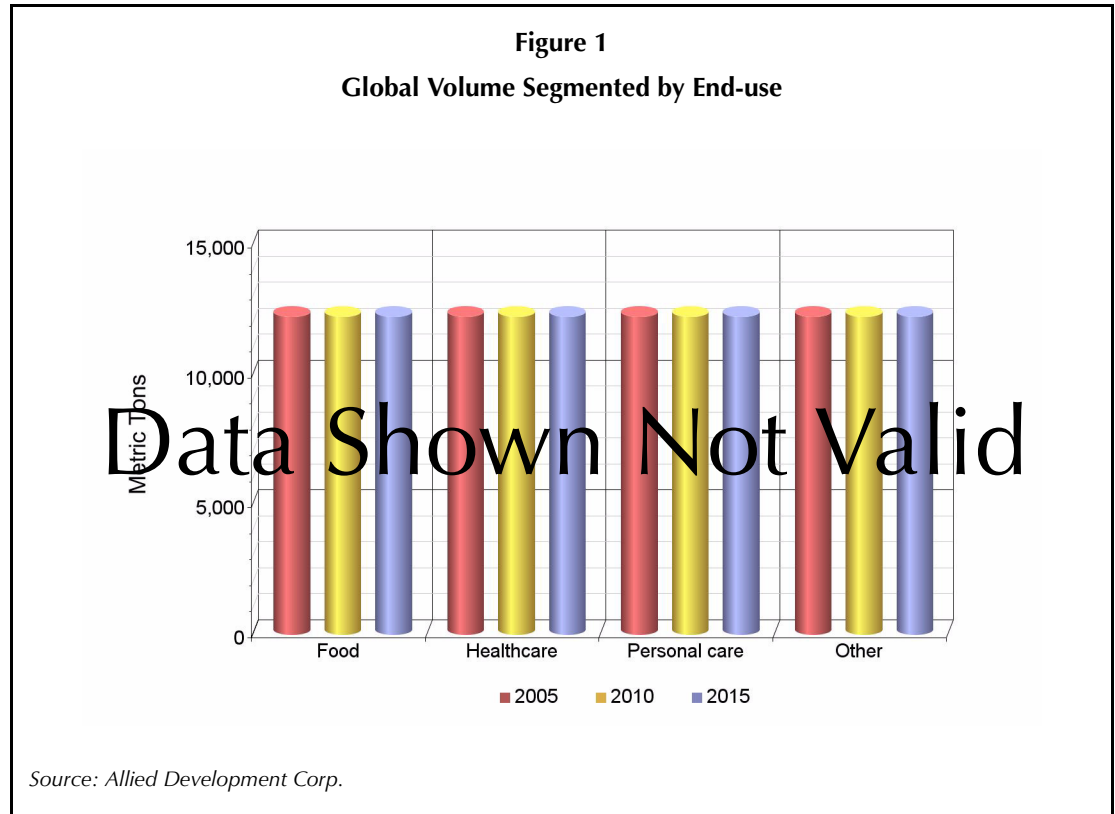


E. Volume segmented by end-use

The market analyses and projections begin now. Figure 1 provides global transparent oxide-coated film volume, segmented by end-use.



Food applications dominate consumption of transparent oxide-coated films (Figure 1). Oxide-coated films are successful in the food market because the core performance characteristics of oxide-coated films meet the performance requirements of many food packages. These core performance characteristics include good barrier to oxygen and moisture in any environmental condition, excellent optical clarity, potential environmental benefits, and transparency to microwaves and metal detectors. Oxide-coated films also have their limitations. Within the food packaging market, oxide-coated films have gained only a small market share. Growth has been limited by the high price for their high performance and by the brittleness of their coatings.

2. AlO_x-coated films

Table 5 provides a list of AlO_x-coated film producers and the brandnames of their products.

Table 5
AlO_x-coated Films

MANUFACTURER

BRANDNAMES

Data Removed

Source: Allied Development Corp.

3. Mix SiO_x/AlO_x-coated films

Toyobo Co. Ltd. of Japan is the only company currently manufacturing an oxide-coated film for packaging that utilizes a combination of silicon- and aluminum-based raw materials. The company manufactures its films under the brandname *Ecosyar*.

4. Survey results – production volumes

The majority of the survey results are presented in the Market section; however, the survey also provides information about the production volume of oxide-coated films. Production volumes, which are presented here, provide an important validation of consumption volumes, which are presented in Market section. We examine production volume in the following paragraphs.

2. Economic results

Table 8 provides the economic results for manufacturing the SiO_x-coated film rollstock.

Table 8
Case 3: SiO_x-coated OPET film – Manufacturing

CATEGORY	Total US\$	%	US\$/kg	Cents/m ²
Revenue				
Materials				
Labor				
Energy				
Distribution Packaging				
Shipping to Customer				
Variable Margin				
Office Supplies				
Labor				
Energy				
Lease cost				
Insurance				
Utilities				
Communications				
Travel				
Maintenance Supplies				
Minor equipment				
Outside services				
Professional services				
Laboratory Supplies				
Ink Supplies				
Plate Supplies				
Metal Supplies				
Plant Margin				

Data Removed

Source: Allied Development Corp.

J. Global volume segmented by geographic region

Table 25 provides global consumption of transparent oxide-coated films, segmented by geographic region.

GEOGRAPHIC REGION	2005	2010	CAGR	2015	CAGR
Europe					
Japan					
North America					
ROW					
Total					

Data Removed

Source: Allied Development Corp.

1. Europe

Europe is the only region outside of Japan that is producing and consuming a large volume of transparent oxide-coated films (Table 25). Europe has three of the twelve suppliers of transparent oxide-coated films in the world today.

European converters are using a mix of domestic and imported films. One reason is that their manufacturers have little capability to produce the more sophisticated AlO_x -coated films. The more sophisticated grades include primer and overcoat layers that enhance the resistance to damage and enhance the barrier properties of AlO_x -coated films. These more sophisticated films are required for challenging applications such as pouches for retorted products.

Like Japan, some European countries passed environmental regulations limiting the use of PVdC, which indirectly provides support for transparent oxide-coated films. In the long term, the unique

Q. Global volume segmented by substrate type

Table 32 provides global consumption of transparent oxide-coated films, segmented by substrate type.

SUBSTRATE	2005	2010	CAGR	2015	CAGR
BOPP					
OPA					
OPET					
Other					
Total					

Source: Allied Development Corp.

Oriented PET films dominate the substrate market for transparent oxide-coated films (Table 32). We examine each substrate type in the following paragraphs.

1. BOPP

BOPP film is a very popular substrate for metallization. It is also used as a substrate for transparent oxide coatings; however, it is used on a very limited basis. One reason for its limited use is that transparent oxide-coated BOPP films don't provide an oxygen barrier that is as good as that from transparent oxide-coated PET film. It is also more difficult to process.

2. OPA

Oriented polyamide (oriented nylon) film is used as a substrate for transparent oxide-coated films when the performance requirements are very high for strength, durability, and chemical resistance. It compares well with PET film in its barrier performance after coating, but OPA film