

UNOFFICIAL TRANSLATION



**MINISTERIAL REGULATION
ON THE ESTABLISHMENT OF THAI AGRICULTURAL STANDARD ON
SULPHUR DIOXIDE FUMIGATION OF FRESH FRUITS
AS A MANDATORY STANDARD
B.E. 2558 (2015)**

By virtue of Section 5 paragraph one and Section 15 paragraph two of the Agricultural Standards Act, B.E. 2551 (2008), the Minister of Agriculture and Cooperatives hereby issues this Ministerial Regulation as follows:

Section 1 This Ministerial Regulation shall come into force after one hundred and eighty days as from the date of its publication in the Royal Gazette.

Section 2 The Thai Agricultural Standard TAS 1004-2014 in accordance with the Notification of the Ministry of Agriculture and Cooperatives on the Establishment of Thai Agricultural Standard: Code of Practice for Sulphur Dioxide Fumigation of Fresh Fruits under the Agricultural Standards Act, B.E. 2551 (2008) dated on 3 November B.E. 2557 (2014) shall be established as a mandatory standard.

Given on the 8th Day of October B.E. 2558 (2015)

(General Chatchai Sarikalya)
Minister of Agriculture and Cooperatives

Remark : Rationale for the promulgation of this Act is that: Fresh fruits fumigation with sulphur dioxide is widely used as the process of post-harvest management to extend the shelf life of agricultural produces for their freshness and quality required. However, improper fumigation of fresh fruit with sulfur dioxide could lead to the excessive sulphur dioxide content leftover which can affect consumer's health. Therefore, the control of fumigation process is required to prevent the excessive residue on the produces against the legal requirement. The ministerial regulation has been announced in order to protect the consumers and to ensure that Thai fruits are safe for consumption, which enhances the trade competitiveness of Thai fruits. This regulation established the measures to control of fumigation process. The Notification of the Ministry of Agriculture and Cooperatives on the Establishment of Thai Agricultural Standard: Code of Practice for Sulphur dioxide Fumigation of Fresh Fruits under the Agricultural Standards Act, B.E. 2551 (2008) was promulgated on the 3rd November 2014. The public hearing for stakeholders was conducted to follow the Section 18 under the Agricultural Standard Act B.E. 2551. Thus, it is deemed necessary to establish the Thai Agricultural Standard: Code of Practice for Sulphur dioxide Fumigation of Fresh Fruits as a mandatory standard.

THAI AGRICULTURAL STANDARD
CODE OF PRACTICE FOR SULPHUR DIOXIDE FUMIGATION
OF FRESH FRUITS

1. SCOPE

This standard establishes code of practice for sulphur dioxide fumigation of fresh fruits so as to obtain fresh fruits which are safe and of quality suitable for consumption and not to cause any impact to the environment.

2. DEFINITIONS

For the purpose of this standard:

2.1 Sulphur dioxide means gas of the chemical formula SO₂ obtained from the burning of sulphur or other methods. The gas is colourless, inflammable and pungent with antimicrobial and antibrowning properties.

2.2 Fumigation means a process where sulphur dioxide application is treated to the produce by the control of concentrations and specified time schedules.

3. REQUIREMENTS

3.1 The processes of sulphur dioxide fumigation for fresh produce in a chamber shall be practiced as shown in Table 1.

3.2 Any fumigation process that does not use the chamber for treatment, whereas some requirements of the Table 1 may not be fulfilled, the criteria and conditions for assessment stipulated by the National Bureau of Agricultural Commodity and Food Standards shall comply to thereof.

Table 1 Requirements for Sulphur Dioxide Fumigation of Fresh Fruits

Items	Requirements
1. Establishment (1) Location	<p>1.1 Locate in the area that does not cause any contamination to the quality of produce and consumer safety without any impact to the environment. If there is any risk, preventive measure shall be in place.</p> <p>1.2 Site of the establishment shall be permitted according to relevant laws and regulations.</p>
(2) Working areas	1.3 Sufficient space for the operations covering raw material receiving, fumigation process and post handling of treated produce shall be in place.

Items	Requirements
(3) Fumigation chamber	1.4 Availability of treatment chamber with sturdy and secure structure
	1.5 Surfaces of walls and floor of the chamber shall be smooth and free from cracks. Materials used shall be resistant to corrosion, impervious to gas and easy to clean.
	1.6 The chamber shall be able to prevent leaking of gas, particularly at the door and seams or joints. In addition, suitable materials which are also resistant to corrosion shall be used.
	1.7 Lighting shall be installed in the proper position provided with adequate light for work and ready for each use.
	1.8 Availability of observatory window to monitor conditions inside the chamber.
	1.9 Availability of air circulation system to disperse the gas throughout the chamber.
(4) Gas recapture system	1.10 Availability of effective gas recapture system.
	1.11 Gas recapture system shall be inspected for its effectiveness at least once a year.
(5) Tools and equipment	1.12 Tools and equipment used for the fumigation shall be in good condition and effective.
	1.13 Suitable weighing scale for sulphur and/or sulphur dioxide shall be accurate and precise
	1.14 Availability of precise timer.
(6) Occupational safety for workers	1.15 Tools and equipment shall be in good working conditions and in sufficient amount for workers. Safety signs shall also be presented at the workplace.
2. Operation control	
(1) Raw materials	2.1 Inspect the incoming produce according to the establishment specifications.
	2.2 inspect the materials used for fumigation such as sulphur and sulphur dioxide according to their specifications.
(2) Containers for fresh fruits	2.3 Containers shall be clean, strong and suitable for the gas to pass through and allow the fruits to be exposed to the gas during the fumigation process.
(3) Sulphur dioxide fumigation process	2.4 Availability of the results on the validation or verification of method of sulphur dioxide fumigation of the chamber. Such results shall include the efficacy inspections of fumigation in the empty chamber and at least one load of produce at the beginning of the operation or changing method of fumigation. The leftover sulphur dioxide residue in fresh fruits shall not exceed the Maximum Level of national or trading partners regulations.

Items	Requirements
	<p>2.5 Availability of clear and correct procedures for the operations such as work flow chart, table showing amount of sulphur or sulphur dioxide usage, duration of treatments in relation with the volume of produce, produce arrangement and possible number of containers in the chamber including periods of storage and transportation.</p> <p>2.6 Availability of operator who has experience and skill in the fumigation process.</p> <p>2.7 The chamber and equipment shall be inspected for their appropriate conditions, cleanliness and readiness for use such as door seal, circulating fan/blower, lighting, sulphur burner, exhaust fan/blower, concentration of lime solution (calcium hydroxide), spray nozzles, weighing scale and timer.</p> <p>2.8 Control of prepared produce for fumigation shall be in accordance with the methods in 2.4.</p> <p>2.9 Control of sulphur or sulphur dioxide usage shall be in accordance with the methods in 2.4.</p> <p>2.10 During the fumigation process, control and monitor the fumigation in accordance with the methods in 2.4.</p>
(4) Post fumigation handling	<p>2.11 When the fumigation process is completed and prior to opening the chamber, the leftover circulation gas in the chamber shall be released appropriately and effectively.</p> <p>2.12 The leftover circulation gas from the chamber referred to in 2.11 shall be diverted and purged into the effectively tested gas recapture unit and monitor the operation system regularly.</p> <p>2.13 Containers of treated produce rested outside the chamber shall be blown to release the remaining sulphur dioxide to prevent residue in fresh produce over the Maximum Level.</p> <p>2.14 Treated produce shall be sampled for sulphur dioxide residue testing at least once a year.</p>
(5) Storage	2.15 Store treated produce or treated produce awaiting transport in an appropriate area.
(6) Waste management	2.16 Waste materials or debris such as leaves, treated waste water from gas recapture unit and waste from lime solution shall be removed from the operation areas and properly disposed.
3. Training	3. Train or put operators on the job training to gain knowledge and skill to their assigned works including refreshment training and updating their performance at least once a year.

Items	Requirements
4. Documents and record keeping	<p>4.1 Availability of documents and records of work operations including sale, distribution and storage, for the purposes of assessment and traceability such as:</p> <ul style="list-style-type: none"> - inspection results of validation or verification method of sulphur dioxide fumigation; - test results of sulphur dioxide residue in treated produce; - receiving of raw materials, storage, and sale/ distribution; - control/monitor of sulphur dioxide fumigation process; <p>and</p> <ul style="list-style-type: none"> - training or on the job training records of operators and the person who controls the fumigation process <hr/> <p>4.2 Documents and records shall be kept for at least 2 years.</p>