

An Economic Value Model for Converters Comparing the Total Cost of Metallized Film vs. Foil in Flexible Packages

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Introduction

As the pressure on converters to reduce costs increases in the flexible packaging industry, they have to rely on film suppliers to develop new and more economical products that still maintain performance. Metallized films have historically had some success in replacing foil for reasons such as aesthetics and improved barrier properties. As the price of ingot continues to increase, metallized films are now starting to grow in applications where historically foil has been used solely due to economics.

This study examines the economic value of metallized film compared to foil by examining the impact of material cost, productivity savings, and inventory. The study will also demonstrate that you can reduce your overall package cost using metallized film over foil and still maintain performance integrity.

Technical Performance

The focus of this study is a comparison of the economics of metallized film to aluminum foil. However, it was important to also compare the barrier performance of each substrate to ensure that cost savings were not being obtained at the expense of product performance. The charts below outline the results of studies conducted, which compared barrier values of metallized polyester to that of aluminum foil.

Typical Transmission Rates

(Measured by Rollprint, from Global Pouch Forum 2006)

	Test Conditions	0.00035" Foil (Unflexed) 3-ply structure	0.00035" Foil (Flexed) 3-ply structure	48g Metallized PET (Unflexed) 2-ply structure	48g Metallized PET (Flexed) 2-ply structure
OTR (cc/ 100 in ² /day)	50%RH, 73.4 ° F.	0.03	3.2	0.1	0.7

Transmission Rate Ranges

	Test Conditions	Standard 48g Metallized PET	Required Barrier Metallized PET
OTR (cc/ 100 in ² /day)	50% RH,	0.05- 0.08	<0.02
	73.4°F		
WVTR (g/100 in ² /day)	90%RH,	0.04-0.07	<0.02
	100°F		

Methodology

It was important to not only capture the area cost comparison of metallized film to foil but also understand the impact of productivity, inventory, and other associated costs. In order to ensure our study was complete and accurate we did the following during our study:

1. Researched historical and future prices of ingot.
2. Interviewed several leading converters on how foil and metallized film perform during the production process. These converters historically processed both film and foil in the same plant, so could provide an accurate comparison between the two substrates.
3. Analyzed the cost of carrying inventory of film vs. foil based on current lead times.
4. Researched other papers that have conducted head to head studies comparing metallized film to aluminum foil.

Cost Comparisons

The charts below demonstrate that using metallized film over foil offers a significant price advantage per msi today, without having to sacrifice barrier performance.

Raw material cost of metallized film vs. foil

	Yield (msi/lb)	Relative Cost	Relative Cost	Savings over 0.00035" foil
Aluminum foil (0.00035")	29.32	1.00	1.00	
Aluminum foil (0.000275")	37.31	1.09	0.86	14.3%
Standard Met PET (48 g)	41.50	0.64	0.45	54.7%
High Barrier Met Pet (2.3 OD)	41.50	0.89	0.63	37.4%
Ultra Barrier Met Pet (2.8 OD)	41.50	0.93	0.66	34.2%

The following chart shows the total relative cost/msi of metallized film and foil, once taking into account raw material, productivity and inventory costs. This total cost model shows that metallized films offer up to a 58% cost saving vs. 0.00035" foil.

Relative cost summary of metallized film vs. foil

	Total Relative Cost	Savings over 0.00035" foil
Aluminum foil (0.00035")	1.00	
Aluminum foil (0.000275")	0.87	12.8%
Standard Met PET (48 g)	0.42	58.5%
High Barrier Met Pet (2.3 OD)	0.56	43.7%
Ultra Barrier Met Pet (2.8 OD)	0.59	41.0%

Conclusions

Metallized films have always been available as an alternative to foil. Historically metallizing has been seen as an excellent replacement over foil for aesthetic reasons in decorative applications or stand up pouches. In recent history, metallized films have also been used in barrier applications that have typically used foil because a new generation of metallized films can now meet the high barrier demands in applications such as dry powders and liquids.

As we stated earlier, the pressure to reduce costs in flexible packaging continues to mount and metallized films has risen to the challenge. Metallized films have proven to be a more cost effective alternative to foil through material cost, production costs, and shorter lead times, which help reduce inventory costs. These savings ensure that the total cost of metallized films will continue to be lower than foil, both now and well into the future.