

# Thermoforming

Manufacturing of plastic cups for food packing and roll-fed thermoforming machines



# Q

Question

How can you control the correct temperature treatment of plastic cups manufactured on roll-fed machines?



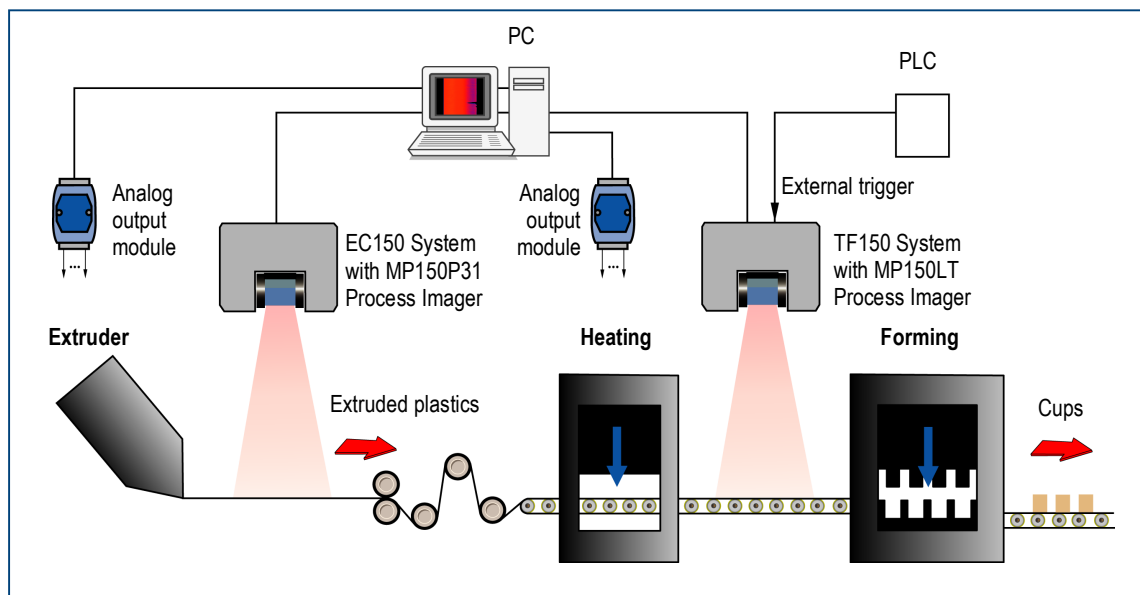
# A

Answer

## Situation Analysis

To produce cups for yogurt or milk products, polypropylene or polystyrene film is extruded 1 to 3 mm thick and up to 800mm wide. The film is cooled, reheated with infrared heaters and then transported to the forming section, where multiple cups are formed in one single step.

The cups are then placed in pallets of several hundred pieces. If quality problems produce cups that leak or are cracked, the wholesalers send back the entire pallet even if only just one of the cups fails the inspection. Uniformity of temperature distribution after the web is extruded is important to achieve high cup quality (exact wall thickness, same form and stability). Before forming the cups, the edges of the web have to be heated more than the areas in the middle of the web because the edges cool at a faster rate. A lower temperature at the edge causes quality problems and a high scrap rate.



# A

Answer

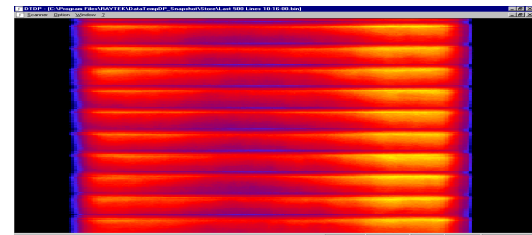
## Solution and Improvements

The “Automatic Sector” in the Raytek® EC150 system continuously monitors the entire extruded film and provides automatic edge detection. Temperature gaps or unacceptable “edge running” are detected automatically. The system allows the output of free definable sub-sectors via an analog output module for the regulation of the extruder heating.

The TF150 system captures consecutive snapshots based on an external trigger coming from the PLC. A zone grid overlay represents the infrared heating elements in the oven depending on size and location. The zone average temperature is output to an analog output module, whereby one output channel controls the power of the corresponding heating element.



**After the extruder:** temperature profile with Automatic Sector and Sub-Sectors



**After the heating section:** thermal image showing 10 consecutive snapshots

## Raytek Product

MP150P31 Process Imager with  
DataTemp EC150 Software

MP150LT Process Imager with  
DataTemp TF150 Software

## Accessories

- Analog Output Modules

## Benefits

- Reduced Energy Costs
- Improved Product Quality
- Reduced Scrap
- Automated Quality Documentation (ISO 9000)

For customized solutions to your process, please contact:

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