Management Summary

Introduction

All corrugated boards are engineered to have a three dimensional structure. Without this structure we are left with a few pieces of paper that have no useful load bearing capabilities.

At one end of the quality spectrum we have well formed, well adhered and undamaged corrugated board - at the other we have board that has been compromised and will not do the job it was designed for. There is a continuum of states between these two extremes but the closer you get to the good end - the better the board will perform, and the less material you will need to do the job.

Figure 1: Chalmers DST

Quantifying MD Torsional stiffness using the Chalmers DST is the global leading way to measure corrugated board's structural strength. The test is quick and easy to perform, with accurate and very reliable results. It can be used by engineering, production or technical staff to immediately quantify the quality of the board. A major benefit is the establishment of a consistent quality product that will allow the down weighting of components.

Value Proposition for the convertor

The Chalmers DST is the first user friendly tester that allows the convertor to see how well they are making their corrugated board. The method is visible, reliable, with repeatable and understandable results. The tester is robust and cannot be adjusted by staff. It is able to be easily incorporated into existing computer data logging systems, and it will reduce the number of tests required for QA.
Save on testing costs

It can be used to examine the whole manufacturing chain and isolate damage points.
Poor techniques, damaging settings or faulty equipment can be remedied quickly

It is designed to be used on the floor by operators to do their own quality checks.
Improve product consistency and ownership by operators

By raising product quality and reducing product variability weight can be taken out of the components so that lighter board can do the same job.
Savings in raw material on some grades could typically be in the order of 15%

Lighter weight components will corrugate faster. **More production off the corrugator**

The pay back for a well managed data acquisition and product improvement system using the Chalmers DST can be in as little as a day. One plant in NZ saved the cost of the DST on one job. Large plants could save millions of dollars annually.

How does the Chalmers DST work?

The basis of the testing technique is as old as physics itself and completely reliable. It uses the simple relationship in a rotating system where the torsional stiffness of an object fixed at one end and twisted slightly about its axis at the other end is equal to the square of the natural oscillation frequency setup on release of the twisting force multiplied by the moment of inertia of the rotating end. This technique has never before been applied to corrugated board and a full US Patent has recently been obtained (US 7,621,187).

Corrugated Board for Corrugators

Corrugated board is made from liners and mediums that have known properties.
If you want a strong corrugated board you use Kraft liners and semichem mediums otherwise you use recycled fiber. Higher liner and fluting medium weights generally make stronger boxes.

But not all liners and mediums are created equal - especially those with recycled fiber.
Some are stronger than others and we know this. We can easily measure the strength of liners and medium with tensile, ring crush or short span compression testing. We can get guaranteed results from our suppliers. We can get reliable raw material into our corrugators. So…

- Why do we need to retest these properties?
- Why don't our boxes perform as well as they should?
- Why do we have to use such heavy components to get reliability?

The answer of course is that we do not make the corrugated board as well as we should. And when we do, we often damage it during printing and converting, because we have no user friendly tools to quantify corrugated board quality.

Damage to corrugated board is almost always damage to the medium.
Liner damage is **uncommon**, it is **visible and easily quantified.**
Medium damage is **common**, it is **invisible and difficult to quantify.**
That is until now.

The Chalmers DST will rapidly quantify the state of the fluted medium and allow you to make better board off the corrugator using your existing raw materials.
It will guide you to where your board is being damaged and give you the data to fix it.

Who uses the Chalmers DST?

Currently over 180 Chalmers DSTs are being used in 30 countries around the world.

Please see our Feedback Summary sheet for what people have been saying about the Chalmers DST to date.