

THE customised solution

## EMG SOLID<sup>®</sup>

# Oil layer measurement



EMG SOLID®

# Visualisation over entire length and width

**EMG SOLID® is our system that is used for the online measurement of oil layers on running strip material.**

The typical application spectrum of EMG SOLID® ranges from the rolling mill, where the initial application of oil is implemented, to metal processors, for whom sufficient lubrication in the forming process and an oil-free sur-

face before coatings or paintings are applied, are essential.

EMG SOLID® performs an online measurement within the production line to determine the oil layer over the entire width and length and then visualises it over the entire measured surface. Thereby it reliably detects dry spots and over-oiling.

To keep the optics clean all EMG SOLID® solutions have a special EMG blow-off device.



*EMG SOLID®IR in operation*

# Secure production release

## Application fields

By using EMG SOLID® you can optimise your pressing and coating processes by assigning the quality features to the corresponding strip sections and/or sheet panels.

Typical fields of application are for example:

- » Rolling mills
- » Galvanising and strip processing lines
- » Slitting and cut-to-length (CTL) lines
- » Inspection lines
- » Press lines
- » Blanking lines
- » Solar panel mounting lines (surface purity measurement)
- » Electrical strip production

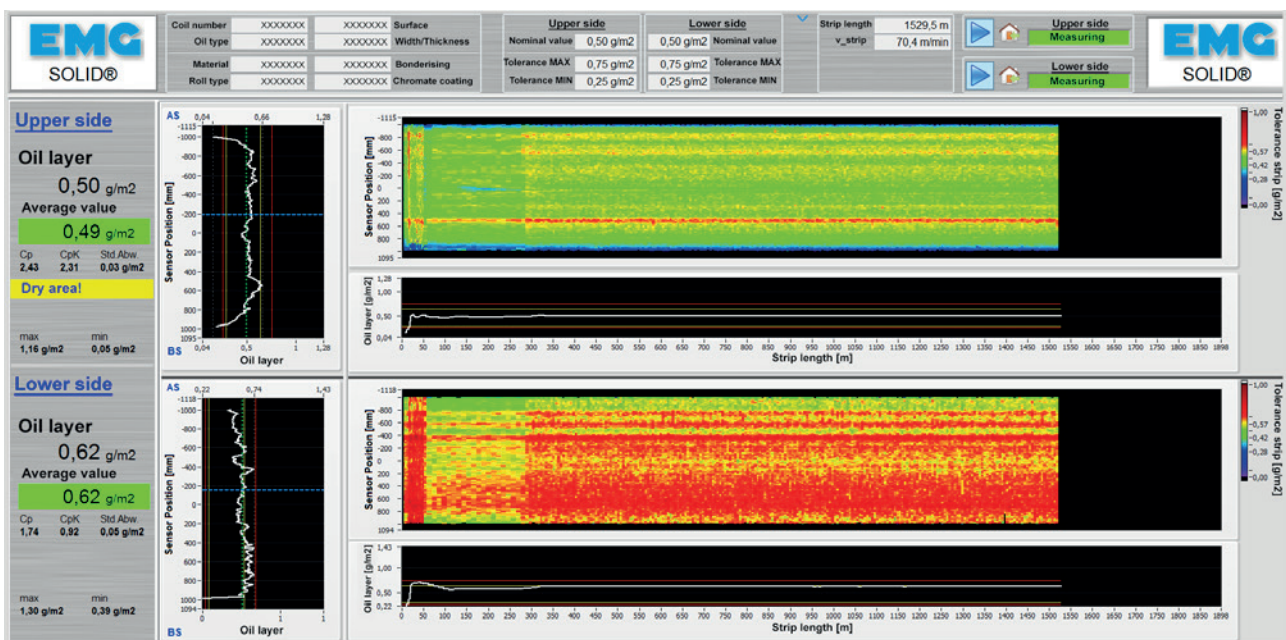
## Materials

All metal and non-metal surfaces, e.g.:

- » steel – cold-rolled strip, hot-dip galvanised, electro galvanised, phosphated, aluminised, ZnMg surfaces, galvanized, electrical strip
- » aluminum – uncoated, pre-treated

## Advantages for your processes

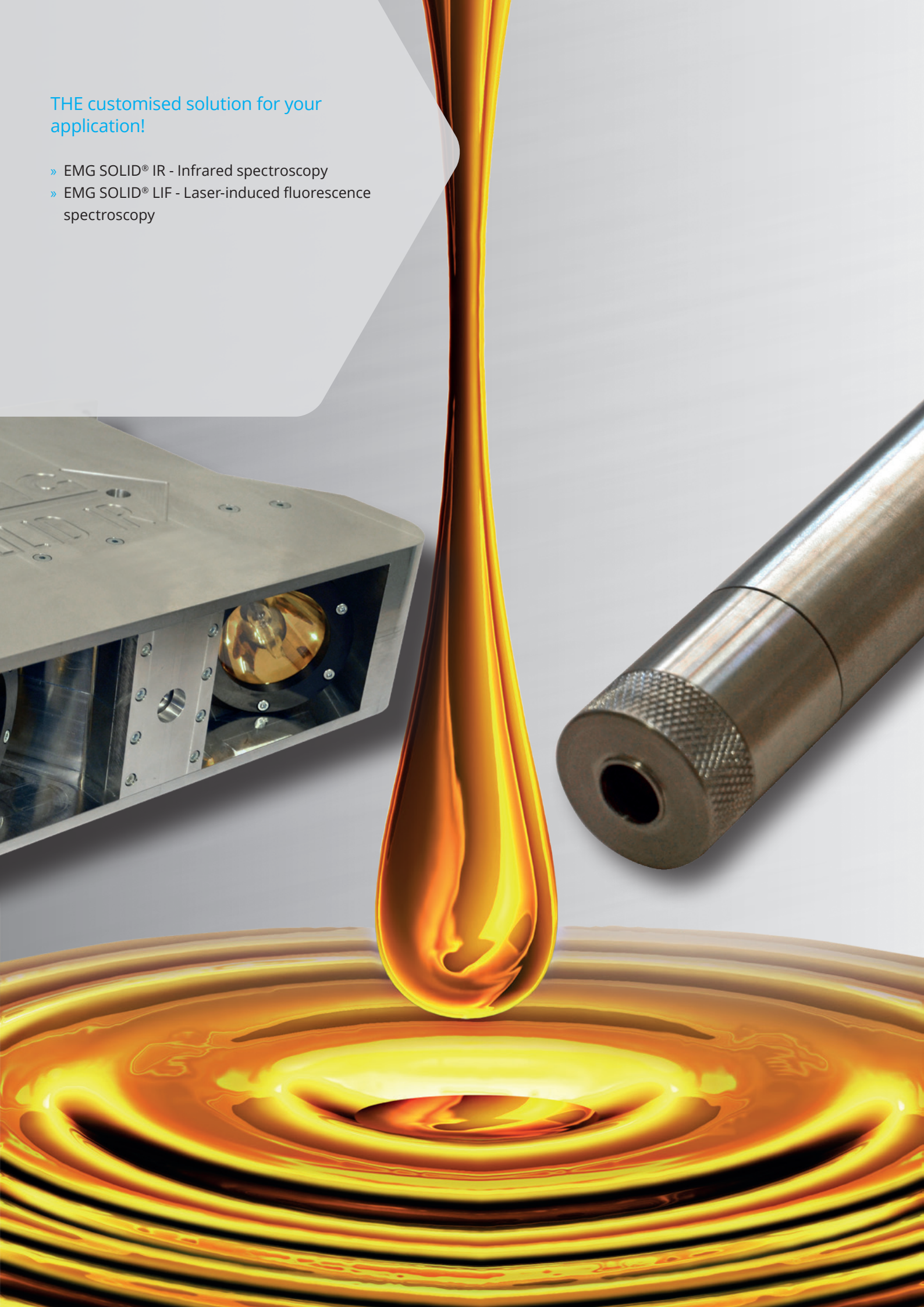
- » Improved process stability and reliability
- » Transparency of input quality and targeted control of the forming process
- » Minimised scrap
- » Secure production confirmation
- » Transparency of the essential quality features
- » Joint database and combined visualisation of the measured values possible
- » Delivery and system integration from a single source
- » Intelligent combination of more quality assurance systems from EMG, electro mechanical and in respect to the software environment:
  - » EMG IMPOC for online measurement of material characteristics
  - » EMG SORM 3plus for online roughness measurement
  - » EMG iTiM for thickness measurement
  - » additional systems, e.g. laser marking can be integrated



Example of the visualisation of a double sided measurement at a continuously running strip.

THE customised solution for your application!

- » EMG SOLID® IR - Infrared spectroscopy
- » EMG SOLID® LIF - Laser-induced fluorescence spectroscopy



# InfraRed spectroscopy

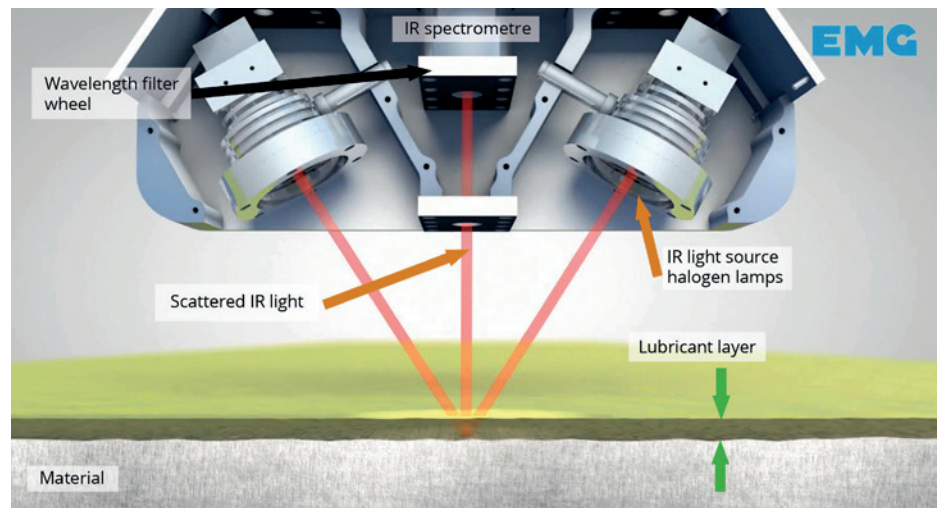
## Functional principle

Our solution EMG SOLID® IR is based on the infrared spectroscopy. The system emits an infrared light that passes through the oil layer, is reflected from the strip surface and passes through the oil layer again.

In doing so the intensity of specific wavelengths of the oil layer is attenuated - the thicker the oil layer, the less light is reflected. According to the Lambert-Beer law, the layer thickness is then calculated.

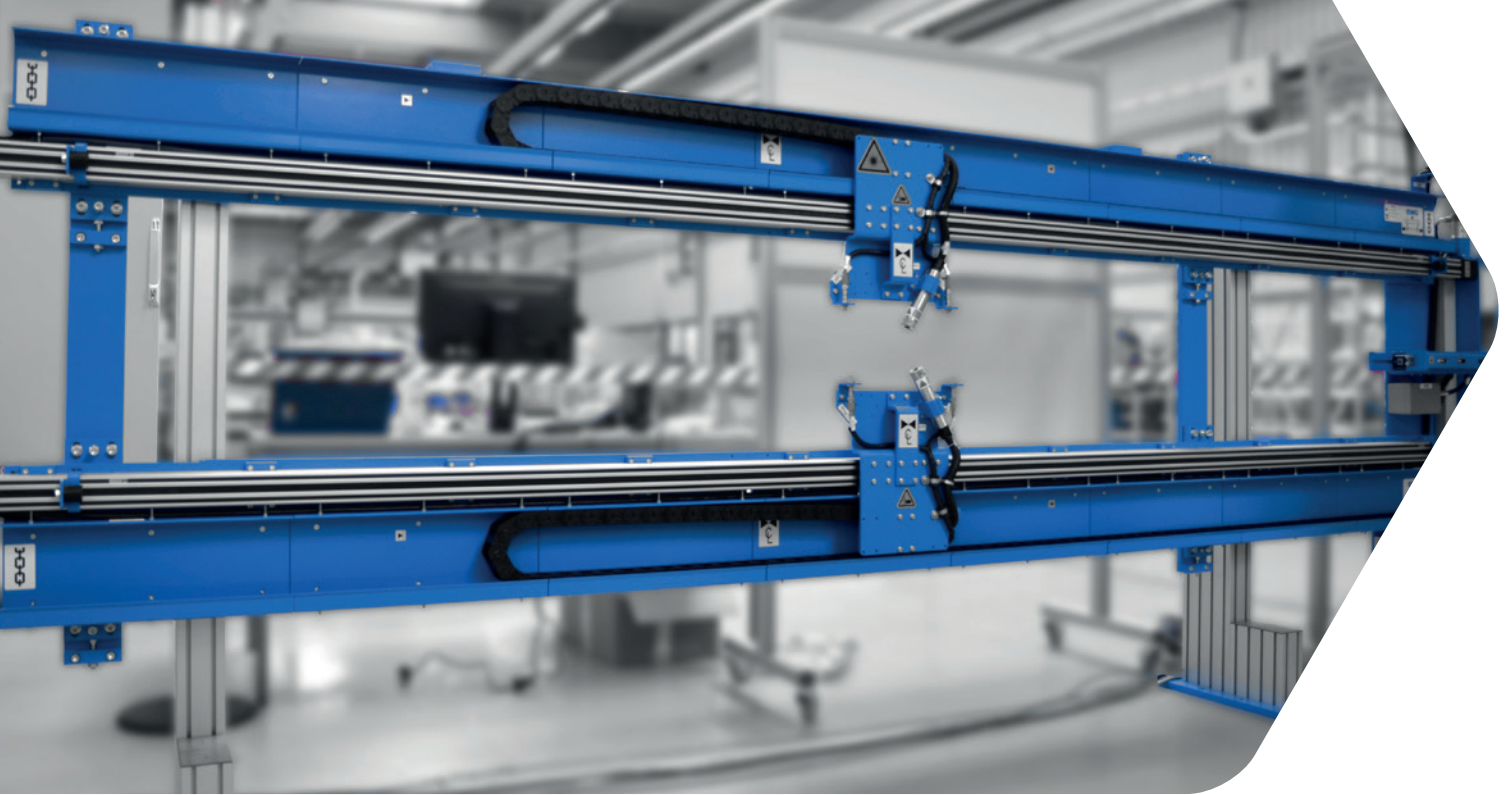
## Your advantages

- » Unaffected by oil mixtures
- » Easy calibration of new oil types and clear oil type classification due to group calibrations
- » High repetition accuracy (min. 0.0015 g/m<sup>2</sup>)
- » Absolute and relative measurements possible
- » No falsification through unevenly applied passivation coatings
- » Special EMG solution for keeping the lens clean
- » Automatic system check via integrated reference measurement
- » High measuring accuracy
- » Worldwide proven technology



## Technical data

Measuring method	infrared spectroscopic
Measured variable	area weight of lubricant layer in g/m <sup>2</sup>
Measuring range	0.1 – 6 g/m <sup>2</sup>
Measuring accuracy	measuring range 0.1 - 0.5 g/m <sup>2</sup> : +/- 0.1 g/m <sup>2</sup> measuring range 0.5 - 2 g/m <sup>2</sup> : +/- 0.2 g/m <sup>2</sup> measuring range > 2 g/m <sup>2</sup> : +/- 10 % from measured value
Repetition accuracy	> 0.0015 g/m <sup>2</sup>
Measuring resolution	0.01 g/m <sup>2</sup>
Lubricants	mineral oil, mineral oil thixotropic, hotmelts, waxes
Operating distance (measuring position)	120 mm (traversing)
Strip height deviations	+/- 10 mm
Ambient temperature	+5 °C up to +50 °C (extended temperature range with cooling possible)
Measuring frequency	60 Hz
Traversing speed	0.5 m/sec



EMG SOLID® LIF

## Laser-Induced Fluorescence spectroscopy

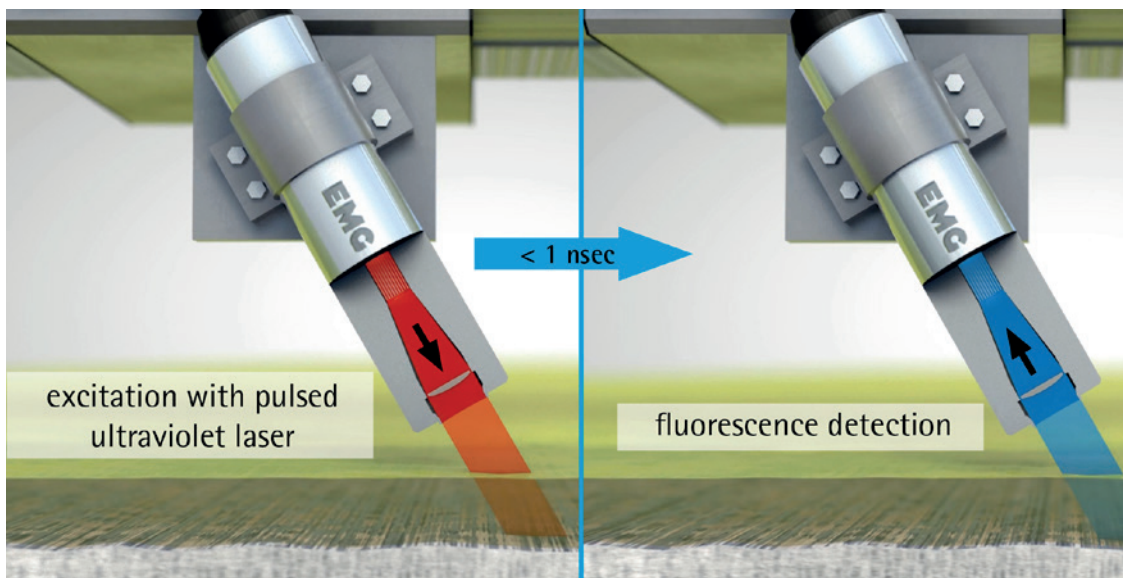
### Functional principle

Via laser-induced fluorescence spectroscopy our system measures the coating weight of the oil layer and visualises it over the entire measured material surface:

- » Special solid state laser delivers 10.000 single pulses per second.
- » Robust and flexible quartz fibre bundle transmits the light energy to the measuring spot.
- » A second quartz fibre bundle transmits the fluorescence signal to the counting system, in which

a photo multiplier detects single photons in a time-resolved manner and analyses them in nano seconds statistically.

- » A micro controller controls the analysing system, manages the system calibrations and calculates the results.



# Transparency about quality features

## Your advantages

- » Low influence of roughness, textures, oil droplets, hotmelt structures, therefore no homogenisation rolls necessary
- » Proof of very thin layers < 20 mg/m<sup>2</sup> in principle possible, therefore usable for cleanliness measurements
- » Only very small space required
- » Absolute and relative measurements possible
- » Special EMG solution for keeping the lens clean
- » High measuring accuracy
- » Very high measuring frequency (10 kHz) and high definition of measuring spot (Ø = 8 mm)
- » Detection of layers of transparent lacquers on electrical strips



EMG SOLID® LIF  
measuring head

## Technical data

Measuring method	laser-induced fluorescence spectroscopy
Measured variable	area weight of lubricant layer in g/m <sup>2</sup>
Measuring range	0 – 6 g/m <sup>2</sup>
Measuring accuracy	+/- 10 % of upper measuring range value (e.g. measuring range: 0.5 - 2 g/m <sup>2</sup> : +/- 0.2 g/m <sup>2</sup> )
Repetition accuracy	< 0.1 g/m <sup>2</sup>
Measuring resolution	0.01 g/m <sup>2</sup>
Lubricants	mineral oil, mineral oil thixotropic, waxes, hotmelts, rolling and skin pass agents, cooling lubricants, emulsions
Other coating materials	passivations, anti-corrosive agents, antifingerprint coatings, cleaning agents, solvents, transparent lacquers, polymers, primers, adhesives
Operating distance (measuring position)	40 mm (traversing)
Strip height deviations	+/- 20 mm
Ambient temperature	+5 °C up to +45 °C (extended temperature range with cooling/heating possible)
Measuring frequency	10 kHz
Traversing speed	0.5 m/sec

The logo for EMG, consisting of the letters 'EMG' in a bold, white, sans-serif font. The background of the entire page is a blue-tinted photograph of industrial machinery, with large circular components and a white line graphic that starts horizontally and then curves downwards and to the right.

EMG Automation GmbH  
Industriestraße 1  
57482 Wenden, Germany

T +49 2762 612-0  
[www.emg.elexis.group](http://www.emg.elexis.group)  
[info@emg-automation.com](mailto:info@emg-automation.com)

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