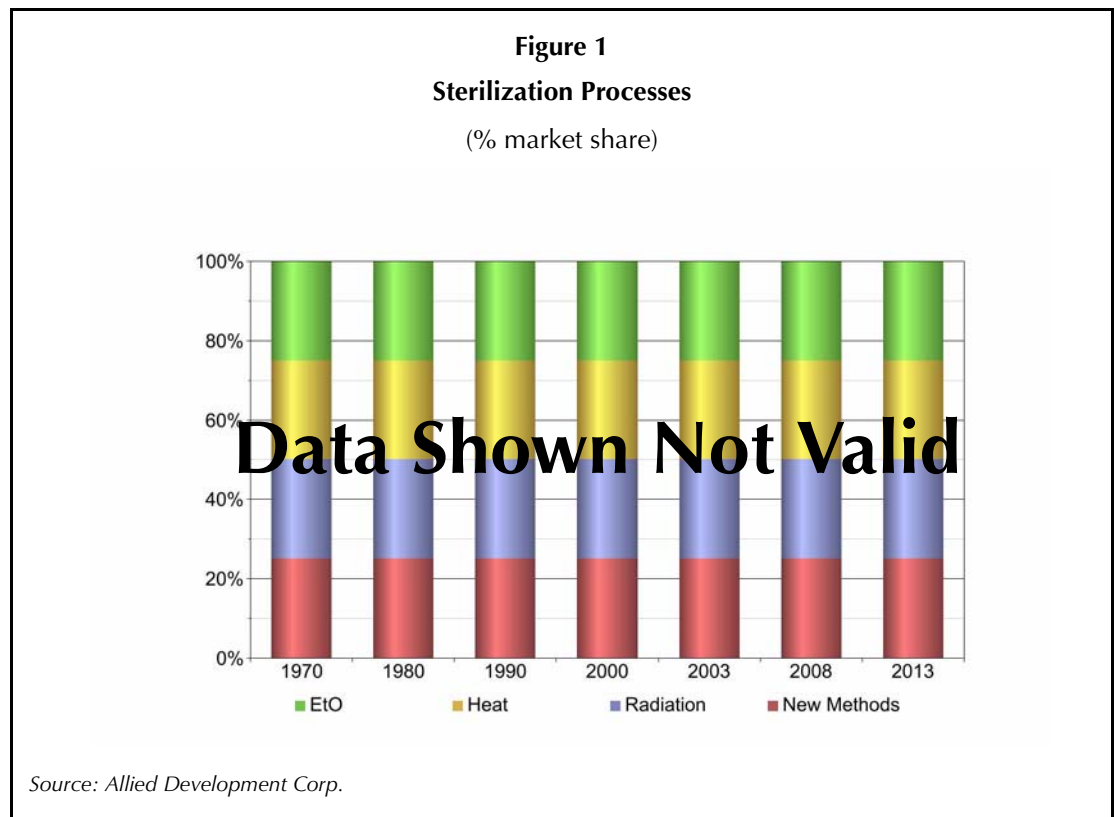


## B. Technology

Technologies including packaging materials, package design, and packaging equipment are all important in the medical device packaging industry. However, one technology differentiates medical device packaging from all others, and that technology is sterilization. It is the most important technology because it impacts so many aspects of the industry – the device itself, packaging materials, processing, and operating procedures.

### 1. Sterilization

There are many sterilization technologies including heat, radiation, ethylene oxide, and a variety of new technologies. Figure 1 provides the market share of these sterilization processes from 1970 to through 2013.



## L. Gloves

Medical gloves consist of examination gloves and surgical gloves. They are generally segmented into sterile and non-sterile products. Non-sterile gloves are typically used by doctors and other medical personnel to perform examinations (examination gloves). The sterile segment is primarily composed of gloves used in surgery, although sterile gloves are sometimes used for examinations and other purposes. A surgical glove is shown in Figure 30. Sterilized gloves are of primary interest to this study, and they are the only gloves and glove packages included in the market statistics.

**Figure 30**  
**Glove and Glove Packaging**



Source: Medline Industries Inc.

The package in Figure 30 is the package used for the surgical glove shown. The package is a two-dimensional pouch that contains one set of gloves. The pouch is fabricated with a heat-seal-coated paper on one side and a non-coated paper on the other side. The gloves were packaged in a semi-automatic mode, starting with a pre-made pouch.

Table 38 provides an additional summary – the global volume of medical device primary packaging, segmented by end-use.

**Table 38**  
**Primary Packaging Volume by End-use**  
 (bsi)

END-USE	2003	2008	CAGR	2013	CAGR
Catheters					
Drapes					
Electro-mechanical devices					
Gloves					
Injection systems	<b>Data Removed</b>				
Non-invasive devices					
Orthopedic devices					
Sutures					
Tubing					
Wound care					
Other and kits					
In-hospital					
<b>Total</b>					

Source: Allied Development Corp.

- urology and other catheters

Table 15 provides brand owner packaging purchases for the catheters market category, ranked by 2008 purchases.

**Table 40**  
**Global Packaging Purchases – Catheters**  
(US\$million)

BRAND OWNER	2008 PACKAGING PURCHASES	MARKET SHARE
Boston Scientific		
Coloplast		
CR Bard		
Abbott Labs		
Cook Medical		
Johnson & Johnson (Cordis, Ethicon)		
Medtronic		
Teleflex Medical (Rusch)		
Astra Tec		
SRS Medical		
B. Braun		
Covidien (Kendall)		
Hollister		
Terumo		
Roundtable Healthcare (Argon)		
Others		
<b>Total</b>		

Data Removed

Source: Allied Development Corp.

## 2. Drapes

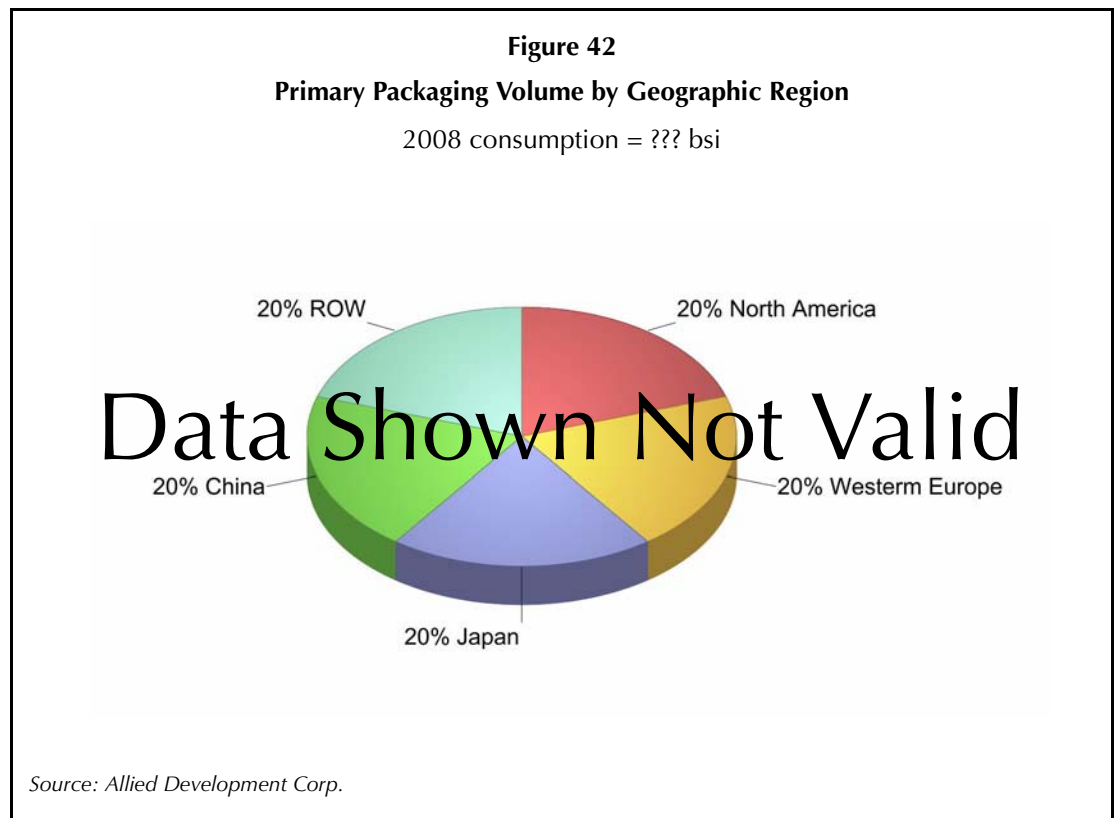
The drapes category includes drapes, surgical gowns, and other protective materials. Many of the buyers listed are distributors of

## K. Primary packaging volume segmented by geographic region

The medical device primary packaging market is segmented into five geographic regions in this sub-section. The volume is accounted for in the geographic area where the device is packaged.

### 1. Market

Primary packaging volume for 2008 is shown in Figure 42, segmented by geographic region.



The medical device industry is global in nature, as stated in the analysis of regulations and healthcare spending. However, there are some key differences by geographic region. The analysis of these factors begins with North America.