OXYCHLORIDE CEMENT ASSOCIATION, INC.
1028 CONNECTICUT AVENUE
WASHINGTON 6, D. C.

Standard Specifications

For

OXYCHLORIDE MAGNESIA (MgO)

OCA 500-10-50 Revised October 31, 1950

SCOPE

1. These specifications cover the chemical and physical requirements for oxychloride magnesia (MgO) suitable for use in magnesium oxychloride cements.

DEFINITION

2. Oxychloride magnesia, also referred to in the trade as oxychloride magnesite, plastic calcined magnesite, or caustic calcined magnesia, is essentially magnesium oxide produced by the calcination of natural magnesite (magnesium carbonate) or other magnesium compounds, and which will react with the chloride or sulfate content of solutions of magnesium chloride or magnesium sulfate of suitable concentrations to form a plastic cement capable of setting and binding inert organic and inorganic fillers and aggregates into a hard, strong and durable mass.

CHEMICAL REQUIREMENTS

3. Oxychloride magnesia for use in flooring formulations shall conform to the chemical requirements prescribed in Table I.

TABLE I - CHEMICAL REQUIREMENTS

(a)	Ignition loss, per cent, maximum	5.0
(b)	Active lime, per cent, maximum	1.5

PHYSICAL REQUIREMENTS

4. Oxychloride magnesia for use in flooring formulations shall conform to the physical requirements prescribed in Table II.

TABLE II - PHYSICAL REQUIREMENTS

(a)	Sieve Analysis	
	Total retained on No. 200 (74 micron) sieve, per cent, maximum	8.0
(b)	Setting Time	
	Initial set, minutes, minimum	100
	Initial set, minutes, maximum	250
	Final set, minutes, maximum	420

(c) Volume Change, Linear

(1) *Gross (or net) contraction, per cent, maximum . . . . 0.60 .35

(2) *Non-plastic contraction, per cent, maximum . . . . . 0.20 .15

(3) *Expansion, measured at 7 days from time of maximum contraction, per cent, maximum . . . . . 0.25 .17

* Defined in methods of test, A.S.T.M. Designations C 253-50T and C 252-50T.

(d) Transverse Strength

Modulus of rupture measured at age of seven days, average of values for 9 breaks, pounds per sq. in., minimum 1600

(e) Compressive Strength

Measured at age of 7 days, average of values for 9 cubes, pounds per sq. in., minimum 5000

summer 115-125 — NORMAL
winter 100-115
+130 min SLOWER
60-95 " FAST

PACKAGING AND MARKING

5. Packaged Shipments

(a) When oxychloride magnesia is delivered in bags the items of information listed in the Table III shall be palinly indicated on each bag:

TABLE III - MARKINGS ON BAGS

(1) Name of manufacturer

(2) Brand name

(3) Lot number

95, 105

(b) The same information as prescribed in Table III shall be provided in shipping advises accompanying each shipment.

(c) A bag of oxychloride magnesia shall contain not less than 75 lb.

6. Bulk Shipments - The shipping advises accompanying each bulk shipment shall provide the same information as prescribed in Table III.

STORAGE

7. The oxychloride magnesia shall be stored in such a manner as to permit easy identification of each shipment and in a suitable weather-tight building which will protect the magnesia from dampness.

REJECTION

8. (a) The oxychloride magnesia may be rejected if it fails to meet any of the requirements of these specifications as determined by tests completed within 40 days after receipt of the shipment.

(b) Packages varying more than 5 per cent from the specified weight may be rejected; and if the average weight of packages in any shipment, as shown by 50 packages taken at random, is less than that specified the entire shipment may be rejected.

METHODS OF SAMPLING AND TESTING

9. The oxychloride magnesia shall be sampled, and the properties enumerated in these specifications shall be determined in accordance with the following tentative methods of the American Society for Testing Materials:

(a) Sampling - Method for Sampling Magnesium Oxychloride Compositions and Ingredients, A.S.T.M. Designation C237-49T.

(b) Chemical Requirements - Methods for Determination of Ignition Loss and Active Calcium Oxide in Magnesium Oxide for Use in Oxychloride Cements, A.S.T.M. Designation C247-50T.

(c) Physical Requirements - As specified in Method for Testing Magnesia (MgO) for Oxychloride Cements, A.S.T.M. Designation C246-50T; and in Method for Sieve Analysis of Plastic Calcined Magnesia, A.S.T.M. Designation C239-49T.

Oxychloride Cement Association, Inc.,
1028 Connecticut Ave., N.W.
Washington 6, D. C.

Tentative Specifications

For

MAGNESIUM CHLORIDE ($MgCl_2.6H_2O$)

OCA 500-11

Revised December 2, 1946

SCOPE

1. These specifications cover magnesium chloride to be used for Oxychloride Cement when tested in accordance with OCA Designation 400-12.

CHEMICAL COMPOSITION

2. Any dry form of magnesium chloride used in preparation of the gauging solution shall comply with the following requirements:

Magnesium Chloride ($MgCl_2.6H_2O$),	min., per cent	99.0
	max., per cent	107.0
Calcium Chloride ($CaCl_2$), max., per cent		0.5
Total Alkali Chlorides, max., per cent		1.0
Magnesium Oxide, max., per cent		0.1

If a solution of magnesium chloride is supplied, the proportions of calcium and alkali chlorides to magnesium chloride shall not exceed those permitted for a dry form of magnesium chloride.

PACKING AND MARKING

3. The magnesium chloride shall be delivered in moisture-proof bags containing approximately 100 lb. each, or in air-tight steel drums weighing not more than 450 lb. each. The name of the manufacturer, the lot number, the approximate net weight, and the percentage of magnesium chloride guaranteed by the manufacturer shall be legibly marked on each container.

INSPECTION

4. Every facility shall be provided the purchaser should he elect to have his representative sample the material at the place of manufacture. If the purchaser decides to sample the material after delivery it is understood that a minimum content of 97 per cent $MgCl_2.6H_2O$ shall be permissible.

REJECTION

5. The magnesium chloride shall be rejected if it fails to conform to any of the requirements of these specifications.

Oxychloride Cement Association, Inc.,
1028 Connecticut Avenue,
Washington 6, D. C.

Tentative Specifications

For

MAGNESIUM SULFATE EPSOM SALTS TECHNICAL GRADE, $MgSO_4 \cdot 7H_2O$

OCA 500-12

Revised March 2, 1948

SCOPE

1. These specifications cover magnesium sulfate to be used for oxychloride cement when analyzed by methods of analysis set forth in the Tentative Method for Analysis of Magnesium Sulfate (Designation____**) of the American Society for Testing Materials.

COMPOSITION

2. The magnesium sulfate shall conform to the following requirements in respect to physical and chemical composition:

Appearance - Small colorless crystals, usually needle-like.

$MgSO_4$ (Anhydrous) - - - - - - - - - - - -	not less than 48.3%
or as $MgSO_4 \cdot 7H_2O$ - - - - - - - - - -	not less than 99.0%
MgO (total alkalinity) - - - - - - - - - -	not more than 0.1%
NaCl (total chloride) - - - - - - - - - -	not more than 0.1%

PACKING AND MARKING

3. The magnesium sulfate shall be delivered in moisture-proof bags or sacks containing approximately 100 pounds each, or in air-tight steel drums weighing not more than 450 pounds each. The name of the manufacturer, the lot number, and the approximate net weight shall be legibly indicated on each container.

INSPECTION

4. Every facility shall be provided the purchaser, should he elect to have his representative sample the material at the place of manufacture. If the purchaser decides to sample the material after delivery, it is understood that a ± 2 percent variation in content of $MgSO_4 \cdot 7H_2O$ from the chemical composition prescribed in Section 2 shall be permissible.

REJECTION

5. The magnesium sulfate shall be rejected if it fails to conform to any of the requirements of these specifications.

A.I.A. File No. 23-D
O.C.A. Specification 100-50

Tentative Specifications

FOR

OXYCHLORIDE COMPOSITION BASECOAT FLOORING

AND

ITS INSTALLATION

OXYCHLORIDE CEMENT ASSOCIATION, INC.
1028 CONNECTICUT AVENUE
WASHINGTON 6, D. C.

A.I.A. File No. 23-D
O.C.A. Specification 100-50

Tentative Specifications

for

OXYCHLORIDE COMPOSITION BASECOAT FLOORING

AND

ITS INSTALLATION

488.4

OCA-100-50

Revised June 30, 1950

SCOPE

1. These specifications cover Oxychloride Composition Basecoat Flooring, with respect to quality of materials and workmanship, installation, finishing, and testing.

TYPES

2. Oxychloride Composition Basecoat shall be furnished in one of the following types, as specified:

Type 1. General Purpose
Type 2. Heavy Duty

MATERIALS

3. Dry Mix.-(a) The oxychloride composition shall consist of an intimately machine-mixed compound of dry ingredients, which at the time of installation, will set to a product as herein required, when mixed with the gauging solution specified.

(b) All ingredients shall be dry, and shall be accurately proportioned and compounded by weight, mechanically mixed, and shall consist of caustic-calcined magnesia conforming to requirements of specification OCA Designation 500-10-50; inert fillers, such as talc, silex, marble flour, asbestos, wood flour, and sawdust; inert aggregates (which are not affected by cleaning compounds), such as sand, fine crushed stone, or other fine, chemically inert, low-absorbent, physically strong aggregates. All materials used shall be alkali resistant and free from deleterious materials, such as clay and silt. (See Note 1.)

(c) The dry mix of oxychloride basecoat composition which is to be used in contact with aluminum alloys shall contain 1.5 per cent (by weight) of potassium dichromate.

(d) Aggregates and fillers shall be uniformly graded in the size ranges specified as follows:

Sieve U. S. Number*	Per Cent Passing			
	Type 1 Type 2		Type 1	Type 2
	Wood Flour, Sawdust and Asbestos	Talc, Silex Marble Flour	Sand, Fine Crushed Stone, etc.	Sand, Fine Crushed Stone, etc.
6	100			100
30			100	
50	80 max.		20 max.	30 max.
100		100		7 max.
200		95 max.		

(e) The use of premixed dry ingredients which have become lumpy shall not be permitted.

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* As designated by A.S.T.M. Standard E 11-39

4. Gauging Solution. - (a) The gauging solution shall be a water solution of magnesium chloride meeting requirements of OCA Specification Designation 500-11-46. The specific gravity of the gauging solution shall be 22.0 ± 0.5° Baumé when tested in accordance with OCA Specification Designation 350-11-50. Water used shall be clean and free from deleterious amounts of acids, alkalies, salts, or organic materials. (See Note 2).

(b) Alternate Gauging Solution. - As an alternate for that specified in Section 4 (a) a gauging solution containing magnesium sulfate may be used. This shall be a water solution of magnesium chloride and magnesium sulfate complying with the requirements of the Specifications for Magnesium Chloride (OCA Designation 500-11-46), and the Specifications for Magnesium Sulfate (OCA Designation 500-12-48), respectively, of the Oxychloride Cement Association. The weight of the magnesium sulfate, calculated as $MgSO_4 \cdot 7H_2O$, shall be ten per cent (10%) of the weight of the magnesium chloride, calculated as $MgCl_2 \cdot 6H_2O$. The specific gravity of the gauging solution shall be 24.0 ± 0.5° Baumé at 70 F when tested in accordance with method OCA Designation 350-11-50. Water used shall be clean and free of deleterious amounts of acids, alkalies, salts, and organic materials. (See Note 2)

(c) Solutions shall be prepared sufficiently in advance to permit their being cooled to at least room temperature before using. Care shall be exercised to insure complete solution of all crystalline material and to insure thorough mixing.

5. Certification of Raw Materials. - Contractor shall certify to the architect or owner that the magnesium oxide, magnesium chloride, magnesium sulfate, fillers, and aggregates conform to the requirements of the specifications designated in Sections 3 and 4.

PROPORTIONING AND MIXING

6. (a) Composition. - The flooring shall be compounded strictly according to the formula used in making the sample or samples approved by and on file with the architect or owner. The composition shall be such as to yield a finished floor essentially the same as or better in appearance than the approved samples.

(b) Mixing. - The pre mixed dry ingredients shall be placed in a clean mortar box or clean mechanical mixer, the specified gauging solution added in an amount corresponding to not less than 4.3 lb. of MgO in the dry mix per gallon of gauging solution (not more than 0.23 gal. of gauging solution per pound of MgO), and the mass mixed until it is free from lumps. In no case shall the material be retempered for use by addition of gauging solution after it has become too stiff to be applied.

(c) Consistency. - The wet mix, prepared as specified in Section 6 (b), shall slump not more than seven inches when tested in accordance with Specification OCA Designation 350-12-50. Sample for test shall be taken immediately after completion of mixing.

CONDITIONING OF WORKING AREA

7. In spaces where the floor is to be laid the temperature shall not be less than 50 F. and shall not exceed 95 F. until final set is attained. The prevailing temperature shall be maintained substantially uniform in a stipulated range, and shall not decrease more than twenty degrees from the temperature at the time of installation for at least twenty-four hours after placing. Heating shall not be accomplished by the use of salamanders. Convection heating may be employed, provided local overheating is avoided, or air level is not in excess of 500 cu. ft. per min. at any location. Openings are to be kept closed or so arranged as to prevent harmful circulation of air.

All water and steam connections from which leaks might affect the oxychloride flooring shall be made tight before placing of the plastic mix is begun.

Note:-It is recognized that, with the specified temperature range, conditions of low relative humidity may be encountered in arid areas which can deleteriously affect linear change characteristics and strength of an installation. Humidification of the atmosphere of the working area is recommended when such conditions are encountered.

PREPARATION OF SUBFLOORS

8. (a) The Oxychloride Composition Basecoat shall be laid only on a subfloor which has been prepared in accordance with the Specification for Preparation of Subfloors to Receive Oxychloride Composition Flooring, OCA Designation 200-50.

(b) Prepared subfloors or basecoats shall be protected from injury and the surface shall be free from any substance deleterious to the formation of a bond, such as water, dust and grease.

METHOD OF APPLICATION

9. (a) When the basecoat is to be laid on an absorptive surface ~~(such as concrete, stone or ceramic subfloor)~~, this surface shall be thoroughly dampened with gauging solution of full strength, leaving no puddles. The surface shall then be broomed with a thin slurry prepared from gauging solution and either the dry mix or neat caustic-calcined magnesia. Areas prepared in this manner shall be covered with the basecoat composition as specified in Section 9 (c) before they become dry or acquire a glaze.

(b) When the basecoat is laid on a non-absorptive surface where an anchoring medium is employed, a thin layer of the basecoat composition shall be thoroughly worked into and around the anchors. Application of additional basecoat composition shall then be made as specified in Section 9 (c).

(c) After preparation of the subfloor surfaces as specified in Section 9 (a) or 9 (b) a thin layer of the basecoat composition shall be thoroughly worked into all recesses and depressions by scraping with a trowel just prior to spreading the basecoat mix. Basecoat composition shall then be spread to the specified thickness and leveled by darbying. At an appropriate time prior to final set, the surface of the basecoat shall be broomed in one direction to produce a finished surface approximating that of tapestry brick. The markings left by brooming shall have a minimum depth of 1/32 in. and a minimum width of 1/32 in. and shall be spaced at a maximum distance of 1/4 in. apart.

THICKNESS

10. (a) The a[redacted] thickness of ~~the floor~~ shall conform to the following requirements:

	Wood Subfloor		All Other Subfloors	
	Min.	Max.	Min.	Max.
Type 1	3/8"	3/4"	3/8"	1"
Type 2	3/8"	1½"	3/8"	1½"

(b) Where it is necessary to use thickness greater than maximum specified, the installation shall be made in two or more applications.

PROTECTION OF FINISHED INSTALLATION

11. The completed basecoat shall be protected from injury and kept clean and dry until it is surfaced.

PHYSICAL REQUIREMENTS

12. Oxychloride Composition Basecoat shall conform to the following physical requirements when tested in accordance with methods listed in Section 17:

	Type 1	Type 2
Density, maximum, pounds per cubic foot	90	------
Transverse strength, minimum, pounds per sq. in. at 7 days	1000	1600
Compressive strength, minimum, pounds per sq. in. at 7 days	3000 ?	5000 ? 6000 ?
Linear change, 1 to 7 days, within limits, %	+0.040 to -0.050	+0.040 to -0.050

WORKMANSHIP

13. The prepared mix shall be laid to the specified thickness, in accordance with drawing details, by qualified workmen, producing the finished surfaces as specified.

SUPERVISION

14. The contractor shall give his personal supervision to the work or provide a competent foreman or superintendent with authority to act for him, who shall be present throughout the entire progress of the installation.

INSPECTION

15. (a) The architect or owner may reserve the right to conduct any inspection or make any test deemed necessary to determine conformance with the requirements of this specification.

SAMPLING

16. (a) The architect or owner may, at the time of or prior to installation take representative composite samples, for testing, of materials from each lot offered for delivery, in accordance with Specification OCA Designation 350-13-49.

Premixed dry ingredients	20 pounds
Gauging solution	2 gallons
Additives (Notes 1 and 2)	1 pound

(b) Samples thus obtained shall be placed in separate clean, dry, airtight, waterproof containers, securely closed, distinctly labeled and dated. Any tests performed shall be completed within 30 days from date of sampling.

METHODS OF TEST

17. All methods of test shall conform to those of the American Society For Testing Materials or the Oxychloride Cement Association, Inc., designated as follows:

	A.S.T.M.	OCA
Sieve Analysis of Magnesium Oxychloride Compositions	C 238-49T	300-10-49
Sampling Oxychloride Compositions and Ingredients	C 237-49T	350-13-49
Field Determination of Specific Gravity of Gauging Solution	C 230-50T	350-11-50
Slump Test for Consistency of Magnesium Oxychloride Cements	C 249-50T	350-12-50
Mixing Oxychloride Cement Compositions with Gauging Solution	C 241-50T	300-20-50
Consistency of Magnesium Oxychloride Cements by Means of a Flow Table	C 230-50T	300-12-50
Setting Time of Magnesium Oxychloride Cements	C 234-50T	300-15-50
Transverse Strength of Magnesium Oxychloride Cement Compositions	C 236-50T	300-13-49
Compressive Strength of Magnesium Oxychloride Cement Compositions	C 232-50T	300-14-49
Linear Change of Magnesium Oxychloride Cements		300-16-50
Magnesia for Magnesium Oxychloride Cements:		
Ignition Loss of Magnesia	C 242-50T	400-1-50
Active Calcium Oxide in Magnesia		400-2-50
Sieve Analysis of Plastic Calcined Magnesia	C 239-49T	400-3-49
Testing, for Magnesium Oxychloride Cements	C 246-50T	400-4-50
Magnesium Chloride Analysis of	C 247-50T	400-12-50
Bulk Density of Oxychloride Compositions	C 248-50T	300-19-49
Magnesium Sulfate, Analysis of	C 244-50T	400-13-50

PACKAGING, MARKING AND STORAGE

18. (a) The contractor shall take such measures as may be necessary to insure the safe delivery and storage of all materials used in oxychloride cement compositions on the job, such measures being adequate to avoid damaging moisture pick-up or other contamination from sources existing at the job site.

(b) In addition to other markings, each package shall bear the specific name of the material and, in the case of premixed dry ingredients, the date of mixing.

(c) All dry premixed, compositions shall be packaged in suitable containers and kept under adequate conditions to prevent damaging moisture pick-up. When aged longer than sixty days from date of mixing, the composition shall be tested, not more than ten days before using, and shall at the time of testing meet the requirements specified herein.

(d) If requested or if samples are to be tested, the flooring contractor shall supply his recommended ratio of gauging solution to dry mix.

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Note 1. Additives intended to make the composition water-repellent or water-resistant, or to lend valuable properties to the composition, may be added to the dry ingredients provided the finished flooring meets specified requirements.

Note 2. If any water soluble ingredients other than specified is used in the gauging solution, it shall be added to the full strength gauging solution, and such material may be used only if the finished floor meets specified requirements and only provided the appearance and durability of the finished floor are not adversely affected.

Oxychloride Cement Assn., Inc.
1028 Connecticut Ave., N. W.
Washington 6, D. C.

A.I.A. File No. 23-D
O.C.A. Specification 101-50

Tentative Specifications

FOR

GENERAL PURPOSE OXYCHLORIDE COMPOSITION FLOORING

AND

ITS INSTALLATION

OXYCHLORIDE CEMENT ASSOCIATION, INC.
1026 CONNECTICUT AVENUE
WASHINGTON 6, D. C.

A.I.A. File No. 23-D
O.C.A. Specification 101-50

Tentative Specifications

for

GENERAL PURPOSE OXYCHLORIDE COMPOSITION FLOORING

AND

ITS INSTALLATION

A-88-2

OCA-101-50

Revised June 30, 1950

SCOPE

1. These specifications cover general purpose oxychloride composition flooring, with respect to quality of materials, workmanship, installation, finishing and testing.

USES

2. The physical characteristics of this General Purpose type of oxychloride cement flooring make it adaptable for use as a surfacing for most areas not subject to heavy service. (See Note 1)

MATERIALS

3. Dry Mix. (a) The oxychloride composition shall consist of an intinately machine-mixed compound of dry ingredients, which, at the time of installation, will set to a hard, dense product, as specified herein, when mixed with the gauging solution specified.

(b) All ingredients shall be dry, and shall be accurately proportioned and compounded by weight, mechanically mixed, and shall consist of caustic-calcined magnesia conforming to requirements of specification OCA Designation 500-10-50; inert fillers, such as talc in quantities not over 3 per cent of the weight of the dry mix, silex, marble flour, asbestos in quantities not over 5 per cent of the weight of the dry mix, wood flour, and sawdust; inert aggregates (which are not affected by cleaning compounds), such as sand, fine crused stone, or other fine, chemically inert, low-absorbent, physically strong aggregates; inorganic pigment (optional). All materials used shall be alkali resistant and free from injurious amounts of deleterious materials, such as clay and silt. (See Note 2)

(c) Fibrous aggregate, fine aggregate and filler materials shall conform to the following requirements in respect to particle size gradation:

Sieve U. S. Number*	Per Cent Passing		
	Wood Flour, Sawdust and Asbestos	Sand, Fine Crushed Stone, etc.	Talc, Silex, Marble Flour
14		100	
20	100		
30		Maximum 94	
50	Maximum 80	Maximum 20	
100			100
200		Maximum 2	Maximum 95

* As designated by A.S.T.M. Standard E 11-39

(d) Fibrous materials not susceptible to screen analysis may be used provided all other requirements of this specification are met.

(e) Fibrous fillers and aggregates shall be of such nature that the final finish, under service, will not become fuzzy.

(f) Use of premixed dry ingredients which have become lumpy shall not be permitted.

(g) The dry mix of oxychloride flooring composition which is to be used in contact with aluminum alloys shall contain 1.5 per cent (by weight) of potassium dichromate.

4. Gauging Solution. (a) The gauging solution shall be a water solution of magnesium chloride complying with the requirements of specification OCA Designation 500-11-46. The specific gravity of the gauging solution shall be 22.0 ± 0.5° Baumé at 70 F when tested in accordance with method OCA Designation 350-11-50. Water used shall be clean and free of deleterious amounts of acids, alkalies, salts, and organic materials. (See Note 3)

(b) Alternate Gauging Solution. As an alternate for that specified in Section 4 (a) a gauging solution containing magnesium sulfate may be used. This shall be a water solution of magnesium chloride and magnesium sulfate complying with the requirements of the Specifications for Magnesium Chloride (OCA Designation 500-11-46) and the Specification for Magnesium Sulfate (OCA Designation 500-12-48), respectively, of the Oxychloride Cement Association. The weight of the magnesium sulfate, calculated as $MgSO_4.7H_2O$, shall be ten per cent (10%) of the weight of the magnesium chloride, calculated as $MgCl_2.6H_2O$. The specific gravity of the gauging solution shall be 24.0 ± 0.5° Baumé at 70 F when tested in accordance with method OCA Designation 350-11-50. Water used shall be clean and free of deleterious amounts of acids, alkalies, salts, and organic materials. (See Note 3)

(c) Solutions shall be prepared sufficiently in advance to permit their being cooled to at least room temperature before using. Care shall be exercised to insure complete solution of all crystalline material and to insure thorough mixing.

5. Strips. Division strips, base dividers or ornaments, when required, shall be formed from oxychloride cement, brass, stainless steel, monel metal, aluminum alloys (see note), or plastics which are chemically resistant to the cement. Aluminum alloy divider strips shall be coated with an alkali resistant clear lacquer or bituminous paint and the oxychloride composition used when aluminum alloy divider strips are included shall conform to the requirement of Section 3 (g).

Note:-Corrosion resistant aluminum alloys shall be used. These include those using alloy additions of silicon, magnesium, manganese, chromium with copper content not exceeding 0.4 percent; and clad products such as Alclad 3S, Alclad 4S, Alclad 24S, or others of equal resistance to corrosion.

6. Certification of Raw Materials. Contractor shall certify to the architect or owner that the magnesium oxide, magnesium chloride, magnesium sulfate, fillers, and aggregates conform to specifications designated in Sections 3, 4 and 5.

PROPORTIONING AND MIXING

7. (a) Composition. The flooring shall be compounded strictly according to the formula used in making the sample or samples approved by and filed with the

architect or owner and the composition shall be such as to yield a finished floor essentially the same as or better in appearance than the approved samples. The composition shall contain fibrous aggregate, fine aggregate and sufficient filler materials to permit troweling to a highly polished finish.

(b) Mixing. The premixed ingredients shall be placed in a clean mortar box or a clean mechanical mixer, the specified gauging solution added in an amount corresponding to not less than 5.0 lb. MgO in the dry mix per gallon of gauging solution (not more than 0.20 gal. of gauging solution per pound of MgO), and the mass mixed until it is free from lumps. In no case shall the material be retempered for use by addition of gauging solution after it has become too stiff to be applied.

(c) Consistency. The wet mix, prepared as specified in Section 7 (b) shall slump not more than 7 inches when tested in accordance with method OCA Designation 350-12-50.

CONDITIONING OF WORKING AREA

8. In spaces where the floor is to be laid the temperature shall not be less than 50 F. and shall not exceed 95 F. until final set is attained. The prevailing temperature shall be maintained substantially uniform in a stipulated range, and shall not decrease more than twenty degrees from the temperature at the time of installation for at least twenty-four hours after placing. Heating shall not be accomplished by the use of salamanders. Convection heating may be employed, provided local overheating is avoided, or air not exceeding 70 F. may be used in forced circulation providing its velocity at the floor level is not in excess of 500 cu. ft. per min. at any location. Openings shall be kept closed or so arranged as to prevent harmful circulation of air. All water and steam connections from which leaks might affect the oxychloride flooring shall be made tight before placing of the oxychloride coating is begun.

Note:-It is recognized that, with the specified temperature range, conditions of low relative humidity may be encountered in arid areas which can deleteriously affect linear change characteristics and strength of an installation. Humidification of the atmosphere of the working area is recommended when such conditions are encountered.

PREPARATION OF SUBFLOORS

9. (a) The flooring composition shall be laid on either an oxychloride composition basecoat in accordance with the specifications for Oxychloride Composition Basecoat Type 1 (OCA Designation 100-50) or a subfloor which has been prepared in accordance with the specifications for Preparation of Subfloors to Receive Oxychloride Composition Flooring (OCA Designation 200-50).

(b) Prepared subfloors or basecoats shall be protected from injury and the surface shall be free from any substance deleterious to the formation of a bond, such as water, dust or grease.

METHOD OF APPLICATION

10. (a) When the floor is to be laid on an absorptive surface (such as oxychloride composition basecoat, concrete, stone, or ceramic subfloors) this surface shall be thoroughly dampened with gauging solution of full strength, leaving no puddles. The surface shall then be broomed with a thin slurry prepared from gauging solution and either the dry mix or straight caustic-calcined oxychloride magnesia.

Areas prepared in this manner must then be covered with the flooring composition as specified in Section 10 (c) before the surfaces set or acquire a glaze.

(b) When the floor is laid on a non-absorptive surface where an anchoring medium is employed, a thin layer of the flooring composition shall be thoroughly worked into and around the anchors. Application of additional flooring composition shall then be made as specified in Section 10 (c) before the surfaces set or acquire a glaze.

(c) After preparation of the subfloor surfaces as specified in Section 10 (a) or 10 (b) a thin layer of the flooring composition shall be thoroughly worked into all recesses and depressions by scraping with a trowel immediately prior to spreading the flooring mix. The flooring composition shall then be spread to the specified thickness, leveled by darbying and finished by means of at least two steel trowelings. The final troweling shall be delayed until the composition has acquired sufficient set so that the operation (hard troweling) will produce a smooth floor of uniform color and a dense glaze free from laitance.

(d) Oxychloride composition coves and bases and wainscots may be installed integrally with the floor, and the same specifications shall apply as if the mix were laid as flooring.

THICKNESS

11. (a) The thickness of the general purpose oxychloride floor at any point shall conform to the following requirements:

	Thickness (each coat) Not Less Than	Not More Than
On Oxychloride Composition Basecoat	3/8"	3/4"
On Wood Subfloors	5/8"	3/4"
On Concrete Subfloors	1/2"	1"
On All Other Subfloors	5/8"	1"

(b) The oxychloride floor may be installed in one or more coats. If oxychloride is applied as basecoat this basecoat shall conform to the requirements of either these specifications or the Specifications for Oxychloride Basecoat Compositions, OCA Designation 100-50 of the Oxychloride Cement Association.

SEALING

12. (a) The floor shall be thoroughly cleaned after final set so that it is free from all foreign materials, laitance, etc., and shall be sealed as prescribed in Section 12 (b) with a sealer of low viscosity and which will maintain a low viscosity after at least 30 minutes' exposure in the form of a thin film to a normal atmosphere at a temperature of 80 F. Such sealers shall impart a uniformly water-repellent or water-impervious character to the surface of finished floor.

(b) The floor surface shall be wet with an excess of the penetrating sealer for at least 30 minutes, after which the excess sealer shall be removed from the surface by means of rags or mop, or by means of sawdust spread over the floor surface to absorb the excess sealer and then completely removed by sweeping. The floor surface shall be free from any substantial surface coating after removal of the excess sealer.

PROTECTION OF FINISHED INSTALLATION

13. (a) After sealing, the floor shall then be covered and protected with sawdust, absorbent paper, or other suitable water-vapor-permeable material until the completion of the work of other trades. Areas used for trucking shall be adequately protected from injury by means of temporary false flooring.

(b) All traffic shall be kept off the finished floor for at least forty-eight hours after the installation has been completed. The finished floor shall not be scrubbed or flooded with water for at least fifteen days after installation is completed.

PHYSICAL REQUIREMENTS

14. General Purpose Oxychloride Flooring shall conform to the following requirements when tested in accordance with the respective methods listed in Section 19:

(a) Linear Change, 1 to 7 days, shall be within the limits +0.040 to -0.050 per cent.

(b) Transverse Strength at 7 days, minimum 1400 pounds per square inch.

(c) Compressive Strength at 7 days, minimum 4800 pounds per square inch.

WORKMANSHIP

15. The prepared mix shall be laid to the specified thickness in accordance with drawings, by qualified workman and in conformance with approved procedures, to produce finished surfaces as specified.

SUPERVISION

16. The flooring contractor shall give his personal supervision to the work or provide a competent foreman or superintendent with authority to act for him, who shall be present throughout the entire progress of the installation.

INSPECTION

17. The architect or owner reserves the right to conduct any inspection or make any test deemed necessary to determine conformance with the requirements of the specifications. Samples approximately 12" x 12" or of other specified size and representative of the finished floor may be requested by the architect or purchaser for selection of the desired color and finish and for filing in connection with acceptance of inspection.

SAMPLING

18. (a) The architect or owner reserves the right to take, at the time of or prior to installation, representative composite samples, for testing, of materials from each lot offered for delivery, in accordance with Specifications OCA Designation 350-13-49. The minimum quantities of these samples shall be as follows:

Premixed dry ingredients	20 pounds
Gauging solution	2 gallons
Additives (Notes 2 and 3)	1 pound

(b) Samples thus obtained shall be placed in separate clean, dry, air-tight, waterproof containers, securely closed, distinctly labeled and dated. Any tests performed shall be completed within 30 days from date of sampling.

METHODS OF TEST

19. All methods of test shall conform to those of the American Society for Testing Materials or the Oxychloride Cement Association, Inc., designated as follows:

	A.S.T.M	OCA
Sieve Analysis of Magnesium Oxychloride Compositions	C 238-49T	300-10-49
Sampling Oxychloride Compositions and Ingredients	C 237-49T	350-13-49
Field Determination of Specific Gravity of Gauging Solution		350-11-50
Slump Test for Consistency of Magnesium Oxychloride Cements		350-12-50
Mixing Oxychloride Cement Compositions with Gauging Solution		300-20-50
Consistency of Magnesium Oxychloride Cements by Means of a Flow Table		300-12-50
Setting Time of Magnesium Oxychloride Cements		300-15-50
Transverse Strength of Magnesium Oxychloride Cement Compositions		300-13-49
Compressive Strength of Magnesium Oxychloride Cement Compositions		300-14-49
Linear Change of Magnesium Oxychloride Cements		300-16-50
Magnesia for Magnesium Oxychloride Cements:		
Ignition Loss of Magnesia		400-1-50
Active Calcium Oxide in Magnesia		400-2-50
Sieve Analysis of Plastic Calcined Magnesia	C 239-49T	400-3-49
Testing, for Magnesium Oxychloride Cements		400-4-50
Magnesium Chloride Analysis of		400-12-50
Bulk Density of Oxychloride Compositions		300-19-49
Magnesium Sulfate, Analysis of		400-13-50

PACKAGING, MARKING AND STORAGE

20. (a) The contractor shall take such measures as may be necessary to insure the safe delivery and storage of all materials used in oxychloride cement compositions on the job, such measures being adequate to avoid damaging moisture pick-up or other contamination from sources existing at the job site.

(b) In addition to other markings, each package shall bear the specific name of the material and, in the case of premixed dry ingredients, the date of mixing.

(c) All dry premixed compositions shall be packaged in suitable containers and kept under adequate conditions to prevent damaging moisture pick-up. When aged longer than sixty days from date of mixing, the composition shall be tested, not more than ten days before using, and shall at the time of testing meet the requirements specified herein.

(d) If requested or if samples are to be tested the flooring contractor shall supply his recommended ratio of gauging solution to dry mix.

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Note 1. - (Section 2) - General Purpose Magnesium Oxychloride Compositions may be so formulated as to obtain various degrees of foot comfort and wearing hardness. It is possible to produce floors of this type which possess a wearing hardness only slightly below that of Tennessee pink marble.

Note 2. - (Section 3 (b)) - Iff additives are included to make the composition more water-repellent or water-resistant, or to lend other valuable properties to the composition, they shall be such that the finished floor qualifies in respect to the specified requirements of these specifications and such that the appearance and durability of the floor are not adversely affected.

Note 3. - (Section 4) - If any water-soluble ingredient is used other than specified, it shall be added to the gauging solution of full strength, and any such material may be used only if the finished floor fulfills the specified requirements and provided the appearance and durability of the finished installation are not adversely affected.