Loepfe

FACTS

OPTICAL YARN CLEARING

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Loepfe

ASSESSMENT OF YARNS AND SURFACES

YARNMASTER®
DIGITAL ONLINE QUALITY CONTROL

Quality assessment of textile surfaces is still mainly a human visual process. This can lead to very different results. This is why an adequate, precise measuring method must be implemented during the first stages of yarn production in order to attain high, constant quality.
Innovative methods have been realized by LOEPFE as pioneer. These are:

- Online classification of yarn faults
- Detection of foreign matters as well as
- online measurement of hairiness and the surface indices SFI and SFI/D.

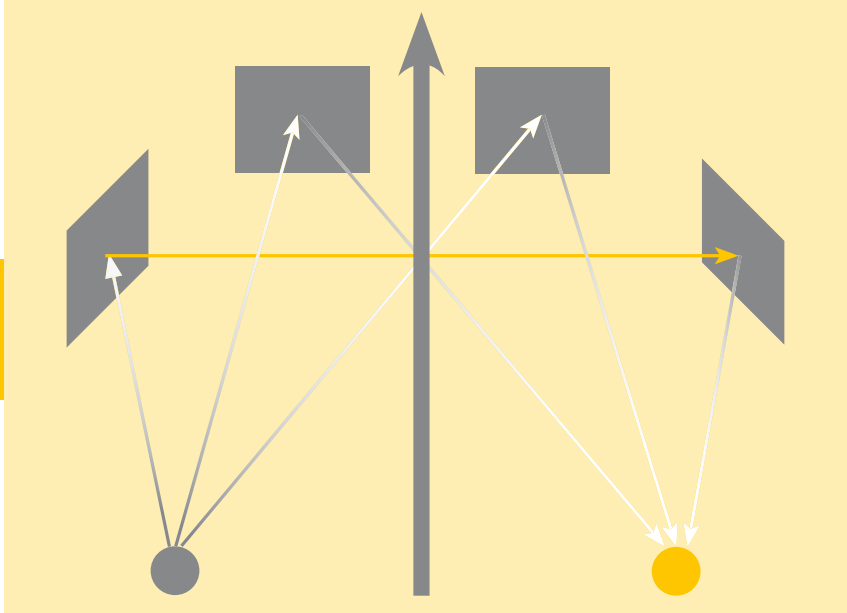
Over 50 years of experience

LOEPFE's yarn clearing and quality assurance systems are based on over 50 years of experience in optoelectronic measurement combined with the usage of the latest digital electronics.

WHY OPTICAL YARN MEASUREMENT?

LOEPFE gives preference to the optical method. This method comes closest to the visual assessment by the user and yarn faults are not determined indirectly through capacitive measurement of the mass.

A further outstanding advantage is that neither moisture, climatic changes nor the material to be checked influence the measurement. For example, a thundershower can increase humidity for a short time and thus influence non-optical measuring methods. Most of the further developments are also based on the optical measuring principle, such as, for example, the detection of foreign matter and hairiness.



Several light beams allow an all-round view

"Despite many high-tech methods, the qualitative assessment of the finished surface is always done with the human eye. Only measuring methods based on the same physical principles lead to the desired result."

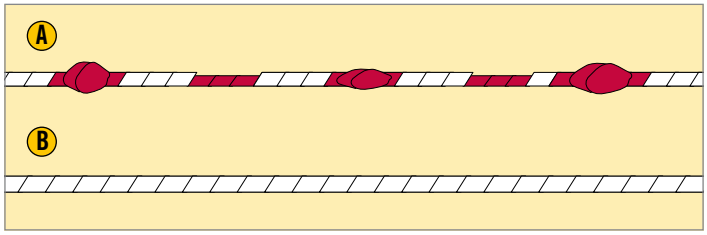
"This is why optical yarn clearing is the proven, best measuring principle, and has been for many decades."

BASIC CLEARING

➜ Thick and thin places / imperfections

Imperfections can have serious effects on the appearance of fabrics or knitted goods as thin places, thick places and neps. An increase in thin and thick places is a serious indication that the raw material or manufacturing process have deteriorated. Larger neps can cause problems especially on knitting machines. (The LOEPFE method using optical measurement detects and removes the faulty or disturbing yarn. Systems measuring the mass can hardly detect the difference.)

Using yarns A and B at the same time *in the textile surface leads to a disturbing difference.*



LOEPFE uses optical measurement to detect and remove the disturbing yarn. *Systems measuring the mass can hardly detect the difference.*

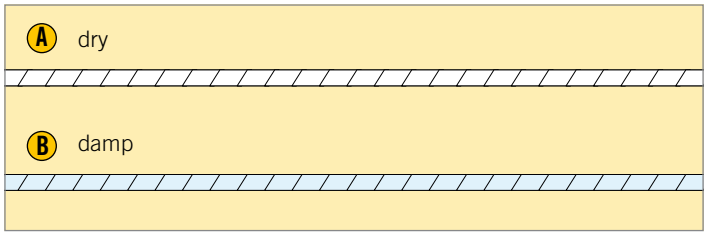
➜ Climatic changes / wet splice

Short-term changes in moisture in yarns do not have a negative effect on optical measuring methods. Humidity can rise to 95% especially in tropical regions, during the rainy season or after thunderstorms. Many spinning mills can only control the room climate by humidifying the air. Dehumidifying the air is not possible with an acceptable effort.

To attain an adequate tensile strength, special yarns produced today, e.g. compact yarns, have wet splices.

Using optoelectronic clearers has proven itself even in such extreme climatic conditions. A capacitive clearer cannot meet these demands.

Using yarns A and B at the same time, *where the yarns had different moisture levels in the yarn test, does not create a disturbing difference in the textile surface.*



The LOEPFE method using optical measurement is not influenced negatively by deviating measured values caused by humidity changes. *Systems measuring the mass identify a supposed yarn difference.*

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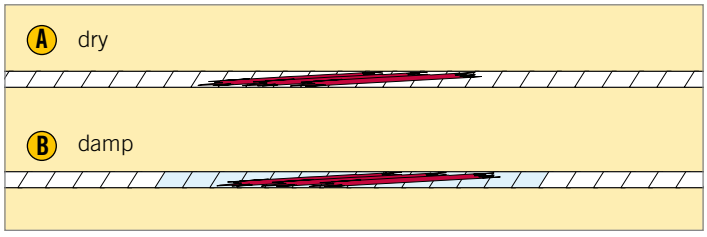

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Hairiness

Higher yarn hairiness is especially visible after dyeing when warp and filling yarns show different absorption capacities for the dye. Surface structures have a very high importance especially for compact yarns. Smallest differences disturb the balanced, clear appearance of the surface.

"Exact detection of hairiness is only possible using the optical measuring principle."

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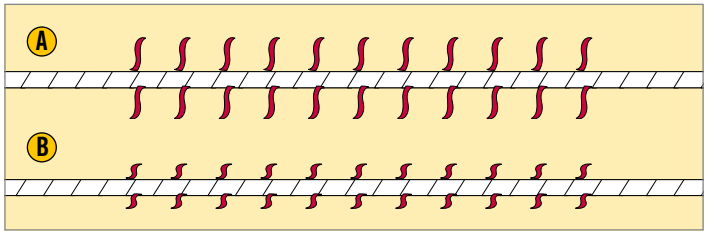

The LOEPFE method using optical measurement detects and removes the faulty or disturbing yarn. *Systems measuring the mass hardly detect the difference because the mass difference is too low.*

Splice

The important assessment criteria for a good splice are:

- Appearance
- Tensile strength and elongation
- Diameter matches the yarn diameter
- Excellent twisting.

A stable splice increases the yarn density as against the normal yarn. This has a negative influence on exact fault detection in the capacitive clearing principle.

"Optical yarn clearing also takes the form of the fault into account which is a basic criteria for good splice classification. Splice classification is based on the criteria visible in the final product."

Bad splices lead to an imperfect final appearance *of the textile surface.*

The LOEPFE method using optical measurement detects and removes disturbing splices reliably. *Systems measuring the mass have problems in detecting good splices.*

➜ Fiber fly

Spun-in fiber fly leads to problems in downstream textile processes, e.g. in the knitting and dyeing mills. An optical clearer detects fiber fly without problems. The capacitive measuring principle is very poor in detecting this problem because the mass growth is minimal in such a case.

➜ Yarn twist

Differences in yarn twist lead to deviations in yarn diameter.

Slipper spindles

Defective ring spindles, soiled spindle drive belts often lead to massive twist faults. Only the optical measuring principle is capable of measuring the twist difference arising from the change in diameter. The capacitive measuring principle cannot detect such problems because the yarn mass remains practically the same with such faults.

Knitting and weaving yarns

Yarns with the same yarn mass are produced with different twists depending on the planned use. Filling and warp twists are differentiated for weaving mills. For example, yarns have much more volume as knitting yarns through relatively few twists.

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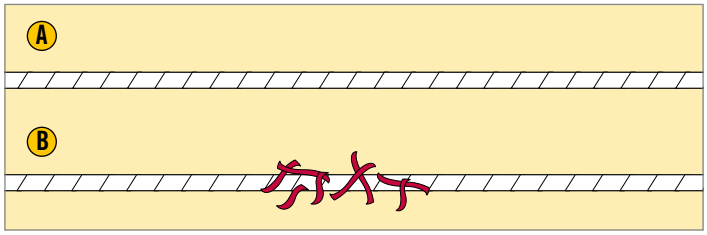

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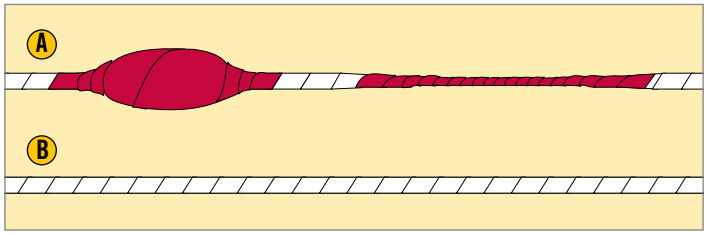

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"The fact is, such twist differences can only be detected using the optical measuring principle. Capacitive measuring fails here."

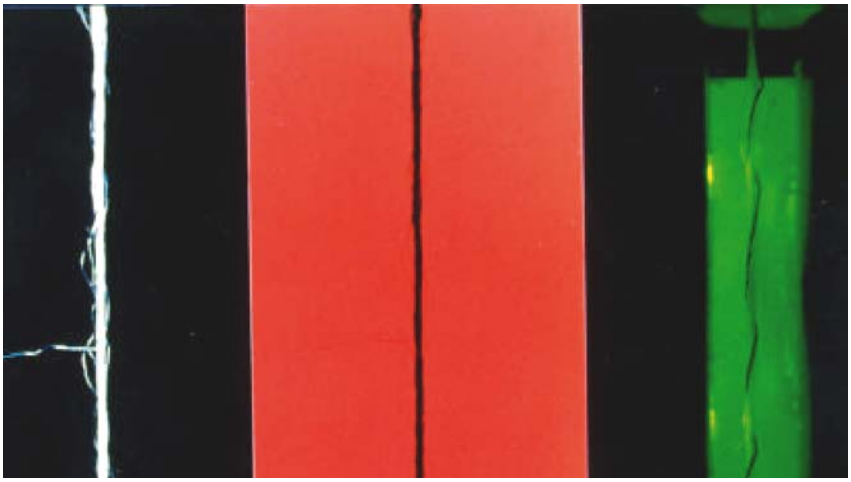
FOREIGN MATTER

Today, clearing foreign matter is a basic criteria for yarn quality.

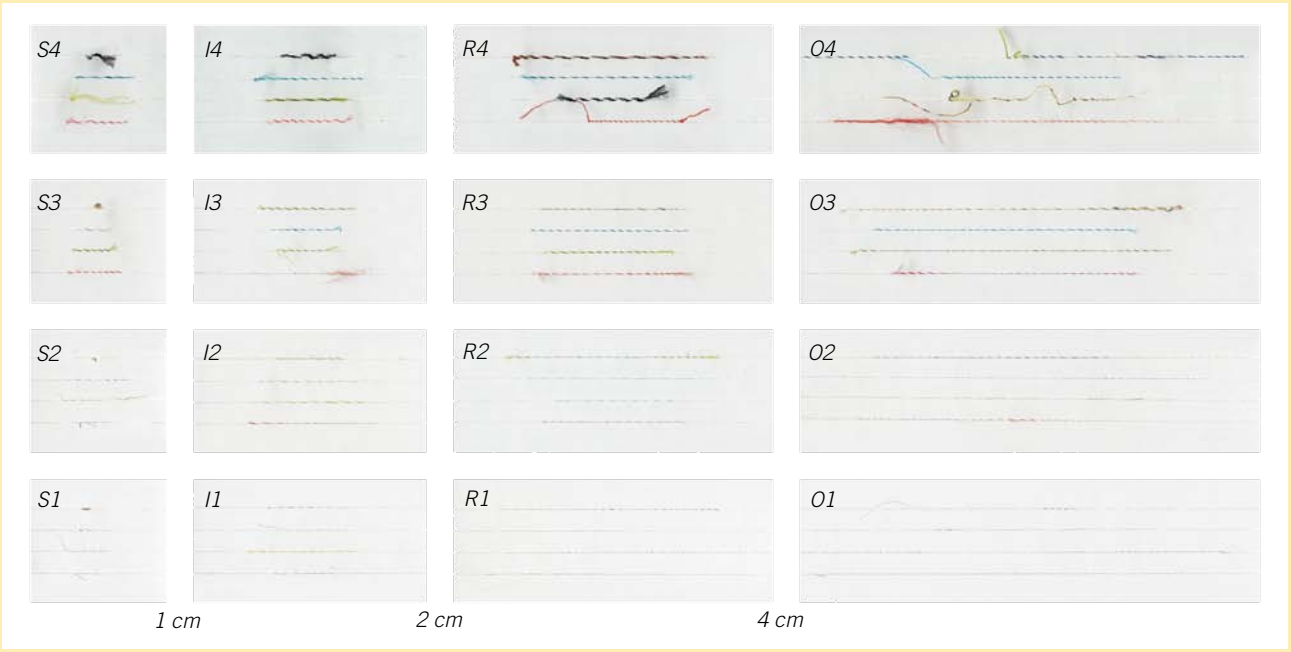
All foreign matters creating a color contrast in the yarn are detected.

The yarn is illuminated sequentially from several sides to detect faults. The signals resulting from reflection and transmission are computed so that yarn diameter differences are compensated and foreign matters made visible.

The foreign matters are then allocated to a class field according to contrast difference and length.



Illuminated yarn in the optical system *Infrared sensor* *YarnMaster® sensor*



LOEPFE foreign matter classification

"Finest contamination through foreign matters can only be detected and cleared reliably using optical clearing."

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