



PACKAGING RECOMMENDATIONS:

Temperature-Sensitive Product Shipments

Temperature-Sensitive Product (TSP) shipments present unique challenges both generally and specifically to each application. The environmental variables, both at the point of packing and throughout the distribution channel, are remarkably numerous.

TSP shipments must be properly packaged to maintain quality (freshness, efficacy, appearance, etc.). Maintaining product integrity, while challenging, must be given careful consideration particularly when shipping outside of a temperature-controlled environment.

The International Air Transport Association (IATA) defines a temperature-sensitive (perishable) shipment if its contents deteriorate over a given time if exposed to harsh environmental conditions, such as excess temperature (hot or cold) or humidity. Of course, harsh is a relative term until it is applied to a particular product. A frozen food product may be more tolerant in terms of acceptable temperature range than an injectable medication.

Protecting TSP shipments is not a “one size fits all” solution. A variety of insulating materials may be applied to a TSP application, including:

- Expanded Polystyrene (EPS) Foam
- High Density Polyurethane
- Radiant-Barrier (Reflective) Bubble and Foam

Within each of these packaging categories are numerous variations related to performance capability and cost.

Designing a packaging solution depends on the particular product requirement as well as the expectations of the recipient of the product. General application goals include:

- Maintain a Specific Range Temp
- Maintain Frozen Temp
- Maintain Fresh Temp
- Minimize Fluctuation in Temp
- Maintain Below Melting Point Temp
- Maintain Above Freeze Temp
- Minimize Moisture (i.e. condensation)



Packaging Guidelines for all TSP Shipments

Once temperature-control standards are established, select a packaging design for testing and evaluation. While it is important for the design to meet the temperature-control requirements, it is equally important to insure the design will withstand the rigors within the distribution channel.

Use of EPS foam product enhances the structural integrity of an outer shipping carton, while radiant-barrier (reflective) products may require a more durable outer shipping carton. It is important to consider total shipment weight, duration of shipment, moisture throughout the distribution channel, and the amount of handling throughout the distribution channel.

The use of a poly liner (2 mil) is recommended for most shipments. Shipments containing water, wet ice, or other liquid should be double-bagged to minimize the potential for leakage. For shipments containing packaged product where the packaging is sensitive to moisture, place the packaged product in a lightweight poly bag as a moisture (i.e. condensation) barrier.

For international shipments, increase the outer carton strength depending on the weight and duration of the shipment. Consult the International Air Transport Association (IATA) website for additional information about both domestic and international shipments, including recommendations specific to TSP shipping and the latest activities of the IATA Time and Temperature Task Force TTF: <http://www.iata.org/workgroups/Pages/ttf.aspx>.

Once a packaging design is selected, multiple test shipments should be conducted to evaluate the performance (temperature and durability) of the packaging design. Providence Packaging provides sample packaging free-of-charge for testing and evaluation. Providence Packaging provides testing services to pre-qualify packaging performance. Contact a Providence Packaging sales professional for assistance with test requirements and costs.

It is important to properly pack TSP shipments. Please see additional links from the "Resources" section for more specific packing recommendations."