HAZEPRO
MEASURING HAZE TO BRING CLARITY TO EXTRUDED TRANSPARENT FILM PRODUCTS

► Ensure Product Quality & Consistency
► Increase Process Efficiency
► Maintain Brand Competitiveness
► Reduce Waste
Haze is a critical quality parameter for plastic films, various plastic sheet products and other transparent materials. This effect can be caused by number of process conditions such as die shear, polymer crystallization, melt flow behavior, the suspension of particles or contaminants, and other factors.

In packaging applications, first impressions are everything. A hazy film can make a product appear low quality in the eyes of the consumer. In other applications, a high level of haze in packaging may be necessary to make colors, graphics and text appear vibrant and deliver visual impact.

**Control the Quality Appearance of Your Products**

NDC’s HazePro gauge accurately and reliably measures the optical quality of transparent materials. Immediate, on-line haze measurements enable you to confirm product quality and precisely adjust the film and sheet extrusion process to tightly maintain the desired product appearance. Process adjustments can be automated for real-time control of optical properties – from high transparency (clarity) to very low haze to high haze. HazePro can be used on both narrow and wide extrusion lines.

**Applications:**

HazePro can be used for the quality control of:

- Optical Films
- Solar Panel Films
- Anti-Glare Films
- Hygienic Films
- Agricultural Films
- Flexible Packaging
- Biax Packaging
- Pharmaceutical Packaging

**HazePro – Defining a New Standard in Haze Measurement**

HazePro is the industry’s only true on-line measurement system that accurately, reliably measures the haze of plastic films and reports critical process information in real time.

HazePro is highly versatile and can be used with any of NDC’s family of sensors such as NDC’s FilmPro IR transmission gauge for measuring the thickness and basis weight of films.
Get the HazePro Advantage

► Haze quality measurements correlate with ASTM standard D1003 for transparent materials
► Immune to most common process variations such as web flutter and short-term film thickness variations
► Can be used in conjunction with any of NDC’s family of high-performance sensors
► Advanced diagnostics provide early detection of haze issues to maintain the highest product quality
► Provides superior measurements over other on-line haze technologies such as camera-based inspection systems
► Engineered for long-term performance and value

How it Works
HazePro measures the amount of light that is diffused or scattered when passed through a transparent material. Its light engine is based on the measurements described by ASTM D1003 using diffuse illumination.

“Haze” is specified as the percentage of light transmission that deviates greater than 2.5 degrees. The lower the haze measurement value, the higher the clarity of the material.

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>Range</td>
<td>0.5% - 75%</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>- Less than 2% Haze: ±0.1% absolute</td>
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<tr>
<td></td>
<td>- 2 to 5% Haze: ±0.3% absolute</td>
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<td></td>
<td>- 5 to 10% Haze: ±0.5% absolute</td>
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<tr>
<td></td>
<td>- 20% Haze: ±1% absolute</td>
</tr>
<tr>
<td>Web Flutter</td>
<td>±5 mm</td>
</tr>
<tr>
<td>Gap</td>
<td>45 mm</td>
</tr>
<tr>
<td></td>
<td>Passline is 12 mm from the top sensor head</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>Up to 50°C (70°C with water cooling)</td>
</tr>
<tr>
<td>Ambient Light Sensitivity</td>
<td>None</td>
</tr>
<tr>
<td>Maintenance</td>
<td>No routine maintenance required - pneumatic air wipe keeps the window clean</td>
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NDC published specifications conform to CEI/IEC 1336: 1996.
Specifications subject to change.