

MARITIME AND PORT AUTHORITY OF SINGAPORE **STANDARDS FOR PORT LIMIT BUNKER TANKERS**

INTRODUCTION

The “Standards for Port Limit Bunker Tankers” covers equipment, operational performance and efficiency of bunker tankers operating in the port. All steel-hulled bunker tankers shall comply with the standards as set out in this document before the owners / operators apply for the SB licence.

The classification of size of port limits bunker tankers is in Gross Tonnes (GT) measured in accordance with the international Tonnage Convention 1969 (ITC 69). For the purpose of setting the standards, port limit bunker tankers are classified into the following 4 sizes:

Unclassified	-	Below 250 GT
Small	-	250 to less than 500 GT
Medium	-	500 to less than 1,500 GT
Large	-	1,500 GT and above

All standards listed in this document are subject to review by the Maritime and Port Authority of Singapore (MPA) from time to time and new standards may be added. All port limit bunker tankers are also required to comply with Port Marine Circulars issued by the Port Master / Marine Services Department, MPA from time to time.

STANDARDS FOR PORT LIMIT BUNKER TANKERS

All steel-hulled bunker tankers shall comply with all items of this document

1 Manoeuvring Requirements

1.1 Manoeuvring Flexibility

The following propulsion types and requirements are set:

<u>250 to less than 500 GT</u>	<u>500 to less than 1,500 GT</u>	<u>1,500 GT and above</u>
Single Screw or equivalent performance	Twin Screw or Single Screw with Bow Thruster(s) or equivalent performance	Twin Screw with Bow Thruster(s) or equivalent performance

1.2 Speed

For bunker tankers of 500 GT and above with twin-screw propulsion, single screw propulsion with bow thruster(s), twin-screw with bow thruster(s) or equivalent, a minimum speed of 8 knots measured at 100% of engine rated load at the time of sea trial under loaded condition shall be attained.

1.3 Engine Reliability

For bunker tankers of 500 GT and above, the following standards shall apply:

(i) Number of Engine Starting

The minimum number of successful starts attainable by the engine shall at least meet the requirement set by the approved Classification Societies.

(ii) Engine Response time

With the bunker tanker travelling at a speed of at least 4 knots, the engine response time from stop to ahead or astern shall not exceed 3 seconds.

(iii) Stopping Distance at Load Draft

The stopping distance at loaded draft with a speed of 5 knots shall not be greater than three ships' length.

(iv) Turning Circle in Confined Waters

The bunker tanker shall have a turning circle of not more than 1.5 times of its own length, and the time taken to complete a swing of 180 degrees from a stationary position shall not exceed 2 minutes.

For bunker tankers of 5,000 GT and above, the time taken to complete a swing of 180 degrees from a stationary position shall not exceed 4 minutes.

(v) Bridge-controlled Propulsion Machinery

The bunker tanker shall have Centralized Bridge Control for the main propulsion system which shall incorporate stopping, reversing and speed control of the main engine(s).

2 Pumping Rate

For marine fuel oil, pumping rates shall be determined at the bunker tanker manifold(s). The bunker tanker shall achieve the following minimum pumping rates when pumping 380cSt fuel [viscosity at 50 degrees Centigrade (C)] and under the pressure of 7 kg/cm² without the use of flow-meter.

<u>250 to less than 500 GT</u>	<u>500 to less than 1,500 GT</u>	<u>1,500 GT and above</u>
300 cu m/hour	500 cu m/hour	800 cu m/hour

For marine diesel and marine gas oil, pumping rates shall be measured in relation of the deadweight of the bunker tanker. The bunker tanker shall achieve the following minimum standards:

<u>Deadweight</u>	<u>Standards</u>
400 - 1000 tonnes	Within 4 hours
1001 – 2000 tonnes	Within 5 hours
2001 – 3000 tonnes	Within 6 hours
More than 3000 tonnes	800 cu m/hour

3 Pipeline Outlets

The bunker tanker manifold(s) shall be fitted with ANSI 150 flange or equivalent.

4 **Loading Rate**

4.1 For marine fuel oil, the bunker tanker shall achieve the following minimum loading rates when receiving 380cSt fuel [viscosity at 50 degrees Centigrade (C)] and under the pressure of 7 kg/cm²:

<u>250 to less than 500 GT</u>	<u>500 to less than 1,500 GT</u>	<u>1,500 GT and above</u>
300 cu m/hour	500 cu m/hour	800 cu m/hour

For marine diesel and marine gas oil, loading rates shall be measured in relation to the deadweight of the bunker tanker. The bunker tanker shall achieve the following standards:

<u>Deadweight</u>	<u>Standards</u>
400 - 1000 tonnes	Within 4 hours
1001 – 2000 tonnes	Within 5 hours
2001 – 3000 tonnes	Within 6 hours
More than 3000 tonnes	800 cu m/hour

4.2 Air-pipes

All cargo tanks' air-pipes shall be sized according to the loading rate and shall comply with the approved Classification Societies' requirements.

5 **Bunker Boom**

All bunker tankers of 250 GT and above shall have bunker boom fitted. The bunker boom shall meet the following standards:

- (i) Pneumatically or hydraulically operated with a safe working pressure of 10 kg/cm² and can be operated by one man.
- (ii) The minimum safe working load shall commensurate with the size of the boom.
- (iii) For non-flow bunker boom having bunker hose attached, lifting bridles and saddles shall be provided at suitable positions along the boom to support the hose and prevent it from bending.

6 **Product Segregation**

If more than one grade of bunkers are carried, it is recommended that double - valve segregation at the pump room and at the manifold(s) between grades be incorporated. In addition, the bunker tanker shall comply with the following:

- (i) has segregated tanks to minimise product contamination.
- (ii) has two main cargo systems.

7 Manifold Size

7.1 The bunker tanker shall have at least the following standard manifold sizes:

<u>250 to less than 500 GT</u>	<u>500 to less than 1,500 GT</u>	<u>1,500 GT and above</u>
100 mm dia.	150 mm dia.	200 mm dia.

7.2 The main manifold(s) shall be located at the mid-ship to facilitate loading and supply.

8 Manifold Drip/Spill Pan

8.1 The manifold(s) of the bunker tanker shall be fitted with drip spill pan to contain any oil spill.

8.2 Gutter plate shall also be provided on the main deck to contain any oil spill on deck.

9 Reducers for Hose Connection

The bunker tanker shall carry Japanese Industrial Standards (JIS) and American National Standards Institute (ANSI) standard reducers and adaptors on board to accommodate the different sizes of bunker manifold flanges on the receiving vessels. The sizes of the reducers and adaptors carried would vary according to the gross tonnage (GT) of the tankers as follows:

<u>500 GT and below</u>	<u>501 to 1,500 GT</u>	<u>Above 1,500 GT</u>
80 mm and 3-inch	80 mm and 3-inch	100 mm and 4-inch
100 mm and 4-inch	100 mm and 4-inch	125 mm and 5-inch
125 mm and 5-inch	125 mm and 5-inch	150 mm and 6-inch
150 mm and 6-inch	150 mm and 6-inch	200 mm and 8-inch
-	200 mm and 8-inch	250 mm and 10-inch

10 **Bunker Hoses**

Bunker hoses shall meet the following standards:

- (i) Corrugated flexible hoses with spring coils having a working pressure of 10 kg/cm², or
- (ii) Composite rubber reinforced type with steel rings having a working pressure of 10 kg/cm².
- (iii) Be subjected to a pressure test based on PSB (Ex-SISIR) or equivalent specifications twice every 5 years. The period between the two tests shall not exceed 3 years.
- (iv) Be visually inspected by an approved Classification Society during the annual survey of the bunker tanker.

11 **Bunker Quantity Control - Cargo Measurement System**

The bunker tanker shall have the following document and equipment for measuring the quantity of bunkers:

11.1 **Tank Calibration Tables**

- (i) The bunker tanker tanks shall be calibrated and certified by an approved Classification Society or a surveying company acceptable to MPA. An original certified copy of the tank calibration tables shall be kept onboard.
- (ii) The tank calibration tables shall contain the following: -
 - (a) name and SB licence number of the bunker tanker;
 - (b) list /trim correction;
 - (c) cargo tanks measurement;
 - (d) reference height of every cargo tank;
 - (e) name and stamp of the company which calibrated the tanks;
 - (f) date of calibration;
 - (g) page number on every page; and
 - (h) tank capacity plan of the bunker tanker.

- (iii) The tank calibration tables shall be sealed and properly bound to prevent any unauthorised tampering.
- (iv) The bunker tanker shall only carry its latest certified tank calibration tables for verification by the vessel receiving bunkers and by the relevant authority. An identical copy of the tank calibration tables shall have been deposited with MPA.
- (v) Should there be any change in the tank capacity of a bunker tanker, the owner and/or operator of the bunker tanker shall not carry out any delivery of bunkers until new tank calibration tables for the affected or modified tanks, which comply with the requirements mentioned in items 11.1 (i) to 11.1 (iv) above, are placed onboard the bunker tanker and a true copy of the same, with each page certified, deposited with the MPA.

11.2 Sounding Pipe

- (i) Each sounding pipe of the cargo tank shall have a reference height which shall be clearly stated in the tank calibration tables.
- (ii) A template stating the reference height shall also be permanently fitted onto every sounding pipe of the cargo tank.

11.3 Ullage and Temperature Measuring Devices

- (i) The bunker tanker shall carry at least one set of portable steel gauging tape approved by ASTM with a 150 mm (6") weight attached to one end.
- (ii) The bunker tanker shall carry at least one set of API/ASTM/IP approved thermometer on board for taking temperature of the oil.
- (iii) The latest ASTM-IP Petroleum Measurement Table 54B and Table 56 shall be available on board for calculation of bunker volume.

11.4 Automatic gauging (Level or Volume) (Optional)

If automatic gauging system is fitted as a supplement to the manual tank sounding / ullaging system, the following standards shall apply:

- (i) The system shall be able to provide remote oil temperature readings to allow for volumetric correction of the bunker quantity.
- (ii) Every cargo tank shall be installed with one level and multiple temperature sensors. The sensors shall preferably be located at the after-bulkheads of the tanks.

- (iii) The system may also be connected to a computer having sounding, volume and weight calculations with specific gravity and temperature corrections.

11.5 High Level Alarm

For bunker tankers which have their keels laid on or after 1 Jun 94, high level alarm shall be provided for the cargo tanks.

11.6 Flow - meter (Optional)

If a flow-meter is used for measurement of the bunker quantity, the following standards shall apply:

- (i) The flow-meter shall have an accuracy of plus or minus 0.2%.
- (ii) Instructions on the flow-meter volumetric calculation shall be available for reference.
- (iii) A certificate of verification issued by the Weights and Measures Office, Singapore, for the flow-meter shall be carried on board.
- (iv) The seal of the flow-meter by the Weight & Measures Office shall be intact.
- (v) The flow-meter shall be calibrated at least once in every 12 months.

11.7 Plans and Diagrams

- (i) General layout plan of the bunker tanker shall be conspicuously displayed on board.
- (ii) Tank capacity plan, Piping Diagram and Trim and Stability Tables shall be available on board for inspection by any party concerned.

12 Bunker Quality Control

The bunker tanker shall be equipped with proper sampling equipment as described below.

12.1 Sampling Equipment

- (i) The bunker tanker shall be equipped with the sampling equipment as per SS 600's requirements:
 - a. A sampling probe extends across the full diameter of the sampler. The end of the sampling probe shall be closed and the wall perforated with 5mm diameter holes spaced 20mm apart throughout its length. A needle valve, with provision for sealing, shall be fitted at

the bottom of the sampling probe outside the sampler to control the rate at which a continuous drip sample can be drawn. This shall also serve as a stop valve for the sampling. The sampling probe shall be detachable for cleaning and inspection.

b. A weather-tight sampling container having a capacity of not less than four litres which can be security sealed.

(ii) An illustration of the sampling equipment is shown in the Appendix 1.

12.2 Automatic Sampling Equipment

(i) Automatic sampling equipment installed on board the bunker tanker shall be approved by the relevant authority for usage.

(ii) The automatic sampling equipment shall be capable of obtaining a sample during the entire bunker process.

(iii) Where the sample is automatically divided into 4 or more individual one-litre sample bottles simultaneously, the sampling equipment must be capable of filling the individual sample bottles to the same level. The sample bottles should be at least 80 percent full at the end of the bunker delivery.

13 Navigation Equipment/Charts/Nautical Publications

(i) The bunker tanker shall have a compass fitted at the main steering position for the helmsman to steer.

(ii) A second compass or other appropriate equipment shall be fitted for taking bearings if the compass mentioned in item 13 (i) above is not suitable for this purpose.

(iii) Appropriate nautical instruments, adequate and updated charts and other nautical publications including the latest "Singapore Tide Tables and Port Information" for the intended voyage shall be carried on board.

14 Signaling Equipment/Document

(i) The bunker tanker shall have the following signaling equipment / document on board:

(ii) Full complement of flags and pendants.

(iii) A copy of the International Code of signals.

(iv) A daylight signaling lamp.

- (v) A ship whistle

15 **Communication Equipment**

The bunker tanker shall be equipped with a radiotelephone which is capable of operating in the International Maritime Mobile VHF Radiocommunication Service in the 156-174 MHz and on such channels as may be specified by the Port Master from time to time.

16 **Other Standards**

16.1 **Identification Marks**

- (i) The licence number of the bunker tanker shall be painted in large letters on each side of the bow against a contrasting background and carved on, cut in, or centre punched into the main beam.
- (ii) The licence number of the bunker tanker shall also be painted or carved in large letters on each side of the navigating bridge and on the bridge front for easy identification purposes.
- (iii) The minimum height (with proportionate breadth and thickness) of the letters and numbers comprising the licence number of the bunker tanker at the bow shall be as follows:

<u>Length of Bunker Tanker</u>	<u>Height</u>	<u>Breadth</u>	<u>Thickness of Letters and Numbers</u>
Between 5 & 20m	20 cm	15 cm	4 cm
Above 20 m	30 cm	20 cm	5 cm

16.2 **Lighting**

- (i) The bunker tanker shall be fitted with adequate safe lighting to cover the area of the bunker tanker, bunker manifold connection and hose handling equipment.
- (ii) The minimum illumination at night shall be at least 50 lux at the bunker manifold(s).

16.3 **Fender**

The bunker tanker shall have proper fender system to minimise damage to the receiving vessel during bunkering.

16.4 **Anti Oil-pollution Equipment**

The bunker tanker shall carry anti oil-pollution equipment and a minimum of 400 litres of approved dispersants at all time.

16.5 Operational Safety

The bunker tanker shall have on board a copy of the International Safety Guide for Oil Tankers & Terminals (ISGOTT).

- End -

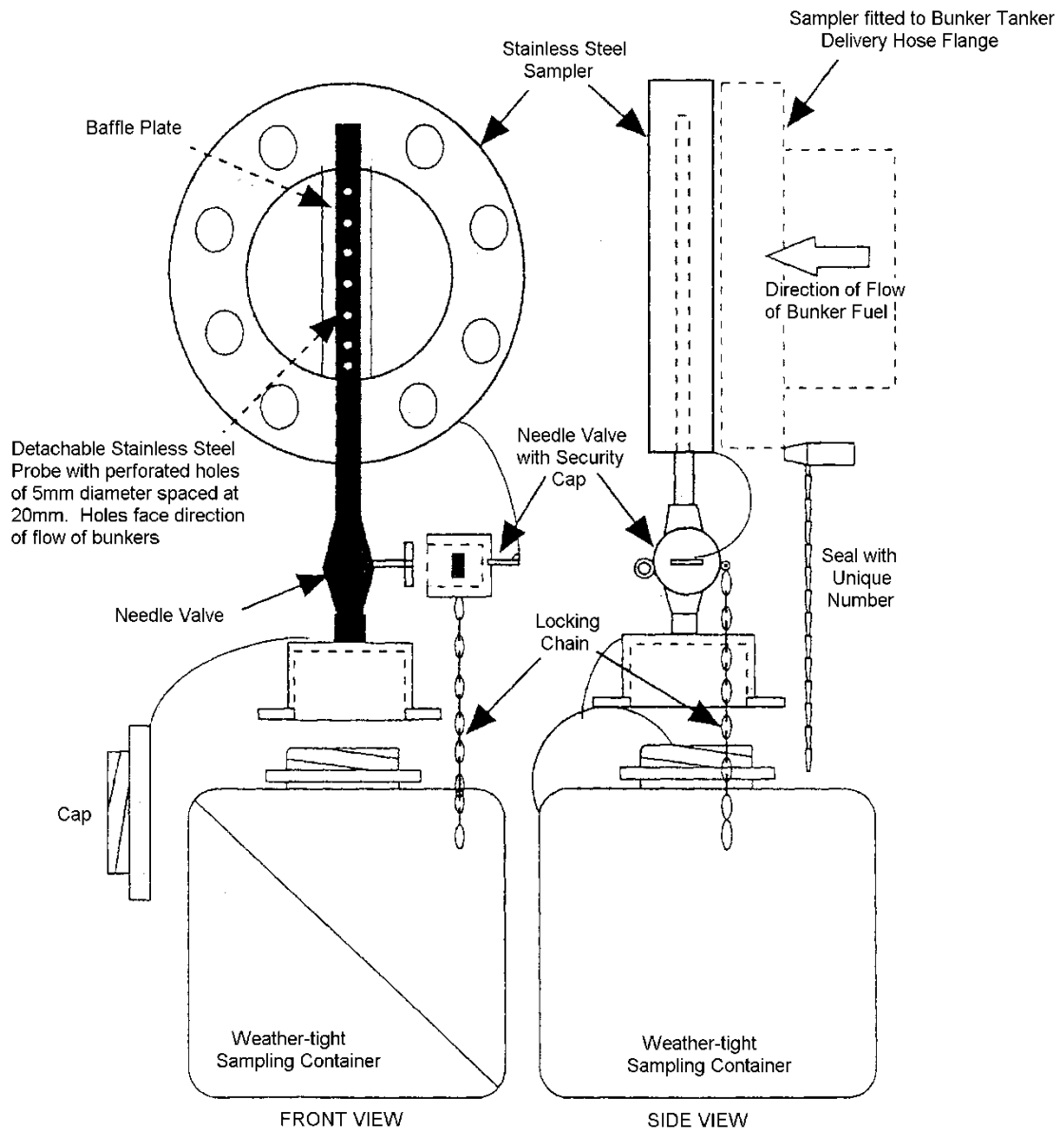
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Appendix 1 (Informative)

Diagrams of sampling equipment

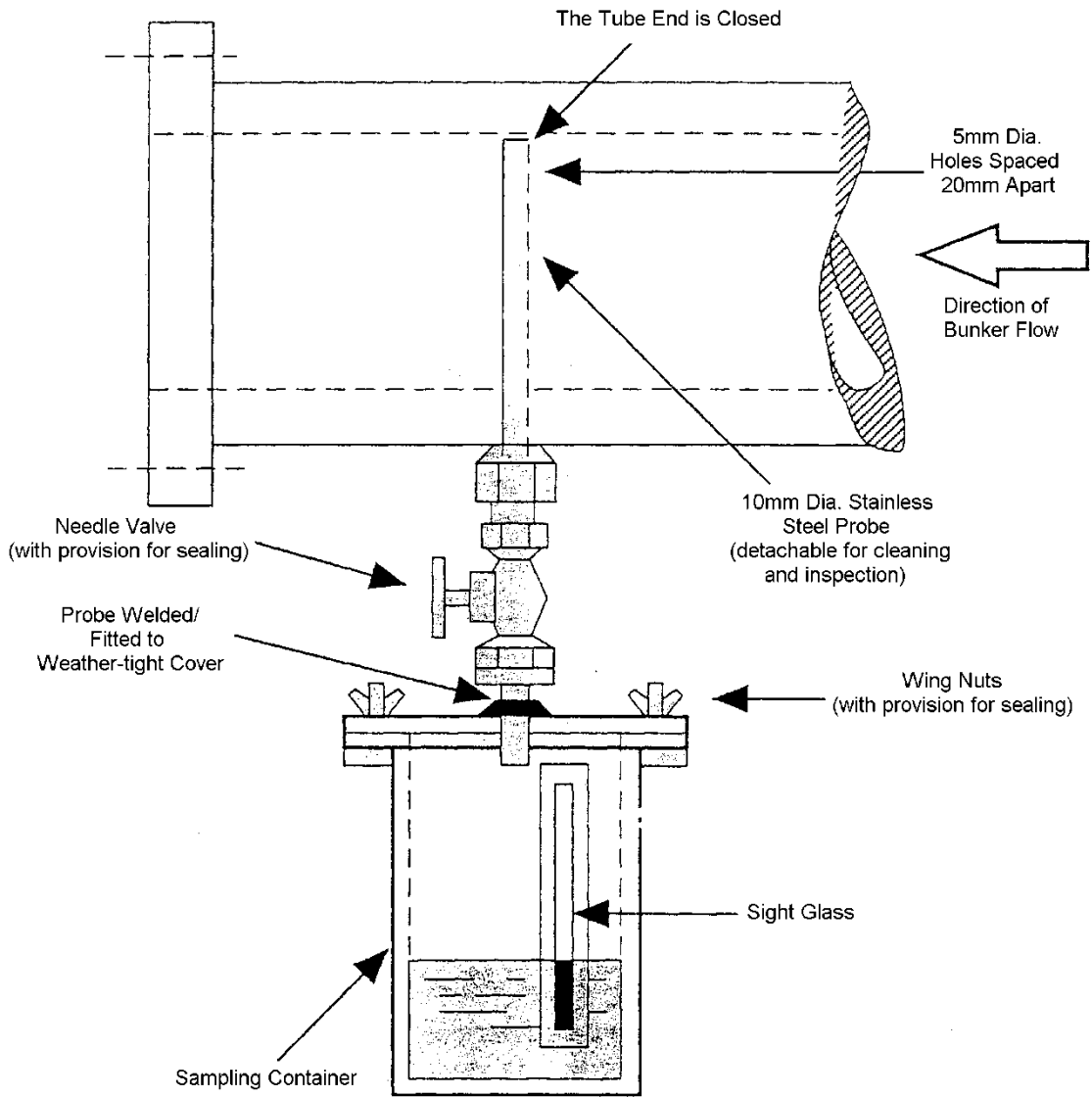
Design of sampling equipment - Example 1



Not to Scale

Design of sampling equipment - Example 2

This sampling equipment should only be used for sample collection if Chapter One of SS 600, clause 1.11.4.2 is applicable.



NOTE – Alternative design of sampling equipment with provisions for sealing if approved in advance by the implementing authority shall also be acceptable.