L&W Autoline Thickness gives precise and exact thickness measurements of paper and board. By providing reliable and accurate information for process optimization, it is used for controlling manufacturing parameters to produce a superior quality product.

Why measure thickness?
Controlling thickness (caliper) uniformity means producing printing paper that performs well in the printing press. In many cases measurements according to standards are a prerequisite for manufacturing to assure paper quality. Thickness is an important property that affects bending stiffness. L&W Autoline Thickness often combined with L&W Autoline TSO in the same module, since controlling a paper machine involves seeing the elastic properties of the paper in addition to basic control parameters (thickness, grammage, and moisture, etc.). This makes accurate prediction of bending stiffness possible.

Measurement results
The module uses the same measuring technology as the proven L&W Micrometer laboratory stand-alone testing equipment, which provides high precision results. Measurement results directly comply with industry standards – no grade dependent correlation is needed. Results are easy to understand without any need for further processing. By using an optical encoder, the need for calibration normally required for analog devices like LVDT is eliminated. To reduce test variability due to dust particles, the module has a unique automatic cleaning mechanism. It uses a combination of air and mechanical cleaning that can be set to take place after each test sequence. The parallelism of the measurement-faces and high quality manufacturing further ensures reliability. Values obtained during the measurement can be presented in metric or imperial units, in accordance with specified standards. The L&W Autoline Thickness module is available in two different versions, each adapted to conform to corresponding industry standards (see table next page).
Testing procedure
The upper measuring-face is lowered with a pre-defined (per the selected standard) or customized speed. To eliminate variation caused by material compression, the recording of measurement results starts after a preset dwell time, as the measuring-face is resting on the sample. The module’s C-frame design eliminate inaccurate tests caused by unparalleled measuring faces. The module has adaptive lifting height, which means that at the start of each measurement cycle, the lifting height of the head is adjusted to reduce the measurement time.

Measurement principle
Thickness is measured by clamping a sample between two measuring faces (upper/lower) and applying a specified static load during a specified time.

DEFINITION:
Single sheet thickness as measured by this method can be defined as the perpendicular distance between the two principal surfaces of the paper or board determined under applied static load, using the standard method of test.

FOLLOWING VERSIONS ARE AVAILABLE:

<table>
<thead>
<tr>
<th>Industry standard</th>
<th>Measuring pressure [kPa]</th>
<th>Approx. dead weight</th>
<th>Measuring surface [cm²]</th>
<th>Lowering speed [mm/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPPI 411, PAPTAC D.4</td>
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<td>2</td>
<td>1</td>
</tr>
<tr>
<td>EN 20534, ISO 534, DIN 53105, BS 3983, APPITA/AS 1301.426, NF Q 03-016/017, SCAN P7</td>
<td>100</td>
<td>2</td>
<td>2</td>
<td>2</td>
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</tbody>
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