



# Technical Resource

## THE ARMOR DEFENDER™ FILM OFFERS STRENGTH, RESOURCE SAVINGS AND A REDUCTION IN CUSTOMER COST

The ARMOR DEFENDER™ is a three-layer film that provides high-level protection while at the same time saving money (cost savings average 10-15 percent). These cost savings are not a reflection of the film's strength or VCI protection, but rather a reflection of ARMOR's engineering expertise which allows for an advanced polyethylene film extrusion process.

The DEFENDER™ was specifically designed to be both tough and economical. It utilizes three layers of film, each formulated with its own properties to prevent corrosion, provide additional barrier protection and increase the durability and puncture resistance (see image 1). This multi-layer film is co-extruded when it is blown, which allows ARMOR to take three layers of film and sandwich them together into one multi-layer film system. Co-extrusion allows for cost and resource savings, the film can be down-gauged by 25-30 percent because the VCI is positioned where it is needed, on the inside layer of the bag. At the same time, ARMOR's DEFENDER™ film provides a 60 percent decrease in oxygen transmission and barrier protection that is 2.5 times that of ARMOR's mono-extruded film.



It is important to note that when the DEFENDER™ film is measured with a micrometer the gauge is 3 mil. However, because the DEFENDER™ has three-layer construction, DEFENDER™ film is equivalent to a 4 mil gauge. Many times the thinner gauge is misinterpreted and is seen as a fault



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when in fact it is the thinner gauge paired with the stronger construction that allows the DEFENDER™ to offer a cost savings. Thinner gauge allows for resource savings, which in turn results in cost savings to customers.

To illustrate this cost savings further, we calculated the total resources used for the manufacturing of Defender™ film since the film was first offered in 2005. To date, ARMOR has used approximately 3,544,640 pounds of polyethylene film in the production of DEFENDER™ film. If this same quantity of film were to be produced via the mono-extrusion process at the traditional 4 mil gauge, an additional 886,161 pounds of polyethylene would have been required. This increase in polyethylene would have added close to \$2.3 million dollars to the cost for production and order fulfillment.

