

INNVENTIA
TESTING SERVICES

PHYSICAL TESTING AND
METHOD LIST 2010





GENERAL CONDITIONS

PRICES

For assignments, please contact respective contact person for an assignment plan and a quotation.

DELIVERY TIMES

Delivery times are confirmed at the time of receipt of the order.

SAMPLE STORAGE AFTER TESTING

Residual test material will be discarded one month after the customer has received the final report.

NOTE! Please indicate on the test instructions if the sample material is to be returned. The costs for this are charged to the customer.

ACCREDITED ANALYSES

Physical Testing is accredited by SWEDAC in accordance with the requirements in ISO 17025. The accredited testing activity (Chemical analysis, Microbiological analysis, Environmental testing and Physical testing) has the accreditation number 1771.

Accredited analyses are in the list indicated by * after the related standard/test method.

FULL CONFIDENTIALITY

The results of an assignment are the sole property of the client placing the order.

OTHER ANALYSES AND OTHER TYPES OF TESTS

Please call us to discuss analyses and types of tests other than those listed.

EXPLANATIONS OF METHOD DESIGNATIONS USED IN THE LIST

SCAN-C, SCAN-CM etc. refer to SCAN-test Methods. The designation ISO refers to an International Standard, SS-EN refers to a European Standard and SS to a Swedish Standard.

The pulp and paper industry are nowadays recommended to use ISO Standards and/or EN Standards for properties related to quality control and thus used in trade.

BASIC FEE

A basic fee of SEK 700 is added per mission.

Pulp

General

Contact person: Marie Bäckström

ISO 1762	Residue (ash) on ignition at 525 °C double test
ISO 2144	Residue (ash) on ignition at 900 °C double test
ISO 1762 ISO 2144	Residue (ash on ignition at 525 °C and 900 °C, double tests
ISO 1762 ISO 2144	Residue (ash on ignition at 525 °C or 900 °C single test, dry-contents samples)
ISO 3688	Preparation of lab. sheets for measurement of ISO brightness
SCAN-C 11*	
–	pH in suspension
ISO 638 *	Dry matter content Dry matter content single test
ISO 4119 *	Stock concentration Stock concentration single test
ISO 5263-1	Wet disintegration of chemical pulp
ISO 5263-2	Wet disintegration of mechanical pulps at 20 °C
ISO 5263-3	Wet disintegration of mechanical pulps at 85 °C Wet disintegration in EW-refiner

Drainability and water retention

Contact person: Marie Bäckström

ISO 5267-1 *	Drainability, SR-number
ISO 5267-2	Drainability, CSF-number
SCAN-C 62	Water Retention Value (WRV) Water Retention Value (WRV) of the fibre fraction >76 µm (incl. fractionation in BDDJ)

Fibre dimensions and shives content

Contact person: Lars-Åke Hammar

SCAN-CM 6	Fibre fractionation, McNett-apparatus 2 steps 3 steps 4 steps Samples for microscope, extra
–	Preparation of fibre fractions in McNett apparatus per fractionation Preparation of fibre fractions in Celleco fractionators
L&W FiberTester	length, width, coarseness, shape factor excl. coarseness
SCAN -CM 66:05	Content of fines, BDDJ > 76µm double test single test
TAPPI 275 sp-98	Somerville Shives content 0.10 mm or 0.15mm

PULP

Beating

Contact person: Marie Bäckström

ISO 5264-2 * +	Laboratory beating - PFI mill method, incl. SR-number and
ISO 5267-1 *	disintegration
ISO 5263-1 *	
	Interpolation of physical properties to certain SR-number after beating a PFI-mill (at least 4 levels of beating)
ISO 5264-2 * +	Beating, preparation and testing of lab. sheets at 5 levels
ISO 5269 * +	(unbeaten and 4 SR-number levels). Complete testing of the
ISO 5270 *	physical properties and interpolation
Voith Lab. refiner, LR 40	Beating of pulp in the Voith lab.refiner 0-5 energy levels excl. SR-number

Preparation of laboratory sheets

Contact person: Marie Bäckström

ISO 5269-1 *	Preparation of lab.sheets for physical testing acc. to ISO 5270 (max 8 sheets) extra sheets, each
Internal method	Preparation of "Sune ark" wet and unpressed lab.sheets Restrained drying of sheets (STFI dryer) extra sheets, each
SCAN-CM 64	Preparation of lab.sheets with a closed water system Using same closed water system for the following samples
SCAN-CM27	Preparation of laboratory sheets for determination of light-scattering and light-absorption coefficient, opacity and Y-value
SCAN-CM11* +	Preparation of laboratory sheets for measurement of ISO
ISO 2470 *	brightness (incl. measurement) Preparation of laboratory sheets of fibre fractions incl. Fractionation in McNett. Preparation of lab.sheets with the Dynamic Sheet Former. e.g.: 1-layer sheets with no additives, role pressing, restrained drying Multi-layer sheets FEX drying extra per sheet Biaxial drying of sheets

PULP

Physical properties of laboratory sheets

Contact person: Shadi Samadnouri

ISO 5270 *	Testing of general physical properties of lab.sheets (60g/m ² or 75
– *	Grammage and density
– *	Tensile strength, strain at break and TEA
– *	Light scattering
– *	Air permeance (Gurley or Bendtsen)
– *	Tearing resistance
– *	Bursting strength
– *	Folding endurance
–	Complete testing
ISO 1924-3 *	Tensile strength, strain at break, tensile energy absorption and tensile stiffness
SCAN-P 77 + ISO 1924-3	Fracture toughness (incl. tensile properties acc. to ISO 1924-3)
ISO 5270	<i>High Unspecified grammage</i>
ISO 5270	Bending resistance (excl. prep. of lab.sheets, incl. grammage)
	Compression strength (excl. prep. of lab.sheets, incl. grammage)
ISO 15361	Zero-span tensile strength (excl. prep. of lab.sheets, incl. grammage)
	dry
	rewetted
SCAN P 20:95	Wet tensile strength and wet tensile strength retention
ISO 9416 *+ ISO 2471*	Light-scattering and light-absorption coefficients + opacity
UNI 9439	Scott Bond
ISO 5629 *	Bending stiffness – Resonance method
SCAN-P 88 *	Structural thickness and structural density
ISO 15754	Z-directional tensile strength

Estimation of dirt and shives

Contact person: Marie Bäckström

ISO 5350-1	Estimation of dirt and shives – Inspection of lab. sheets (incl. disintegration and preparation of sheets)
ISO 5350-2	Estimation of dirt and shives – Inspection of mill sheeted pulp

Sampling

Contact person: Marie Bäckström

ISO 7213

Pulps – Sampling for testing

ISO 186

Paper and board – Sampling to determine average quality

ISO 801 –1

Determination of saleable mass in lots – Pulp baled in sheet form

PAPER

General

Contact person: *Shadi Samadnouri*

ISO 1762	Residue (ash) on ignition at 525 °C double tests
ISO 2144	Residue (ash) on ignition at 900 °C double tests
ISO 1762 ISO 2144	Residue (ash) on ignition at 525 °C and 900 °C, double tests
ISO 287	Moisture content
ISO 534 *	Thickness and apparent bulk density or apparent sheet density
SCAN-P 88 *	Structural thickness and structural density
ISO 536 *	Grammage
	Grammage connected with strength tests

Absorbency and permeance

Contact person: *Shadi Samadnouri*

ISO 535	Water absorbency, Cobb method
ISO 8787	Capillary rise of water, Klemm method
ISO 5636-3 *	Bendtsen air permeance
ISO 5636-5 *	Gurley air permeance

Contact person: *Christina Olmers*

- Water vapour transmission rate, folded sample
- Water vapour transmission rate, unfolded sample

Mechanical properties

Contact person: *Shadi Samadnouri*

SCAN-P 77	Fracture toughness (incl. tensile stiffness acc. to ISO 1924-3)
ISO 2493 * (SCAN-P 29)	Bending resistance
ISO 1924-2 *	Tensile strength, stretch and TEA
ISO 1924-3*	Tensile strength, strain at break, TEA and tensile stiffness
SCAN P 20:95	Wet tensile strength and wet tensile strength retention
ISO 15361	Zero-span tensile strength
	dry
	rewetted
–	TSO (Tensile Stiffness Orientation) by ultra sonic evaluation
–	Dynamic mechanical properties, MTS (Materials Testing System)
ISO 8226-1	Hygroexpansivity (66 ± 2) % RH
ISO 8226-2	Hygroexpansivity (84 ± 2) % RH

ISO 9895 *	Compression strength – Short span test
ISO 1974 *	Tearing resistance – Elmendorf method
UNI 9439	Scott Bond
ISO 2758 *	Bursting strength of paper
ISO 2759	Bursting strength of board
ISO 5629 ‡	Bending stiffness – Resonance method
ISO 5626 *	Folding endurance
ISO 3781	Tensile strength after immersion in water
SCAN-P 20	
ISO 15754	Z-directional tensile strength

Surface and structure properties

Contact person: Shadi Samadnouri

ISO 15359	Static and kinetic coefficients of friction –Horizontal plane method, paper-paper e.g. top side MD – bottom side CD price per combination
SCAN-P 88 *	Structural thickness and structural density
ISO 8791-2 *	Bendtsen surface roughness
ISO 8791-4 *	PPS Print-Surf method PPS Surface compressibility

Optical properties

Contact person: Shadi Samadnouri

ISO 2469	RX, RY, RZ C/2° reported as Rx, Ry, and Rz in per cent.
ISO 2469	RX, RY, RZ D65 adjust. reported as Rx, Ry, and Rz in per cent
ISO 2470-1	ISO Brightness C/2° indoor UV adjusted and excluded
ISO 2470-2	ISO Brightness D/65° outdoor UV adjusted and excluded
ISO 11475 *	CIE-Whiteness -UV (D65/10°) adjusted and excluded
ISO 5631	L*, a* and b* UV (C) adjusted
ISO 2471 *	Opacity, Y-value
ISO 9416 *	Light scattering and light-absorption coefficients

PAPER

Contact person: Marie Bäckström

Direction/sides

Dynamic Sheet former and FEX-paper

	Preparation of sheets for grammage and density	
ISO 1924-2	Tensile properties, constant rate of elongation 20mm/min	MD+CD
ISO 1924-3	Tensile properties, constant rate of elongation 100mm/min	MD+CD
ISO 9416	Light scattering-and absorption coefficients (Kubelka-Munk)	one side
ISO 2471	including opacity and Y-value	
	<i>Luftpermeans:</i>	
ISO 5636-5	Gurley air permeance	
ISO 5636-3	Bendtsen air permeance	
ISO 1974	Tearing resistance	MD+CD
ISO 2758	Bursting strength	two sides
ISO 8791-2	Bendtsen surface roughness	two sides
ISO 8791-4	PPS Print-Surf method	two sides
ISO 9895	Compression strength	MD+CD
ISO 5629	Bending stiffness-Resonance method	MD+CD
UNI 9439	Scott-bond	MD+CD
ISO 535	Cobb ₆₀	two sides
ISO 2493	Bending resistance	MD+CD
ISO 15754	Z-directional tensile strenght	ZD

Tissue

EN ISO12625-1	General guidance on terms
EN ISO12625-3	Thickness, bulking thickness and apparent bulk density
EN ISO 12625-4	Tensile strength, stretch at break and TEA
EN ISO12625-5	Wet tensile strength
EN ISO12625-6	Grammage
EN ISO12625-7	Optical properties
SS-EN 12625-8	Water absorption time and residual water absorption capacity, manual and automated basket immersion test method
SCAN P 53	Air permeance Gurley method
EN ISO 12625-12	Tensile strength of perforated lines - Calculation of perforation efficiency

PHYSICAL TESTING - PAPER

CEPI-Comparative Testing Service

2 rounds per year

Contact person: Lucyna Lason

All participants receive a report of the results from all Swedish laboratories, an identity number for their own laboratory and a final report showing the distribution of European test results.

Property. There are 2-4 levels for each property (2-4 sample sets)

Basic properties: Thickness, Thickness of corrugated board, Grammage,

Strength properties: Tensile strength and stretch, Tensile strength after immersion in water, Tearing, SCT, RCT, FCT, CMT, ECT; Puncture resistance, Relative humidity, Grammage, thickness, tensile strength, strain at break, compression, tearing resistance, Scott Bond, Bursting strength, (paper and board), Bursting strength (corrugated board) Folding endurance, (Köhler-Molin and Schopper),

Stiffness properties: Bending stiffness, resonance method, Bending resistance (7.5°, 15°, 50mm) Bending resistance, static (5°, 50 mm), Bending resistance(15°, 10mm), TSO,

Surface properties: Smoothness Bekk, Roughness Bendtsen, Roughness PPS, Coefficient of Friction (static and dynamic)

Structural properties: Air permeance Schopper, Air permeance Bekk, Air permeance Bendtsen, Air permeance Gurley,

Optical properties: ISO Brightness, D65 Brightness, CIE Whiteness, Opacity, C Luminous reflectance factor. Rx, RY, RZ, D65 Luminous reflectance factor. Rx, Ry, Rz, Gloss 75°

Chemical properties: Kappa number, pH of aqueous extracts, Alkali reserve, Residue ash

Tissue Properties: Thickness, Tensile strength after immersion in water Finch, Water absorption

Printability properties: Picking resistance IGT, Oil penetration, IGT

Miscellaneous properties: Cobb60, Drainability- SR-number, Relative Humidity of the testing room, Fiberlength and Fiberwidth

Price per sample set (property/level/round)

Price 5 - 10 sets (property/level/round)

Price > 10 sets (property/level/round)

Newsprint and Magazine paper. Comparative testing ***4 rounds per year***

Contact person: Shadi Samadnouri

All participants receive a report of the results from all laboratories, an identity number for their own laboratory and a report showing the distribution of all participants test results.

- *Newsprint and Magazine paper:*
Tensile strength, strain at break, TEA, tensile stiffness, tearing resistance, thickness, ISO-brightness, opacity, Bendtsen air permeance, Bendtsen roughness, PPS roughness
4 rounds/year, price per round:
Price per set (property / level)
Price \geq 10 sets (property / levels)

PULP-Comparative Testing Service
2 rounds per year

Contact person: Margareta Fryklund

All participants receive a report of the results from all laboratories and the identity number of their own laboratory.

Suspension:

Round-1 May-June
Bleached Hardwood

Round-2 Nov.-Dec
Bleached Softwood

ISO 5267/1-1999	SR-number, 2 levels
SCAN-C 62:00	WRV, 2 levels
	SR-number + WRV, 2 levels

Sheet dried pulp

Laboratory beating

PFI mill method

Round-1 May-June Bleached Hardwood, Beating and testing

Bleached Hardwood, 500, 1000, 2000,
 3000 and 5000 revolutions

Round-2 Nov.-Dec. Bleached softwood, Beating and testing
 Bleached softwood, 1000, 2000, 4000,
 and 8000 revolutions

Each round includes.:

ISO 5264/2-2005	Laboratory beating - PFI mill method
ISO 5269/1-2005	Preparation of laboratory sheets
ISO 5270:1998	Determination of physical properties Grammage, density, Tensile properties, burst index, Tear index, light scattering coefficients
ISO 15361:2000	Gurley, Zero-span tensile index dry and rewetted (hardwood at 3000rev., softwood at 4000 rev.)