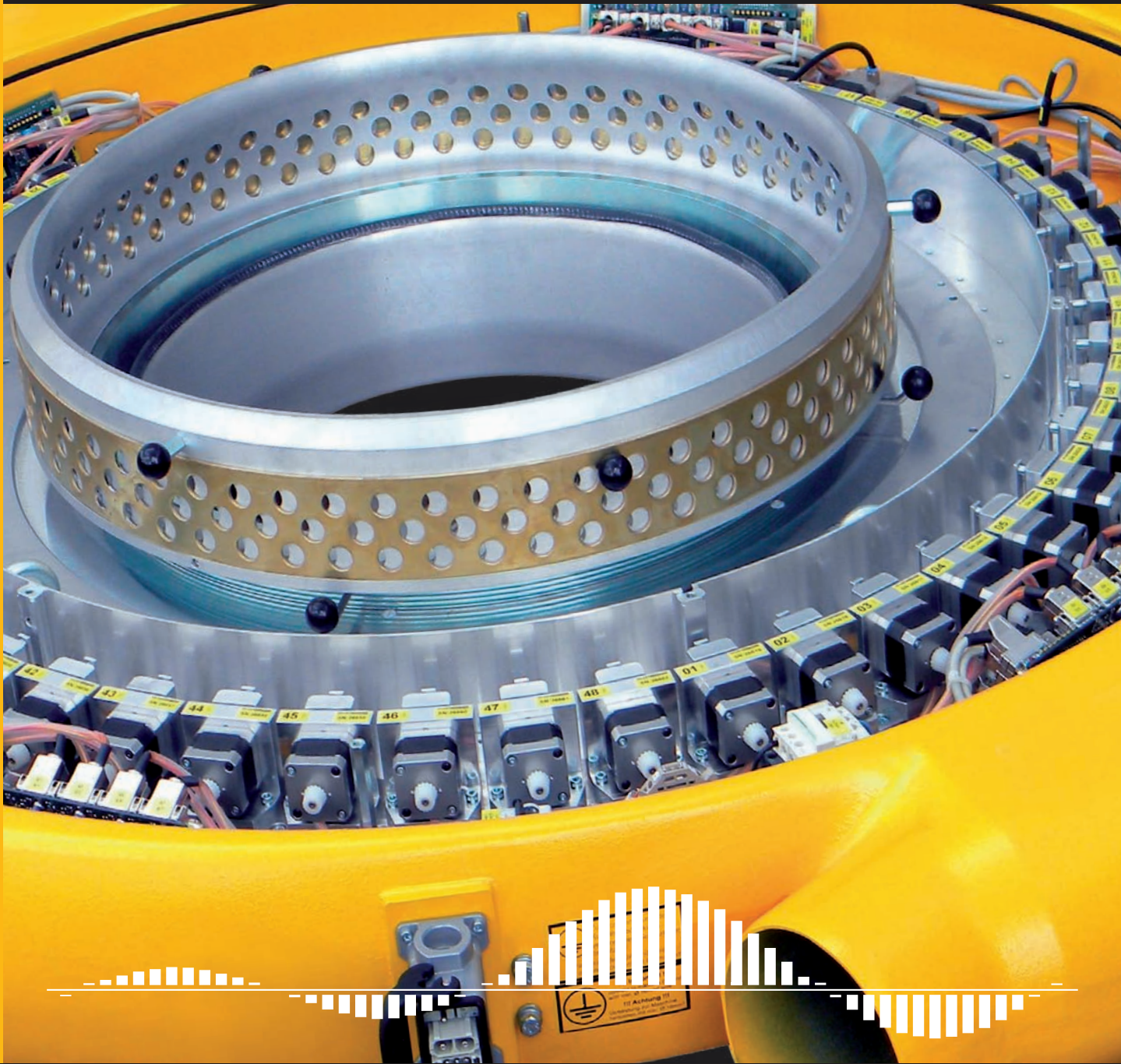


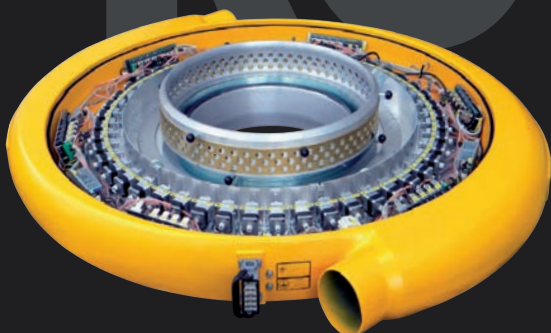
**EFFECTIVE AUTO GAUGE CONTROL**



**PRO-CON**

**GAUGE CONTROL + SMART COOLING  
WITH *PRO-CON***

**SAVE ENERGY AND  
MATERIAL**



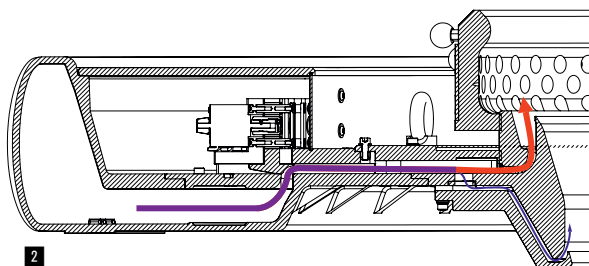
**PLASTCONTROL**

## PRO-CON PERFECTION & HOW IT WORKS

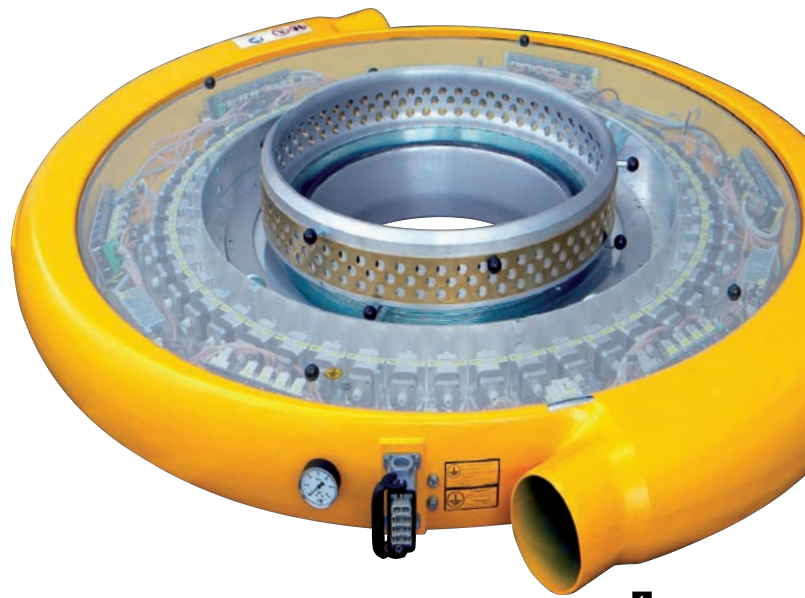
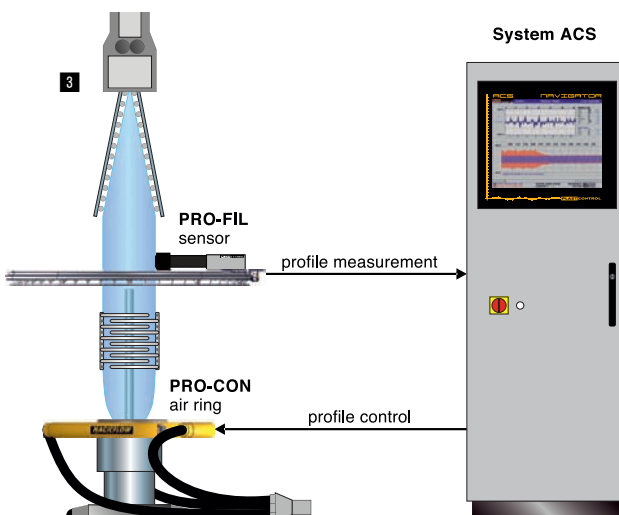
As one of the pioneers in the development of automatic systems for the reduction of transverse direction (TD) profile tolerances, PLAST-CONTROL has continuously developed and refined its systems.

PRO-CON utilizes our own profile measurement devices which transmit profile data to the process computer. The software calculates and carries out the correct positioning of the actuators which in turn controls air flow through the segmented air ring.

Functionally the computer opening or closing of actuators within the **PRO-CON** air ring will increase or decrease the volume of air in each segment. This influences the melt temperature and in turn the film thickness during film blowing expansion stage.



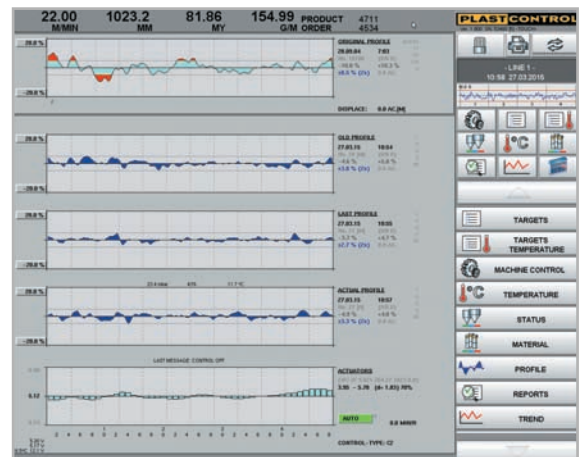
To compensate for the displacement due to the mechanical oscillation in the film line the **PRO-CON** software measures and calculates "shift" in the measured profile. This feature adapts itself depending on bubble oscillation and profile scan speed. Accurate and consistent reduction of profile tolerances without operator adjustment is achieved irrespective of product dimensions.



- 1 PRO-CON ...a view inside
- 2 Cross section of PRO-CON C-400
- 3 Schematic diagram
- 4 Operator screen display

The air rings are available in six sizes up to 2.200 mm in diameter. In combination with **MAGIC FLOW**, improvement of at least 50% of the basic tolerances can be expected, along with higher output rates.

More than 1.340 PRO-CON have been installed to date.



### Advantages of gauge control:

- Downgauging: see sketch 3 next page
- High quality film
- Fast product changeover
- Less waste production
- Better converting and printing

## SAVE MATERIAL & TIME WITH **PRO-CON**

Automatic Gauge Control Systems from PLAST-CONTROL enable the user to produce a high quality film with perfect tolerances and without additional energy input in the most efficient way of **PRO-CON** technology.

### **Additional advantages with PRO-CON:**

- At least 50% improvement of the basic tolerances
- No additional energy input: Read more on page 4
- Simultaneous control of thin and thick areas
- Higher output with **MAGIC-FLOW** insert
- Flexible inserts for all products
- Available as **DUO II**, airing with elevating device
- Specials with **PRO-EVAC** and **BLACK MAGIC**



1

## HIGHER OUTPUT WITH **MAGIC FLOW**

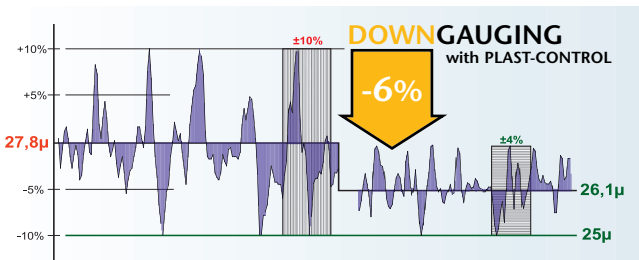
**MAGIC FLOW** is the result of extensive research in the increase of cooling capacity for blown film lines. This has been achieved by improving the aerodynamic flow path between the blower, manifold and cooling ring.

**MAGIC-FLOW** allows a fast return on investment due to higher output (up to + 40%) and reduced material consume (i.g. 3%).

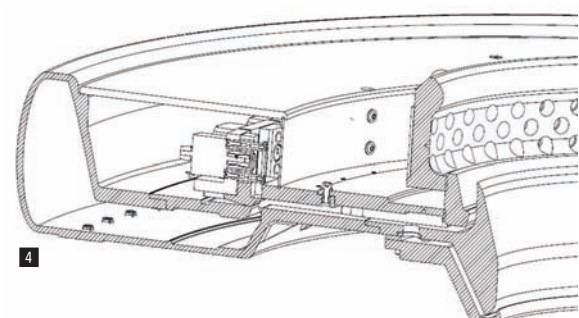
Additionally extensive developments in the internal geometries of the cooling ring and the complete redesigned lip shape allows higher air speeds and air volumes at the cooling interface.

The net effect is that bubble stability is increased, transverse tolerances improved and higher machine outputs are achieved.

2



3



4

- 1 PRO-CON DUO II
- 2 Effective internal cooling
- 3 Downgauging
- 4 Cross section of PRO-CON C-400

# SAVE ENERGY WITH **PRO-CON** GAUGE CONTROL

All major machine builders supply gauge control systems with thermo bolts inside the cooling ring although promoting energy efficiency.

The advantage of heater based control is the lower initial investment of approx. 10%. However thermo control air rings consume much more electrical energy, for the heating elements and for the pre-installed chillers.

### **A typical example:**

A thermo bolt air ring for a 300 mm die consumes 23 kW additional energy. 7.800 operational hours over the year uses 179.000 kWh, equivalent to 44 households (Europe) and 93.080 kg CO<sup>2</sup> emission.

**Thermo bolt controlled air rings are not energy efficient!**

The **PRO-CON** system uses less than 1 kW energy input per hour.

### **Real advantages:**

- *Fast return on investment*
- *Large operational influence on film tolerances*
- *Constant bubble stability*
- *Fast control response*
- *No additional energy input*
- *No energy requirement to maintain the profile control set point*
- *Excellent base profile tolerances*
- *Down gauging of nominal thickness*
- *Reduced order change time*
- *Reduced scrap rates*
- *Improved mechanical film properties*

- 1 PRO-CON on an 11 layer high barrier line
- 2 PRO-CON C-400 for industrial packaging
- 3 PRO-CON C-400 for an Asian OEM
- 4 PRO-CON for a Turkish OEM



1



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3



4



1



2



3



4



5

- 1 C-400 for special application, OEM
- 2 C-400 for an Asian customer
- 3 C-400 for a European OEM
- 4 C-200 for FFS production
- 5 K 1650 for agriculture film



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