



# OLIVE STONE TO CARBON

*One of the world's leading producers of activated carbon has installed a complete turnkey milling and process control system from Hosokawa Micron Ltd to give them unmanned production, 24 hours a day, 7 days a week, grinding olive stones prior to processing into activated carbon. The system produces an olive stone flour with 100% consistent particle size below 150 microns.*

**Activated Carbon** is a micro-porous carbonaceous material which is produced from various raw materials such as peat, wood, lignite, fruit pips or shells. The raw materials are converted into activated carbon using steam (temperature above 900°C) or acid (temperature above 450°C). The activation process creates pores in the carbon, whose surface may exceed 1500 m<sup>2</sup>/g. It is by far the most important adsorptive media due to its wide range of pore sizes.

This adsorptive process is used extensively for the removal of unwanted colours, odours or tastes, contaminants, or hazardous elements from process materials. It is involved in the production of almost every product containing sugar or sweeteners to guarantee a pure end product. It has a vital function in the purification of pharmaceuticals, and is also used in some dialysis apparatus to purify the blood of patients suffering from kidney failure. The importance of surface area is paramount in the efficiency of this process, therefore the need for efficient milling and grinding of the material is of equal importance.

## The Process

A metal detection system removes any tramp material from the olive stone feedstock, which is then introduced into the pneumatic bypass of the Hosokawa Micron ACM 150 Air Classifier Mill via a rotary valve.

The material entering the grinding chamber is aggressively comminuted by the action of the hammers on the grinding track. The fine material rises up on the air stream and is presented to the classifier. In-specification material passes through the separating device to be conveyed onwards. Control of particle size is affected by the classifier speed which is controlled by a variable speed motor and frequency converter. Oversize material drops back into the grinding area for further size reduction and classification.

The acceptable milled material is conveyed upwards and collected on the filter bags of the reverse jet filter and is released by the sequential pulsing of the bag sets. The differential pressure between the clean and dirty sides of the system is continually monitored to identify any process problems relating to bag efficiency.

Collected product is discharged from the filter hopper by means of a constant speed rotary valve. The milled material falls under gravity on a vibratory safety sieve, whose task it is to remove oversize grits. The in-specification material discharges into an intermediate hopper fitted with level probes which monitor material levels and is finally dense phase conveyed to an existing storage silo.

All ductwork for the system was provided by Hosokawa within the scope of supply from the air inlet section to the dense conveying line to the storage silo as was the steel framework supporting the system and all system lighting. The electrical installation for the services and the plant as a whole was engineered and installed by Hosokawa.

The system was supplied with all the necessary instruments and valves to meet the process duty and the customer's requirement for a control and data acquisition system and was designed to meet all prevailing safety standards. Software philosophy is based on a multi-page screen format allowing the plant operator to monitor the plant in overview mode during normal operation. Only when alarm conditions or process changes are required is it necessary to magnify the detail on the screen format. All the major system parameters are datalogged and statistically trended. These trends provide valuable data to assist in process solving when required.

Hosokawa's technical team commissioned the system with final de-bugging, functional testing and material runs to meet the process guarantee.

