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STRATEGY & SOLUTIONS

Development of qualified cold chain solution for vaccine transport to Uganda

Challenge

Stable cold chain transport

A government contractor required the development of a repeatable and effective pack out which could maintain steady temperature of 2°-8° C (35°-46° F) during transit for the transportation of vaccines (varying payloads) which were shipped to Uganda as part of a study. This was quite challenging given the logistical challenges that exist given the remoteness in access.



Solution

Develop qualified pack-out specific to payloads (vaccines)

The requirement to ship varying amounts of payload while maintaining a steady temperature seems challenging but it was not for our solution engineers. Using a bracketing approach the payloads were boxed in, this provided the control needed to limit variables which could impact the size of the solution (literally). High performance components such as shippers with higher R-value (Insulation value) and easy to use thermal phase change material were used in varying combinations to come up with an effective and tested pack out which could maintain a steady 2°-8° C during transit. In order to provide the monitoring that is required, calibrated temperature data loggers were used along with the payload.

Result

Reliable cold chain transport

The development of the solution required the assessment of the shipping lanes along with the consideration for the numerous variables affecting supply chain, right from the time the shipment is loaded to the time the shipment is delivered as part of the gap analysis performed. Critical control variables which impact temperature such as environmental and cargo carriage conditions, package orientation, material of fabrication were isolated and evaluated in order to develop a robust pack out. The identification of the thermal phase change material and the conditioning requirements were critical in achieving over 72 hours of temperature maintenance between 2°-8° C (35°-46° F). Solution repeatability was an important factor for consideration, the mechanism to control exterior conditions will always be the most important challenge while developing a cold chain solution. The recognition of the same helped us develop transit profiles to test and mimic environmental conditions to gauge and develop the effectiveness of the solution.

