client and from our own experience, Calgon Carbon Corporation can provide preliminary carbon dosage data for a particular process for most applications. Alternatively, using techniques developed by our Technical Service Laboratory, breakthrough curves can be established to give realistic carbon consumption data based on the client's actual process stream. This can be performed at the application site or in the Calgon Carbon Corpo-



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## Pilot Trial

In major projects, it is customary to establish an on-site pilot trial to develop specific design and process parameters necessary for a full scale plant. These include the number of vessels, carbon exchange frequency, and optimal contact time to achieve a particular product quality. The main intent of such a trial is to verify breakthrough curves and to generate realistic data from an often variable feed stream.

## Comprehensive Technical Support

Through the continuous development and application of granular activated carbon and reactivation to a variety of processes, Calgon Carbon Corporation has established extensive expertise in the practical use of granular activated carbon in the food industry. Our engineering support may include initial assessment, on-site or off-site pilot work, process evaluation, and equipment specification including carbon handling systems. The involvement in the process scheme enables us to optimize product quality in the simplest and most cost effective way. We welcome the opportunity to provide this expertise to ensure the most efficient use of activated carbon and site resources for a particular process.

## Reactivation

One of the key features of granular activated carbons supplied by Calgon Carbon Corporation is that they have been designed for multiple reactivations. During reactivation, the adsorbed organics are thermally destroyed and the carbon is returned to a quality suitable for reuse. Reactivating the carbon overcomes the need to consider using increasingly expensive landfill options for carbons that cannot be reactivated. Any carbon losses in reactivation are made up with virgin carbon so that the same volume of carbon is returned to the adsorption process.

## Engineering and Process Design

Based on preliminary process data, Calgon Carbon Corporation can assemble a process design package which includes a process description, carbon handling and operating conditions to assist in properly defining a required scope of work. Such a package is designed to establish a full evaluation of a proposed carbon system investment. Effective carbon handling and adsorber design are vital to the efficient operation of a plant. These are two areas where Calgon Carbon Corporation has developed particular expertise. To ensure the successful performance of the plant, operating manuals can be provided along with a custom designed operator training program.

## Technical Service Assistance

In order to optimize the use and the performance of the carbon in a process, Calgon Carbon Corporation can provide a number of supporting services.

- Site assistance, prior to the initial carbon fill of the adsorber vessels, to review the defined operating conditions of the plant and make final recommendations before commissioning.
- Site assistance at the start-up to supervise the first carbon transfer and the operations of sweetening-on and sweetening-off prior to first reactivation.
- Site assistance once the plant is in operation to evaluate performance and propose any modifications to operations or procedures.

## Quality: ISO 9001 & ISO 9002

The quality management systems at each of our activated carbon manufacturing facilities are certified to ISO 9002-1994. The Purchasing, Logistics, and Quality Assurance corporate functions are included in these certifications.

## Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable federal and state requirements.



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