



Energy Efficiency

at Lacquer Craft

A highly efficient dust filtration and extraction system allows one of the largest furniture plants in the world to substantially reduce energy costs and gain greater flexibility in rearranging its production floor. Goh Tz'en Long reports.



Bob Yang (Left), Executive VP, Lacquer Craft (Zhejiang) and W K Tan, MD, Lignar Engineering

The scenic landscape of Jiashan City in Zhejiang province, PR of China is home to one of the largest furniture plants in the world. In the massively sprawling premises of Lacquer Craft Mfg Co, Ltd, owned by Taiwan's Samson Group, produces furniture for the Universal and Legacy Classic range. The Samson Group has two production bases in China, the other one located in Dongguan. Lacquer Craft produces furniture mainly for the US market and its extensive product range includes dining room, bedroom, living room and kids' furniture.

The Lacquer Craft factory in Zhejiang, has a production capacity of more than 1,000 standard 40-foot containers per month. The advanced furniture factory is equipped with rough mill, smooth mill, sanding, assembly, one-mile long finishing lines, massive automated warehousing complexes and dormitories for its management staff and workers. Each warehousing complex occupies over 240,000 sq m of floor space.

The factory currently employs some 7,800 staff, of which some 6,700 are direct labour for its factories and has a total of six production lines, four lines for producing case goods and one line each for its bedroom and dining furniture ranges. The Phase II implementation will see three more production lines being added, boosting output to some 2,000 units of 40 foot containers per month.

Reducing Costs

With such a massive operation, Lacquer Craft is constantly looking into ways of reducing its production costs and realising greater energy savings, especially when new production lines were being built as part of its expansion plans. The total dust extraction air volume for the Phase I and Phase II implementations is estimated to be 3.2 million m³/hr. It engaged dust filter and extraction systems specialist



Lacquer Craft's massive automated warehousing complex

Lignar Engineering, which is the agent for Moldow dust extraction systems in Southeast Asia and China to come up with a proposal.

"During Phase I implementation, which included six production lines and the rough mill process, we did a calculation and found that by using the Moldow dust extraction system, as compared to a locally produced one, the difference in initial investment could be recovered from the savings in energy within a period of two years," said Bob Yang, Executive Vice President, Lacquer Craft (Zhejiang).

According to Mr Yang, benefits of the new system include greater energy savings, fire safety features and higher efficiency.

Maximum Flexibility

The ideal dust extraction system would also allow maximum flexibility to arrange and rearrange machines in the production halls, with the possibility of constantly connecting new machines as well as relocating existing ones, if required.

"With today's production requirements, which tend to move towards lower volume and high diversity manufacturing, the necessity of changing the plant floor layout arises, along with the addition and

subtraction of machines. With traditional dust collection systems, this may not always be possible or convenient and often causes a drop in efficiency and performance of the dust collection system," said Mr Yang.

Going With The Flow

The Transflow system was developed to provide flexibility of operation on heavily loaded extraction systems. It operates as a collecting duct with the waste material partially separated from the air stream. The heavy particles fall to the base of the Transflow where a mechanical drag-link conveyor passes it to a rotary valve situated at the bottom of the unit. After passing through the rotary valve, the material is transported in a high-speed pneumatic conveying system of small dimension to the silo, while the light airborne dust, which is retained in the main air stream flow, passes to the filter.

Greater Savings

"The Transflow system utilises a centralised conduit and conveyor system for collecting dust with many connection points. The system is highly flexible and does not result in significant pressure losses with a constant suction head along the line even as machines are added or disconnected," added Mr Yang.

A variable extraction volume can be used without the problems normally associated with a low conveying velocity. The substantial saving in energy means that the payback on the initial investment is rapid.

"At present, we find that the heaviest usage of electrical energy derives not from the dust collector system, but our air compressors. This is indeed an interesting finding. We are therefore thankful to Lignar Engineering for helping us make the right choice, even though the initial investment was higher," Mr Yang enthuses.

Higher Loads

The Moldow High Load (MHL) filter system with negative pressure extracting system was chosen for the production halls. The MHL filter has been specially designed for high loadings and high pressure cleaning where continuous operation is required. The filter bags are fitted with an inner spring bracing and a special bag design reduces the air velocity between the bags, which increases the air and dust load considerably. Sub-pressure operation with highly efficient clean air fans means that considerable energy savings are realised when air is exhausted through the filter with over 90 percent efficiency.

The modular filter system allows for easy future expansion and is equipped with high efficiency fans which can be turned on automatically and independently by inverter control. Auxiliary fans are turned on automatically only when necessitated by an increase in capacity requirements.

"In the past, woodworking processes such as planing or moulding sometimes resulted in dust or foreign particles sparking and catching fire with the danger of dust explosions happening. The new system is also much safer as it is equipped with GreCon spark detection systems," commented Mr Yang. **FDM**

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Moldow's Transflow system allows maximum flexibility to change the production layout.