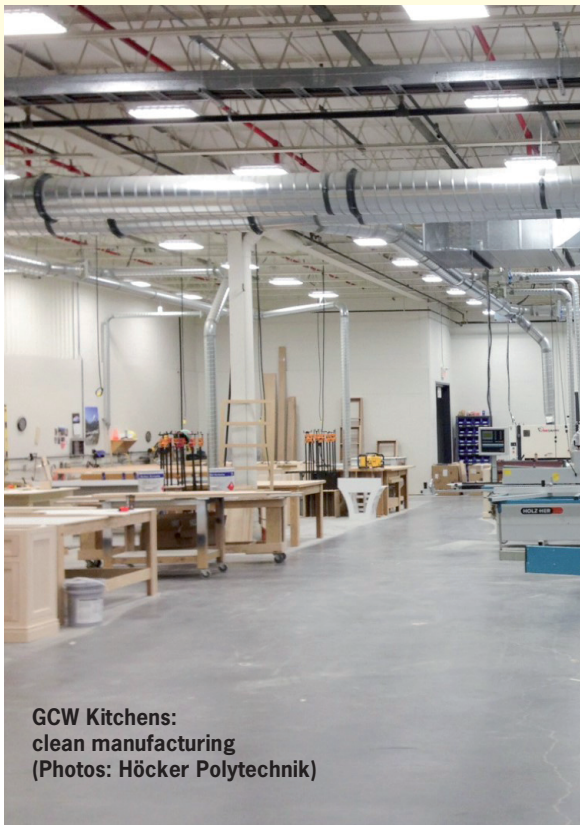
Efficiently dedusting kitchen production

On Lake Erie kitchen dreams come true. With its 70 employees the GCW Custom Kitchens & Cabinetry inc. from St. Thomas in Ontario makes the wishes of their customers in Canada and the United States come true in stylish perfection. And with kitchens ranging in price from CDN $ 5,000 to CDN $ 250,000 GWC has the right solution for every need and requirement – precision installation included of course.
GCW uses modern machinery and knows how important professional dust removal is to have work processes running smoothly and to produce the highest product quality. So when the production facilities were relocated and the production capacity expanded in the process, the old extraction unit was really put to the test. The conclusion was clear: the overpressure system was overburdened with the increased demands on energy efficiency and extraction performance. A new purchase would lay the groundwork for a productive future.



GCW Kitchens: clean manufacturing (Photos: Höcker Polytechnik)

Höcker Polytechnik develops extraction solution

Partnering in developing the new extraction solution was Höcker Polytechnik GmbH from Germany with its Canadian sales and service representative Taurus Craco Woodworking Machinery Inc. in Brampton. In close cooperation with the experienced project manager Uwe Rother, Höcker designed an extraction solution perfectly matched to the new production environment.
Proven a 1,000 times over, the "Multi Star" filter solution now operates as a powerful filter system outside the new hall. To reduce the distances between production machines and filters to a minimum, the unit was positioned as centrally as possible. The siting of the filter was facilitated by the minimal space required by the "Multi Star" filter – with a footprint of only 4 × 4 m. Also the technical data is quite impressive. The filter operating in the vacuum produces an extraction performance of 60,000 m^3/h and has reserve capacity to connect additional equipment when required. This air flow is generated by the three fans built into the clean-air side fan attachment module with a total capacity of 100 kW. This keeps fans and transported materials strictly separate and so especially safe from ignition – a clear plus in terms of fire and explosion protection.

Amortisation within three years, thanks to heat recovery

The air extracted by the "Multi Star" filter system has a residual dust content of only 0.1 $mg/m^3/h$ and is returned directly to the operation via a system of ducts. A return air system with residual dust monitoring recycles the precious heat generated in the production process. This saves on fuel for the heating, and the entire system can pay for itself in just three years.
The filter is cleaned via highly efficient compressed air impulse cleaning (jet cleaning) in which the filter hose and filter cake are blown clean by a blast of compressed air from the inside out. In the background, the controller monitors the differential pressure and activates the jet cleaning as soon as the degree of contamination of the filter hoses reaches a defined threshold. The cleaning stages are significantly reduced and operating costs for compressed air minimised, the filter material is spared and the noise level reduced.
An agitator with articulated spring arm technology operating horizontally on the floor of the filter safely discharges and transports the filtered material into the chip container by means of a rotary valve and a transport fan. The agitator is further able to discharge material intermittently up to a certain volume and weight, so that the transport fan does not have to operate continuously. This also saves energy. This solution allows extremely energy-saving and low-noise operation. Compared to the old system, the suction power and hence extraction performance could be increased by approximately 50%.

Smart controller reduces energy costs

Naturally, Höcker Polytechnik also connects the production machinery to the central extraction unit in the production facility. More than 30 automatic gate valves ensure here that the vacuum required for optimum extraction is always at the point where it is needed and that machines are disconnected from the extraction system

"Multi Star" filter installation with warm air recirculation and pneumatic transport into chip container

Machines coupled via automatic gate valves

when shut down. In the background the smart PLC control system monitors the filter operation and adjusts the ventilation power to the output required in the production process. The combination of gate valves coupled to the controller with the fan motors controlled by the VFD ensures optimum extraction performance at fair energy use, regardless of whether only one machine is in use, or extraction takes place at 30 stations.

GWC Kitchen is aware of its responsibility to the environment, and is optimally supported by Höcker Polytechnik GmbH in all aspects of energy efficiency.

Energy-saving features such as the energy-saving "Multi Star" filter, a return air system designed to recycle the heat extracted with the air to the production facilities, and the energy-efficient controller ensure a reliable production environment with minimal energy consumption.

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