

## Challenge

### Liquid Reagents to Lyophilized Beads

There are several advantages in moving away from using liquid reagents in POCT kits and microfluidics devices. Benefits include - lower shipping costs in being able to ship without refrigeration; reduced inventory waste due to extended shelf-life of final product; reduction on carbon footprint throughout the supply and delivery chain.



## Solution

Using BioDot's patented dispensing technology, small volumes are dispensed into isolated wells, that are kept chilled with liquid nitrogen. Volume, drop rates, speed, placement in and above the isolated wells, and imaging of the dispense are controllable parameters of the lyobead application on a BioDot Sphera™ platform. The Sphera platform can be configured with multiple dispense channels to address various bead throughputs from 10,000 beads per hour per dispense channel.



BioDot's Sphera™ Platform

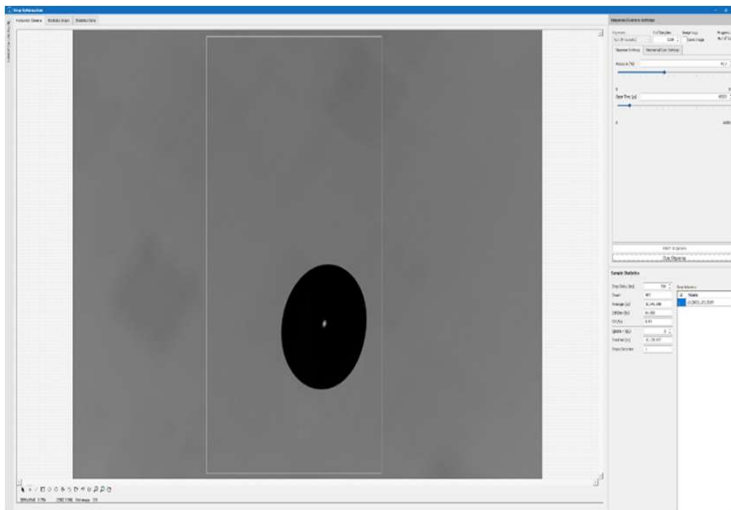
## Results



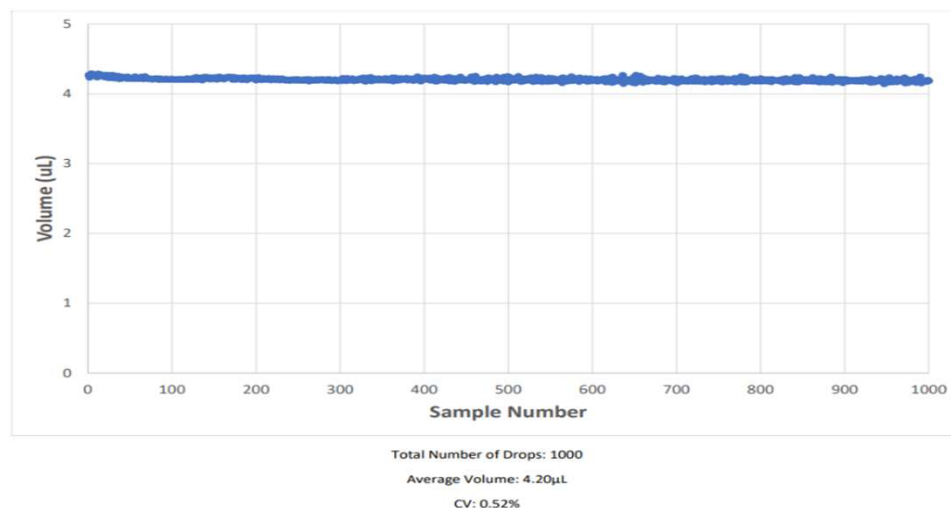
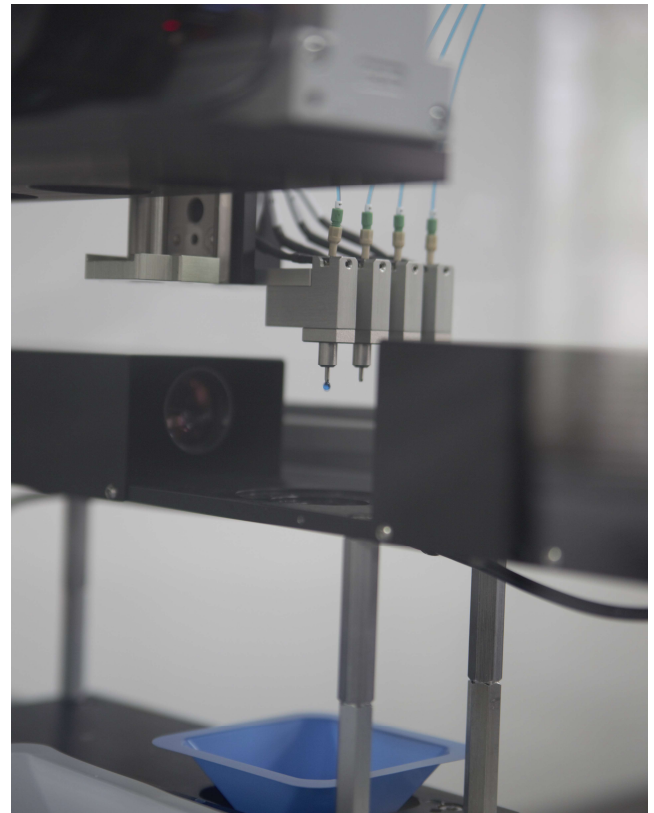
Lyobeads in liquid nitrogen after dispensing

The BioDot Sphera allows for scalability and versatility. Regarding versatility with drop size, the system can be configured to dispense a range in drop sizes from 2 $\mu$ L-30 $\mu$ L. The system can scale to address changing throughputs by adding dispense channels, in the field. Multiple channels can be installed on a single dispense arm allowing simultaneous on-the-fly dispensing into isolated wells. Multiple passes are repeated with synchronization of freeze cycles and drop times to generate an optimized number of beads per pass.

Lyobead formation relies on uniformity of bead size to the desired drop volume. An integrated camera is used to measure the volume of the bead in-flight to ensure process performance.



Images: In-flight capture of 10µL drops (above); Drop Camera (right); 1000 drops of 4.2µL in volume captured in-flight showing 0.52% CV (below)



## CONCLUSIONS

Some companies will dedicate in-house engineering resources to develop a custom solution to create lyobeads. This can take months of learning about the nuances of the science. A home-made solution requires continual support and is best assigned to experts in the application. Unleash the power of BioDot's Discrete Droplet Dispensing™, our platform design expertise and providing robust and global support are available in an established product for lyobead formation.



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