AIR CARGO

Air cargo service has become more attractive to shippers as aircraft capacity, frequency of lifts, handling facilities and the number of locations serviced have been increased.

Air cargo losses can be controlled with the shipper as the key figure in effective loss control. Recognition of the hazards involved, packing cargo to survive the toughest leg of the journey and prudent selection of transportation services will assist the shipper in realizing successful loss-free delivery of his or her goods.

Inadequate packing and improper marking of cargo are the leading causes of air cargo losses. It is in these areas where the shipper can effectively influence the sound arrival of goods.

THE AIR CARGO ENVIRONMENT HAZARDS

In The Aircraft

Acceleration/Deceleration-Fore-and-aft pressures are exerted on cargo during takeoff and landing. Compression forces are exerted during rough landings.

Turbulence-Rough or "bumpy" flight conditions subject cargo to rapid alternating vertical movements, imposing heavier pressure one moment, and almost weightless conditions the next.

Altitude-As altitude increases, atmospheric pressure decreases, subjecting liquid cargo to leakage hazards and pressurized cargo to increased internal pressure.

Temperature- Aircraft cargo compartment temperatures normally range between 30°F and 70°F (-1°C and 21°C). However, cargo aboard an aircraft parked in freezing or very hot weather will be subjected to unusual cold or heat conditions.

Cargo Compartments - The main cargo compartments of air freighters are normally well equipped for adequate stowage. Passenger aircraft belly compartments, however, are often loaded with limited cargo restraint equipment permit-ting the possibility of movement during flight and inviting damage from adjacent cargo.

In Terminals

Handling - Many larger terminals are equipped with conveyor systems and mechanical cargo handling gear, permitting rapid and safe movement within the terminal. Manual handling involves the stacking of cargo on pallets and in containers. In smaller terminal facilities, it is the rule. Overcrowded conditions contribute to handling damage as cargo may be stacked above recommended heights or re-positioned frequently.

Storage - Modern terminals provide segregated security areas for high value cargo, and some have cold storage (reefer) facilities for perishables.

Terminals not so equipped are subject to increased theft, pilferage and deterioration loss hazards. Overcrowded conditions may also require storage of some cargo outdoors, exposing it to the elements.

Ramps - Cargo is exposed to the weather while enroute to loading ramps. If cargo transfer carts, pallets and containers are not adequately covered (tarped), water damage may result. High-value cargo is particularly susceptible to theft when not in the aircraft or the terminal.

Security- Security-conscious carriers provide maximum physical measures to protect cargo from theft or pilferage. Examples include restricting working areas to employees, applying modern locking and alarm devices and enforcing strict cargo documentation procedures. When these measures are not enforced, cargo security is jeopardized.

Dangerous Goods - Only trained personnel should handle this cargo. Consult appropriate publications for guidance such as the ICAO *Technical Instructions For The Safe Transport of Dangerous Goods by Air* or IATA *Dangerous Goods Regulations*.

On Trucks

Most cargo is delivered to both carrier and consignee by truck.

Often, air cargo is stored in ware-houses or on transfer docks before forwarding, increasing exposure to theft, pilferage and handling damage. INSIST UPON PROMPT PICKUP

AND DELIVERY OF YOUR CARGO! This is the most effective means of reducing expo-sure to loss.

Preparing Cargo For Air Shipment/ Pack For The Toughest Leg Of The Journey:
Trucking to air terminal, handling in terminals, stowing in aircraft, inflight, unloading aircraft, transfer to terminals, truck transport to consignee.
Cargo Should Be Packed To Withstand: Stacking up to 8 feet high, pressure from adjacent cargo, crushing action of tie-down straps, manual handling, exposure to the elements.
Unitise, Palletize, Containerize To: Minimize manual handling, reduce incidents of lost or stray items, limit exposure to theft and pilferage, and minimize stowage damage. Provide water-protective coverings, which will accompany pallet and unit loads on entire journey.

Liquid Cargo
Do not fill containers completely-
Provide expansion space to compensate for temperature and/or pressure variations. Be sure all caps, valves and seals are tightly closed. Put orientation marks (arrows) on all sides of package.

Large, Heavy or Awkward Cargo
Check with carrier to determine allowable aircraft floor weight concentrations.
Provide skids for ease of mechanical handling.
Check dimensions to be sure cargo will pass through aircraft loading doors.
Provide adequate locations for application of tie-down straps.

Water Damage Protection
Pack cargo in wooden crates with waterproof paper or polyethylene liners.
Line non-impregnated fiberboard boxes with waterproof paper or polyethylene.
Large items can be shrouded with polyethylene sheeting. Be sure there are drain holes in the base of the crate.
Use desiccants (moisture absorbent materials) in conjunction with waterproof barrier wrapping when packing moisture sensitive items.
Use shrink wrap, stretch wrap or plastic shrouds on unit and pallet loads.

Perishable Cargo
Provide adequate package ventilation where required. Furnish appropriate instructions i.e., carrying temperatures and handling requirements, to carriers. Use direct flights where possible. Delivery and pick-up should be closely timed with aircraft departure and arrival.

Marking
Avoid marks and advertising that reveal contents are of a valuable or desirable nature. Apply appropriate coded identification marks to at least three sides of item. Use international handling symbols. Include handling instructions in both English and the language of the country of destination. Use indelible inks and water-proof labels.

AIR CARGO CONTAINERIZATION

Shippers can realize savings and minimize cargo loss by containerizing their air cargo shipments. Airlines encourage use of containers by providing special tariffs for containerized FAK (Freight-All-Kinds) shipments on many routes.
Certain commodities are excluded from air cargo FAK special rates. Consult with your carrier or forwarder for specifics on excluded items and on articles prohibited by IATA's *Dangerous Goods Regulations*.
Air carriers prefer containerized shipments for a number of reasons:

Reduces the number of individual pieces of cargo that must be handled in terminals.
Provides for most efficient use of cubic capacity of the aircraft.
Permits use of mechanical handling systems and equipment to best advantage.
Speeds loading and unloading of aircraft.
Minimizes exposure of cargo to weather, theft, pilferage and handling damage while in custody of the carrier.

Air Cargo Containers Fall into Four Basic Categories

1. Air Cargo Pallets
Designed for use with conveyor systems in terminals and in aircraft. The low-pro-file flat pallet is equipped with fittings for securing the pallet firmly to the main deck of an all-cargo aircraft. Cargo is normally secured to the pallet by use of cargo nets, tightened over cargo by the application of tensioned straps.

2. Contoured Air Cargo Containers
Contoured, semi-structural covers called Type "A" are used to provide protection for cargo and keep cargo within safe dimensions for loading in aircraft.

These containers may have one side (front) open, with cargo secured by nets or have metal or fiberglass removable doors, which are capable of being sealed.

3. Lower Deck Containers
Developed for use in the lower deck cargo spaces of high-capacity aircraft, they are fully structured and completely enclosed.

Cargo is loaded into the container, which may be equipped with shelves for accommodation of small or irregularly shaped cargo.

The container doors of metal, fabric or a combination of both are closed and sealed.

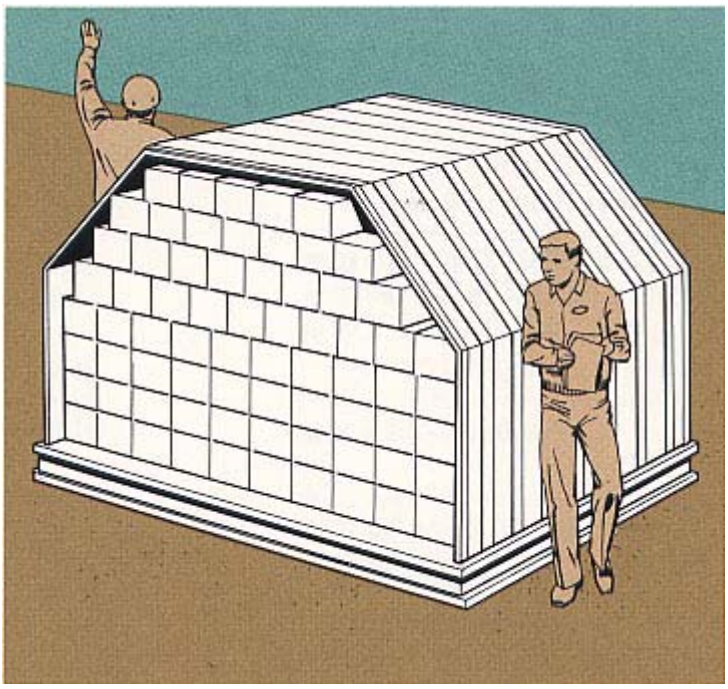
Containers are locked directly into air-craft restraint systems without need for nets or tie-downs. Provide dunnage or shelving to prevent crushing of cargo at recessed end of lower deck container.

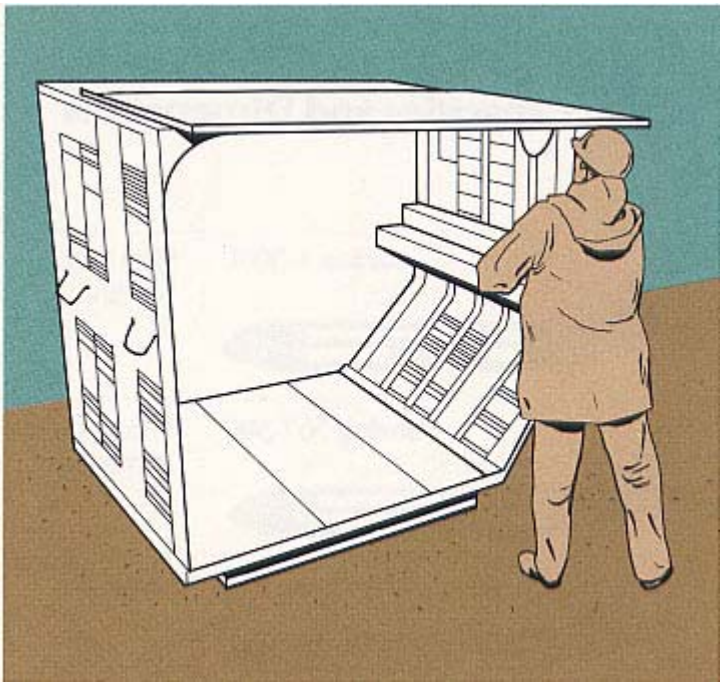
4. Box-Type Containers
Developed in standard sizes to facilitate establishment of uniform shipping rates, they are used to consolidate shipments.

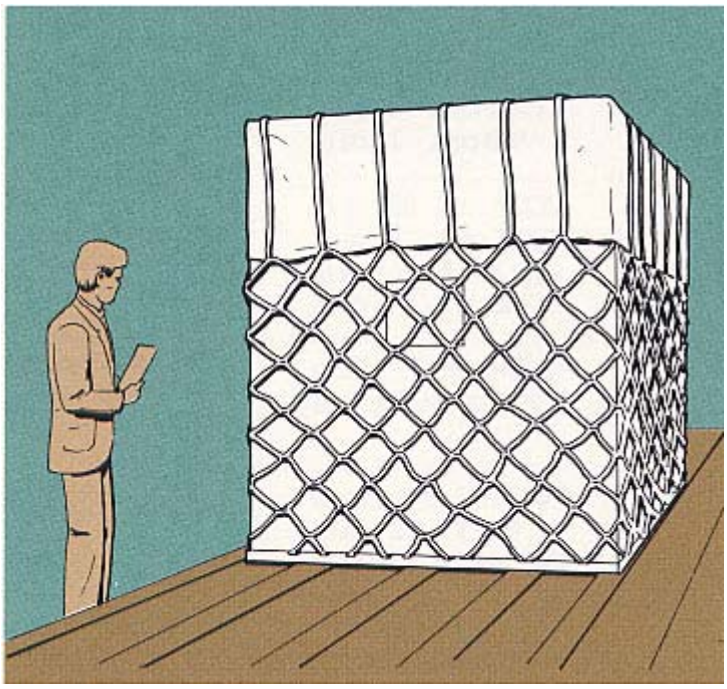
Box-type containers are often used by freight forwarders to consolidate shipper's cargo into one easily handled and rated unit.

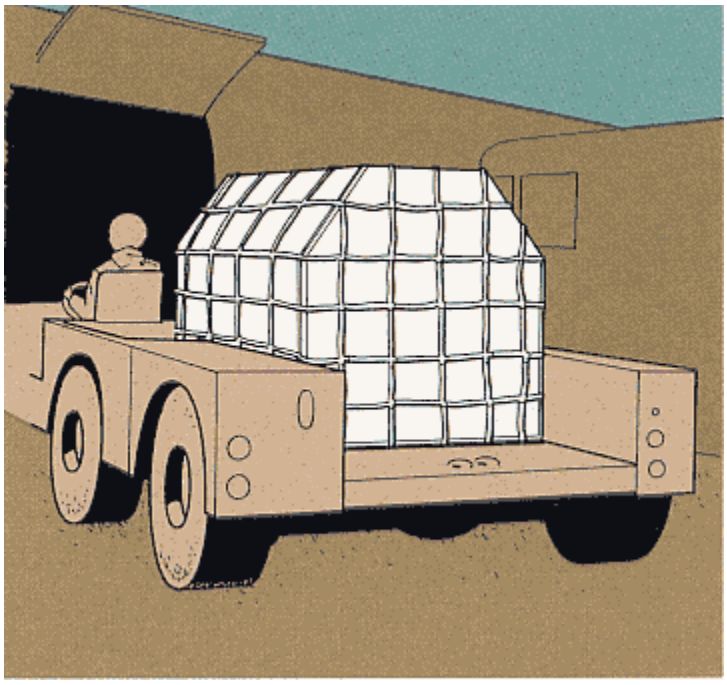
These containers are constructed of wood, fiberglass, plywood, fiberboard, metal or combinations of these materials.

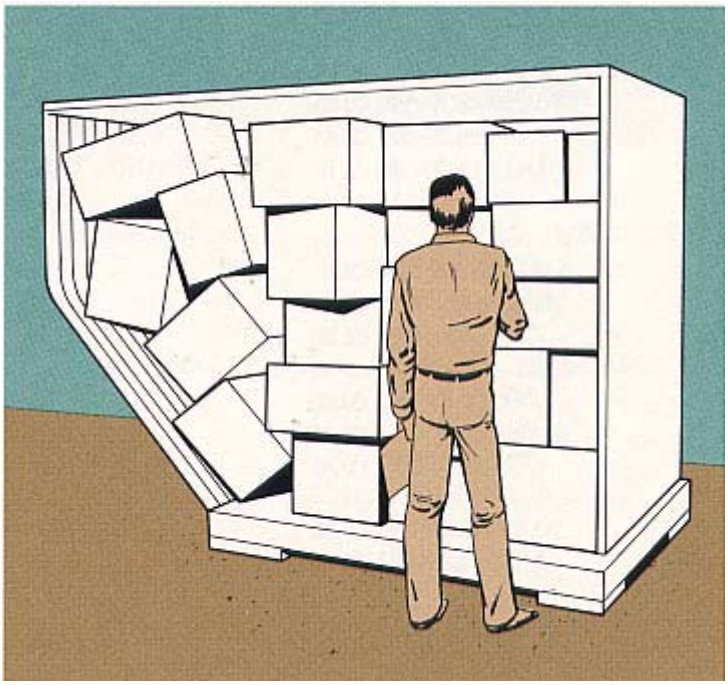
Air/Land Containers- Introduction of the 747-class freighter has permitted adding an air dimension to the intermodal container. Lightweight 20- and 40-foot containers permit land and air transportation without rehandling or reloading.

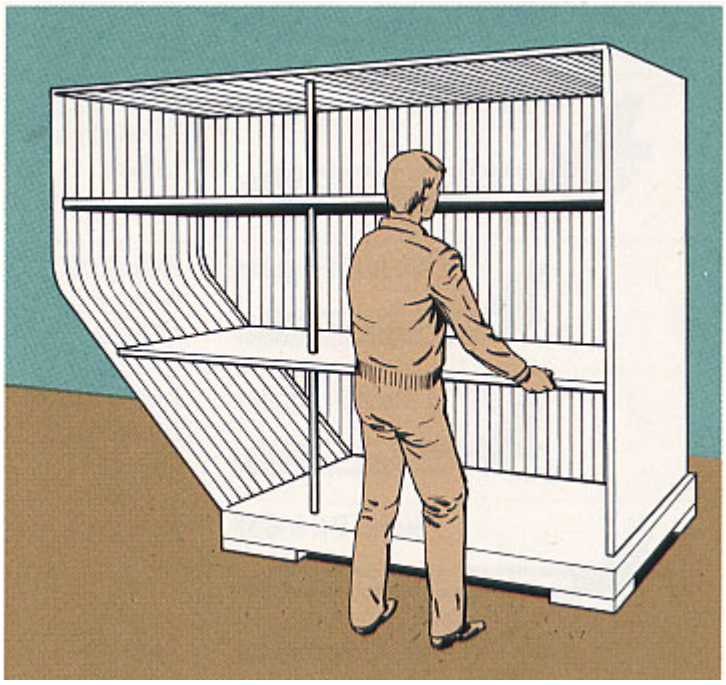












Provide dunnage or shelving to prevent crushing of cargo in contoured end of lower deck container.

AircraftCapacities and Dimensions

	Cubic Capacity	Maximum freight capacity	Access door dimensions
Main deck Forward Aft	7,169 cu.ft.- 203 cu.m. 1,896 cu.ft. - 53.7 cu.m. 1,264 cu.ft. - 35.81	111,763 lbs - 50,695 kgs (total freight capacity)	101” x 141” – 257cm x 358cm 95.9” x 67.5” – 24.3cm x 171cm 71.3” x 67.4”-181cm x 171cm

Airbus A-300C		cu.m.		
				
Boeing 767-300	Main deck Forward Aft	3,600 cu.ft. – 101.9cu.m.	69,850 lbs - 31,684 kgs	AFT 700” x 69”- 178cmx175cm
				
Boeing 757	Forward Aft	700 cu.ft. - 19 cu.m. 1,090 cu.ft. - 30 cu.m.	25,700 lbs- 11,657 kgs (total freight capacity)	FWD 55” x 44”-140cm x 112cm AFT 55” x 44”-140cm x 112cm
				
Boeing 747C	Main deck Forward Aft Bulk compartment	9,145 cu.ft. – 259 cu.m. 2,225 cu.ft. – 63 cu.m. 742 cu.ft. – 21 cu.m. 1,271 cu.ft. – 63 cu.m. 800 cu.ft. – 22.6 cu.m.	92,000 lbs- 41,500 kgs 55,500 lbs- 25,175 kgs 20,400 lbs- 9,250 kgs 22,600 lbs- 10,280 kgs 14,800 lbs- 6,750 kgs	134” x 120”- 340cm x 305cm 104” x 66”- 264cm x 168cm 104” x 66”- 264cm x 168cm 44” x 47” – 112cm x 119cm
				
Boeing 747F	Main deck Forward Aft Bulk compartment	21,270 cu.ft. – 602 cu.m. 2,528 cu.ft. – 72 cu.m. 2,212 cu.ft. – 63 cu.m. 800 cu.ft. – 22.6 cu.m.	260,000 lbs– 117,936 kgs (total freight capacity)	134” x 123”- 340cm x 312cm 104” x 68”- 264cm x 173cm 104” x 68”- 264cm x 173cm 44” x 47” – 112cm x 119cm
				
Boeing 737	Main deck Forward Aft	2,730 cu.ft. – 77.3 cu.m. 875 cu.ft. – 24.9 cu.m.	39,000 lbs- 17,687 kgs (total freight capacity)	134” x 84.5”- 340cm x 214cm
				
Boeing 707F	Main deck Forward Aft	8,000 cu.ft – 227.2 cu.m. 875 cu.ft. – 24.9 cu.m. 910 cu.ft. – 25.8 cu.m.	90,000 lbs- 40,8244 kgs 14,300 lbs- 6,486 kgs 13,900 lbs- 6,305 kgs	134” x 86.6”- 340cm x 224cm 48” x 50”- 122cm x 127cm 48” x 48”- 122cm x 122cm 35” x 30”- 39cm x 76cm (smaller rear door)
				
Boeing 727-100C	Main deck Forward Aft	3,300 cu.ft. – 93 cu.m. 420 cu.ft. – 119cu.m. 470 cu.ft. – 133 cu.m.	37,960 lbs- 17,236 kgs (total freight capacity)	86“ x 134“- 224cm x 340cm 48“ x 35“- 122cm x 89cm 48“ x 35“- 122cm x 89cm
				
DC 10-30CF	Main deck Forward hold Aft Bulk Compartment	12,236 cu.ft. – 346 cu.m. 2,155 cu.ft. – 61 cu.m. 1,413 cu.ft. – 40 cu.m. 459 cu.ft. – 13 cu.m.	84,865 lbs- 38,495 kgs 56,000 lbs- 25,401 kgs 35,000 lbs- 15,875 kgs 7,480 lbs- 3,400 kgs	102“ x 140 “- 259cm x 356cm 104“ x 66 “- 264cm x 168cm 70“ x 66 “- 178cm x 168cm 30“ x 36 “- 76cm x 91cm
				
DC 8F Jet Freighter	Main deck Forward hold Aft hold	5,092 cu.ft.– 144.2 cu.m. 688 cu.ft. – 19.5 cu.m. 724 cu.ft. – 20.5 cu.m.	83,790 lbs- 38,000 kgs 10,320 lbs- 4,690 kgs 10,470 lbs- 4,760 kgs	140“ x 85 “- 356cm x 216cm 36“ x 44 “- 91cm x 112cm 36“ x 44 “- 91cm x 112cm
				
DC 8 Combi Freighter	Forward cabin Forward hold Aft hold	1,600 cu.ft. – 45.2 cu.m. 688 cu.ft. – 19.5 cu.m. 724 cu.ft. – 20.5 cu.m.	8,000 lbs- 3,600 kgs 10,320 lbs- 4,690 kgs 10,470 lbs- 4,760 kgs	140“ x 85 “- 356cm x 216cm 36“ x 44 “- 91cm x 112cm 85“ x 140“- 216cm x 356cm
				
Super DC 8-63F	Cabin Forward hold Aft hold	10,331 cu.ft. – 293 cu.m. 2,500 cu.ft. – 71 cu.m.	119,000 lbs- 54,000 kgs (total freight capacity)	85“ x 140“- 216cm x 356cm 63“ x 54“- 160cm x 137cm
				

	Main deck Aft	2,680 cu.ft. – 76 cu.m. 420 cu.ft. – 11.9 cu.m. 318cu.ft. – 9 cu.m.	33,297 lbs- 15,135 kgs 6,952 lbs- 3,160 kgs 5,000 lbs- 2,265 kgs	113“ x 81“- 341cm x 203cm 53“ x 50“- 135cm x 127cm 36“ x 50“- 91cm x 127cm
	Forward hold Aft hold	373 cu.ft. – 10.5 cu.m. 227 cu.ft. – 6.4 cu.m.	5,595 lbs- kgs 3,403 lbs- kgs	53“ x 50“- 135cm x 127cm 36“ x 50“- 91cm x 127cm
	Main deck Lower deck	12,066 cu.ft. – 342 cu.m. 3,415 cu.ft. – 98 cu.m.	146,500 lbs-66,518 kgs (total freight capacity)	134“ x 100“- 340cm x 254cm
	Main deck Aft	1253 cu.ft. – 35.5 cu.m.	18,795 lbs- 8,525 kgs	FWD 48“ x 34“- 122cm x 86cm AFT 48“ x 35“- 122cm x 89cm

The table below lists standard air cargo containers. Minor variations in internal dimensions and cube will occur due to differences in the construction techniques and materials used.

Air cargo is a popular mode of transportation for live animal shipments. Consult individual airlines for specific requirements and restrictions. Equally important, check on the import regulation and quarantine laws that affect shipments.

Air Cargo Containers. The following is a brief description of the various containers used.

External Dimensions (inches)	Mazimum Gross Weight(lbs.)	IATA	ATA
125 x 96 x 96	15,000	ARA	M1
240 x 96 x 96	25,000	ASE-ASG	M2
88 x 125 x 87	13,300	SAB-UAB	A1
88 x 125 x 87	12,500	AAA-SAA	A2, A3
81 x 60.4 x 62.75	4,500	--	FTC
47 x 60.4 x 64	2,700	APA	LD2
79 x 60.4 x 64	3,500	AVE-AKE	LD3
96 x 60.4 x 64	5,400	DLP-DLF	LD4
125 x 60.4 x 64	7,000	AWB-AWD	LD5, LD11
25 x 60.4 x 64	5,680	AWC-AWF	LD6
125 x 60.4 x 64	13,300	AAP-AAR	LD7, LD9
196 x 60.4 x 60	5,400	ALE	LD8
125 x 60.4 x 64	5,680	AWR-AWS	LD10
98 X 42.2 X 41.6	1,700	--	LDW
84 X 58 X 76.45	5000	--	B
42 X 58 X 76.45	2500	--	B2
58 X 42 X 45	2,000	--	D
42 X 29 X 25.5	500	--	E
35.4 X 21 X 21	250	--	EH
56 X 55 X 57	3,160	--	LD-N
39.5 X 27.5 X 21	400	--	Q