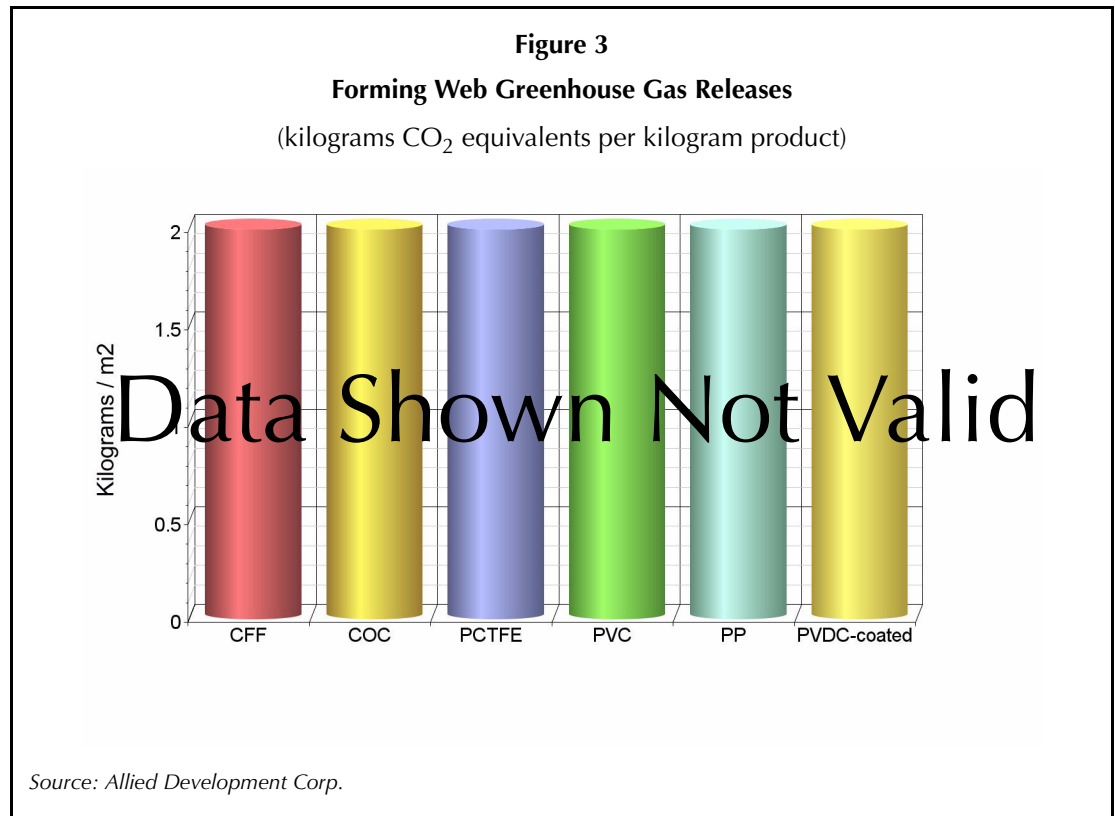


2. Environmental impact

Figure 3 provides the greenhouse gas releases to manufacture the forming webs used for blister packs.



Environmental factors are not as pervasive as economic factors when selecting a bottom web; however, they do make a difference. For example, in Japan, polypropylene webs are used more extensively than other countries, due to the fact that polypropylene webs are considered more environmentally friendly when incinerated.

sterilization or aseptic packaging due to the natural defenses of the digestive tract of the human body. The body is far more susceptible to pathogens that are mistakenly injected into the body along with medication.

The vast majority of drugs packaged in blister packs are taken orally; thus, they do not require sterilization after packaging or aseptic packaging. This fact may be surprising, but the logic is similar to the logic for packaging foods. Sterile packaging isn't required for most foods, but there are many health safeguards in place for packaged food, and the same is true for blister packaged pharmaceuticals.

5. Suppliers

Table 4 provides the suppliers of blister pack machines, ranked by 2009 revenue derived solely from the sale of blister pack machines for packaging pharmaceuticals. All of these suppliers are profiled in this study.

Table 4
Blister Pack Equipment Suppliers
(US\$million)

COMPANY

2009 REVENUE

Data Removed

Total

Source: Allied Development Corp.

generic drugs, utilizing blister packs with child-resistant secondary packaging.

Blister pack consumption for physician samples will continue to decline, based on the outlook for new drugs in future years. Blister pack volume for clinical trials will continue to grow slowly, but clinical trials are also slowing down due to the low output of blockbuster drugs from the pharmaceutical industry. In one example,

All end-uses considered, we project blister pack consumption in North America to achieve an annual growth rate of ???(Table 10) through 2014.

2. Europe

Table 11 provides blister pack consumption in Europe, segmented by end-use.

| Table 11 | | | | | |
|--------------------------------------|---------------------|------|------|------|------|
| Europe Consumption by End-use | | | | | |
| (billion units) | | | | | |
| END-USE | 2004 | 2009 | CAGR | 2014 | CAGR |
| Over-the-counter | | | | | |
| Prescription - retail | | | | | |
| Prescription - institutional | Data Removed | | | | |
| Physician samples | | | | | |
| Clinical Trials | | | | | |
| Total | | | | | |

Source: Allied Development Corp.

Blister packs in Europe are used extensively for both prescription and OTC drugs. The basic advantages of blister packs were critical to this achievement for the blister pack industry, but legislation in Europe that favored unit-dose packaging helped a great deal. Blister packs were the best solution to comply with the legislation, which is why

Cold form foil, PCTFE, and the Other category (again primarily PET) are projected to achieve above average growth through 2014 (Table 17).

3. Japan

Table 18 provides the quantitative projection of forming web consumption in Japan, segmented by structure.

| FORMING WEB STRUCTURE | 2004 | 2009 | AGR | 2014 | AGR |
|-----------------------|---------------------|------|-----|------|-----|
| Cold form foil | | | | | |
| COC | | | | | |
| PCTFE | Data Removed | | | | |
| PVC | Data Removed | | | | |
| PP | Data Removed | | | | |
| PVdC-coated | Data Removed | | | | |
| Other | Data Removed | | | | |
| Total | Data Removed | | | | |

Source: Allied Development Corp.

The forming web mix in Japan is unusual due to its extensive use of PP instead of PVC. Both PVC and PVDC-coated PVC have much lower consumption in Japan than any other area in the world. Japan has adopted the use of PP because of Japan's extensive use of incineration for waste disposal and the corresponding safety and environmental concerns from incinerating PVC. PVC incineration generates unhealthy gas emissions that do not occur with PP incineration.

Of the high volume structures, cold form foil is projected to achieve the highest growth rate through 2014 (Table 18).