

CORNING

Delivering Value

**Improving fill-finish efficiency with
a new drop-in vial solution**



Corning Velocity® Vials' Low Coefficient of Friction Coating

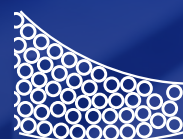
has consistently enabled a 20 – 50% improvement in fill-finish efficiency



Corning's patented low coefficient of friction (COF) external coating can overcome many of the fill/finish issues common with conventional vials. Velocity® Vials can reduce bottlenecks and the likelihood of damage, including cracks, glass particulates, or other defects generated during the fill/finish process, leading to better throughput and higher yield.

Designed to improve filling line performance

Corning's low COF coating reduces glass-to-glass & glass-to-metal friction, enabling:



Reduced Vial Jams



Reduced Damage



Reduced Tipovers

[Click below to see Corning Coated Vials in action](#)



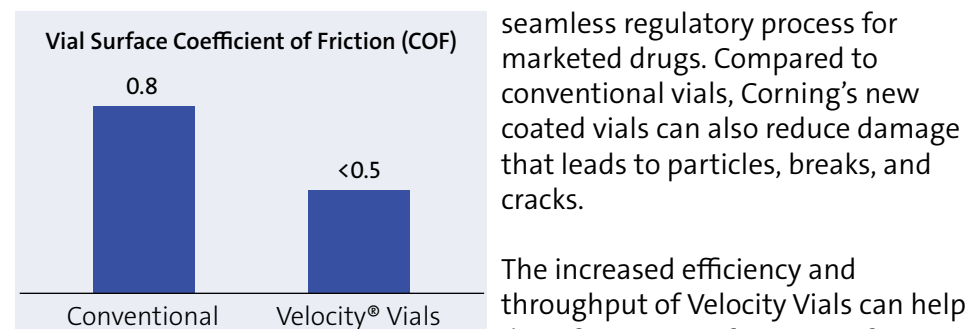
USP Type I Packaging Designed for Speed and Efficiency

One of the fundamental concerns in fill-finish manufacturing is friction created by glass-to-glass and glass-to-metal contact. This resistance can limit filling line efficiency and speed, ultimately constraining throughput and slowing down the delivery of essential medications and treatments. The glass friction from conventional vials can also generate damage that leads to high particle counts, glass breakage, and cracks. These quality issues not only impact throughput, but can also impact to the sterility assurance of medicinal packaging, creating an increased risk of container closure integrity issues, ultimately leading to recalls or contaminated medications reaching the patient.

The COVID-19 pandemic intensified pharmaceutical supply chain constraints and fill-finish capacity shortages that have existed for many years, due in part to the limitations of conventional glass vials. Many have come to accept these limitations as a standard cost of doing business, but innovations in glass packaging are enabling a step-change in performance that shatters these old assumptions.

To meet the immediate need for a primary packaging solution that can improve yield and overcome quality issues as a drop-in solution, Corning introduced Velocity® Vials, a USP Type I borosilicate vial externally coated with Corning's proprietary low coefficient of friction (COF) technology.

Velocity Vials are engineered to deliver better economics, better quality, and a more environmentally sustainable design compared to conventional vials. Velocity Vials can improve filling line efficiency from 20% to 50% while lowering packaging production costs, and can be implemented with a



essential medications to meet rising global demand. Pharmaceutical companies and fill-finish contract manufacturers (CMOs/CDMOs) can leverage the improved efficiency as a drop-in solution to increase throughput, thereby producing more vaccines and other drug products in less time.

In a capacity constrained environment, Velocity Vials create immediate fill-finish capacity, allowing pharma's to potentially delay capital investment for new capacity and reduce costs. When adopted broadly across an entire pharmaceutical filling system, Velocity Vials could significantly improve productivity and quality, thus lowering manufacturing cost for pharmaceutical companies and CMOs/CDMOs.

Case Study

Corning Velocity® Vials showed superior performance on customer filling line

In hopes of improving fill finish efficiency and lowering total cost of ownership, a leading pharmaceutical company reached out to Corning to learn more about Velocity Vials. Needing to quickly increase yield without implementing expensive capital projects, the pharma company was looking for a drop-in solution.

The company and its CMO filling partner knew that even well-designed filling lines encounter throughput constraints with vial handling due to the physical interactions between the machines and conventional glass vials. Stress and friction generated on turn tables, depyro tunnels, tracks, and trays, can lead to jams, tip overs, glass breakage, and human line interventions (which risks greater contamination of sterile environments). In addition, the pharmaceutical company and CMO wished to avoid direct lubrication of the filling equipment due to the potential for sterility and line maintenance issues.

Collaborating with the CMO, Corning collected batch data for over 60 conventional vial runs and 30 Velocity Vial runs. Each batch run consisted of approximately 130,000 vials. As shown in Figure 1, Velocity Vials reduced the average number of glass-related downtime events, average glass-related downtime minutes, and average number of vial breakage events per lot. In this trial, Velocity Vials demonstrated 35% higher efficiency* when compared to conventional glass vials.

The CMO line operator found that Velocity Vials ran so well that they decided to end the trial after 30 runs and move forward with broad adoption of the new technology.

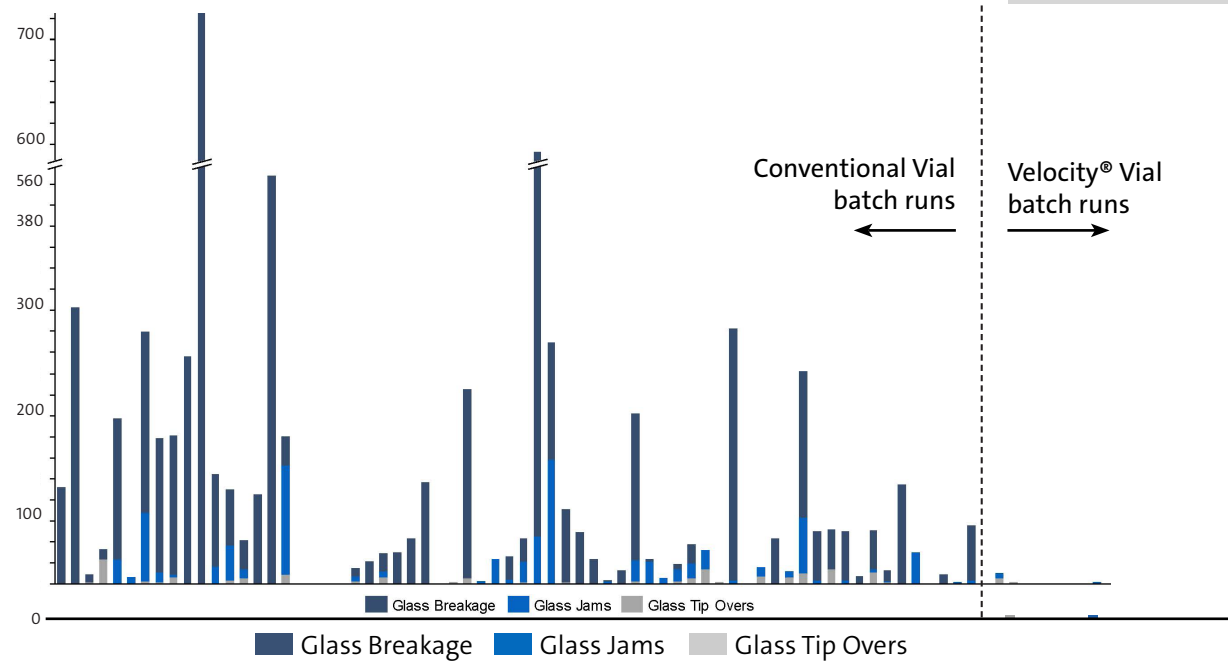


Figure 1 - Per-batch glass-related downtime (minutes) for conventional uncoated vials versus when using Velocity Vials. Batches were run sequentially over time. 60 conventional vial batches were run first and then 30 Velocity Vial batches were run. CMO decided to stop at 30 Velocity runs believing they had seen the value prop confirmed. Average batch size was approximately 130,000 vials.

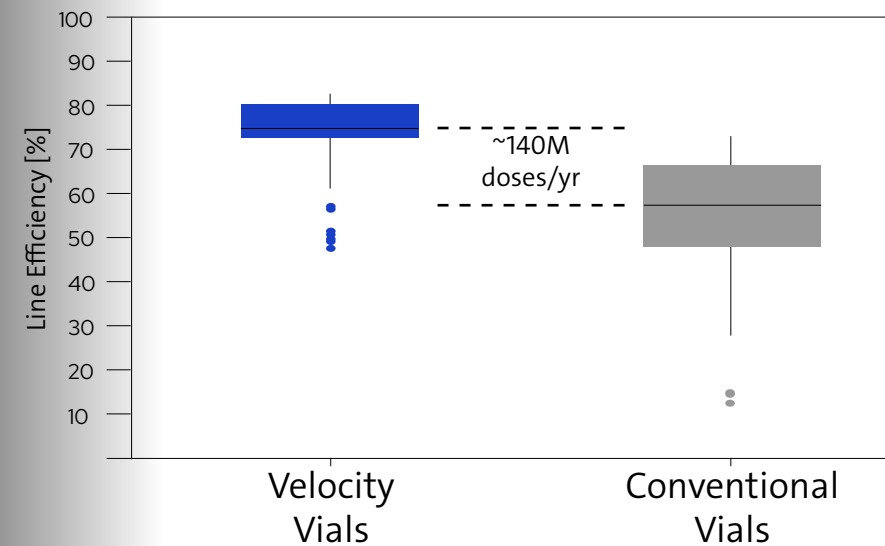
*Run time efficiency is calculated as the (Effective Line Speed/ Line Set Speed) x 100. 39 Velocity vial runs and 66 Conventional borosilicate runs; data was found to be statistically significant through two-sample t-test ($t(102)=7.33, p=0$)

Velocity Vials demonstrated significant improvements over conventional vials on Customer's filling line.

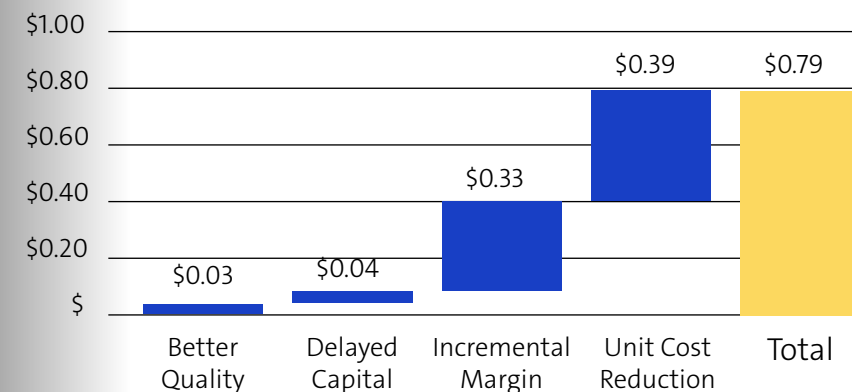
- 81%** reduction in glass related downtime events per lot
- 99%** reduction in glass related downtime minutes per lot
- No glass breakage events**

Velocity Vials demonstrated a 35% improvement in efficiency

	Conventional Borosilicate Vials (n = 66)	Velocity Vials (n = 39)	Percent Improvement
Average Line Efficiency [%]	54.0	72.8	34.8%
$\bar{X}_{\text{Boro}} \neq \bar{X}_{\text{Velocity}} : p\text{-value} \ll 0.001$			



Efficiency gain could translate to value of \$0.79 per vial for customer A



For a line capable of running 40 million vials, this equates to 14 million more vials and an added value of \$11 million

“Ensuring consistent production, high quality, and less downtime is essential as we work to keep pharmaceutical supply chains moving, and to this extent, Corning’s Velocity Vials have already shown very promising results. Corning’s Velocity Vials demonstrated a significant improvement in efficiency when compared with traditional borosilicate vials on our fill-finish lines.”

- CMO Vice President & General Manager

Corning Velocity® Vials

Glass Packaging Designed for Speed and Efficiency

Velocity Vials can deliver better economics, better quality, and a more environmentally sustainable design compared with traditional pharmaceutical packaging.

Our coated borosilicate vials boost efficiency from manufacturing to delivery—increasing the production of life-saving drugs without sacrificing quality or value.

Contact a member of our team to learn more

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The Corning logo is a black square with the word "CORNING" in white, uppercase, sans-serif font centered within it.

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