Laser Misting Measuring Unit

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Content:

1. Laser Misting Measuring Unit objectives

The Novomatics **Laser Misting Measuring Unit** allows automated misting evaluation of printing inks at a high degree of accuracy and reproducibility. It operates in combination with AlphaTack Plus or LithoTack II and is so part of Novomatics modular printing ink measuring system.

Due its automatic controlled test conditions the laser-based methodology offers significant advantages over the usual misting testing methods, like visual observation of white papers or vacuum cleaning filters. It is an objective, quantitative method and so independent of the operator.

Features:

- quantifies flying ink droplets in real-time
- integration into standard tack tests of AlphaTack Plus or LithoTack II
- misting results are printed in same report like tack results
- operator independent, fully automated measuring system
- stable measurements over the lifetime of the instrument
- accurate, reliable and easy to operate
- cost savings because of no extra operator time and accurate measurements
- usually no cleaning needed, but if so, done within a few seconds
- space saving, compact design
- easy installation by “plug and play”
- ideal for QC and R&D
- ideal for use outside of the laboratory

2. Importance of ink misting measurement for the printing ink industry

2.1. What is ink misting?

Ink misting is the sum of flying ink droplets ejected on nip outlets of rotating press rollers. It is a direct effect of the ink film splitting process happening on roller nip outlets.

An ink film splits under creation of filaments on roller nip outlet. When these filaments split on more than one-point free ink volumes form free droplets. These release the rotating rollers as spray or mist. Longer inks create longer filaments and have so a higher tendency to mist than shorter inks. So the ink misting is directly affected by rheological and adhesive ink properties and the internal cohesion of the ink itself.

Of course ink misting is an undesired property of the printing ink. Ink misting leads to higher air pollution, higher cleaning effort and higher ink consumption. In other words ink misting hazards the health of workers and creates unnecessary operational costs. **Ink misting has to be minimized.**

Ink misting increases with higher press speeds. Nowadays speeds of 10 m/s – 15 m/s are standard which is leading to higher challenges to the ink manufactures to optimize their products for minimized misting, too.

2.2. What are the current methods of ink misting determination?

Misting indications are possible in laboratory already. Until now there are two main methods in combination with fast rotating rollers of tack measuring instruments.

Mainly a blank page of paper is placed near to the nip outlet. After the run with ink under test the page is evaluated for contamination by the operator. This subjective method leads to higher variations by different operators, may be up from ambient light and takes time.

A further method is a vacuum cleaner arrangement which entry is placed close to the nip outlets. At the end of test the operator evaluates the vacuum cleaning filter for ink contamination. This has similar disadvantages like the method described before. Certain variations by different operators, ambient light dependencies and extra time for preparation and cleaning of the vacuum cleaner arrangement.

Summarized the previous methods are time consuming because of subjective factor, low accurate and do not enable the integration into an automated ink measuring system.

2.3. Operation principle of Laser Misting Measuring Unit

The new Novomatics Laser Misting Measuring Unit overcomes the principal problems of the current subjective methods.

A laser beam is placed close to roller nip. Ink droplets which are passing that beam reflect its light. A photocell array nearby receives that reflected light.

The Laser Misting Measuring Unit is able to quantify the droplets concerning their number and size. All necessary calculations are performed in real-time resulting in a misting representing parameter. This parameter is recorded and reported like other ink related parameter.

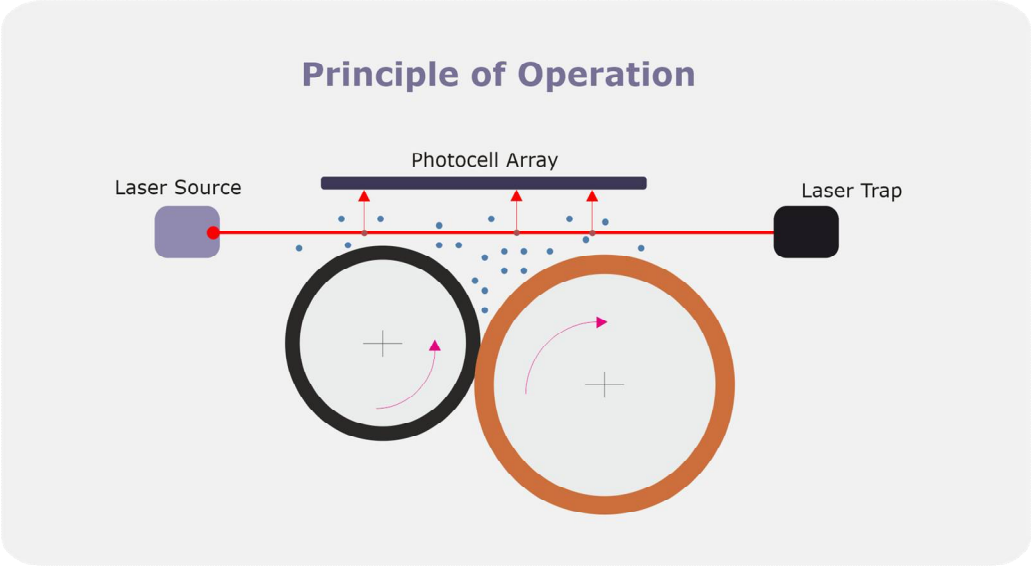

Figure 1 Principle of Operation

The laser beam is modulated by a unique signature. That's why only the light that contains that signature is considered by the light receiver. The light of other sources in ambient is actively cancelled.

For operators' safety the laser power is very low. Further it is stopped into a laser trap and so it is impossible to be exposed to.

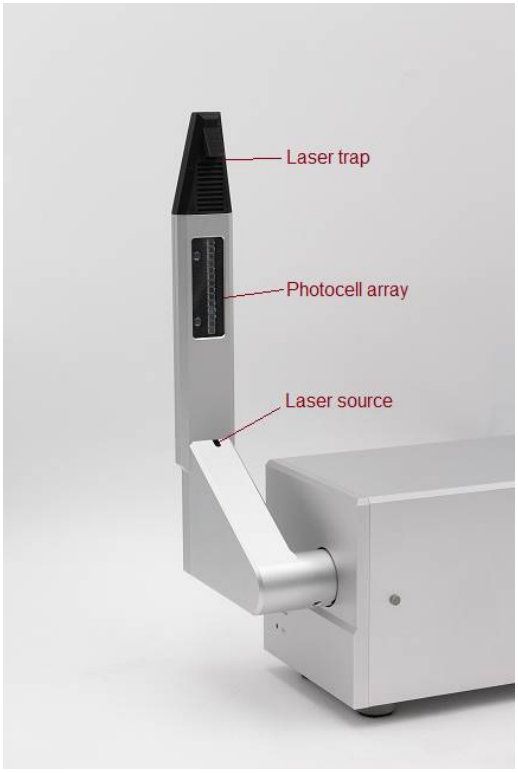

Figure 2 Design of measuring lever

Figure 3 Measuring lever in horizontal position applied to AlphaTack

2.4. Report examples for misting

There are different misting examples shown below using the MistingReport.T2D as report template.

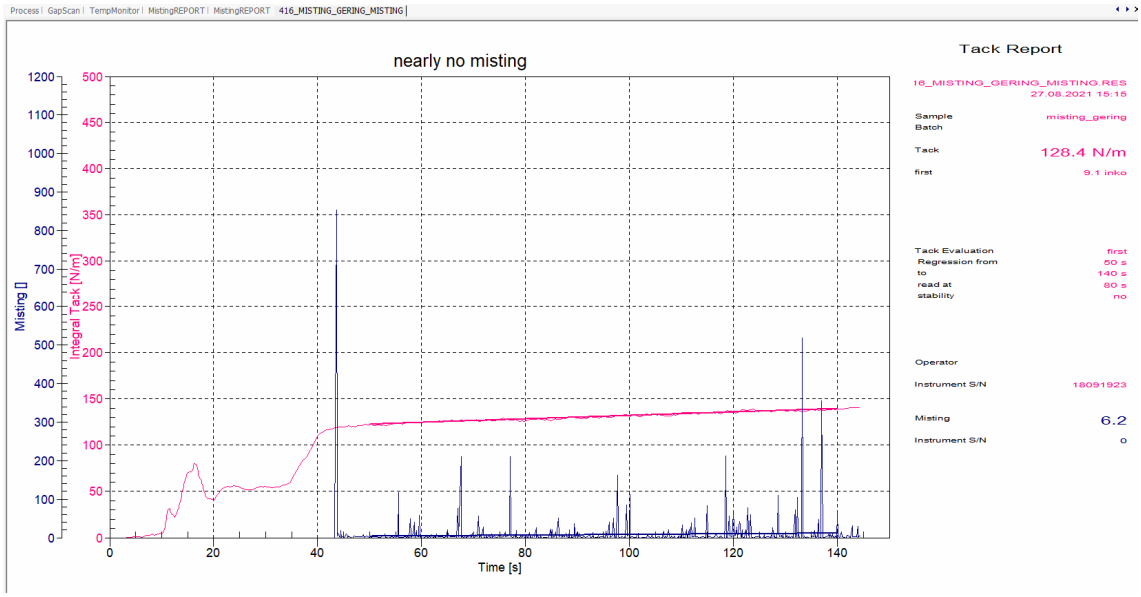

Figure 11 low misting example

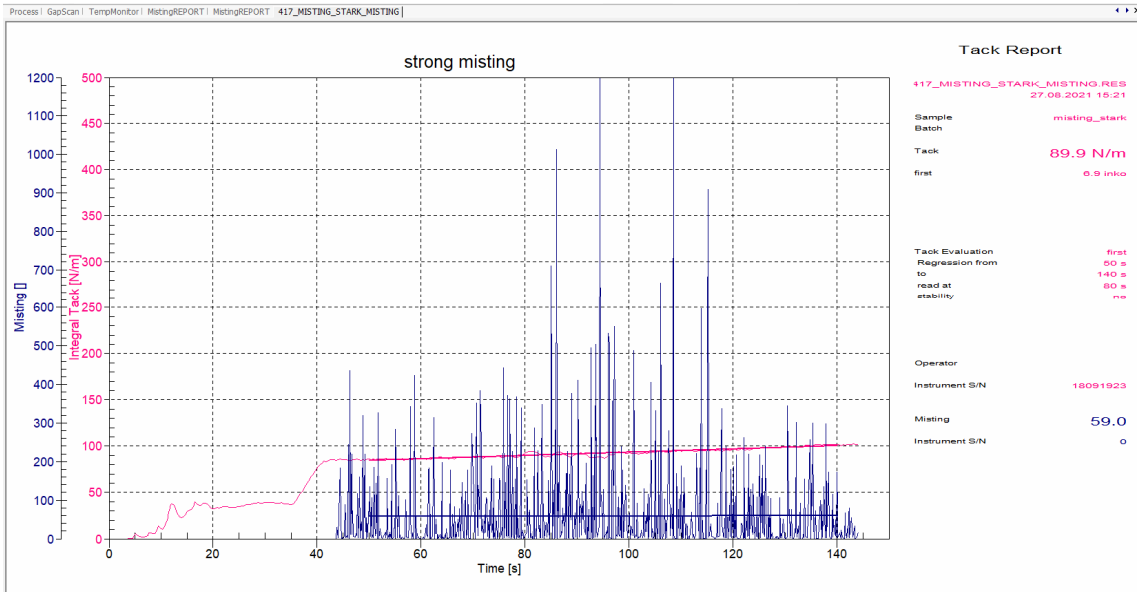

Figure 12 significant misting example

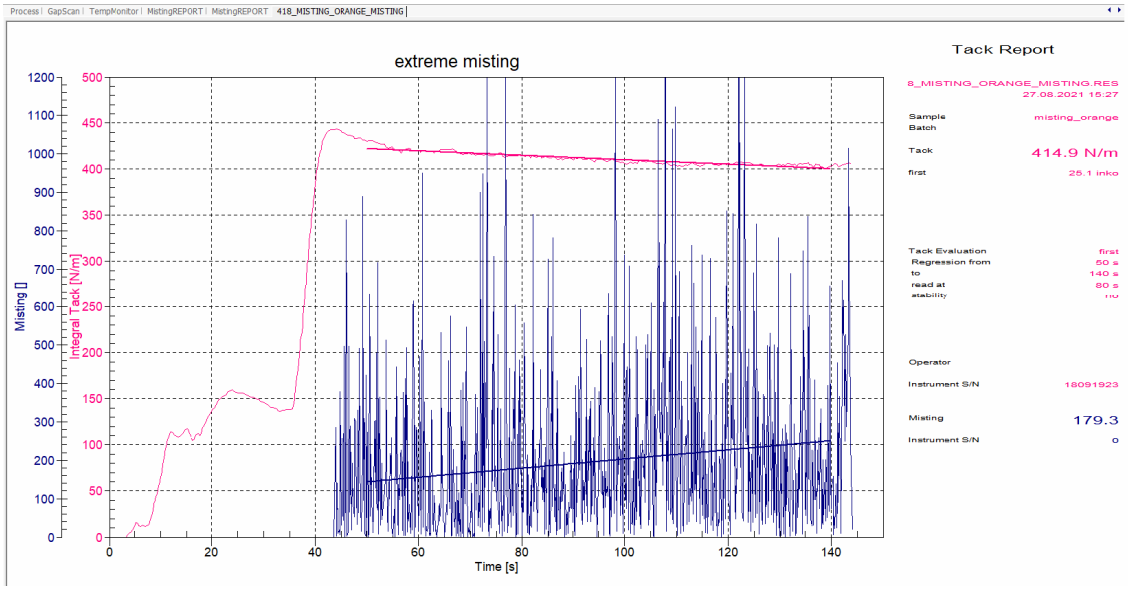

Figure 13 extreme misting example

3. Technical specification

Conception

Laser based misting measuring unit. Robust metal case consisting of anodized aluminum and glass components. Sensitive measurement devices are completely encapsulated. Full automated measurement control by WinAlphaTack PC-software via USB interface.

Misting Measurement

- by means of modulated laser beam
- high-sensitive photo cell detection unit, locked to laser beam modulation
- dynamic ambient light noise cancellation
- online determination of ink misting as function of speed, line force or water content
- processes simultaneously to standard operation as tack measurement
- software extension for online determination of misting and data evaluation
- operable in combination with AlphaTack Plus or LithoTack II

Power supply	
Operation voltage	100 - 250 V, 50 – 60 Hz
Power consumption	25 VA
Laser	
Power	1 mW (eye save)
Wave length	650 nm
Dimensions, weight	
L x W x H	36 x 13 x 35 ccm (Measuring lever in horizontal position)
Weight	5 kgs
Computer	
Interface to PC	USB 2.0
Operating System	Windows 10
Software	WinAlphaTACK V 3.00 (provided with the measuring system)

4. Contacting Novomatics

Please don't hesitate to contact your local distributor or Novomatics for any further information.

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