

**On-line
Thickness Measurement**

CTM-S



**Thickness measuring system suitable
for all non-magnetic flat materials**

such as:

- Films and sheets made of PET, PVC, PP, PS, HDPE, LDPE
- Coextruded films
- Rubber, laminates
- Leather cloth
- Waterproof sheetings for roofs
- PUR foam
- PE foam etc.

**Now available with web width recognition
and automatic die control!**

CTM-S Continuous thickness measurement

Low cost on-line thickness measuring system for

- Quality optimisation
- Documentary proof of product quality
- Saving raw materials

Application

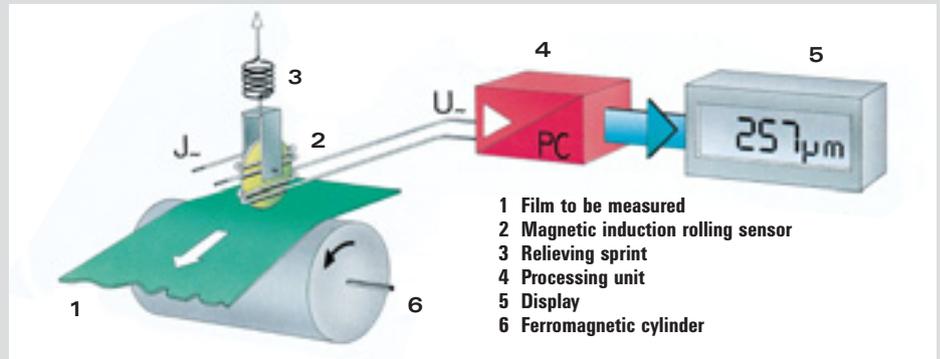
The CTM-S thickness measuring system, designed for non-destructive and continuous thickness measurement, proved to be most suitable for measuring the following non-magnetic flat materials during the production process:

- PE, PP, PET, ABS, HDPE, LDPE, PVC, coextruded films
- Vulcanised and uncured rubber
- Leather cloth, rubber blankets, etc.
- Waterproof membranes, waterproof sheetings for roofs
- Coated and uncoated paper board and paper
- Ceramic foils, glass

Measuring principle and description

Using the principle of magnetic induction, the CTM-S thickness measuring system works in compliance with German and international industrial standards.

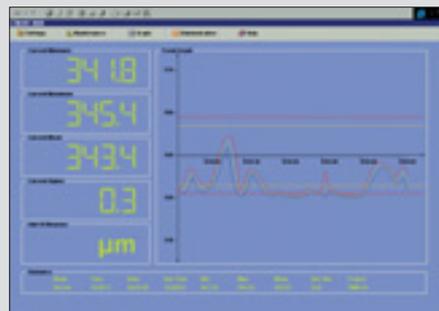
The system incorporates a ferromagnetic measuring cylinder over which the web or film passes. A suitable arc of wrap ensures a good contact of the web on the measuring cylinder so as to prevent fluttering effects. The active rolling sensor scans over the surface line of the film to perform direct and continuous thickness measurement. Readings are displayed in μm , mm, mils or inches.



What is actually being measured is the interferric space, i.e. the distance between the rolling sensor and the cylinder (see illustration of principle).

Assembly and Installation

The CTM-S system has been designed for easy do-it-yourself assembly and installation. The complete system is to be mounted on two supports. The material to be measured is to be guided over the measuring cylinder in a suitable arc of wrap.



Trend graph

The sensor system can be lowered onto the web by means of an air-operated device. Thickness measurement is carried out in machine direction.

Technical reasons for choosing an ElektroPhysik system

Performing active and direct measurement, the magnetic induction sensor offers many advantages, especially from the technical point of view.

Wide field of application:

Suitable for all non-magnetic flat materials such as plastic films and sheets, rubber, coated and uncoated textiles, leather cloth, roofing sheet, paper etc.



Current thickness

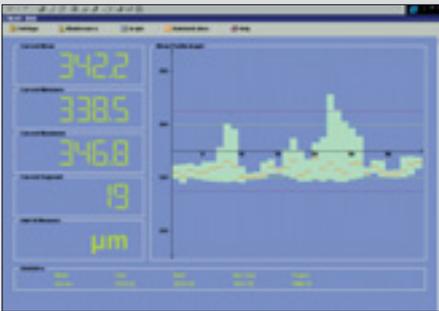
Highest precision and measuring accuracy:

The material thickness is captured directly and converted into an electronic signal. The measurement is thus unaffected by mechanical constructions, machine vibrations or changes in temperature. Unlike laser systems, inductive displacement transducers, air gauges or generally all sensors measuring from one fixed surface to another fixed position, the CTM-S is unaffected by:

- Fluttering effects
- Eccentricities of the measuring cylinder
- Vibrations in the surrounding fields
- Deflections of the traverse or cylinder
- Changes in distance of the sensor positions due to variations in temperature

Measurement without traces:

The specific design of the rolling sensor tip in conjunction with the fine-hand adjustable spring-mounted sensor system reduce contact pressure to approx. 0 Newton – even sensitive materials are not damaged.



Mean profile

Unaffected by material properties:

Measurement is unaffected by variations in density, humidity or colour of the material. Single or multi-layer materials can be measured without problems.

One-time calibration:

Calibration is easy and should be performed during set-up of the measuring system. In general, the system should be recalibrated once per year or if the measuring cylinder has been replaced.

Safety of operation:

No safety, health or other governmental restrictions.

Easy assembly:

Using the detailed instructions for assembly and operation, the customer can easily install the complete system without special knowledge being required.

Data administration:

Due to the web-based technology, the CTM-S system can easily be linked to the company's network as well as to the Internet. Operation and monitoring of the system can thus be performed via Intranet/Internet.

Also regarding data acquisition, communication and management, the new web-based measuring system offers new possibilities: additional features such as process control engineering systems, plant monitoring systems, MDC/ADC or machine control systems can be integrated without problems.

Economical reasons for choosing an ElektroPhysik system

Raw material savings:

Improved safety margins allowing minimal tolerance limits enable raw material savings of up to 5%.

Shorter start-up times:

Reduction of start-up times to up to 50% through real time display of product data allowing quick intervention into the production process.

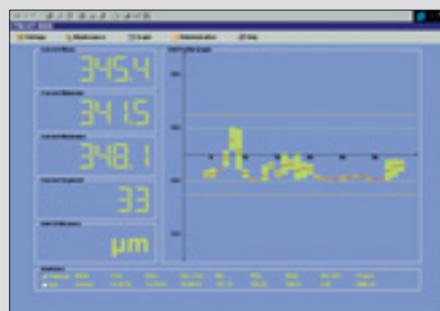
Reduced scrap:

Direct control through clear and exact visualisation on CRT and TFT monitors of:

- Cross profiles
- Mean of cross profiles
- Trends of individual measuring lines
- Current thickness distribution
- Internal operating tolerances and external tolerance limits

Quality assurance through:

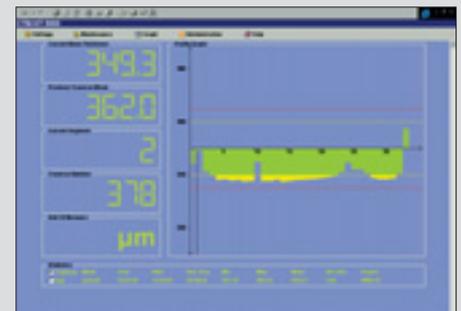
- Accurate on-line measurement
- Monitoring of tolerances
- Audible and visual alarm
- Documentation of statistical parameters



Roll profile

Maintenance

Notification of errors, maintenance and trouble shooting via Internet allow remote service and thus reduce down-times considerably which is especially important for cost-intensive production processes.

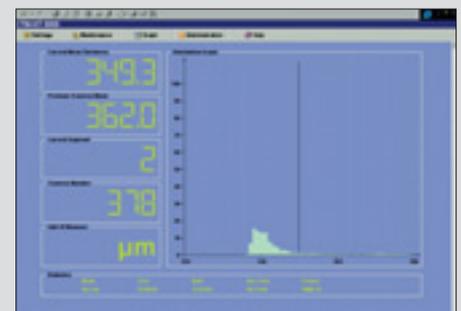


Current profile

The new design of the CTM-S system allows exchange of all wearing parts through standard components which are available world-wide, i.e. short service and delivery times.

Advancing with technology:

The combination of modern technology and long-time experience in development and production of precision thickness gauges ensures the suitability for industrial durability and reliability of ElektroPhysik measuring systems.



Normal distribution curve

ElektroPhysik systems pay back rapidly – often within a few months.

Technical data

CTM-S-components

Processing unit mounted in 19" (small) PC-cabinet

- Industrial PC in 19" rack mounting
- 17" colour monitor
- ASCII keyboard
- Software package incl.
 - Display of readings alphanumerically in μm , mm and in the form of bar charts
 - Cross profile including tolerance limits and display of probe position
 - Trend including tolerance limits and on a time scale
- Operating language: German, English, French – other languages on demand
- Serial interface for output of readings and triggering alarm unit
- Web-based data-access, e.g. for remote monitoring or service
- Connection of protocol printer possible

Traversing unit type

- TAC traversing system with AC motor drive max. $V = 10 \text{ m/min}$ or touch control max. length = 3,000 mm, other lengths on request
- TK gantry system with fixed probes for three fixed probes maximum
- Measuring cylinder

Probe system

- Magnetic-induction rolling sensor D1 or A1



Software options:

- Roll profile with tolerance limits and display of probe position
- Mean of cross profile
- Histogram with current distribution curve
- Trends with tolerance limits and longitudinal axis, distance measurement
- TCP/IP interface for data output and triggering alarm unit
- Process interface with protocol Siemens 3964

Hardware options:

- Potential free alarm outputs
- Analogue output 0/4...20 mA/0...10 V
- TFT Active Matrix Display
- Menu-guided operation via touch-screen monitor

- Photoelectric barrier for detection of material blocking
- Customer specific cabinets, designed for 19"
- Air conditioning equipment
- Web width recognition
- Automatic die control

Further instruments from our range of products:

Continuous pinhole detection system CPD

- For continuous detection of pins, cracks and holes in electrically conducting flat foils such as PUR, PET, PVC etc. thickness range: 0.1...8 mm* $V_{\text{max.}}$ 200 m/min*
*depending on material

Coating thickness gauges

- For virtually all coatings applied on steel and non-ferrous metal

Probe type

Measuring principle:

magnetic induction according to DIN EN ISO, ASTM, BS

D1



A1*



Measuring ranges:

D1: 10 μm ...6 mm

A1: 100 μm ...6 mm

Tolerance

0.01...4 mm:

0.01...500 μm : $\pm 5 \mu\text{m}$

(in on-line operation):

$\pm (0.5\% \text{ of reading} + 2 \mu\text{m})$

0.1...6 mm: $\pm 1\% \text{ of reading}$

4...6 mm: $\pm 1\% \text{ of reading}$

Repeatability:

1 μm or 0.5% of reading

3 μm or 0.5% of reading

Operating temperatures:

Probes: 0...70°C; PC 0...40°C; Material to be tested: 0...120°C

* especially suitable for soft materials



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