

Measurement of board quality and its effect on cost and performance



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Why of interest?

A corrugated board quality measurement is of interest to:

- **Box manufacturers**

Our measurement system will provide the manufacturer with real time board damage data, sufficient to allow the reduction in box strength variability by 10% to 30%





Why of interest?

A corrugated board quality measurement is of interest to:

- **Box manufacturers**
- **Brand Owners**

Receipt of low variability boxes , improved packaging line efficiency and improved field performance. Lower packaging cost.





Why of interest?

A corrugated board quality measurement is of interest to:

- **Box manufacturers**
- **Brand Owners**
- **Environment**

Packaging board is a major contributor to landfill in the world. The option of down gauging by 15% provides the industry a mechanism for demonstrating to Government “voluntary adoption”.





The Size of the Prize

The performance of a box in a given application is dependent upon:

- The undamaged potential of the box components (liner and medium weights and strengths).
- Loss in performance potential of the box due to manufacturing process damage.
- The logistic chain environment.





The Situation

The new **Box Quality Measure (BQM)** measures the shear stiffness of the medium and is very sensitive to medium damage (crushing).



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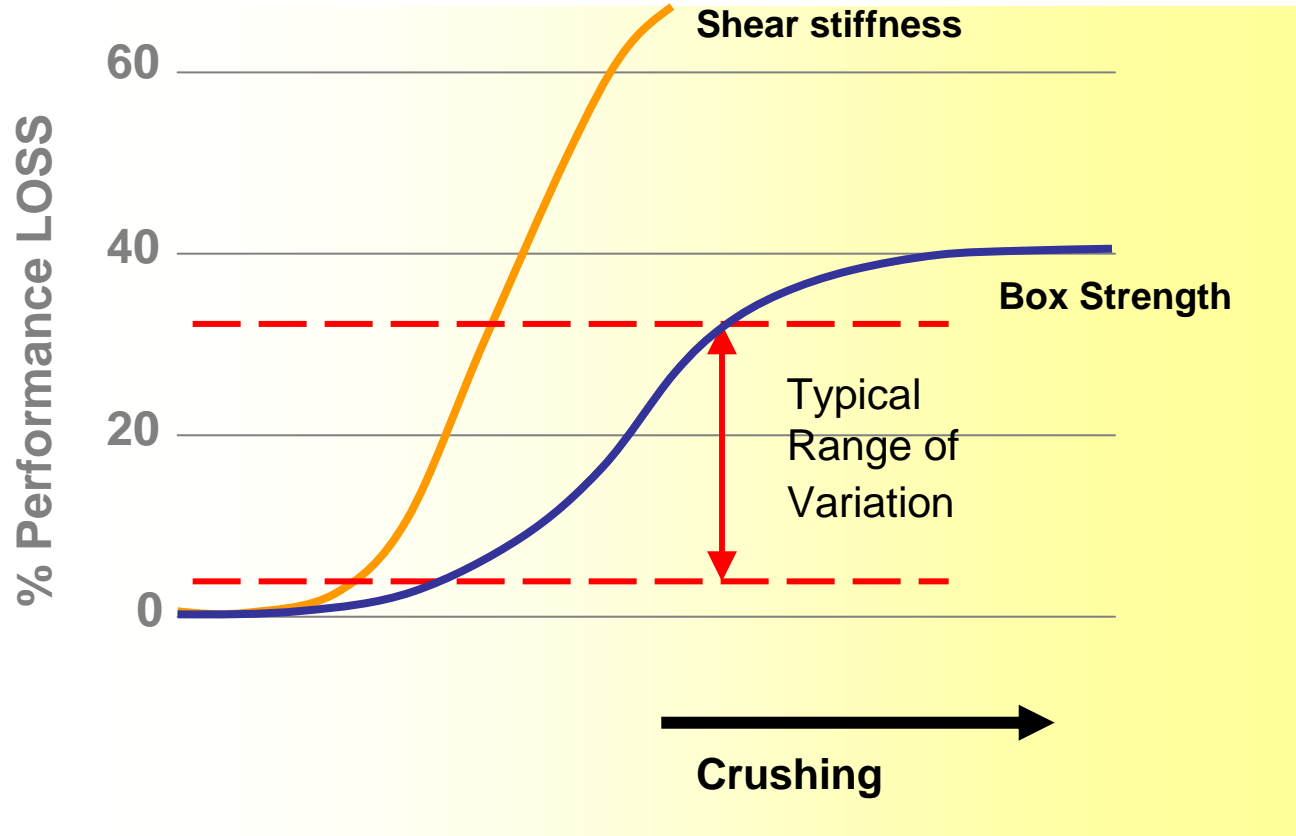
Typically, process damage during manufacture and conversion introduces up to 30% uncertainty in the designed box strength.

This loss in performance is met by manufacturers through increasing the box weight and so, the manufacturing cost.





The Size of the Prize



- Typical manufacturer variation in BQM translates to a 10-30% loss in box strength and greater variation in box survival time.





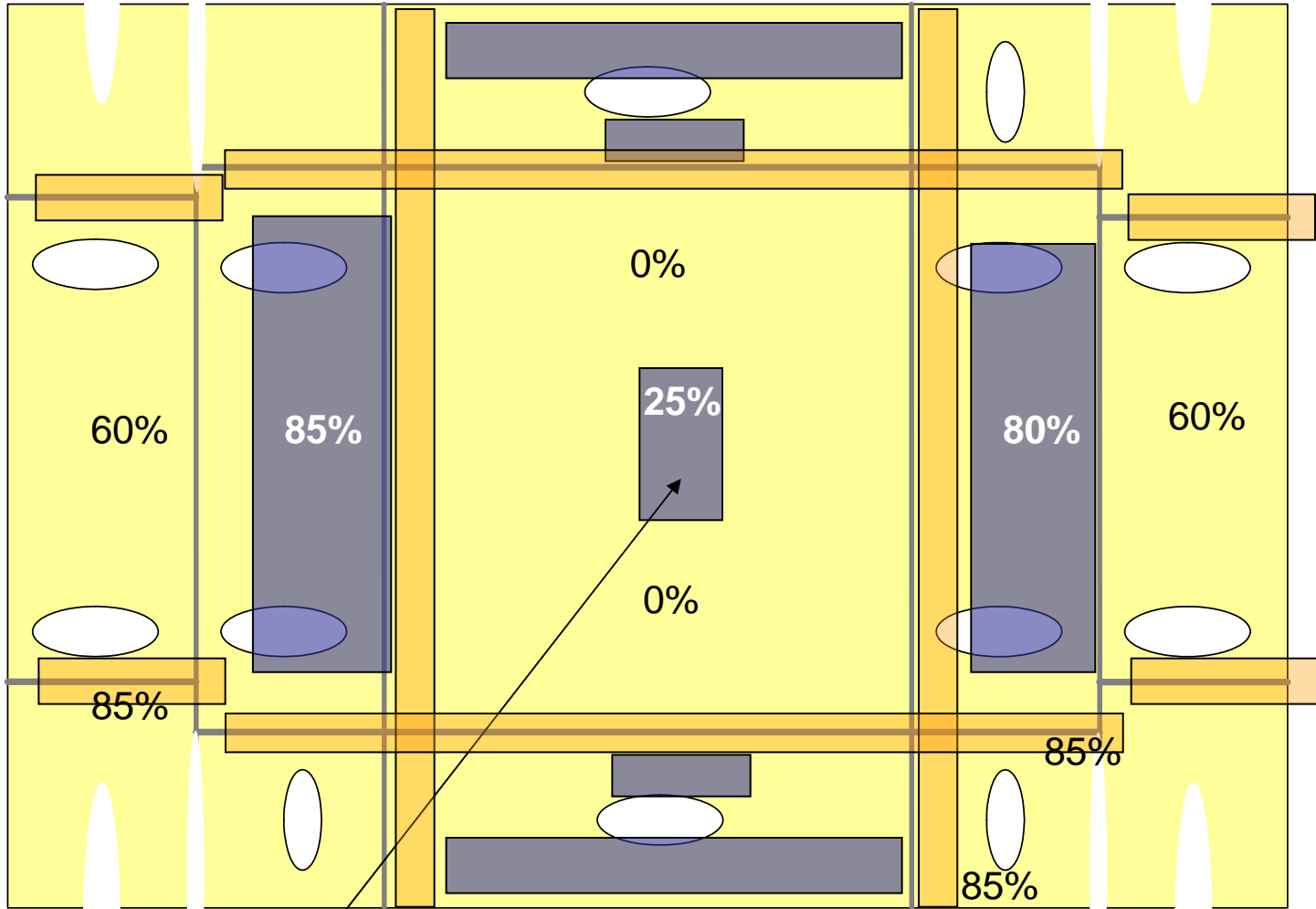
Example

Tray Blank

Creases

Print

% Shear Loss



Manufacturer's Logo

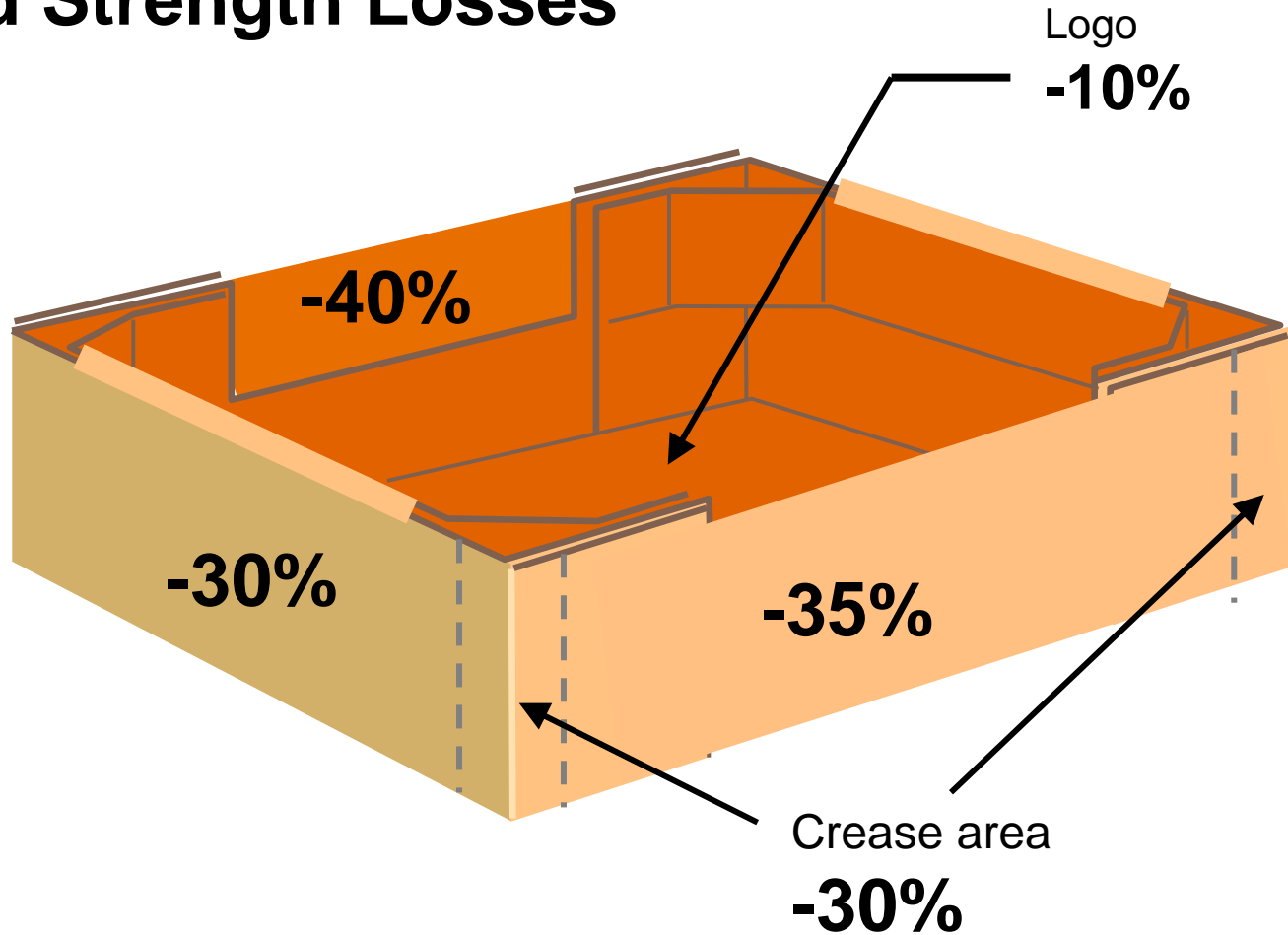
Lost medium performance



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Board Strength Losses





Solution

- **Measure** and **control** the board quality at the box plant.
- Introduce **acceptance testing** based on board quality performance (BQM) levels and cost at the customer site.

These two simple and chain-integrated measures will ensure that the **full value** of the box is realized by the customer.



In Conclusion

- The **BQM** is a hand-held testing unit that **reliably measures** levels of box deterioration routinely occurring in box plants.
- Conservative estimates show that a **10%** lowering of board strength variability is available through proper quality management.
- There is a requirement for customers to incorporate **medium damage specifications** to ensure full value is obtained from corrugated packaging.





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Messmer Instruments Ltd.  *Stacking*

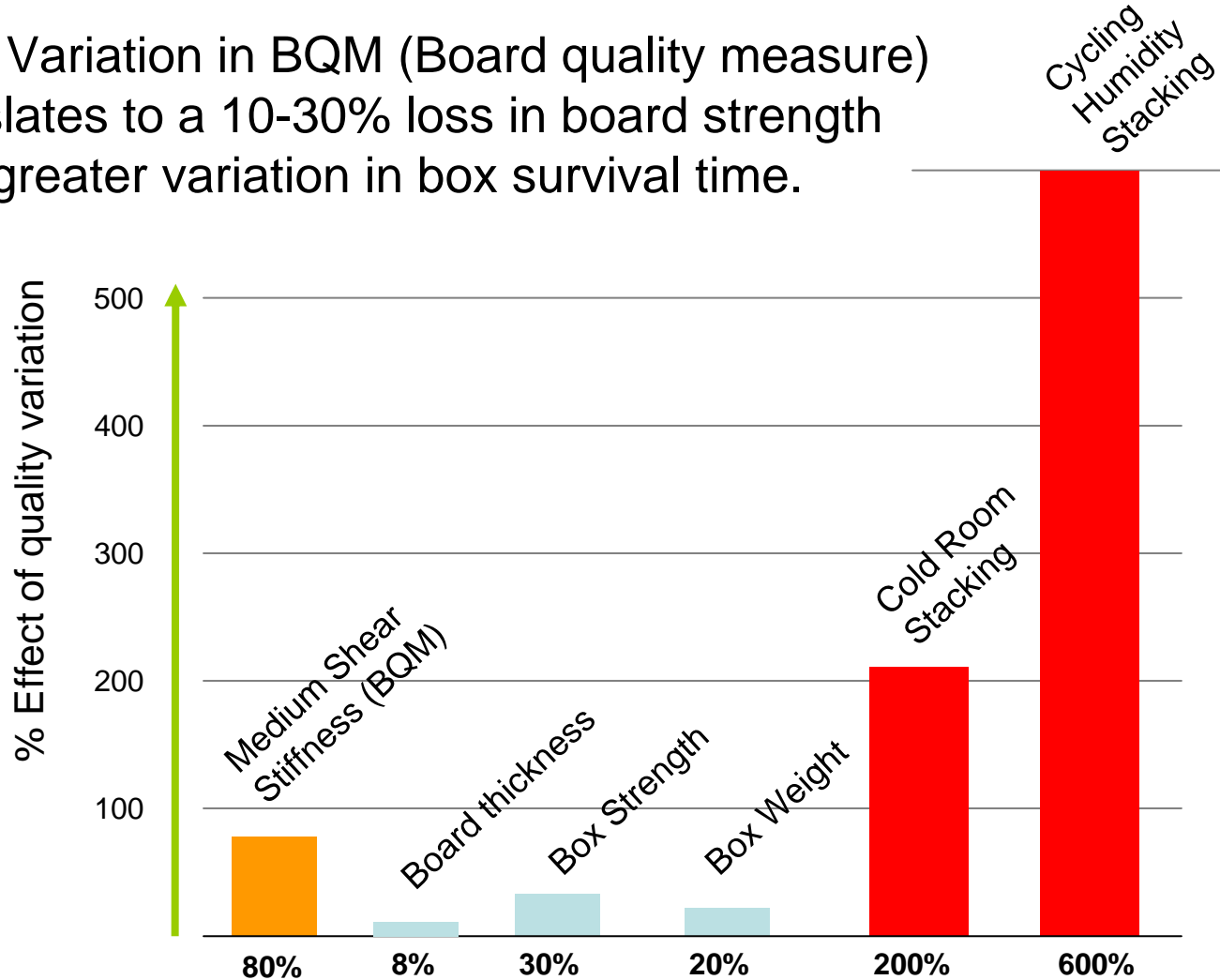
 *Tacoma*

 *Single flute*



Technology details

- 80% Variation in BQM (Board quality measure) translates to a 10-30% loss in board strength and greater variation in box survival time.





Technology

Tacoma Narrows Bridge

Principle of resonance reflects the natural frequency of the structure.

At resonance the structure moves in sympathy with the excitation applied and large displacements are possible.

The natural frequency reflects the stiffness and geometry of the structure.

Click on the Photo

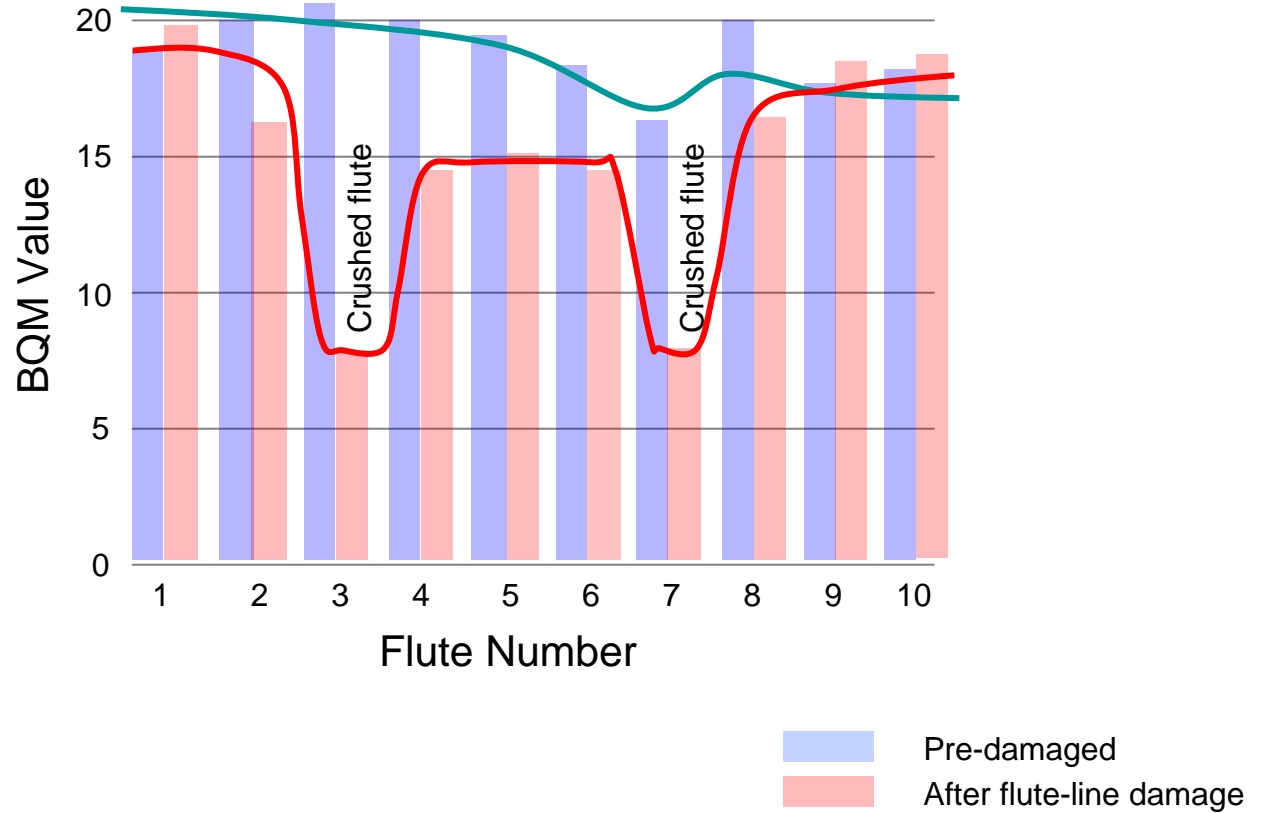


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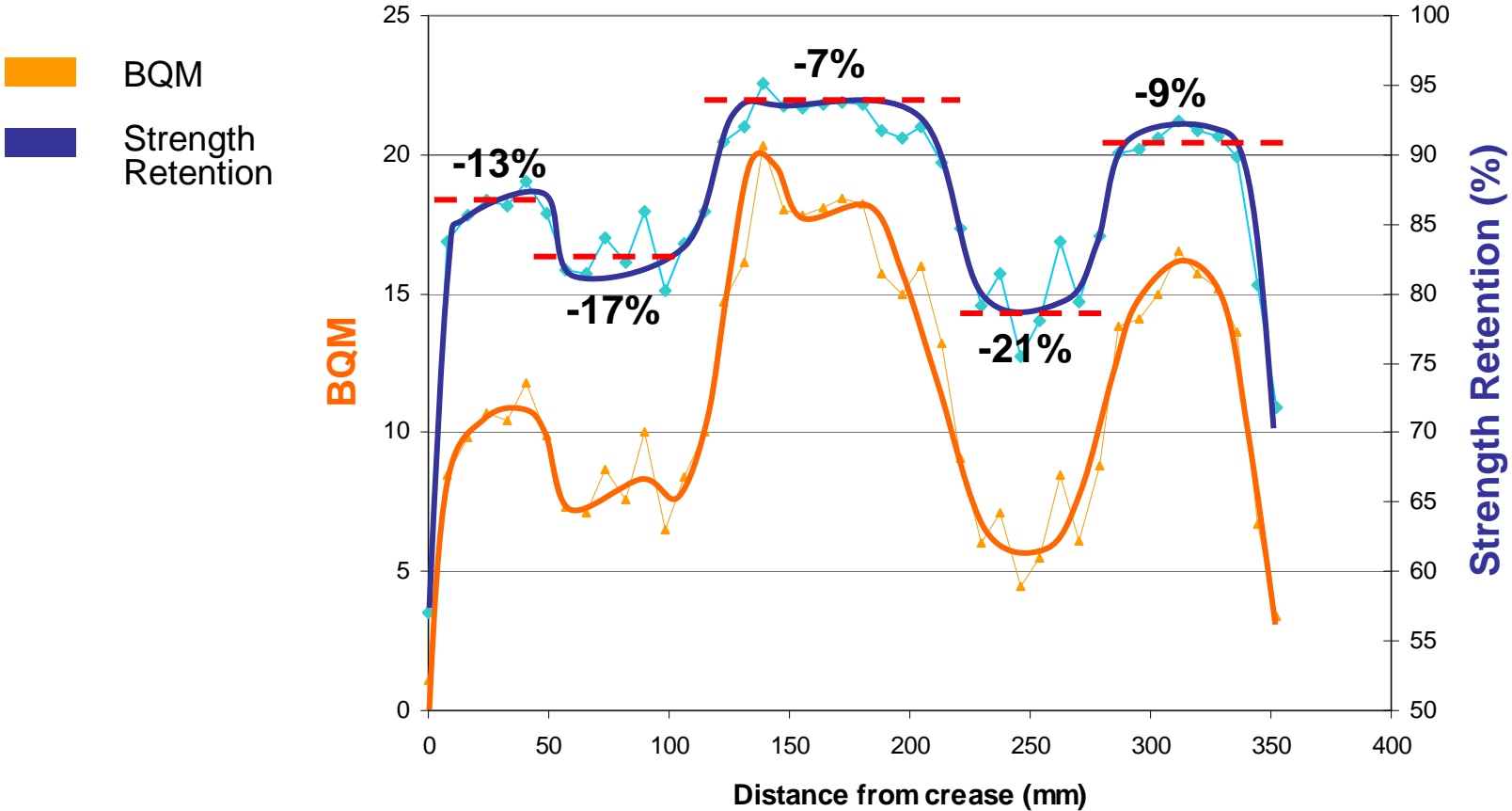


Effect of damage to one flute line





Major publishers box panel





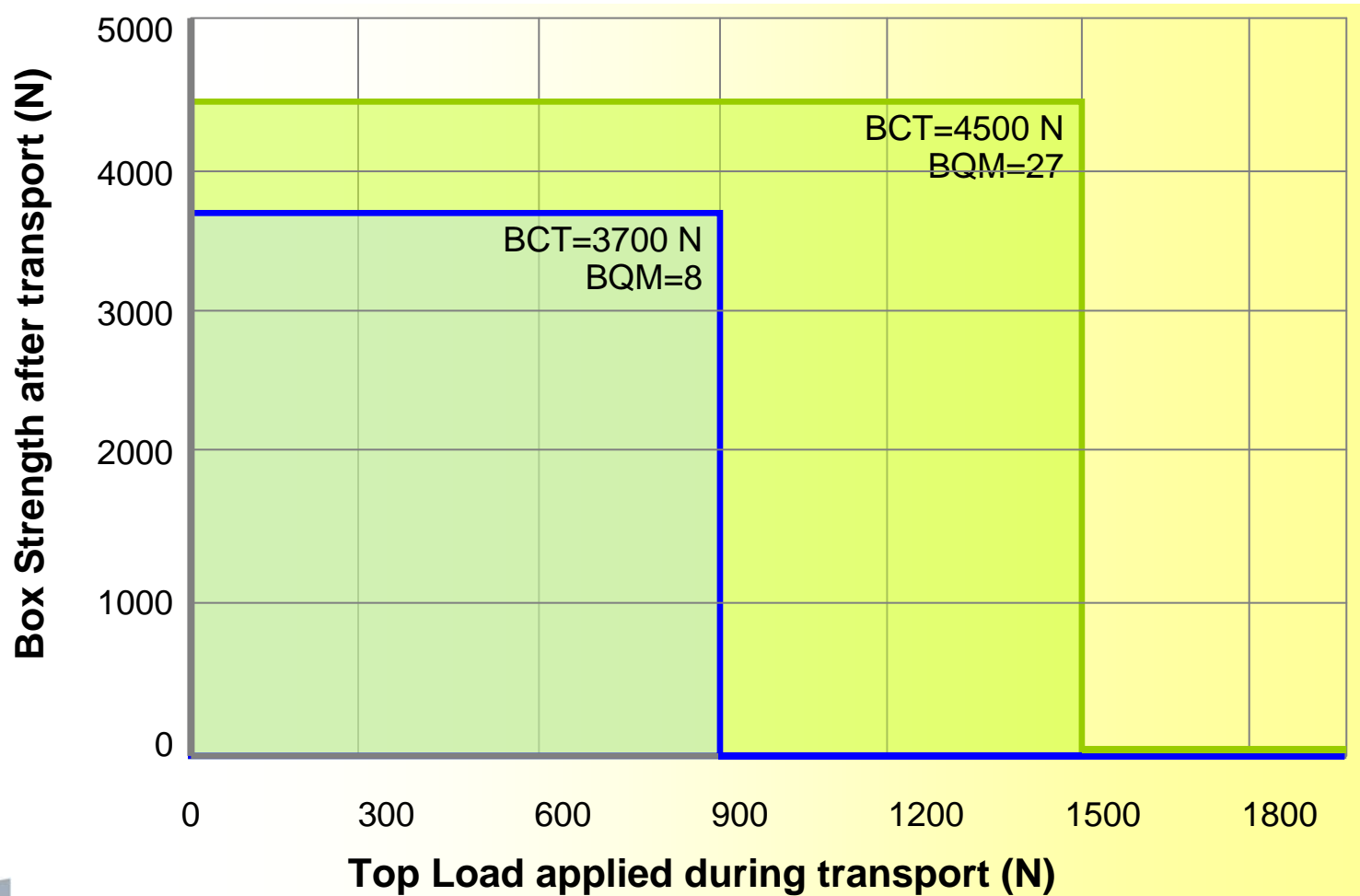
Measurement of board quality and its effect on cost and transport performance



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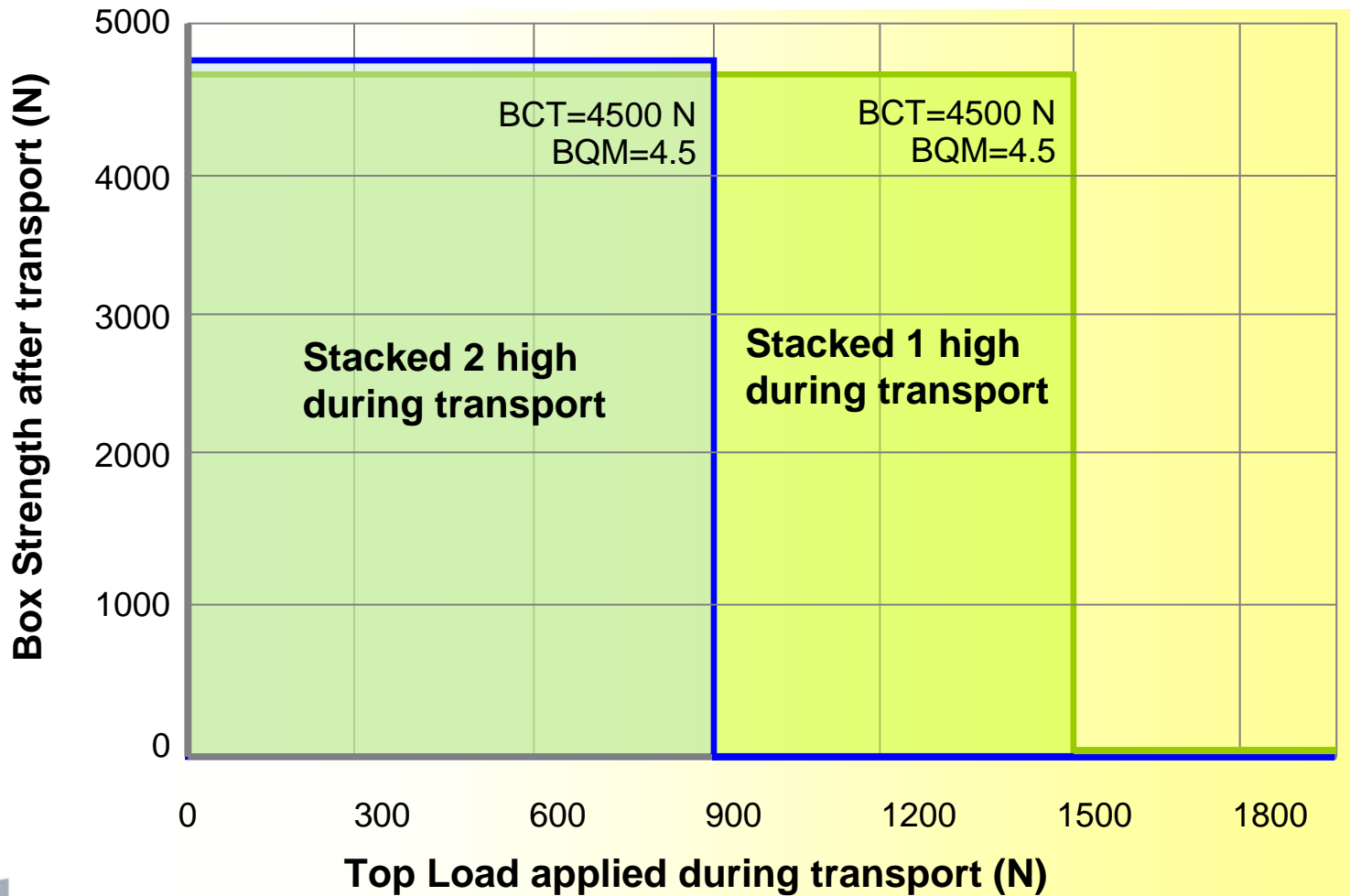
Effect of damage on transport performance

Transport: 10 min, Level II vibration (= 165 km truck trip)
Stacked 1 high.



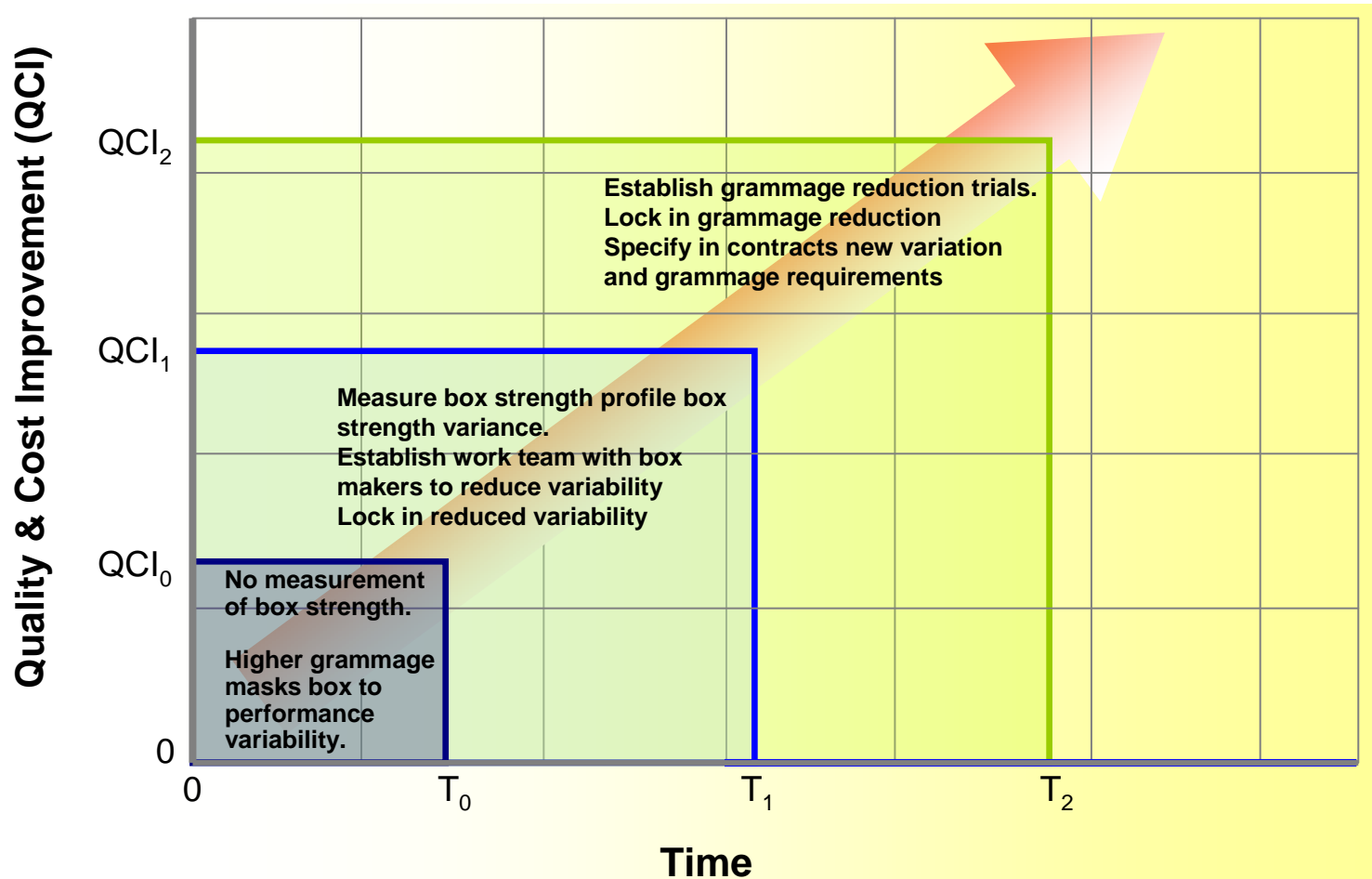
Effect of damage on transport performance

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Box Quality and Cost Improvement Path





Crease distance impact

