

Case story | VLT® Solutions

## VLT® AutomationDrive helps fluorescent tubes power down the line

Philips India Ltd in Vadodara, in the state of Gujarat, manufactures fluorescent tubes and bulbs. Until recently the company used additional manpower to manually adjust the unevenness of the tubes on the conveyor belt. That resulted in low productivity due to slow machine speed and breakage of the tubes. With Danfoss Drives' VLT® AutomationDrive and the VLT® Motion Control Option, the situation has been dramatically improved.

Philips India Ltd is familiar with VLT® frequency converters as they have used VLT® products in various applications since 1998. About 100 frequency converters are running in different Philips applications. Philips also learned that Danfoss Drives had helped a company in the northern part of India with a similar problem.

### A satisfied customer

Six VLT® AutomationDrives and four VLT® Motion Control Options MCO305 have now reduced costs and provided continuous line synchronisation irrespective of the line speed.

It was a challenge for the Danfoss staff to install several Motion

Control Options in one line with the same dynamic response in the different sections.

### Trouble-free operation

Philips India Ltd now benefits from improved productivity, reduced maintenance costs, increased line speed, reduced manpower and trouble-free operation.



### Operation of the machine:

The tube puller continuously pulls the hot glass tube and provides feedback to the tube cutter section for cutting the specified length.

The tube cutter cuts the hot tube into the specified lengths based on the speed of the tube cutter motor. The customer does not use a closed-loop system because there are only a few specific lengths required.

The shortening shaft is a very important synchronization shaft for synchronising the machine continuously with the tube cutter and the rest of the delivery shafts. Once the tube cutter has cut the tubes this is taken to the shortening shaft. The shortening delivery shaft deliver the tubes to the cutting chain conveyor. The cutting chain conveyor takes the tubes from trimming to the glazing conveyor and the edge of the tubes is passed through the gas cutter.

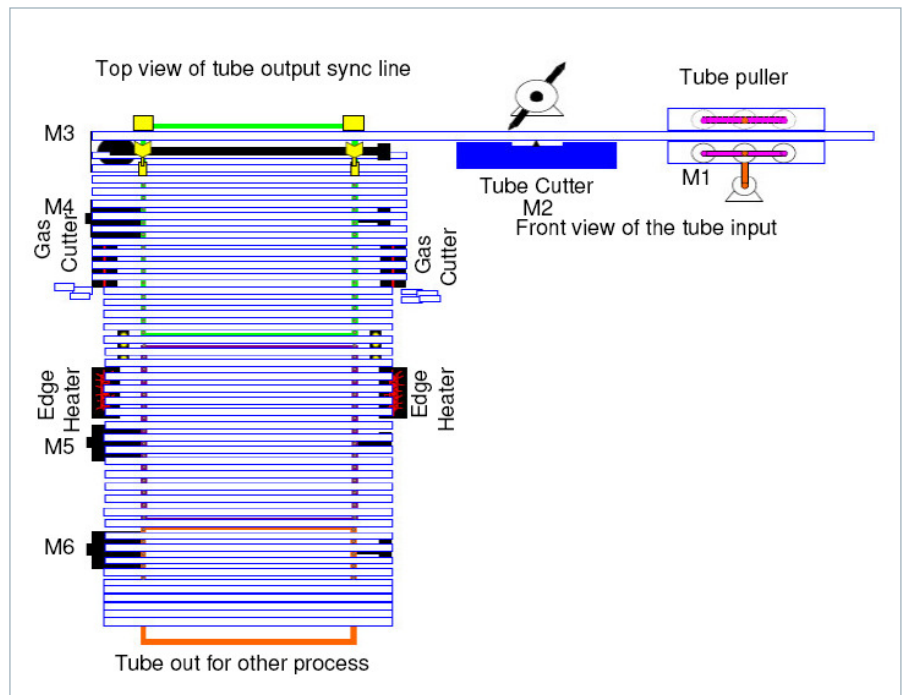
In the glazing section the cut ends of the tubes are heated up to reduce the sharpness of the edges. From here the tubes are delivered to the cooling conveyor and are manually delivered to other processes.

The speed of the motors M3 to M6 is controlled with a VLT® AutomationDrive with the VLT® Motion Control Option MCO305.

The M2 tube cutter motor encoder works as a master reference for the M3 to M6 motors.

There are individual feedback encoders installed in the delivery shaft for marker synchronization through Z-pulse of the encoders.

The complete machine is thus synchronised from tube puller to the cooling section.



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