Pneumofore

Air Compressors and Vacuum Pumps with Rotary Vane technology excellence

Pic. 4 - *'90 years' logo Pneumofore*

Pneumofore
Rotary vane machines since 1923

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The Mediterranean Diet: Stomach filled... with Vacuum

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Pneumofore
Life cycle cost: we always win

The Mediterranean Diet: Stomach filled... with Vacuum

Best pasta quality, colour and taste thanks to vacuum pumps

The crucial activity of vacuum enhances the excellence inherent to natural products, for it binds and processes ingredients, as a guarantee of the total quality of the global king of food.

In the last decades, vacuum for industrial uses has undergone remarkable evolution on account of increasingly numerous and different applications. Every day we use objects that are made with this resource, such as: glass bottles, different plastics, expanded products, bricks, tiles and foodstuff, among which pasta stands out.

Durum wheat pasta is one of the most well-known Italian products.

The simplicity of the product, whose recipe is set by law and consists in just two natural ingredients, wheat and flour, makes it the base of the Mediterranean diet. Industrial durum wheat pasta is made by means of extrusion and drying lines mainly produced in Italy, which grant perfect cooking and that bright colour that is typical of the raw material.

Every production line has its own mixer, inside of which durum wheat flour is mixed with water by means of computerized systems, in such a way as to optimize the dough for the making of the different types of pasta.

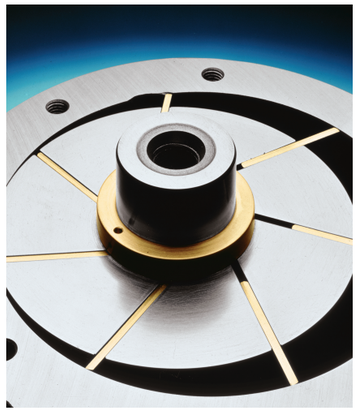
Pic. 1 - *Pasta type called 'Farfalle'*

After some 20 minutes' processing, the dough is transferred to a smaller mixer, so-called "vacuum". Hence a helical screw presses the dough into a die (different for any type of pasta), under which a knife cuts the pasta along the pre-set length line. Teflon or bronze dies are utilized to get a kind of pasta with a rough surface, which is preferred by gourmets because it is able to absorb the sauce better.

The vacuum inside the mixer enables to reduce the humidity of the dough right from this stage. To avoid the pasta from piling up, its surface is dried for some minutes right after cutting by means of a warm air jet.

After some one-hour pre-drying phase, the real drying process is started and lasts for some hours (3 or more) up to final 12% humidity degree. All drying processes are performed at 90°C. At the end of which, the pasta is cooled at room temperature for 5 minutes as to prevent any condensation during packaging. Automatic production lines avoid any contact during process, as further guarantee of high-quality end product.

You can notice that as well as water and flour, the only element that contributes to the processing is vacuum and its main role is taking off the air inside the dough. The pasta processed at inadequate vacuum levels shows "white spots" after drying and these are source of porosity. Therefore, porous pasta loses its texture during cooking and no pasta al dente will be possible. In addition to this, taking air off means taking oxygen out, which in addition to oxidizing the product, it also tends to make the natural golden colour of wheat to fade.



Pic. 2 - *Rotary Vane Technology*

The quality of pasta highly depends on the quality of wheat, its origin, water with mineral salts, and vacuum level that needs being high and constant.

Since its foundation in 1923, Pneumofore has been committed to research and development of innovative, dependable, long-life, and eco-friendly solutions in the vacuum pump and air compressor sector. Evolution has spurred the change of V Series vane pumps with drip-feed lubrication (used since the 40s) right to the UV Series, featuring unique and exclusive performances in lubricated single-stage pumps.

Up to some years ago, applications such as pasta, brickwork and expanded work, characterized by steam and water, used to be just exclusive prerogative of liquid ring pumps; today, thanks to Pneumofore UV Series vane pumps, we can get matchless higher performance in terms of load and vacuum, by using less power and reducing the footprint due to liquids management (water and oil), source of remarkable procurement and disposal expenses.

Energy saving combined with moderate maintenance costs generated such return on investments as to make new ones not to be postponed. Moreover, thanks to improved absolute performances, the quality of the products has turned out remarkably higher.

In 1998, at Pastificio Garofalo, in Gragnano, where the quality of pasta is a paramount feature, the first UV16 pump was installed to replace the three water liquid ring pumps on site. In addition to eliminating any problem due to water management, the power used decreased by 15%; with the same load, the vacuum degree increased and quality improved as a consequence. Presently, seven UV16 BP units and one UV8 BP are running at this facility as evidence of the dependability, constant performance and energy saving granted by Pneumofore vacuum systems, which on the other hand mirror the flawless quality of end products.

In 2010, on occasion of the creation of two new production lines, historic pasta factory Divella, working since 1890 in Rutigliano, Bari, installed (in cooperation with Termocond) two UV30 BP with capacity 45 kW: one is running to guarantee absolute pressure of 80 mbar(a) in the vacuum chamber, the other is in stand-by mode. At the factory, consisting of 9 production lines interlocked with 5 liquid ring pumps of 45 kW each, residual pressure is about 150 mbar(a).

The present rebuilding of the old production lines of the facilities, upon recommendation of Pneumofore and Termocond, saw the dismissal of the liquid ring pumps for the installation of two UV30 BP of 45 kW and one UV30 BP VS55. The latter, provided with inverter, features variable capacity which, while running at constant pressure, enables better regulation of the vacuum level and synchronous reduction of energy consumption of all the pumps connected to the plant.

After the renovation, all the 11 lines have absolute pressure of 80 mbar(a) and the variable capacity pump runs at minimum speed for just 24 kW power.

Pic. 3 - *Installation of rotary vane vacuum pumps mod. UV16*

To summarize, fundamental improvements in terms of vacuum degree accompanied with higher quality end products, energy saving higher than 20% in comparison with the previous plant, for following short-term return of investment, have been confirmed. We also need to mention the elimination of any economic/environmental impact deriving from the disposal and process water treatment of the pumps previously used.

Colussi Group is owner of Agnesi pasta factories in Piedmont (Fossano), in Liguria (Imperia), and in Romania.

The liquid ring vacuum pumps running in the different factories have been replaced in recent years by two UV16 BP pumps on the Fossano premises, three UV16 BP pumps at the factory in Imperia, and two UV8 BP pumps in Romania. Thanks to the results achieved in these pasta factories, Pneumofore pumps have been selected again by Colussi for a plant built in 2010 (in cooperation with Infolink) in Russia, in the Balashov region. In the first stage, two UV16 BP equipped with accessories accurately sized have been installed as to reduce load loss.

These are just some but a few Italian pasta factories with which Pneumofore started initially with a supply and then went on with a real relationship between customer and provider, with the creation of the standard combination: quality pasta and Pneumofore vacuum.

As well as dependable UV pumps and know-how backed by extensive experience, customer retention throughout the years has been possible also thanks to Pneumofore technical assistance in plant sizing and selection of the most suitable accessories, such as tanks for vacuum (built upon Pneumofore specifics), liquid separators with connected dischargers and optimized filtering systems.

After-sales service providing assistance, maintenance and original spare parts, is largely responsible of customer retention, and relies on a worldwide distribution network.

The thousands of industrial plants running on the five continents motivate Pneumofore's ownership to look at the future under a bright light.