

# Unravelling capping issues using Styl'One™

## Dwell Time or Punch Speed

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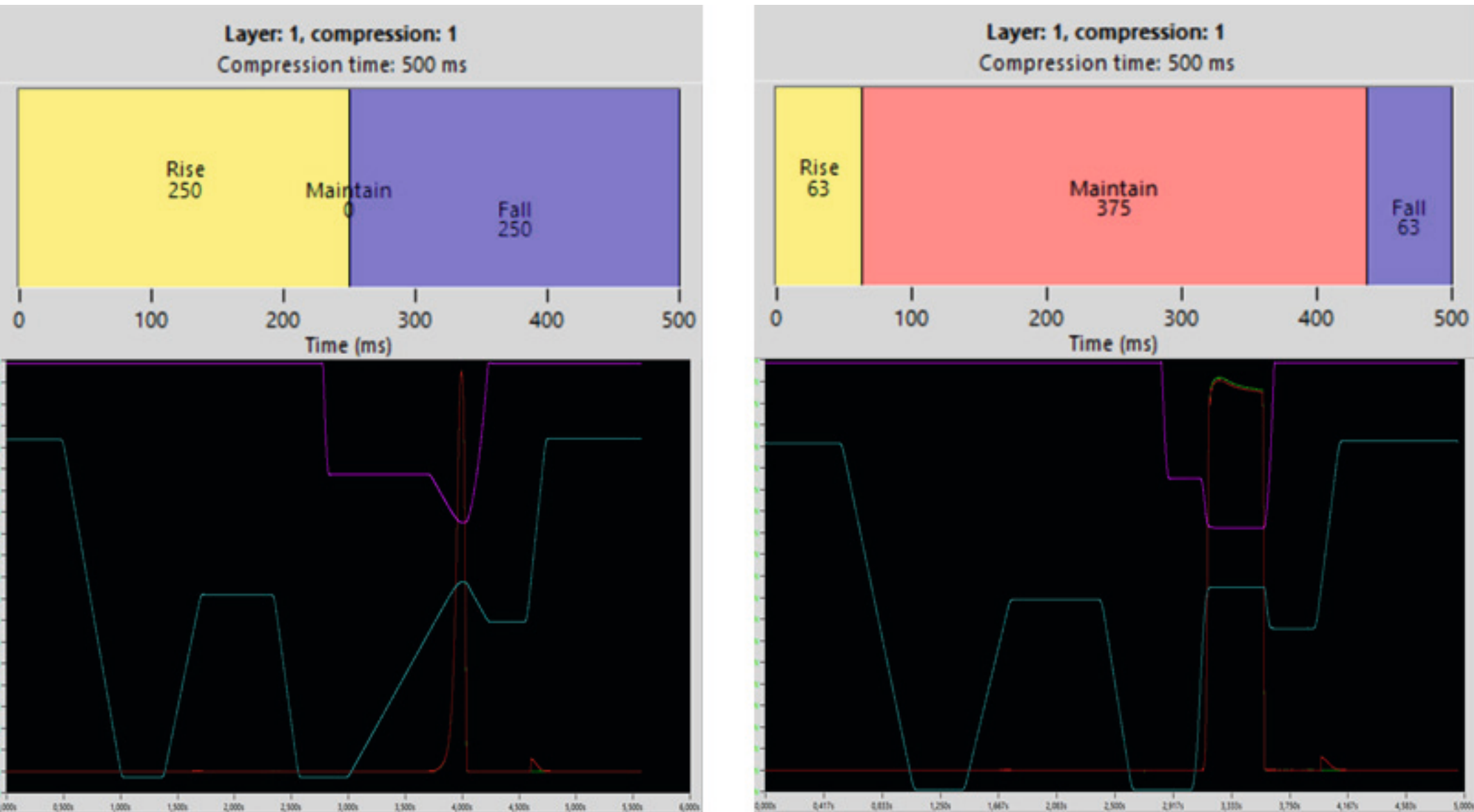
### Introduction

Capping is a common problem encountered during tablet formulation and industrial production; whose origin has been attributed to several causes as air entrapment, compression speed, viscoelastic recovery; and stress and density distribution. The speed at which the punch travels during the compression influences tablet properties [1].

However, this speed is not constant: it accelerates to a maximum when in contact with the roller and then is reduced to zero when the roller reaches the flat portion of the punch head during dwell time. The effect of the compression speed and dwell time is different for each formulation [2,3].

The purpose of this work was to study the influence of punch speed and dwell time on the appearance of capping.

### Experimental Methods



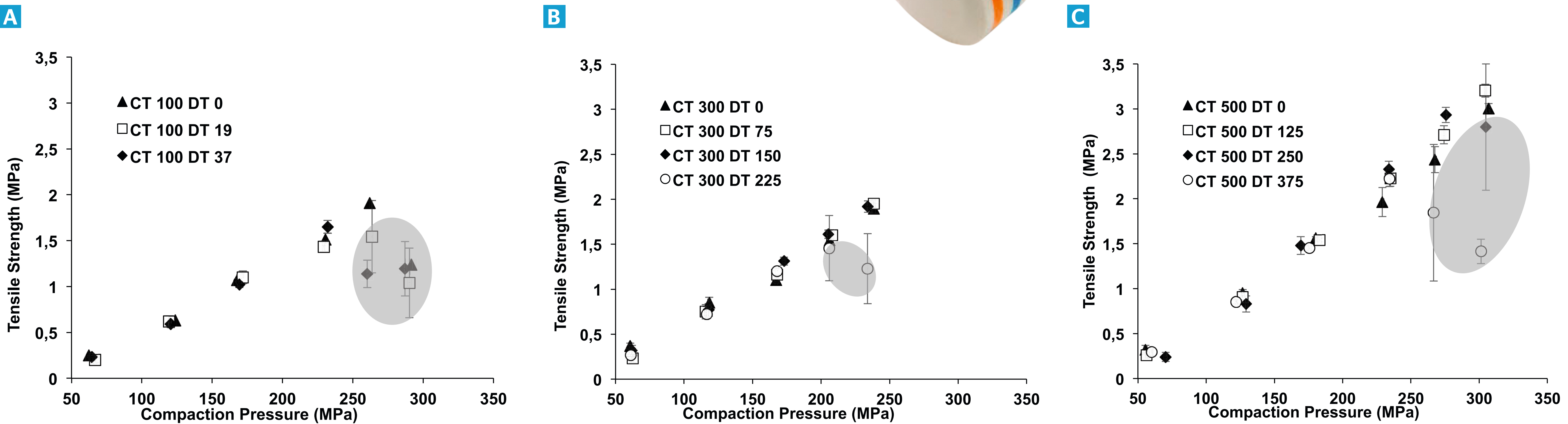
Compression and Dwell Time settings on AnalisTM software

500 lactose tablets lubricated with 0.5% of magnesium stearate. Tablets were produced on a Styl'One™ tableting instrument, equipped with Euro B 10 mm concave punches.

Compression and dwell times were changed directly into the Analis™ software of Styl'One™.



### Results and Discussion



Tensile strength of lactose tablets lubricated with 0.5% MgSt using a compression time of (A) 100 ms (0; 19 and 37 ms of dwell time); (B) 300 ms (0; 75; 150 and 225 ms of dwell time) and (C) 500 ms (0; 125; 250 and 375 ms of dwell time)

### Conclusion

It was found that at high pressures, fast punch speeds lead to capping of lactose tablets and extended dwell times do not seem to remediate this problem.

Understanding the influence of compression parameters, like punch speed and dwell time, on tablet properties during early research & development can ensure an appropriate scale-up. This can be easily and quickly evaluated using a Styl'One™ tableting instrument, using minimal amounts of powder.

### References

1. Sarkar, S., Ooi, S.MM, Liew, C.V. and Heng P.W.S. Influence of rate of force application during compression on tablet capping, J. Pharm. Sci. 104, 1319-1327 (2015)
2. Charlton, B. and Newton, J.M. Theoretical estimation of punch velocities and displacements of single-punch and rotary tablet machines, J. Pharm. Pharmacol. 36, 645-651 (1984)
3. Sinka, I.C.; Morazedian, F.; Cocks, A.C.F. and Pitt, K.G. The effect of processing parameters on pharmaceutical properties, Powder Technology. 180, 276-284 (2009).