

**SASO 220
(GS 21E)**

**HYGIENIC REGULATIONS FOR FOOD
PLANTS AND THEIR PERSONNEL**

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HYGIENIC REGULATIONS FOR FOOD PLANTS AND THEIR PERSONNEL

1. SCOPE AND FIELD OF APPLICATION

This standard is concerned with hygienic regulations required for food plants and their personnel.

2. COMPLEMENTARY REFERENCES

Gulf standard to be approved by Standardization and Metrology Organization for G.C.C. on "Bottled and Unbottled Drinking Water".

3. DEFINITIONS

- 3.1 Food Plant: The building or buildings collectively or separated or parts thereof, used for the production, operation, processing, packaging, handling and storage of its materials and products. including the surrounding area which is under plant control.
- 3.2 Contamination: Arrival or addition of any harmful and objectionable matter, directly or indirectly, to the product, or the presence of such matter originally in the product.
- 3.3 Disinfection: The reduction of microbial load, by means of hygienic chemical or physical agents, to a level that will not lead to harmful contamination of food or for humans.
- 3.4 Food hygiene: Following the means necessary to ensure the safety, wholesomeness, and soundness of food at all stages of its preparation, production, processing, handling, storage and shipping.
- 3.5 Food handling: Any process included in production, preparation, processing, packaging, storage, transportation, distribution and sale of foods.
- 3.6 Plant wastes:
 - 3.6.1 Sewages: The wastes of humans and animals, including liquids and suspended solid materials in sewerage system.
 - 3.6.2 Plant losses
 - 3.6.2.1 Water, liquids and solid materials residual from processing operations.
 - 3.6.2.2 Fumes and gases produced from processing operations.
- 3.7 Pest control: The different means used in protection or fight against all pests and insects, their secretions or their parts; and exterminating them by appropriate hygienic methods.

- 3.8 Hygienic control program: The assurance of adopting hygienic regulations in each of the following processes:
- Inspection and control of raw materials.
 - Scheduling the succession of equipment operations.
 - Inspection and control of the finished product.
 - Shipping and storage control.
 - Examination and training of personnel for sound hygienic manners.
- 3.9 Acceptance levels: The number of samples - taken from the lot which indicate the maximum number of defective permitted samples in the lot, in order to consider it as meeting the requirements of the standards approved by Standardization & Metrology Organization for G.C.C.

4. MATERIALS, DESIGN, PROCESSING AND REQUIREMENTS

- 4.1 Hygienic requirements for equipment and utensils:
The following shall be met in the equipment and utensils.
- 4.1.1 Materials:
- 4.1.1.1 All surfaces in contact with foods shall be non-toxic, not producing an objectionable odour or taste, corrosion-resistant, enduring frequent wash and disinfection, smooth, free from pits, crevices and loose scales, unaffected by foodstuffs and non-absorbent unless the use of other surfaces as wood might be necessary due to the nature of work.
- 4.1.1.2 Galvanized iron shall not be used for the surface contacting foods in the food processing equipment.
- 4.1.1.3 Alloys containing lead or antimony or cadmium Platings shall not be used for the surfaces contacting foods in the food processing equipment.
- 4.1.1.4 Equipment made of copper or its alloys shall be plated with tin so that foods shall not come in direct contact with the metal.
- 4.1.1.5 Plastics or glass used in manufacturing food processing equipment shall be abrasion resistant and shall not contain phenols or free formaldehyde or any other substances affecting the characteristics of the food with which it comes into contact.
- 4.1.1.6 Steam boilers and packing materials shall be non-porous and non-absorbent and shall not react with the product. Joints between boilers shall be accessible for cleaning.
- 4.1.1.7 Canvass belts used in food plants shall be made of suitable material, easy to be cleaned and non-absorbent to food juices.
- 4.1.2 Sanitary design:
- 4.1.2.1 Equipment and utensils shall be designed and fixed in such a way to prevent hygienic hazard and to be easily cleaned and sterilized.

- 4.1.2.2 Industrial safety and protection means shall be provided for sharp ended equipment and utensils.
- 4.1.2.3 No drops or condensation shall appear over processing lines.
- 4.2 Hygienic requirements for buildings:
The following hygienic requirements shall be met in food plants:
- 4.2.1 Location:
- 4.2.1.1 The building shall be far away from objectionable odours, smoke, dust, or other contaminants and shall not be in an area subjected to floating wherever is its source.
- 4.2.1.2 Size:
The building shall be vast and designed in a size sufficient for the purpose intended, without crowding of equipment, personnel or materials. It shall include sufficient space for storage of both raw materials and finished product.
- 4.2.1.3 Roads and courtyards:
Roads and courtyards serving the plant and located in plant area shall be suitable for cars traffic.
- 4.2.1.4 Design:
The plant design shall easily allow for sufficient maintenance and cleaning operations and for sound hygienic control at all the stages of production:
- 4.2.1.4.1 The building shall be sound and perfect.
- 4.2.1.4.2 The building shall be so designed as to prevent the entrance and harbouring of pests, insects, birds and environment contaminants such as smoke and dust.
- 4.2.1.4.3 The plant shall be so designed as to apply hygienic operations in a regulated flow in the process lines, from the arrival of raw materials to the complete processing of the finished product, and to lead to suitable conditions for processing.
- 4.2.1.4.4 Floors:
They shall be made of water-proof and non-absorbent materials. They shall also be washable and cleanable, non-slippery, non-toxic and free from crevices and pits, and shall not be affected by weak acids, alkalines and steam. They shall slope to the drainage system.
- 4.2.1.4.5 Walls:
They shall be built of heat-insulating bricks, be smooth, water-proof, non-absorbent, washable, easily cleaned and preferably painted with a harmless paint of a light colour and be free from crevices.
- 4.2.1.4.6 Ceilings:
They shall be so constructed as to prevent the accumulation of dirt, condensation and mold development, and can be easily cleaned.

4.2.1.4.7 Stairs, lifts, and additional installations (such as pavements, portable stairs and slopes):

They shall be designed or constructed so as to avoid contamination of food and to facilitate the process of cleaning them frequently.

4.2.1.4.8 Doors:

They shall have smooth and non-absorbent surfaces, and shall be designed in such a way as to be tightly self-closed.

4.2.1.4.9 Windows and other openings:

They shall be so constructed as to avoid accumulation of dirt. Openable windows shall be provided with suitable net screens made of non-corrosive materials (to prevent entrance of flies, insects and rodents) and designed in such a way as to facilitate their cleaning and maintenance. They shall have smooth and non-absorbent surfaces. Internal window-sills (if any) shall be sloping so that they may not be used as shelves. Windows shall be tightly self-closed.

4.2.1.4.10 Ventilation:

Adequate ventilation shall be provided to prevent excessive heat, steam condensation and dust, and to remove contaminated air. The direction of air flow shall never be from contaminated areas to clean areas. Processing spaces and rooms shall be provided with internal ventilation means.

4.2.1.4.11 Lighting:

Natural or artificial lighting, shall be so sufficient as to avoid discolouration. Electric bulbs fixed and suspended over process lines - at all the stages of production - shall be of the safe type and maintained in a way that prevents contamination of food in case they are broken. Shadows and strong glare shall be avoided.

4.2.1.4.12 Dressing rooms and bath rooms:

- Dressing rooms: To change their clothes, personnel shall have suitable rooms provided with special wardrobes to keep their clothes in. The work overalls shall be clean and dry.
- Bath rooms: Personnel shall have bathrooms provided with sufficient hot and cold water. Bath rooms shall not directly open into food handling places. They shall usually be kept clean and provided with suitable cleaning materials. The walls of bathrooms shall be lined with glazed ceramic tiles to be easily cleaned, preferably painted with a harmless paint of a light colour and be free from crevices.

The number of bathrooms shall not be less than the following:

Number of personnel in a shift	Number of bathrooms
From 1 to 10	2
From 11 to 20	4

From 21 to 40	6
From 41 to 60	8
From 61 to 80	10
From 81 to 100	12
More than 100	One bathroom for Every additional 10 persons

4.2.1.4.13 Toilet rooms:

They shall be constructed in such a way to facilitate elimination of wastes under hygienic conditions and shall be provided with self-closing doors, well lighted and ventilated. They shall not open directly into food handling areas, shall usually be kept in a sanitary condition, equipped with siphon and suitable cooling and heating systems, and provided with hand washing and drying facilities as mentioned in 4.2.1.4.14.

Notes shall be posted requiring personnel to wash their hands with soap and detergents after using the toilet.

The number of toilet rooms shall not be less than the following:

Number of personnel in a shift	Number of toilets	Number of hand washings
From 1 to 10	2	2
From 11 to 20	4	4
From 21 to 40	6	6
From 41 to 60	8	8
From 61 to 80	10	10
From 81 to 100	12	12
More than 100	one toilet room for every additional 10 persons	one hand washing for every additional 10 persons

4.2.1.4.14 Hand-washing facilities:

Adequate and convenient facilities for personnel to wash and dry their hands, shall be provided wherever necessary, being in full view of the working places.

Disposable towels are recommended. Such facilities shall always be kept in a sanitary condition.

4.2.1.4.15 Waste disposal:

Disposal of waste shall be carried out in such a manner to avoid contamination of potable water sources and foods. The plumbing lines and waste disposals shall be approved by the official hygienic authorities. They shall be covered so as to prevent the diffusion-odours and the appearance of pests and insects.

4.2.1.4.16 Water supplies:

– Potable water:

It shall be provided in sufficient amounts and suitably protected against contamination. It shall conform to the Gulf standard to be approved by Standardization and Metrology Organization for G.C.C. on “Bottled and Unbottled Drinking Water”. Disposable cups shall only be used.

– Non-potable water:

It shall conform to hygienic regulations approved by official hygienic authorities, and be free from microbiological contaminants. It shall contain not more than 4 per 100 ml of coliform bacteria.

4.2.1.4.17 Collection and disposal of spoiled materials and foods equipment:

Means necessary to collect spoiled materials and foods and transport them to specific areas outside the plant shall be provided.

4.3 Hygienic processing requirements

The following shall be met during processing:

4.3.1 Raw materials handling

4.3.1.1 The raw materials shall not be accepted if it originally contains decomposed toxic or extraneous substances which will not be removed to acceptable levels by normal plant procedures of sorting, preparation or processing.

4.3.1.2 Raw materials shall be stored in the plant premises under conditions that will protect them against contamination and infestation and quick deterioration. Stores and their doors and windows shall be constructed so as to prevent entrance of rodents. If rodents are present, stores shall be completely emptied and disinfected from rodents and then tightly closed to prevent their re-entrance.

4.3.1.3 Water used for conveying raw materials, shall comply with the Gulf standard to be approved by Standardization and Metrology Organization for G.C.C. on “Bottled and Unbottled Drinking Water”. Sea water used for transporting fish and other marine products shall only be allowed by the permission of the

official concerned hygienic authorities, and shall be subject to periodical examination.

4.3.2 Inspection and sorting:

Prior to introduction into the processing line, or at a convenient point within it, raw materials shall be inspected, sorted and selected as required to remove unsuitable materials. Such steps shall be carried out under hygienic conditions, so that only sound and clean raw materials shall be processed.

4.3.3 Washing or other preparatory operations:

Raw materials shall be washed as needed to remove dust or other contaminants. Water used for such purposes shall not be recirculated unless suitably treated to maintain it nonhazardous for public health.

4.3.4 Preparaton and processing:

Preparatory operations leading to the finished product and the packaging operations shall be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of pathogenic microorganisms or toxicity. Random samples shall be drawn from processing line and from the finished product to assure safety of production.

4.3.5 Methods of packaging and preservation of the finished product:

The following shall be met in packaging and preservation of the product:

4.3.5.1 Type of packaging material:

Packaging materials shall not contain any substances causing objectionable organoleptic changes in the product, and shall be treated in such a way as not to cause toxicity or affect the food with which they come into contact.

Packaging materials shall be non-absorbent, tasteless and odourless and shall assure convenient protection for the product against contamination.

4.3.5.2 Packaging and preservation techniques:

- Packaging shall be carried out under suitable hygienic conditions.
- Methods of preservation shall be such as to protect the product against contamination, infestation, disease communication and any development hazardous to public health.

4.3.6 Finished product coding:

Processed products prepared for sale or those distributed during processing or packaging shall be coded to enable identification of lots and their production date, so that, when necessary, a specified food lot which may have become contaminated or unfit for the purpose of its use shall be segregated.

- 4.3.7 Storage and transportation of the finished product:
- 4.3.7.1 The finished product shall be stored and transported under such conditions as to preclude its contamination or proliferation of microorganisms. The product shall be protected against deterioration or damage of containers.
- 4.3.7.2 During storage, periodic inspection shall be carried out on the finished product to ensure that the food is fit for human consumption and that it complies with the standard specifications of the finished product.
- 4.3.7.3 Store rooms shall be moisture free and air conditioned and refrigerated and shall be rodentproof.
- 4.4 Hygienic requirements for personnel:
- The following shall be taken into consideration:
- 4.4.1 The food handling persons shall be medically examined, before their appointment, by the responsible official medical authorities according to the requirements stated by the concerned department in the Ministry of Health. This medical examination shall be carried out periodically on those persons, after their appointment, once or more every year as need may arise, to ensure that they are medically fit and free from communicable diseases.
- 4.4.2 Personnel who have infected wounds, sores or any communicable disease shall be isolated till their recovery.
- 4.4.3 Personnel of perishable foods preservation plants shall take a bath before and after processing operations. Also they shall wear masks on their mouths and noses to prevent contamination of foods.
- 4.4.4 Personnel shall keep their nails short and clean and wash their hands with soap and water or detergents before the start of work. All kinds of jewelery shall not be worn to avoid their contact with food products.
- 4.4.5 Personnel shall be provided with clean uniforms, clean and sound gloves, and clean caps where necessary. No clothes shall be hung in the processing rooms.
- 4.4.6 Eating, drinking, spitting, nose cleaning, chewing of gum and the use of snuff, tobacco in any form shall be prohibited during the manufacturing, handling and packaging processes and in the storage area of the plant.
- 4.4.7 During the manufacturing processes, the worker shall not apply his finger to his mouth, eyes, ears, nose or scalp, and also shall not cough or sneeze near any food.
- 4.4.8 Personnel shall not sleep or lie in a Processing or handling areas or in food stores.
- 4.4.9 Precautions shall be taken to prevent food contamination by visitors during handling.

5. PEST CONTROL

The following shall be considered:

- 5.1 All outside pest breeding places, as well as all inside harbouring and hibernating spots, shall be under periodic control.
- 5.2 Floors, walls, bucket elevators, and conveyors shall be frequently inspected for detecting the presence of insect secretions and eggs in crevices.
- 5.3 Pest resisting substances shall be highly effective for rodents. They shall be used in a manner not leading to contamination of foods, and their toxicity shall be low for humans.
- 5.4 After application of pesticides, contaminated equipment and utensils shall be thoroughly cleaned to remove residues. Cleaners must be completely soluble, non-corrosive for metal surfaces, of good wetting or penetrating action, with an emulsifying action on fat and dissolving action on food residues and having germicidal action.
- 5.5 Pesticides shall be stored in locked rooms used only for that purpose and dispensed and handled by authorization, and through properly trained personnel. Extreme care shall be taken to avoid food contamination.

6. HYGIENIC CONTROL PROGRAM

The following shall be considered:

- 6.1 Each plant shall designate a single individual responsible for the cleanliness of the plant, whose duties are preferably separated from production.
- 6.2 This individual shall have assistant personnel, well trained on the use of special cleaning tools, and their assembling. They shall be aware of the hazards of contamination.
- 6.3 Critical area, equipment and materials shall be kept under special attention and care.

7. LABORATORY CONTROL METHODS

The following shall be considered:

- 7.1 Each plant shall have a special laboratory to carry out tests necessary to assure the safety of the products.
- 7.2 Official authorities, each according to its duties and functions, shall periodically take samples representative of the production for analysis purpose, to assure the safety of the product and its compliance with the standards.

8 HYGIENIC TRAINING FOR PERSONNEL

- 8.1 Personnel shall be informed of the hygienic rules necessary to be applied during food processing and of contamination prohibition.
- 8.2 Information programs prepared for plant personnel (seminars-films-lectures-posters...) shall be introduced -to emphasize the importance of food handling under hygienic conditions and precautions necessary to prevent contamination of foods.