
शक्कर उद्योग के लिए स्वास्थ्यकर संहिता
(पहला पुनरीक्षण)

**Code for Hygienic Conditions for
Sugar Factories**
(*First Revision*)

ICS 13.100; 67.180.10

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Price Group 6

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Sugar Industry Sectional Committee had been approved by the Food and Agriculture Division Council.

Consumers do not have the available knowledge or means of determining the hygienic quality of the food they purchase. For this, they rely on the hygienic standards of various industries that prepare and handle food materials. Unless the factory producing the food is governed by a strict hygienic code in respect of plant layout and personnel, the quality of food produced cannot be considered as safe. These factors have been taken into consideration in the preparation of this code.

This standard was originally published in 1996. In this first revision, application of general principles of food hygiene as per IS 2491 has been included as a basic requirement and requirements relating to employee hygiene and checklist have been updated. One amendment issued to the standard has also been incorporated in the revision.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act, 2006* and the rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CODE FOR HYGIENIC CONDITIONS FOR SUGAR FACTORIES

(*First Revision*)

1 SCOPE

This standard prescribes the hygienic conditions required for establishing and maintaining a sugar factory.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards:

<i>IS No.</i>	<i>Title</i>
IS 2491 : 2013	Food hygiene — General principles — Code of practice (<i>third revision</i>)
IS 3103 : 1975	Code of practice for industrial ventilation (<i>first revision</i>)
IS 3646 (Part 1) : 1992	Code of practice for interior illumination: Part 1 General requirements and recommendations for working interiors (<i>first revision</i>)
IS 4251 : 1967	Quality tolerances for water for processed food industry
IS 6911 : 2017	Stainless steel plate, sheet and strip — Specification (<i>second revision</i>)

3 SITE

A sugar factory shall preferably be situated in some open, clean and healthy surroundings, away from garbage dumps; open sewage drains or other places likely to breed flies and rodents. It shall be free from sources of obnoxious fumes, smoke, odours or excessive dust.

4 BUILDING

4.1 The structure shall be of permanent nature and shall be suitable in size, construction and design to facilitate maintenance and hygienic operations for processing purposes. It should provide sufficient space for housing of equipment and storage of materials (raw as well as finished products/byproducts) as is necessary for hygienic operations. The material of construction shall be of brick, plaster, cement, concrete, tile or any other equivalent-materials which ensure cleanliness to protect contamination.

Construction of the building shall be such that it shall be rodent proof and bird proof. The sugar bagging house shall also be fly proof, and rodent proof.

4.2 No portion of building shall be used for domestic purposes or other type of food preparations unless separated by suitable partitions or locations or other effective means so as to avoid contamination of the product with undesirable micro-organisms, odour, chemicals, filth or other foreign material.

4.3 Ventilation and Lighting

The premises shall be adequately lighted and ventilated. Ventilation and lighting shall also be in accordance with the *Factories Act*, 1948 [see IS 3103 and IS 3646 (Part 1)]. Exhaust fan shall be provided wherever necessary. Attention shall be given to provide proper ventilation to the equipment producing excessive heat, steam, vapors and gases.

4.4 Floor

The floor shall be smooth, washable, properly sloped to gullies connected to sewers or drains. It shall be impervious to water and not affected to weak acids, alkalis or steam. Cemented floor shall be made for work room (ground floor), store room and godowns.

4.5 Walls

Internal walls shall have smooth, non-absorbent light coloured surface, free from crevices and sharp angles, to facilitate their efficient cleaning. The junction of the floor with the walls and the junction

between the two walls shall be rounded to prevent accumulation of dust.

4.6 Repairs

The building shall be maintained in a proper state of repair and cleanliness all times. Whenever required, it may be lime washed, painted, disinfected, disinfested and deodorized.

4.7 Drainage

4.7.1 Effective drainage shall be provided to drain off a large quantity of water used for washing machinery, equipment, furniture, floor, etc, 15 cm to 30 cm half circular drains with glazed pipe at the bottom shall be provided. The slope of the floor shall be towards the drains. The drain openings shall be provided with screen traps to prevent solid matter from clogging the drains. The ends of the drains leading to the outside of the factory shall be made rodent proof by providing screens. The screens shall be examined periodically and replaced or cleaned, if necessary. The drains shall have water seals and shall be cleaned periodically to keep them free from any deposits and to prevent habitation of cockroaches and rodents in closed areas of drains. Ends of the drainage shall lead to the effluent treatment plant of the factory.

4.7.2 Drains carrying high pollution load effluent for example juice, syrup, molasses and filter mud, etc, shall be segregated from those carrying lower pollution loads, for example, injection, cooling and condensate water. Oil and grease traps shall be provided in mill house and other drains wherever necessary to separate them from other organic matter.

5 RAW MATERIAL HANDLING

5.1 The raw material to be accepted for processing shall not contain any visible decomposition or discoloration.

5.2 The raw material selected for sugar processing shall be stored in premises which will protect it against contamination and infestation and minimize deterioration.

6 FACTORY AND PROCESSING HYGIENE

6.1 The sugar factory shall follow the general practices of food hygiene as outlined in IS 2491.

6.2 The floors shall be swept periodically followed by sprinkling with water and thereafter rubbing with bagasse for drying which shall be sent to the boiler.

6.3 Waste and rubbish shall be collected in covered receptacles and shall not be allowed to scatter on the

floor of the unit. It should be disposed off in a manner which is not detrimental to the hygiene of the surroundings after its disposal.

6.4 To keep check over microbial activity during juice extraction, mills shall be thoroughly steamed in every shift with live steam of 5 kg/cm² to 7 kg/cm² or disinfected by any other suitable method. During long stoppages all the juices shall be removed from the mills, gutters, imbibition tanks and then they shall be washed with hot water followed by steaming. Judicious use of disinfectant shall be made to keep the growth of micro-organisms under check.

6.5 Leakages in the juice, syrup and molasses pumps etc, spillage from tanks and pipelines shall be avoided minimized. Leakages depending upon their quantum shall be removed from time to time either by soaking in bagasse or by lifting through pump and sent to the process again.

6.6 Filter cake shall be discharged directly into the trucks or trolleys for its disposal. Its accumulation in the factory shall be avoided as it provides a rich substrate for the growth of micro-organisms.

6.7 The factory effluents shall be disposed off from the factory in a manner which is not detrimental to the hygiene of the factory and its surroundings. The factory effluents shall be suitably treated before final disposal, such that the treated effluents conform to the standard prescribed by the State Pollution Control Board.

6.8 All water disposal lines shall be large enough to carry peak loads. All lines shall be water tight and the waste disposal shall be effected in such a manner as not to cause contamination with potable water supplies.

6.9 There shall be an adequate supply of safe and potable water (*see* IS 4251). The storage tank for water shall, unless completely sealed, be kept covered with tight fitting lids, examined and cleaned regularly.

6.10 In centrifugals, uncontaminated water, preferably, condensate water, shall be used in order to produce sugar almost free from contamination.

6.11 Suitable fly ash arrestors shall be installed before discharging the flue gases in the atmosphere and the suspended particulate matter (SPM) of flue gases shall conform to the emission standards prescribed by the State Pollution Control Board.

6.12 Perfect sanitary conditions shall be maintained during packing and storage of sugar. Sugar godowns

shall be kept dry and air tight to prevent growth of micro-organisms.

6.13 Proper places shall be provided for storage of brooms, brushes, buckets and other cleaning gear. Sugar dust catchers/collectors should be provided in the drier house.

6.14 Window glass and light fittings shall be maintained clean and dust-free at all times.

6.15 There shall be no cobwebs in any part of the unit, birds, rodents and domestic animals shall not be allowed in any part of the unit.

6.16 No lavatory, sink, cesspool or garbage shall be situated or maintained in such a manner that odours fumes there from pervade any room where the product or raw materials are prepared or stored.

7 PLANT AND EQUIPMENT HYGIENE

7.1 Materials for Equipment

7.1.1 All surfaces coming in contact with the products from sugar factory shall be smooth, free from pits, crevices and loose scales and shall be non-absorbent preferably of stainless steel (*see* IS 6911). Besides surfaces shall be non-toxic and unaffected by sugar house products and cleaning chemicals.

7.1.2 Galvanized sheets shall not be used at places where it comes in contact with sugar house products. stainless steel may be used.

7.1.3 Cadmium and lead shall not be used where they may come in contact with sugar house products.

7.1.4 All gasketing and packing materials shall be non-porous, non-absorbent and fitted in a manner such that stagnation of material between the gasketed joints is avoided and proper cleaning is possible.

7.1.5 Wherever sugar house products normally come in contact with the equipment surfaces, coatings used as a lining to prevent corrosion of the base material of the equipment shall be non-toxic, unaffected by and inert to the sugar house product in contact with it or cleaning chemicals used on it. Furthermore, such coatings shall be non-absorbent, odourless and tasteless.

7.2 Installation of Equipment

7.2.1 All equipment shall be installed in foundation of durable, easily cleanable material.

7.2.2 The placement and design features of the equipment in use shall be such that they can be cleaned easily. An ample supply of steam and water, hose, brushes, cleaning chemicals and equipments

necessary for the proper cleaning of machineries and equipments shall be available.

7.2.3 Whenever equipment passes through walls or floors, it shall be sealed or sufficient clearance shall be allowed to permit inspection, cleaning and maintenance.

7.2.4 All electrical connections, such as switch boxes, control boxes, conduit cables shall be installed in such a way to facilitate proper cleaning, or be completely sealed to the equipment or wall.

7.2.5 The entire processing system shall be cleaned periodically.

8 WATER SUPPLY

8.1 There shall be an adequate supply of safe and potable water (*see* IS 4251). Running water under pressure shall be easily accessible to all rooms and areas in which food is handled and equipments are washed.

8.2 The equipment shall be so installed and used that back siphonage of liquid into the potable water lines is precluded.

8.3 Hot and cold water in ample supply shall be provided for plant clean-up needs, where necessary.

8.4 The storage tanks for water should, unless completely sealed, be kept covered with tight fitting lids, examined regularly and cleaned out at least once every six months. The date of the last cleaning and next cleaning shall be prominently displayed on the storage tanks.

8.5 The water shall be periodically examined as desired by the Licensing Authority, chemically and bacteriologically. A record of such examination shall be maintained.

9 EMPLOYEE HYGIENE

9.1 Every person employed in the sugar factory shall be healthy and shall not be suffering from tuberculosis or any communicable disease. A certificate to this effect shall be furnished by the person from an authorized registered medical practitioner.

The employees shall notify the medical officer of the factory and the management, cases of fever, vomiting, diarrhea, typhoid, dysentery, boils, cuts and sores and ulcers (however small), discharging ears and any other notifiable diseases occurring in their own homes and families.

9.2 Employees shall keep their finger nails short and clean and wash their hands with soap detergent and water before commencing work. No worker shall

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allow his hands or any part of his body or clothing to come in contact with the finished product. He/she should adopt strict hygienic practices so as to avoid adding any microbial contamination to the material. No workers shall be allowed to wear ornaments.

9.3 All employees shall be inoculated and vaccinated against the enteric groups of diseases once a year. In case of an epidemic all workers shall be inoculated.

9.4 No worker shall be allowed to work without proper tight clothing and footwear for bottom hygiene.

9.5 Eating, spitting, nose cleaning or the use of tobacco in any form or chewing betel leaves shall be prohibited within the manufacturing, packing and storage area of the unit. Notice to this effect shall be prominently displayed and enforced.

9.6 Sufficient and suitable sanitary conveniences shall be provided, maintained and kept clean in every factory. The conveniences shall be properly lighted. Separate conveniences shall be provided for each gender, the conveniences shall always be maintained clean and in good repairs.

9.7 No conveniences shall open directly into any work room in the factory. However, these should be conveniently situated and accessible to workers at all times while they are at the factory.

9.8 Sufficient number of wash basins with adequate provision of nail brushes and soap, latrines and urinals in the prescribed manner should be provided. The wash basins shall be installed in or alongside the sanitary conveniences.

9.9 Signs shall be displayed in attractive coloured posters on walls as reminders to include good hygiene and sanitation practice in employees.

9.10 Workers shall wear mask, gloves, cap and shoes to avoid food safety contamination to those who are working in bagging area.

9.11 Proper record shall be maintained for needle/knife used in dryer house/bagging house.

10 CHECK LIST FOR HYGIENE/ SANTTATION AND SAEFTY MEASURES

10.1 A check list for use by a responsible officer of the management is given in Annex A. It shall be used at regular intervals, to ensure hygienic sanitation and safety measures of the unit.

11 STORAGE

11.1 Storage area shall be free from dampness and shall be rodent and fly proof.

11.2 Separate storage space shall be provided for storing machinery, equipment, various chemicals etc.

11.3 Insecticides and pesticides must be stored separately to prevent pick up of off-notes by the product.

11.4 Damaged product bags to be stored separately to prevent contamination.

ANNEX A*(Clause 10.1)***CHECK LIST FOR HYGIENE AND SANITATION IN SUGAR FACTORIES****A-1 SITE**

- 1) Are there any pesticide chemical/petrochemical leather or paper industries nearby? Yes/No
- 2) Any cattle sheds and open sewage drains nearby? Yes/No
- 3) Are there any stagnant effluents stagnating outside factory premises? Yes/No

A-2 BUILDING

- 1) Is any part of the building-being used for domestic purposes/food preparations without proper partitions?
Yes/No
- 2) Are the floors being maintained properly without any breakages/cracks/holes? Yes/No
- 3) Are the roofs/ceiling free of water leakage? Yes/No
- 4) Are the doors/windows having proper netting/mesh? Yes/No
- 5) Are scheduled repairs, white wash, disinfection being carried out regularly? Yes/No
- 6) Are the lights shielded to prevent broken glass contaminating the product? Yes/No

A- 3 RAW MATERIAL HANDLING

- 1) Are the raw material stored in clean and hygienic area? Yes/No
- Are the raw material received, free from visible decomposition or discoloration? Yes/No

A-4 FACTORY AND PROCESS HYGIENE

- 1) Are the floors swept/washed periodically? Yes/No
- 2) Is the waste and rubbish kept in covered receptacles and disposed off regularly? Yes/No
- 3) Is the leakage/spillage of juice/syrup/massacuite/molasses being bagasse cleaned/collected and sent to the process? Yes/No
- 4) Is there any mould growth on the equipment? Yes/No
- 5) Are the premises kept free from birds, rodents and flies? Yes/No
- 6) Are the drains cleaned regularly? Yes/No
- 7) Are the filter cake be discharged directly into the truck or trolleys? Yes/No
- 8) Is there adequate supply of potable water? Yes/No
- 9) Are suitable fly arrestors installed operating? Yes/No
- 10) Are proper hygienic conditions maintained in packing and storing area? Yes/No

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11) Is place be provided for keeping brooms, brushes and other cleaning material? Yes/No

12) Are the window glasses and light fittings cleaned periodically? Yes/No

13) Are separate area provided for meal consumption away from production? Yes/No

A-5 PLANT AND EQUIPMENT

1) Are the surfaces coming in contact with product be smooth, free from pits, crevices and loose scales? Yes/No

2) Is the use of galvanized sheets be avoided where it comes contact with sugar house products? Yes/No

3) Are the contamination of cadmium and lead be avoided coming in contact with sugar house products? Yes/No

4) Are the gaskets and packing material non-porous, nonabsorbent type to facilitate cleaning? Yes/No

5) Are the gaskets and packing material be used in a manner to avoid stagnation of material between the joints?
Yes/No

6) Are the inertness of the coatings/ lining to prevent corrosion be ensured? Yes/No

7) Are the equipments installed on place which can be easily washed/cleaned? Yes/No

8) Are the equipments designed/ installed to suit cleaning by chemicals, water and steam? Yes/No

9) Are the equipments passing through wall properly installed to permit inspection, cleaning and maintenance?
Yes/No

10) Are the electrical installation installed in a manner to facilitate easy cleaning? Yes/No

A-6 WATER SUPPLY

1) Is sufficient potable water available for flushing the equipments? Yes/No

2) Is hot and cold water supply be provided for cleaning the plant? Yes/No

3) Are the storage tanks for water properly covered? Yes/No

4) Are the storage tanks cleaned periodically? Yes/No

5) Is the water being analyzed for its portability and records of such analysis being maintained? Yes/No

A-7 STORAGE

1) Is the storage place free from dampness? Yes/No

2) Is the storage place rodent and fly proof? Yes/No

3) Is separate place for keeping chemicals, machine parts, etc, provided? Yes/No

4) Is storage of pesticides/insecticides isolated to avoid off notes to the products? Yes/No

5) Is separate room provided for storage of damaged product bags? Yes/No

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Sugar Industry Sectional Committee, FAD 02

<i>Organization</i>	<i>Representative(s)</i>
National Sugar Institute, Kanpur	SHRI NARENDRA MOHAN (<i>Chairperson</i>)
Army Service Core (ASC), New Delhi	LT COL B. B. SAHU
CONCERT, Chennai	SHRI R. SANTHANAM SHRI M. SOMASUNDARAM (<i>Alternate</i>)
Consumer Guidance Society of India, Mumbai	SHRI SITARAM DIXIT DR M. S. KAMAT (<i>Alternate</i>)
Food Corporation of India, New Delhi	SHRI DEEPAK KUMAR PANWAR SHRI RAKESH KUMAR RANJAN (<i>Alternate</i>)
Food Safety Standards Authority of India, New Delhi	MS APOORVA SRIVASTAVA
Global Cane Sugar Ltd, New Delhi	DR G. S. C. RAO SHRI ANIL SRIVASTAVA (<i>Alternate</i>)
Indian Institute of Sugarcane Research, Lucknow	DR A. D. PATHAK DR A. K. SHARMA (<i>Alternate</i>)
Indian Institute of Toxicology Research, Lucknow	DR YOGESHWER SHUKLA
Indian Sugar Exim Corporation, New Delhi	SHRI RAJIV AGGARWAL SHRI RAJEEV KURUP (<i>Alternate</i>)
Indian Sugar Mills Association, New Delhi	SHRI G. K. THAKUR SHRI DEEP MALIK (<i>Alternate</i>)
MAARC Labs, Pune	DR VASUDHA KESKAR
MANAS Industry, Nagpur	SHRI JEEVAN VASANT JADHAV
Ministry of Consumer Affairs, Food & Public Distribution, New Delhi	SHRI SURESH CHANDRA
National Co-Operative Development Corporation, New Delhi	SHRI K. P. VAISH SHRI N. K. SHARDA (<i>Alternate</i>)
National Federation of Co-Operative Development Corporation, New Delhi	SHRI PRAKESH P NAIKNAVARE SHRI S. SOMASUNDARAM (<i>Alternate</i>)
The Sugar Technologists Association of India, New Delhi	SHRI SANJAY AWASTHI SHRI ANURAG GOYAL (<i>Alternate</i>)
Triveni Engineering & Industries Limited, Muzaffar Nagar	SHRI RAJESH SINGH SHRI P. K. KHADELWAL (<i>Alternate</i>)

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<i>Organization</i>	<i>Representative(s)</i>
Tamil Nadu Sugar Corporation Limited (TASCO), Chennai	SHRI E. MUTHUVELAPPAN
Vasantdada Sugar Institute, Pune	DR RAJEEV DANI
Walchand Nagar Industries	SHRI D. R. SARDESHMUKH SHRI P. V. KAWADE (<i>Alternate</i>)
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'E'/DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
SHRI RAJPAL
SCIENTIST 'D'/JOINT DIRECTOR
(FOOD AND AGRICULTURE), BIS

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