Mate Gauge

New automatic methods for paste control for consistent product performance

IBMA Webinar, October 14, 2022

Steve Mate
Founder | CEO
Mate Gauge

IBMA

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Outline

1. Company and Market Status
2. Benefits and Objectives
3. Technical Implementation
4. Equipment Review

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Insights based on experience.

- Focus on thickness measurement
- History in lead battery production
- Multiple clients and OEM partnerships
- 25+ countries
- 16 years of non-stop product evolution

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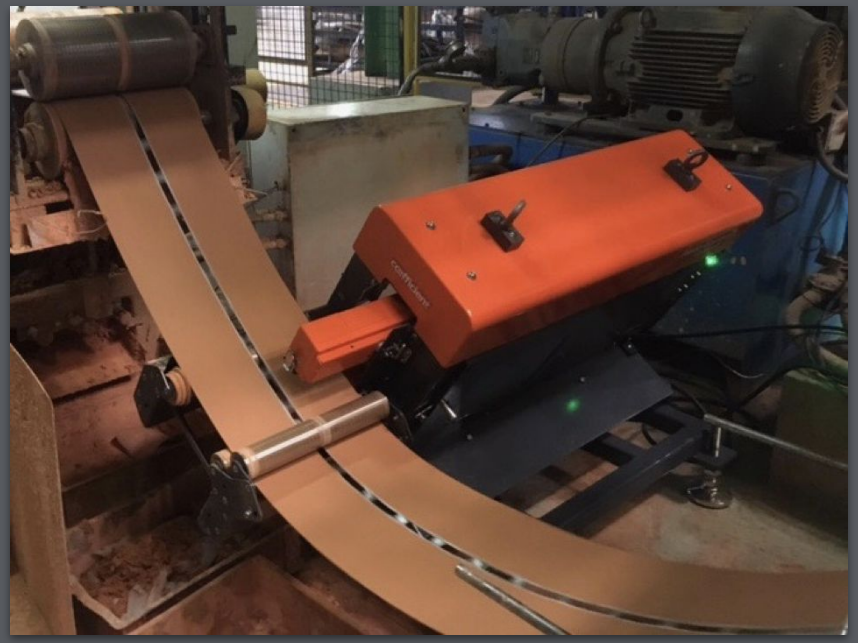
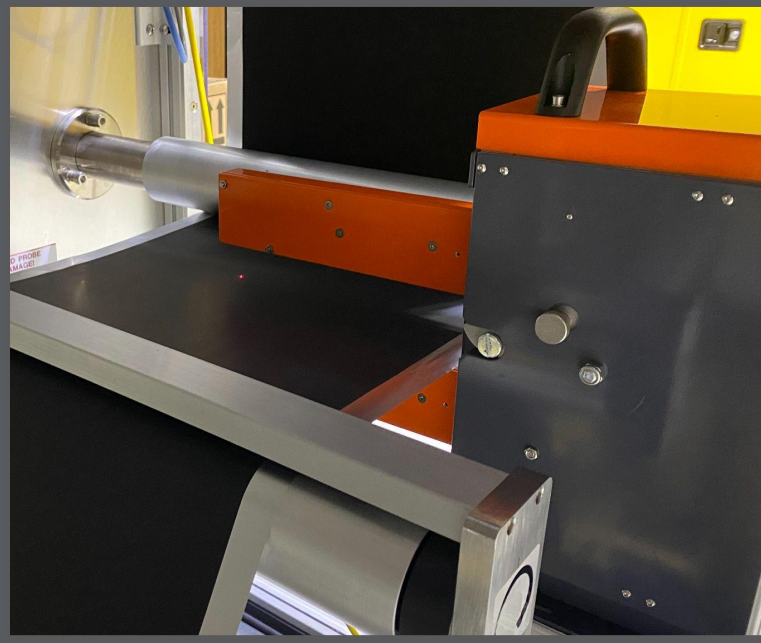
Battery Thickness Measurement Applications

Lead Strips



Pasted Plates



Li-Ion Electrodes

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I'd love to continue the conversation…

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Impacts Post-Covid

1. Covid Precautions
2. Supply Chain
3. Cybersecurity
4. Labour Shortages

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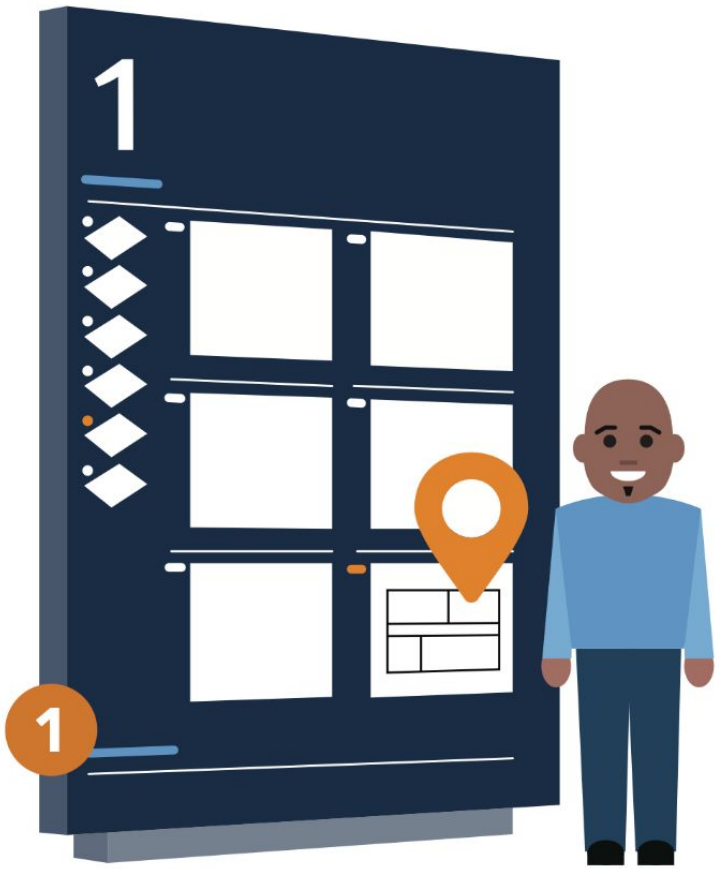
Other benefits to Smart Manufacturing Technologies ....

Jakob's Heuristic

1 Visibility *of* System Status

Definition The design should **always keep users informed** about what is going on, through appropriate feedback within a reasonable amount of time.



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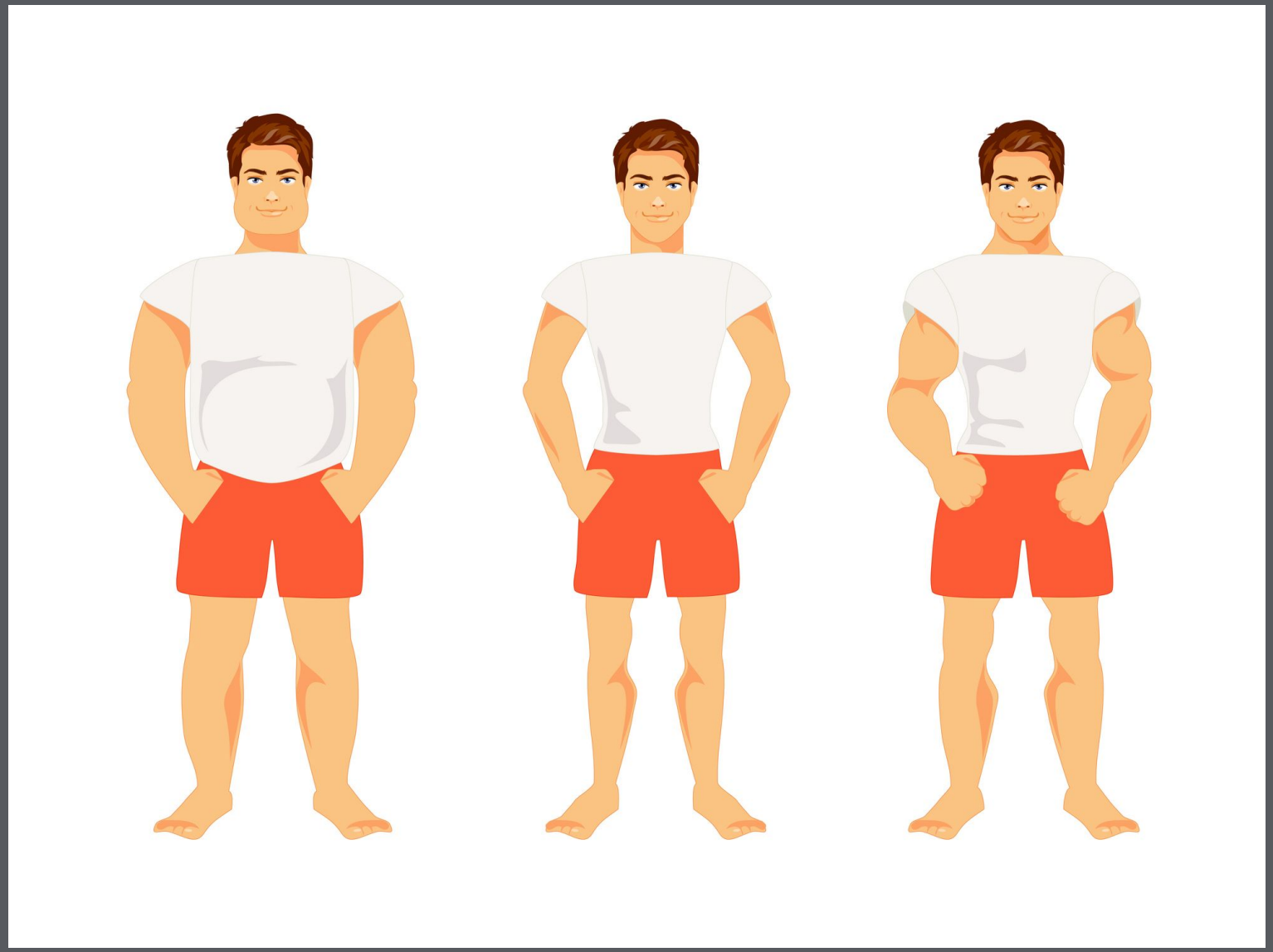
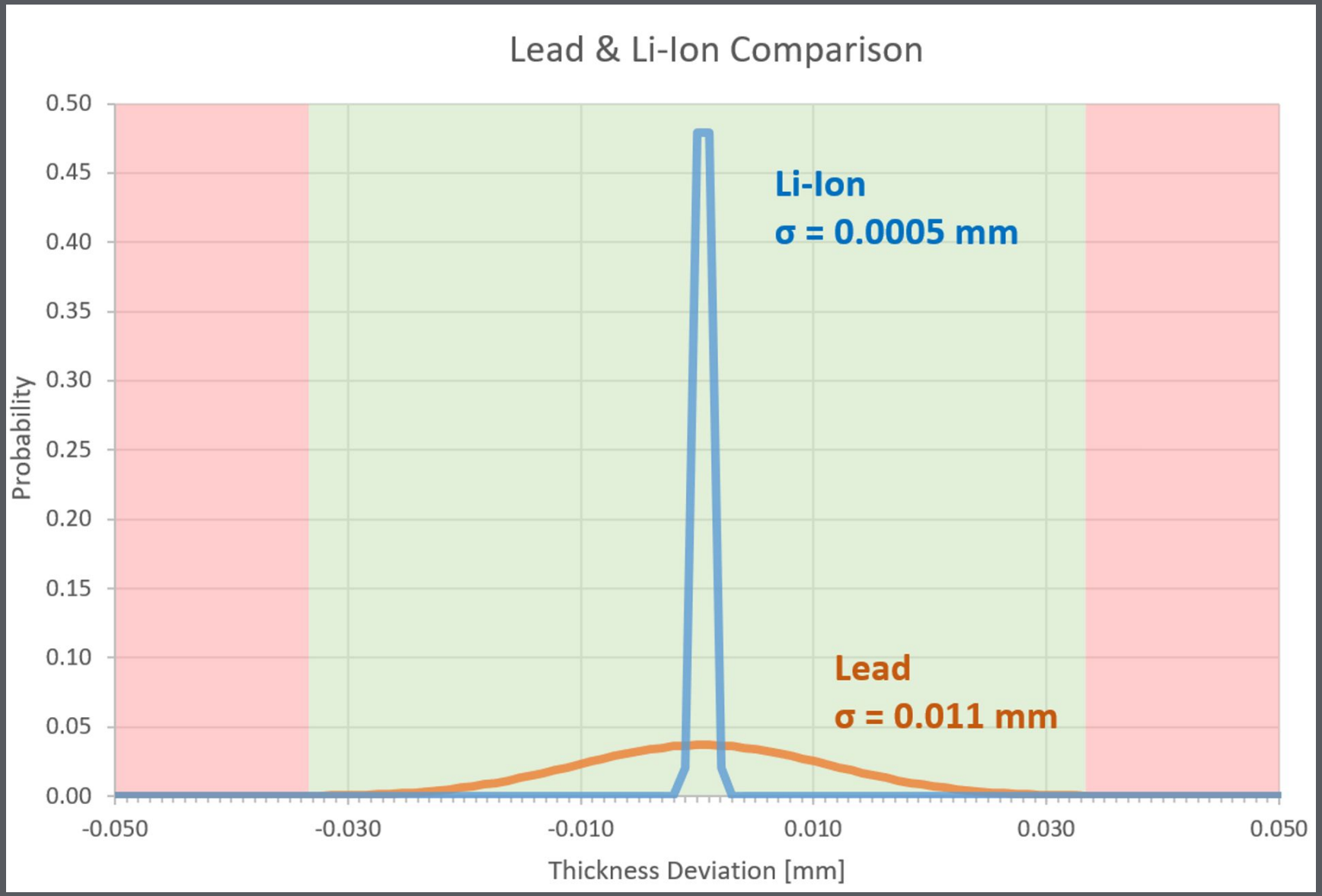
Product:
0.0536 in
0.0541 in
0.0540 in
0.0540 in
0.0538 in
0.0543 in
0.0539 in
0.0540 in
0.0540 in
0.0540 in
0.0570
0.0550
0.0540
0.0530
0.0510
06:30AM
07:00AM
07:30AM
08:00AM
08:30AM
09:00AM
09:30AM
10:00AM
10:30AM
11:00AM
Scan Time
LEFT
RIGHT
Gauge is paused until line starts...
4.8.8 (build 716)
7/19/2022
11:27:06 AM

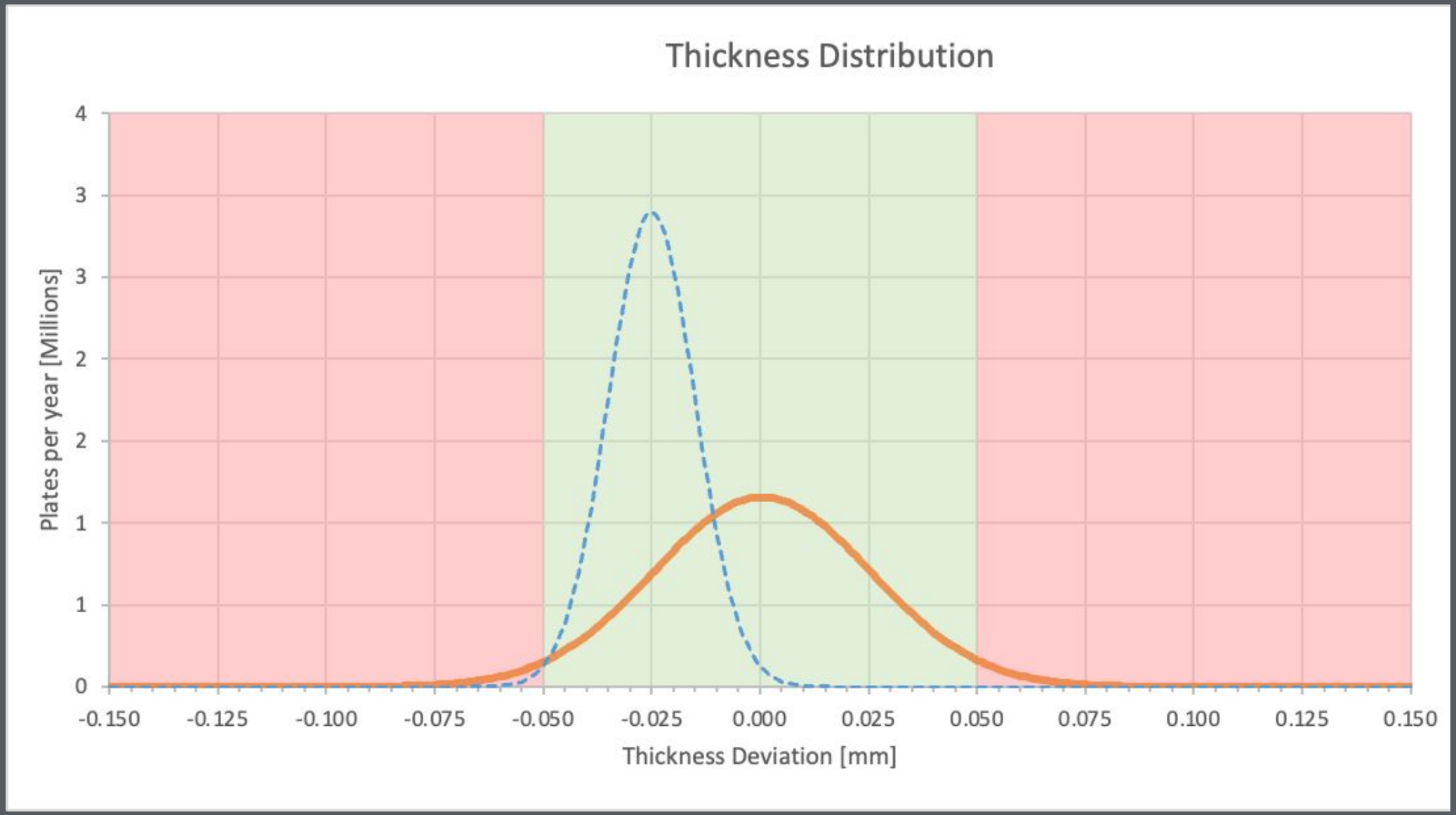
Quality and Technology for everyone...



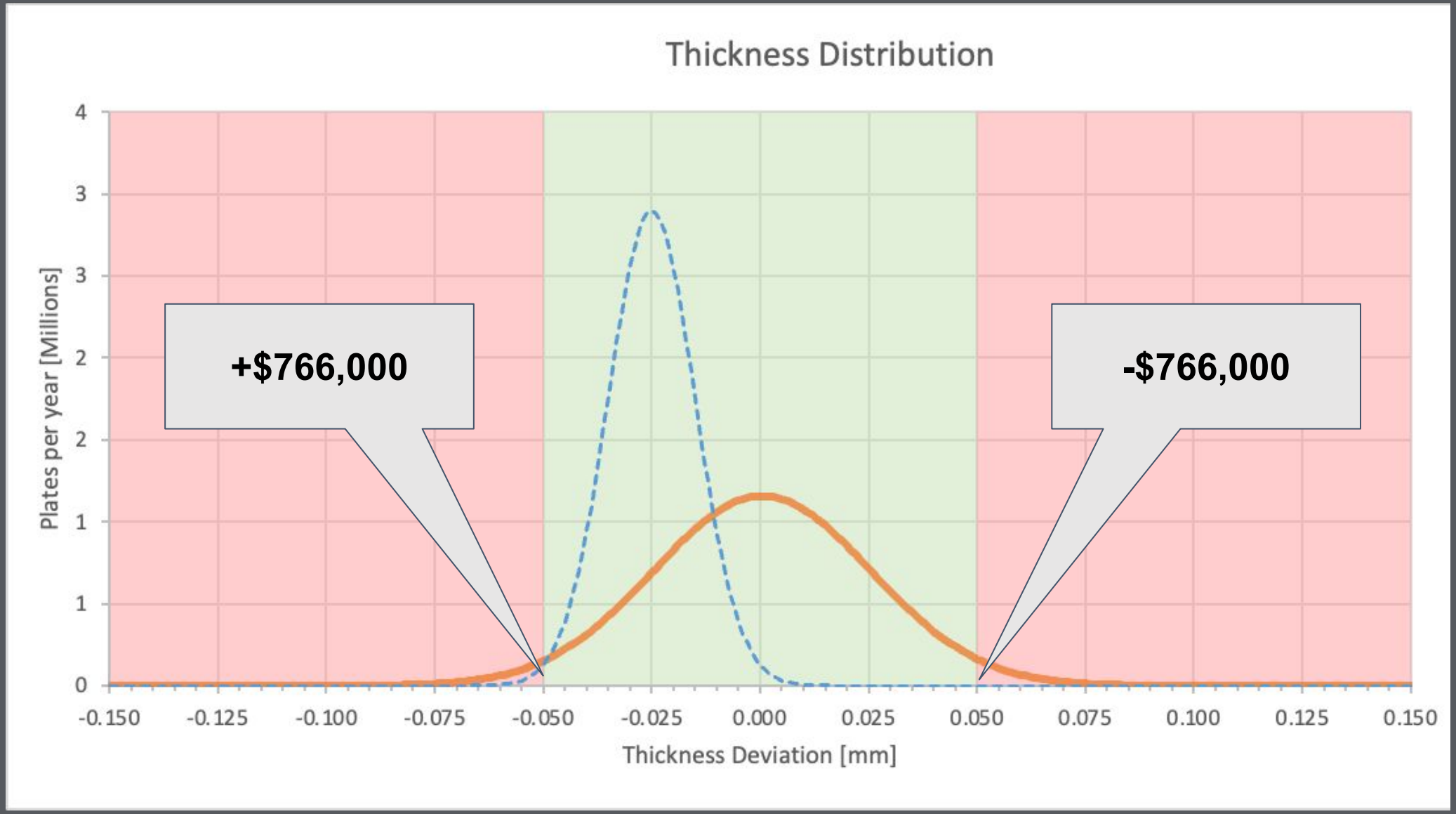
Lead and Lithium Comparison



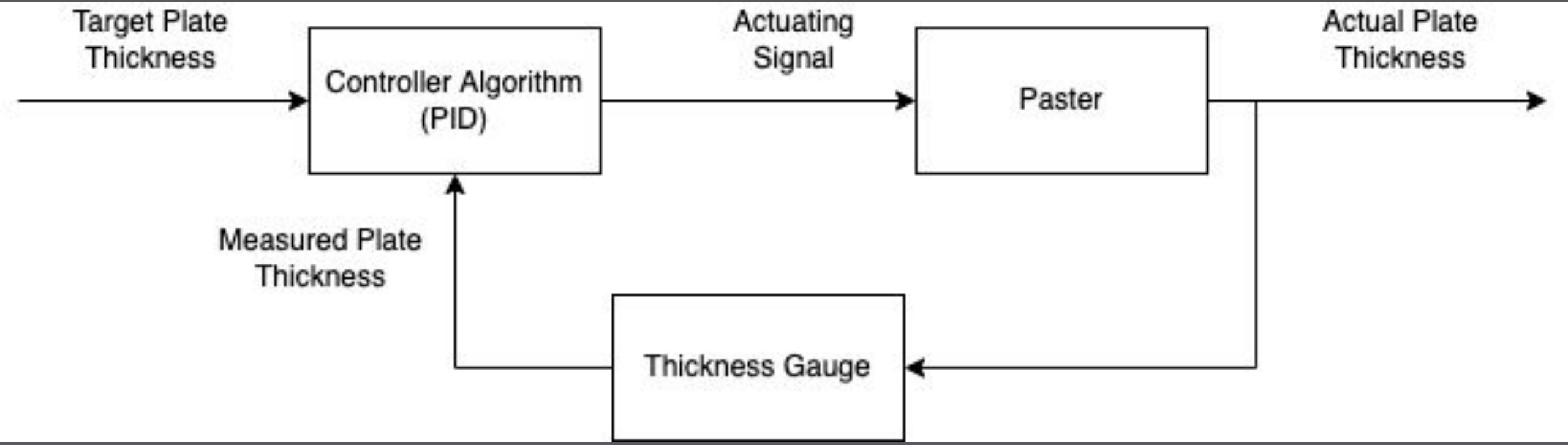
What the future could be...



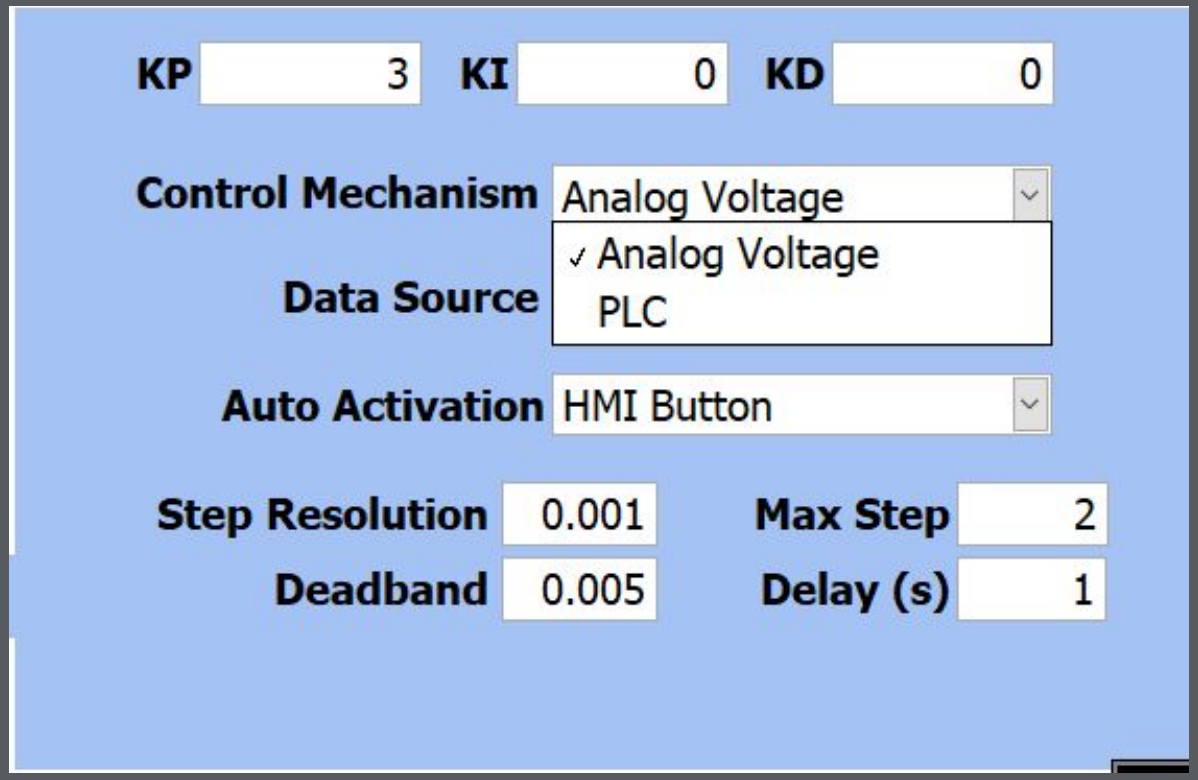
Through a different lens ...



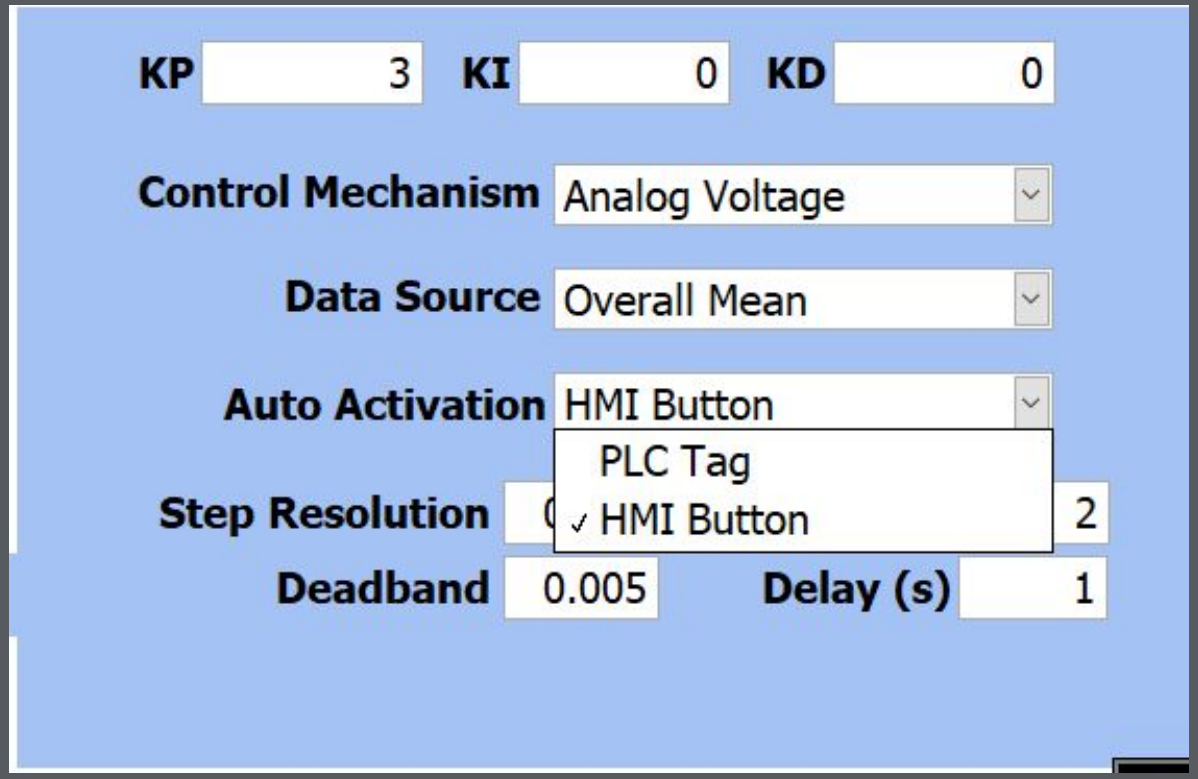
Automatic Methods



Automatic Methods



Automatic Methods



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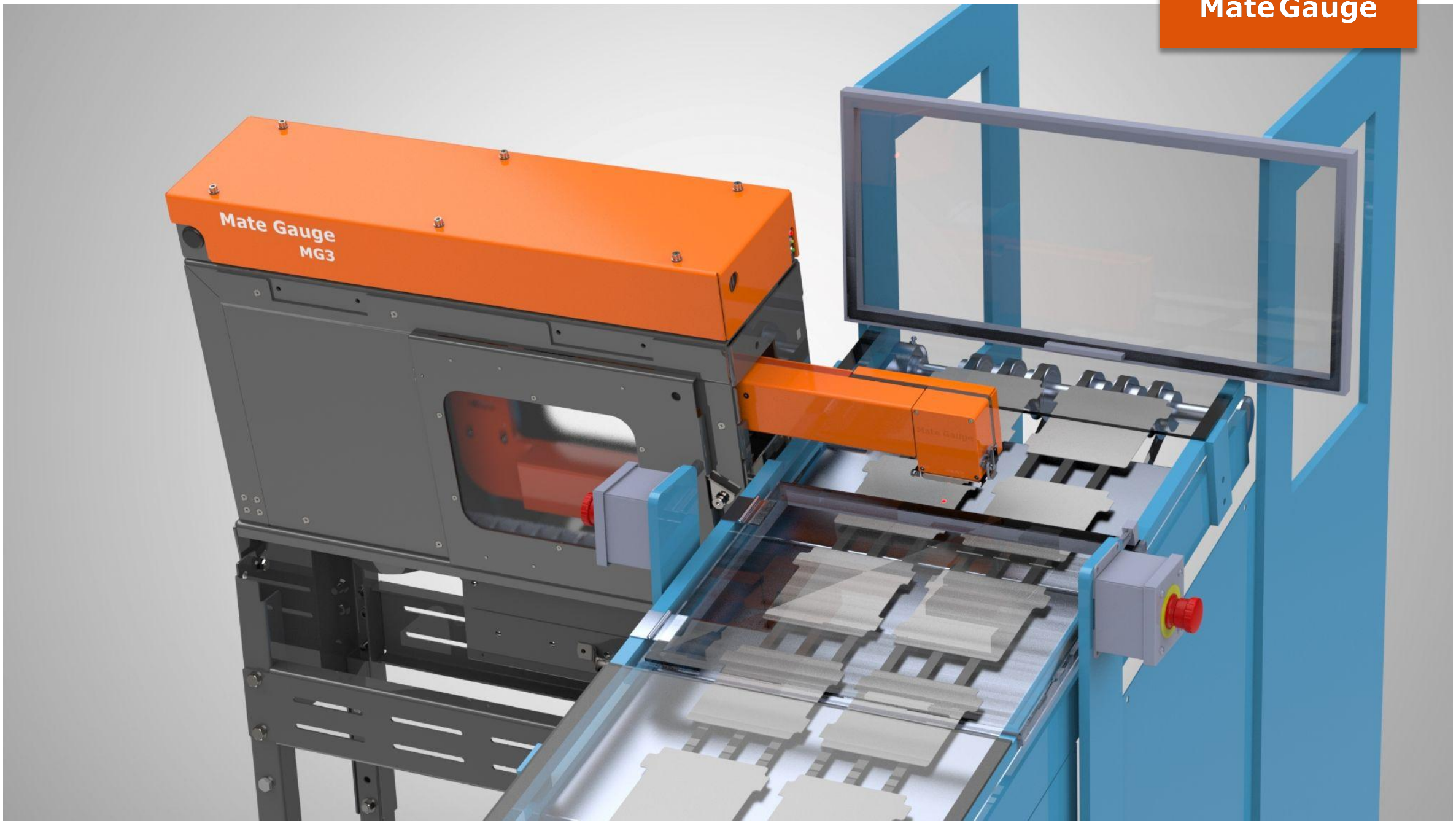

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How Mate Gauge is responding:

Reducing operator involvement

- Complete, plug-and-play thickness measurement solutions
- Self-calibration
- Better data access via faster and easier PLC setup and integration

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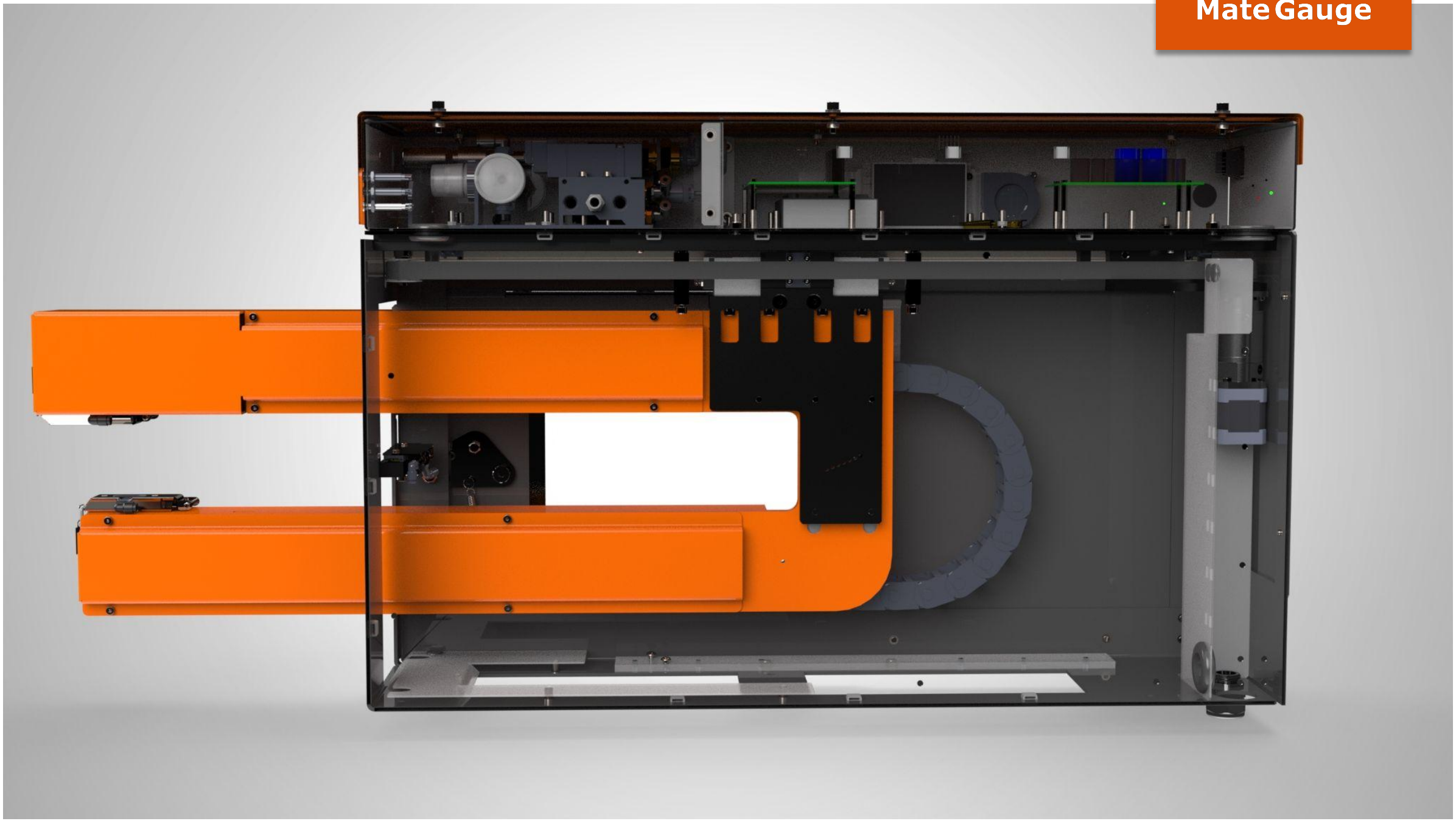
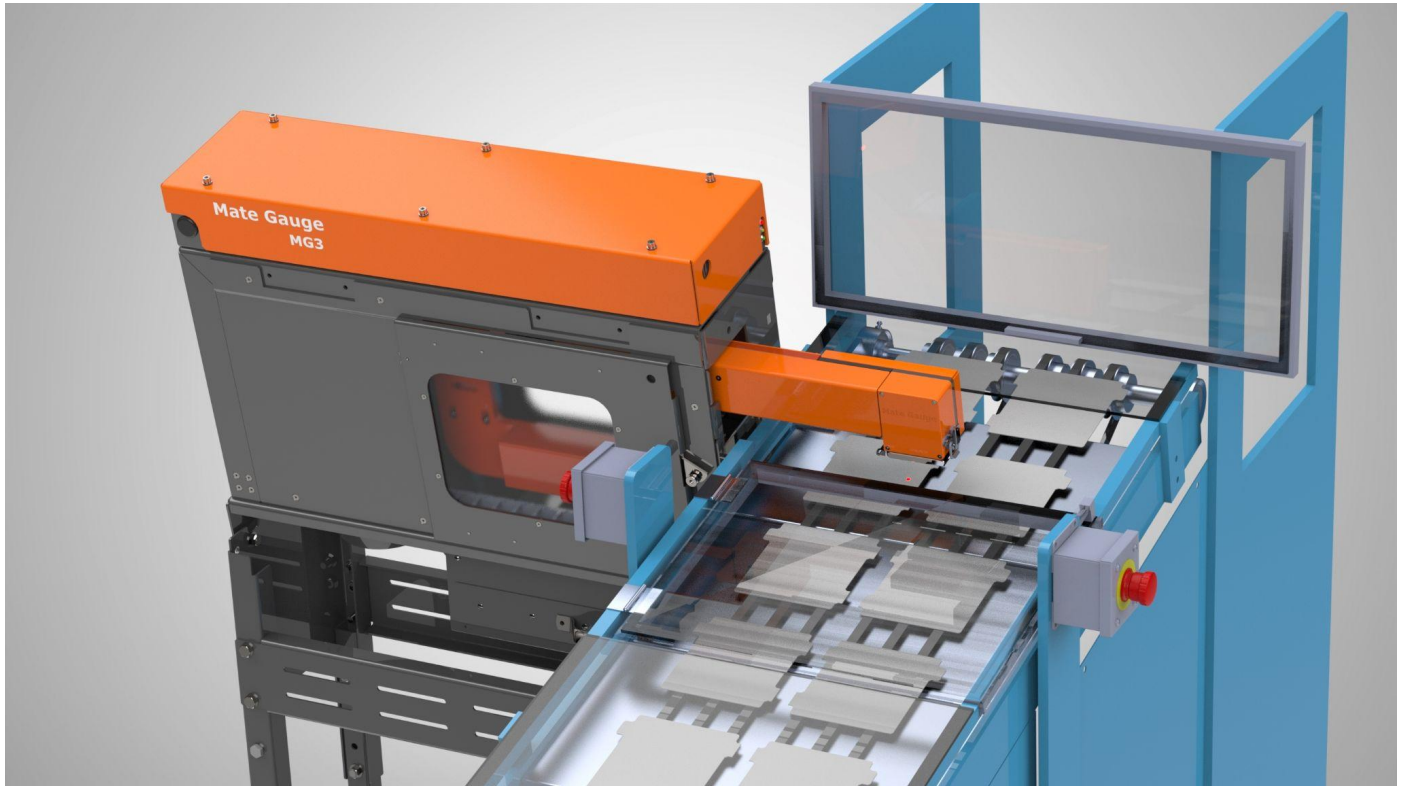


Mate Gauge



After Flash Dry Oven

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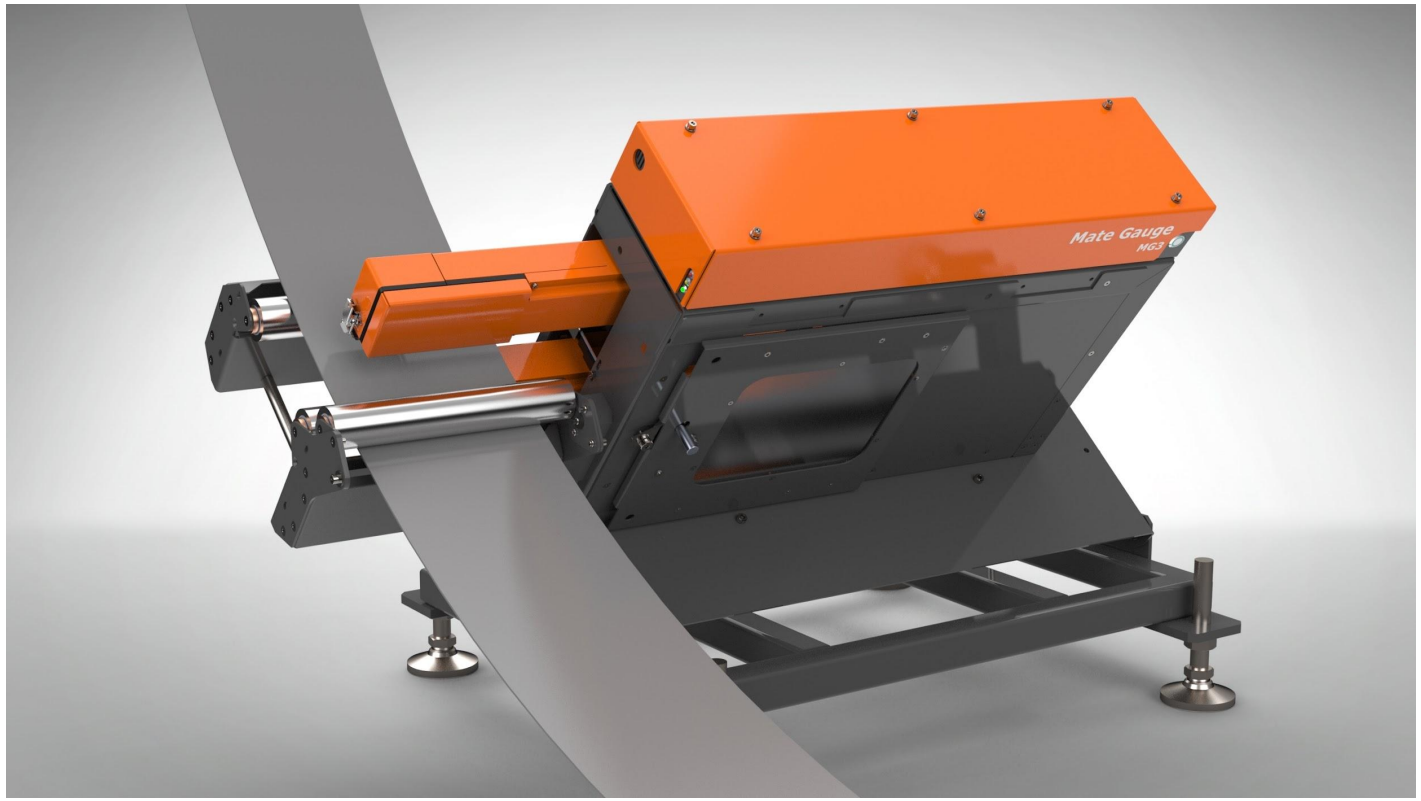
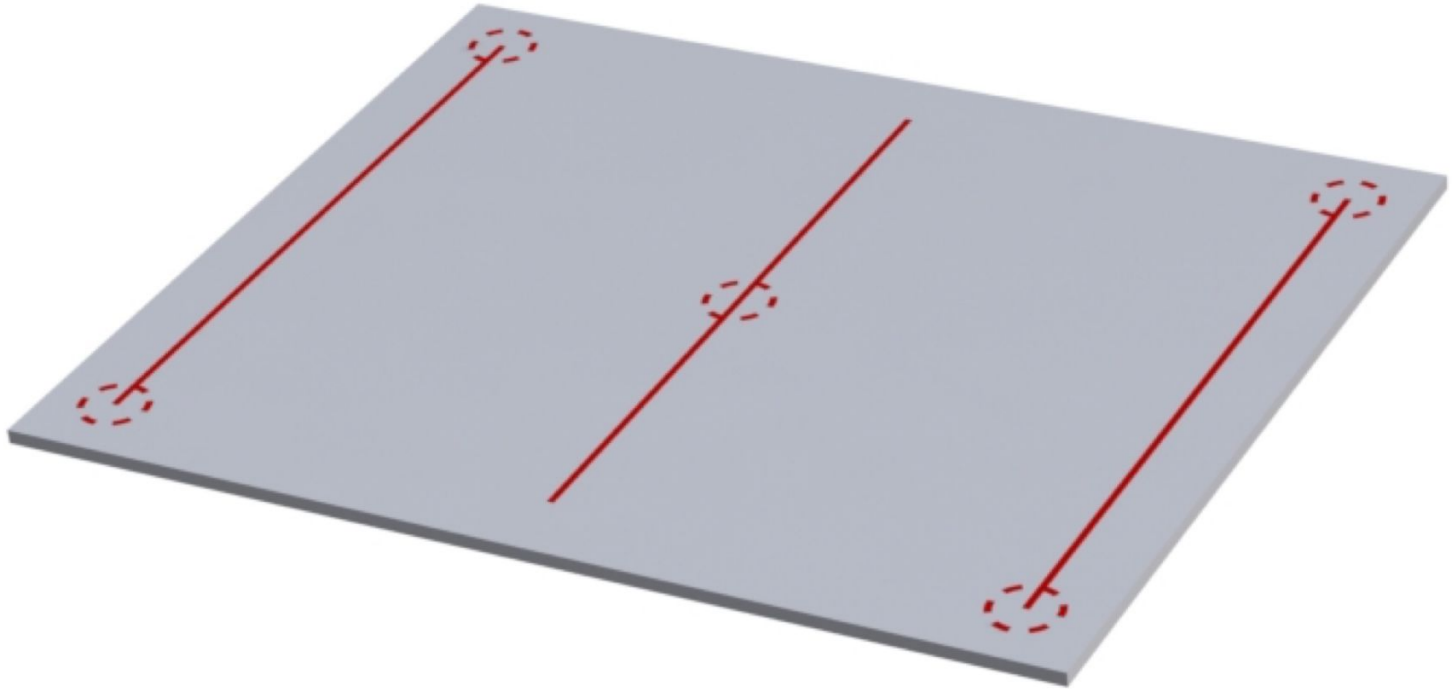
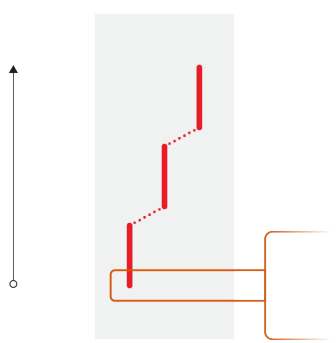


After Paster

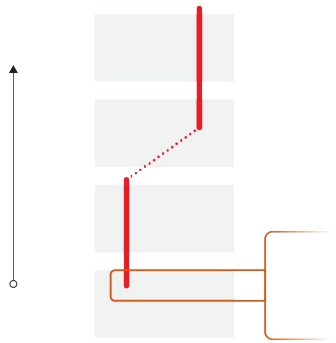
Mate Gauge



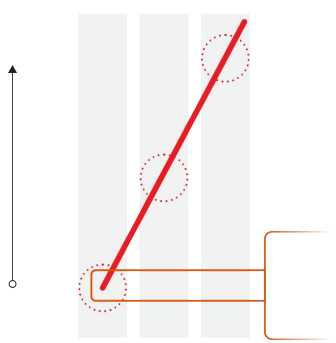
Measurement Apps



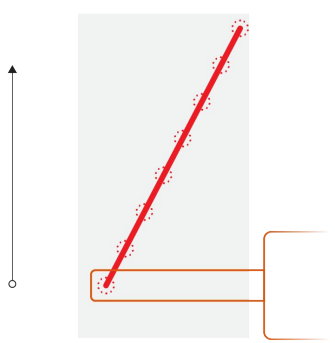
Gauge and Go



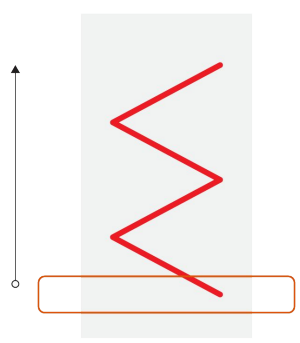
Plates



Strips

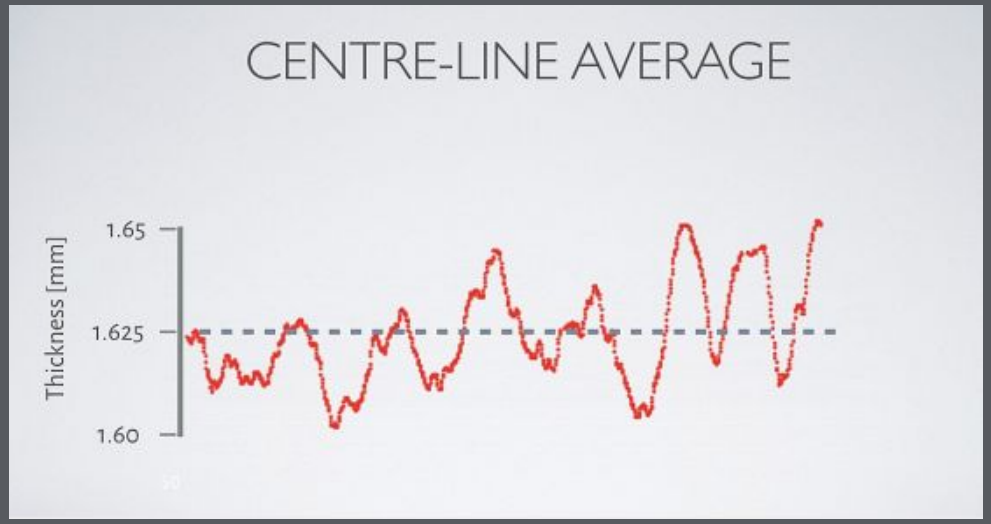


Zones

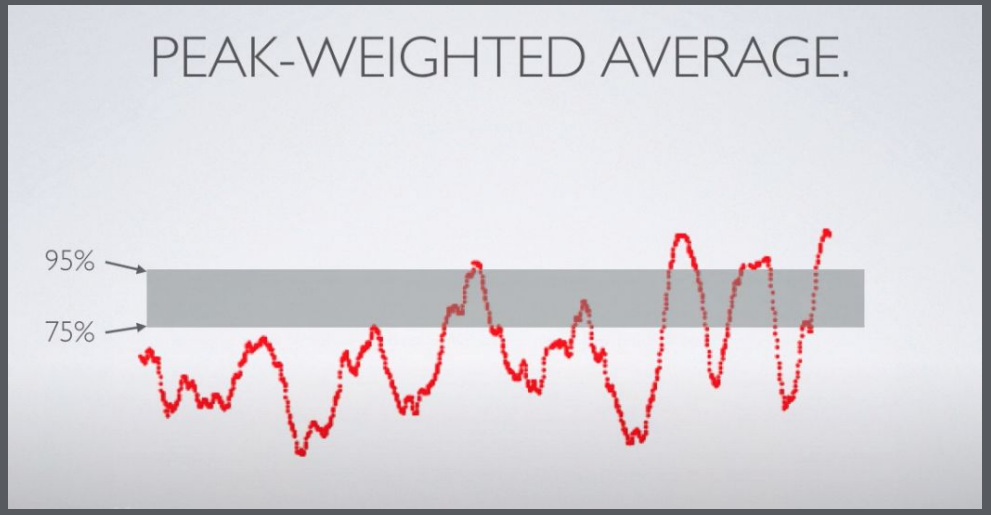


Panels

Built-In Filtering



Pros: weight and thickness correlation.



Pros: better correlation with legacy measurement tools (e.g. micrometer).

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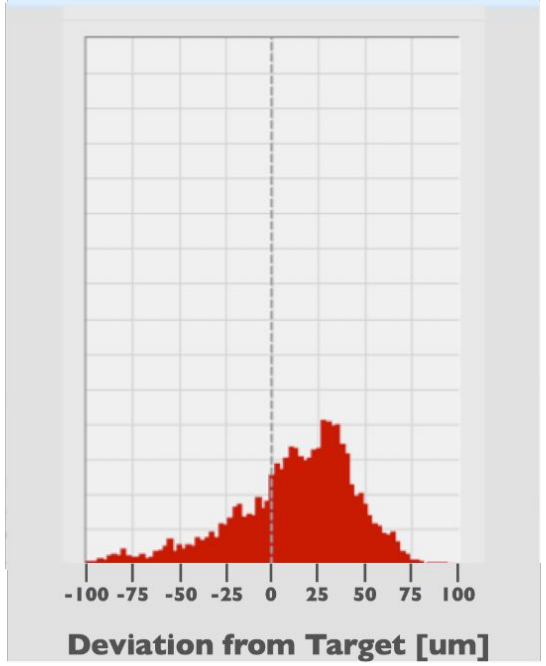
Control Method: Weight Control

3X Std. Dev:

0.075 mm

Cpk 0.5

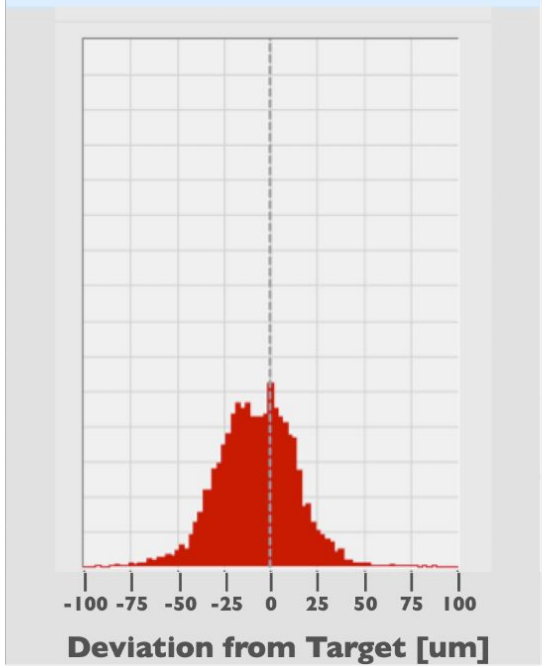


Control Method: Laser Only

3X Std. Dev.:

0.039 mm

Cpk 0.9

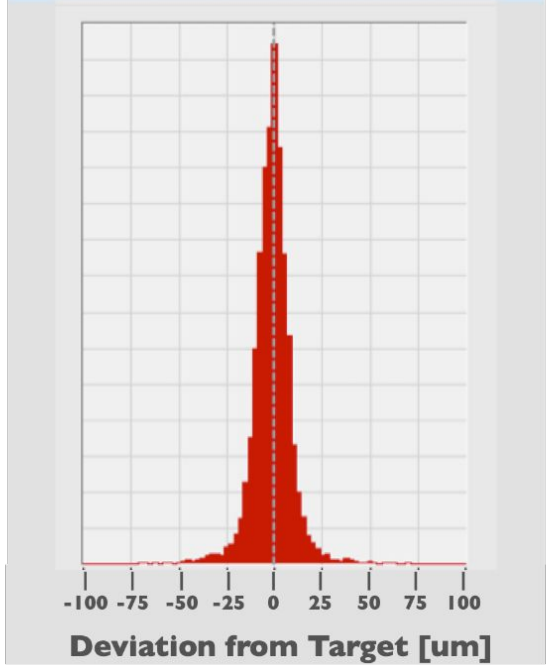


Control Method: Paste Saver

3X Std. Dev.

0.024 mm

Cpk 2.2



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How Mate Gauge is responding:

New MG3 is:

- Complete
- Compact
- Continuous

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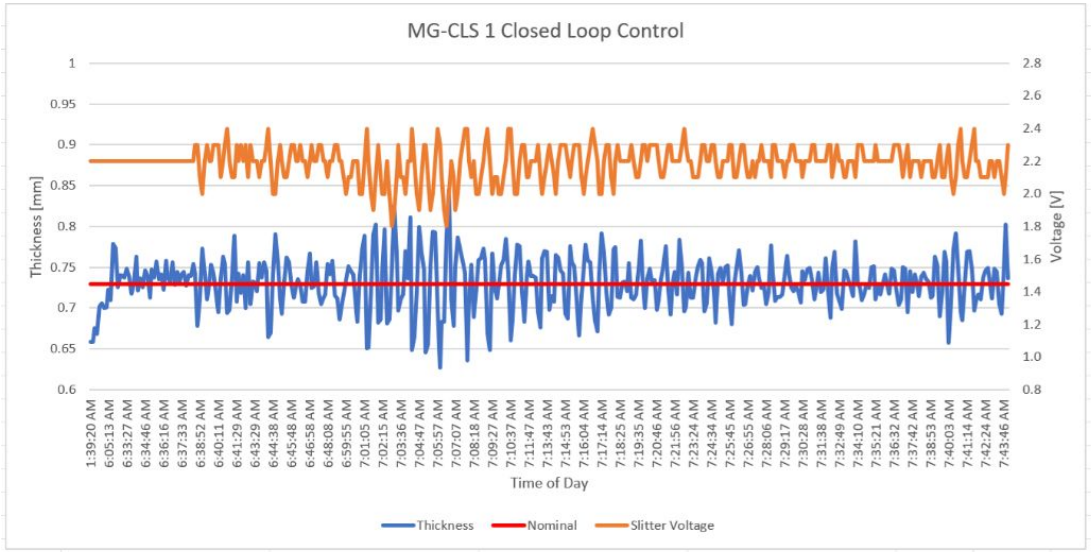
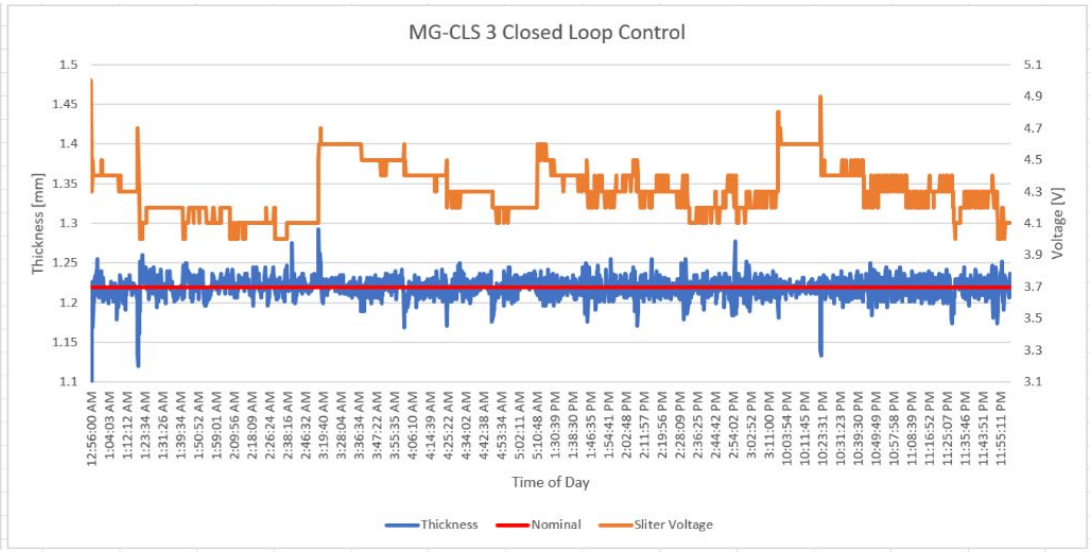
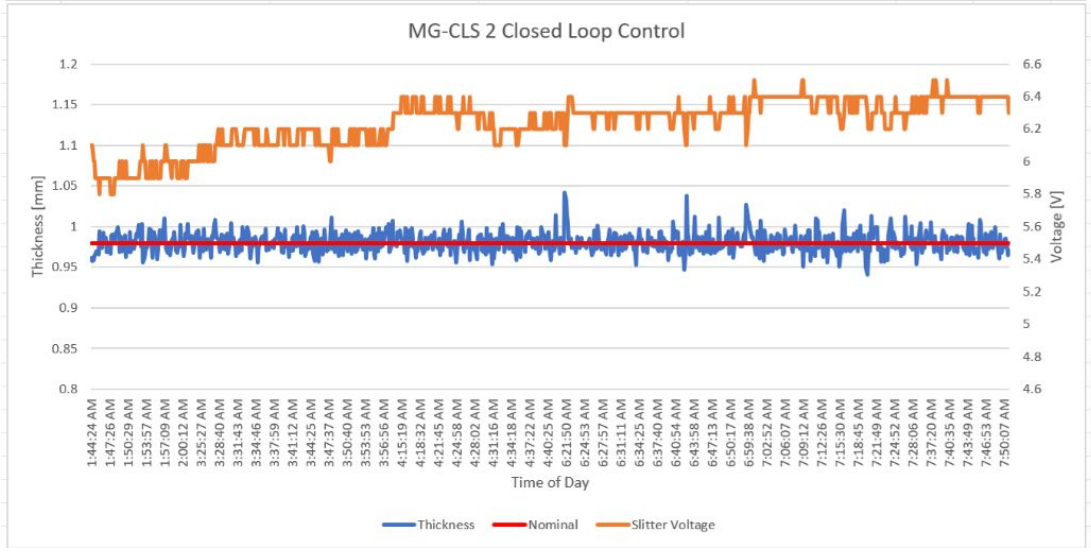
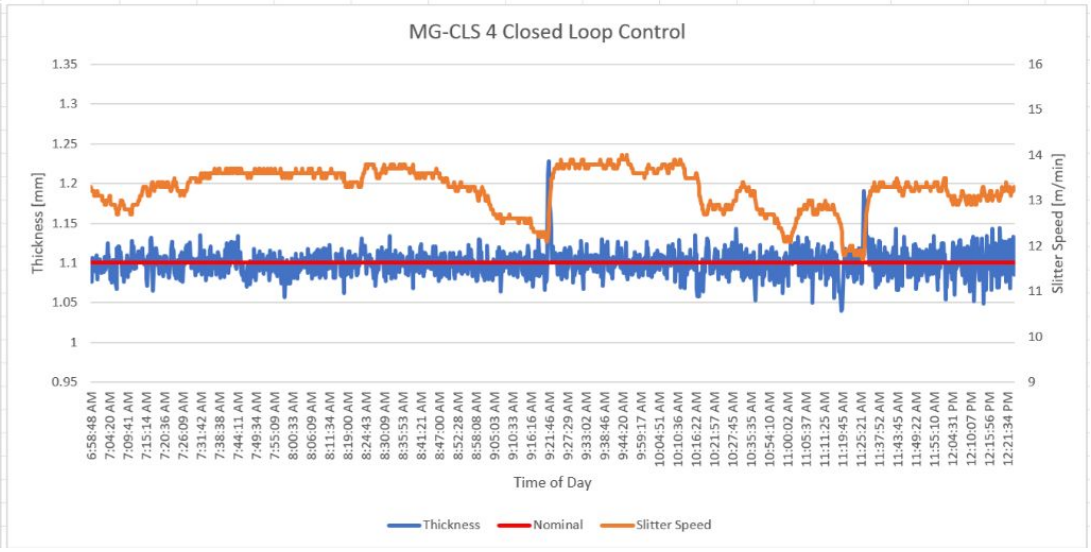
Four client case studies (Lead Strip)









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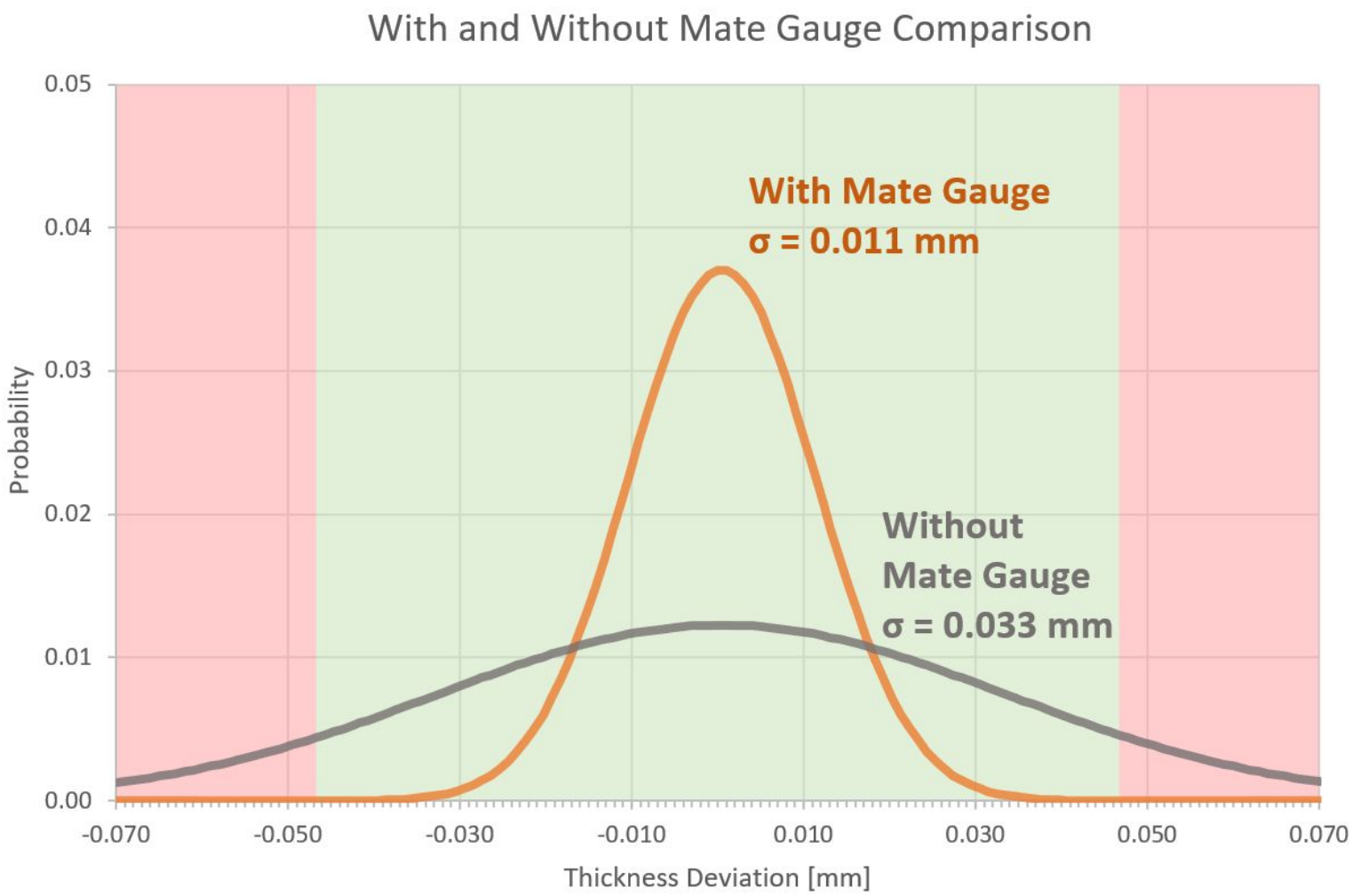
Tighten your Dispersion

Avoid material overages



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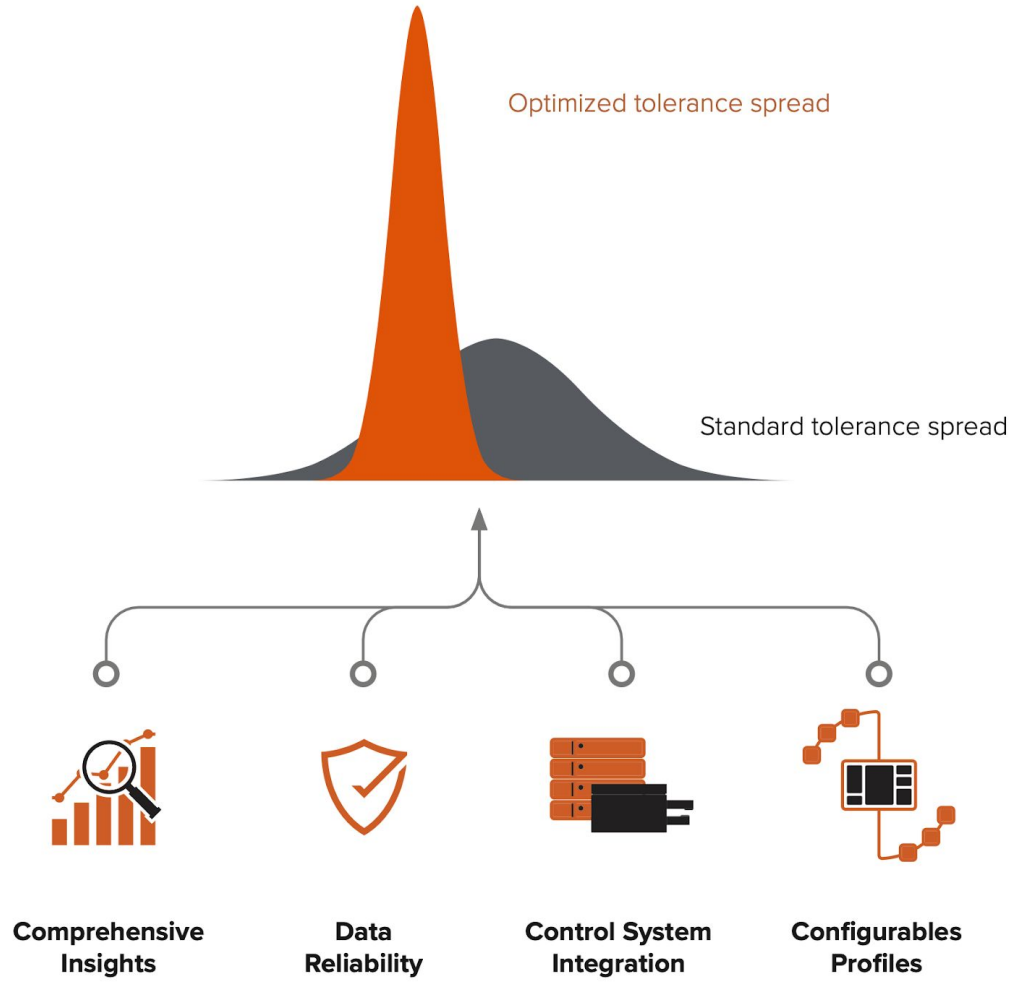

How Mate Gauge is responding:

We're on an ongoing quest to increase production efficiency

- Reduce downtime
- Improve line consistency
- Show production changes in real time
- Access live and historical reporting

Thank you for listening.

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All-in-one thickness measurement solutions

Data Portability

- Full compatibility with industry standard control systems, including Allen-Bradley, Siemens, Omron, and more
    - Includes tagging, automation, and bidirectional communication
- Automatic data stream storage to CSV
    - Fully accessible through Windows
- Data publishing and thickness results
- Remote access for downloading and managing data