



The Chemical Company

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Technical Data Guide

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Cementitious  
Waterproofing

# MasterSeal® 581

Waterproof cement-based coating for concrete and masonry

FORMERLY THOROSEAL®

## PACKAGING

MasterSeal 581:

- 50 lb (22.7 kg) polyethylene-lined bags for MasterSeal 581 white, standard gray, all landscape colors and custom colors
- 50 lb (22.7 kg) pails for MasterSeal 581 white, standard gray, and pearl gray

MasterEmaco A 660:

- 1 qt (0.9 L) bottles (8 qt per carton)
- 1 gal (3.8 L) bottles (4 gal per carton)
- 5 gal (18.9 L) pails
- 55 gal (208 L) drums

## YIELD

- 225 ft<sup>2</sup>/50 lb (20.9 m<sup>2</sup>/22.7 kg) bag as a base coat at 1/16" (1.6 mm) dry-film thickness.
  - 450 ft<sup>2</sup>/50 lb (41.8 m<sup>2</sup>/22.7 kg) bag as a topcoat at 1/32" (0.8 mm) dry-film thickness.
- Coverage will vary depending on surface texture and porosity.

## SHELF LIFE

1 year when properly stored

## VOC CONTENT

0 g/L less water and exempt solvents

## DESCRIPTION

MasterSeal 581 is a Portland cement-based coating for concrete and masonry that resists both positive and negative hydrostatic pressure. Polymer-modified with MasterEmaco A 660, MasterSeal 581 creates a low maintenance and highly durable waterproof barrier.

## PRODUCT HIGHLIGHTS

- Waterproof to help protect building interiors from dampness and moisture damage
- Resistant to both positive and negative hydrostatic pressure, making MasterSeal 581 suitable for use below grade interior and exterior and in water treatment construction
- Breathable, allowing interior moisture to escape without damaging coating
- Compatible with high-performance coatings, including a wide range of architectural coatings and textured finishes
- Hides minor surface defects and blemishes in architectural concrete
- Available in ten landscape colors and custom colors (with minimum order quantities)
- Certified to the NSF/ANSI Standard 61 for potable water contact

## APPLICATIONS

- Vertical and light-pedestrian horizontal surfaces
- Interior and exterior
- Above and below grade
- Alternative to mechanical finishing or rubbing of concrete
- Waterproofing basement and retaining walls
- Foundations
- Bridges and tunnels (non- traffic bearing surface)
- Water cisterns

## SUBSTRATES

- Cast-in-place and precast concrete
- Block, brick and porous stone

## COLOR

- White and standard gray
- Custom and landscape colors are available for 5,000 lbs (2,268 kg) minimum order.
- Ten landscape colors: bone, dijon, French vanilla, good earth, light khaki, Thoro gray, Navajo white, parchment, pearl gray and putty tan

## STORAGE

Transport and store in unopened containers and keep in a clean, dry place protected from rain, dew and humidity. Do not stack bags more than two pallets high. If dry onsite storage of bags is unavailable or if project is located in a very wet, humid climate zone, then specify MasterSeal 581 packaged in 50 lb (22.7 kg) metal pails. Store MasterEmaco A 660 in similar conditions. Do not allow MasterEmaco A 660 to freeze.

**Technical Data**

**Composition**

MasterSeal 581 contains cement, graded sand, and proprietary additives.

**Test Data**

PROPERTY	RESULTS	TEST METHOD
<b>Initial Set</b> , min, at 70° F (21° C), 50% rh	10	Lab Method
<b>Final Set</b> , at 70° F (21° C), 50% rh	90	Lab Method
<b>Density</b> , (cured), lbs/ft <sup>3</sup> (kg/m <sup>3</sup> )	129 (2,080)	Lab Method
<b>Positive resistance to hydrostatic pressure</b> , hrs, at 200 psi (1.4 MPa), 461 head ft, air cured at 70° F (21° C), 50% rh	752 No leakage, no softening	CRD C 48, modified
<b>Negative resistance to hydrostatic pressure</b> , hrs, at 200 psi (1.4 MPa), 461 head ft, air cured at 70° F (21° C), 50% rh	664 Limited dampness	CRD C 48, modified
<b>Water absorption</b> , %, boiling water submersion at 24 hours	3.6	ASTM C 67 (Section 7.3)
<b>Compressive strength</b> , psi (MPa) 7 days 28 days	4,200 (29) 6,030 (42)	ASTM C 109
<b>Flexural strength</b> , psi (MPa) 7 days 28 days	360 (2.5) 1,027 (7)	ASTM C 348
<b>Tensile strength</b> , psi (MPa) 7 days 28 days	250 (2) 440 (3)	ASTM C 190
<b>Modulus of elasticity</b> , psi (MPa) 28 days	2.72 x 10 <sup>6</sup> (1.87 x 10 <sup>4</sup> )	ASTM C 469
<b>Artificial weathering</b> , hrs Xenon Arc Carbon Arc	5,000 = No failure 500 = No failure	ASTM G 26 ASTM G 23
<b>Adhesion strength</b> , psi (MPa)	418 (2.9)	Test by tensile bond
<b>Artificial weathering</b> , 500 hours	No cracking, loss of adhesion, checking, or other defect	Atlas Type DMC weatherometer
<b>Freeze/thaw resistance</b> , 200 cycles	No change	ASTM C 666 (Procedure B)
<b>Salt spray resistance</b> , 300 hours	No defect	ASTM B 117
<b>Carbon Dioxide (CO<sub>2</sub>)</b> , in (mm)	1/16 (1.6) Equivalent to 3/4" (19 mm) new concrete	Lab Method Diffusion
<b>Permeance</b> , perms (metric permeability)	12 (0.10698) 18 x 10 <sup>3</sup> resistance	ASTM E 96 (water-vapor transmission) Swedish standard SS-02-15-82

**Test Data, continued**

PROPERTY	RESULTS	TEST METHOD
<b>Wind-driven rain</b> , hrs	8 = excellent	Fed. Spec. TT-P-0035 (Para 4.4.7)
<b>Coefficient of thermal expansion</b> , in/in/° F (mm/mm/° C), at 28 days	$6.99 \times 10^{-6}$ ( $5 \times 10^{-7}$ )	ASTM C 531
<b>Impact strength</b> (Gardener impact tester)	No chipping	Fed. Spec. TT-P-0035 (Cement paints para. 3.4.8)
<b>Hardness</b> , (Barber Coleman Impressor) Requirement min = 30, max = 60		Fed. Spec. TT-P-0035 (para 4.4.9)
7 days	35	
14 days	47	
21 days	52	
<b>Abrasion resistance</b> , 3,000 L sand	Passed	Fed. Spec. TT-P-141B
<b>Standard Reflectance</b>		ASTM D 2244 using Hunterlab D-25 meter
Gray MasterSeal 581	64.2	
White MasterSeal 581	88.1	
<b>Fungus resistance</b> , at 21 days	No growth; meets all requirements	Fed. Spec. TT-P-29B
<b>Surface burning characteristics</b>		ASTM E 84
Flame Spread	0	
Smoke developed	5	
<b>Fire Propagation</b>	Index = 1.5	BS476: Part 6:1981
Flame spread	Class 1	BS476: Part 7:1971

Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

## HOW TO APPLY

### SURFACE PREPARATION

1. Surface preparation is extremely important for proper adhesion. Substrates must be sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds or any other contaminants. Verify substrate has properly cured. Concrete should obtain 80% of design strength, typically achieved within 3–14 days. If efflorescence is present, mechanically remove it before proceeding. For extreme cases where this is not adequate, contact Technical Service.
2. Patch all holes and non-moving cracks before installation with appropriate BASF product.
3. Relieve hydrostatic pressure in concrete block with weep holes.
4. Roughen or brush blast extremely smooth surfaces such as precast and cast-in-place concrete to ensure good mechanical adhesion of MasterSeal 581.
5. Completely saturate the substrate with water and allow surface to dry before application starts. A damp surface will prevent surface drag on the material, keep the substrate cool and eliminate flash drying.

### MIXING

1. Mix MasterSeal 581 with a mixing liquid consisting of a blend of MasterEmaco A 660 diluted with water. Maximum dilution ratio is one part MasterEmaco A 660 to three parts water. Approximately 6 quarts of mixing liquid is needed per 50 lbs of MasterSeal 581 powder. Up to 2 additional quarts of mixing liquid may be added when using as a rubbing compound.
2. For best results, mechanically mix MasterSeal 581 with a slow-speed drill and mixing paddle. Gradually add the powder to the mixing liquid while drill is running.
3. When properly blended, MasterSeal 581 will have the lump-free consistency of smooth, heavy batter.
4. Allow the MasterSeal 581 and MasterEmaco A 660 mixture to rest undisturbed for a minimum of 10 minutes to fully wet out all the powder. Then mix the wet mixture and apply. A small amount of mixing liquid can be added to the mixture.
5. Pot life is 60–90 minutes at 70° F (21° C). At high temperatures and low relative humidity, pot life can be significantly less.

### APPLICATION

1. Apply MasterSeal 581 with a tampico brush or broom or equivalent stiff fiber brush or by textured spray equipment. Spray applications of the first coat require back brushing or brooming to properly fill voids and achieve uniformity and optimum adhesion.
2. It is essential to work first coat thoroughly into the substrate to completely fill and cover all voids, holes and nonmoving cracks. Finish with a horizontal stroke for an even coat.
3. Allow to cure 24 hours, then apply the second coat and finish with a vertical stroke. Above grade, the second coat can be replaced with a Thoro high-build architectural coating to achieve better color uniformity.
4. On block or masonry walls, allow 5–7 days before applying second coat to eliminate joint read through or shadowing.

### SPECIFIC APPLICATIONS

Above-grade interior or exterior applications in positive pressure situations (direct contact with rain or standing water with a low head of pressure)

1. A 50 lb (22.7 kg) bag of MasterSeal 581 will provide the following coverage at the designated material usage.

#### RECOMMENDED COVERAGE:

- First Coat: 2 lbs/yd<sup>2</sup> (1.1 kg/m<sup>2</sup>) = 225 ft<sup>2</sup>/50 lb bag (20.9 m<sup>2</sup>/22.7 kg bag)
- Second Coat: 1 lb/yd<sup>2</sup> (0.54 kg/m<sup>2</sup>) = 450 ft<sup>2</sup>/50 lb bag (41.8 m<sup>2</sup>/22.7 kg bag)
- Total: 3 lbs/yd<sup>2</sup> (1.6 kg/m<sup>2</sup>), cured nominal thickness of 1/16" (1.6 mm).

Coverage will vary depending on surface texture and porosity.

2. A 3 lbs/yd<sup>2</sup> (1.6 kg/m<sup>2</sup>) application rate does not eliminate surface irregularities such as struck mortar joints. To hide surface irregularities, spray and back-brush a base coat of MasterSeal 581 at 2 lbs/yd<sup>2</sup> (1.1 kg/m<sup>2</sup>) and allow it to cure for 5–7 days. If additional leveling is required use MasterSeal 581 Plaster Mix.

### BELOW-GRADE INTERIOR APPLICATIONS

1. The standard application is 3 lbs/yd<sup>2</sup> (1.6 kg/m<sup>2</sup>).
2. For high hydrostatic pressure conditions (over 15 psi [0.10 MPa]), increase application rate to 4 lbs/yd<sup>2</sup> (2.2 kg/m<sup>2</sup>) and waterproof from the positive side wherever possible.

### BELOW-GRADE EXTERIOR APPLICATIONS

1. Use MasterSeal 582 (see Form No. 1019907) For high hydrostatic pressure conditions (over 15 psi [0.10 MPa]), apply a base coat of MasterSeal 582 at 2 lbs/yd<sup>2</sup> (1.1 kg/m<sup>2</sup>) and allow to cure for 5–7 days.
2. Then apply MasterSeal 581 at 2 lbs/yd<sup>2</sup> (1.1 kg/m<sup>2</sup>). If additional leveling is required use MasterSeal 581 Plaster Mix. A steel trowel finish is recommended.
3. For both below-grade interior and below-grade exterior applications where water might move between vertical walls and slab or footer, it is recommended to cut out and place a MasterSeal 590 cove at the wall and floor junction prior to the application of the MasterSeal 581 base coat.
4. MasterSeal 581 can be covered with extruded polystyrene insulation board during the second coat application. The board must be fully coated with MasterSeal 581 and embedded into the still-wet coating already in place on the walls. Use care when placing the coated board because it should not be moved or slipped. Once placed, do not move the board. After curing, prepare the above-grade portions of the boards by roughening or removing the surface skin and then coating with MasterSeal 581 to protect them from UV light degradation.

### WATERPROOFING POTABLE WATER TANKS OR RESERVOIRS

1. Install MasterSeal 581 as directed in the general Application instructions.
2. After MasterSeal 581 has fully cured, wash down the MasterSeal 581 surface with saline solution (salt brine, 1 lb salt per 1 gallon water).
3. Leave saline solution on the entire MasterSeal 581 surface for at least 24 hours.
4. Rinse off saline solution completely. If needed, reapply saline solution until final rinse water is completely clean and clear.

### **COLOR UNIFORMITY**

With any cementitious product, such as MasterSeal 581, it may be difficult to achieve color uniformity due to weather and substrate variability. For this reason, it may be necessary to apply a topcoat of a MasterProtect architectural coating.

### **CLEAN UP**

Promptly clean hands and all tools with warm water while product is still wet. Cured material may only be removed mechanically.

### **FOR BEST PERFORMANCE**

- MasterSeal 581 must be modified with MasterEmaco A 660 to achieve the properties listed in the technical data section.
- Do not apply to substrates with active water leaks or moving cracks; patch all leaking static cracks and holes with MasterSeal 590. Repair any other nonmoving cracks or voids with the appropriate Thoro repair product and repair all moving cracks or voids with appropriate sealant.
- Do not apply in rain or when rain is expected within 24 hours. Do not apply above 90° F (32° C) or below 40° F (4° C) or when temperatures are expected to fall below 40° F (4° C) within 24 hours. For hot and cold temperature applications, store MasterSeal 581, MasterEmaco A 660 and water at 50° F (10° C) to 70° F (21° C) before use.
- Hot substrates will affect working time and material strength.
- Variations between inside and outside temperatures may result in condensation on below-grade walls treated with MasterSeal 581. This can be alleviated by assuring that adequate ventilation exists.
- Windy, dry or hot conditions may require rewetting of MasterSeal 581 during cure and the use of polyethylene barriers.
- Before specifying MasterSeal 581 for water retaining structures, conduct tests to determine water quality. MasterSeal 581 is not intended for continuous contact with acid or sulfate-containing water. Very soft water will have an adverse effect on MasterSeal 581.
- Service temperatures: immersion, up to 140° F (60° C); cleaning water, up to 200° F (93° C); dry air, up to 220° F (104° C).
- On all projects, it is recommended that a sample be prepared on site and approved prior to the commencement of the work. The site sample should confirm the color, texture and workmanship required until the job is finished and accepted. Retain the sample until final approval is secured.
- Allow MasterSeal 581 to cure 7–10 days before immersion in water.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

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#### HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us), e-mailing your request to [basfbcst@basf.com](mailto:basfbcst@basf.com) or calling 1(800)433-9517. Use only as directed.

**For medical emergencies only,  
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