

**List of properties for which samples are provided and their indicative ranges**

Approved by the CEPI-CTS WG in Apeldoorn on April 23 2004

Updated Rev.18: November 2011 (CL for FCT changed, prop. 9.6 + 9.7 added, 2.16 removed, Cobb splitted)

Updated Rev.19: August 2012 (ISO standard for Friction corrected)

Updated Rev.20: December 2012 (2.3, 4.3, 6.4, 6.5, 6.6, 8.4, 9.5 Indic. range changed, new 9.8, 9.11, 10.5-10.7)

Updated Rev.21: January 2013 (Indicative ranges CTP and Smithers-Pira properties updated)

Updated Rev.22: January 2014 (all EXP properties are implemented)

Updated Rev.23: September 2014 (D50 on white papers implem., Dennison Waxes as EXP)

Updated Rev.24: May 2015 (EN ISO -&gt; ISO, Tissue Softness as EXP)

Updated Rev.25: August 2015 (PTS indicative ranges)

Updated Rev.26: October 2015 (Contact Angle as EXP)

Updated Rev.27: December 2016 (Dennison Waxes, Tissue softness as regular tests, Contact angle, Moisture as EXP)

Updated Rev.28: January 2017 (PTS new indicative ranges)

Updated Rev.29: January 2018 (New CL's and general update)

Updated Rev.30: February 2018 (New CL's and general update)

No	Property	CL	Standard	Units	Levels	1	2	3	4	5	Shortname for macro
<b>1</b>	<b>Basic properties</b>										
1.1	Thickness	Innovhub-SSCCP	ISO 534	µm	4	45.0÷55.0	70.0÷80.0	200÷250	500÷600		Thickness
1.2	Thickness corrugated board	CELABOR	ISO 3034	mm	2	3.8÷4.4	6.6÷7.2				CB Thickness
1.3	Grammage	SMITHERS-PIRA	ISO 536	g/m <sup>2</sup>	3	55.0÷65.0	85.0÷105	270÷290			Grammage
1.4	Moisture content	PTS	ISO 287	%	2	4,7 - 5,3	6.5÷6.9				Moisture
<b>2</b>	<b>Strength properties</b>										
2.1(a)	Tensile strength	Innovhub-SSCCP	ISO 1924-2	kN/m	4	2.50÷3.50	4.50÷5.50	7.00÷8.00	9.50÷11.5		Tensile Strength
2.1(b)	Stretch at break	Innovhub-SSCCP	ISO 1924-2	%	4	6.00÷8.00	1.00÷2.00	1.00÷2.00	4.00÷6.00		Tensile Stretch
2.2	Tensile strength after immersion in water	Innovhub-SSCCP	ISO 3781	N/m	2	500÷700	1500÷2000				Wet Tensile
2.3	Tearing resistance (Elmendorf)	SMITHERS-PIRA	ISO 1974	mN	4	280÷340	500÷900	1200÷1500	1700÷2000		Tear
2.4	Tear growth (Brecht-Imset)	PTS	DIN 53115	mNm/m	3	450÷550	870÷990	1240÷1400			Tear Brecht
2.5	Compressive strength (short span test)	PTS	ISO 9895	kN/m	4	1.40÷1.90	2.00÷3.00	5.00÷6.00	9.00÷11.0		SCT
2.6	Ring crush test (RCT)	CELABOR	ISO 12192	kN/m	3	0.60÷1.00	1.60÷2.10	3.10÷3.90			RCT
2.7	Flat crush resistance (FCT)	CELABOR	ISO 3035	kPa	2	150÷300	300÷450				FCT
2.8	Flat crush resistance after laboratory fluting (CMT)	SMITHERS-PIRA	ISO 7263	N	2	100÷250	300÷500				CMT
2.9(a)	Edgewise crush resistance (ECT) Pre-cut	CELABOR	ISO 3037	kN/m	2	6.0÷8.0	10.0÷15.0				ECT pre-cut
2.9(b)	Edgewise crush resistance (ECT) Lab cut	CELABOR	ISO 3037	kN/m	2	6.0÷8.0	10.0÷15.0				ECT lab-cut
2.10	Puncture resistance	SMITHERS-PIRA	ISO 3036	J	2	5.00÷9.00	10.0÷15.0				Puncture
2.11	Scott internal bond strength	Innovhub-SSCCP	TAPPI T-569	J/m <sup>2</sup>	3	100÷150	200÷300	500÷700			Scott IB
2.12	Folding endurance (Schopper)	SMITHERS-PIRA	ISO 5626	log <sub>10</sub> (n D.F.)	2	2.00÷2.50	2.60÷3.40				Folding Schopper
2.13	Folding endurance (Kohler-Mölin)	IGT	ISO 5626	log <sub>10</sub> (n D.F.)	2	2.20÷3.00	3.00÷3.30				Folding KM
2.14	Bursting strength paper	SMITHERS-PIRA	ISO 2758	kPa	4	100÷160	300÷400	600÷700	750÷900		Burst paper
2.15	Bursting strength board	SMITHERS-PIRA	ISO 2759	kPa	5	130÷170	300÷400	600÷700	750÷900	1100÷1700	Burst board
2.17	Bursting strength corrugated board	CELABOR	ISO 2759	kPa	2	800÷1200	1800÷2400				CB Burst
2.18a	Tensile strength	SMITHERS-PIRA	ISO 1924-3	kN/m	3	2.0÷3.0	6.0÷8.0	14.0÷16.0			Tensile Strength-m3
2.18b	Tensile stretch	SMITHERS-PIRA	ISO 1924-3	%	3	3.0÷6.0	6.0÷9.0	1.0÷3.5			Tensile Stretch-m3
2.18c	Tensile energy absorption (TEA)	SMITHERS-PIRA	ISO 1924-3	J/m <sup>2</sup>	3	50÷90	250÷500	150÷250			Tensile TEA-m3
2.18d	Tensile stiffness	SMITHERS-PIRA	ISO 1924-3	kN/m	3	150÷350	300÷600	1200÷2000			Tensile Stiffness-m3
<b>3</b>	<b>Stiffness properties</b>										
3.1	Bending stiffness resonance method	SMITHERS-PIRA	ISO 5629	mNm	4	0.30÷0.50	6.00÷8.50	22.0÷30.0	100÷150		Bending stiffness RM
3.2	Bending resistance (7.5° 15°; 50 mm)	PTS	ISO 2493-1, -2	mN	3	40.0÷60.0	300÷400	1200÷1700			Bending resistance Taber
3.3	Bending stiffness static (5°; 50 mm)	PTS	ISO 5628	mNm	3	5.5÷5.9	30÷35	230÷270			Bending stiffness Static
3.4	Bending resistance (15°; 10 mm)	CELABOR	(ISO 2493)	mN	2	28.0÷34.0	46.0÷56.0				Bending res 15°-10mm
3.5(a)	TSO – Tensile stiffness index MD	PTS	---	kNm/g	4	7.0÷10.0	8.0÷10.0	10.0÷13.0	10.0÷13.0		TSO-index MD
3.5(b)	TSO – Tensile stiffness index CD	PTS	---	kNm/g	4	1.5÷2.5	2.5÷4.2	4.2÷4.8	6.0÷6.9		TSO-index CD
3.5(c)	TSO – Orientation angle	PTS	---	°	4	-2.0÷3.0	-1.0÷4.0	-1.00÷3.00	1.00÷3.50		TSO-angle
<b>4</b>	<b>Surface properties</b>										
4.1	Smoothness Bekk	PTS	ISO 5627	s	4	30.0÷45.0	120÷160	200÷300	1000÷2000		Smoothness Bekk
4.2	Roughness Bendtsen	PTS	ISO 8791-2	ml/min	3	35.0÷60.0	200÷300	1300÷2300			Roughness Bendtsen
4.3	Roughness Parker Print-surf	SMITHERS-PIRA	ISO 8791-4	µm	3	1.0÷2.0	2.5÷3.5	5.0÷7.5			PPS
4.4(a)	Coefficient of friction static	IGT	ISO 15359	---	2	0.25÷0.45	0.45÷0.80				Static Friction
4.4(b)	Coefficient of friction dynamic	IGT	ISO 15359	---	2	0.20÷0.30	0.30÷0.70				Dynamic Friction
4.5	Coefficient of friction, inclined plane	IGT	UNI 9802, DIN 53119-2. NF Q 03-083	---	2	0.25÷0.45	0.45÷0.80				Static Friction IPM
4.6 EXP	Contact Angle	IGT	?	°	3	30.0÷50.0	70.0÷90.0	110.0÷130.0			Contact Angle
<b>5</b>	<b>Structural properties</b>										
5.2	Air permeance Bekk	PTS	---	s	4	5.00÷12.0	10.0÷20.0	20.0÷120	220÷260		Air permeance Bekk
5.3	Air permeance Bendtsen	PTS	ISO 5636-3	ml/min	4	40.0÷60.0	130÷180	450÷550	1800÷2400		Air permeance Bendtsen
5.4	Air permeance Gurley	PTS	ISO 5636-5	s	3	35.0÷55.0	60.0÷100	400÷650			Air permeance Gurley



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10.1(a)	Water absorption Cobb 60s (paper)	CELABOR	ISO 535	g/m <sup>2</sup>	2	15.0÷20.0	25.0÷30.0				Cobb Paper
10.1(b)	Water absorption Cobb 600s (board)	CELABOR	ISO 535	g/m <sup>2</sup>	1	90÷140					Cobb Board
10.1(c)	Water absorption Cobb 1800s (corrugated board)	CELABOR	ISO 535	g/m <sup>2</sup>	1	100÷130					Cobb CB
10.2(a)	Drainability (Schopper-Riegler)	Innovhub-SSCCP	ISO 5267-1	SR	3	15÷25	30÷50	50÷70			Drainability (°SR)
10.2(b)	Drainability ("Canadian Standard" freeness)	Innovhub-SSCCP	ISO 5267-2	ml	3	100÷250	250÷400	400÷600			Drainability (CSF)
10.3	Relative humidity	SMITHERS-PIRA	EN 20187	%	1	---					RH
10.4(a)	Fibre length	Innovhub-SSCCP	ISO 16065	mm	2	0.7÷1.0	2.0÷2.5				Fibre length
10.4(b)	Fibre width	Innovhub-SSCCP	ISO 16065	µm	2	12÷25	15÷35				Fibre width
10.5(a)	Peel adhesion (180°) at 300mm per minute (20min)	PTS	FINAT 1, 20min	N/25 mm	2	0.3÷0.8	7.0÷10.0				Finat 1 20min
10.5(b)	Peel adhesion (180°) at 300mm per minute (24h)	PTS	FINAT 1, 24h	N/25 mm	2	0.5÷1.7	8.0÷11.0				Finat 1 24h
10.6	Low speed release force	PTS	FINAT 3	cN/50 mm	2	8.0÷12.0	15.0÷21.0				Finat 3
10.7	'Loop' tack measurement	PTS	FINAT 9	N	2	2.0÷4.0	10.0÷14.0				Finat 9