Chapter 7. CTU suitability

7.1 Suitability in general

7.1.1 Freight containers and some other types of CTUs (e.g. swap bodies for rail transport in Europe) require type approval. In addition, depending on the type, the verification of a periodic or continuous examination scheme might be required as well. A CTU requiring approval (and examination) and not bearing a valid approval plate is not suitable for transport (see subsection 8.2.1).

7.1.2 Freight containers and swap bodies showing serious defects in their structural components (e.g. top and bottom side rails, top and bottom end rails, door sills and header, floor cross members corner posts and corner fittings) may place persons into danger and are therefore not suitable for transport (see subsection 8.2.2).

7.1.3 Road vehicles, semi-trailers and railway wagons showing deterioration in major structural components or other obvious defects impede the safe traffic on road or rail and are therefore not suitable for transport.

7.2 Suitability for the cargo

7.2.1 All cargo which is sensitive against weather conditions such as rain, snow, dust and sunlight, or against theft and other consequences of easy access should be carried in a closed or sheeted CTU. Freight containers, closed or sheeted swap bodies, semi-trailers and other road vehicles are suitable for most cargoes.

7.2.2 Single packages such as:

- Cartons stacked by hand;
- Drums or similar packages stacked by forklift truck; or
- Any kind of palletized cargo

can be packed and preferably stowed from boundary to boundary. However, it depends on the type of CTU, whether such firm stowage alone provides sufficient cargo securing or whether additional securing is needed (see section 9.4).

7.2.3 Certain cargoes such as cocoa or other agricultural produce are sensitive against climatic effects and may be damaged when the humidity within the CTU is condensed due to a decrease of temperature. This effect is specific for long distance sea transport and can be controlled by appropriate ventilation. Standard freight containers however allow only restricted air changes. Therefore, specially designed containers with increased ventilation may be preferred for such sensitive cargo.

7.2.4 Certain perishable cargoes such as foodstuffs and, in particular, deep frozen products, require transport at low temperatures. Other products, e.g. certain chemicals, need to be protected from frost. Such commodities should be transported in insulated and temperature controlled CTUs which can be refrigerated or heated as appropriate.

7.2.5 Heavy items such as granite and marble blocks may also be packed into closed CTUs. However, this cargo cannot be simply stowed from wall to wall. Bracing and blocking against the frame of the CTU and/or lashing to the securing points is necessary (see annex 7, section 4.3). As the lashing capacity of the securing points in general purpose freight containers is limited, such standard containers might not be appropriate for certain large and heavy cargo items. Instead, platforms or flatracks could be used.

7.2.6 Cargo items of extreme dimensions may not fit inside a standard CTU as they exceed the inner width, length and perhaps also the height of the unit. Such cargo may be accommodated on a platform or on a flatrack. When the cargo is only “over-height” but not “over-width” an open top CTU may also be suitable.

7.2.7 Heavy cargo items lifted by a forklift truck may result in a front axle load exceeding the maximum permissible concentrated load inside a CTU. For example modern freight containers are designed to withstand a force of 0.5 kN/cm^2 which may limit package masses to approximately 3 to 3.5 tons depending on the type of forklift truck used. For heavy cargo, open top, open side or platform CTUs should be used so that the cargo can be loaded from the top or from the side without a need to drive into the CTU with the forklift truck. For load distribution, see annex 7, section 3.1.

7.2.8 Some cargoes such as scrap metal are usually handled by grabs or by conveyors. When this cargo is to be loaded into a CTU and a conveyor is not available, the only suitable CTU type is an open top CTU capable to be loaded with grabs. Placing the CTU vertically on its end and “pouring” the cargo in through the open doors is not permitted.

7.2.9 General purpose CTUs are not suitable for certain long, heavy and irregular cargo items such as timber logs, as the side walls are not designed to withstand the acceleration forces of such cargo and may suffer bulging damages. Stowage in shape of a pyramid and securing by lashing is extremely difficult in a freight container, because the securing points are not accessible after this cargo is loaded, unless the lashings are arranged before loading. Therefore, such cargo should preferably be carried only on platform or flatrack CTUs.

7.2.10 Liquid and solid bulk cargoes should be preferably transported in tank CTUs or solid bulk CTUs. Under certain conditions, liquid bulk cargo may be carried in flexitanks which are stowed in CTUs. Similarly, solid bulk may be carried in general purpose CTUs which are equipped with a liner. However, CTUs used for such purposes should be suitably reinforced[9] and prepared, operational restrictions regarding the permissible payload should be observed (see annex 7, section 5).

7.3 Suitability for the transport mode

7.3.1 Freight containers, including swap bodies and regional containers designed for stacking and approved under the CSC are basically suitable for all modes of transport. However, freight containers having an allowable stacking mass of less than 192,000 kg marked on the approval plate (see annex 4, section 1) require special stowage on board a ship, where the superimposed stacking mass will not exceed the permitted limits as marked on the plate. Furthermore, some freight containers and swap bodies may have a gross mass of 34 tons or higher for which some road chassis and railcars will not be capable of carrying such heavy units. Therefore, especially for heavy massed containers, it is of utmost importance to arrange for an appropriate chassis and tractor vehicle or railcar, as applicable.

7.3.2 As the maximum permissible payload of a railcar is not a fixed value for the distinguished wagon but depends in addition on the track category of the railway network (see annex 4, section 5.1), the railway operator should be contacted when necessary, in order to prevent overloading.

7.3.3 Swap bodies and semi-trailers are designed for an easy change of the means of transport. In most cases this might be an interchange between different carrier vehicles for swap bodies or different tractor vehicles for semi-trailers. When an intermodal change from road to rail is intended, it should be ensured that the swap body or the semi-trailer is capable of being lifted by grappler arms and approved for rail transport.

7.3.4 CTUs on ro-ro ships

7.3.4.1 Before dispatching a CTU for carriage on a ro-ro, the shipper needs to confirm with the CTU operator and/or the ro-ro ship operator whether specific requirements apply. Further, the shipper needs to ensure that the CTU to be used is fit for this kind of transport.

7.3.4.2 When road vehicles or semi-trailers are intended to be transported on a ro-ro ship, they should be equipped with securing points of a defined minimum strength in sufficient number according to the following table[10]:

Gross vehicle mass (GVM (tons))	Minimum number of securing points on each side of the vehicle	Minimum strength of each securing point (kN)
3.5 ≤ GVM ≤ 20	2	$\frac{GVM \times 10 \times 1.2}{n}$
20 < GVM ≤ 30	3	
30 < GVM ≤ 40	4	
40 < GVM ≤ 50	5	
50 < GVM ≤ 60	6	

where n is the total number of securing points on each side of the vehicle

[9] False bulkheads may be fitted at the rear (door) end as required.

[10] See IMO Resolution A.581(14).

7.3.4.3 Road trains, comprising two or more trailers, require each trailer to be considered in isolation and be fitted with, and secured by, the minimum number of securing points for the GVM of that trailer component. Semi-trailer tractor or towing vehicles are excluded from the table and should be provided with two securing points or a towing coupling at the front of the vehicle.

7.3.4.4 When railway wagons are intended to be transported on a railway ferry, they should be able to pass over the kink angle of the ferry ramp and to pass through the track curves on the ferry vessel. In general, there are more restrictions for wagons equipped with bogies than for wagons equipped with two wheel sets only. The details should be clarified with the ferry line operator.

7.3.4.5 Railway wagons should be equipped with securing points on both sides in sufficient number when used in ferry traffic. To determine the required number and strength of securing points the ferry operator should be contacted. The maximum permitted axle loads and maximum permitted loads per linear metre depend on the properties of the ferry ramp and of the characteristics of the ferry vessels employed in the respective ferry service.