Laser, X-ray and isotope technology

EMG iTiM

Thickness measurement in perfection

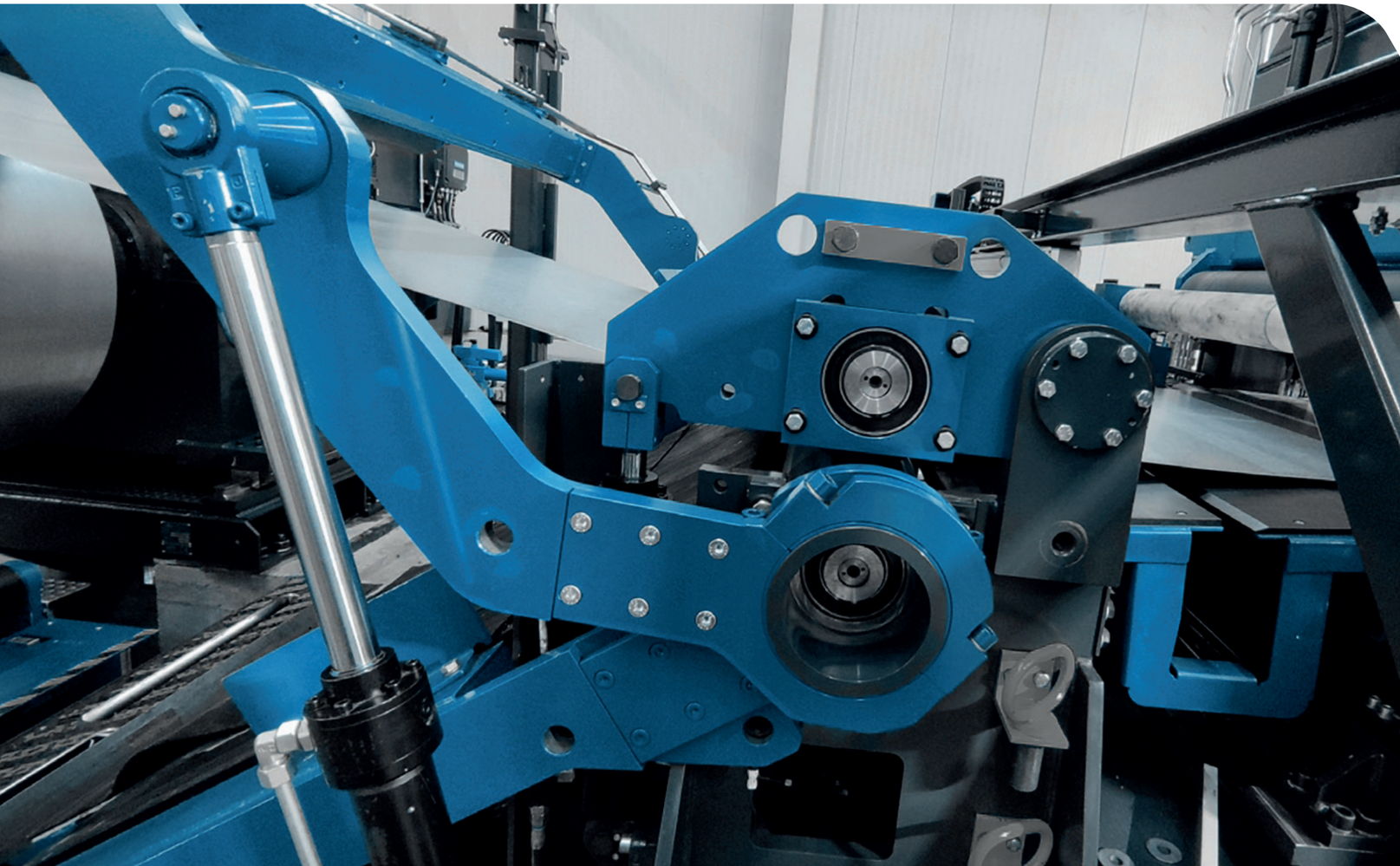
EMG iTiM – Precision technology for thickness measurement

EMG – Technological competence paired with application knowledge

High-precision, fully automatic online thickness measurements require a high level of technological expertise that covers a wide range of applications. Only a precise understanding of the specific purpose and consideration of the accuracy requirement results in the tailor-made solution for the individual application.

Laser measurement systems, for example, are easy to use and comparatively inexpensive, but they are subject to physical limitations in terms of absolute measuring accuracy.

And this is where EMG's comprehensive solution competence, based on decades of experience, comes into play, which is reflected in the wide range of applications for EMG products: in addition to hot and cold rolling, process lines and foil applications, EMG also offers reliable and proven quality assurance solutions for steel and aluminium service centres as well as for the automotive industry.



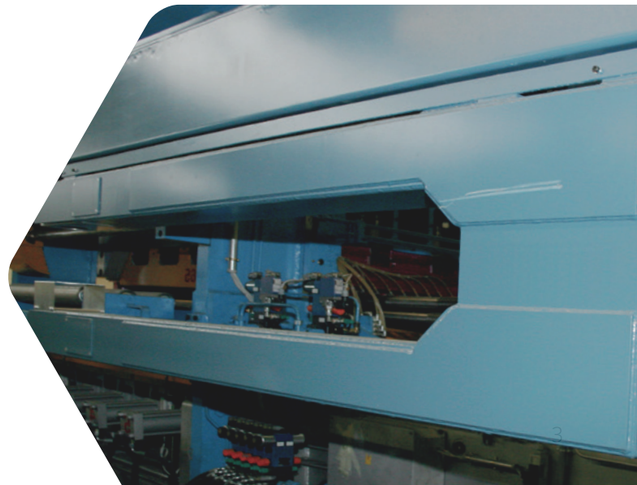
perfecting your performance

Reliable complete systems from a single source

Precise thickness measurement with EMG iTiM

EMG's broad product portfolio in the area of quality assurance solutions now also includes qualified thickness measurement technology under the product name EMG iTiM (intelligent Thickness Measurement) and thus offers complete solutions from one supplier.

The optimal integration of the systems and solutions into the production line enables a bundling of forces: The worldwide EMG sales and service network, excellent design know-how, deep process understanding, a high vertical range of manufacture as well as proven, industry-tested solutions guarantee the highest customer benefit and best results.



Using established know-how

Modernisation through new solutions

The right system for your requirements. EMG helps you to optimally implement your technological goals and production requirements with the wide variety of different series and mechanical design options. Existing systems can also be effectively modernised by seamlessly integrating the EMG solutions into your production line. The flexible design enables installation solutions for almost all conditions and requirements.

The focus is always on reducing the user's effort and material costs. For example, existing isotope sources can often be reused and the special plug-and-play units can be installed within just a few hours. The EMG software solutions, which can also be integrated into existing systems, also contribute to maximum effectiveness.

All from a single source

The individual application areas

To optimise your individual requirements, EMG uses three measuring principles in thickness measurement technology that diversify the areas of application and allow use in a variety of production scenarios:

» laser technology
» X-ray technology
» isotope technology

Solutions with a combined measurement of thickness, width, length, speed as well as temperature are also possible.

Rolling and coating processes

» Precise strip thickness measurement
» Data sources for advanced process control
» Increased yield
» Less downgrading
» Combined measurement systems and visualisation of data
» Feed forward and monitor values for thickness control

Steel and aluminium service centres

» Control of the incoming material thickness
» Precise strip thickness measurement also for shears and slitting lines
» Provision of thickness data for end customers or downstream processes
» Increased material yield
» Combined visualisation, e.g. for thickness and width
» Coil and plate-related provision of thickness data

Automotive

» Control of the incoming material thickness
» Precise strip thickness measurement also for shears and laser cutting machines
» Blank-related provision of thickness data
» Reduction of rejects in the further production process
» Combination of further EMG quality assurance systems, such as roughness measurement, width measurement, etc. possible

Non-contact thickness measurement for fully automated process control

EMG iTiM laser

The principle of laser thickness measurement

The laser-based thickness measurement system EMG iTiM laser stands for a multitude of possible applications.

The focus of the development of the system, as with all other solutions, was the non-contact thickness measurement and the collection of the desired production data for the digitalisation of the process flows. For measurement, two laser distance sensors are arranged on opposite sides of the strip.

One sensor is mounted above, another sensor below the material to be measured. The thickness is determined from the distance of both measuring heads to each other and the difference of the individual distances to the material to be measured.

To compensate for temperature influences on the sensor geometry, for example, the measuring system has an integrated calibration sample.

The EMG iTiM laser thickness measuring system is particularly low-maintenance, easy to install and can be used as a plug-and-play solution for non-contact and alloy-independent thickness measurement of flat products such as metal strips as well as sheets and foils. With this EMG system, reliable thickness measurements are also possible with structured materials, regardless of the material composition.

Technical data* EMG iTiM laser

Thickness measuring range:	200 µm to 150 mm
Linearity:	± 2.2 µm
Repeatability:	± 0.25 µm
System performance:	± 5 µm (depending on thickness range)
Measuring resolution:	± 1 µm

** according to IEC 61336*

Fast measured value output, short integration time, high accuracy

EMG iTiM xray

The principle of X-ray measurement

The highest measuring accuracy and reliability is provided by the X-ray transmission measuring method. When using this method, the X-ray source and detector are arranged on opposite sides of the material to be measured. The non-absorbed part of the X-ray radiation provides the basis for a precise thickness measurement, where material-related influences are compensated by the software. With very high measuring accuracies in combination with fast measured value output and short integration times, thickness measurement becomes economically efficient. In addition, the measuring system provides the required reference variable for all rolling applications at the speed required for automation.

The EMG iTiM X-ray measuring system has been developed to ensure protection of the entire system even when used under the most difficult conditions in hot and cold rolling applications. It is resistant and insensitive to harsh environmental conditions.

Technical data* EMG iTiM xray

Thickness measuring range:	5 µm to 50 mm
Measuring accuracy:	± 0.1 % / ± 1 µm
Statistical noise:	± 0.1 %
Sampling time:	0.2 to 8 ms
Repeatability:	± 0.05 %
Drift:	± 0.1 %

** according to IEC 61336*

Ideal basis for documenting material quality

Due to the wide range of X-ray generators, the EMG iTiM xray measuring system can be used in a large thickness range and on different materials. The result: highly precise measurement results for the thinnest aluminium foil up to 50 mm thick and 1200 °C hot steel sheets. For use in rolling stand controls, a laser-optical speed measurement is integrated into the measuring frame so that the entire measuring technology, including the sensitive parts of the speed measuring device, are protected.

The EMG iTiM xray also provides the ideal basis for documenting material quality in quality assurance applications in the automotive industry or steel and aluminium service centres.

The high flexibility of the system allows individual adaptations to all measuring tasks in the areas of quality assurance.

A combination with further EMG quality assurance systems, such as roughness measurement, width measurement, etc. is possible.

Safety feedback through double signal closure

EMG iTiM iso
The principle of isotope measurement

The isotope transmission method is the third in the series of EMG measurement methods. Here, the isotope source and detector are on opposite sides of the material to be measured. The isotope emits a constant gamma or beta radiation, which is limited to a defined form due to the built-in collimator. The part of the radiation that is not absorbed or scattered in the material to be measured enters the detector through the provided entrance window.

The ionisation of the gas in the ionisation chamber generates electrons which are dissipated by means of applied high voltage and processed as a measurement signal.

After amplification of the measurement signal, the correct measured value is calculated, taking the calibration curve into account. This takes into consideration the corrections necessary for alloy compensation.

In this robust as well as low-maintenance measuring process, EMG iTiM iso is used in all applications where the highest precision and continuous operation are required. Typically, these systems have been successfully used for decades to measure the overthickness in the infeed area of processing lines.

Technical data* EMG iTiM iso

Thickness measuring range:	200 µm to 7 mm
Measuring accuracy	± 0.1 % / ± 1 µm
Statistical noise:	± 0.14 % / 100 ms
Sampling time:	0.2 to 8 ms
Repeatability	± 0.1%
Drift:	± 0.05 %

** according to IEC 61336*

Precise coating thickness measurement

The thickness measurement system based on isotope technology can also be used in coating lines for coating thickness measurement for quality control of dry coatings. Based on the principle of beta backscatter with cascaded sensors for base material, primer and finisher, the EMG solution provides reliable thickness information of the dry coatings there for optimum control of the coating process.

The flexible EMG software concept

Software integration
One provider, one contact.

EMG offers a high degree of flexibility in software integration:

- Connection of EMG thickness gauges EMG iTiM to customer database server
- Storage of measurement results directly in the quality or material flow database
- Communication via Ethernet TCP/IP
- Interface for SQL database systems
- SAP connection via RFC (Remote Function Call)
- Other interfaces available (full range on request)

Future-proof control of the systems

EMG is a full-range supplier of thickness measurement technology and all other quality assurance systems. The hardware components for non-contact thickness measurement technology are perfectly complemented by the appropriate software solutions, thus making the system and process future-proof. Since customer requirements are diverse and individual, there is also the possibility of developing user-specific individual solutions on the software side.

The customised implementation of interfaces to process and product databases ensures a smooth process flow – **perfecting your performance**!

perfecting your performance

Our portfolio, your advantage

Quality assurance as an overall concept

As a full-liner, EMG offers complete solutions for increasing quality while optimising productivity. Thickness measurement is a crucial element in this. In this way, EMG succeeds in ensuring maximum effectiveness and guaranteeing the competitiveness of all customers.

The use of EMG solutions in the entire process chain of flat product manufacturing, including rolling and coating lines, as well as in the automotive industry and at steel and aluminium service centres, optimises the value-added process of EMG customers.

This sustainable industry standard is not only underlined by the technologies used, but also future-proofed by the modular and highly flexible software.

Our solution - your benefit

HIGHLY ACCURATE
Thickness measurement using laser, X-ray and isotope technology up to a measuring accuracy of ± 0.1 %

EFFECTIVE
Sampling times of up to 0.2 ms

LOW MAINTENANCE
Due to the proven sensor technology

FUTURE-PROOF & DIGITAL
Due to the modular design of the software and hardware components as well as through a variable interface concept

DIVERSE
In hot rolling mills: For centre and traversing profile measurement, in use on the roughing stand and finishing mill, on heavy plates and strip material.

In cold rolling mills: On tandem and reversing stands as a manipulated variable for control, for testing in pickling, inspection, slitting and cut-to-length lines as well as in continuous galvanising and annealing lines.

In steel and aluminium service centres:
For checking the incoming material thickness and for precise strip thickness measurement, also for shears and slitting lines.

In the automotive industry:
For checking the incoming material thickness and for precise strip thickness measurement, also for shears and laser cutting systems; combination with other EMG quality assurance systems possible

6 Premises that EMG focuses on with its thickness measurement systems:

TECHNOLOGY
Latest industry standards and interfaces

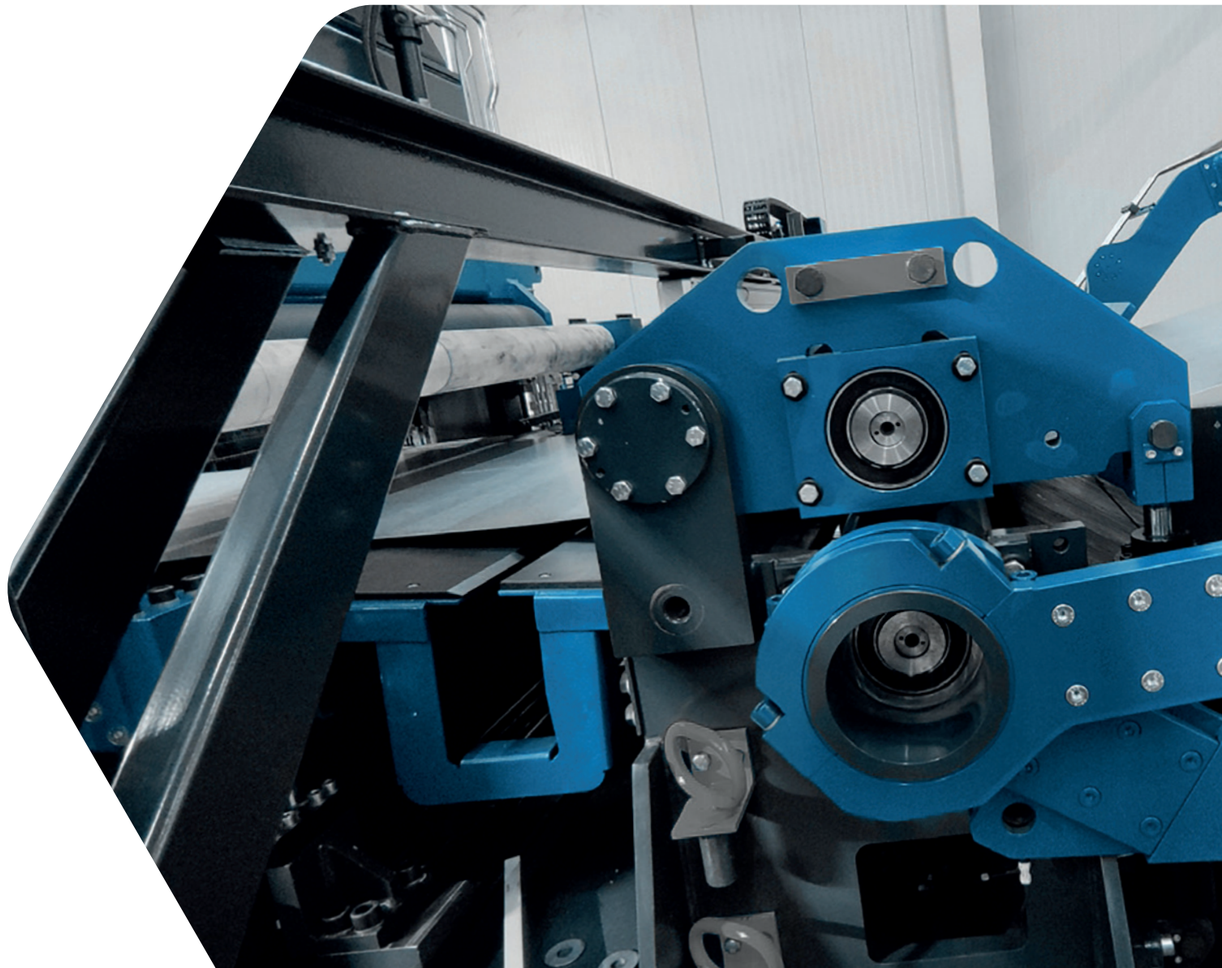
FLEXIBILITY
Adaptable components for new or existing plants

RELIABILITY
Detectors and electronics with digital bus interface

USER-FRIENDLINESS
WINDOWS 10 based master and client visualisation

SUSTAINABILITY
Long-term data storage and quality protocols

RESPONSIBILITY
Worldwide service and spare parts support



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