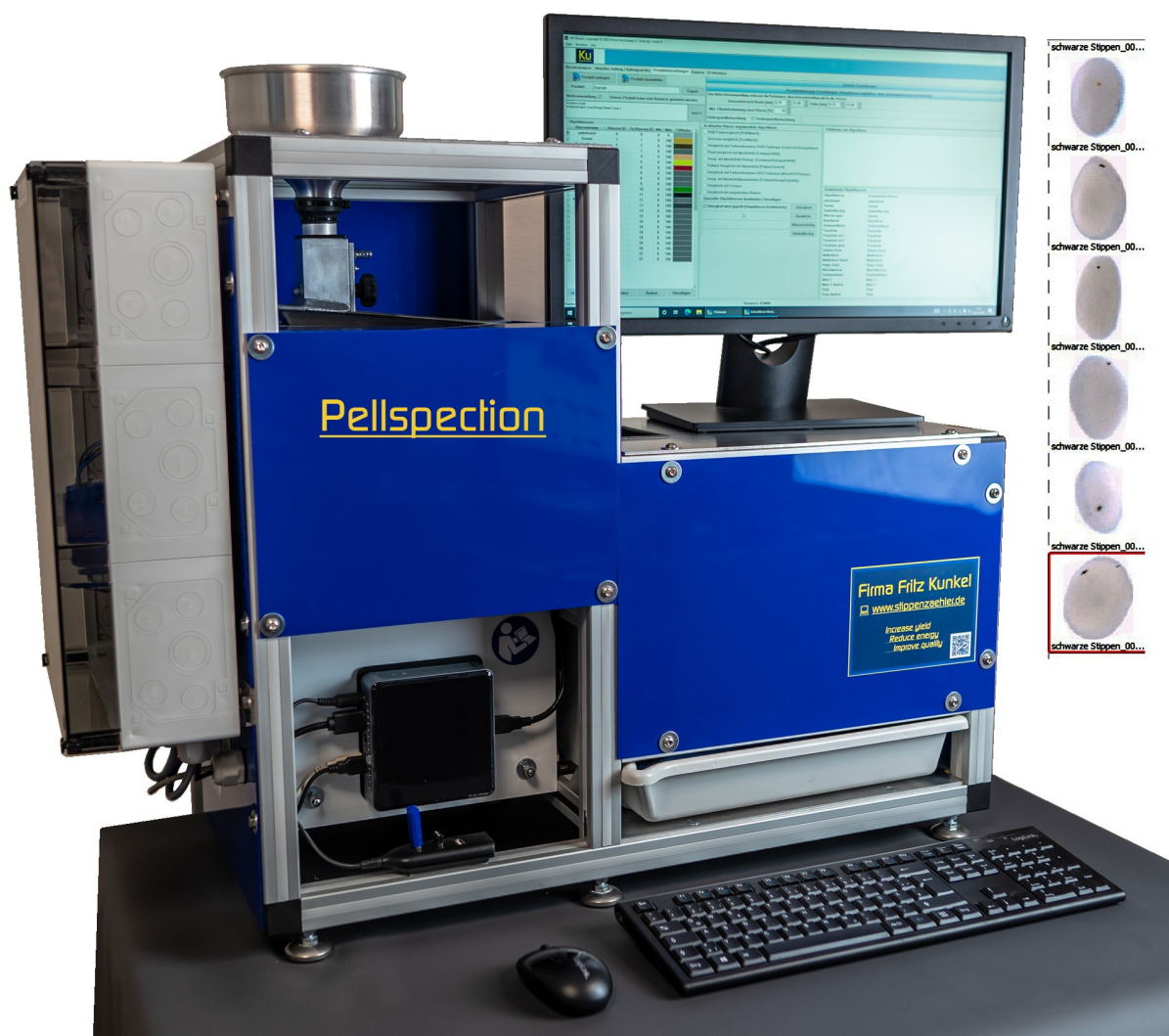


Pellspection

Fully automatic optical inspection for plastic pellets



Pellspection is a fully automatic machine for detecting impurities and discolouration in plastic pellets and granulates. In addition, the colored components of a mixture, e.g. in the case of recyclates, can be determined with great accuracy. The laboratory machine is compact and can be used quickly alongside production for ongoing quality control. With the internal algorithms, which are based on Kunkel's tried-and-tested grain inspection machine, black and brown specks, inclusions, burns and optical foreign bodies can be detected. Pellspection is set up for the customer and the products are preconfigured.

On-site users only need to enter a sample, select the product in the software, and click „Start Order“. Through the continuous measurement in percent, an objective analysis of the quality is issued at any time.



Kunkel
Systems

Pellspection

Plastics – Diverse and individual

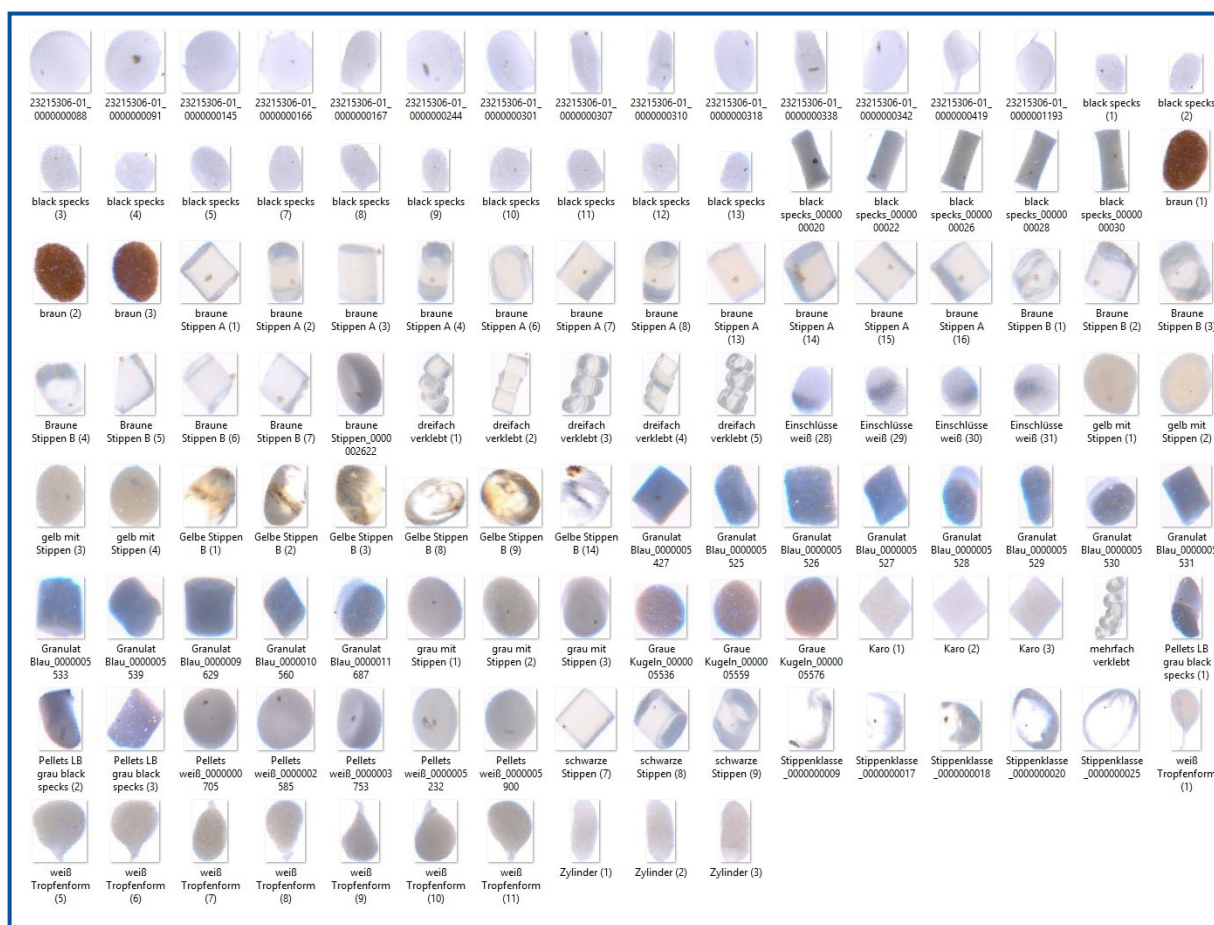


Image: An excerpt from the analyzed product samples

There are countless different kinds and types of plastic. Various problems and reductions in product quality can occur during production. Therefore, you need a measurement system that is able to adapt to a wide range of quality problems and that is available to help you with the analysis.

Manual analyzes of plastic granules are also time-consuming. If the proportion of contaminated goods is in the range of 0.005 percent, for example, at least one kilogram must be examined with tweezers and a magnifying glass until a representative measurement value can be formed. The manufacture of plates and test patterns for optical inspection is also expensive and inefficient over time. The Pellspection System simplifies and automates optical inspection, the sample remains intact and can be reused as needed.

Thanks to our specially developed, flexible classification system and the latest methods of digital image processing, very different parameters can be searched for in one go.

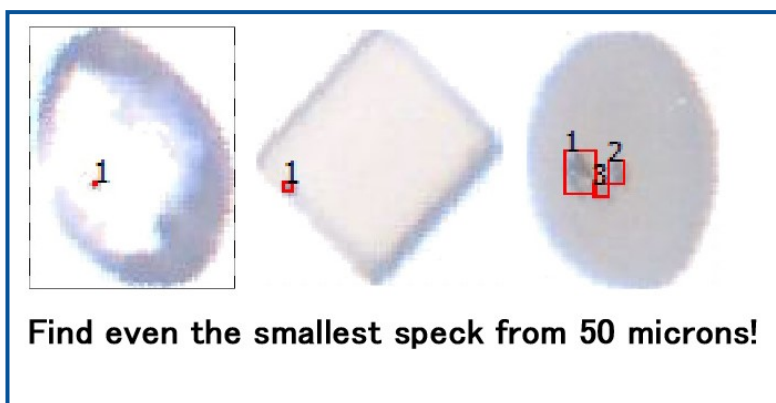
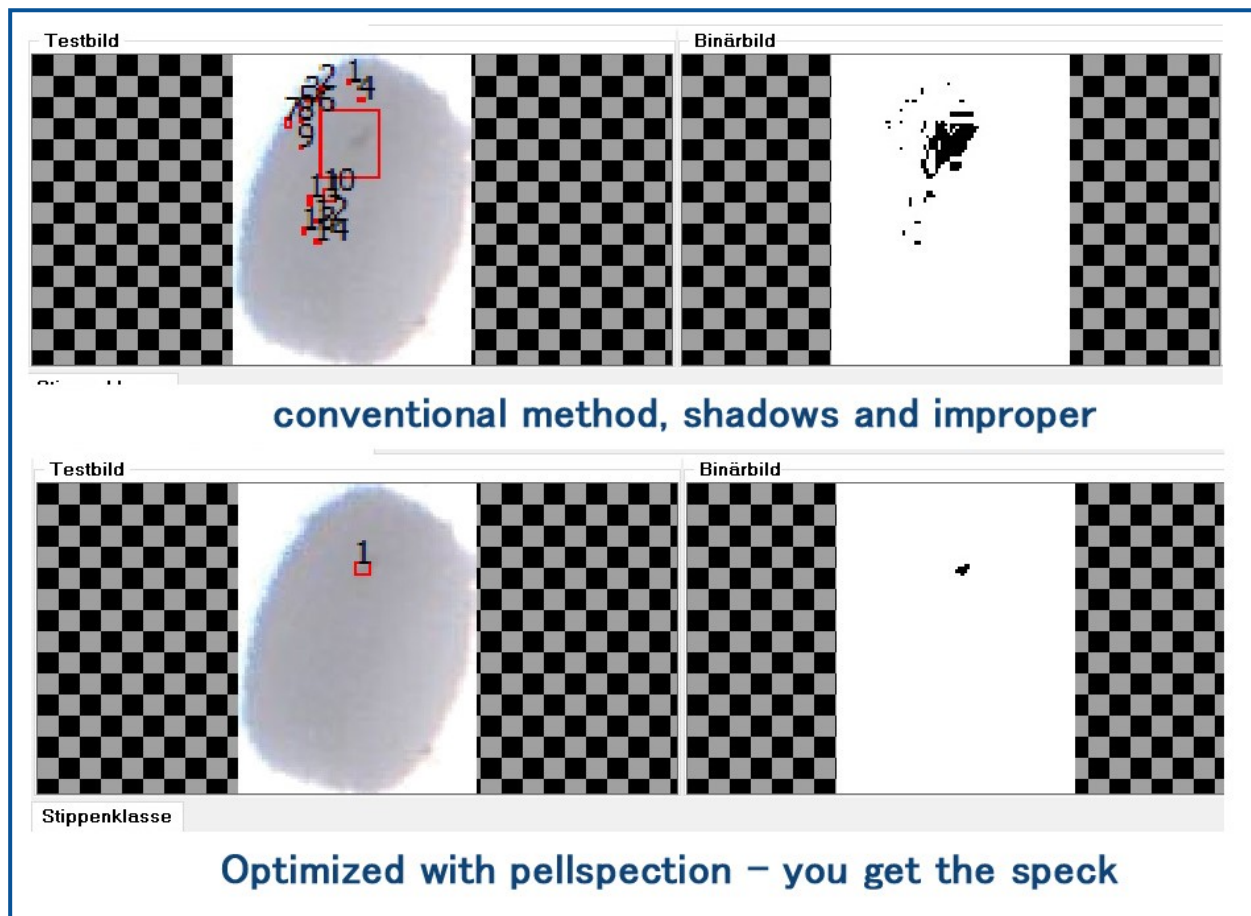


Kunkel
Systems

Pellspection

A new process optimized for black specks

Pellspection was developed by people who care deeply about the quality of the products. Therefore, our experience with specks and the "black specks" detection is the focus. For this we have developed a new procedure that finds the black specks quickly and reliably. This is made possible by many new individual limit, threshold and measured values to optimize the speck search. Even if there are edges or shadows. We look like people: individually and precisely - but the whole thing only takes a few milliseconds.



Specks can be found from a size of 50 microns. As a customer, you receive a perfect, pure end product.



Pellspection

Behalten Sie den Überblick über Ihre Produktqualität

When the job is finished, the system creates a report with all relevant measurement data. Each contaminant is listed individually and sorted by size in a chart. You will also receive the percentage of each individual error class, the exact number of objects and the total contaminant area in mm². Of course, the new value "contaminant contamination mm² on m²" only refers to the area of the actually measured pellets. The order can be printed or exported as a PDF file. You can give your customer a certificate and prove successful quality control. Thanks to the storage option and the collected control images, you can keep a perfect overview of your products in the database.

Job display and contaminant list

OK

Contaminants

Gesamt - Verteilung

ID	Breite [µm]	Höhe [µm]	Area [mm²]
1	350	200	0,07
2	200	150	0,03
3	100	100	0,01
4	150	100	0,015
5	150	200	0,03
6	150	150	0,022
7	100	200	0,02
8	100	100	0,01
9	150	100	0,015
10	100	100	0,01
11	200	200	0,04

Stippenklasse

Prüfbericht Pellspection

Prüfgerät: Pellspection
Version: 1022022

Auftragsnummer: 474
Auftragsname: Pellets Analyse
Startdatum: 18.03.2022
Startzeit: 13:57:03
Endzeit: 14:01:01

Prüflabor	Kundendaten
Name der Firma: Straße: PLZ und Ort: Land: Deutschland Telefon: Email: Homepage: Geprüft von: Julia Böttcher	Firma des Kunden: Testkunde Name des Kunden: Straße: PLZ und Ort: Land: Telefon: Email: Webseite:

Produkteigenschaften	Messeinstellungen
Produktname: 25118867 weiß P.-beschreibung: Research 1-093503 F3 Chargennummer: Untercharge: Batchnummer: Artikelnummer: Objektform: Liefermenge (kg): 0 Verpackung: Anzahl Proben: 0 Produktfarbe: Probengewicht: 0 Probenname:	Rezept: Klassen-Set: Anzahl Scans: 1 Sequenz-Name: HauptklasseProzent: 99,3

Ergebnisse für Kontaminanten

Gezählte Objekte (gesamt): **5311**

Anzahl Kontaminanten: **244**

Kontaminanten-Fläche (mm²): **4,26**

Prüfergebnis alle Klassen:

OK

Größenverteilung meiste Kontaminanten

Stippenklasse

Editor Speichern Drucken Vollbild Autofit Zoom [%] 23



Pellspection

The technical data

Technische Daten

Dimension	Width: approx. 33,46 in Height: approx. 26,97 in Depth: approx. 11,81 in
Weight	approx. 55 lbs, to be transported by two people
Power voltage	230 V
Power consumption	ca. 300W
Analysis duration	ca. 1 minute per 100 gram (3.22 ounce)
Sampling rate	Ca. 100 objects per second (camera+software)
Sampling throughput	ca. 80-90 % of a sample are captured by the camera recording
Sampling type	Real-time assessment, continuous percentage measurement
Measuring parameters	Speck class, size comparison, RGB color comparison, histogram comparison, RGB and HSV color occurrence, pattern match, pixel comparison, roundness
Type of search	Black, brown, colored specks. speck distribution per m ² , size of contaminants, foreign bodies, inclusions, roundness, discolouration, shape
Count of searching classes	Unlimited, freely adjustable according to customer requirements
Software	OKS Pellspection 1.0
PC	NUC 7 Home, ultra-compact PC, pre-installed software
Lightning	COB surface LED, approx. 50 watts
Camera	12bit USB 3.0 industry camera
Monitor	HDMI FullHD resolution 1920x1080 pixel

Company Fritz Kunkel
In den Kappesgaerten 4
67280 Ebertsheim
Germany

Phone (+49) 6359 4090598
Mobil (+49) 176 55133640
Fax (+49) 6359 4090597

fritz.kunkel@kunkel-systems.de
<https://www.kunkel-systems.de>

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