

# Maintaining 250°C Gap Uniformity on Extruder Dies

Interview with Robert Foster and Bryan Manning, Capacitec

## 1. CAPACITEC INTRODUCED THE UPDATED CAPACITIVE NON-CONTACT SLOT DIE GAP MEASUREMENT SYSTEM IN 2011 AND THE NEW GAPMAN GEN3 PORTABLE SLOT DIE COATER GAP MEASUREMENT SYSTEM IN 2012. WHAT DOES THE MARKET STILL NEED IN THE WAY OF SLOT DIE GAP MEASUREMENT?

Today we are introducing flexible non-contact gap measurement wands that can measure gaps in extruder dies at 250°C. Manufacturers using slot die and other types of dies to extrude a variety of materials (i.e. thermal plastics) have been searching for a repeatable method to set the uniformity of the die at elevated temperatures. Most companies had to settle on mechanical contact gap measurement methods such as feeler gauges. This procedure could not provide the required accuracy and the repeatability was poor due to the subjective variation between users. In addition they were forced to live with gap variations of more than 0.0015 mm over the length of the extruder dies. Additional disadvantages of feeler gages are:

- Could damage highly polished surfaces such as the mouth of a coater
- Once the gap is set it is very difficult to recheck the actual dimension
- Feeler gauges cannot accurately measure «inboard» gaps

Extruder companies have been challenged for years to find an improved method to control elevated temperature gaps but found no acceptable solution on the market. In response to this pain, Capacitec is introducing the new non-contact capacitive gap measurement GPD-2-E+ sensor wand that measures extruder lips gaps at operation temperatures up to 250°C (see figure 1). It functions the same as standard dual sensor wands except it opens up new possibilities for use in considerably hotter extrusion and coating die processes. This gap tool can operate short term at up to 300°C. Currently there are no electronic gap gauging tools to confirm gap sizes in adjustable extruder dies operating at these elevated temperatures.

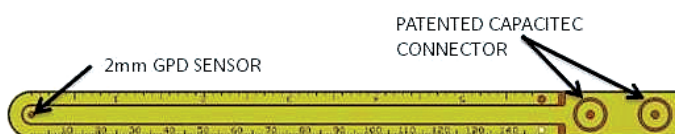


Fig 1: Model GPD 250°C non-contact extruder gap measurement wand

## 2. WHY IS IT IMPORTANT TO MEASURE GAP UNIFORMITY?

Measuring gap uniformity is important because the gap width changes in relationship to the thermal expansion of the extruder die lip between ambient and production temperatures. The new Capacitec high temperature extruder die gap measurement system now allows users to accurately confirm gap sizes before starting production as well as after the adjustable dies have been reset from sized gap settings. It also allows extruder die manufacturers to study the true position and repeatability of their adjustable die setting processes.

## 3. WHERE IN THE PRODUCTION OR LAB PROCESS DO THESE NEW GAP MEASUREMENT WANDS NEED TO BE INSTALLED?

These high temperature flexible non-contact gap uniformity sensors are installed into the existing standard lab slot die coater gap measurement system. These new wands can be used in existing Capacitec systems as a new option. If users prefer a portable system to audits of the gaps of extruders on the shop floor they can be installed into the Gapman Gen3 system (see figure 2). The lab version has been upgraded to the new 220-S electronic package which is 1/3 the size of the legacy 4100 series electronics (see figure 3).

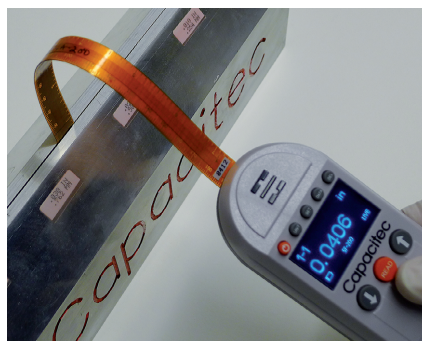


Fig 2: Gapman Gen3 portable system

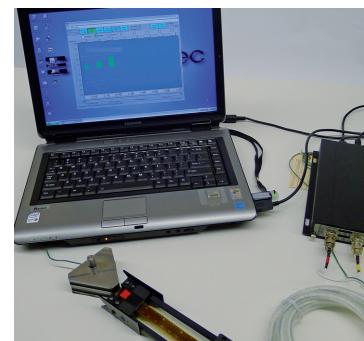


Fig 3: New electronics on slot die system

## 4. WHO NEEDS THESE NEW GAP MEASUREMENT WANDS?

Manufacturers of a variety of materials produced with the use of extruder dies are the target users that could take advantage of this new development. High temperatures play a role, for example, in plastic sheet manufacturing, where polymer solutions are extruded through dies at elevated temperatures. Additional applications where customer have found great value in this new tech-

nology are during the production of backsheet film for solar panels, plastic pipe and tube extrusion, the production of foam and plastic food packaging materials, or to regulate thermal forming die gaps for medical fluid distribution (IV bags), or control roll coating gaps for aerospace composite materials (CFRP).

Gentlemen, thank you for the interview.

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