

Centralized vacuum offers countless advantages, modern factories employ it more frequently.



**Vacuum shall be always available for Production. Instead of several small on-board pumps, the crucial vacuum supply for various packaging steps on different machines can be managed centrally, analogous to the other energy forms like electricity, pneumatic energy or cooling water. The experience collected by Pneumofore over decades results in proven solutions with impressive feedback.**

It is an unfortunate habit to install many packaging machines with on-board vacuum pumps within the same factory. The management of different small pumps of various manufacturers is both complicated and non-cost effective. Additional disadvantages emerge in specific cases.

One of the worst situations is the sliced meat packaging in cold rooms. The temperature inside these food-clean areas is about 2°C, the workers active in this environment are dressed respectively and the key factors are the packaging speed, the precision and protection towards contamination. The sliced product is placed on tablets, the transparent plastic is welded on the edges, so that no oxidation can occur inside the pack. Eventually, the pack is filled with an inert gas like nitrogen. Vacuum is used in any case, the less oxygen remaining in the package, the longer will be its shelf-life. The energy balance of this cold room must evaluate: the heat generated by the operators, the mechanical movements, electrical motors and other heat-dissipating devices like vacuum pumps. These pumps are usually installed below, almost non visible and generate warm air, as they are air-cooled. If the on-board pumps are dry, the heat emission are worse. More problematic are the exhaust fumes, which inevitably will occur after several thousand running hours, in the case of lubricated pumps. Regarding operators, their complaint is the noise, especially in case of dry pumps. Finally, we have exhaust fumes which risk the contamination of the product, we have the heat which needs to be compensated with more air conditioning power and we have the workers, whom are constantly disturbed by the noise emission of the small on-board pumps.

Modern packaging producers have centralized vacuum, as are their compressed air and electricity supply. To speed up food packaging to the limits of present feasibility, high tech factories run with different vacuum levels: there is an initial evacuation using vacuum at about 60%, this is immediately followed by the evacuation (second circuit with dedicated pipeline system) by 95 to 99% vacuum. No air remains in the package, the packaging operation itself is fast, as the two-step evacuation allows considerable speed-up potential of 20%.

Engineering makes the difference. Today the world market offers small vacuum pumps of endless makes, all about the same with three consumable plastic vanes. Their economically designed cooling system includes problematic oil separation cartridges (up to 22 per pump in most ridiculous cases), the moisture which is evacuated with air creates an emulsion, which does not keep the cooling and lubricating features of the oil. To avoid vacuum level losses, the air intake filter is eliminated as an immediate solution in order to bypass the stop of production. Because of a few kilowatt device, sometimes the entire sequence of packaging ceases. The replacement pump must be available, brought to the installation point, connected, tested and set for the specific evacuation task. This takes time, money, resources and disturbs massively the productivity.

To lead in this field, Pneumofore continues to invest in Research & Development. Vacuum pumps up to 220 kW, rotary vane technology, air-cooled, designed to cover all kinds of challenges in the 24/7 industrial food processes, succeed in replacing obsolete 'compact pumps' with Return on Investment calculations as short as 12 months. Specific for the food packaging, where the evacuated humidity must be considered, Pneumofore installs vacuum pumps of the UV H Series. One UV16 H with 22 kW nominal power and 1000 m<sup>3</sup>/h capacity has the ability to evacuate 78 kg of water per hour. Frequently the pumps of the UV Series are combined with a second roots stage for higher vacuum levels and larger capacities. The replacement of many small pumps with few centralized units notably solves also the energy balance issues in the cold rooms: the environment is more pleasant for the workers due to the lower noise, less electricity is required to keep the cold room temperature constant and no oil fumes compromise the integrity of the products. The massive improvement of the packaging speed is the main result given by Pneumofore pumps.

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