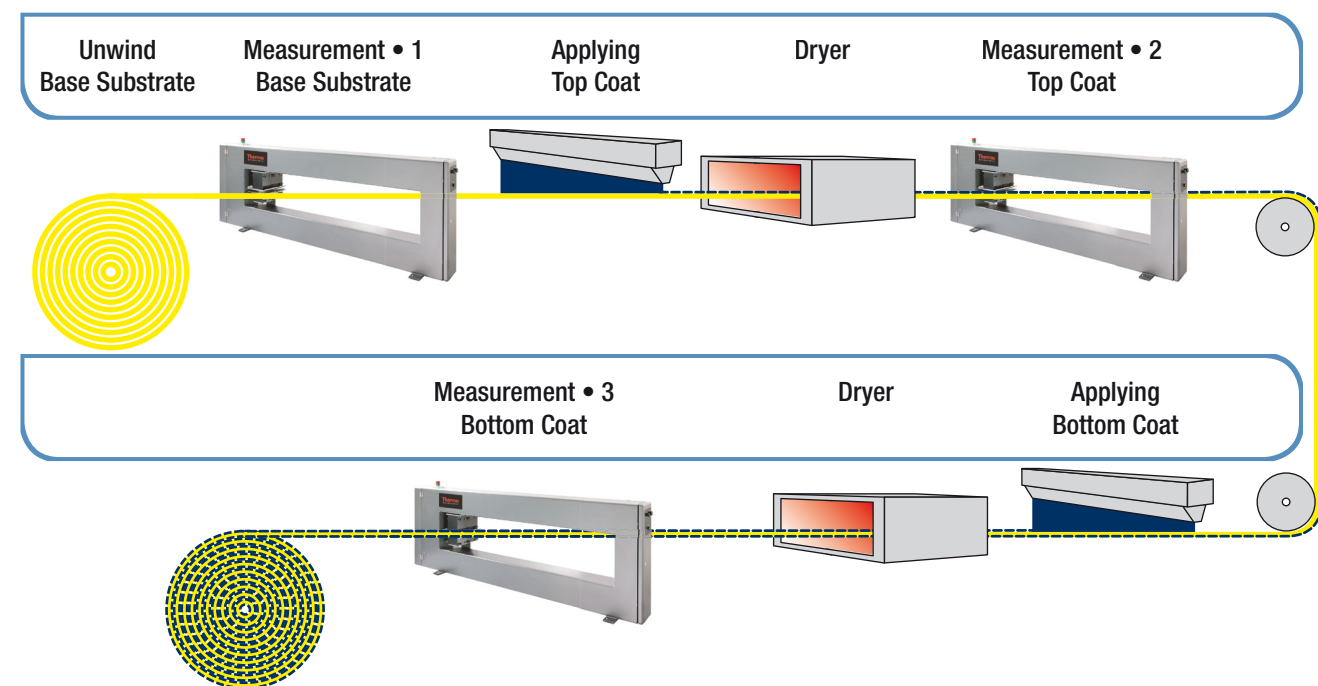


Anode and Cathode Coating Solution



Other Notable Features on 21Plus Measurement and Control System:

EXACTRAX same spot measurement

For accurate differential measurement of the base substrate, top and bottom coating by perfect alignment of the measurement paths of all scanners in a multi-scanners solution.

EZCal software

For easy calibration of Prosis IR sensor to measure newly formulated separator film products.

Roll Report

For production quality tracking and archiving.

Email us at sales.webgauging.de@thermofisher.com
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Thermo Scientific 21Plus!
Measurement and Control System

Solutions for

Lithium-Ion Battery

Improve the performance of lithium ion batteries
with advanced coating technology.

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Application Overview

From small hand-held electronics to medium sized electric vehicles such as cars, buses and trucks to larger marine vessels and smart grid energy storage systems, Lithium Ion Battery technology is changing our lives. Critical to the advancement of the battery is the emergence of higher quality separator film, the coating of separator film for higher efficiency, and the coating of the anode and cathode. Discover how the Thermo Scientific™ 21Plus! thickness measurement and control solutions are helping the industry improve the quality, consistency and productivity of lithium ion batteries.

Separator Film

Separator film is one of the key components of a lithium ion battery. It is a thin but permeable layer of film used to separate the anode from the cathode and prevent short circuiting while facilitating the flow of charged ions. Separator films are usually produced either by a dry or wet process to create the required micro porous structure. Consistent thickness of the film and homogenous distribution of the pores are therefore necessary to optimize performance and life of the battery. Additionally, separator film can also be coated with ceramic or some other material to improve efficiency.

Anode and Cathode Coating

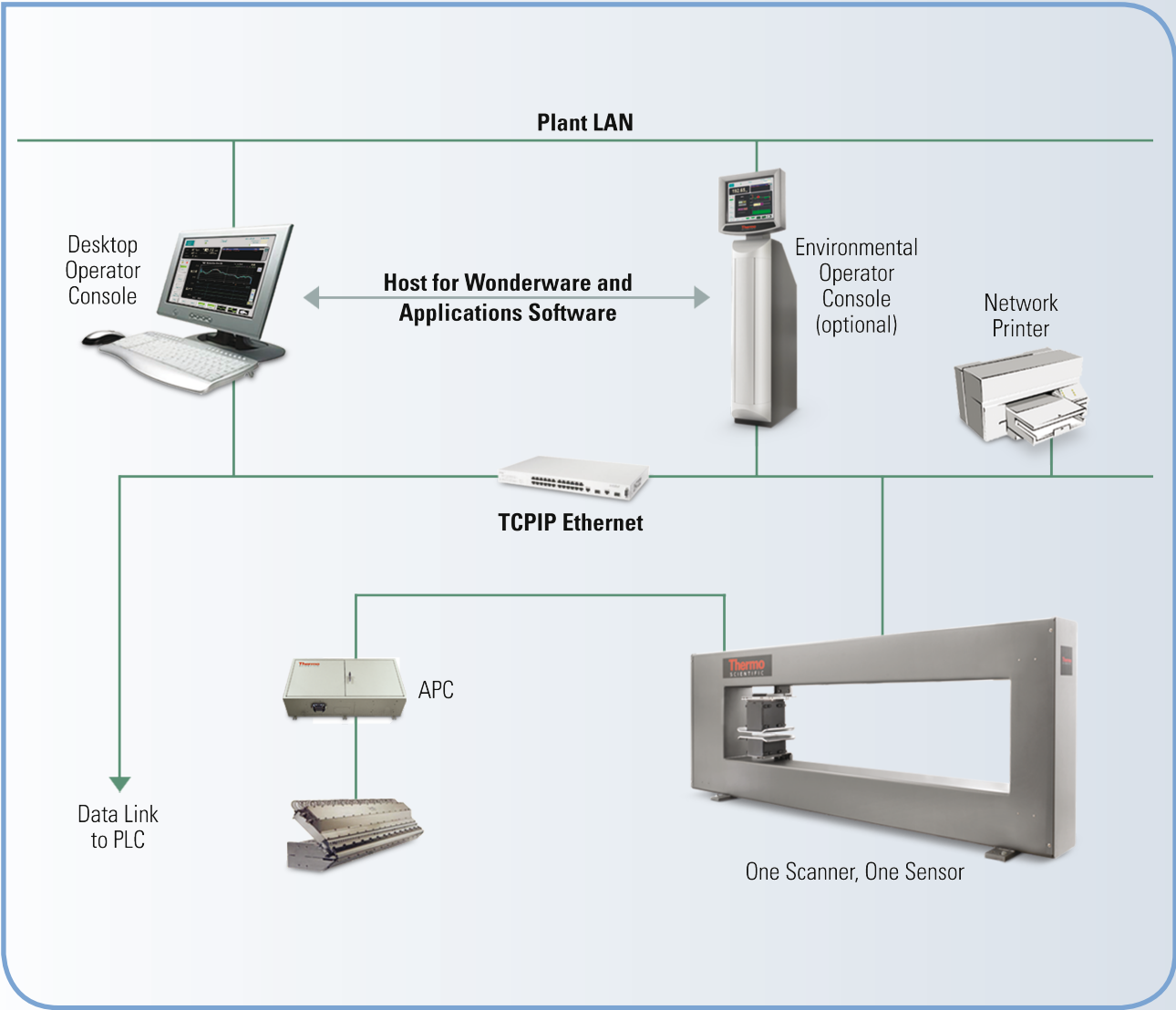
Continuous or patch coating on aluminum substrate for the cathode or on copper substrate for the anode is an expensive and demanding operation. Uneven coating of the cathode or anode will ultimately result in poor construction of the battery or even worse, creating a hotspot which could lower the efficiency of the battery, shorten its lifespan, increase charge time and/or increase the risk of thermal runaway. Additionally, coated products are not recoverable. Therefore, an accurate measurement of the coat weight on both sides of the substrate is paramount to controlling and perfecting the process and improving yield and quality.

Measurement & Control Solution for Li-Ion Battery

Direct Thickness Measurement of Separator Film using Prosis IR Sensor and Beta Plus on 21Plus! Measurement and Control Platform

Leveraging over 20 years of experience with on-line Infrared measurement technology, the Thermo Scientific™ Prosis™ IR sensor is a new breed of advanced non-nuclear measurement technology and is the ideal solution for measuring the thickness of separator film. Designed to provide the highest accuracy and measurement resolution possible, the Prosis IR sensor has a wider spectral coverage range that allows it to measure more materials than ever before. Unlike any other IR sensing technology available on the market, the Prosis IR sensor analyzes the full spectral response of the separator film to IR energy and provides the most accurate thickness measurement possible. Coupled with options like automatic process controls for AutoDie and machine direction, the 21Plus! on-line gauging platform will provide measureable return on investment through higher quality production, increased yield and decreased scrap.

Alternatively, the Beta Plus sensor can be used for the measurement and control of separator film especially those that are coated with ceramics or other similar inorganic material.



Coat Weight Measurement of Anode and Cathode with Beta Plus Sensors on 21Plus! Measurement and Control Platform

Thermo Scientific Beta Plus Sensors are the ideal sensing technology for measuring the coatings on the cathode and anode. The Beta Plus sensor features exceptionally high signal with extremely low noise and a unique isotope geometry that results in the most accurate coating weight measurement possible and highest edge resolution. With the dynamic scanning repeatability of ±0.025% (Krypton-85 model), the performance of the Beta Plus sensor is unparalleled. Combining this with the Lithium-Ion Battery Coating Application Software Package available on the Thermo Scientific 21Plus! gauging platform, it is able to intelligently measure the correct coat weight by recognizing both coated and uncoated sections of the anode or cathode. This will ensure high quality and in-spec production and help reduce the risk of non-uniformity and other downstream battery construction problems.