

4.1.3 In general the size and design of the pallet is made to suit the asbestos bags and the type of shipment involved. For example, small tonnages in break bulk vessels should be on pallets similar to the sketch shown at Fig. 2. The actual dimensions of the pallet should be such that the bags slightly overhang the pallet on all sides. If the pallet protrudes beyond the bags it can easily damage bags in an adjacent pallet load. It should also be a 'wing' style as shown at Fig. 2. This is to permit easy lifting with slings and to assist in anchoring shrink or stretch wrapping.

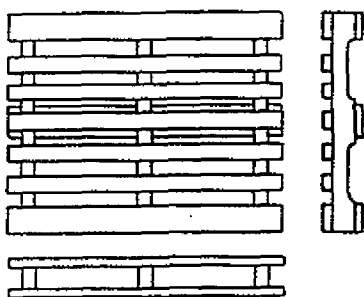


Fig. 2

4.1.4 The afore-mentioned pallet is also suitable for loading in containers, vans and railway wagons, because it can be picked up from all four sides with a lift truck.

4.1.5 Another style which is also suitable for containers and has gained wide acceptance is shown at Fig. 3.

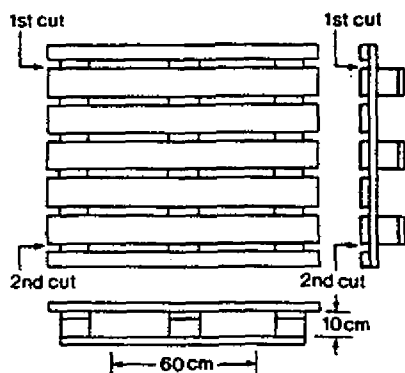


Fig. 3

4.1.6 This pallet should have the following dimensions:

- four entries, 10 cm high
- min. 60 cm width of opening on each side allowing the lifting by any forklift.

The two wings may be cut easily to allow for the re-use of the pallet for finished products. For example, a pallet of size 100 x 120 cm can be altered with one cut to 90 x 120 cm or with two cuts to 80 x 120 cm (standard European size). Thus, the rather high pallet costs are offset and the disposal problem of the one-way pallet presently in use is solved.

4.2 Marino slings

4.2.1 For charter shipments where several thousand tons of asbestos are stowed in a vessel, experience has shown that pallets should not be used because the wood may damage bags during loading and unloading or through the movement of cargo during the voyage. These problems can be overcome by the use of disposable marino slings (see Fig. 4). A design which has been found very satisfactory for use with chrysotile asbestos (but which is not generally recommended for use with amphibole asbestos) incorporates the use of webbing straps and has a plastic sheet embedded in the bottom to create a platform on which a unit of bags is placed. These units must be made up of interlocked bags and not exceed five layers high. Each unit should then be stretch wrapped to ensure maximum stability.

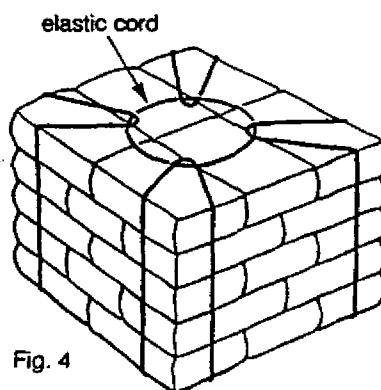


Fig. 4

The four corner straps should be held together by an elastic cord to keep them available for lifting. Otherwise stevedores may have to search for them, which delays unloading.

4.2.2 For the most efficient handling of these units, spreader devices of particular design have been created. These permit the handling of multiple units at one time, thereby greatly reducing the time required to load and unload from the vessel.

4.2.3 It is also important to understand that once the units in marino slings are removed from the ship they are placed on pallets for further handling by fork-lift truck.

4.3 Plastic cover

4.3.1 In order to further protect the bags against damage and to bring stability to the unit, a plastic cover should be added. It should be used for units on wooden pallets as well as for units in marino slings.

4.3.2 There are two basic types of plastic covers, namely shrink-wrapping and stretch-wrapping. The shrink-wrapping has the advantage of being a complete cover for the top and four sides of the unit. It is heated causing it to shrink and tighten around the unit ensuring very good stability. However, the heat may in some cases cause the cover and bags to stick together. To avoid this a satisfactory alternative is stretch-wrapping. This form of wrapping generally covers only the four sides of the unit. If it is important that the top be protected (in case of double stacking), a top cover can be added and held in position by the stretch-wrapping.

4.3.3 An ultra-violet inhibitor should be added to both types of wrapping to increase their outdoor resistance further. However, this will only prolong their resistance to sunlight for a short period of time (e.g. a few months). Neither the stretch- nor the shrink-wrapped units are weather proof and they should therefore be covered if outside storage is necessary.

4.3.4 An alternative form of cover recommended for use with palletised units of amphibole asbestos is a heavy-gauge plastic cover which fits over the top and four sides of the unit and is strapped in position.

4.4 'Big bags' and 'tank trucks'

Two methods have been developed to handle asbestos in bulk form. These are 'big (balloon) bags' and 'tank trucks', which have a limited application; they are only capable of handling short asbestos fibres and are only economical for transporting short distances. It is also necessary that the receiving plant is suitably equipped to handle each delivery in a controlled manner.

5. Transportation

5.1 Closed vehicles

5.1.1 The ideal methods of transporting asbestos are palletised and plastic-wrapped units loaded in either closed road vehicles or railway cars for overland and closed containers for overseas shipment. As the doors are closed at the asbestos mine or port and opened only when the shipment arrives at the user plant, any spillage of asbestos during transport is completely avoided.

5.1.2 The direct unloading of these vehicles by fork-lift truck may not be possible unless a ramp is available. If not, a satisfactory alternative is to pull the palletised units to the doorway with a trans-pallet where they can easily be picked up with a fork-lift truck. More expensive solutions are the use of mobile ramps or special trailers which lift the containers to the ground.