



Optical Measuring System

CAMERA-CLUSTER-SYSTEMS (CCS)

Sheet-/Plate Geometry Measurement

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COMPLAINTS COST MONEY AND ORDERS

A common reason for complaints regarding metal sheets and plates is the exceed of tolerance limits for length, width, diagonals and squareness. The requirements of the processing industry are becoming ever higher and more difficult to implement. Due to a high variation in material properties, surface finishes, lengths, widths and thicknesses, production plants are increasingly being pushed to their limits.

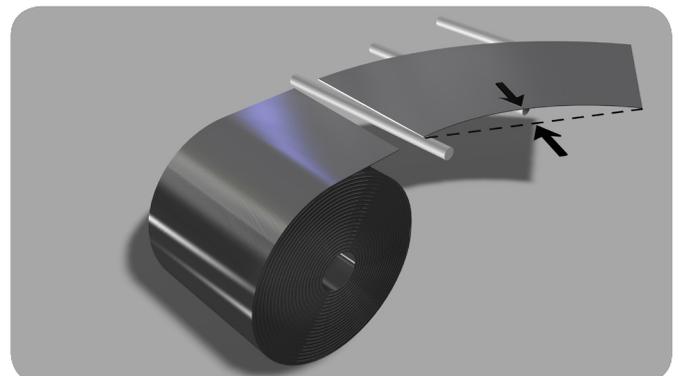
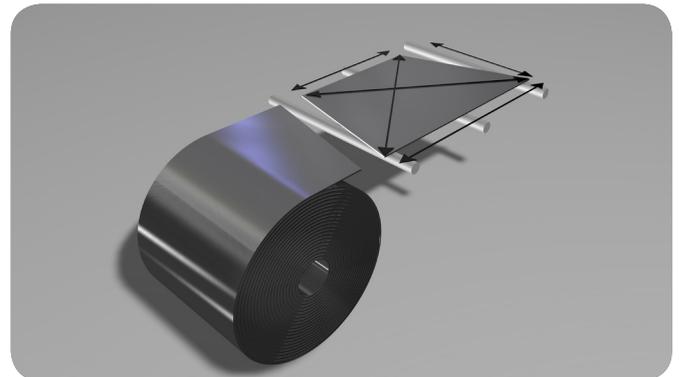
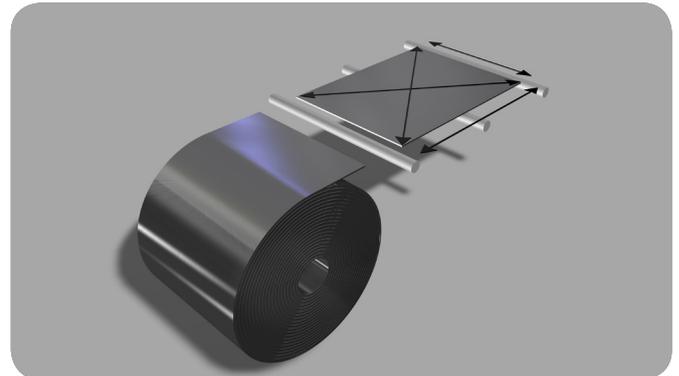
QUICKER THROUGHPUT, LESS SCRAP

Your production lines must work highly efficiently. You are confronted daily with high setup times, caused by, among others, manual measurement of the individual sheets and plates and non-automated recording of the results.

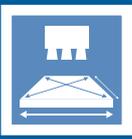
Critical problems lie in the often difficult access to the machinery and the high risk of injury, especially when measuring thick materials.

Both measurement with calliper gauges or measuring tape and time-consuming measurement on measuring tables involve a relatively high magnitude of measurement error. Transmission errors in manual data setup and data processing are inevitable.

The quality of the product cannot be achieved by sorting, but only by careful production.



Our customers require information on the condition of their plants at all times. Meaningful, adapted interventions ensure dimensional accuracy during cutting. The measurement results should be transmitted directly to the shear controller or displayed to the operator. By detecting errors, it is possible to take appropriate measures during production.



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AWAY FROM SPOT QUALITY CHECKS TO 100% INSPECTION

The camera cluster systems, which are unique throughout the world, reduce the time needed for measurement and data processing to a few fractions of a second. The systems deliver measurement results with extremely high accuracy from the first to the last cut sheet. Transgressions of length, width and squareness tolerances are detected immediately during production and indicated.

You can intervene before producing rejects.

The end customers are given quality reports on every single sheet delivered, thus ensuring 100% quality assurance.

Our optional quality data management system, MEVInet-Q, saves the measured data as well as the production and order data continuously, thereby enabling tracking and verification at every point in time.

MODULAR DESIGN

A gauge basically consists of two types of component – two camera unit beams and LED light sources. Thanks to *modular construction*, they can be adapted to every strip width.

Further decisive advantage:

Thanks to customer-specific design, it is possible to integrate the measuring system into existing production lines without modification of existing plant components.

TOP PRECISION AND DURABILITY

Unique “camera cluster systems” (CCS) are used to perform this measurement task. They consist of a large number of high-speed, intelligent and yet inexpensive cameras that are arranged closely next to each other in groups – the clusters. By stringing multiple cluster modules together, it is possible to measure sheets and plates of any width. One hundred cameras per 1000 mm strip width are used for sheet and plate geometry measurement.

The LED technology used in the light sources guarantees operation of the measuring systems over years without replacement of components. *Optical filters eliminate possible influences of extraneous light almost completely.* The intelligent camera cluster technology and controllable light source make it possible to compensate for physical ageing of the LEDs.



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THE PRINCIPLE

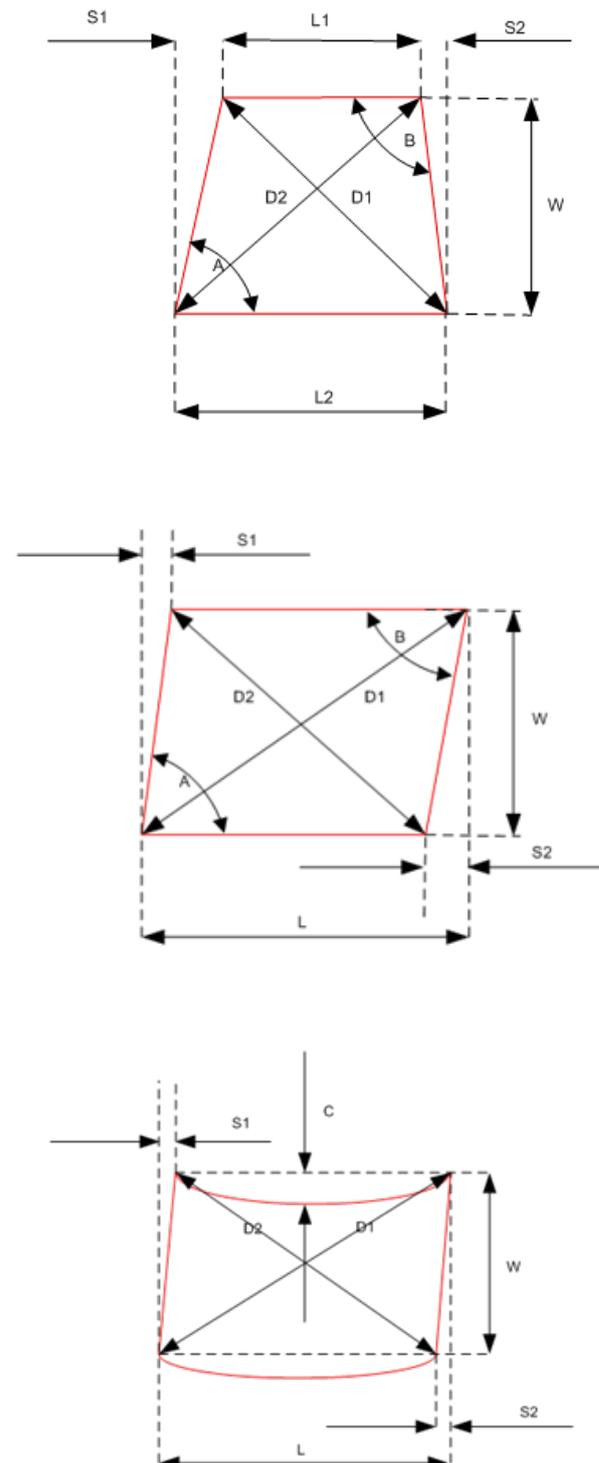
The measuring system is installed between the shear and the stacker. The metal sheets and metal plates transported on the conveyor belts or rollers are inspected individually inline at the highest speeds.

The measurement is based on optical reflection. During the measurement, the light reflected by the sheet surface is detected by the camera and defined as object edges. The main task of the lighting is to create a contrast between the sheet and the conveyor belt.

Hundreds of millions of measuring points generated for each sheet serve evaluation of the length (L), width (W), diagonals (D1, D2), angles (A, B), squareness (S) and camber (C).

Not only the edge area of the sheets, but the complete cut edge is recorded.

Existing disturbances at the sheet edges, such as damage or wear from the conveyor belt, metal powder residues, cutting edge (burr, fracture) or residual protective paper under the sheet, which is mainly used for sensitive surfaces, are eliminated by mathematical algorithms and adaptable plausibility criteria.





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IMPORTANT DECISION-MAKING CRITERIA:

Conventional multi-camera systems have many disadvantages:

- Measurement is only carried out in the edge area of the sheet. The cut edge can not be detected completely.
- There are only a few measuring points available for evaluation, and they react very sensitively to disturbances.
- It is necessary to traverse in strip cross direction to the nominal edge. Measurement is not possible in the case of centreline deviation.
- Very sensitive to ambient temperature fluctuations
- Not suitable for multi-blanking lines
- High computing power for data processing

THE SOLUTION: CAMERA CLUSTER SYSTEMS FROM IMS

Our camera cluster systems use mini cameras known from many everyday applications such as rear view cameras in the automotive industry. High-performance FPGAs see to fast embedded image processing. Computers with high computing power are not needed.

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- ✓ Quicker throughput, less scrap
 - ✓ Product quality at the highest level
 - ✓ Quality reports on every single sheet delivered
- 100% quality assurance is ensured
 - ✓ Complete measurement process in a fraction of a second
 - ✓ Continuous sheet measurement from the first to the last one with extremely high accuracy
 - ✓ Suitable for cut-to-length lines, multi-blanking lines and scoll lines
 - ✓ Measurement not only of standard formats, but also of sheets with scrap-minimising shapes such as trapezoid and scroll
 - ✓ Long service life and top precision



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Your Challenges:

Our solution for you:

 High investment costs when using conventional camera systems

 Camera cluster systems use hundreds of mini cameras that can be deployed in measuring systems economically

 High setup times caused by, among others, manual measurement

 Inline measurement and data processing in milliseconds

 Unreliable manual sheet and plate measurement with calliper gauges or measuring tape

 High resolution and high measuring accuracy for lengths, widths and squareness

Use of 100 cameras per metre inspection area

 Difficult access for manual measurement
High risk of injury

 Fully automatic sheet/plate measurement
No manual operation at the measuring system necessary

 Measurement errors due to extraneous light influences

 Optical filters eliminate the influences of extraneous light almost completely

 High maintenance costs when using conventional light sources

 High lifetime of the LED modules

 Physical ageing processes of light sources

 Intelligent light sources with light intensity control

 Restricted space particularly in existing production lines

 Customer-specific construction enables simple integration into existing production lines