GLOBAL GAUGE CORPORATION

Coating Weight Measurement Solutions

Precision X-Ray Fluorescence Gauging for Steel Coating Lines

Industrial Measurement Systems

Made in America | Respected Worldwide

SECTION 01

About Global Gauge

25+ years of precision measurement excellence serving the global metals industry.

Global Gauge Corporation

MADE IN AMERICA | RESPECTED WORLDWIDE

25+

Years of Industry Experience

300+

Systems Installed Worldwide

24/7

Customer Service & Support

Global Gauge Corporation manufactures precision measurement systems for the primary metals and materials industries, with a legacy dating back to the 1950s.

Our Capabilities:

- X-ray thickness gauges for hot and cold mills
- Coating weight gauges for plating lines
- Width gauges and crop optimization
- Defect detection systems
- Legacy system upgrades and modernization

We build critical sensors in-house and use off-the-shelf components for reliability.

SECTION 02

Coating Applications

Comprehensive coating measurement solutions for galvanizing, tin plating, and specialty coating lines.

Coating Weight Measurement Applications

Tin Plating (Electrolytic)

Food-grade packaging. Sn L-line fluorescence at 3.4-3.7 keV.

Galvalume (55% Al-Zn)

Superior corrosion resistance. Simultaneous Al and Zn measurement.

Electrogalvanized (EG)

Thin zinc layers for automotive body panels. High precision.

Hot-Dip Galvanizing (HDG)

Zn coating for automotive and construction applications.

Aluminized Type 1

Heat-resistant Al-Si for exhaust systems. Al K-line measurement.

Galfan / ZAM / Alloy Coatings

Zn-Al-Mg alloys. Multi-element measurement capability.

All applications use non-contact XRF for real-time inline measurement.

SECTION 03

XRF Technology

X-Ray Fluorescence provides non-contact, real-time measurement of coating weight and composition.

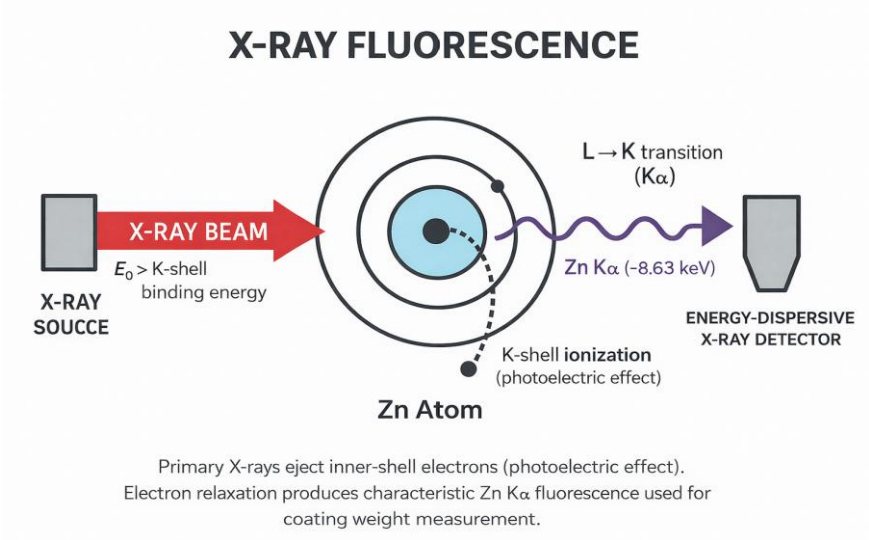
What is X-Ray Fluorescence (XRF)?

Basic Concept

- X-ray beam excites atoms in coating material
- High-energy X-rays knock out inner-shell electrons
- Outer electrons fill vacancies, releasing fluorescence

Why It Works

- Each element emits X-rays at unique energies
- Energy identifies which elements are present
- Intensity reveals how much coating exists



Primary X-rays eject inner-shell electrons (photoelectric effect). Electron relaxation produces characteristic Zn Kα fluorescence used for coating weight measurement.

From Physics to Measurement

Key Physics Effects

Photoelectric Effect

Primary X-ray knocks out inner-shell electrons.

Fluorescence Emission

Secondary X-rays at characteristic energies.

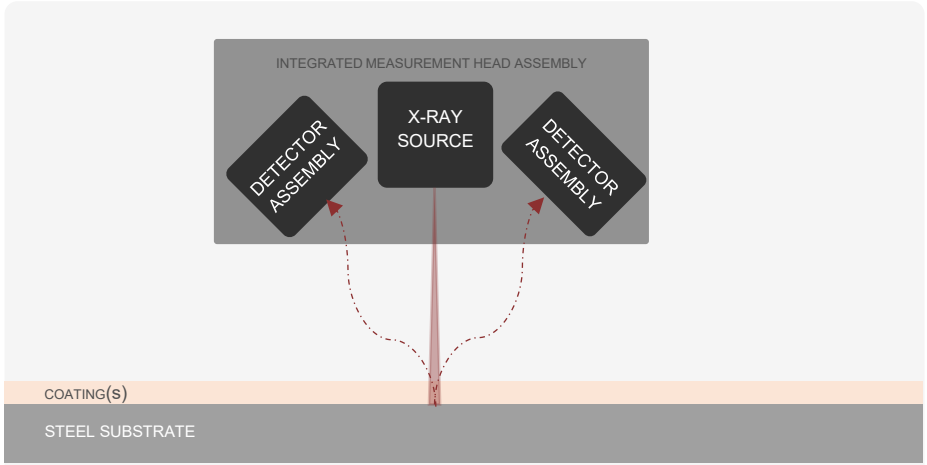
Absorption and Scattering

Requires mathematical corrections in calibration.

Measurement Implementation

How We Leverage These Principles:

- Detector collects fluorescent X-rays at specific energy
- Intensity proportional to coating thickness
- Multiple detectors improve signal-to-noise ratio



Signal intensity proportional to coating weight

Corrections Applied:

- Absorption compensation for self-attenuation
- Backscatter effects from substrate
- Temperature and distance compensation

SECTION 04

Product Solutions

Two electronics platforms with shared mechanical systems for complete coating weight measurement solutions.

Coating Weight Gauge Platforms

Two electronics options sharing common mechanical systems

Perfecta CWG

PLC-Based Platform

- Allen-Bradley or Siemens PLC options
- Industrial-grade reliability
- Easy plant automation integration
- Familiar programming environment

Best for: Existing PLC infrastructure

Accura CWG

PC-Based Platform

- Industrial PC with Windows
- Industrial-grade reliability
- Easy plant automation integration
- Simplified hardware architecture capabilities

Best for: Cost conscious applications

Shared: O-Frame, sensor heads, motion control, cooling systems, and cabling are common to both platforms.

Perfecta Coating Weight Gauge

PLC-Based Electronics Platform

System Components

O-Frame Assembly
Linear guides, drives, cable handling

Sensor Heads
X-ray source, 4 ion chambers

Electronics Cabinet
PLC, I/O modules, power

Local Control
Push buttons for head control

PLC Options:
Allen-Bradley ControlLogix or Siemens S7-1500

Key Features

- Multi-detector averaging for reliability
- Built-in redundancy (operates with faults)
- Outlier rejection algorithms
- Automatic standardization

Optional Add-Ons

- Remote Operator Console
- Advanced Analytics Package
- Coil report generation

Accura Coating Weight Gauge

PC-Based Electronics Platform

System Components

O-Frame Assembly
Linear guides, drives, cable handling

Sensor Heads
X-ray source, 4 ion chambers

Electronics Cabinet
PLC, I/O modules, power

Local Control
Push buttons for head control

Hardware Platform:
Industrial Fanless PC running Windows LTSC

Key Features

- Multi-detector averaging for reliability
- Built-in redundancy (operates with faults)
- Outlier rejection algorithms
- Automatic standardization

Optional Add-Ons

- Remote Operator Console
- Advanced Analytics Package
- Coil report generation

Main Components

Shared platform for Perfecta & Accura coating weight gauges

O-Frame / Split Frame

- Custom-manufactured in USA
- Heavy-duty steel construction
- Linear guide rails
- Precision ball screws
- Position encoders
- Cable handling system

Split-frame option for retrofit installations.

Integrated Sensor Heads

- X-ray tube with adjustable kV
- 4 ion chamber detectors at 45 deg
- Multi-detector averaging
- Water-cooled for stability
- Automatic shutter control
- Built-in standardization

Redundant design for continuous operation.

Supporting Systems

- Closed-loop water chiller
- Servo drive motion control
- Industrial cabling assemblies
- Local control station
- Safety interlock systems
- Air purge systems

Designed for mill environments.

Mechanical Systems

Shared platform for Perfecta & Accura coating weight gauges

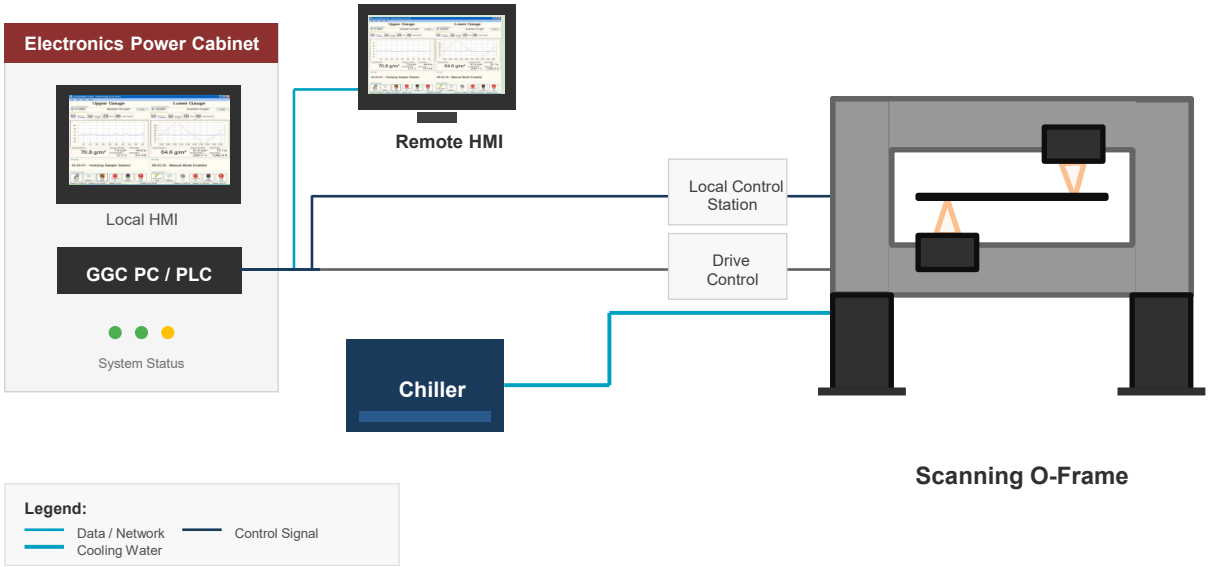
O-Frame Frame

- Custom-manufactured in USA
- Heavy-duty steel construction
- Linear guide rails
- Precision ball screws
- Position encoders
- Cable handling system

Split-frame option for retrofit installations.

Scanning O-Frame Configuration

Standard system architecture for coating weight measurement



Mechanical Systems

Shared platform for Perfecta & Accura coating weight gauges

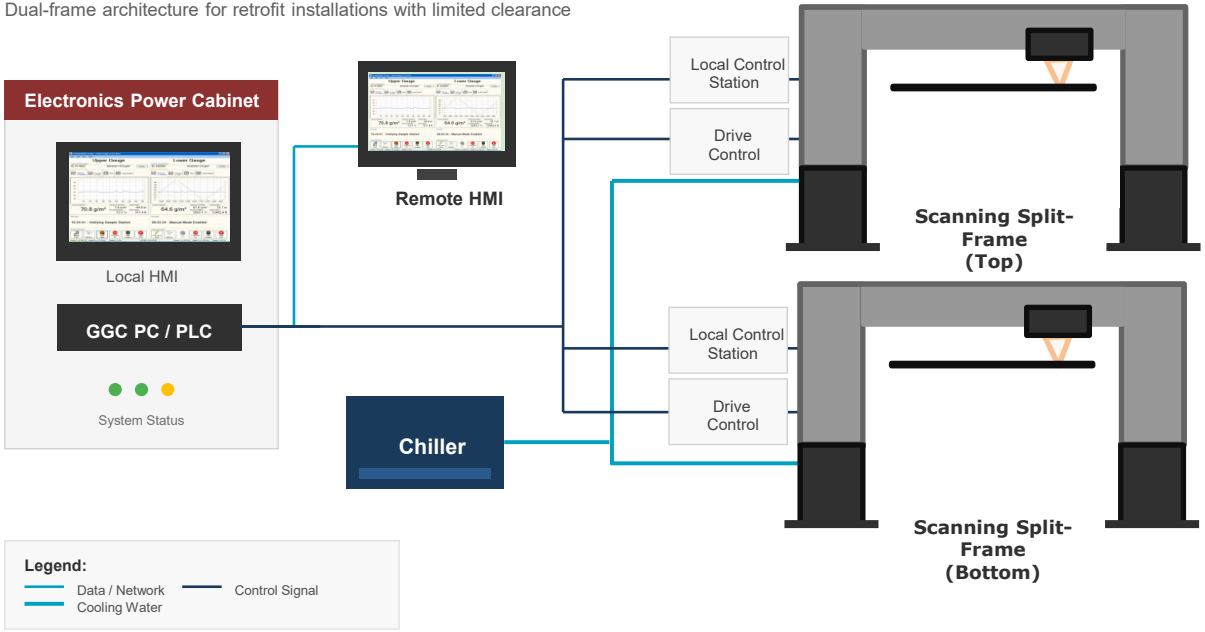
Split Frame

- Custom-manufactured in USA
- Heavy-duty steel construction
- Linear guide rails
- Precision ball screws
- Position encoders
- Cable handling system

Split-frame option for retrofit installations.

Scanning Split-Frame Configuration

Dual-frame architecture for retrofit installations with limited clearance



Sensor Assembly

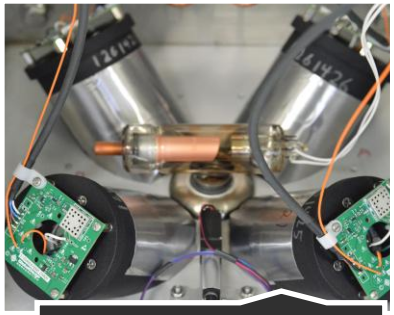
Shared platform for Perfecta & Accura coating weight gauges

Integrated Sensor Heads

- X-ray tube with adjustable kV
- 4x ion chamber detectors at 45°
- Multi-detector averaging
- Water-cooled for stability
- Automatic shutter control
- Built-in standardization

Redundant design for continuous operation.

4x ion chamber detectors at 45° angles



Central X-ray tube for uniform excitation

Integrated Measurement Head

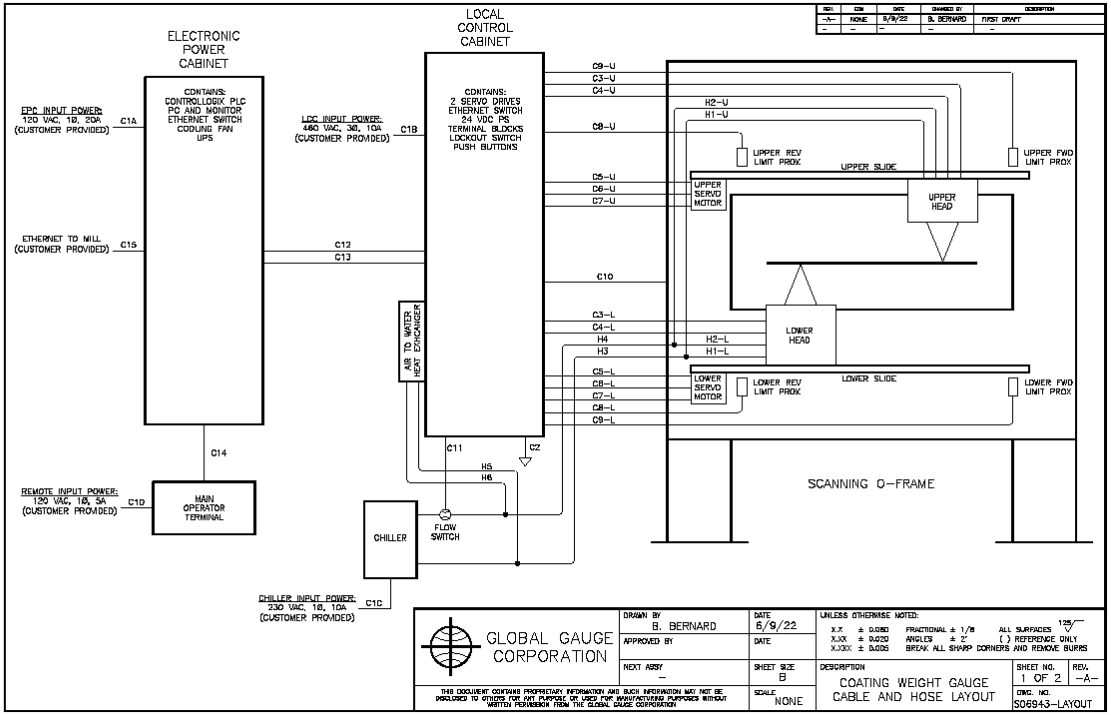
Robust Auxiliary Systems

Shared platform for Perfecta & Accura coating weight gauges

Supporting Systems

- Closed-loop water chiller
- Servo drive motion control
- Industrial cabling assemblies
- Local control station
- Safety interlock systems
- Air purge systems

Designed for mill environments.



SECTION 05

Benefits & Support

Improve quality, reduce costs, and maximize uptime with GGC's measurement solutions and support services.

Benefits for Coating Line Operations

Quality and Process Control

- Real-time coating weight monitoring
- Profile measurement across strip width
- Tighter coating weight tolerances
- Reduced over-coating (material savings)

Operational Efficiency

- Non-contact measurement
- High-speed inline measurement
- Automatic air knife feedback possible

System Reliability

- Multi-detector redundancy
- Built for harsh mill environments
- High uptime with outlier rejection

GGC Support Services

- 24/7/365 technical support hotline
- In-house X-ray generator manufacturing
- Domestic USA spare parts supply

Thank You

Let's discuss how GGC can support your coating line measurement needs.

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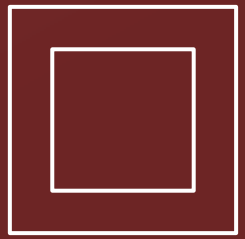

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