



Private Company

Replicating industrial coil coating processes in a laboratory setting

Industrial materials

Background

We are a global leader in coatings, developing advanced solutions for durability, aesthetics, and performance across diverse industries, from construction to automotive and industrial applications.

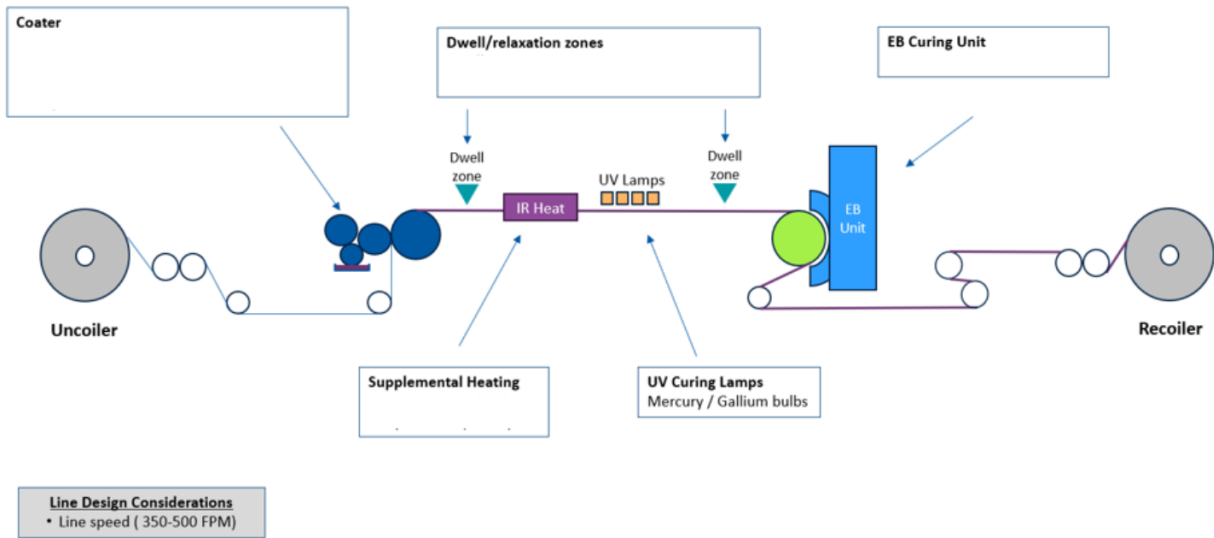
Coil coating is a continuous, automated process used to apply coatings to metal sheets before they are fabricated into final products. This process is widely used across industries to enhance corrosion resistance, improve aesthetics, and add functional properties to metal substrates, which are later stamped, bent, and formed after coating application.

One of the key challenges in developing new coil coatings is ensuring that laboratory results translate effectively to real-world production conditions. In the lab, coatings are typically applied using the ["drawdown" method](#), where a fixed amount of coating is spread across a substrate using a controlled applicator, such as a coating rod, to achieve a uniform film thickness. However, [in a production environment](#), coatings are applied using high-speed applicator rollers, often exceeding 500 feet per minute (FPM). This discrepancy can cause inconsistencies in film properties, adhesion, flow, and overall coating performance when transitioning from lab to full-scale manufacturing.

An approach that better replicates production conditions within a laboratory setting would improve the predictability of lab results, reduce costly production trials, ensure a smoother transition from R&D to full-scale manufacturing, ultimately improving the performance and reliability of next-generation coil coatings.

What we're looking for

We are looking to replicate real-world coil coating production conditions in a laboratory setting. This could involve a small-scale pilot line or alternative methods that mimic key industrial parameters. The diagram below illustrates the key parameters and setup of current customer line conditions, providing insight into the critical factors that must be replicated or simulated in a lab environment.



The ideal solution would be able to simulate coating applications in similar production settings while ensuring coatings meet key performance standards, such as appearance, dry film thickness, gloss control, adhesion, and flexibility—critical factors in predicting coating performance and ensuring consistency from lab to production.

Solutions of interest include:

- Pilot-scale coating line replicating critical process parameters
- High-speed roller for lab-based testing
- Alternative lab methods to simulate real-world application dynamics
- Novel application techniques that mimic high-speed industrial coating

Our must-have requirements are:

- Accommodates aluminum or steel (HDG, galvalume) substrates
- Supports substrate thickness of 0.2-0.8mm
- Achieves dry film thickness of 0.2 mills (primer) and 0.8 mills (topcoat/clearcoat)
- Uses EPDM (ethylene propylene diene monomer) application rollers—polyurethane rollers are not acceptable due to swelling
- Includes a curing step (e.g., UV, thermal curing)

Our nice-to-have's are:

- Includes an electron beam curing unit
- Ability to test multiple curing methods in one setup
- Adjustable application parameters to match different production lines

What's out of scope:

- Manual roll application and drawdown methods, including wired bar coating

Acceptable technology readiness levels (TRL):

Levels 3-9

1. Basic principles observed
2. Concept development
3. Experimental proof of concept
4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you

Eligible partnership models:

Sponsored research
Co-development
Equity investment
Supply/purchase
Licensing
Material transfer

Benefits:

Sponsored Research

Funding is proposal-dependent, with up to \$100,000 for proof-of-concept, plus potential additional funding for further development.

Expertise

Partners will be connected to industrial coatings R&D scientists with expertise in coating chemistry and formulation, coating application and testing, catalysis, materials science, and analytical chemistry.

Tools and Technologies

Common instruments for materials science and analytical chemistry. Coating related tests can be conducted by the research team of the sponsor.

Facilities and Services

We can offer complimentary testing and proof-of-concept validation at our facilities.

Please contact the University of South Florida Technology Transfer office representative for submission – Karla Schramm at kschramm@usf.edu