

Press release

Meeting Steel Processing Demands in SSCs with EMG QA Solutions



EMG QA systems for SSCs clockwise; EMG iTiM, EMG iCAM®, EMG SOLID®, EMG BREIMO

Introduction

Steel service centres (SSCs) are modern, high-performance processing companies with an extensive delivery and service programme of slit strips, sheets, and blanks of hot-rolled and cold-rolled material, surface-finished strips and special alloys.

Investments of SSCs are focused on a wide range of solutions for quality assurance and increasing production yield. In this article, we'll focus on the news in EMG's quality assurance product portfolio for SSCs and steel processors.

Quality requirements at steel service centres and processors

The basic quality requirements of a steel processing centre refer firstly to the dimensional measurement of the strip, be it the strip thickness or the strip width.

Additional quality requirements concern, among other things, the correct oiling of the processed material.

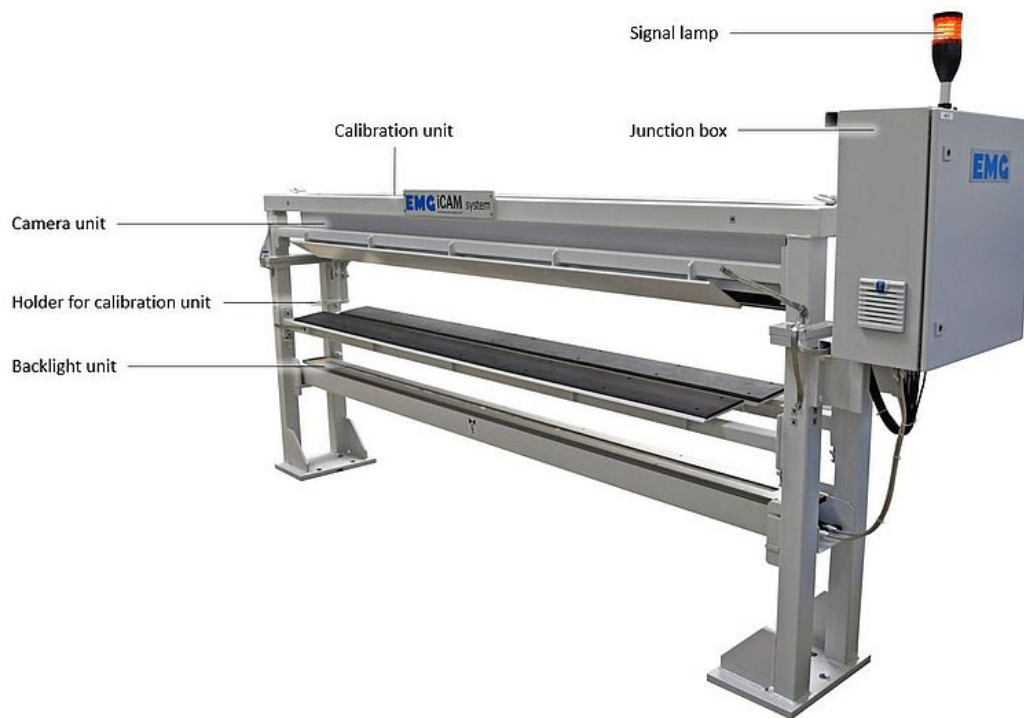
Strip width measurement with EMG BREIMO and EMG iCAM®

The more precisely the width can be determined for the cutting process, trimming and slitting, the more material can be used and delivered to the end customer. EMG provides two technical solutions for strip width measurement EMG BREIMO and EMG iCAM®. The opto-electronic system EMG BREIMO has been established in SSCs for decades, especially for uncoiling and recoiling processes. The recently introduced CMOS camera-based system EMG iCAM® is a novelty for the demanding user who deals also with slit strips.

Strip width and slit strip width measurement with EMG iCAM®

The EMG iCAM® intelligent width measurement system is the perfect answer to SSC demands, which include:

- A precise width inline measurement over the entire coil length in a scalable width range for narrow strip (< 100 mm), middle strip (100 - 600 mm) and wide strip (600 - 2200 mm).
- The possibility to measure the width of slit strips in a range of typically 10 to 500 mm for each individual slit strip.
- The availability of data for further analysis and customer quality assurance databases.
- A robust and reliable measurement working uninterruptedly in long time intervals in an industrial environment.



EMG iCAM® width measuring system - camera modules in the upper part, light emitters (backlight unit) in the lower part

The main components of the EMG iCAM® measuring system are shown above. These are the multi-camera detection unit at the top of the measuring frame and the light source - an infrared backlight unit with a scalable number of LED module units - for illuminating the entire strip width, which is integrated in the lower beam of the measuring frame. On the right is the junction box with the signal light and below the strip pass-line two transfer boards for strip protection are located.

EMG iCAM® fully meets the extended user requirements for an intelligent width measurement system and offers added value for SSCs and steel processors with the possibility to also measure slit strips after the slitting process with high precision.

Strip thickness measurement with the EMG iTiM system family

For SSCs and steel processors, the exact knowledge of the thickness of the incoming material is the key for the material allocation to different end customers and for the internal processing and machinery usage.

The expansion of EMG`s product portfolio to all the thickness measurement methods currently used in industry (X-ray, isotopes, laser), and the associated design and software know-how, opens completely new opportunities for the SSC user, also for modernisations and revamps.

Each technology has its own specific advantages and disadvantages, and in the end, it is the application that determines the selection or even the most appropriate combination of measurement methods.



Three sensor technologies (clockwise: laser, isotope, x-ray) and plenty design concepts for EMG iTiM thickness measurement systems

Strip thickness measurement EMG iTiM iso with isotope systems: an established solution

EMG iTiM isotope radiation-based thickness measurement systems offer several advantages for the application in SSCs:

- EMG iTiM iso systems can provide highly accurate thickness measurements; typically within 0.1 % of the true thickness.
- EMG iTiM iso systems can measure a wide range of thicknesses, typically from 200 μm to 150 mm (depending on the isotope used), which makes them suitable for measuring a variety of flat steel products.
- EMG iTiM iso systems are designed to withstand harsh industrial environments and require minimal maintenance, which reduces operational costs and downtime.

Isotope-based techniques are well established in the SSCs worldwide. The major drawback is the increasingly limited availability of suitable isotope sources and the need to comply with relevant safety regulations, including those relating to radiation exposure and environmental protection. Fortunately, the modular design of EMG iTiM iso thickness measurement solutions means that existing isotope sources can often be re-used for revamps and modernisations.

Strip thickness measurement with EMG iTiM laser: flexibility is key

EMG's laser-optic systems are characterised by low complexity, reasonable space requirements and flexible integration into the production line. Based on the principle of laser distance or difference measurement, triangulation sensors are mainly used for the EMG iTiM laser systems. Thanks to their compact design, the measuring systems can be easily integrated even in confined spaces and process lines. There are several arguments in favour of using EMG iTiM laser systems in SSCs:

- EMG iTiM laser systems provide highly accurate measurements of flat steel in a very wide range between 200 µm to 150 mm, with precision up to the micrometre level.
- EMG iTiM laser systems can be used to measure the thickness of all steel grades independent of the alloy composition. This makes them a versatile tool for steel service centres and processors.
- EMG iTiM laser systems can still be a significant investment, but they are in general less costly and easy to integrate into new and running production lines, following a modular system.
- EMG iTiM laser require no special certificates lowering the total cost of ownership dramatically.

Overall, laser-based triangulation thickness measurement systems offer a range of benefits for SSCs and steel processors, including accuracy, speed, efficiency, versatility, and cost-effectiveness.

Strip thickness EMG iTiM xray: for special cases and with accuracy in focus

X-ray-based measurement techniques are well established in the steel sector. The X-ray measuring devices can be used over a wide thickness range due to different generator voltages and deliver highly accurate measurement results.

For metal service centres EMG iTiM xray only comes into play when high accuracy is required, or isotope-based systems are not available or should be avoided.

Lubrication of coils and sheets – oil layer thickness measurement with EMG SOLID[®] IR & LIF

There are several important aspects concerning online oil layer measurement in SSCs and flat metal processing:

- Online oil layer measurement helps ensure consistent oiling of steel coils, which is critical for achieving consistent quality in downstream processing and end products. That is not only true for determining a sufficient lubrication for the planned processing, but also for providing an oil-free surface before coatings or paintings are applied.
- Accurately measuring the oil layer can help optimise the amount of oil used, reducing waste and costs associated with over-oiling or under-oiling coils.
- By measuring the oil layer online, service centres can quickly and easily adjust oiling systems to maintain optimal levels, without the need for time-consuming manual measurements.
- Over-oiling and oil leaking from coil windings can create a slippery surface that can be hazardous for workers and for coil logistics.

EMG offers two technological approaches for oil layer measurement: infrared spectroscopy with EMG SOLID[®] IR and laser-induced fluorescence spectroscopy with EMG SOLID[®] LIF. Each technology has its advantages and limitations, so the best option is used for each application. In about two-thirds of cases, the widely established EMG SOLID[®] IR technology is applied (due to the robustness against effects of oil mixtures).

EMG SOLID[®] covers a wide range of applications in online oil layer measurement in the metal industry. Depending on the application requirements, either infrared technology or laser-induced fluorescence technology is used. On request, EMG can supply a complete solution including additional units, such as C-frames or homogenising rolls, including the design integration into the production plant and the associated commissioning services.

EMG scope of delivery: from components, systems, and service to turn-key solutions

EMG provides technical solutions, systems, and global service with consultancy.

Through partnerships with local representatives and subsidiaries, EMG offers customized solutions. EMG's experience in modernizations helps companies improve efficiency, reduce downtime, and increase product quality. EMG also provides turn-key projects, taking full responsibility from concept to completion.

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About EMG Automation

EMG Automation GmbH, a company of the elexis group, belongs to the leading suppliers, due to its technological competence in the core area of regulation systems as well as quality assurance in automated manufacturing processes. Fields of application are fast running continuous production processes in the metal and especially in the steel industry. The product portfolio includes, besides quality assurance systems, strip running regulators. The EMG group runs its own factories as well as sales and service offices in Wenden/Germany, Oschersleben/Germany, Bielefeld/Germany, Gerona/Spain, Verrières Le Buisson/France, Saronno/Italy, Istanbul/Turkey, Elmhurst/USA, Madison/USA, Twinsburg/USA, Belo Horizonte/Brazil, Osaka/Japan, Mumbai/India, Beijing/China, Shanghai/China, Bangkok/Thailand as well as Australia.