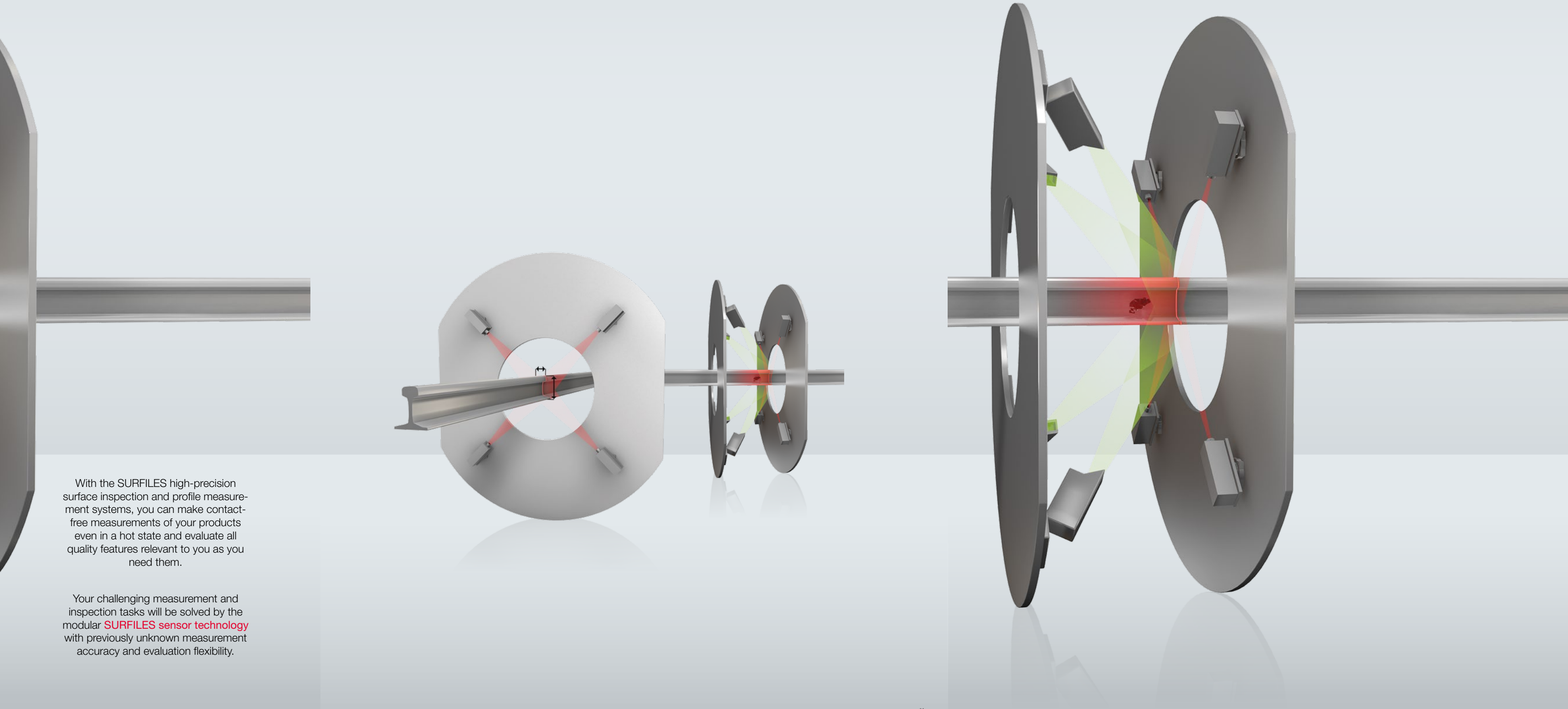


SURFILES

SURFILES

SURFILES



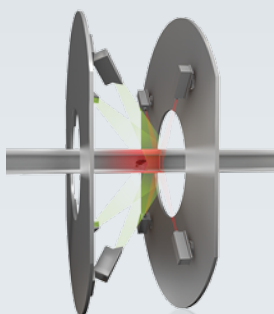
With the SURFILES high-precision surface inspection and profile measurement systems, you can make contact-free measurements of your products even in a hot state and evaluate all quality features relevant to you as you need them.

Your challenging measurement and inspection tasks will be solved by the modular SURFILES sensor technology with previously unknown measurement accuracy and evaluation flexibility.

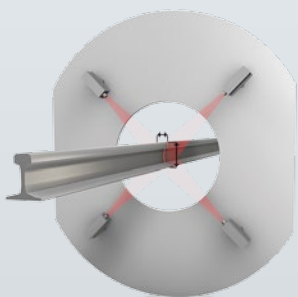
next**SENSE**

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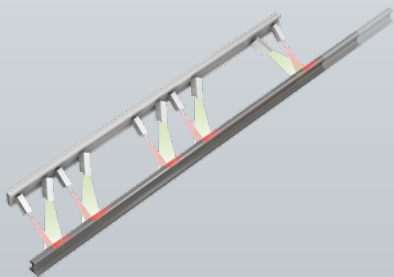
SURFILES



**HOT SURFACE INSPECTION
WITH ABSOLUTE DEFECT
INFORMATION**



**UNIVERSAL PROFILE
MEASUREMENT WITH FLEXIBLE
MEASUREMENT RULES**



**COMPLETE FLATNESS
MEASUREMENT WITH
ADAPTABLE CONSTRUCTION**

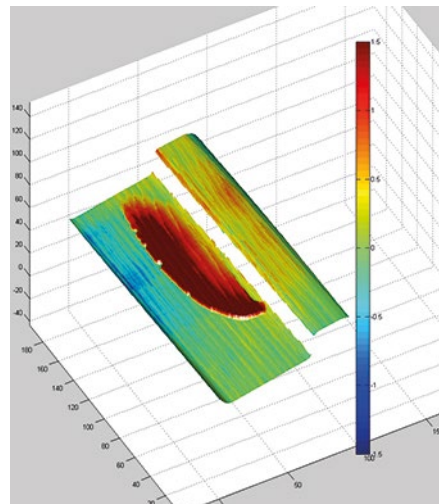
DETECTION OF SURFACE DEFECTS ON COLD AND HOT SURFACES.



COMPLETE RECORDING. ABSOLUTE DEFECT INFORMATION WITH DYNAMIC SENSITIVITY ADJUSTMENT.

+ *DIRIS 3D surface inspection systems allow for the high-precision measurement and complete documentation of the quality of long products. Both longitudinal defects and minimal defect depths can be detected thanks to the three-dimensional recording of the product surface. The sensitivity of the object recognition is adapted dynamically in accordance with the surface quality.*

The surfaces are recorded three-dimensionally. The applied inspection system is based on image processing that uses a special laser light section technology. It specially serves for the identification of surface structures and the classification of defects, e.g. scabs, chips, reefs, roll-ons, scales, etc.

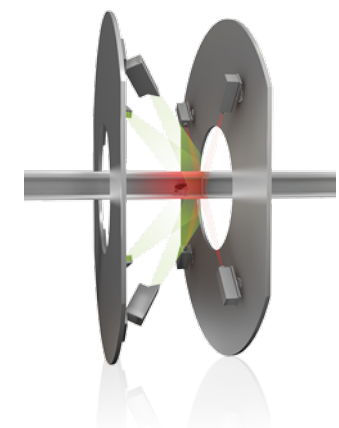


The data evaluation is conducted on the basis of 3-D images with color-code depth information. All data will be stored on a server in an SQL database. Lists of qualities and errors can be queried directly from this server.

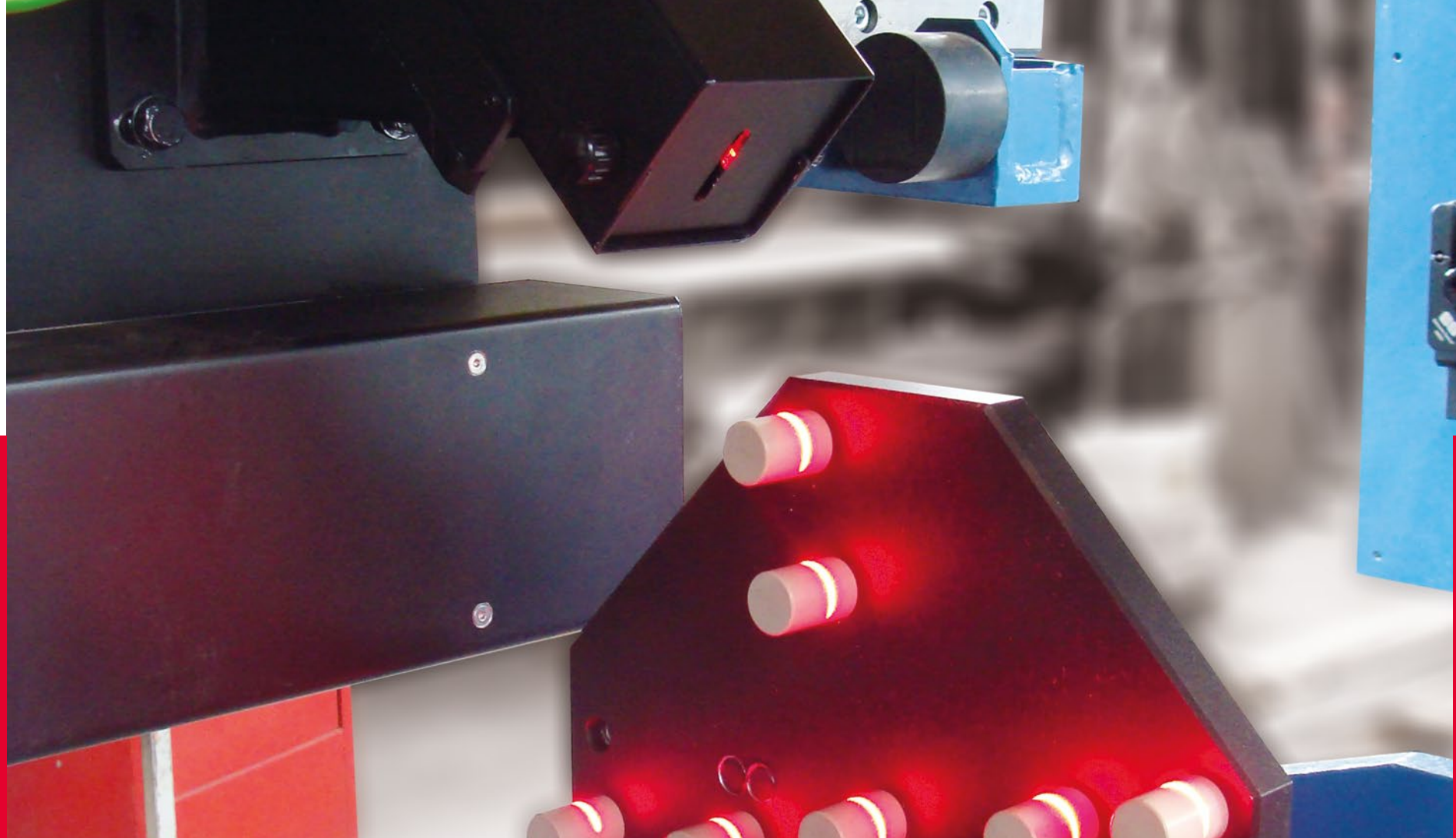
EARLY DETECTION. RESOURCE-SAVING REDUCTION OF REJECTS WITH AUTOMATIC DEFECT DETECTION.

+ *The surface inspection systems (DIRIS 3D) minimize reject costs and labour costs. The automated inspection even of hot surfaces allows for the elimination of production errors. In addition, time-consuming and labour-intensive manual inspections and defect classification can be dispensed with.*

The defects are classifiable. Based on cutting-edge 3-D imaging technology, small and large 3-D structures are dissolved, which allows for the automatic detection of surface defects. Subsequently, these defects are classified and documented in accordance with customer specifications. The DIRIS 3D measurement systems detect surface defects even with surfaces that are ~1,000° C hot.



The sensors are arranged in a ring around the profile to be recorded. During the inspection, the long product passes through the measurement system in the center of the ring so that a complete recording of the entire surface is ensured.



HIGH-PRECISION MEASUREMENT OF DIMENSIONAL ACCURACY OF ANY PROFILE.

ACCURATE MEASURING. INNOVATIVE MEASUREMENT & CALIBRATION PROCEDURE WITH A MAXIMUM OF ADAPTABILITY.

+ The SURFILES profile measurement systems (PMG) achieve the greatest accuracies on account of an innovative calibration procedure. Customer-specific measurement rules and logging mechanisms meet all customer requirements.

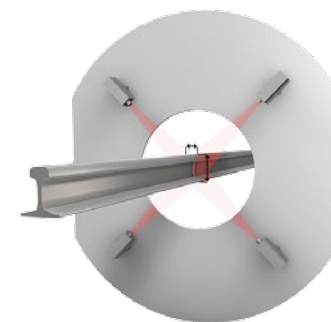
The analysis options are manifold. Depending on the products and the target of the measurements, operators need different rules for the evaluation. Our PMG measurement systems meet these requirements by providing a broad range of customized profiles and measurement rules that can be created on one's own. Flexible measurement instructions and a revolutionary special calibration method allow for accuracies previously unknown when inspecting dimensional accuracy.



The measurement system offers various modes for the display of the measurement results. In the "Shape Display," the currently measured cross-section will be visualized in comparison to the nominal cross section. The "Trend Display" shows the course of the measurements in relation to the corresponding tolerance zones. Any exceeded tolerance will be color-marked.

REDUCE OVERALL COSTS. TEMPERATURE-INDEPENDENT MEASUREMENT WITH SLIM PROFILE MEASUREMENT SYSTEM.

+ With the "PMG HOT" version, defects can be detected and corrected early in the production process through the measurement on hot surfaces. A slim and precise measurement system is used here that saves hardware costs and operational costs.



The system reduces costs. In comparison to conventional systems for the measurement of dimensional accuracy, PMG measurement systems require fewer camera-laser units because of their innovative sensor technology. This quality significantly reduces acquisition costs and expenses for necessary maintenance and spare parts.

High-precision measurements of rail cross-sections, for instance, can be made with SURFILES PMG. The measurements to be determined are height of rail, width of rail but also values usually hard to measure like the cross-sectional area.

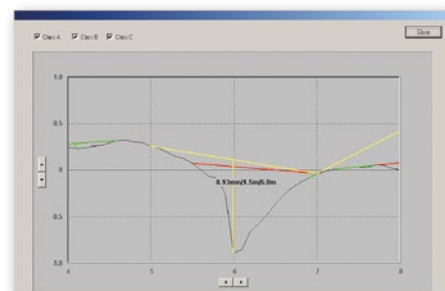
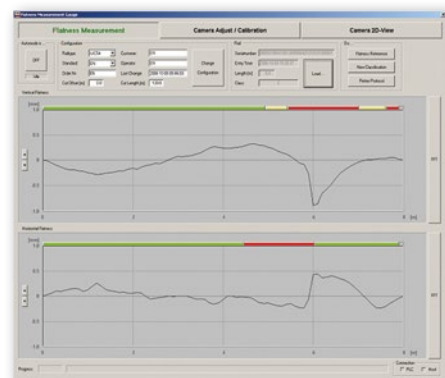


AUTOMATIC FLATNESS MEASUREMENT THROUGH TO THE PRODUCT ENDS.

ENTIRE RECORDING. COMPLETE MEASUREMENT AND DOCUMENTATION WITH POTENTIAL FOR SAVING.

+ The high-precision systems for flatness measurement (FMG) enable measurements up to the ends on account of cutting-edge light section technology and sophisticated algorithms. Combined with slim and resilient mechanics, this results in low acquisition costs and operational costs.

The measurements are complete. The horizontal and vertical flatness of long products can be determined through to their ends. Hence a separate system for the analysis of the ends can be dispensed with and the quality can be demonstrated to the end customer without gaps. Subsequent to the measurement, an automatic classification of the evaluation results according to defined testing standards is carried out.

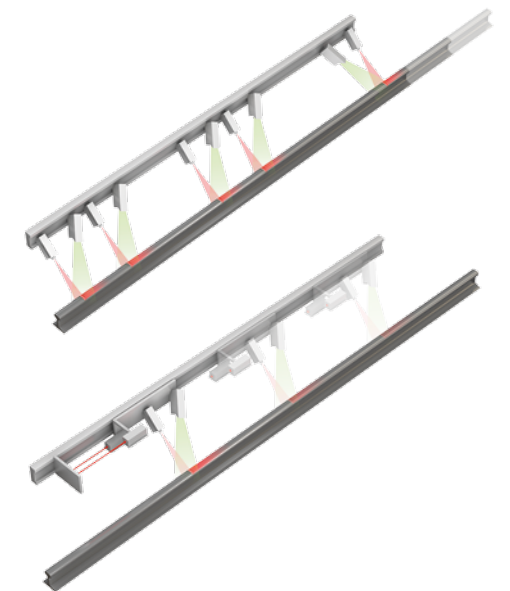


Flatness graphs with classification rulers and detailed valley depth displays are used for the data evaluation and visualization of the horizontal and vertical flatness. A color code according to the set testing standards displays the results neatly arranged.

FLEXIBLE SYSTEM. MULTI-VARIANT MEASUREMENT SYSTEM WITHOUT ALIGNMENT EXPENDITURE.

+ Corresponding to the customer's requirements, the flatness measurement systems (FMG) are available in various technical versions. Costly and time-consuming setting procedures are dispensed with profile changes regarding both mobile and immobile measurement objects.

The system is adaptable. The flatness measurement systems can be integrated with existing rolling processes or, in the case of immobile measurement objects, be implemented by a scanning system. The measurement systems are structurally adapted to customer needs and equipped with interfaces to a higher-level computer system in compliance with the customer's requirements.



The main component of FMG is a rigidly fixed measurement beam onto which the sensors are attached. The laser lines are projected on the object to be measured, recorded by cameras and converted into a two-dimensional profile graph in an evaluation computer. The structure of the flatness measurement systems for mobile measurement objects differs from the standard version by a measurement slide (FMGs = scanning mode).