

versatile

Ultraflute
by **sappi**

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by **sappi**

All over the world there is an increasing need to use renewable, sustainable and biodegradable resources. Sappi's range of versatile Containerboard paper products ensures that whatever the application may be, there is a solution best suited to that need.

Sappi's products are manufactured with the end-use in mind and the versatility of the range allows for functional paper combinations to create value added products.

Our extensive range of kraft linerboard and semi-chemical fluting with a significant percentage of virgin fibre, is ideally suited for the high-end, heavy duty market applications which endure rigorous conditions within the supply chain.


Ultraflute is our new semi-chemical flute. Ultraflute is made with **virgin NSSC fibre** and is the preferred choice for maximising machine performance and runnability. Using Ultraflute has a cost advantage for customers due to its **strength** and **convertibility** characteristics, resulting in an improved **yield** and a lower cost end-use product whilst still meeting the required **performance** standards.


Ultraflute is made from renewable resources derived from responsibly managed and sustainable plantations. It is biodegradable and recyclable, making Ultraflute your natural choice for packaging requirements.

 biodegradable

 recyclable

 responsible

 sustainable





STRENGTH

HIGH HUMIDITY
PERFORMANCE

CONVERTIBLE

LIGHTWEIGHT

ULTRAFLUTE
SPECIFICATIONS

GLOSSARY

SAMPLE SHEETS

Applications:

- Agricultural and industrial applications including:
 - Fruit and vegetable paper packaging market where boxes are exposed to changing cyclic humidity conditions.
 - Agricultural applications where the cold chain is employed in both local and export markets.
 - Non-food applications such as tobacco leaves and long stem flowers.
 - Industrial applications where heavy duty boxes are required for shipping, e.g. automotive parts, domestic appliances, beverages and cans.
 - Frozen applications such as fish and meat.



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STRENGTH

Strength



Strength

Ultraflute, with its high virgin fibre composition, is a world-class semi-chemical product offering superior strength characteristics.

Benefits

1

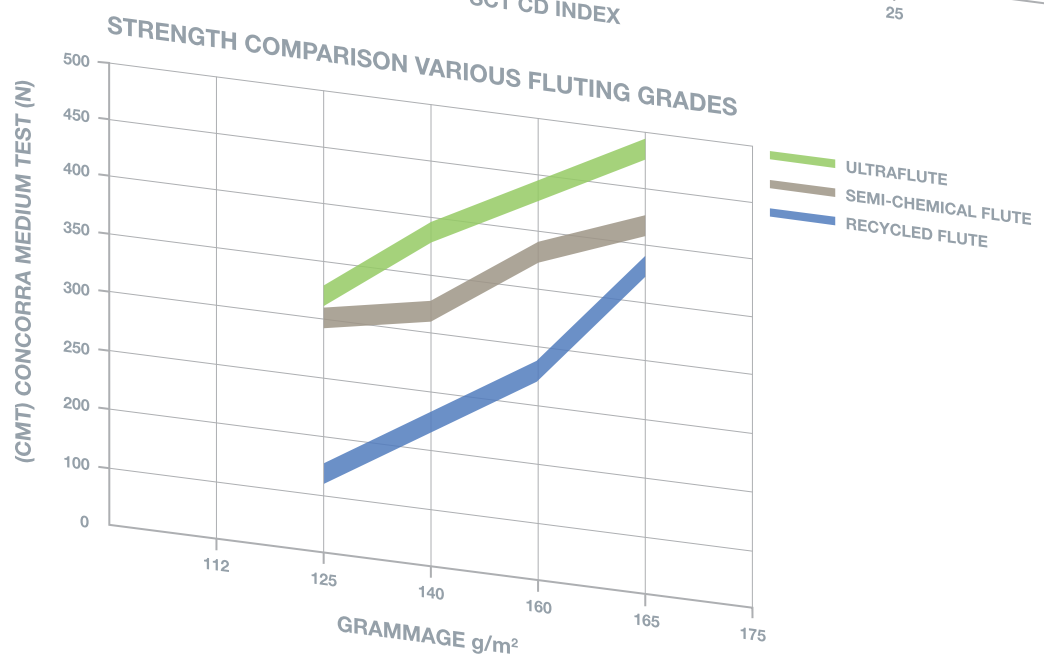
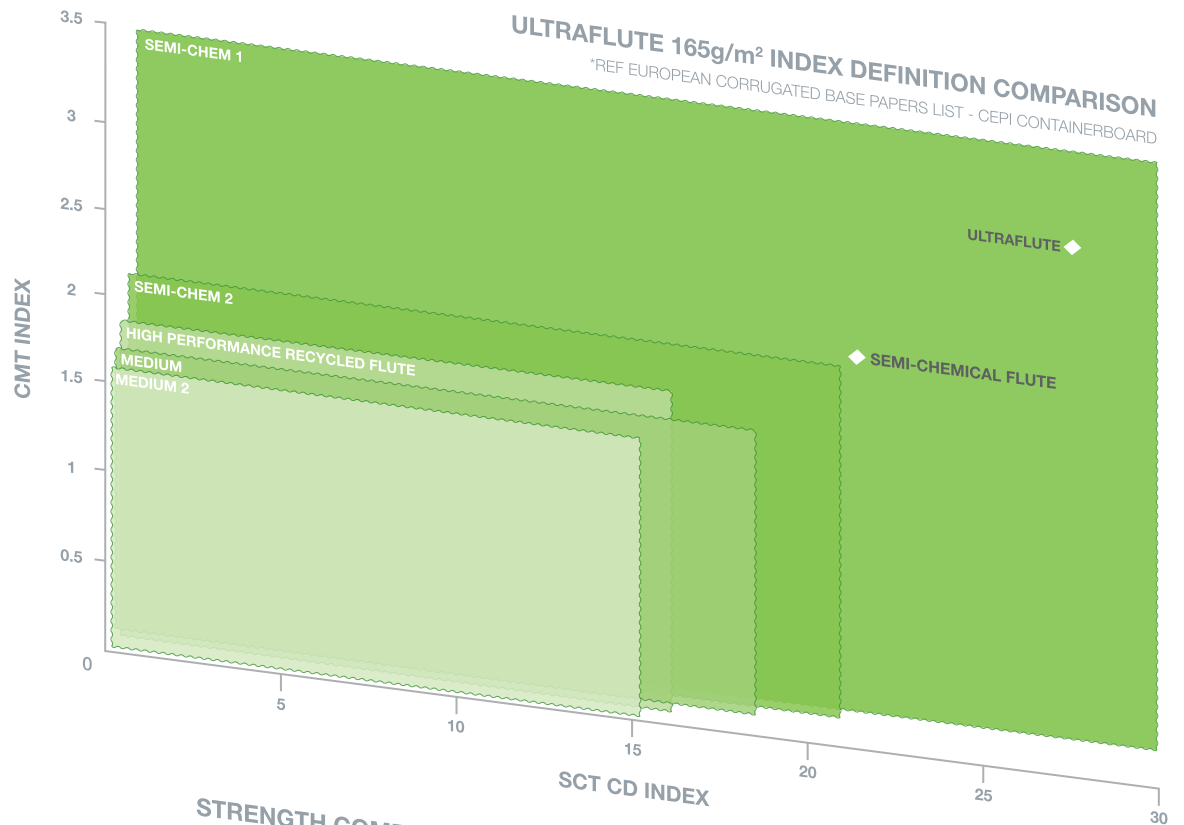
STRONGER BOXES

2

IMPROVED STACKING STRENGTH

3

YIELD ADVANTAGES



	CMT 30 INDEX	CCT 30 INDEX	SCT-CD INDEX
Semi-chemical 1	≥ 2.2	≥ 20.0	≥ 21.0
Semi-chemical 2	≥ 1.9	≥ 16.0	≥ 17

HIGH HUMIDITY
PERFORMANCE

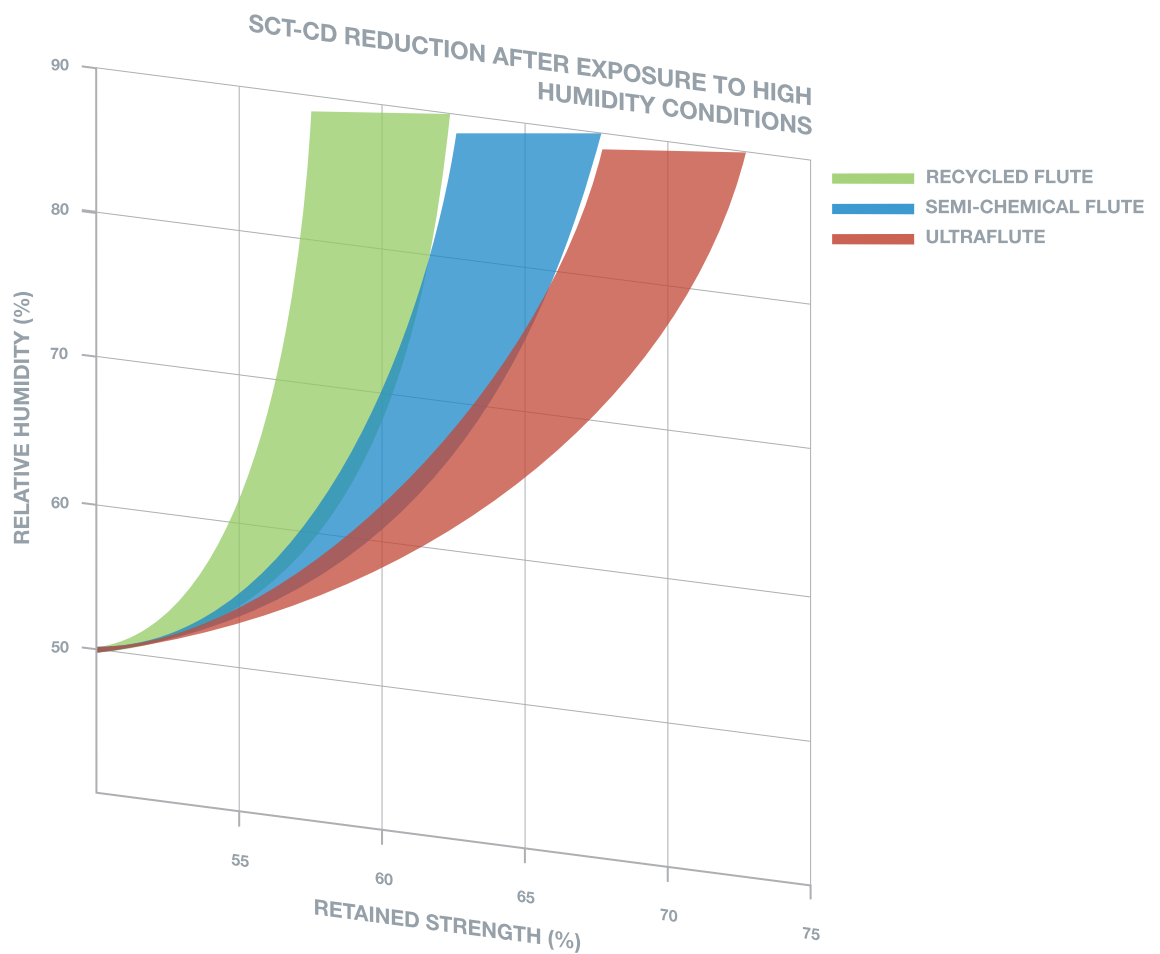
high humidity
performance

High Humidity Performance

The performance of fluting under high humidity conditions is a critical measure for box performance. Stacking strength can be achieved through the use of different types of fluting and basis weights, under standard testing conditions. However, exposure to high humidity can result in an entirely different performance level.

Ultraflute resists strength reduction under high humidity conditions better than our previous range of semi-chemical flute. Ultraflute typically retains more than 70% of its initial strength under high humidity conditions, and therefore this aspect of its performance supports the potential yield benefits.

Benefits



convertible



Convertible

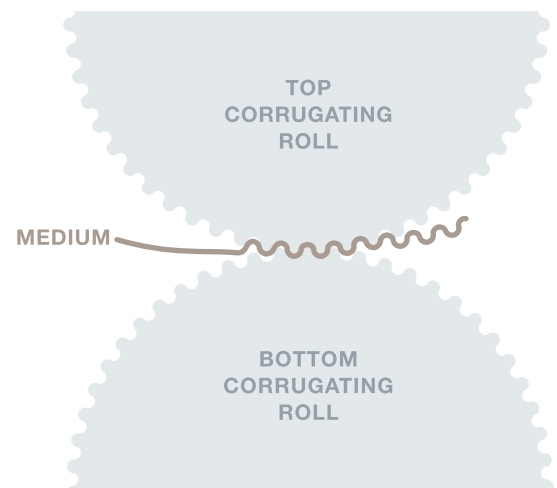
Convertibility is influenced by paper properties as well as the optimised running speed of machines.

Ultraflute allows for improved flexibility and better strength properties such as tensile, stretch and tear which could provide an increase in the operating window for the corrugator.

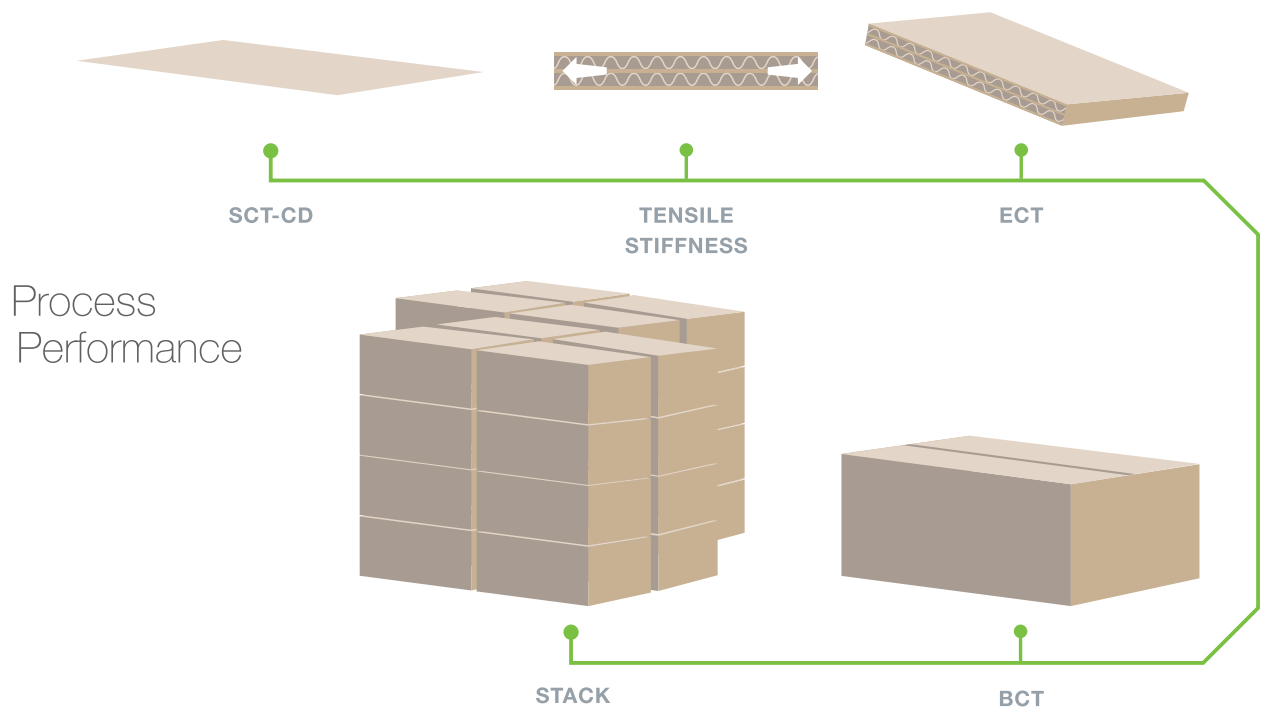
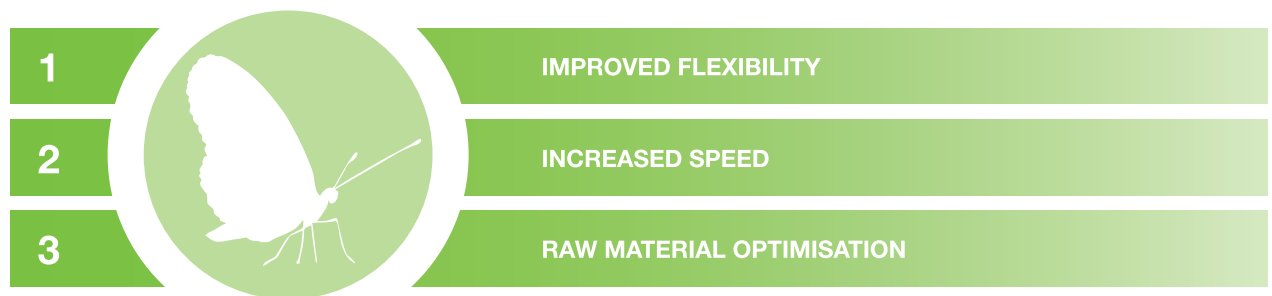
Using lower grammage Ultraflute allows for improved heat transfer, which can then result in corrugator speed increases.

Ultraflute allows the optimisation of raw material input costs.

Combining these factors leads to superior board and box quality.



Benefits



Process Performance

Lightweight

LIGHTWEIGHT

Lightweight

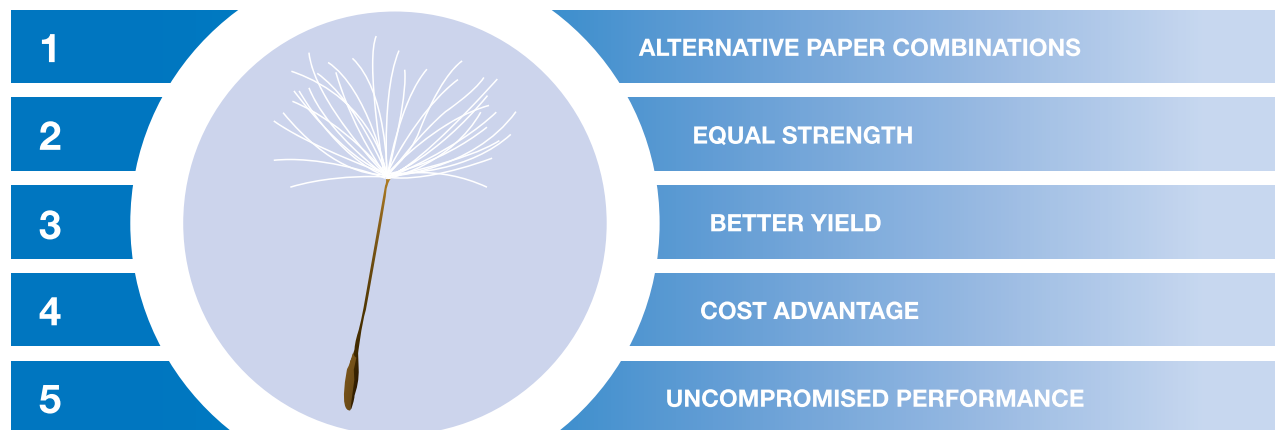
Lightweighting is a worldwide trend with decreasing average board weights. Ultraflute's lightweight benefit is that there is no compromise on product performance and the structural integrity of the box is maintained.

This reduces road, sea and air freight shipping costs with the added benefit of an improved carbon footprint. As a result of lightweighting the end-product becomes more cost-effective.

Replacing a higher grammage waste based fluting with Ultraflute enables customers to decrease the flute component of boxes, creating optimised fluting and liner combinations.

Ultraflute's better yield means you can use less paper to achieve the same results, allowing for more competitively priced end-use products.

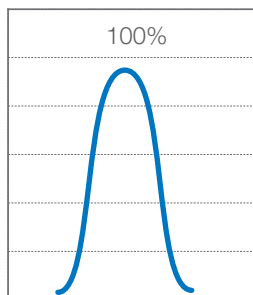
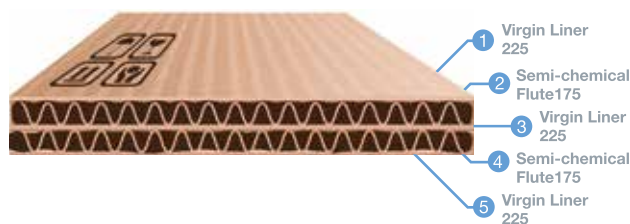
Benefits



Lightweighting cost analysis illustrative study

BOARD 1 - 175g/m² SEMI-CHEMICAL FLUTE

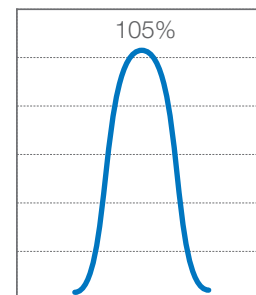
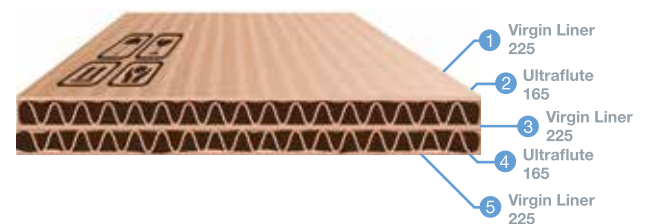
Total Board Weight: 1152g



CARTON BCT
at high humidity

BOARD 2 - 165g/m² ULTRAFLUTE

Total Board Weight: 1125g



CARTON BCT
at high humidity

Benefits

- 2.4% reduction in board weight - % drop in board grammage
- 5.7% cost saving at equal price for both fluting products - paper yield improvements
- 5% improvement in BCT

typical values

ULTRAFLUTE
SPECIFICATIONS



Typical Values

ULTRAFLUTE - STANDARDISED GRAMMAGE RANGE

PROPERTY	UNIT	METHOD OF ANALYSIS	125	140	150	165
Nominal Basis Weight	g/m ²	On-line	125	140	150	165
Moisture	%	On-line	9.5	9.6	9.6	9.3
Burst Index	kPa.m ² /g	ISO 2758	3.6	3.5	3.5	3.5
Ring Crush CD	kN/m	ISO 12192	1.2	1.5	1.7	2
CMT	N/10AF	ISO 7263	322	370	427	482
SCT CD	kN/m	ISO 9895	3.2	3.7	4.1	4.4
Porosity (Bendsten)	ml/min	ISO 5636/3	149	117	109	118
Test Date			May	May	May	May

Above values indicative of typical values

Also on request - other tests: CCT, Tensile MD, Tensile CD

Reel Size

1270 mm diameter x 102 mm core

Certifications

ISO 14001

ISO 9001

Forest Stewardship Council (FSC)®

Ultraflute has been tested for compliance with heavy metals and cadmium as specified by the BfR Recommendation XXXVI - Paper and Board for Food Contact.

Glossary

Glossary

BCT - Box compression test. Measure of the top to bottom compression strength of a corrugated container or box. It provides an indication of the container's ability to resist loads and protect its contents. The BCT test is measured in kilogram-force (kgf).

BfR - German Federal Institute for Risk Assessment.

Bursting Strength - Measure of the amount of pressure a piece of paper or paperboard can resist before rupture, measured in kilopascals (kPa). The burst strength provides an indication of a paper's resistance to rupture during handling and transportation.

CCT - Corrugated Crush Test (kN/m). Measure of the corrugating medium's resistance to crushing when a force is applied in the direction parallel to the fluted tips. The CCT provides an indication of the ability of the corrugated material to contribute to the overall compression strength of the container.

CD - Cross Direction of the paper sheet.

CEPI - CEPI Containerboard (CEPI Containerboard is the organisation formed from the merger in 2009 of the European Containerboard Organisation (ECO) and Groupement Ondulé (GO).

CMT - Concorra Medium test, also Flat Crush Test (N/10AF). The flat crush provides a measure of the flute rigidity of the corrugated board and essentially quantifies the resistance of the flutes to a crushing force applied to the surface of the board under prescribed conditions.

ECT - Edge Crush Test (kN/m). Provides a measure of the cross-direction crushing resistance of corrugated board. ECT is influenced by the board components, flute profile and the quality of the corrugating process.

FSC - Forest Stewardship Council™.

Grammage / Basis Weight - The weight of the paper per square metre g/m². Paper is generally bought on the mass, but the grammage of the paper determines the area of paper that the customer receives per ton and hence the yield. The lower the basis weight of the paper, the higher the yield.

High Humidity - 87% RH (+/- 2%) and 32 degrees Celsius (+/- 1%).

ISO - International Standards Organization.

ISO 14001 - Environmental Management System.

ISO 9001 - Quality Management System.

MD - Machine Direction of the paper sheet.

Medium / Flute - The term medium can be used interchangeably with fluting.

NSSC Pulp - Neutral Sulphite Semi-Chemical Pulp produced in a semi-chemical pulping process in slightly alkaline conditions. Wood chips are firstly softened by chemical treatment, with the remainder of the pulping action carried out via a disk attrition or by a similar mechanical device used for separating the fibres. NSSC Pulp provides excellent strength properties, particularly a high stiffness that is desirable in Containerboard grades.

RCT - Ring Crush Test (kN/m). Similar to the SCT in that it measures the compression resistance of the liner or corrugating medium. However, the impact of buckling is more prevalent in this test when compared to the SCT. Paper caliper also influences this test.

Recycled Flute - Fluting made with predominantly secondary or recycled fibre.

	CMT 30 INDEX	SCT-CD INDEX
Medium High Performance	≥ 1.8	≥18.0
Medium	≥ 1.6	≥ 15.0
Medium	≥ 1.3	≥ 13.5

SCT - Short Span Compression Test (kN/m). Measure of the characteristic 'compressive' strength of the paper or paperboard. Conducted over a shorter test length than traditional testing methods such as Ring Crush Test, therefore providing a greater buckling stability. SCT is taking over as the more predominant paper property used to predict the final compression characteristics of containers. Measured in the CD of the sheet.

Semi-chemical Flute - Fluting made with predominantly semi-chemical fibre such as NSSC.

Standard Humidity - 50% RH (+/- 2%) and 23 degrees Celsius (+/- 1%) - Conditioned.

Tensile - The tensile strength is the maximum tension that a sheet of paper can withstand before breaking.

Typical Value - 3 month moving average data, at time of print.