

<p>भारतीय मानक मसौदा</p> <p>कागज तथा गत्ते के भंडारण के लिए रीति संहिता</p> <p>(आईएस 4645 का दूसरा पुनरीक्षण)</p> <p><i>Draft Indian Standard</i></p> <p>CODE OF PRACTICE FOR STORAGE OF PAPER AND BOARD</p> <p>(<i>Second Revision of IS 4645</i>)</p> <p>(Not to be reproduced without the permission of BIS or used as an Indian Standard)</p> <p>ICS 85.060</p>	
Paper based packaging materials Committee, CHD 16	Sectional Last date of comments: 20 March 2023

FOREWORD

(Formal clause shall be added to be later)

The paper producing units have to keep large stock of finished paper of various types, varieties, sizes, etc. Similarly wholesale dealers and big consumers like government offices and printing presses have also to keep stock of different types of papers to meet their day-to-day requirements. Paper is liable to be attacked by insects like termites and cockroaches if certain precautions are not taken during the storage. Paper is highly combustible material and it is necessary to guard it against fire risks. Further the quality of the paper deteriorates with increased humidity and as such it is necessary to maintain suitable environmental conditions. In big godowns, large quantities of paper are moved in and out daily. To facilitate its handling, it is necessary that it should be stocked and placed in certain order.

This standard was originally published in 1968 to provide a guideline for minimizing deterioration of paper from all the factors mentioned above and to make the handling of paper safe and easy. In the first revision, an attempt was made to incorporate the changes in the storage practices evolved during the period to bring it at par with the latest practices.

This revision has been brought out to bring the standard in the latest style and format of Indian Standards.

1 SCOPE

1.1 This standard lays down the recommended practices to be followed for the storage of paper and board.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions 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 the standards indicated below:

<i>IS No.</i>	<i>Title</i>
432 (Part 1) : 1982	Mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement: Part 1 mild steel and medium tensile steel bars
432 (Part 2) : 1982	Mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement: Part 2 hard-drawn steel wire

2 WAREHOUSE STRUCTURE

2.1 The construction shall be climatically suitable, damp proof and moth proof. The structure shall be strong and well-built. It shall be of cement concrete, brick and mortar or of steel and aluminium. The soil shall be chemically treated before laying down the foundations. The walls of the warehouse shall have cement plaster and the floor shall be of cement concrete. The internal walls shall be painted with coal tar or oil paint up to a height of at least 2 m to make it damp proof and moth proof. The floor shall be treated with water proofing compounds. The height of the structure shall be at least 5 m and the area depending on space available and the quantity of paper to be stored. Roofing of the structure shall be leak proof shall be constructed from RCC or of asbestos sheets.

2.2 There shall be sufficient windows opening outwards and on a height of 2 m from the floor level. Placing of windows shall be such so as to allow cross and natural ventilation and each window shall be properly secured with reinforced glass panes and wire nettings for prevention of direct sunlight, rain, fire and theft. Besides windows, there shall be ventilators just below the ceiling for air circulation. Electrical air circulator and exhaust arrangement for removing moisture and dampness if provided, shall be installed in such a way that the entire godown space shall have at least 10 changes of air per hour and the exhaust fans shall be placed on either walls, a little below the ceiling or on the top of roofing.

3 MODE OF STACKTNG

3.1 Each stack of flat paper or board shall be built in the form of rectangular blocks with alternate layer of bundles in cross direction with a sufficiently broad base to permit stacking up to a suitable height and to be arranged in such a way that an air space is left at its centre. For stacking of paper to a suitable height, it is advised that a makeshift stair be built with bundles of paper conveniently placed to facilitate smooth movement. However, reels may be stacked on their sides 5 to 6 tiers high provided sufficient care is taken to prevent damage to the reel sides as well as core while handling.

3.2 Each stack shall preferably have paper or board of same variety having the same size and substance and should have proper identification by display of identification cards. For facility of

handling movement space shall be provided all round the stacks. The stacks shall be built up on raised platform resting on concrete blocks preferably precast (precast RCC slab) manufactured from vibrated cement concrete processed with vacuum and reinforced with mild steel (*see* IS 432) and designed for the superimposed load. Alternatively, movable metal trays/stands painted with non-corrosive paint may be used for stacking flat paper. This will also facilitate easier movement of paper with the help of the mini hydraulic trucks. The metal trays/stands should be 15 cm high from ground. A space of at least 45 cm shall be maintained between the stacks in the same row and from the stacks to the walls to allow cleaning and dusting of the godowns and to pass round in case of fire or for inspection. The raised platforms would allow the floor underneath to be cleaned or swept and spraying of insecticides when needed.

3.2.1 Varieties of paper in small lots may be stored in steel racks suitably built with flat shelves running parallel to the direction in which reams are inserted and they should stand at least 45 cm apart from the walls.

3.3 Where manual handling and carriage of load on head is done, the height of the stack shall not exceed 2 m. Reams of paper packed and secured with gummed tape can be stacked heavily but reams tied with jute strings shall not be stacked so heavily to avoid string marks on the sheets of paper.

3.4 Gangway or lane between two rows of stacks shall be at least 100 cm wide for manual or small hand trolley operation, but it shall be at least 300 cm wide in a godown having a forklift handling equipment.

3.5 While stacking paper, consideration should be given to age, frequency of use and weight of the stocks. Stocks which are in greater demand shall be kept in easily accessible positions and it shall also be ensured that these are drawn in rotation. Piling of fresh deliveries immediately on top of existing stock shall be avoided.

4 GENERAL PRECAUTIONS

4.1 Damage by Insects and Rodents

4.1.1 Termites, rats and cockroaches are formidable enemies of paper storage. To prevent the attack of these, suitable pesticides shall be sprayed, dusted and applied on walls and floor from time to time. Depending on the atmospheric conditions, the frequency of spraying pesticides may vary; but it should be at least once every month. Cellulose in paper attracts moisture from atmosphere which encourages growth of termites and hence all possible care shall be taken to keep the godown dry and clean.

4.1.2 The use of wooden racks may be totally avoided.

4.1.3 Constant watch is necessary to detect any signs of attack by termites and to maintain clean and hygienic conditions in the godown.

4.2 Care Against Environmental Damage

4.2.1 Special care shall be taken to ensure that paper is not kept stacked in one place for long. For proper aeration, paper stock shall change place at least once every quarter.

4.2.2 Paper loses its printable smooth surface if stored for a long time in any damp godown. It also loses its brightness if stored for a long time in any store exposed to excessive sunlight and heat. Therefore, suitable care should be taken to guard against these deteriorations.

4.3 Protection Against Fire

4.3.1 Electrical wirings inside the godown shall be laid through metal or plastic conduit pipe which shall be properly earthed and the main fuse and switch shall be installed outside the godown.

4.3.2 Each godown shall be adequately equipped with chemical fire extinguishers which shall be installed on the inside and outside walls of the store house in places within easy reach. Automatic fire alarms should be installed in the godown. Godown may preferably have thermostat controlled water spraying ducts for automatic prevention of fire. Fire fighting authorities should be consulted for protection of a big store against fire and adequate arrangement shall be made.