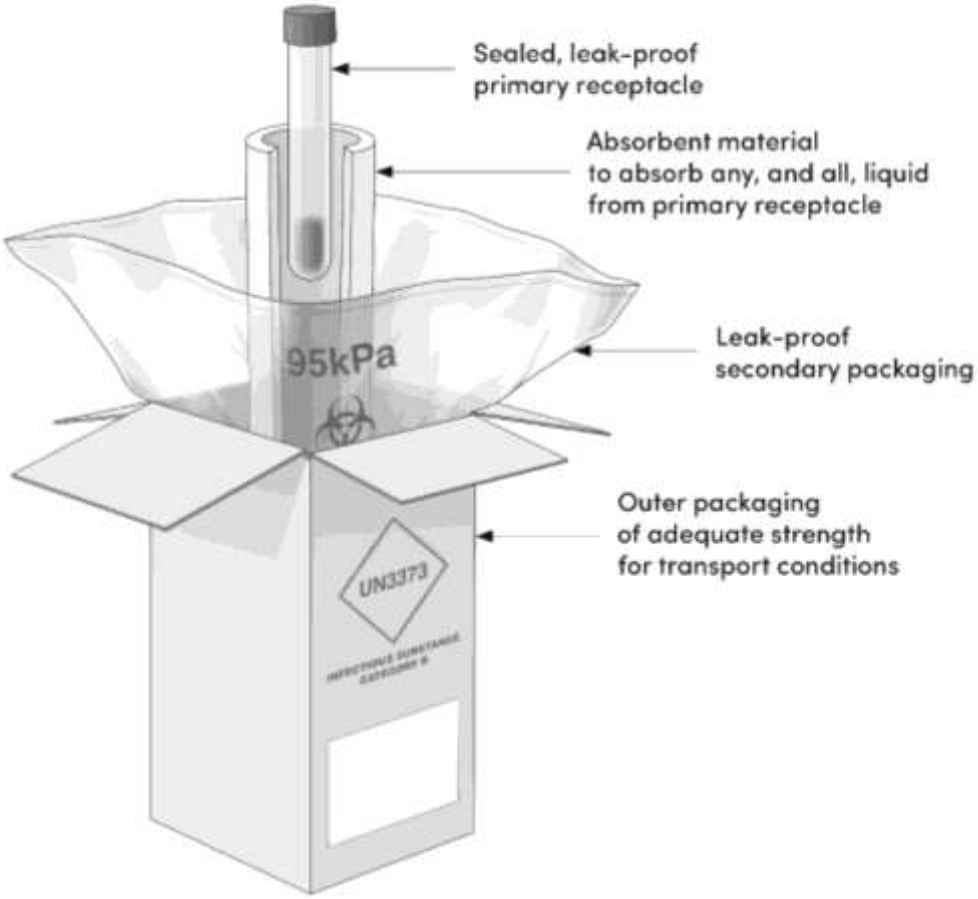

Figure 5. Example of triple packaging materials that may be used to comply with P650 for Category B infectious substances.

6.3 Packing Instruction P620 (Category A Packaging Requirements)

Packing instruction P620 outlines the requirements and special packaging provisions that must be met for 'approval' for use with Category A infectious substances. In addition to the components of a basic triple packaging system, packaging for Category A infectious substances must include the following:

1. **Primary Receptacle**
   a. Whatever the intended temperature of the consignment, the primary receptacle OR the secondary packaging must be capable of withstanding a **pressure differential of not less than 95kPA (0.95 bar)**, as well as temperatures in the range of **-40°C to +55°C**.
   b. When the shipment is being carried at ambient temperature (or above), the primary receptacle must be **glass, metal or plastic**. Positive means of ensuring a leakproof seal should be provided e.g. a heat seal, skirted stopper, or metal crimp seal. If screw caps are used, they must be secured by positive means e.g. paraffin sealing tape, tape, or manufactured locking closure.
   c. Lyophilized substances may also be transported in primary receptacles that are **flame-sealed glass ampoules or rubber-stopped glass vials** fitted with metal seals.

2. **Secondary Container**
   a. As already stated above, either the primary receptacle or this secondary container must be capable of withstanding a pressure differential of not less than 95kPA (0.95 bar), and temperatures in the range of -40°C to +55°C.

3. **Third, Outer Packaging**
   a. Must be **rigid**.
   b. The smallest external dimension shall be not less than 100 mm.
   c. An itemized list of contents shall be enclosed between the secondary container and outer packaging, including the proper shipping name and technical name in parentheses of the biological agent present in the infectious substance. When the infectious substance to be transported are unknown, but suspected of meeting the criteria for inclusion in Category A, the words "suspected Category A infectious substance" must be shown in parentheses following the proper shipping name.

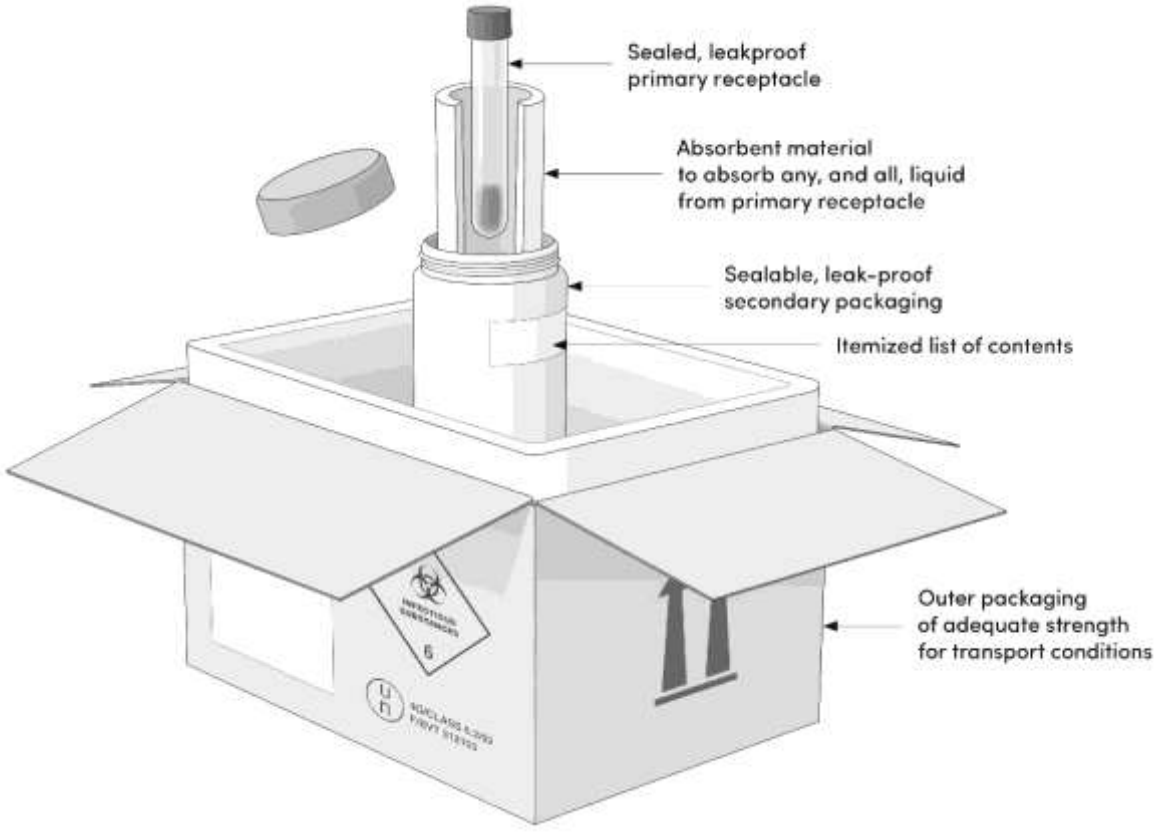

Figure 6: An example of triple packaging materials that may be used for Category A infectious substances

Quantity Limits (Category A)

For shipments being carried in the cargo hold of passenger aircraft, no more than 50mL or 50g of Category A infectious substance per package is allowed.

For shipments being carried on a cargo only aircraft, no more than 4L or 4kg of Category A infectious substance per package is allowed.

For shipments being carried via surface transport (road, rail or maritime), there are no quantity limits per package.

The ability of packagings for Category A infectious substances to meet the requirements above must also be properly verified. The UN Model regulations stipulate that Category A infectious substances must **only** be transported in a triple packaging system which has been tested according to the '**Requirements for the Construction and Testing of Packagings for Division 6.2 Infectious Substances of Category A**. which detail the challenges and conditions that must be applied to the complete triple packaging system in order to verify the material quality. The tests described include dropping, stacking and puncture tests, and the application of pressure, water spray and cold/high temperatures. For more details on the specific testing requirements, please consult Chapter 6.3 (6.3.5.3) of the UN model regulations.

Given the detailed and technical nature of the testing required, the manufacture of Category A 'approved' packagings is generally performed by dedicated packaging specialists and governed by a quality assurance program, overseen by a competent authority. Manufacturers should be able to demonstrate compliance with the requirements, by providing documentation and evidence of the methods used, and results obtained from package testing. Packagings which have been manufactured (and approved) in accordance with the UN model regulations requirements are then to be marked with the **United Nations Packaging Symbol**, followed by a series of numerals and symbols that provide information on how, when and where the packaging was manufactured and approved.

4G/Class 6.2/21/GB/2470

1 2 3 4 5 6

This mark comprises:

1. **The United Nations packaging symbol**
2. **An indication of the type of packaging (in this example a fibreboard box (4G))**
3. **An indication that the packaging has been specially tested to ensure that it meets the requirements for Category A infectious substances (Class 6.2)**
4. **The last two digits of the year of manufacture (in this example 2021)**
5. **The competent state authority that has authorized the allocation of the mark (in this example GB, signifying Great Britain)**
6. **The manufacturer's code specified by the competent authority (in this example 2470)**

Figure 7. A description of the features of the UN specification mark for Category A infectious substances packaging (for UN 2814 and UN 2900).

6.4 Packing Instruction P621 (Medical or Clinical Waste Requirements)

Medical or Clinical waste which contains biological agents consistent with classification of Category B infectious substances, is assigned to UN3291. UN3291 is then subject to the packaging requirements outlined in the UN Model Regulations P621.

Medical or Clinical waste classified under UN3291 does not have to conform to a triple layer of packaging. Packagings for UN3291 may comprise various types including drums, boxes or jerricans, provided that these packagings conform to the general provisions outlined in the UN Model Regulations for a "**Packing group II**" level of performance. Packing group II performance levels may differ for liquid or solid infectious substances. It should be noted that infectious substances containing liquid must be packed with sufficient absorbent material to absorb all liquid present.

Finally, packagings for UN3291 (Biomedical Waste, n.o.s, Clinical Waste, Unspecified, n.o.s, Medical Waste, n.o.s. and Regulated Medical Waste, n.o.s.) intended to contain sharp objects, such as broken glass and needles, must be resistant to puncture and retain liquids under the performance test conditions for the packaging

6.5 Packing with Coolants

A 'coolant' (also known as a refrigerant) is a substance which is used to maintain a cool temperature around the dangerous goods, to preserve its integrity until it reaches its final destination. Many of the most commonly used coolants are themselves dangerous goods of other classes. Therefore, in addition to following the requirements of the relevant packing instructions for infectious substances (i.e. P620, P621 and P650), other packing requirements specific to these substances may need to be observed.

Some of the general requirements for packaging used to contain infectious substances together with a coolant material include:

- Packaging used must be capable of maintaining integrity at the temperature afforded by the coolant.
- The coolant must be placed between the secondary container and outer packaging, or in an overpack used to transport multiple packages together (for more information on overpacks, see section 6.7).
- Persons handling the packages should be appropriately trained on the coolants in use.
- Coordination between the shipper and carrier should ensure that the cargo transport unit being used to carry the packages is well ventilated for the coolants in use. This is especially important in the case of air transport, to ensure ventilation safety procedures are followed. The carrier may also need to ensure cargo transport units are appropriately marked with warning and hazard labels.

Special provisions applicable to the use of dangerous goods as coolants may be found in Chapter 5.5.3 of the UN Model regulations.

An overview for some of the more specific packing requirements for the commonly used coolants is provided in the following section. Additional requirements necessary for the marking, labelling and documentation of packages containing coolants will be briefly described in later Section 7. However, for detailed information, the relevant chapters of the UN Model Regulations should be consulted.