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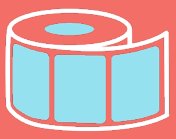
Cryogenic Labels That Don't Fall Off

Application
Laboratory

Product Used
Labels



Situation

- National reference laboratory was using cryogenic labels that fell off during processing
- Label failure resulted in added material and labor cost and system downtime

Outcomes

- Annual savings potential of $160K in materials and $2.76M in labor
- Reduced automation system downtime

Background

A leading, national reference laboratory processes over 100 million tests per year.
These tests begin with the collection of patient samples in specimen collection containers, such as tubes or cups. Next, these samples are transported to any number of specialized testing facilities around the nation to undergo analysis. During this analytical phase, samples are subjected to a variety of environmental extremes as dictated by processing protocols. A common set of protocol steps involves cryogenic freezing and, later, thawing of either the original sample or a processed specimen. To ensure samples are always tracked appropriately, barcoded labels are attached to every specimen container throughout these processes. It is imperative that these labels remain with the sample at all times to ensure samples are not lost or mixed up with one another. If labeling errors do occur, there is significant risk of patient misidentification which may result in inaccurate or delayed diagnosis.

Challenge

The laboratory was using a cryogenic label that was designed to adhere to a tube during the freezing process, but not to a specimen that was already frozen.
However, in testing protocols, new barcoded labels commonly have to be adhered to pre-frozen, pre-labeled containers and the labels in use failed to adhere under these conditions. To mitigate the risks associated with label detachment, staff were applying a rubber band around every tube when a new label was applied.

This led to a number of inefficiencies:

- The added time spent rubber banding every single tube
- Rubber bands or flagging labels occasionally blocked automation systems and had to be corrected, resulting in processing downtime
- Some tubes would require relabeling, which also adds a patient safety risk

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Solution

Caresfield was given the task of customizing a label that would perform under all test environments and would work with existing hardware.

Specifically, the label needed to adhere to a pre-labeled specimen tube, both at room temperature and directly out of a cryogenic environment. Our quality and operations team prototyped several labels composed of specialty face stock and adhesives. Every prototype was developed to meet the specification requirements of barcode printers in use at the testing sites. The prototyped labels were subsequently tested for both use cases to determine which label formulation met performance criteria. Representative pre-labeled sample tubes were brought in-house and the labels were applied to some at room temperature and some tubes that had been frozen for 24 hours. Adhesion was assessed for each prototype and the highest performing labels were provided to the laboratory's quality engineering team for internal validation testing.

The laboratory assessed label performance based on the print quality and function at relevant environmental conditions. The labels worked flawlessly with existing printers and maintained quality barcode scannability. Sample tubes were then applied to pre-frozen and room temperature tubes which were then placed on dry ice for 24 hours and subsequently thawed. Label adhesion was maintained throughout this period and performance was confirmed by repeating these tests at six validation sites around the United States. With the final label formulation approved, Caresfield established manufacturing to meet the demand potential of these new labels at reference laboratories across the nation. To easily distinguish these specialty cryogenic labels from labels that otherwise appear the same, a blue identity core is used.

Result

The adhesive on the cryogenic label was specifically designed to stick to the pre-labeled specimen containers that are placed on dry ice or kept at room temperature.

These new labels can enable sites to cease their use of rubber bands to mitigate the risk of labels falling off of the tubes. The labels were not designed for use on clean, unlabeled tubes. Using the volume of tests performed at the frozen processing stations of the reference lab discussed here, the cryogenic labels allow for an annual savings potential of $160,000 in material costs of rubber bands and up to $2.76 million in labor costs based on the time previously spent applying and removing rubber bands on every specimen. Overall, the cryogenic labels improved process efficiency, reduced the risk of labeling errors, and reduced risk of machine downtime on automation lines.

ABOUT CARESFIELD

At Caresfield, we've spent the last 30 years dedicated to providing healthcare facilities with the most responsive and humanized service in the industry. From our one-of-a-kind customer care to our high-quality identification and specimen collection products manufactured right at our headquarters in Minnesota, our teams will deliver exactly what you need, exactly when you need it. We see you. We hear you. We understand, and we are here for you. Because humanity makes business better. Let's talk!

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