Scorpion for bread and buns

At the iba 2015, Reading Thermal featured new oven profiling solutions developed specifically for tunnel ovens in the bread and bun industry.

++ Pan+Dough Probe

When there is a need to make measurements really comparable, or to assemble whole series of measurements, the main requirement is to measure the same parameters at the same point. That's exactly what Reading Thermal promises with the newly developed travelling oven sensors that transmit their information to the Scorpion 2 data logger. Two decisive measurement points when producing bread and buns are the core temperature and the temperature at the transition between product and pan/tray. The core temperature is usually measured by sensor rods stuck into the dough. Whether the core or center of the product is actually reached in this process is rather a matter of feeling, and whether the measuring probe remains there is a question of oven spring. Reading has solved this problem by combining together the two measurement points.

The Pan+Dough Probe consists of a copper plate that is put into the pan. It measures the temperature at the transition between the dough and the pan, which influences the degree of browning of the underside of the bread or roll. Due to the dough on top of it, the plate remains fixed at the same single point during the entire passage through the oven. Attached to the plate is a pin whose length differs depending on the product being baked and which extends to the center of the dough. Due to the fastening and the standardized height of the pin, it stays where it is and the measurement is comparable and repeatable. The two sensors transmit their data to a temperature interface in the Scorpion. The combination of these two sensors allows the temperature profile in the baked product to be measured, documented and assessed a number of times during the entire residence time in the oven.
However, as well as the temperature events in and around the baked product itself, the Scorpion 2 offers a whole series of other sensors that determine and monitor the climate and its changes with time and with the distance travelled in the oven, and make these available to control the lines.

1. They include the **Heat Flux Sensor**, which measures both convection and radiation heat and does so in either Btu/hr.ft^2 or in W/m^2. The sensor consists of two components. One measures the total heat flow that would act on a product passing through the oven at the same position as the measuring instrument, while the second measures only the convection heat. Both are displayed graphically, so on the one hand they can be used to describe the baking profile of the respective products, while on the other hand they also allow a comparison between the thermal performances of two ovens.

2. **Humidity sensors** are able to measure the specific humidity of the air at extremely high and extremely low temperatures. There is also a bulk air or dry bulb temperature sensor. The humidity sensors are housed in a special compartment into which the air in the oven or in the refrigerator can enter in a defined way. The sensors convert the moisture in the air into a voltage, which is displayed

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++ Temp+Airflow sensor array in production; it contains 9 Temp+Airflow sensors spaced evenly across the length of an aluminum bar

graphically. This allows the moisture development to be measured and controlled directly on the product, which not only improves the shelf life but also the desired crispness or breaking strength, e.g. for rusk and similar products.

3. **Anemometers** (air flow velocity meters) which are mounted on a bar in a similar way to the temperature sensors and record, measure and display graphically the air movement across the whole width of the oven.

4. **Temperature Sensor Array** measures the temperature field at product height. The sensors are mounted on a bar that can extend across the whole width of the conveyor belt. This allows the temperature profile over the entire

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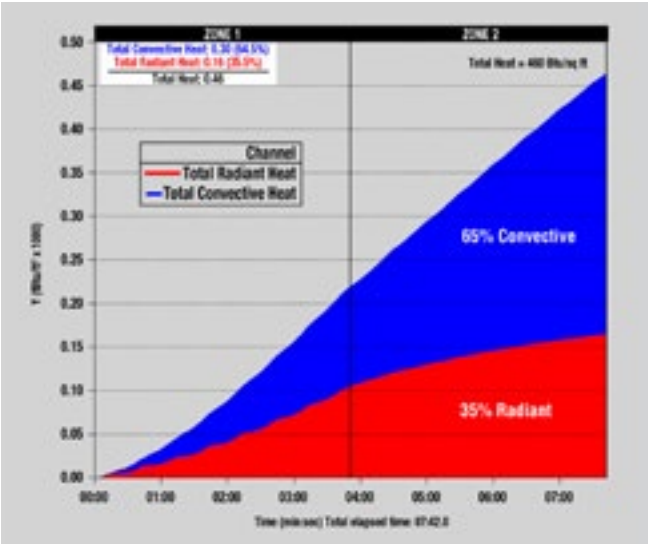
++ R&D Sensor with production probes

length and width of the oven or refrigeration equipment to be recorded in a single pass. Two sensor types can be considered for this purpose. Type A measures air temperature and belt temperature on steel and fine wire mesh belts. Type B is used mainly on wide wire mesh belts, and measures both the temperature above the belt and the temperature passing through the holes in the belt. A new development for bread and buns is the **Temp+Airflow Sensor Array**, which is designed to simultaneously profile temperature and airflow across the whole width of the oven. The result is a complete picture of the oven surface area that makes hot or cold spots visible immediately. This allows optimum adjustment of the burner and turbulator.

5. The fifth available sensor, connected to a data logger positioned at the same point as a product, is the **R&D Smart Sensor** which simultaneously detects four parameters that affect product quality: the surrounding temperature, the product's core temperature, the air movement and the energy transfer. This allows a quick overview of an oven's baking profile to be obtained in order to enable comparisons to be made where necessary or to permit its suitability for a particular product to be assessed. Here again there are two alternative temperature sensors, Type A which is suitable for steel belts and tightly-woven wire mesh belts, and Type B for open-weave wire mesh belts.

All the data gathered by the various sensors converge in the Scorpion 2 and are processed by the software to yield figures and graphs. Export in Microsoft Excel is possible, to enable the data to be accepted into other quality assurance programs if necessary.

The SCORPION® 2 Data Logger provides management with real-time data, not only in tunnel ovens but also in cooling spirals or on the conveyor belts of refrigeration lines, which can afterwards be downloaded for analysis. +++



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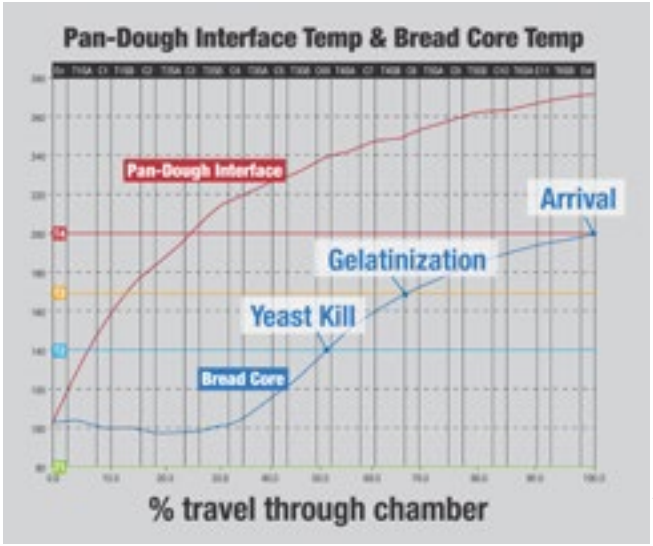
++ Total heat experienced by the product; proportion of convective and radiant heat



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++ Scorpion Software Version 8 automatically calculates the three key S-Curve data points: Yeast Kill, Gelatinization and Arrival

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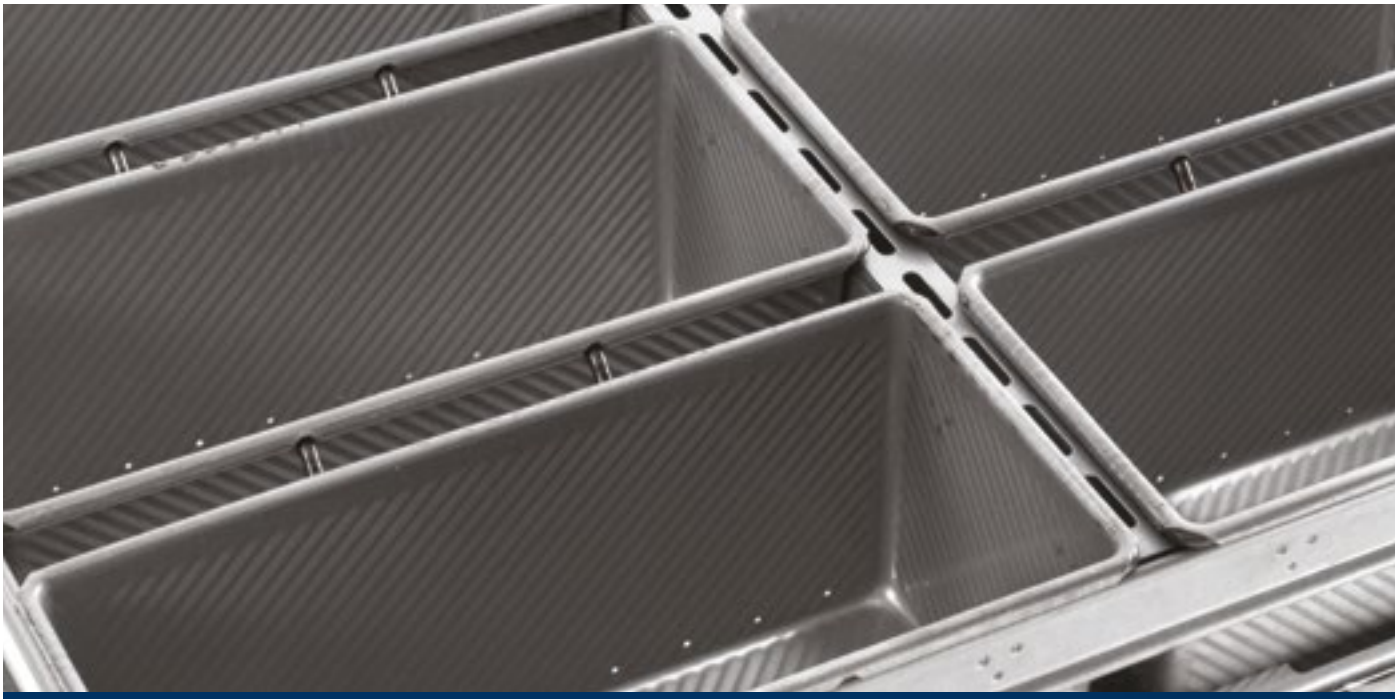
New Food Technologist at the Science & Innovation Center

Reading Bakery Systems (RBS) has announced the appointment of Michael Snarski (Photo) as new Food Technologist, effective immediately. Michael Snarski will be located at the RBS Science & Innovation Center and will support new product development and adaptation of existing products to the continuous mixing and new high-pressure extrusion platforms. Snarski graduated from Penn State University with a degree in Nutritional Science and prior to joining Reading Bakery Systems, he worked at the Lehigh Valley Dairy as a Laboratory Technician.



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