

MasterSeal® 581

Air Barrier and 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 and standard 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 ft²/50 lb (20.9 m²/22.7 kg) bag as a base coat at 1/16" (1.6 mm) dry-film thickness.
 - 450 ft²/50 lb (41.8 m²/22.7 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 air infiltration and positive as well as 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
- Air barrier reduces air infiltration
- 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
- Bridges and tunnels (non- traffic barring surface)
- Water cisterns
- Flashing of rough opening concrete or masonry openings
- Refer to Specific Application section for installations such as Stucco, Below grade, water tanks, etc.

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.
- One landscape color: pearl gray

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.

APPLICATIONS

- General
 - 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

Technical Data

Composition

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

Test Data

| PROPERTY | RESULTS | TEST METHOD |
|---|--|--|
| Initial Set , min, at 70 °F (21 °C), 50% rh | 10 | Lab Method |
| Final Set , at 70 °F (21 °C), 50% rh | 90 | Lab Method |
| Density , (cured), lbs/ft ³ (kg/m ³) | 129 (2,080) | Lab Method |
| Positive resistance to hydrostatic pressure , 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 |
| Negative resistance to hydrostatic pressure , 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 |
| Water absorption , %, boiling water submersion at 24 hours | 3.6 | ASTM C 67 (Section 7.3) |
| Compressive strength , psi (MPa) 7 days 28 days | 4,200 (29) 6,030 (42) | ASTM C 109 |
| Flexural strength , psi (MPa) 7 days 28 days | 360 (2.5) 1,027 (7) | ASTM C 348 |
| Tensile strength , psi (MPa) 7 days 28 days | 250 (2) 440 (3) | ASTM C 190 |
| Modulus of elasticity , psi (MPa) 28 days | 2.72 x 10 ⁶ (1.87 x 10 ⁴) | ASTM C 469 |
| Artificial weathering , hrs Xenon Arc Carbon Arc | 5,000 = No failure 500 = No failure | ASTM G 26 ASTM G 23 |
| Adhesion strength , psi (MPa) | 418 (2.9) | Test by tensile bond |
| Artificial weathering , 500 hours | No cracking, loss of adhesion, checking, or other defect | Atlas Type DMC weatherometer |
| Freeze/thaw resistance , 200 cycles | No change | ASTM C 666 (Procedure B) |
| Salt spray resistance , 300 hours | No defect | ASTM B 117 |
| Carbon Dioxide (CO₂) , in (mm) | ⅛ (1.6) Equivalent to ¾" (19 mm) new concrete | Lab Method Diffusion |
| Permeance , perms (metric permeability) | 12 (0.10698) 18 x 10 ³ resistance | ASTM E 96 (water-vapor transmission) Swedish standard SS-02-15-82 |

Test Data, continued

| PROPERTY | RESULTS | TEST METHOD |
|--|--|---|
| Wind-driven rain, hrs | 8 = excellent | Fed. Spec. TT-P-0035 (Para 4.4.7) |
| Coefficient of thermal expansion, in/in/°F (mm/mm/°C), at 28 days | 6.99×10^{-6} (5×10^{-7}) | ASTM C 531 |
| Impact strength (Gardener impact tester) | No chipping | Fed. Spec. TT-P-0035 (Cement paints para. 3.4.8) |
| Hardness, (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 | |
| Abrasion resistance, 3,000 L sand | Passed | Fed. Spec. TT-P-141B |
| Standard Reflectance | | ASTM D 2244 using Hunterlab D-25 meter |
| Gray MasterSeal 581 | 64.2 | |
| White MasterSeal 581 | 88.1 | |
| Fungus resistance, at 21 days | No growth; meets all requirements | Fed. Spec. TT-P-29B |
| Surface burning characteristics | | ASTM E 84 |
| Flame Spread | 0 | |
| Smoke developed | 5 | |
| Fire Propagation | Index = 1.5 | BS476: Part 6:1981 |
| Flame spread | Class 1 | BS476: Part 7:1971 |
| Flame spread | | BS476: Part 7:1971 |
| Water Penetration | | ASTM E 514 |
| Adhesion | | ASTM C 297 |
| Masterseal 581/CMU | | |
| Masterseal 581/concrete | | |
| Stuccobase /Masterseal 581 | | |
| ASTM C 926 Stucco/Masterseal 581 | | |
| Shear bond | | ANSI 118.4 or similar |
| StuccoBase/Masterseal 581/CMU | | |
| StuccoBase/Masterseal 581/concrete | | |

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 Master Builders Solutions 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 (1½ quarts) to three parts water (4½ quarts). 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 MasterProtect 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/yd² (1.1 kg/m²) = 225 ft²/50 lb bag (20.9 m²/22.7 kg bag)
 - Second Coat: 1 lb/yd² (0.54 kg/m²) = 450 ft²/50 lb bag (41.8 m²/22.7 kg bag)
 - Total: 3 lbs/yd² (1.6 kg/m²), cured nominal thickness of ⅛" (1.6 mm).
Coverage will vary depending on surface texture and porosity.
2. A 3 lbs/yd² (1.6 kg/m²) 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/yd² (1.1 kg/m²) 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/yd² (1.6 kg/m²).
2. For high hydrostatic pressure conditions (over 15 psi [0.10 MPa]), increase application rate to 4 lbs/yd² (2.2 kg/m²) 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/yd² (1.1 kg/m²) and allow to cure for 5–7 days.
2. Then apply MasterSeal 581 at 2 lbs/yd² (1.1 kg/m²). 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.

APPLICATION

1. MasterSeal 581 shall be applied to CMU or concrete substrates in accordance with and prepared per MasterSeal 581 Technical Guide.
 2. Mix MasterSeal 581 with a mixing liquid consisting of a blend of MasterEmaco A 660 diluted with water. Dilution ratio is one part MasterEmaco A 660 to three parts water.
 3. Apply MasterSeal 581 at standard recommended thicknesses with a stiff fiber brush using a two coat application. Allow the first coat to cure 24 hours and then apply a second coat perpendicular to the first coat.
 4. Allow MasterSeal 581 to cure and then directly apply Master Builders Solutions Stuccobase per manufacturers specifications (need link to website or websites) or Portland Cement Plaster (Stucco) per ASTM C 926. Nominal thickness shall be 5/8".
- 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 Master Builders Solutions personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

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 MasterEmaco 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.

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HEALTH, SAFETY AND ENVIRONMENTAL

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IN CASE OF EMERGENCY: Call CHEMTEL +1 (800) 255-3924 or if outside the US or Canada, +1 (813) 248-0585.

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