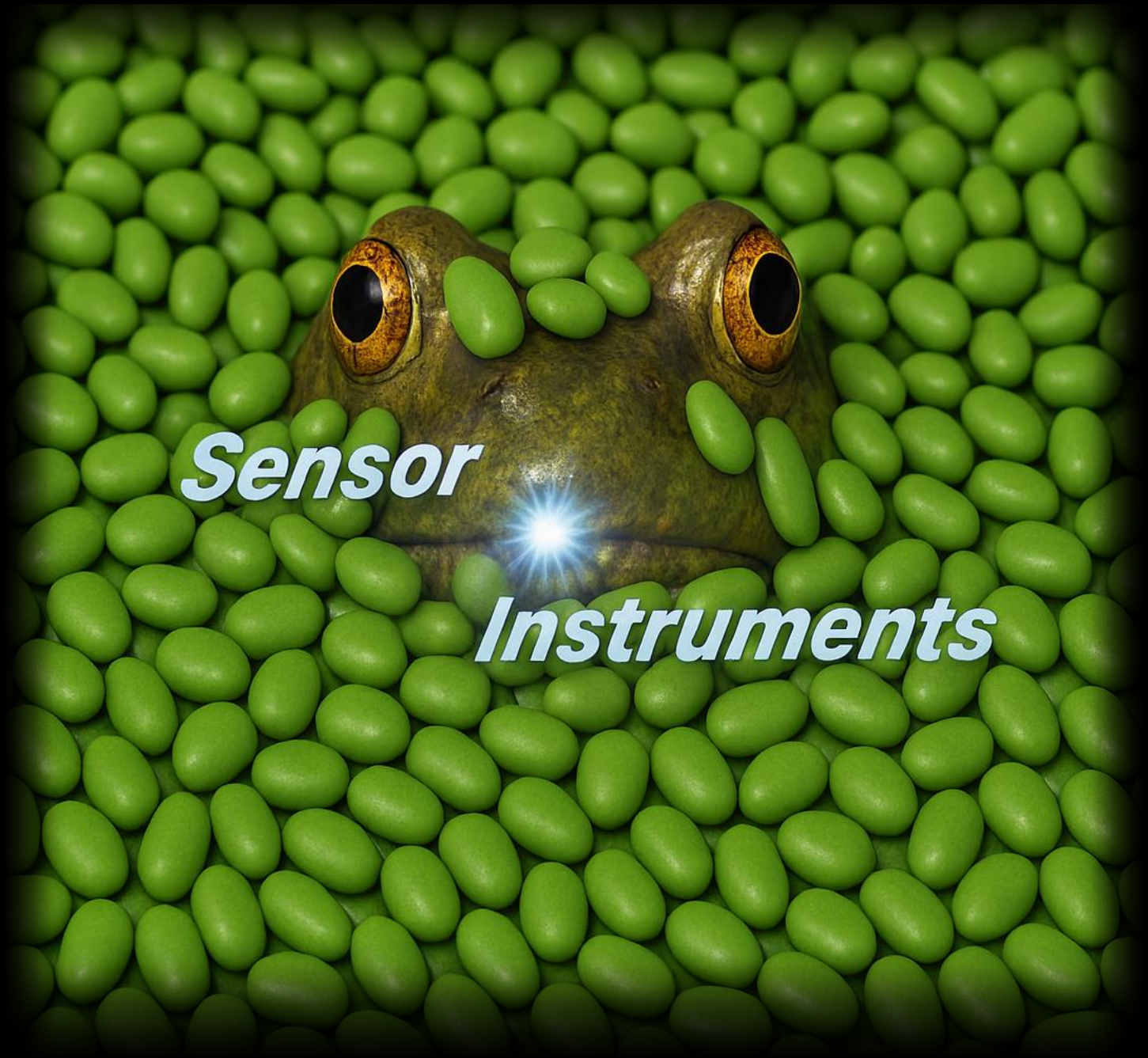
Seeing the Visible Is Basic – Breaking into the Near-Infrared Is Next Level

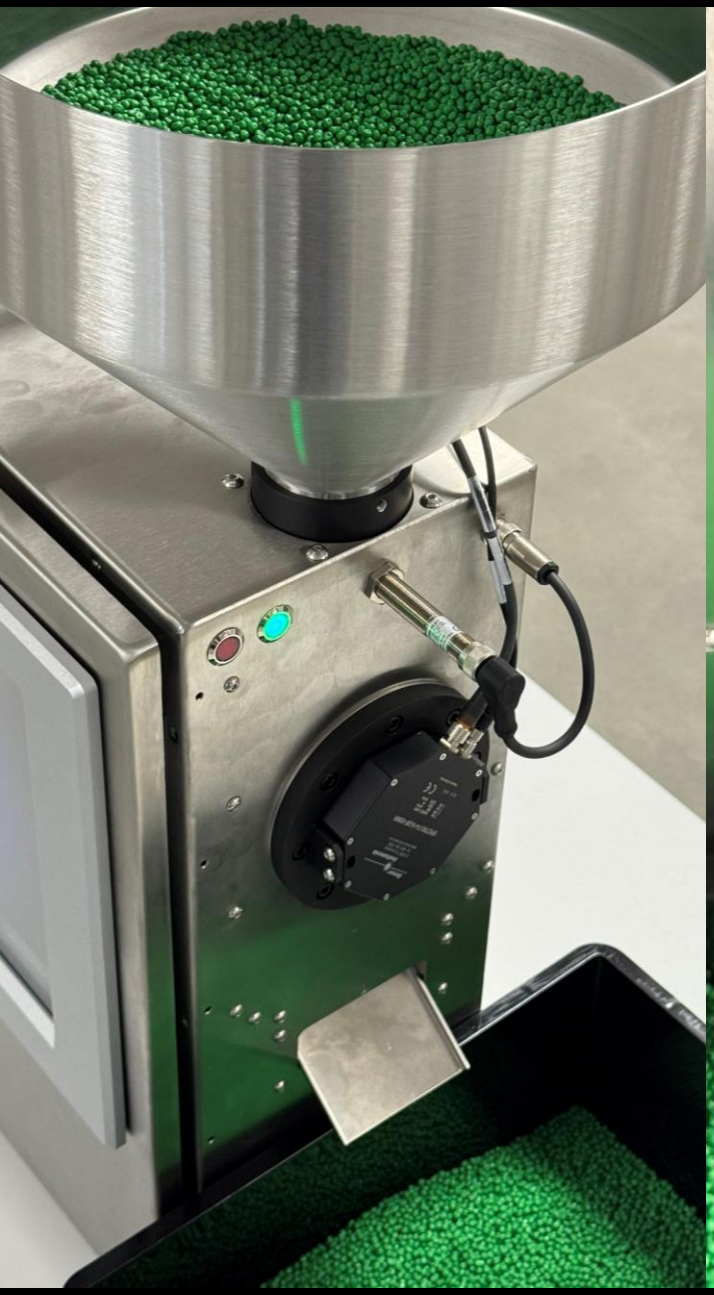
The SPECTRO-T-4 Series

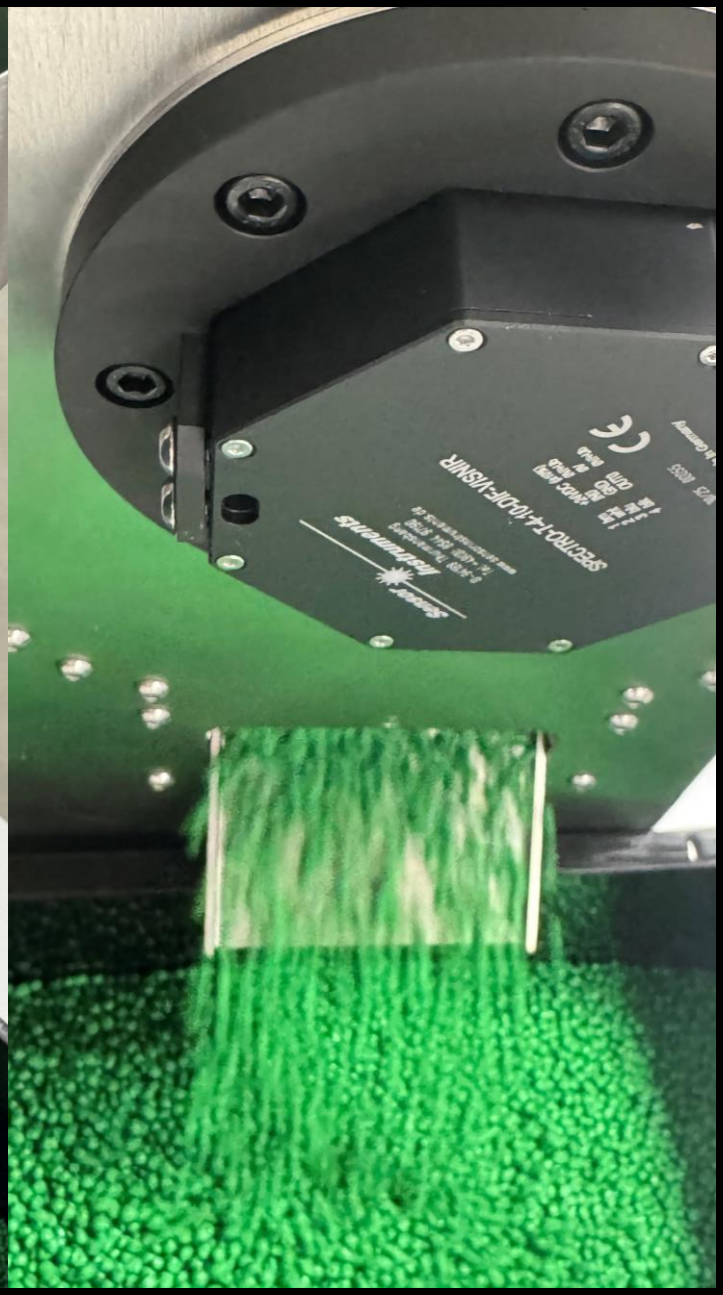


Inspired by nature, we've equipped our color sensor systems with NIR technology – now they don't just see color, they recognize the very identity of plastics.

It’s not just about extending vision from visible to NIR – it’s about taking the same sensor from mobile to lab to inline.

With SPECTRO-T-4-MOBILE you can test pellets right after delivery – even in the big bag. Drop the sensor into the granulate, kick off the measurement on the portable PC, and sweep the head in a figure-eight. You’ll hit dE and dNir values down to 0.3, and thanks to the extra battery in the portable unit, the sensor keeps going for hours.



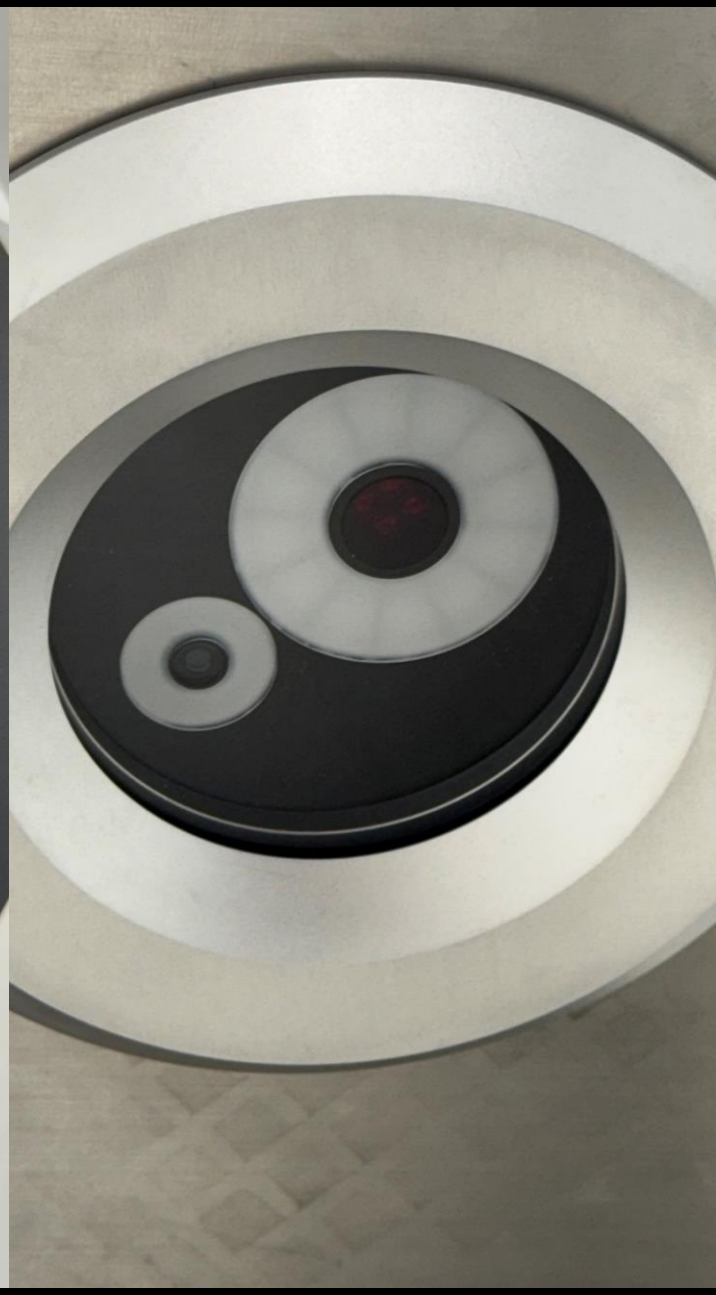


Same sensor in lab, inline, or mobile – results you can truly compare.

Pellets are measured on the fly, always through a sight glass that shields the optics from the stream. A key advantage of measuring pellets in motion is that the random orientation of each pellet in the light spot is effectively averaged out. Over just a few seconds, as the granulate flows from the hopper, this results in a stable mean – achieving a dE value and a dNir value of 0.3.
Just hit the button and let it measure.

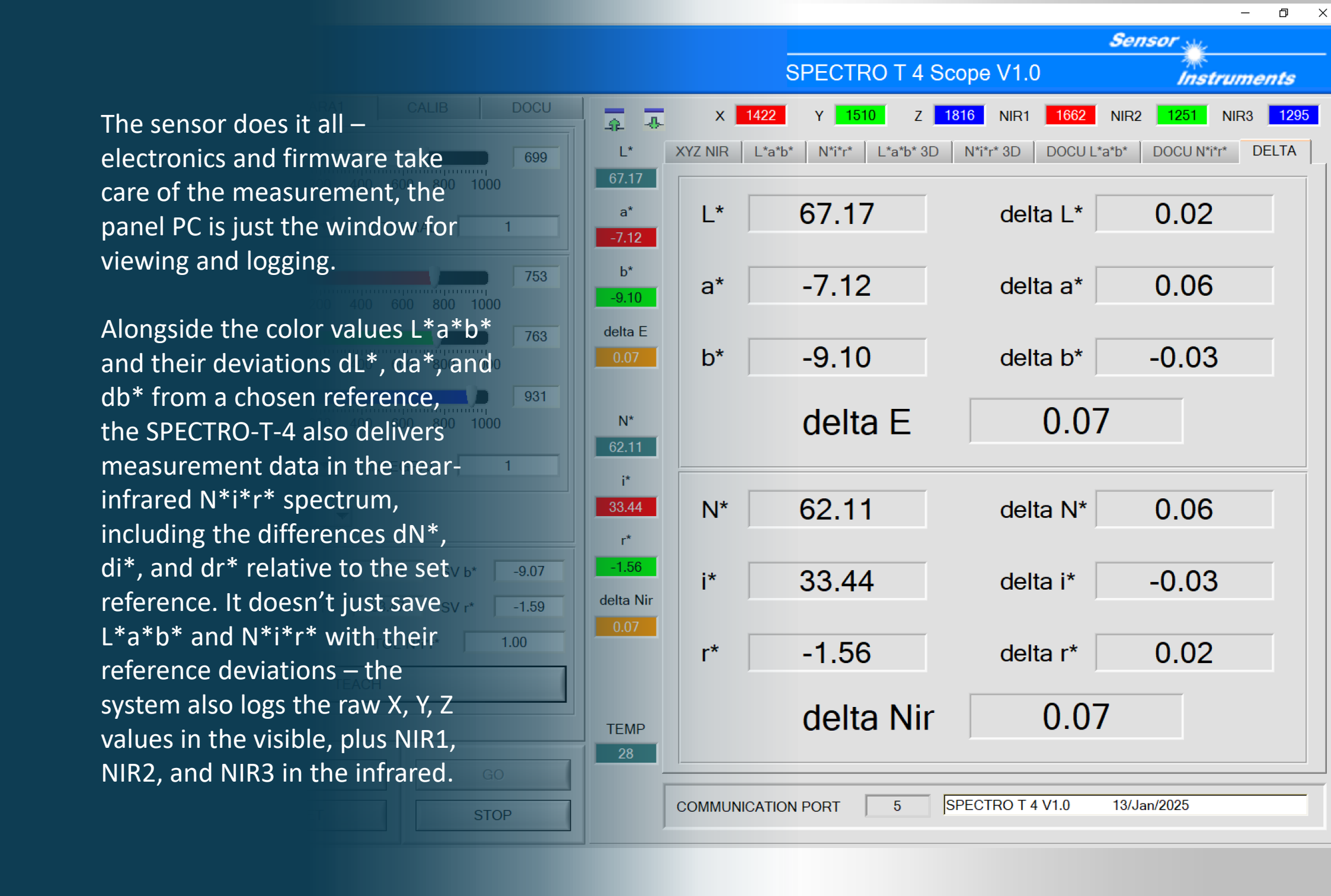
Inline, the SPECTRO-T-4 sensor system can be mounted to a dosing unit via a sight glass.
The measurement data reveals whether the recyclate can be used 1:1 or if virgin material needs to be added to stay within tolerance limits. The sensor data can also be fed directly to the dosing unit to close the control loop.

Pellets just delivered? Whether in the silo, day silo, or bag emptying station, recyclate quality can be checked on the spot – with sensor data sent over Ethernet or fieldbus right to QA.



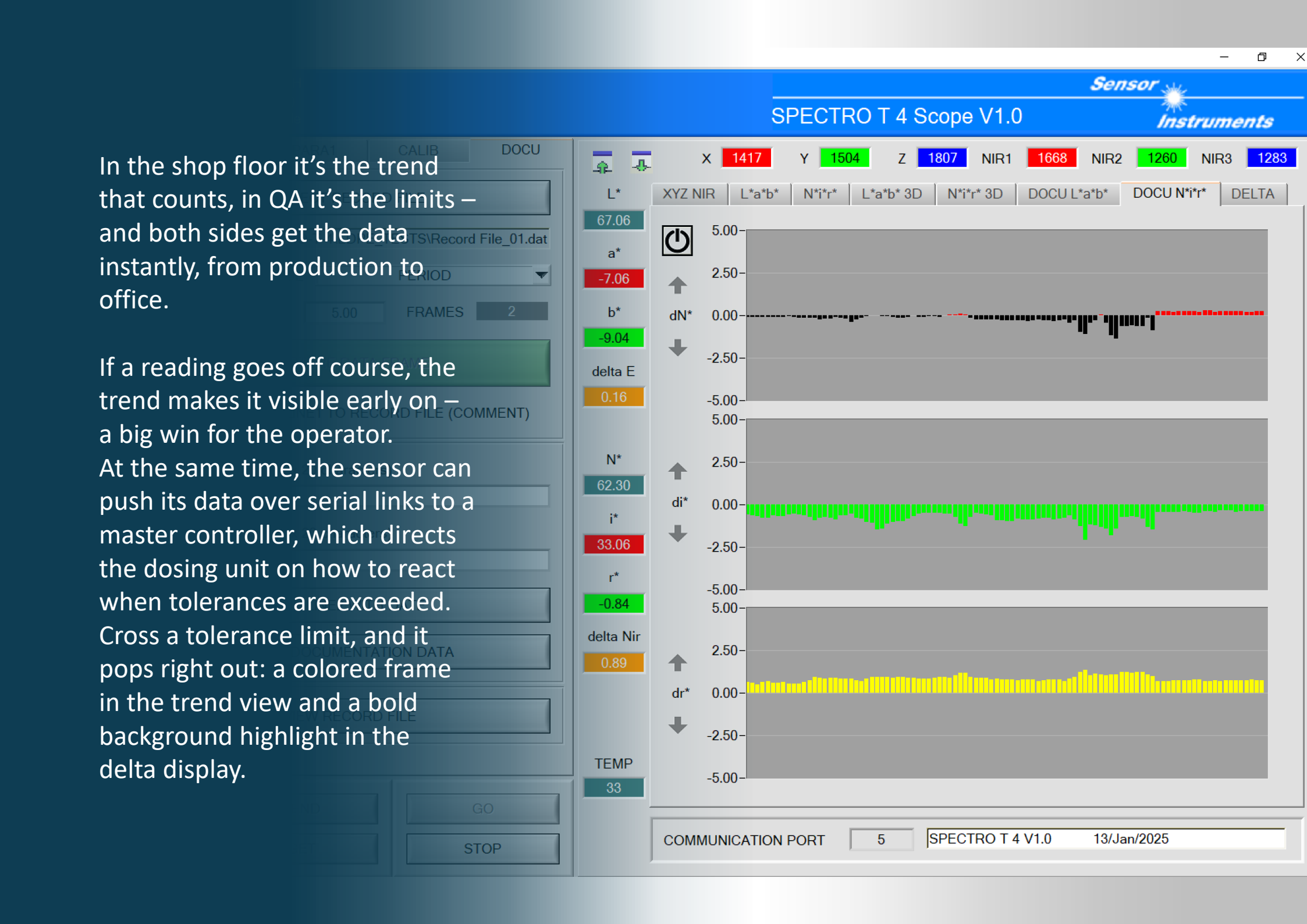
The sensor does it all – electronics and firmware take care of the measurement, the panel PC is just the window for viewing and logging.

Alongside the color values L*a*b* and their deviations dL*, da*, and db* from a chosen reference, the SPECTRO-T-4 also delivers measurement data in the near-infrared N*i*r* spectrum, including the differences dN*, di*, and dr* relative to the set reference. It doesn't just save L*a*b* and N*i*r* with their reference deviations – the system also logs the raw X, Y, Z values in the visible, plus NIR1, NIR2, and NIR3 in the infrared.



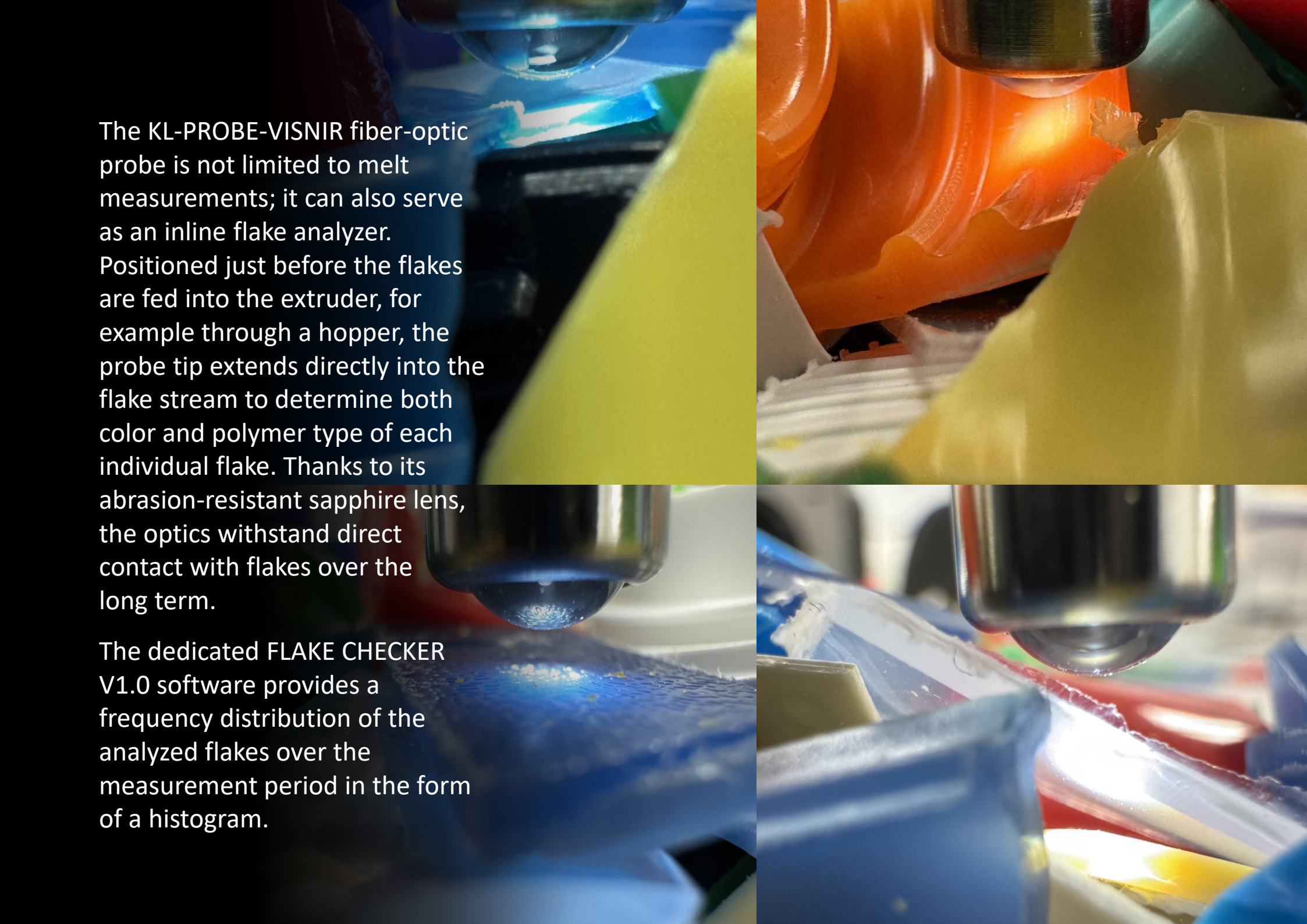
In the shop floor it's the trend that counts, in QA it's the limits – and both sides get the data instantly, from production to office.

If a reading goes off course, the trend makes it visible early on – a big win for the operator.
At the same time, the sensor can push its data over serial links to a master controller, which directs the dosing unit on how to react when tolerances are exceeded.
Cross a tolerance limit, and it pops right out: a colored frame in the trend view and a bold background highlight in the delta display.



Beyond fixed optics, the SPECTRO-T-4 also goes fiber. With the SPECTRO-T-4-FIO, you can measure both color and polymer type straight in the melt. The fiber front end matches standard temp and pressure probes, so it drops easily into an extruder or melt filter.

Light from the NIR LEDs and the white LED is funneled through the fiber connectors to a shared end face, then fired into the melt through a sapphire lens.
On the way back, part of that light is caught again, and sent straight to the color and NIR detector. Extruders and melt filters push up to 200 bar and 400°C – that’s why the fiber probe is sealed tight and packed with fibers built to take the heat.



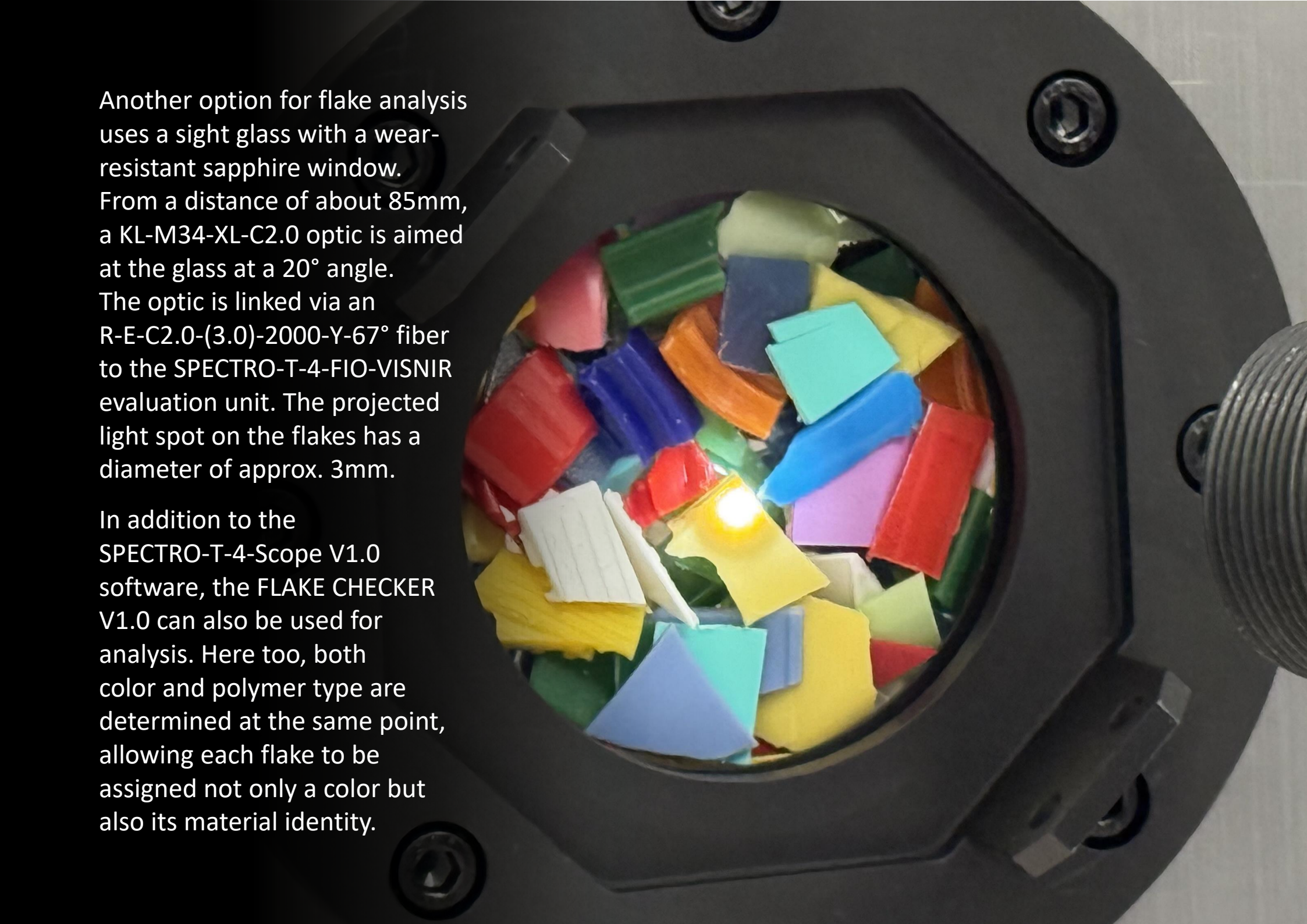
The KL-PROBE-VISNIR fiber-optic probe is not limited to melt measurements; it can also serve as an inline flake analyzer. Positioned just before the flakes are fed into the extruder, for example through a hopper, the probe tip extends directly into the flake stream to determine both color and polymer type of each individual flake. Thanks to its abrasion-resistant sapphire lens, the optics withstand direct contact with flakes over the long term.

The dedicated FLAKE CHECKER V1.0 software provides a frequency distribution of the analyzed flakes over the measurement period in the form of a histogram.

The KL-PROBE-VISNIR

Another option for flake analysis uses a sight glass with a wear-resistant sapphire window. From a distance of about 85mm, a KL-M34-XL-C2.0 optic is aimed at the glass at a 20° angle. The optic is linked via an R-E-C2.0-(3.0)-2000-Y-67° fiber to the SPECTRO-T-4-FIO-VISNIR evaluation unit. The projected light spot on the flakes has a diameter of approx. 3mm.

In addition to the SPECTRO-T-4-Scope V1.0 software, the FLAKE CHECKER V1.0 can also be used for analysis. Here too, both color and polymer type are determined at the same point, allowing each flake to be assigned not only a color but also its material identity.



Clarity about Color and Polymer Type

Color L*a*b* and NIR measurement N*i*r*

Maintain control over the recyclate

Our specialists are happy to tell you more about it

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Let's make sensors more individual