L&W Autoline S-test
ABB Ability™ Quality Management System

Overview
ABB’s L&W Autoline S-test module offers a better and easier method for strength classification of medium fluting than the traditionally used CMT measurement. The method was developed together with a group of fluting producers (CCB-CEPI) as a way to overcome the tedious sample preparation needed to produce the test pieces and perform the CMT test in a crush tester. By modifying the SCT test method used for container board, the S-test method was developed for analyzing fluting strength. The S-test name comes from the S-shaped sample during testing.

Why measure compression strength?
Medium fluting has a very important role in the corrugated board construction, which combines high thickness with low grammage. Keeping thickness high and grammage low produces strong boxes at optimal cost. If the medium fluting can take Z-direction loads, the liners are kept apart, which means that box strength is maintained.

Features
• Fully automated compression test follows S-test method, pioneered by ABB
• Eliminates time-consuming lab corrugating
• Test results in seconds
• Quickly determines CMT first plateau for box performance
• Uses standard ABB components
• Sturdy C-frame design ensures stability and reliability

Benefits
• Easier test method with faster test results
• S-test data enables improved quality and box performance
• Precise and reproducible tests
• Removes need for time-consuming sample conditioning
• Repeatable, automated test reduces risk from manual errors
• Analysis of MD and CD profiles
• Excellent after-sales service from ABB

The compression strength in the Z-direction of medium fluting in corrugated board is important to keep the liners apart to maintain the stacking ability of boxes. L&W Autoline S-test automates the measurement of compression strength of fluting with a faster and less complex method to provide precise results.
Measurement results
By measuring crushing resistance at initial damage of the specimen in a CMT test, one can get an indication of the strength potential of the fluting medium and its ability to keep the liners apart without losing its own strength. CMT first plateau has been used to define initial damage in this case. The S-test is a predictor of the CMT first plateau to overcome the manual operations in CMT.

Testing procedures
In traditional CMT tests, the flute must be converted in a laboratory fluter, which changes temperature and moisture content. As non-consistent temperature and moisture content also influence the testing results, the S-test is a more repeatable measurement. The manual tape handling during traditional CMT tests is time-consuming and can affect test repeatability. The L&W Autoline S-test is fully automated and not influenced by human operator variances and errors.

The automatic and integrated sample punch prepares the correct 15 mm wide test pieces. The cut sample is then automatically transferred to the sample clamps on the measuring unit.

The test starts and the movable clamp moves towards the stationary clamp, and the sample is compressed. The initial span length is 4 mm and there is a 1 mm offset between the clamping lines. The clamps move in the direction of the arrows. The force at test piece failure is recorded and presented in kN/m or lbf/in.

Technical specifications
– L&W Autoline S-test, Code 634

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring method</td>
<td>Medium fluting strength in Z direction</td>
</tr>
<tr>
<td>according to the S-test method</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>kN/m or lbf/in</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0.07–26.5 kN/m (0.4–151 lbf/in)</td>
</tr>
<tr>
<td>Sample width</td>
<td>15 mm (0.59 in)</td>
</tr>
<tr>
<td>Sample length</td>
<td>90 mm (3.5 in)</td>
</tr>
<tr>
<td>Test span</td>
<td>4.0 mm (0.16 in)</td>
</tr>
</tbody>
</table>

Instrument:
- Inclusive: Check device including dead weight
- Max force: 400 N (89.9 lbf)
- Power: 5 W (max. 10 W)
- Air pressure: 0.5–1 MPa (72–145 psi)
- Air consumption:
  - Average: 45 Nl/min (1.6 SCFM)
  - Max: 130 Nl/min (4.6 SCFM)

Dimensions:
- B 0.32 x H 0.6 x D 0.6 m
- B 13 x H 24 x D 24 in

Net weight: 67 kg (148 lb)

Applicable standards:
- DIN 5014

Measurement principle

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The information provided in this data sheet contains descriptions or characterizations of performance which may change as a result of further development of the products. Availability and technical specifications are subject to change without notice.

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