IS 658 (1982): Code of Practice for Magnesium Oxychloride Composition Floors [CED 5: Flooring, Wall Finishing and Roofing]

BLANK PAGE

IS : 658 - 1982
(Reaffirmed 2001)

Indian Standard

CODE OF PRACTICE FOR MAGNESIUM OXYCHLORIDE COMPOSITION FLOORS

(Second Revision)

UDC 69·025·331·1:69·001·3

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 4

December 1982

Indian Standard

CODE OF PRACTICE FOR MAGNESIUM OXYCHLORIDE COMPOSITION FLOORS

(Second Revision)

Flooring and Plastering Sectional Committee, BDC 5

Chairman

SHRI O. P. MITTAL,
C4/56 Safdarjung Development Area,
New Delhi 110016

Members	*Representing*
SHRI E. T. ANTIA	Concrete Association of India, Bombay
SHRI M. G. DANDAVATE (*Alternate*)	
SHRI S. K. BANERJEE	National Test House, Calcutta
SHRI P. R. DAS (*Alternate*)	
BRIG P. M. BHATIA	Institution of Engineers (India), Calcutta
SHRI DINESH A. CHOKSHI	Arcoy Industries, Ahmadabad
SHRI RASIKLAL A. CHOKSHI (*Alternate*)	
DIRECTOR	Maharashtra Engineering Research Institute, Nasik
RESEARCH OFFICER, MATERIAL TESTING DIVISION (*Alternate*)	
DR V. S. GUPTA	The Fertilizer (Planning & Development) India Ltd, Sindri
SHRI K. V. GURUSWAMY	Indian Oil Corporation Ltd, New Delhi
SHRI G. V. PANGARKAR (*Alternate*)	
JOINT DIRECTOR (ARCH), RDSO	Railway Board (Ministry of Railways)
DEPUTY DIRECTOR (ARCH) RDSO (*Alternate*)	
SHRI S. C. KAPOOR	Modern Tiles & Marbles, New Delhi
SHRI A. C. KAPOOR (*Alternate*)	
SHRI C. P. KAPANI	Builders' Association of India, Bombay
SHRI G. P. LAHIRI	Engineers India Ltd, New Delhi
SHRI T. S. BHAGAT (*Alternate*)	
SHRI K. E. S. MANI	Bhor Industries Ltd, Bombay
SHRI RAMESH D. PATEL (*Alternate*)	
DR MOHAN RAI	Central Building Research Institute (CSIR), Roorkee
DR R. K. JAIN (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
SHRI M. V. MURUGAPPAN	Coromandal Prodorite Pvt Ltd, Madras
SHRI R. SRINIVASAN (*Alternate*)	
SHRI O. P. RATRA	National Buildings Organization, New Delhi
SHRI D. B. SEN	Indian Institute of Architects, Bombay
SHRI S. B. SHIROMANY (*Alternate*)	
LT COL M. P. SHARMA	Engineer-in-Chief's Branch, Army Headquarters (Ministry of Defence)
SHRI A. P. JAIN (*Alternate*)	
SHRI A. K. SHRIVASTAVA	Public Works Department, Govt of Uttar Pradesh, Lucknow
SHRI DARSHAN SINGH (*Alternate*)	
SUPERINTENDING ENGINEER (PLANNING AND DESIGNS CIRCLE)	Public Works Department, Govt of Tamil Nadu, Madras
EXECUTIVE ENGINEER (BUILDING CENTRE DIVISION) (*Alternate*)	
SUPERINTENDING SURVEYOR OF WORKS (CZ)	Central Public Works Department, New Delhi
SURVEYOR OF WORKS I (CZ) (*Alternate*)	
SHRI G. RAMAN, Director (Civ Engg)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI K. M. MATHUR
Deputy Director (Civ Engg), ISI

Composition of Magnesite Flooring Composition Subcommittee, BDC 5:1

Convener

SHRI G. DORAISAMY	Ministry of Railways

Members

SHRI C. G. DALAL	Flintrock Products Ltd, Bombay
SHRI N. HARILAL	Oxy-Chloride Flooring Products Ltd, Bombay
SHRI H. J. VAKEEL (*Alternate*)	
SHRI M. T. KANSE	Directorate General of Supplies and Disposal, New Delhi
SHRI N. G. S. IYER (*Alternate*)	
SHRI A. C. KAPOOR	Modern Tiles and Marbles, New Delhi
SHRI J. R. MEHTA	Salem Magnesite Ltd, Salem
SHRI R. VENKATESAN (*Alternate*)	
SHRI K. S. MEHTA	Bharat Pulverising Mill Pvt Ltd, Bombay
SHRI C. CHATTERJEE (*Alternate*)	
DR MOHAN RAI	Central Building Research Institute (CSIR), Roorkee
SHRI R. S. SRIVASTAVA (*Alternate*)	
SHRI MOHAN SHANKRAN	Burn Standard Co Ltd, Salem
DR PRANLAL PATEL	Premier Art & Composition Flooring Co, Bombay
LT COL M. P. SHARMA	Engineer-in-Chief's Branch, Army Headquarters (Ministry of Defence)
SHRI A. P. JAIN (*Alternate*)	

Indian Standard

CODE OF PRACTICE FOR MAGNESIUM OXYCHLORIDE COMPOSITION FLOORS

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 4 February 1982, after the draft finalized by the Flooring and Plastering Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Magnesium oxychloride composition consisting of mixture of calcined magnesite filters and pigments provides a good floor if proper ingredients are mixed in correct proportions and skilled labour is employed in laying the floor. Too wet a mix with excess of magnesium chloride results in sweating of the floor surface. Mineral oils, greases or vegetable oils do not affect the floor. The flooring is not seriously affected by alkalis, but strong alkalis such as soda or harsh cleaning agents tend to attack the protective dressing and thus exposing the flooring to action of water. However, the finished floor needs to be protected from water or excessive moisture by periodic applications of wax polish or oil at regular intervals.

0.2.1 Magnesium oxychloride flooring should not be used in any situation where it would be exposed to damp conditions for long periods, unless other suitable protective measures are taken. The flooring should not also be used in places where it will be exposed to acids or salts continuously. Under normal conditions proper waxing or oiling of floors will provide adequate protection against the attack of moisture.

0.3 This standard was first published in 1956 and later revised in 1962 to bring out a long felt uniformity in the variety of practices being followed by various organisations in the country in efficient laying of this type of floor. It has been revised again to incorporate the improvements found necessary in the light of the usage of the standard and the suggestions made by various bodies implementing it. In this revision guidance has been provided with respect to the composition of chloride solutions to be used for mixes for bottom coat, top coat and for mixes of coves and skirtings. The application and laying has been dealt in detail and the provisions of protection of metal work against corrosion have been suitably elaborated.

The technical committee responsible for preparation of the revision, however, appreciates the need of specifying the maximum percentage of active magnesium oxides and calcium oxide present in the dry mix. Investigation in this regard has been initiated and if opportunity occurs the data will be added in future revisions. The limits of grading for fillers and aggregates as well as the methods of testing the dry mix for various physical properties has been deleted from this revision and are covered in IS : 657-1982* and in IS : 10132-1982†. The former also covers detail specifications of materials prescribed in this code of practice.

0.4 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 : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirement regarding material, application and maintenance of magnesium oxychloride floorings.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Dry Mix — An intimately mixed product consisting of calcined magnesite, suitable fillers, aggregates and pigments which at the time of installation will set to a hard dense product when mixed with gauging solution.

2.2 Pattern Sample — A sample slab 300 x 300 x 20 mm prepared to represent work.

2.3 Wet Mix — The dry mix gauged with magnesium chloride solution of suitable strength.

2.4 Working Consistency — Consistency of the wet mix best suited for laying a given type of floor.

2.5 Matrix — The cementing material consisting of magnesium chloride, calcined magnesite and fillers, which binds the aggregates.

*Specification for materials for use in the manufacture of magnesium oxychloride flooring compositions (*second revision*).

†Method of tests for materials for use in the manufacture of magnesium oxychloride flooring compositions.

‡Rules for rounding off numerical values (*revised*).

3. TYPES

3.1 Magnesium oxychloride composition floors shall be of the types given under **3.2** to **3.8**.

3.2 General Purpose Floor (Trowel Finish) — This type of floor shall contain an adequate amount of calcined magnesite, fillers such as talc, saw dust and asbestos, and fine aggregates which with magnesium chloride of suitable strength make a product which may be trowelled to a dense, smooth and semi-glossy finish. The composition may be applied monolithically. It has wearing properties which make it adaptable for service conditions in offices, ship decking, railway carriages, hospital rooms and wards, residences and industrial floors.

3.3 Heavy Duty Floor (Trowel Finish) — This type is closely related to the general purpose floor. The principal difference is that the quantity of fillers used is minimum and the proportion of aggregates is increased, the aggregates being of a hardness similar to crushed granite. It is adapted for special service conditions in industrial and restaurant kitchens, light industrial plants, corridors, lobbies and business establishments having large usage.

3.4 Non-spark Static Discharging Floor (Trowel or Ground Finish) — This type of floor is similar to the heavy duty floor except that the aggregates used are not siliceous and do not contain materials which will produce a spark when struck with any object. This type of floor is suitable for hospital operation theatre, ammunition and chemical plants or other areas subject to explosion hazards.

3.5 Non-slip Floor (General Purpose) — This type of floor is also similar to heavy duty floor except that a certain proportion of the aggregates is of the abrasive type. This floor is specially adaptable to areas, such as entrance lobbies, ramps, stair treads, landings, etc.

3.6 Mosaic or Terrazzo Floor (Ground Finish) — The matrix in this case is the same as in general purpose, non-sparking or non-slip floors but the aggregate used is marble chip. With each 100 kg of the dry mix, 125 to 200 kg of coarse aggregate is used. The floor is finished by grinding to expose the coarse aggregate. The floor is adaptable for places where a highly decorative effect coupled with wear resistance is required.

3.7 Industrial Granolithic Floor — This type of floor is essentially the same as a mosaic or terrazzo floor in which the matrix is the same as in the heavy duty floor and the coarse aggregate consists of granite chips or similar hard stone chips. With each 100 kg of dry mix, 200 to 225 kg of coarse aggregate is used. This type of floor is recommended for the most severe and abrasive service conditions.

3.8 Base Coat — This type has the maximum resilience and is employed as a light-weight base for the types of oxychloride floors mentioned under **3.2** to **3.7**. Two sub-types are generally employed:

a) Sub-type 1 — General purpose base coat, and
b) Sub-type 2 — Heavy duty base coat.

4. MATERIALS

4.1 All materials used in the manufacture of magnesium oxychloride floor finish should comply with IS : 657-1982*. The test limits for calcined magnesite given in the standard are based on a notional mix of calcined magnesite and saw dust gauged with magnesium chloride and do not obviate the need to test the floor finishing mixes in order to check compliance with as given in **7.2**.

4.1.1 Materials for magnesium oxychloride composition floors shall be supplied in two parts namely dry mix and magnesium chloride.

4.2 Dry Mix

4.2.1 *Dry Mix for All Types of Floors* — The dry mix shall consist of an intimately mixed composition of dry ingredients. If talc is used as a filler, it shall not exceed 5 percent by weight of the dry mix.

4.2.2 *Dry Mix for Non-spark Static Discharging Floor* — The dry mix for non-spark static discharging floor shall contain only such materials in its composition which are free from substances capable of producing a spark when struck or abraded with a steel tool.

4.2.3 *Dry Mix for Non-slip Floor* — About 35 percent by weight of the aggregates used in the dry mix for non-slip floor shall consist of abrasive aggregates which shall be of non-rusting natural (emery) or manufactured (fused alumina) product, the particles of which are of irregular shape and of slightly open texture.

5. DESIGN CONSIDERATIONS

5.1 Suitability for Various Conditions of Use — A magnesium oxychloride floor finish is suitable for industrial, commercial or domestic use, depending on the type of fillers, but is not recommended where it may be exposed to high humidity or to damp conditions. It should not be exposed to the action of sea water.

*Specification for materials for use in the manufacture of magnesium oxychloride flooring compositions (*second revision*).

Where the base is in direct contact with the ground it is essential that an efficient damp-proof layer of the sandwich membrane type should be incorporated in the floor.

5.2 Pattern Sample — The floor finish should be selected by reference to a sample of size 300 x 300 x 20 mm to which the finished work should conform in hardness (*see* **7.2.3**), nearness to colour, texture, number and thickness of coats.

5.3 General Properties — The durability of a magnesium oxychloride floor finish is good and the surface, if properly maintained, is free from dusting and splintering. If properly laid and maintained it is easily cleaned and of good appearance. Wood-filled magnesium oxychloride floor finish is moderately warm and resilient; it is strong and hardwearing yet light in weight.

5.4 Resistance to Chemical Attack

5.4.1 *Water* — The floor finish, if not adequately protected by oiling or waxing, gradually disintegrates under continuous exposure to water.

5.4.2 *Alkalis* — The floor finish is not seriously affected by alkalis but strong alkalis such as soda or harsh cleaning agents attack the protective dressing and expose the floor finish to the action of water.

5.4.3 *Acids* — The floor finish is subject to attack by acids. Adequate protection against occasional contact with dilute acids may be obtained by oiling or waxing.

5.4.4 *Salts* — The floor finish is subject to attack by continuous exposure to salts; under normal conditions of use, some protection may be obtained by oiling or waxing.

5.4.5 *Organic Materials* — The floor finish is not affected by non-drying oils, fats, greases and organic solvents, but these materials may attack the protective dressing and expose the floor finish to attack by other agencies.

5.5 Slipperiness — If the surface is treated in the manner described in **6.1** it should not be slippery. Special non-slip surfaces may be obtained by incorporating abrasive grit in the floor finish.

5.6 Sweating — Sweating of the magnesium oxychloride floor finish is characterized by beads of magnesium chloride solution forming on the surface in humid atmospheres and is not merely the result of the condensation of moisture on a cold surface. The tendency to sweat is, to some extent inherent in the material, since magnesium chloride, an essential ingredient, readily takes up moisture from damp air.

A floor finish that is properly laid and maintained does not sweat appreciably under normal indoor conditions.

5.7 Efflorescence — If the ingredients of the floor finish mixture comply with IS : 657-1982*, there should be little tendency towards efflorescence.

5.8 Thickness of Floor Finish — The thickness of the floor finish shall be decided by the designer. The thickness, however, shall be not less than 10 mm.

5.9 Liability of Cracking — The magnesium oxychloride floor finish should not expand, lift, nor develop shrinkage cracks, but it may do so readily if either the quality of materials used or the workmanship is inferior, or if the base fails.

Contamination of the floor finish mixtures with free lime tends to cause expansion. The floor finish is liable to lift or crack if laid on a light weight concrete base or on a dense screed which is not firmly bonded to the base.

5.10 Coves and Skirtings — Coves and skirtings can be formed with magnesium oxychloride floor finishing material. Contact between the oxychloride mix and the wall plaster should be avoided by the use of an intervening fillet of wood or other suitable material. A sand cement rendering on the wall surface is desirable as a backing.

5.11 Corrosion of Metalwork — Metalwork, such as partitions, or gas, water and electrical services in contact with a magnesium oxychloride floor finish is liable to corrode and should be isolated from the floor finish by not less than 25 mm of uncracked dense concrete or protected by a coating of bitumen or coal tar composition (*see* Appendix A) or by suitable material.

6. APPLICATION

6.1 Preparation of the Base

6.1.0 The base shall be sound, rigid, free from rising damp and not unduly porous. The base may be of cement concrete, or timber. Highly absorbent materials such as pumice concrete, breeze or clinker concrete and aerated concrete shall not be used unless a layer of damp proof coarse is laid between the base and the main floor.

*Specification for materials for use in the manufacture of magnesium oxychloride flooring compositions (*second revision*).

6.1.1 *New Cement Concrete Base* — The base or screed should have a true and even surface which has been slightly coarsened by means of a stiff broom or wire brush and should be free from ridges and hollows. A steel trowelled finish is not desirable. The levels of the base should be such that the specified thickness of magnesium oxychloride can be applied uniformly. It is of particular importance to ensure that there is a minimum cover of at least 25 mm of impervious uncracked dense concrete or a screeded bed over any base containing reinforcement either as rods or filler joists. Any magnesium chloride solution going access to the reinforcement may cause serious damage. New concrete to which oxychloride composition is to be applied directly should be allowed to age for at least 28 days before the application of oxychloride composition. No hardening agent other than water shall be used in the concrete. No lime admixture shall be allowed in the concrete where oxychloride is to be applied directly to the concrete.

6.1.2 *Existing Concrete Base* — This should be checked for absorption in accordance with Appendix B. The existing cement concrete base should be roughened to a suitable degree by tooth chisling, picking or by any other suitable process before oxychloride composition is laid.

6.1.3 *Timber Base* — A suitable mechanical key should be provided between the timber base and the floor finish such as dove tailed wooden battens or galvanized wire netting firmly secured to the base at approximately 200 mm centres with galvanized clout nails driven home at joints of the mesh. An equal number of galvanized clout nails should be used at 200 mm centres and be left proud of the base.

6.1.3.1 The moisture content of the timber base shall not exceed the limits specified for the corresponding zones given in IS : 287-1973*.

6.2 Preparation of Floor Finish Mixture

6.2.1 *Magnesium Chloride Solution* — Magnesium chloride both before and after it has been dissolved should not be allowed to come into contact with any floors or walls. Whenever possible, the work of breaking up and dissolving the solid material or diluting the solution should be performed outside the building. Where the work has to be done inside, adequate protection should be provided under and around all vessels containing the chloride by means of tarpaulins, trays or other suitable devices. The solid chloride should be broken up and dissolved in a watertight vessel by covering the same with clean water, that is, clean and free from deleterious acids, alkalis, salts or organic material and stirring the same from time to time. The solution should be allowed to stand over night so that residue,

*Recommendations for maximum permissible moisture content of timber used for different purposes (*second revision*).

dust, impurities, etc, may settle to the bottom. The clean concentrated solution should be well stirred after each dilution before determining the specific gravity. The solution shall be prepared sufficiently early so that it is cooled to room temperature before use. The specific gravity of the chloride solution should be maintained at a selected value within the limits shown in Table 1. This value will depend upon the type of work, the nature of the base and ambient temperature conditions.

TABLE 1 SPECIFIC GRAVITY OF MAGNESIUM CHLORIDE SOLUTION

(*Clause* 6.2.1)

Flooring Finish Mix (1)	Baume (Be) Scale (2)	Specific Gravity (3)
Single coat and top coat	20° to 24°	1·16 to 1·20
Bottom coat, coves and skirtings	18° to 20°	1·14 to 1·16

6.3 Proportions of Dry Materials — The proportions of the dry materials may be varied within certain limits, in order that the properties of the finished product may be best suited to the proposed conditions of use. Proportioning should be done by weight and the dry materials should be thoroughly mixed by machine.

6.3.1 *Proportion of Chloride Solution* — A strong floor finishing material may be formed by adding only sufficient magnesium chloride solution to dampen the dry mixed materials. For single coat and top coat mixes, some additional solution is usually required to enable the mix to be placed and brought to a smooth finish. The extra chloride does not improve the strength of the mixture and the use of excessive amount will have harmful effects.

6.3.1.1 The amount of solution required for a given weight of dry mixture cannot be stated with accuracy. However, the following guidelines are provided:

a) *Bottom coat floor finish mixes* — Bottom coat floor finish mixes should be gauged to a damp but not plastic consistency, just sufficient solution being used to enable the mix to bind together when thoroughly compacted by tamping. As a convenient practical guide, a mix from which liquid can be pressed by squeezing it firmly in the hand should be considered unduly wet.

b) *Bottom coat mixes for coves and skirtings* — Bottom coat mixes for coves and skirtings should be gauged to a consistency just sufficiently plastic to allow the mix to be spread on the wall.

c) *Single coat and top coat mixes* — Single coat and top coat mixes should be gauged with no more solution than is needed to produce a stiff mix which is just sufficiently plastic to be spread with trowel.

6.4 Final Mixing — The mixing of the chloride solution with the dry mix should be carried out in trough or box or on a bunker and in no case directly on the floor. The quantity of material mixed in any one batch should be such as can be laid easily before initial set begins. The addition of further quantities of chloride solution during laying should not be permitted. If the mix becomes too stiff to be worked, it should be discarded.

6.5 Laying the Floor Finish — If the floor finish is to be laid on a concrete base, this should be thoroughly dry before commencement of laying.

The floor finish should not be laid over or near any localized source of heat (*see* **6.7**).

6.5.1 *Size of Bay* — The floor finish should be laid between battens trued and levelled to ensure that the thickness of each coat complies with the requirements. The optimum size of bay will depend upon the temperature conditions at the time of laying and, generally, the controlling factor would be the time taken to obtain adequate compaction of the floor finish.

6.5.2 *Jointing* — Where a dimension of floor surface in either direction is 7·5 m or more, joint shall be provided at intervals of not more than 5 m. These may be in the form of mastic insertions or may consist of strips about 5 mm in width of hard wood, vulcanite, non-ferrous metal or other suitable material bedded flush with the surface of the flooring materials. Where the flooring is laid over concrete sub-floor, it is important that any joint in the flooring should be arranged to coincide with joint in the sub-floor.

6.5.3 *Laying* — A concrete base or screed should be damped before laying the floor, finish, but excessive wetting or flooding should be avoided. The damping should be carried out with either:

a) A solution of magnesium chloride which should be not weaker than 12° Be nor stronger than 14° Be, or

b) A wash composed of a 14° Be magnesium chloride solution and magnesia mixed to the consistence of cream and brushed over the base.

6.5.3.1 If a thickness greater than 40 mm is required, the extra thickness should be obtained by laying an additional coat or coats, each of which should be not more than 20 mm thick.

6.5.3.2 For skirtings on a sand cement rendering the mix may be applied in a single coat not less than 5 mm thick. Then the backing is unrendered; the mix should be applied in two coats to a total thickness of not less than 15 mm.

6.5.3.3 Each coat should be thoroughly compacted (not merely spread with a trowel) but care should be taken that laitance is not formed upon the surface. Bottom coats should also be compacted by tamping.

6.5.3.4 When the top coat has hardened sufficiently, its surface should be felt finished after trowelling. Scraping should only be undertaken on ornamental work such as mottled finishes.

6.5.3.5 On new concrete surface, the laying shall be done at least after 28 days of concreting.

6.6 Curing — Rapid drying of the floor finish should be avoided for at least the first 24 hours after laying. It should be allowed to set and harden, undisturbed for at least three days before being opened to traffic. The setting and hardening process is affected by the surrounding temperature conditions and, in cold weather, it may be advisable to allow a longer period before the floor is put into use. In any case, some weeks should necessarily elapse before the floor finish is fully dried and hardened and, for this reason, it should not be exposed to abnormally heavy traffic during this period (*see* **7.2.3**).

6.7 Protection of the Surface — During laying and until the floor finish has hardened, it should not be exposed to extremes of heat or cold. The surface should be protected from the direct rays of the sun and rain.

6.8 Surface Treatment — Any efflorescence should be removed by dry steel wool, the floor finish should then be washed with clean warm water changed frequently and wiped dry. This treatment should be continued at regular intervals until the efflorescence has ceased. At this stage the floor finish may be treated with a mixture of equal volumes of double boiled linseed oil (*see* IS : 77-1976*) and turpentine (*see* IS : 533-1973†) or with a suitable wax or drying oil.

6.9 Mottled Floor Finish — The magnesium oxychloride floor finish to give a mottled effect should always be laid in two-coat work. The procedure and precaution should be substantially the same as for normal two-coat work.

---

*Specification for linseed oil, boiled, for paints (*second revision*).

†Specification for gum spirit of turpentine (oil of turpentine) (*first revision*).

7. INSPECTION AND TESTING

7.1 Inspection — The work should be inspected before laying is commenced, while in progress and after completion, special attention being paid to the following points:

a) General condition of the base,
b) Protection of all metal work liable to corrosion,
c) Correct mixing,
d) Proper compaction, and
e) Correct curing.

7.2 Testing

7.2.1 *General* — The testing of the flooring composition shall be carried out on specimens made from samples or from the mixes being laid. Samples should be taken from at least three different parts of the mixing vessel and thoroughly mixed together. For mottled floor finishes, the different coloured mixes required for the surface should be tested individually.

7.2.2 *Physical Requirements* — The physical properties of the mixes used shall comply with the following requirements:

a) *Setting Time* — The setting time of single coat and top coat mixes when tested in accordance with the method described in IS : 10132-1982* on a sample taken immediately after the batch has been mixed and brought to its final working consistency ready for laying, should be within the following limits:

Initial Setting Time	1 to 2 hours
Final Setting Time	3 to 6 hours

b) *Strength* — The transverse and compressive strength when tested in accordance with the method described in IS : 10132-1982* shall be as given in Table 2.

c) *Linear Change* — The average change in length of four beams made, stored and tested in accordance with the method described in IS : 10132-1982* should not exceed the following:

Expansion	0·15 percent
Contraction	0·25 percent

*Method of test for materials for use in the manufacture of magnesium oxychloride flooring composition.

TABLE 2 PHYSICAL REQUIREMENTS OF MAGNESIUM OXYCHLORIDE FLOORING COMPOSITION

(*Clause* 7.2.2)

Sl No.	Type of Flooring Composition	Minimum Transverse Strength		Minimum Compressive Strength	
		7 days N/mm²	28 days N/mm²	7 days N/mm²	28 days N/mm²
(1)	(2)	(3)	(4)	(5)	(6)
1.	General purpose floor (trowel finish)	7	10·5	24·5	31·5
2.	Heavy duty floor (trowel finish)	10	14	28	35
3.	Non-spark static discharging floor (trowel or ground finish)	8·5	12·5	28	35
4.	Non-slip floor (general purpose)	10	14	28	35
5.	Mosaic or terrazzo floor (ground finish)	7	10·5	24·5	31·5
6.	Industrial granolithic floor	10	14	28	35
7.	Base coat: Sub-type 1	7	8·5	17·5	24·5
	Sub-type 2	11	14	28	35

Note 1 — In the case of flooring compositions for mosaic or terrazzo floor and industrial granolithic floor, the dry mix shall be sieved through IS Sieve 1·18 mm and the material passing through this sieve tested for ascertaining the physical requirements.

Note 2 — The strength of any mix, if tested at an age of 56 days, should not show a decrease of more than 10 percent on the strength at 28 days.

7.2.3 *Hardness of Finished Flooring* — The floor finish, when tested by the method described in IS : 10132-1982* should attain, within two months of laying, the same hardness as that of the pattern sample (*see* 5.2) or other agreed surface.

8. MAINTENANCE

8.1 General — The floor surface should be cleaned by scrubbing with warm water only. A mild household soap free from alkali may be used occasionally, but soda, household cleaning powders or sweeping powders, should not be used. The surface should then be treated with a wax polish or a drying oil dressing.

*Method of test for materials for use in the manufacture of magnesium oxychloride flooring composition.

9. STORAGE OF MATERIALS

9.1 Magnesium chloride and the dry mix containing magnesia should be stored in the containers away from heat, draught, rain and dampness.

APPENDIX A

(*Clause* 5.11)

PROTECTION OF METALWORK

A-1. Where necessary metalwork should be treated with an anti-corrosive coating that adheres well to the metal. The surface of the metal should be thoroughly clean and free from rust and loose mill scale. The coating material should be capable of producing a non-brittle film and should be applied so as to form a substantial impervious coating over the whole of the surface requiring protection. Suitable materials are:

a) A bituminous or a coal tar composition, with or without added fillers, intended for hot application; and

b) A solution of bitumen or of coal tar in a volatile solvent with or without added fillers, intended for cold application, but excluding bituminous paints containing drying oils.

A-2. Coal tar for use in either of the compositions (a) or (b) should be prepared as follows:

a) The crude coal tar should be heated to about 120°C and maintained at that temperature until all water and volatile matter is removed.

The percent by weight of hydrated lime should then be stirred in and stirring and heating continued for 30 minutes.

When the coal tar is required for hot application, the addition of a filler, such as 5 percent by weight of asbestine, will help the material to resist flow after application.

Thinners should not be added to any of the compositions.

APPENDIX B

(*Clause* 6.1.2)

METHOD OF TESTING THE BASE FOR ABSORPTION

B-1. Concrete bases should be tested for absorption in the manner described below to ensure that the floor finish mix is not adversely affected by loss of magnesium chloride solution. The test should be carried out at three agreed positions on the floor.

At each position, a reservoir 300 mm sq by 15 mm deep should be made on the floor by building walls of putty or plasticine.

One half-pint of water should then be poured into the reservoir and the time noted. If, after five minutes, the water at any place has been completely absorbed into the surface, the floor should be deemed unduly absorbent.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m²
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m²

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31 **Telegrams : Manaksanstha**

Regional Offices:

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	27 50 90
Southern : C. I. T. Campus	MADRAS 600113	41 24 42
Northern : B69, Phase VII	S. A. S. NAGAR (MOHALI) 160051	—

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	22 48 05
Gangotri Complex, Bhadbhada Road, T. T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
5-8-56C L. N. Gupta Marg	HYDERABAD 500001	22 10 83
R 14 Yudhister Marg, C Scheme	JAIPUR 302005	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	4 72 92
Patliputra Industrial Estate	PATNA 800013	6 28 08
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

Printed at Manipal Power Press, Manipal, India