WEB GAUGING AT A GLANCE

NDC Advantage Series
NDC Technologies Web Solutions

Engineered to deliver outstanding results from your process

NDC’s Web Solutions are designed to deliver greater results through measurement, control and process visibility. Industry 4.0 OPC UA communications are supported by NDC intelligent solutions.

NDC’s TDi™ (Total Distributed Intelligence) Web Gauging platform is based on a robust industrial architecture that ensures high reliability, low cost of ownership and straightforward installation. The TDi architecture supports intelligent sensors (iSensors™) and scanning frames (iFrames™) with each device running its own compact powerful processor called the D-BRIC™. This architecture supports fast Ethernet communications between the system components, but also provides fast commissioning and remote diagnostics capability.

Customer Benefits:
► Higher quality and productivity
► Lower manufacturing costs
► Improved process visibility
NDC’s TDi Platform

A reliable, scaleable platform that can be configured for a wide range of applications

NDC’s Web Gauging systems are engineered to deliver greater results through measurement, control and process visibility. The flexible TDi architecture means they can be configured for applications ranging from fixed-point measurement to multi-scanner systems with complex controls.

**8000F Fixed-Point Web Gauging System**
- Simple, accurate measurement solution
- Common TDi architecture with NDC’s family of web gauging systems
- Capable of supporting more than one line
- Seamless upgrade path to NDC’s 8000 TDi scanning systems
- Supports NDC’s GBS and IR sensors
- Process visibility provided by NDC’s MiniFlex™ Operator Work Station (OWS) or a customer-provided PC
- Compact sensor form factors deliver measurements from restricted process locations
- No sensor standardization
- High-reliability system with low cost of ownership

**8000 TDi Web Gauging System**
- Web Gauging solutions for the extrusion, converting, calendering and nonwovens industries
- Common TDi architecture that includes NDC’s intelligent sensors and scanning frames
- Fast Ethernet communications between all of the system nodes
- Supports up to three AccuTrak™ or MiniTrak™ scanners and four sensors
- Extensive library of operator and maintenance displays with NDC’s MiniFlex OWS
- Complete package of available machine direction and advanced profile controls

**Pro.Net TDi Web Gauging System**
- Offers expanded measurement, control and information capability
- Provides the incremental power of an industrial PC running Windows® software
- Suitable for large, complex processes, for example film orientation lines, tire calenders, multi-station coaters and sandpaper lines
- Supports up to six AccuTrak™ or MiniTrak™ scanners and eighteen sensors
- User-configurable displays that enable operators to organize essential information on a single screen
The Largest Number of Web Gauging Sensors

NDC offers a measurement solution for the most demanding web gauging applications

NDC’s web gauging portfolio includes infrared, beta, X-ray, laser, gamma and optical measurement technologies. These gauges are all supported by the TDi platform, representing the widest range of measurement technologies available for the web gauging business.

**HazePro**
- HazePro accurately, reliably measures the haze of narrow and wide plastic films online for real-time process and product quality control.

**FilmPro**
- FilmPro measures the true thickness and weight of thin film to thick sheet polymeric products and coatings with multi-layer discrimination.

**NW710S Infrared**
- The NW710S employs forward-scatter optics to measure the basis weight and moisture of spunbond nonwoven products.

**SR710S Infrared**
- The SR710S is specifically designed to measure clear coatings on metal, foils, metallized papers and plastics.

**NDC710S Infrared**
- The NDC710S sensor provides coat weight and moisture measurements and can effectively discriminate individual layers in co-extruded coatings.

**XRT X-Ray Transmission**
- Provides basis weight or thickness measurement across a wide range of products with minimal safety licensing issues.

**XRB X-Ray Backscatter**
- The XRB sensor offers cost-effective thickness or weight measurement in a compact single-sided form factor.

**OptiMike**
- The OptiMike optical micrometer projects a beam of light across the apex of the product on a roll to measure thickness.

**Laser Dual-Sided**
- NDC’s laser gauges measure thickness via a distance triangulation computation of a laser beam.

**Laser Reflection**
- The reflection laser gauge measures thick products in tight process locations as an alternative to nuclear technologies.

**Beta Transmission**
- NDC’s 310 Beta transmission gauges feature a high-efficiency detector and minimized source activity for safety and performance.

**Gamma Backscatter**
- The Gamma Backscatter family provides cost-effective basis weight measurement in a compact form factor.
## Measurement Configurations

### NDC’s measurement solutions

...by application

<table>
<thead>
<tr>
<th>Sensor Technology</th>
<th>Industry: Extrusion</th>
<th>Industry: Converting</th>
<th>Industry: Calendering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Thickness</td>
<td>Gamma Backscatter</td>
<td>gamma backscatter</td>
<td>gamma backscatter</td>
</tr>
<tr>
<td>Basis Weight</td>
<td>IR Transmission</td>
<td>IR transmission</td>
<td>IR transmission</td>
</tr>
<tr>
<td>Voided Film Thickness</td>
<td>IR Backscatter</td>
<td>IR backscatter</td>
<td>IR backscatter</td>
</tr>
<tr>
<td>Barrier Layer Thickness</td>
<td>IR Forward Scatter</td>
<td>IR forward scatter</td>
<td>IR forward scatter</td>
</tr>
<tr>
<td>Blown Film Thickness</td>
<td>IR Reflection</td>
<td>IR reflection</td>
<td>IR reflection</td>
</tr>
<tr>
<td>Haze</td>
<td>X-Ray Transmission</td>
<td>X-ray transmission</td>
<td>X-ray transmission</td>
</tr>
<tr>
<td></td>
<td>X-Ray Backscatter</td>
<td>X-ray backscatter</td>
<td>X-ray backscatter</td>
</tr>
<tr>
<td></td>
<td>OptiMike Laser Shadow</td>
<td>OptiMike laser shadow</td>
<td>OptiMike laser shadow</td>
</tr>
<tr>
<td></td>
<td>Beta Transmission</td>
<td>Beta transmission</td>
<td>Beta transmission</td>
</tr>
<tr>
<td></td>
<td>Laser Tiangulation</td>
<td>Laser tiangulation</td>
<td>Laser tiangulation</td>
</tr>
<tr>
<td></td>
<td>Light Transmission</td>
<td>Light transmission</td>
<td>Light transmission</td>
</tr>
</tbody>
</table>

This chart presents the typical sensor technology choices for the measurements indicated.
Company overview

Combining industry-best performance and reliability with a global support structure

NDC Technologies, headquartered in Dayton, Ohio, designs, develops and produces a wide range of process measurement and control instrumentation for a broad scope of manufacturing industries.

NDC has manufacturing facilities in Dayton, Ohio and Maldon, UK, with centers of excellence at each of these locations including Irwindale, California and Ans, Belgium. In addition, we have a manufacturing and service facility in Middletown, Connecticut and direct sales and support facilities in France, Germany, Italy, India, China and Japan. There is also a highly trained network of Sales and Service distribution channels in more than 60 countries around the world.

NDC Technologies is strategically structured to serve the following key industry segments:

► **Film Extrusion and Converting**
  NDC provides basis weight, thickness, coat weight and moisture measurement and control systems for a diverse array of applications in the film extrusion and converting industries and also provides solutions for customers in nonwovens and calendering.

► **Food, Bulk and Tobacco**
  NDC delivers both on-line and at-process analyzers for the measurement of key constituents such as moisture, fat, oil and protein. NDC’s broad spectrum of measurement solutions are used in the food, chemicals, minerals building materials, pharmaceutical and tobacco industries.

► **Cable and Tube**
  NDC serves the wire, cable, fiber optic, pipe and tube industries with a broad portfolio of on-line and off-line measurement and control solutions for the dimensional monitoring of diameter, ovality, wall thickness, eccentricity, length and speed, and other parameters.

► **Metals**
  In the steel and aluminum industries, NDC offers advanced solutions to measure the coatings applied to metal surfaces and the non-contact length and speed of products at critical points in the manufacturing process.