STOWING CARGO

PREPARING THE CARGO

An intermodal container is essentially a ship's hold on a reduced scale. When the containers are placed aboard ship for an ocean voyage, the cargo stowed in them is subject to the same forces and damage hazards while at sea that affect cargo shipped in break-bulk fashion.

The same principles and techniques that govern export packing and cargo stowage of break-bulk shipments are equally valid when preparing cargo for intermodal shipment.

Pack For The Toughest Leg Of The Journey!

Refer to the Basic Packing Guide section of this booklet for guidance in selection of packaging.

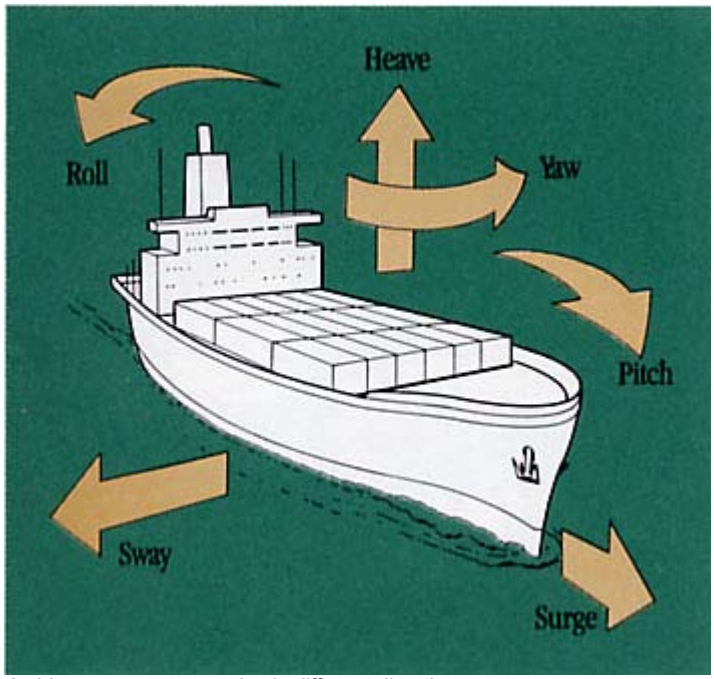
Be certain that goods cannot move within the fiberboard box, wood crate or other shipping package. Immobilize the contents by blocking or bracing and/or providing adequate cushioning.

Fiberboard boxes or wood crates must be able to withstand the weight of cargo stacked up to an 8-foot height. They must be able to survive lateral pressures exerted by adjacent cargo—up to 70 percent of the vertical stacking weight pressure. This will help to prevent crushing as the container leans (up to 45°) during han-dling or at sea.

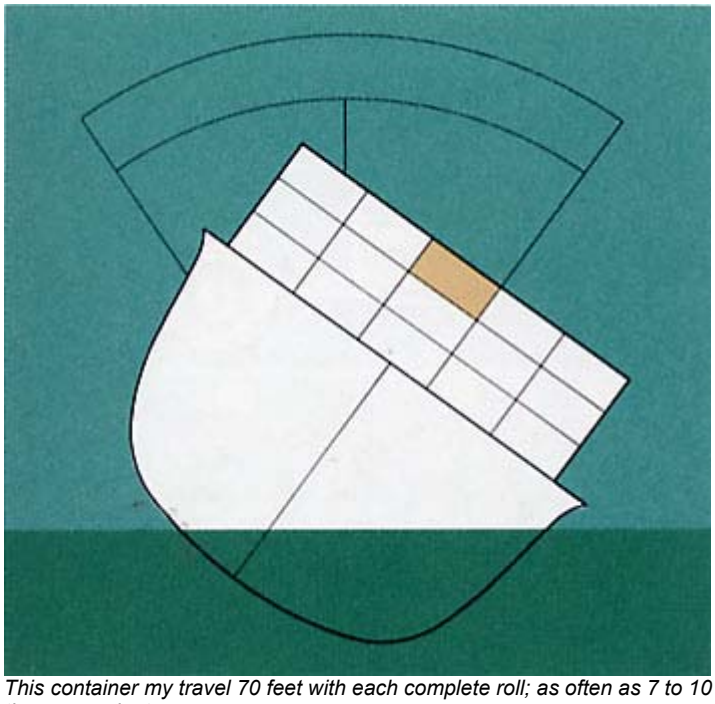
Heavy items, machinery and cargo not uniform in shape or dimension should be crated, boxed and/or provided with skids to permit ease of handling and compact stowage.

Where possible, cargo should be uni-tized or palletized. Cargo handlers are then required to use mechanical handling equipment to move cargo. The "Pennsylvania", one of the first iron steamships built in America expressly for ocean-going commerce.

Provide adequate water damage pro-tection. Use ofdesiccants (moisture-ab-sorbing materials), moisture or vapor barrier paper, plastic wraps, sheets or shrouds will protect cargo from water contact or condensate damage. Corrosion susceptible machine parts should be coated with a preservative or rust inhibitor.



A ship at sea may move in six different directions.



This container my travel 70 feet with each complete roll; as often as 7 to 10 times per minute

PLAN THE STOW

Observe Weight Limitations
Do not exceed rated capacity of package or intermodal container. Do not exceed permissible weight concentrations per square foot of floor load. Check highway weight-axle limitations on both sides of the ocean voyage because some con-tainers have total capacities that exceed local limits.

Avoid Mixing Incompatible Cargo
Cargo that emits odor or moisture should not be stowed with cargo susceptible to tainting or water damage. Items with sharp projections or awkward shapes should be segregated from other cargo by boxing, crating, padding or use of parti-tions. Cargo subject to leakage or spillage should not be stowed on top of other cargo.

Observe Hazardous Material/ Dangerous Goods Regulations
Consult with carrier/or regulations and restrictions regarding shipment of:
• combustibles
• explosives
• flammable liquids
• flammable solids
• gaseous materials
• radioactive materials
• magnetized materials
• spontaneous combustible materials
• corrosives
• poisons
• oxidizers
• infectious substances
• etiologic agents

After receiving information from car-rier, proceed as follows:

Label and mark hazardous material/ dangerous goods properly. (See Hazard-ous Materials section.) Affix warning plac-ards to container exterior. Note that placards vary throughout the world. What is acceptable at origin

may not be in com-pliance with enroute or destination coun- . tries' regulations. Check before shipment to avoid embargo or delay.

Record the nature of the cargo on all shipping documents.

Have All Cargo and Materials Ready Before Stowage Begins

Planning ahead facilitates proper place-ment, stacking and weight distribution. Additionally, it precludes removal of cargo already stowed to accommodate unex-pected items, and permits installation of blocking, bracing and filling of voids as stowing operations progress.

Plan for Ease of Unloading

Stow cargo in reverse order of desired cargo discharge.

Be sure that cargo for multiple consign-ees is physically separated by partitions, dividers or other suitable means.

Make sure that forklift openings in pal-lets or skids face doors.

Fill any voids, but avoid wedging or jamming cargo in container.

Cosmetic Damage

The exterior packing of your commodity is often the first representative the consig-nee sees of your company. A package showing exterior damage, although per-haps only cosmetic in nature, can cause loss of market, poor shipper/consignee relationships and more importantly cause the goods to be rejected and/or not be paid for even though the contents may arrive without damage.

Repackaging commodities can be very costly as well as time consuming. Remem-ber, the appearance of your product is in many cases as important as the product itself.

STOWING THE CARGO

Fiberboard Boxes

Fiberboard boxes containing tightly packed, dense items that support sides and ends of the box are stowed using the "bonded block" method. Fiberboard boxes containing lightweight or fragile items that provide little or no support to the box surfaces are stowed by stacking directly one atop the other. This method takes advantage of the vertical rigidity of the side walls and corrugations in each box.

Use plywood or lumber dunnage or fiberboard dividers as auxiliary decking sheets to segregate tiers of different sized fiberboard containers.

Provide plastic or water-repellent shrouds over top and sides of load to pro-tea against damage from water (ship's sweat or leaking containers).

Use dunnage or pallets on the con-tainer floor to elevate the cargo and allow drainage should water ingress.

Fill all voids by bracing or using fillers to prevent sliding or shifting of cargo.

Fill end voids to prevent sliding or shifting of cargo.

Use of Retaining Paper

Use rough paper between stowage blocks of fiberboard containers with smooth ex-teriors to prevent sliding or shifting.

Lumber

Should be clean and dry (not above 19 percent moisture content).

1. Use suitable hardwoods as filler, deck-ing, blocking, bracing and for constructing partitions/dividers.
2. Most common sizes used are nominal 2" X 4" and 4" x 4". Should be free of significant splits or knots.

Plywood

1. Use for partition faces, dividers, auxil-iary decking and blocking in limited spaces.
2. Should be clean and dry.

Inflatable

Available in paper, fabric, rubber or plas-tic; in both reusable and disposable forms. A check for sharp edges and/or protru-sions must be made to avoid punctures. Use it
for filling voids; light and medium duty bracing.

Patented Systems
Various patented cargo control and dun-nage systems are available. Pre-built parti-tions, shelves, straps, laminated linerboard bulkheads and dunnage bars facilitate stowage and securing of cargo.

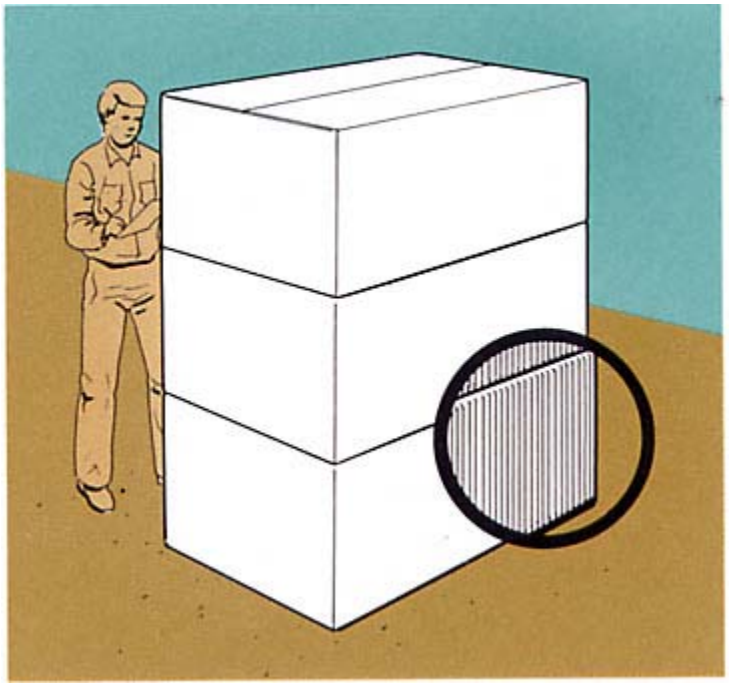
Fiberboard
Available in sheets, rolls and in prescored structural shapes. Use sheet for dividers, decks, partition facings and auxiliary decks.

Use rolled fiberboard sheets (solid or corrugated) for linings or facings and for filling voids.

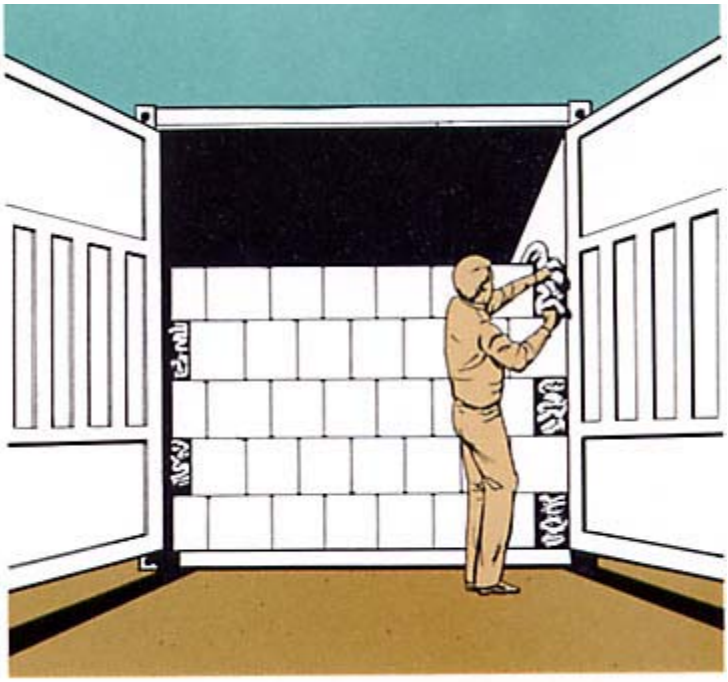
Strapping
Heavy duty metal strapping is used to sep-arate cargo units and for securing heavy or awkward items.

Nonmetallic strapping is used for light-weight cargo and has only a fraction of the strength of similar steel material. It would not resist shearing on a sharp edge, and will stretch as much as 9 percent.

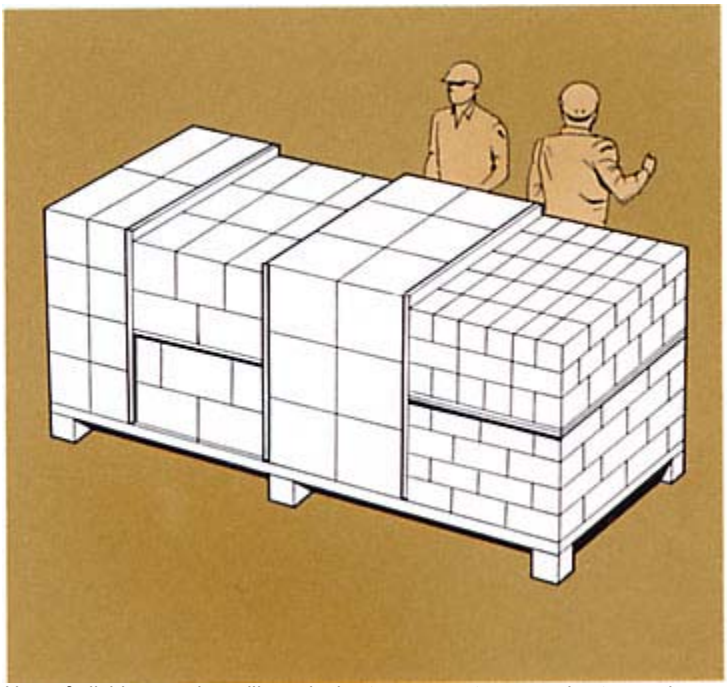
Metal and plastic straps must be firmly anchored and properly tensioned.



Vertical positioning of corrugated flutes provides best support for stacking



Fill side and end voids to prevent movement of cargo.



Use of dividers and auxiliary decks to segregate cargo by type, size or destination.

When stacking directly on top of lower boxes, keep voids at the center and immobilize by constructing partitions or inserting inflatable securing materials.

WOOD CRATES

Wood Boxes and Crates

Crates of uniform size and weight should be stacked directly one atop another.
Separate groups of crates with different weights or dimensions by use of parti-tions, dividers or auxiliary decking.
Fill voids at top, sides or ends by use of partitions or fillers.
If large voids are present, block, brace and tie down cargo to prevent movement in any direction.
When bracing crates, apply bracing to strength members only, not to panels or sheathing.

Machinery or Heavy Items

Distribute weight by proper placement and use of cradles or skids.\

Use deck cleats and bracing to prevent lateral and fore-and-aft movement. Use metal strapping to prevent vertical movement.

Extremely heavy dense items should be properly secured to the container floor. Consult with carrier or container leasing operator for approved method(s).

Top-heavy items should be shored and braced to prevent toppling. Do not brace against the side panels of the container. All bracing must bear on a structural member of the container. Diagonally positioned bracing to the container floor is preferable for cargo that is top heavy.
Provide plastic or water-repellent pa-per shrouds over the top and sides of the item to prevent water damage.

Bags, Sacks and Bales

Use "crosstier" method of stacking bags and sacks. (Refer to illustration.)

Use sufficient dunnage layer on con-tainer floor to provide for condensate drainage.

Separate bags, sacks and bales from other cargo by using partitions.

When stowing bales, provide dividers be-tween rows and tiers to prevent chafing and friction between metal bands or strapping.

Liquid Cargo (Drums)

Drums of liquid cargo should be sepa-rated from other cargo by use of parti-tions. Use adequate dunnage between tiers of drums to provide a level flooring surface for

stacking.

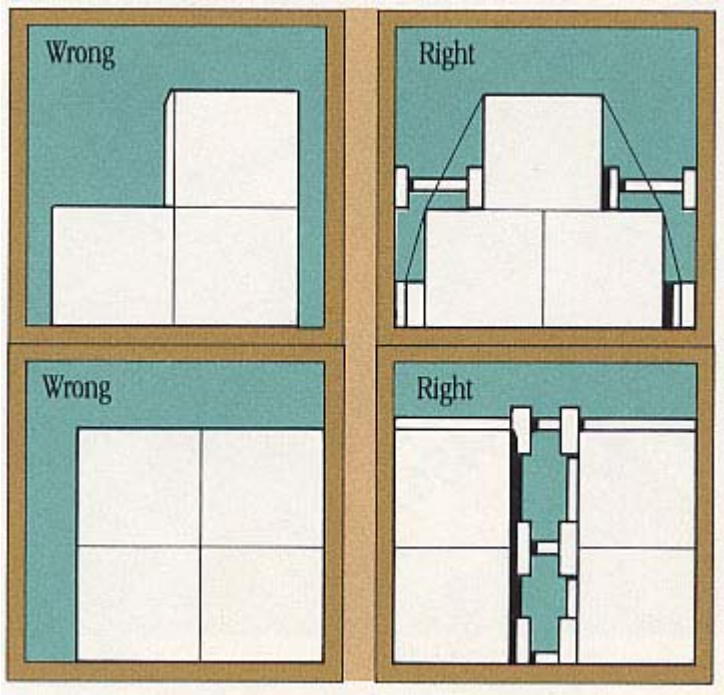
Drums containing liquids should be floor loaded. The drums should be stowed on end with filler holes up as opposed to on their "rounds." Use dividers to protect drum rims from chafing damage.

COMPLETING THE STOW

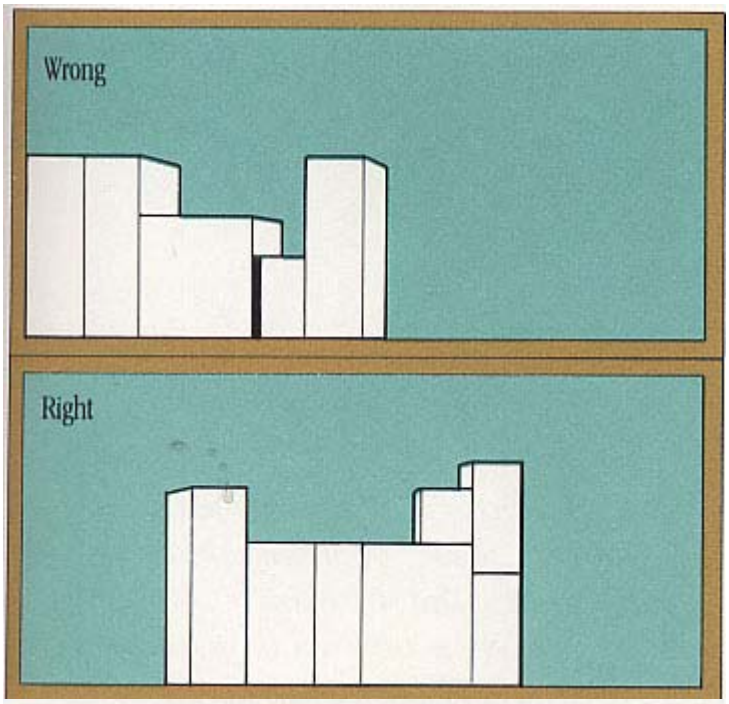
Isolate Cargo From Container! Jrailer/Railcar Doors—Construct partition across rear of stowed cargo to prevent it from contacting doors and fall-ing out when doors are opened.

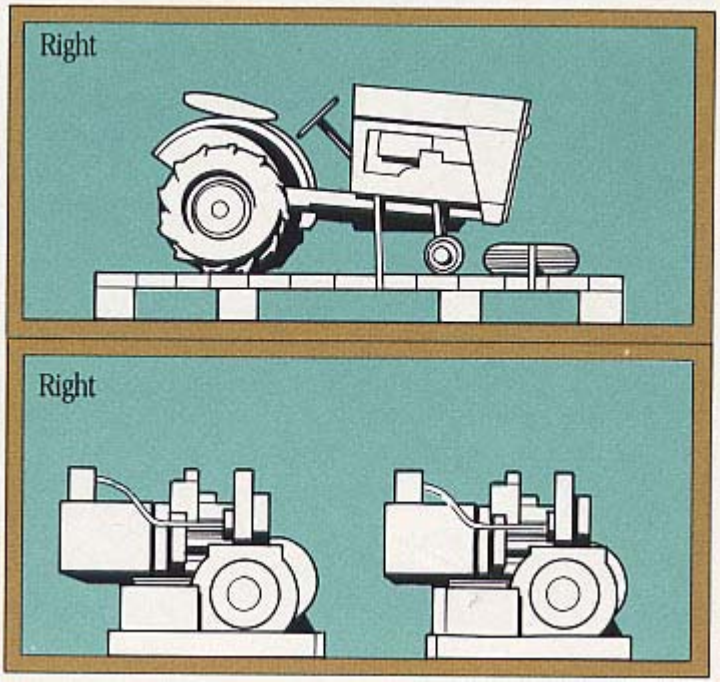
Provide Water Damage Protection— Cover cargo adjacent to doors with plastic or waterproof paper sheets to protect cargo from possible water ingress via door gaskets.

Close and Seal Doors—Be sure all locking cams are engaged. Affix locks and seals. (On units with side and end doors— be certain to check both.) Record seal number and enter on shipping documents.



Weight Distribution – Heavy Loads


Wrong
Right


Right
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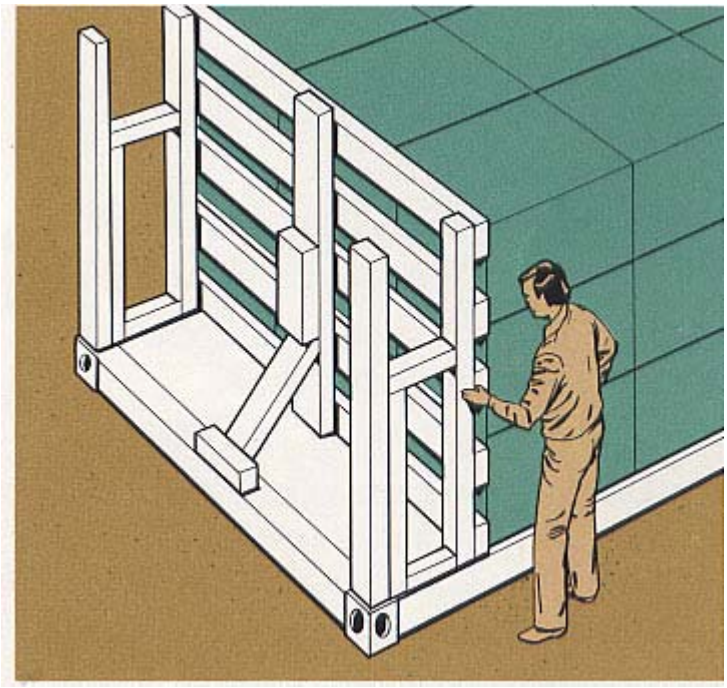
Bags and Sacks “Crosstier” Loading



Bracing the completed load to prevent movement aft

CARGO SECURITY SEALS

As previously noted, once loaded, all in-termodal and air cargo containers, trailers and railcars should be sealed. The particu-lars of a shipment, namely product type, value, marketability, susceptibility and routing/destination should be considered prior to seal selection. The most popular seal, usually constructed of polypropylene or galvanized tin plate can be breached and, even re-fitted, with basic tools. Stronger heavy duty cable seals or high security seal locks offer additional pro-tection as they generally deter all but the most determined thief. In addition to de-terring physical entry of the container, trailer or railcar, other desirable proper-ties of seals include:

• Unique and clearly visible identity.
• Corrosion — resistance especially for those containers destined for ocean carriage.
• Tamper-proofing so that it is impossible to re-fit.
• Strong enough to withstand accidental damage during handling/transit.

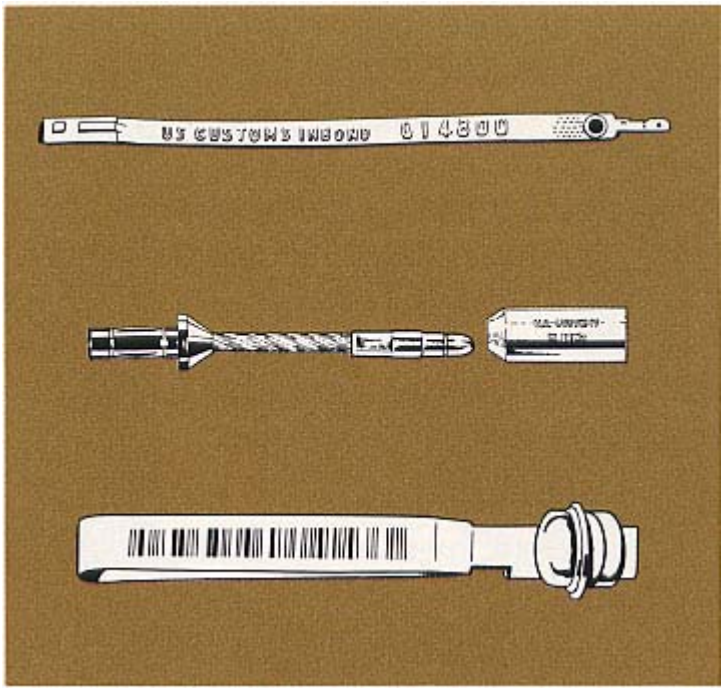
Technology has allowed for several sophisticated variations on these themes. Today, a shipper can choose from several seal types. There are bar-coded seals that enable automatic recording of seal num-bers, indicator seals that release a bright dye into a transparent casing that is clearly visible from considerable distances and, at least, one manufacturer has developed a seal consisting of randomly set acrylic op-tical fibers jacketed in a high impact plas-tic body. These seals each have a unique "fingerprint" that can be verified by a spe-cially designed camera.

Regardless of the type seal used, its value is compromised if application is not properly supervised and it is not in-spected at regular intervals during transit. Effectiveness is also only as good as the controls maintained over seal inventory. Seals should be stored in a controlled area and released to as few people as practical. A log indicating to whom seals identified by number, have been released, is a necessary control measure.

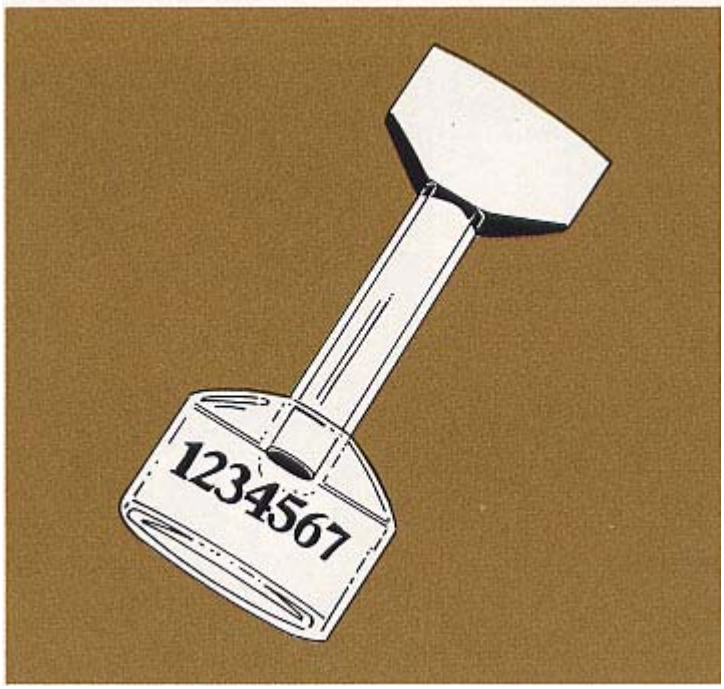
Through the years, the function of a seal has been to reveal evidence of entry. Given time, opportunity, and, in some cases, tools all can be defeated. Also, hi-jacking, the stealing of the entire trailer or container and contents, is a real potential. (With seals serving only to inconvenience the perpetrator^]). In fact, in some areas of Africa, South America and Southern Europe, this is becoming a major concern.

Aside from compliance with proven in-transit security procedures such as direct routing and convoying, vehicle/cargo tracking is a viable alternative given cer-tain cost and geographical constraints. The global network of satellites and land-based terminals enables two-way messag-ing between a vehicle and a central loca-tion.

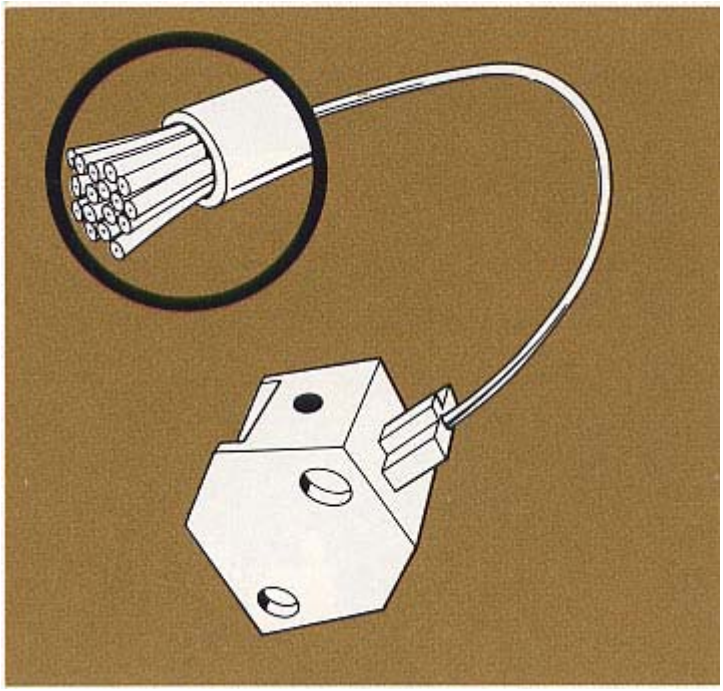
This real time communication and periodic positioning capability has cargo security implications. Available system en-hancement options include driver paging, vehicle diagnostics and refrigerated trailer monitoring.



Custom Seals



Serialized Indicative Seal



Fiber Optic Seal