

**New kid on the block innovates box quality**

Historically, the presence of corrugated board damage has been measured by determining the calliper or thickness of the finished board.

Unfortunately, by the time thickness measurement shows any measurable decrease the board may have lost enough performance to drop the resulting box strength by 30 per cent.

In more recent times Amcor has used in-house technology to detect the onset of medium damage by deducing the shear stiffness of the medium in the converted board. However, as the measurements are proprietary in nature, other companies are unable to take advantage of the technology.

Now, this type of measurement is about to be made available to the world packaging community through the innovative developments of small technology development company, XQ innovations, based in Mount Waverley, Melbourne Australia.

Although difficult to measure, the damage experienced by the corrugated medium through the manufacture and

converting processes can have a disproportionately large effect on the ultimate performance of the board when converted into a corrugated box. Experience shows that a typical box plant will have variation in box strength due to damage of the medium between 10 per cent and 30 per cent of the full box potential. This is not the end of the story.

Because the performance of box in stacking applications is so non-linearly related to overall box strength, the performance variation in say, survival life time in high humidity environments, can be many times greater. Figure 1 shows the effect on performance of a typical variation in box strength caused by medium damage within the box plant. Surprisingly, depending upon the storage conditions, a 10 per cent change in box strength from medium damage may result in a 300 per cent variation in the final box performance in service.

Whilst measurements for assessing box quality related to medium damage have required sampling and interruption to the continuous corrugating process the new XQi technologies are suited to non-contact and continuous measurement. This makes the introduction of these technologies capable of integration into control and automatic process strategies as well as feeding back information in real time for quality and process assessment.

XQi also have developed a robust, hand-held variant for instant off-line measurement, especially applicable to measuring finished boxes.

The measurement itself relies on the structural properties of the corrugated board being exercised in a particular mode that is sensitive to the medium stiffness. Early testing showed a strong correlation with existing shear measurements and subsequent development has confirmed the usefulness of the technology in non-contact control applications.

The commercial reality is simply this: it's generally recognised that more than half of corrugate box cost is in the fibre itself. Stabilising the process to reduce the current variation and then reducing board grammage, effects immediate, significant reductions in cost and hence overall profitability. Tinkering with anything else on the corrugator will never achieve the magnitude of these benefits.

It has been estimated by XQi that use of the technology will decrease performance variation and allow a 10-20 per cent decrease in weight for a given container application. Not only does this equate to a reduction in fibre material costs of up to 10 per cent but it also flags an available increase in corrugator speed.

Perhaps not as obvious to manufacturing or commercial management are the environmental advantages of a reduction in paper and paper packaging use. As evidenced by the NPC requirements, real outcomes are becoming increasingly sought after by Australian industry and government.

Application of this technology meets most of the key criteria for any NPC Action Plan – substantial reduction in material used, optimisation of recycle content and reduced energy water usage. In fact, on environmental grounds alone this development is worthy of adoption.

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**Australia's XQ innovations has developed a world first in testing box quality.**

