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In this Issue:

Foreword

Welcome to the 13th issue of the Cepi-CTS Newsletter.

In 2026 the CEPI Comparative Testing Service will celebrate its 50th anniversary! Below you will find a short history of the world's best proficiency testing scheme.

You'll also find details about the three new tests we will implement in 2026. Then we will discuss the reasons to implement the Tensile Energy Absorption on tissue papers. Finally, we will show the importance of barrier properties of cellulose based materials for packaging applications.

We greatly value your feedback and suggestions to improve the Service: if you have questions, doubts or requests do not hesitate to contact your national Distributing Laboratory or myself at the contacts listed on the left.

Fulvio Savagnone
Cepi-CTS Chairman

Cepi-CTS: 50 years of service to the European Paper Industry

Next year, 2026, will mark the Cepi-CTS 50th anniversary.
Fifty years of uninterrupted service and support to the European Paper Industry, to ensure that the testing procedures of its laboratories are reliable and give results that are statistically comparable to those of other laboratories, both from the paper Industry itself and from its suppliers and clients chain.

In the mid-seventies a number of proficiency testing services run by the foremost European paper research institutes were unified under the umbrella of what was then CEPAC, "Confédération Européenne de l'Industrie des pâtes, papiers et cartons" and its Working Group "Étalonnage". Thanks to the illuminated vision of such scientists as Mr Ramaz (CTP, France), Mr Lemm (BAM, Germany), Mr Fuit (TNO, The Netherlands), Mr Attwood (PATRA, GB) and Mr Luciani (ENCC, Italy), the CEPAC Calibration Check Service started its activities in 1976. In 1980 14 properties were available for control: today these are more than 100.

The Service operations were similar to today, Co-ordinating, Authorised (today they are called Distributing) and Qualified Labs were the members of the Working Group that ran its activities.

Also its reports were quite comparable: the real big difference was that samples were not identified with reference values and their Warning and Action Limits. Such important deliverables were introduced in 1992, at the same time that CEPAC merged with EPI to form Cepi (Confederation of European Paper Industries): Swiss and Scandinavian Institutes joined the WG: EMPA and KCL, STFI and PFI brought new impulse to the Service.

Cepi-CTS as we know it today is the result of the work done during all these years by many dedicated scientists and technicians; at the same time it bears the fruit of continual innovations, such as a sound quality system thoroughly documented, an efficient back-up system in case of failure of one of the managing laboratories and much more.

New tests in the pipeline

In 2026 three new tests will be available in the Service:

- S-Test according to ISO 7763. This test will be available in three levels with indicative ranges 0,70÷1,10, 1,80÷2,30 and 2,50÷3,50 kN/m.
- Tissue, Disintegration in water according to ISO 12625-17. This test will be available in three levels for each of the three measuring times of 30s, 120s and 600s. The indicative ranges will be:
  - Level 1: 30s and 120s: 0,00÷2,00 %; 600s: 0,00÷5,00 %
  - Level 2; 30s: 5,00÷30,0 %; 120s: 50,0÷90,0 %; 600s: 90,08÷100 %;
  - Level 3 : all times: 98,0÷100 %.
- Tensile Energy Absorption (TEA) of Tissue according to ISO 12625-4. This test will be available in two levels with indicative ranges 8,00÷15,0 and 30,0÷60,0 J/m². See below the article explaining the reasons for the implementation of this test.

Why measure the Tensile Energy Absorption (TEA) of tissue papers? *(M. Buchignani and B. Marsili, LUCENSE)*

The tensile test on tissue papers can be considered, just as for many other materials, the most characterizing test, compared to others such as water absorption, brightness, thickness, etc.. The test is described in the standard:

EN ISO 12625/4 (2022) Tissue paper and tissue products - Part 4: Determination of tensile strength, stretch at maximum force and tensile energy absorption.

The evaluation of the results of the tensile test determines the potential for workability and final usability. For this reason, it is important to know not only the maximum strength and elongation values, but also the shape of the load-elongation curve, quantified with the TEA parameter (the measurement of the area under the curve).

Evaluating different materials by comparing only their maximum strength values can be misleading, as some papers may have similar tensile strengths or even lower maximum strength values and at the same time exhibit higher energy. In other words, the same energy values can be achieved with a high breaking load and low elongation, or vice versa. Therefore, we must look at this parameter, TEA, to evaluate the product's potential (see Fig. 1).

Each stress generated in the converting process or in the end use develops a certain amount of energy that the paper absorbs, partially deforming; if this energy exceeds the paper's capacity to absorb it, the paper breaks, and this happens even if the maximum resistance value is never exceeded. For example, kitchen papers or cleaning papers are used to perform a rubbing task (i.e. repeated tension), sudden impacts, etc. in which not only maximum resistance comes into play, but also the ability to absorb various stresses, lower than the maximum value, without breaking.

The tensile energy absorption is a measure of this capacity; it is a synthetic index of the real behaviour of the material under stress, since it simultaneously integrates resistance and deformability through the area under the load-elongation curve.

Another important application is the converting phase of the tissue manufacture: here the paper is subjected to particularly severe conditions: high-speed winding and unwinding, impacts and stresses in the transitions between cylinders, and embossing, where the rollers exert high and localized pressures. In all these phases, simply specifying the maximum load the paper can withstand is not enough: it is essential that he paper can absorb energy without weakening or breaking. A high TEA value assures this ability: the material deforms, dissipates energy, and resists sudden stresses better. The TEA provides

insights and differentiate similar tissue papers in terms of strength thus explaining the different behaviour of papers with comparable tensile indexes.

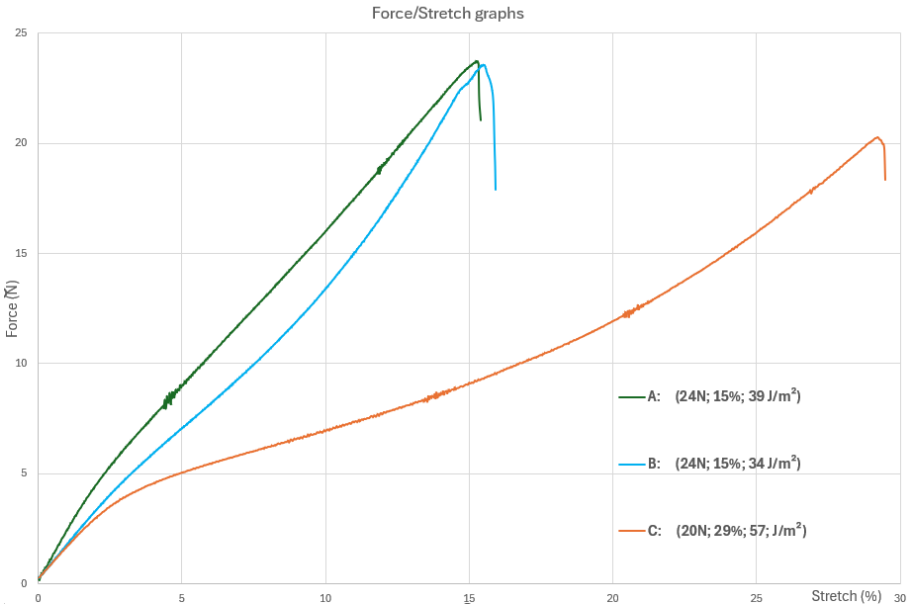

Fig.1: Load-elongation graphs in a tensile test (machine-direction); comparison of 3 different tissue papers (kitchen papers)

TEA evaluation is particularly important for tissue papers that exhibit elongation in a wide range (typically from 10 to 30% in the machine direction) and therefore significant TEA values, even if they may have low tensile strength values.

TEA is a key to understanding the real mechanical behaviour of tissue under dynamic conditions both during the converting phase and during end-use by the consumer.

Barrier properties of cellulose based materials for packaging applications *(X. Joppin, Celabor)*

Cellulose-based packaging is gaining popularity due to its renewable and biodegradable nature, but its effectiveness relies heavily on barrier properties.

Oxygen permeability (Oxygen Transmission Rate – OTR) and water vapour permeability (Water Vapour Transmission Rate - WVTR) are key factors in ensuring food preservation and protection against spoilage. Excessive permeability can lead to oxidation of sensitive products or loss of crispness, while insufficient water vapour barrier promotes moisture ingress and microbial deterioration.

Accurate measurement of these parameters not only helps evaluate the performance of surface treatments or coatings but also optimizes film formulations for specific applications. These measurements are essential for developing sustainable packaging that combines environmental responsibility with food safety. Furthermore, they provide a reliable indicator for comparing alternatives to traditional plastics.

Understanding the interactions between cellulose, humidity and oxygen is therefore fundamental for designing high-performance and durable packaging.

Cepi-CTS is working on implementing these properties for upcoming rounds, with the aim of distributing samples in 2027.

Come to meet us and share technical ideas!

Every year Cepi-CTS organises a Technical Meeting to discuss paper-testing issues relevant to the Service and a Technical Workshop to have a hands-on experience on selected technical topics.

Both the Technical Meeting and the Workshop are open to the public: they are therefore a unique occasion to discuss state-of-the-art technical matters with scientists and technicians from the most important European research institutes that manage a proficiency testing scheme with no equal in the world with regards to scientific soundness, scope of availability of tests, efficiency, number of satisfied clients and last but not least, historical tradition.

The 2025 Cepi-CTS Technical Meeting and Workshop were held @ Celabor, Chaineux, Belgium: the Workshop was focused on the management of gas permeability and barrier properties of food packaging made entirely from cellulose-based materials.

To make your attendance even more fruitful, we will strive to organise such meetings in correspondence with national or international fairs, conferences and so on. We will adequately publicise our next Technical Meeting and Workshop, don't miss this opportunity!

What they say about us

"In addition to calibration and climate condition an additional cross check if sample testing and preparation is according to standards "

Klingele Paper & Packaging SE & Co. KG

The next issue of the Newsletter will be out December 2026