III. 6.2 Cleaning and sanitising

6.2.1 Methods

6.2.1.1 Introduction

All operators carrying out cleaning and sanitising procedures should be made fully aware of the appropriate regulations regarding entry to tanks and the safety precautions necessary for materials and procedures being used. They should be provided with the necessary protective clothing and equipment. It must be particularly noted that 'overproof' spirits are classifiable as hazardous 'inflammable liquids', and tanks may in addition contain residual narcotic fumes. When entering a tank, suitable rubber footwear should be worn to avoid scratching or damaging the internal surfaces on the tank.

Procedures for achieving suitable and Acceptable Cleanliness should include steps which will effect the following functions.

- Pre-cleaning (using a pressure spray system with rotating head or equivalent with fresh, possibly softened, potable water).
- Cleaning (using a pressure spray system with rotating head or equivalent with a solution of a suitable cleaning agent in fresh potable water).
- Rinsing (using a pressure spray system with rotating head or equivalent with fresh potable water).
- Sanitising (By use of steam, hot potable water or approved chemical sanitiser).
- Rinsing after chemical sanitisers have been used (using a pressure spray system with rotating head or equivalent with fresh potable water).
- Draining. A sample of the final rinse water should be visibly clear, free from odour and containing no traces of sanitisers after testing. After cleaning, tanks should be thoroughly drained of rinse water in such a manner as to minimise any re-infection.
- Possible drying of the tank to avoid ice formation.

It may be useful to retain a sample of the final rinse water with a view to performing taste tests and microbiological analyses.

Tankcontainer and roadtanker operators should ensure that tanks are not moved prior to the completion of the draining process and that the valves and man lid covers

have been closed.

6.2.1.2 Tank cleaning

All tanks used for transporting wine shall be of Acceptable Cleanliness before use.

An approved methodology for tank cleaning should be agreed between the Freight Forwarder, the Supplier and the Recipient of the wine.

Cleaning is to be carried out with the aid of a solution of cleaning agents and water, hot and/or cold as required, according to the manufacturer's recommendation.

Manual cleaning of tanks may be necessary periodically, and this may be carried out by means of scrubbing the internal surfaces with a soft brush and a solution of cleaning agent. Brushes should be free of any metal or rough parts that may damage or scratch the tank surfaces.

Special attention should be paid to the cleanliness of the manway door, manway seal, outlet valves and their washers. These should be manually brushed with cleaning agent and rinsed thoroughly, possibly after dismantling.

Manway door seals and any outlet valve washers should be examined regularly and replaced as required to ensure their continued fitness for use.

During the cleaning cycle, outlet valves should be opened to allow a flow of the cleaning solutions to pass through.

After cleaning, all traces of chemicals/cleaning agents used must be completely removed by rinsing. The rinsing cycle should be continued until a sample of the rinse water is visually clear and free from any chemical odour or taste. The rinse water should not contain after testing (coloured indicator, pH paper....) residues of cleaning or sanitising agents.

Ideally, tanks should be given the full cleaning procedure immediately after unloading of the wine has been completed. When this is not possible, all items must be rinsed immediately after unloading and the complete cleaning procedure carried out as soon as possible thereafter. The selection of a suitable chemical/cleaning agent depends on the regulations in the country concerned and to some extent on the nature of the previous cargo.

For effective cleaning, it is essential that chemical/cleaning agent strengths, the contact time and the temperature are maintained at the Manufacturer's recommended levels at all times.

All tanks to be used for the transportation of wine shall undergo cleaning procedures that include a chemical/cleaning agent cycle and a rinse prior to sanitising procedures.

Flexible containers are cleaned externally by high-pressure spraying with detergent

solution and brushing as necessary to remove dirt and grease marks, followed by rinsing. Before the use of hot water, cleaning with detergent can be useful to avoid incrustation of wine residues. If the material will tolerate it, internal cleaning is by the use of hot water spraying at 85°C - 87°C for a minimum of 25 minutes, and until such time that the outlet water is completely clean and free from any solids or traces of previous cargoes. These procedures are conducted on a container previously placed on a cleaning cradle and inflated to 35 hPa using a low-pressure, high-volume industrial blower fitted with a filter suitable to prevent contamination and re-infection of the flexible container.

6.2.1.3 Tank sanitising

Sanitising may be carried out by the use of steam, hot fresh, potable water or chemical sanitisers approved in the regulations of the country concerned. Flexible containers are usually sanitised by the use of chemicals, except for operational fittings, where chemicals and/or steam are used as appropriate. An approved method should be agreed by the Purchaser or his Agent and the Freight Forwarder depending on the facilities available. If air is used after sanitising, it is imperative to filter it.

In countries with a cold climate, the trapdoor of the tankcontainer may be rinsed after cleaning and sanitation with 1 to 2 litres of a solution of pure ethanol, having an alcohol content of 70% to finish the sanitation process and to prevent icing of the trapdoor and the valve.

6.2.1.3.1 Steam

Steam should be applied through the manway door using suitable injection equipment (rotating head system or equivalent) to allow the steam to penetrate thoroughly to all parts of the tank and

fittings. A sufficient supply of steam should be applied in such a way that, for example, a temperature of at least 82°C is measured at the outlet for at least 20 minutes. This can be determined by the use of temperature indicating tape, discs or contact thermometer. The steam supply must be clean and free from any taint or contamination (some boiler feed treatments may result in contamination from phenolic material or calcium). A suitable steam filter should be fitted if necessary. Before attaching the steam supply to the tank, the steam hoses should be blown through for 5 minutes or until all condensate has been removed.

The manway door and any additional valves or outlets in the tank should be partially closed during steaming to allow for maximum contact or should be separately sanitised.

After steaming is complete, the condensate should be drained away and care taken to allow sufficient venting (with filtered air or neutral gas) during cooling to prevent

implosion. This should be done in such a manner as to minimise re-infection. Tankcontainers and roadtankers should not be moved until adequately vented and all man lids and valves have been closed.

In the case of ships' tanks, when sanitising has been completed the tank should be closed, sealed so as to avoid possible re-infection or recontamination and labelled CLEANED/SANITISED with the initials of the operator. If the need arises, according to the agreement of the parties, the cleaner may be required to place seals on the tanks.

6.2.1.3.2 Hot water

Sanitising may be effected by the use of hot, fresh, potable water, providing that a constant water temperature of 82°C can be maintained for a minimum of 30 minutes, timed from the point when the hot water draining from the tank reaches 80°C (reference table to be used). Hot water should be applied either by high pressure spray using a rotating head or equivalent capable of impinging the hot water on all surfaces of the tank. Scavenging of hot water from the bottom of the tank during this process should be sufficient to prevent build-up of water in the bottom of the tank.

The hot, potable water supply must be clean and free from any taint or contamination.

After the hot flushing has been completed, the tank must be allowed to drain and cool completely.

When sanitising has been completed, the tank should be hermetically closed to prevent possible re-infection or contamination and possibly sealed.

6.2.1.3.3 Chemical Products

Various chemical sanitisers are available, and the choice of a sanitiser should be made from a list of approved chemicals to be agreed between the Freight Forwarders or Ship Owners and the Purchasers, in conformity with the regulations of the countries concerned.

The concentration of the solution used, the temperature and the minimum contact time required vary with the type of product used, and it is essential that the manufacturer's recommendations should be strictly followed.

The correct working strength of the chemical sanitiser must be maintained throughout the sanitising procedures if effective sanitising is to be achieved, and facilities for checking this should be made available.

The sanitising solution should be applied by pressure spraying with a rotating head or equivalent, capable of impinging the sanitiser on all surfaces of the tank or container. Scavenging of the sanitiser from the bottom of the tank during this process should be sufficient to prevent a build-up of sanitising solution in the bottom of the tank.

After sanitising has been completed, all traces of the sanitiser must be removed by adequate rinsing with fresh, possibly softened, potable water. Potable water used for rinsing must be clean, free from any taint or contamination, and of an acceptable biological condition.

The rinsing cycle should be continued until a sample of the rinse water is visually clear, free from any chemical odour or taint and from chemical residues detectable using appropriate tests (pH paper, coloured indicator,...)

When rinsing has been completed, the tank should be allowed to drain completely. The tank should then be hermetically closed to prevent re-infection or contamination, and possibly sealed.

Chemical sanitising is suitable for use on stainless steel and most tank materials, but advice should be sought before selecting a chemical sanitiser as approved by the Supplier or Purchaser to ensure that the chemical is suitable for the construction materials of the equipment being used and for the micro-organisms to be eliminated.

For ships' tanks, sanitising should be carried out the same day as loading.

Sanitising for tankcontainers and roadtankers should be carried out within an elapsed time agreed between the Freight Forwarder and the Supplier or Purchaser.

6.2.1.4 Ancillary equipment

All pumps, pipelines, hoses, fittings, etc., used to carry wine to or from the tanks should be rinsed with water before use (see 3.2.6) and after use, cleaned, sanitised and maintained in a fit condition.

Cleaning and sanitising of ancillary equipment should be carried out by any one of the methods previously described.

Outside surfaces of hoses and fittings should be kept in a clean, sound condition. Inside surfaces of hoses and any sealing washers should be regularly examined for signs of wear. If wear is observed, the worn items should be replaced.

In the interest of overall cleanliness and hygiene, any item of equipment which may come into contact with the wine, such as sample cans, dipsticks, etc., should be effectively cleaned and sanitised before use. The equipment should then be rinsed with fresh, potable water prior to use.

6.2.2 Microbiological standards of acceptable cleanliness

It is recommended that interested parties carry out microbiological examinations at regular intervals to monitor the effectiveness of the cleaning and sanitising procedures.

Freight Forwarders may not have the necessary facilities of their own with which to monitor the effectiveness of their sterilisation procedures. However, it is in their own

interests to ensure that the required standard of commercial hygiene is achieved and the services of a suitably qualified analyst may be engaged to carry out this work. The Purchaser may also be prepared to assist in carrying out a microbiological survey and random audits of cleaning stations.

The recommended microbiological standards following sanitation are specified in the International Oenological Codex.