



IN-LINE X-RAY THICKNESS GAUGE

Evolved multi-channel system with high speed and high-density measurement

Comparable level is achieved with the use of soft X-rays, instead of using beta ray.

No qualified operator. No need for calibration ray.

High precision

- Datum of 1mm interval in CD is measured and displayed.
- Margin of measurement error is minimized by correcting influences of temperature and humidity at every traverse.
- The precise traverse mechanism has been adopted.

Safe and secure

- Low-energy X-ray ensures safe condition. (No influence on human body even in nomal operation.)
- No need for an X-ray supervisor.
- X-rays are not emitted when the power is off.

User friendly operation

- Automatic absorption condition acquisition.
- Up to 1000 items of condition for a measurement can be registered.
- Graphs to suit various purposes can be displayed.

Long lifetime

The lifetime of X-ray tube has been 3 times compared with the former model by changing power device.

Applicable to wide material

- Wide materials also can be measured by adopting a new driving system.
- Possible to measure the coating layer thickness.
- Thickness measurement is available. e. g. adhesive layer of adhesive tape, coating layer of dry film resist, and etc.

■ Light weight and compact body.

Driving system, including X-ray head and sensor head, are composed compactly.



Measurement theory

The law of an X-ray penetration

$I=Io \cdot EXP(-A \cdot T)$

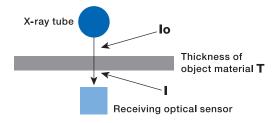
T ······ Thickness of measurement material

A ····· The absorption coefficient object material

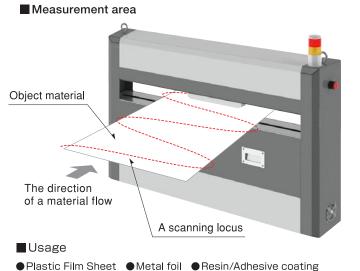
Io Intensity of a signal when no object material between sensors

I Intensity of a signal when object material between sensors

As shown in the below figure, the magnitude of absorpotion of object material is measured, and thickness is measured by correlating it.

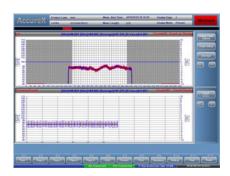


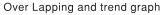
System Configuration

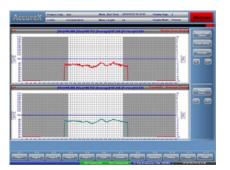


- Non-woven fabric
- Paper
- Various paint coatings

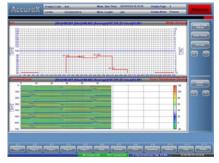
Various data display methods







Single scan display + average scan display



Width division and Color distribution

Measurement sample

| Material Name | Maximum Thickness Measurement Available | Measurement Accuracy | Appendix |
|---------------------------------|--|-------------------------|---|
| PP (Polypropylene) | 4000μm | ±0.3% | Accuracy is \pm 0.2% if Ti Tube is used. |
| PE (Polyethylene) | 3500μm | ±0.3% | Accuracy is $\pm 0.2\%$ if Ti Tube is used. |
| PET(Polyethylene terephthalate) | 2000μm | ±0.25% | |
| Polycarbonate | 2000μm | ±0.3% | |
| Non-woven Sheet | 2000g/m ² | ±0.5% | |
| Aluminum Foil | 200μm | ±0.2% | |
| Copper Foil | 60µm | ±0.2% | |

General Specification

■General specification

| Power supply | AC100V 1.5kVA | | |
|-------------------------|---------------------------|--|--|
| Detection algorithm | X-ray transmission method | | |
| Path line gap | 15mm | | |
| Measurement spot width | About 5.0mm | | |
| Measurement speed | 150mm/sec (MAX250mm/sec) | | |
| Measurement pitch | 1.0mm | | |
| X-ray tube pipe voltage | 9.5kV% | | |
| X-ray energy | 5~6keV (9.5kV) | | |
| · | | | |

^{*} There is also tube available 15kV.



URL:http://www.futec.co.jp ver.1103

■ Head Office and Factory

FUTEC Europe S.r.I

FUTEC China Inc. FUTEC America Inc. 1217 Hayashi-cho, Takamatsu, Kagawa 761-0301, JAPAN TEL:+81-87-868-9991(Overseas div.) FAX:+81-87-865-7250

Via Gerolamo da Cardano,18 21013 Gallarate (VA) ITALY TEL:+39-0331-792456 FAX:+39-0331-247407

Room2106, Singular mansion No.322 Xianxia Rd, Shanghai 200336 CHINA TEL:+86-21-5257-4298 FAX:+86-21-5257-4299 105 Commerce Drive, Suite E, Fayetteville, GA 30214 USA TEL:+1-770-461-0548 FAX:+1-770-461-0558

Malaysia Representative Office Level27 Centrepoint South, The Boulevard, Mid Valley City Lingkaran Syed Putra 59200 KL MALAYSIA TEL: +60-3-2096-9638 FAX: +60-3-2096-9797

■ Taiwan Representative Office 5F-10, No.41, Nanjing W.Rd, Datong Dist, Taipei City 10352 TAIWAN TEL:+886-2-2559-6712 FAX:+886-2-2559-6509