

THE EFFECT OF TAG ORIENTATION AND PACKAGE CONTENT ON THE READABILITY OF RADIO FREQUENCY IDENTIFICATION (RFID) TRANSPONDERS

By

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Radio frequency identification (RFID) is a rapidly expanding area in the field of automatic identification and data collection, with the potential to revolutionize supply chain management. With several large retailers, government agencies and consumer packaged goods manufacturers implementing, recommending and mandating the use of 915MHz RFID systems, the technology is rapidly expanding as a supply chain management tool.

The objective of this research was to determine the effect different products and tag orientations have on the readability of RFID transponders in a pallet load, when driven through a portal set up. Cases were tagged with Matrics 915MHz Class 0 RFID tags utilizing several different orientations (tags facing inward, outward, forward, upward and downward) and products (foam, rice, empty bottles and water filled bottles).

This research found that orientation and product type have a significant effect on tag readability. Granular and water-based products have a negative effect on tag readability. Tags oriented facing inward and downward had the highest number of no-reads across all product types; these orientations having no tags in the direct line-of-sight to the system antennae. The tier, column and/or row of the tagged cases also had an effect on tag readability. Tags were evaluated based on both the percentage of total reads and the number of trials having 100% pallet reads.