COLD TREATMENT HOODS

Cold treatment of glass items is a very common practice in hollow glass factories: in fact, this simple treatment gives more strength and a better look to glass containers, increasing the quality of the final product.
Commonly, the treatment is distributed over the items by spray machines: this system can offer an efficient distribution of oleic acid on the surfaces, and is particularly indicated for bottles. Otherwise, spray system has a limit: in case of jars or, in general, wide mouth containers, there is no control over the distribution of oleic acid. In other words, if the glass container has a wide mouth, there is no possibility to avoid that oleic acid goes inside the container itself. This means that, although the treatment on external side is correctly made, the products that will fill the containers (jam, juice, tomato or any other kind of food) will be contaminated by oleic acid

This problem can be avoided using a different kind of treatment machine: the **cold treatment hood.** This machine is installed at the end of the lehr, before the conveyors of the cold end. It's bigger than a traditional spray machine, but can avoid the problem of contamination of internal side of glass containers.
Technically, the hood is very simple: it's a metallic structure, closed on the sides and equipped with adjustable screens at the beginning and the end of the machine, to fit exactly to the height of the different articles that may be produced. Over the hood, are positioned 3 central fans that control the air flow inside the machine. The air inside the hood is heated by a series of resistances, which keep the temperature inside the machine around 100°-120°C (it can be regulated consequently to the needs of production). On the sides of the machine, there are the distribution systems of oleic acid. The fans, the resistances and the treatment distribution system are controlled by a simple electrical panel that activates or regulates these devices when needed.

Now, let's see how this machine works. The "secret" of cold treatment hood is that oleic acid is not sprayed directly on glass items: the treatment is nebulized inside the machine, creating a sort of oily "fog". The 3 fans control the movement of air inside the machine, so that the treatment remains inside the hood. In particular, the central fan "pushes down" the air in the machine, while the external fans "suck" the air to the top of the machine, avoiding contamination of external environment. While passing in the high part of the hood, air is heated by the resistances, which keep temperature in the correct range.
The articles, passing through the machine, are in constant contact with the oily fog, and the oleic acid gently deposit on the external surface of the glass. How is possible that the treatment "falls" only on external side of glass containers, and doesn't contaminate them inside? The answer is very simple, and comes from Physics, in detail from Thermodynamics. In fact, the internal temperature of the hood is about 100°C. When the glass articles go out of the lehr, they are hotter than the air in the machine: this means that the air inside the articles creates a sort of internal pressure, which avoids that the oily fog goes inside them.
In this way, only the external side of the container is exposed to treatment, and the internal side remains clean from oleic acid.

In this way, the glass factory can offer a product with a higher value for money: the articles keep all the advantages of cold treatment, and in addition the final Customer has really lower risks of contamination of his product from oleic acid.
Moreover, cold treatment hoods can be designed to fit on every type of lehr and can be installed or removed with no problems in short time.

VIBRATING TABLES

Glass factories that produce special glass containers have special needs. For special containers, we can intend perfumery in general and bottles with particular shapes (conical or similar). All these items have a peculiarity: in particular conditions (accumulation, for example), they have the tendency to be unstable. In these situations, the risk of fall of articles is very high, with all the consequent problems in the cold end.
One of the most sensible points is the exit of the lehr: in this point, the articles must be transferred from the belt of the lehr to the conveyor of the cold end. Normally, in this transition point, the articles have to pass on dead plates: their movement is given by the pressure of the other articles arriving from the lehr. Of course, if we have conical bottles or unstable glass containers, this pressure often causes the fall of a great number of articles in the zone of the dead plates. In this situation, the only way to solve this problem is a constant presence of personnel that picks up the fallen bottles.

Another possibility to solve this problem is installing **vibrating tables** between the lehr and the conveyor. The purpose of these special devices is moving the articles from the belt of the lehr, and delivers them gently onto the conveyor. With this solution, the articles are moved by the vibrating tables, and not by the pressure of the other articles coming from the lehr: in this way, fall of articles caused by physical contact between them is virtually eliminated.
The way the vibrating tables work is the following: using controlled vibrations, adjustable in frequency depending on the needs of production, the articles are moved one by one in the desired direction. Depending on the weight of the articles and the volume of production, the vibrations can be regulated so to obtain the maximum stability of the articles themselves and their optimal speed between the lehr and the conveyor. Moreover, in particular conditions, the plates of the vibrating tables can be regulated independently.

The vibrating tables are installed on an independent heavy support, that is placed between the lehr and the conveyor. The basic structure of this machine is always the same: there are four vibrating panels, aligned side by side along all the width of the belt of the lehr. The heavy support where the panels are installed is not fixed to the lehr or to the conveyor, to avoid resonance problems with these structures. Moreover, the mass of the support avoids interferences between the panels themselves. The panels are independent vibrating systems: the vibrations are generated electrically by special coils, independently controlled by a specific control panel (in general, it's an electro-mechanical control panel). The 4-panels vibrating table kit can be installed on small and medium-sized lehrs. For larger lehrs, two vibrating tables kit are installed side by side, to cover all the width of the belt of the conveyor. In this way, there are 8 vibrating panels working together.
In this situation, 8 vibrating systems could generate problematic resonances between the plates themselves. To avoid this problem, it has been developed a more sophisticated control system, instead of the traditional electro-mechanical panel. In fact, the vibration frequency is separately controlled plate by plate by intelligent electronic devices that work in a close-loop feedback system. Specific sensors, installed on each vibrating plate, are able to sense in real time a possible resonance problem: in case of resonance, just in fractions of second the electronic system makes all the necessary corrections of frequency on the single plates, in order to avoid any resonance problem. This intelligent control panel allows the perfect interactions of 2 independent kits of vibrating tables 24 hours a day, with any kind of article.

Of course, the consequence of all this is a really better flow of articles at the beginning of the cold end and a drastically reduced presence of operators in the zone of the aligner, with a consequent important reduction of costs.

Another secondary effect of the vibrating tables is that the bottom of the articles is cleaned from possible dirt of the lehr while passing on the panels themselves: in fact, the special tissue that covers the panels gently cleans the bottom of bottles and jars while vibrations deliver them to the conveyor.