

L&W Pulp Tester Sample Preparation

Lorentzen & Wettre Products | Pulp Measurements

L&W Pulp Tester is a reliable, repeatable and cost-effective online system for process and laboratory control of pulp. Constantly having a complete pulp quality specification it is a major help in achieving uniform paper quality and stable runnability.

L&W Pulp Tester Sample Preparation

The basis of the system is the sample preparation unit with a dilution tank, to which all different pulp samplers are connected. In this unit samples are diluted to accurate consistency level and thereafter distributed to the different measuring modules. In L&W Sample Preparation unit it is possible to incorporate a module for manual input/output. In the system the sample arrives first in a primary dilution tank, where it is diluted in a first stage, waiting until the current sample is released. In a secondary dilution tank the sample is diluted to a preset consistency value, 0.3% or 0.2%, before it is released to the different measuring modules in L&W Pulp Tester. To obtain accurate dilution, both optical and gravimetric consistency is measured in the sample preparation unit. Modules for consistency measurements and sample input/output are described in the following sections.

L&W Pulp Tester Gravimetric Consistency

True consistency can only be measured by knowing the gravimetric dry weight of a pulp sample; hence a sheet former is integrated in the sample preparation unit. The sheet former includes pressing, drying and a scale for weighing the dry pad. True consistency is of essence for correct freeness (CSF) and Schopper-Riegler (SR) measurements according to standards, and for several fibre morphology parameters. The dry pad is also used for measuring the optical measurements (brightness, whiteness and ERIC 950). The gravimetric section is filled with pulp up to a defined volume. The pulp is then de-watered over the wire screen where it forms a sheet (pad). To make sure that the forming section is working correctly a pressure test is performed by the software before every sample. When the de-watering sensor shows that no more water is inside forming section, the sheet is considered ready for the next step, the press section. The sheet is moved to the press section by a scraper. The sheet is pressed and dried using warm air heated in a preheater. A moisture sensor measuring the conductivity is placed in this section to make sure that the pad gets completely dry. The sheet is moved by an arm to the scale for weighing using vacuum. The scale rests on a spring support foundation to reduce vibrations and when the measurement is done the sheet is dropped in the waste disposer. The module is rinsed after each measurement so that any residual fibres are removed.

L&W Pulp Tester Optical Consistency

In order to dilute the pulp sample to the correct consistency level, an optically based system for measuring consistency is used in L&W Pulp Tester Sample Preparation. A defined consistency or amount of pulp can then be transferred to each measurement module. The optical consistency module gives speed to L&W Pulp Tester. The amount of water needed for dilution varies between applications. The sample from secondary dilution tank flows between two narrow glass plates, where a led diode sends light through the pulp and the light that has passed is detected on opposite side. A calculation is made from the result and the consistency is determined. Since different pulp qualities have different properties a correction constant is needed. The correction constant must be calculated every time a new quality of pulp is introduced to the system. Inside the optical consistency module the temperature sensor is placed. The pulp sample temperature is important for some properties that can be measured with the L&W Pulp Tester.

L&W Pulp Tester Sample Input/Output

L&W Pulp Tester Sample Input/Output is used for manual in- and output of samples and can be mounted in L&W Pulp Tester Sample Preparation unit. The input sample is then automatically tested in the modules in L&W Pulp Tester. Default settings for input samples are 1–2% consistency with a volume up to 3 litres (higher consistencies can be used). Laboratory sample with given consistency up to 5 liter, can be taken out directly from the dilution tank.



Sample preparation unit with incorporated module for manual input/output.

Technical specifications

L&W Pulp Tester Sample Preparation – code 961

Included	Connections and computer cabinet with standard PC and air conditioning. Sequence control with standard PLC.
Power	Maximum consumption 2300 W
Instrument air	Class 2-4-3
Pressure	0.5–1 Mpa Average consumption with sheet former 270 l/min, max. 650 l/min
Water	Filter 25 µm Consumption with both freeness and fibre morphology (4 minutes cycle time) Qmax = 50 l/min, Q/h = 900 l/h
Dimensions	1350 × 2000 × 660 mm 53.1 × 78.7 × 26.0 in
Weight	342 kg
(sample preparation, including sheet former and sample input)	754 lb

L&W Pulp Tester Gravimetric Consistency – code 971

The module is placed in the L&W Pulp Tester Sample Preparation module.

Measurements	<ul style="list-style-type: none"> - True consistency by weight - Gravimetric consistency is used to update the optical consistency sensor - Fibre coarseness automatically with the fibre morphology module - No. of fibres/gram together with the fibre morphology module - Fibre area/gram together with the fibre morphology module - Fibre volume/gram together with the fibre morphology module - No. of vessels/gram together with the Vessel & Kink module - Vessel area/gram together with the Vessel & Kink module - No. of shives/gram together with the Vessel & Kink module - Shive volume/gram together with the Vessel & Kink module - True consistency compensation for CSF module and SR module, according to standard - Sheets for optical properties
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Sheet diameter	40 mm
Sheet weight	dependant on application (in the range 0.5–1 gram)

L&W Pulp Tester Optical Consistency – code 972

The module is placed in the L&W Pulp Tester Sample Preparation module.

Measurement area	50 × 50 mm
Measurement gap	3 mm
Light source	LED flash

L&W Pulp Tester Sample Input/Output – code 973

The module is placed in the L&W Pulp Tester Sample Preparation module.

Consistency range	1–2%
Measurement gap	3 mm
Sample volume	1–3 litre
Dimensions	400 × 1860 × 350 mm 15.7 × 73.2 × 13.8 in
Weight	36 kg 79.3 lb



Sample preparation and sample distribution.

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