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There's a "Best Choice" -- RFID Label Design for the Job

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If you are responsible for specifying RFID labels for an in-house labeling operation, be sure to select RFID labels that are application-compatible. Choosing the correct label is as important as purchasing the right RFID printer/encoder or print/apply system. The optimal RFID label design can help ensure high label read rates, whereas a poor choice can result in a high number of "dead" labels.

Knowing the basics of RFID label construction can make label selection easier. Unlike standard labels, RFID labels consist of three integrated layers: the label surface or facestock, which carries visible printed information and bar codes; the liner, which adheres to the carton or product; and the inlay, a layer of plastic film inserted between the facestock and liner. The inlay contains a small metal antenna attached to an integrated circuit.

RFID labels are available in various sizes and with different antenna configurations to fit different applications. The chart below presents specs for three popular RFID label types: AD-620, AD-610 and AD-410. Note the varying antenna dimensions and suggested label applications.

RFID Label Type	AD-620	AD-610	AD-410
EPC Standard	Impinj/Class 0+	Class 1	Class 1
Memory	96 bit read/write	96 bit read/write	96 bit read/write

Antenna Dimensions	4.2 x 3.82 in.	5.28 x 1 in.	3.66 x 1.38 in.
Read Range	Up to 20 feet	Up to 15 feet	Up to 15 feet
Description & Applications	<ul style="list-style-type: none"> •Triangular antenna;. general-purpose RFID carton & pallet tag. •Excellent metal/liquid insensitivity. •Ideal for solid-surface metal packages such as foil-lined boxes. 	<ul style="list-style-type: none"> •Horizontally shaped antenna; RFID carton, tray & pallet tag. •Ideal for difficult-to-label contents. •Excellent for labeling variable-surface metal containers such as metal cans. 	<ul style="list-style-type: none"> •Versatile RFID carton, tray & pallet tag. •Good performer on cartons of metal and liquids when properly positioned.
Label Dimensions	4 x 6 inches	6 X 1.5 inches	4 x 6 inches 4 X 2 inches

Certain applications pose special challenges for RFID labels. For example, metal containers such as aluminum cans can deflect radio frequency signals, impairing signal transmission between encoded labels and RFID readers. Containers holding liquids can also interfere with RFID signals, resulting in poor read rates. In these cases, choose RFID labels that are recommended for use with liquids or metals. Your RFID label supplier can help you make a good selection.

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