

volume justifies selective choice of specific materials for different products. However also keep in mind that two types, or grades, may be needed. A product may need an initial wrap of paper, or sealing in a plastic bag with a desiccant (a drying agent). For example when using air bubble sheet, a 3/8 in. grade should be used to wrap the products - then a 1/2 in. grade used as actual packing in the carton. Pre-molded shells or shapes made out of cellular material can be excellent packing, but the cost of permanent molds generally restricts their use to high volume production. Bubble pads and cellulose wadding or indented kraft are usually cost effective for intermediate and low volume products. Expanded foam-in-place urethane is particularly useful for low volume, irregularly shaped products, but may lose its advantage as production volume rises. Its appearance may also be incompatible with point of sale needs relative to the product.

**Shock absorption** - The properties of shock absorption vary for specific materials. One material may be an excellent cushion when used to protect small, light fragile items, but this same material may be unsatisfactory when used to protect small, heavy, fragile items. The cushioning material must be able to absorb a series of shocks and must have the ability to return to its original size and shape after each deformation. Cushioning material that "settles" so that looseness develops is not entirely satisfactory.

**Resiliency** - Soft plastic foam will "bottom out" if a heavy load is placed on it, unless a large area is used to distribute the weight or alternately, a thick cushion is used. Conversely, a fairly stiff plastic foam will not deflect and provide a cushion for a very light object.

**Texture and workability** - The ability of cushioning materials to protect finished surfaces against abrasion is dependent on the texture of the materials. Generally, materials supplied in roll form are soft textured and can be placed in contact with easily marred surfaces. Rolled cushioning materials are sufficiently pliable to be used without difficulty to cushion irregularly shaped items. They can be used to bulk out irregular surfaces and may be used for wrapping small miscellaneous parts.

**Cleanliness** - Small particles become detached, during use, from most cushioning materials. Items having operational functions that can be harmed by dust particles should be wrapped or protected against exposure to dust. Conversely, items that will not be protected from dust by the end user need not be protected against dust particles when packaged for shipment.

**Corrosivity** - Many paper based materials are corrosive and could not be used with highly finished metal parts. Other materials may become corrosive with chemical treatment, eg. fungus-resistance treatment.