

Manufacturers are unwittingly putting fluid formulations at risk of failure



It is a common belief among manufacturers that the syringe is integral to safeguarding fluid formulations. This way of thinking not only gives manufacturers a false sense of security, but it also blows holes in the warranties that they assume will provide them with protection. This white paper is written to put this flawed reasoning to rest, as well as to reveal the real culprit at the root of fluid formulation and bond failures.

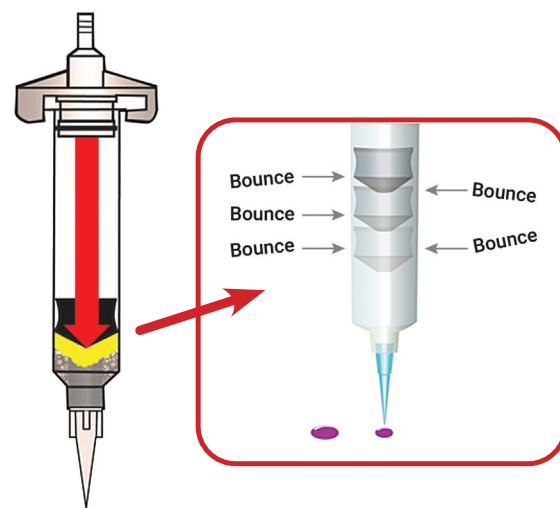


Syringes offer zero protection against the ferocity of compressed air

Assembly fluid dispensing began with pneumatics. Air driven fluid dispensing drive systems rely on a column of air under pressure to force assembly fluid through the dispensing tip and onto a substrate. On the surface, it may not seem like this method of dispensing puts assembly fluids at risk of failure. But when one more closely examines this forceful action, a different picture emerges.

The first signs of trouble are issues with reliability and quality control that include variations in viscosity and dot size, dripping and waste of the material, and changes in homogeneity. It is clear to see how these problems can challenge the accuracy and repeatability of fluid dispensing systems. Regrettably, the stress on assembly fluids by compressed air only makes things worse for manufacturers. Look more deeply, and the forcefulness necessary to operate air driven systems wreak havoc on fluid formulations, increasing the likelihood that warranty claims will be denied.

There is no way to sugarcoat it, but the surge of air pressure into a syringe is violent. It crashes the piston into the fluid creating tremendous internal fluid pressure. The dissipating compressed air adds insult to injury because it is so abrupt the fluid pressure from the downward movement launches the piston up the syringe barrel in a bouncing motion. The process is repeated every few seconds creating "piston bounce".



Butter is meant to be churned, adhesives are not

The violent action that occurs with air driven systems can be compared to a butter churn where the wooden piston is rammed into the cream at a rapid rate to heat the liquid until the cream thickens and eventually becomes butter. This may be fine when making butter, but what it does to assembly fluids is an entirely different matter. The piston bounce over the course of a production day heats the fluid formulation which can cause the chemistry to change. When it changes, so do the bonding properties, which result in weak bonds and failed products. These issues put the warranties protecting assembly fluids, along with those safeguarding a manufacturer's products at serious risk.

Moisture entering the syringe creates more problems

The intensity of compressed air also delivers moisture from plumbed air lines into the syringe barrel. This occurs because its design features a 0.002 to 0.005 thousands interference fit between the piston wall and the syringe barrel. The gap may not seem large, but it prevents the chamber from being completely sealed, which introduces moisture into the assembly fluid. This poses risks to any type of assembling fluid, but especially to cyanoacrylates since moisture is the catalyst required to quickly cure them.



AirFree® Technology



It takes a gentle approach to protect fluid formulations

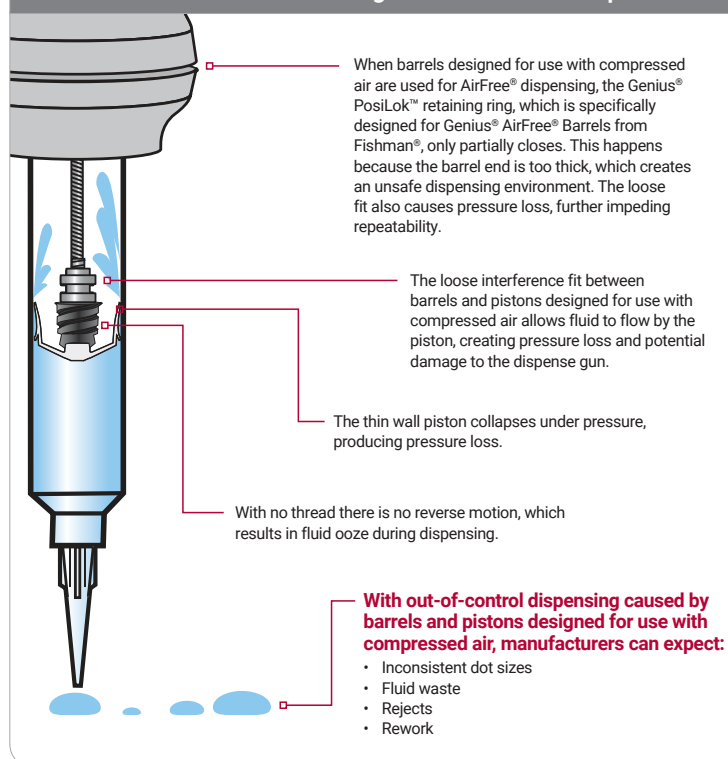
To prevent the violent actions provoked by air driven systems, Fishman® Corporation developed a system that replaces compressed air. The solution, which is the only one like it available today, is comprised of a Linear Drive System (LDS) utilizing a motor, lead screw and algorithms.

A forward motion algorithm was developed to install a gentle ramping motion, which helps eliminate stress to the fluid. The reverse motion of the piston is controlled by an attached lead screw. This stops the piston from wildly recoiling, while a reverse motion algorithm controls the speed. Both forward and reverse speeds are managed by the programmer or operator of the system, ensuring that the assembly process runs efficiently.

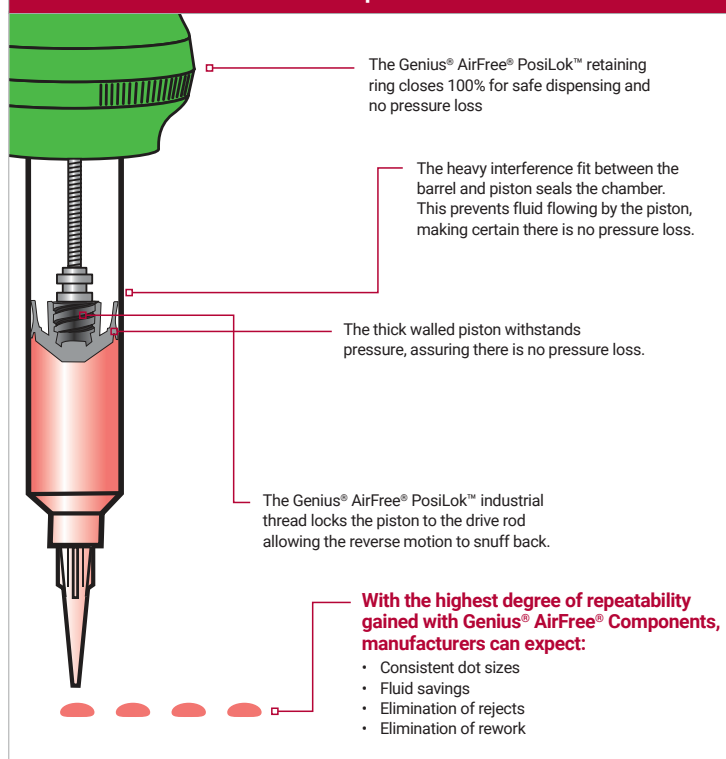
When compared to the intensity required by air driven systems, it is little wonder that the gentle ramping motion of the LDS of the SmartDispenser® with AlgorithmicControl™ and patented AirFree® Technology is the safest way to dispense fluids. This safe dispensing method is also the best way for manufacturers to protect the formulation and bonding properties of the fluids they depend on to assemble products.



Air Pulse Barrels and Pistons Designed for Use with Compressed Air



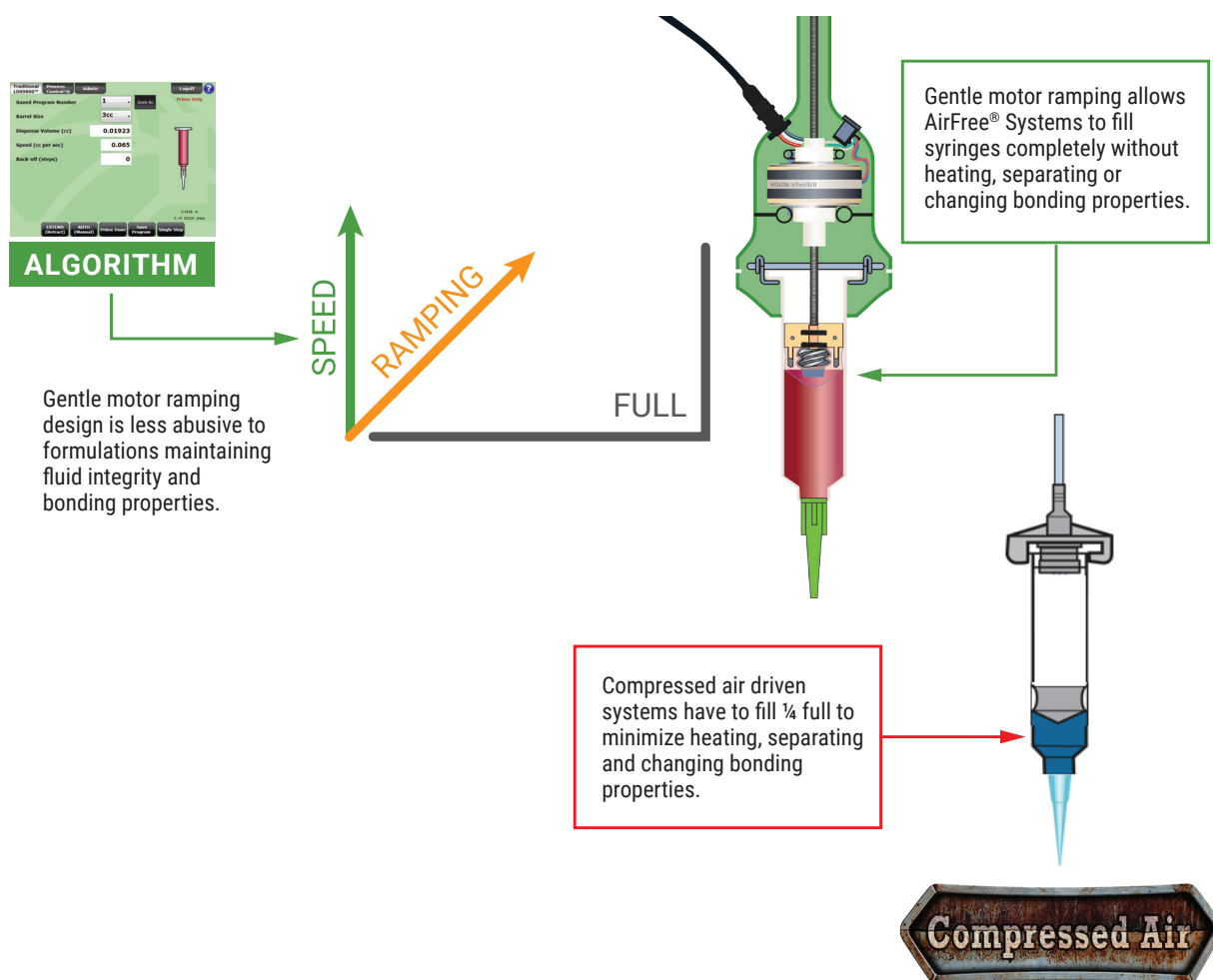
Genius® AirFree® Components from Fishman®



More savings and better quality with AirFree® Technology

Another advantage with AirFree® Technology is that, unlike air driven dispenser syringes that must be kept at $\frac{1}{4}$ or $\frac{1}{2}$ full to try to eliminate overheating and separation, the gentle ramping motion of the Fishman® LDS allows syringes to be completely filled. This not only greatly reduces the cost of having to purchase reduced-filled syringes, but it also eliminates post-production scrap and fluid waste while increasing production yields.

At the end of the day, the Fishman® LDS has everything to do with protecting against fluid formulation and bond failure while the syringe offers not a single safeguard. By selecting the Fishman® LDS, combined with Genius® AirFree® pistons, syringes and tips, and Posi-Lok™ components, manufacturers benefit from a solution that truly protects both fluids and bonds. This provides them with a degree of security that permits them to confidently stand behind the products they assemble and offer to their customers.



AirFree® Technology is supported by a history of successes

Fishman® Corporation first introduced AirFree® Technology in 1998 with its legacy product, the LDS9000. Always with an eye towards the future, Fishman® launched the second generation of AirFree® Technology with the SmartDispenser® in 2010. Fishman® has sold and installed thousands of AirFree® fluid dispense systems around the world. They are designed to gently dispense a wide range of fluids, including thin fluids, thick greases, cyanoacrylates and specialty UV cure adhesives. In the past quarter century, Fishman® has never seen a single fluid formulation fail because of Genius® AirFree® Components used with any of its AirFree® fluid dispense systems.



For more information on the SmartDispenser® with AlgorithmicControl™ and patented AirFree® Technology, and how its LDS offers a level of fluid formulation and bond protection that cannot be matched by any other fluid dispense system on the market today, please visit fishmancorp.com