

Product Data Sheet and Application Guide

DESCRIPTION: CEM Polyure MCU-600 is a High Gloss, Aliphatic, High Performance, Single Component, Solvent-borne Moisture Cured Polyurethane which yields a highly light reflective, smooth finish with U.V. Stability and good gloss retention.

CEM Polyure MCU-600 may be applied directly to properly prepared, dry/cured concrete as well as over stains, resinous coating systems, properly prepared Terrazzo and topcoat Metallic. A low sheen finish may be achieved with the addition of CEM LSA-300 Low Sheen Additive.

RECOMMENDED AS A FINAL TOPCOAT FOR:

- Industrial, Commercial & Retail Environments
- Interior Decorative Concrete
CEM Metal

HIGHLIGHTS:

- U.V. Stable - For Interior & Exterior* Use (*Exterior requires primer)
- Long Working time
- High Performance – Improves service life of coating system
- Great Chemical & Stain Resistant
- Easy to Clean
- Very Good Gloss Retention & Light Reflectivity
- Resistant to Hot Tire Pickup
- Less Odor than Traditional Solvent-based, MCU products
- Low VOC's
- Return to service for full traffic – Next Day

STORAGE: Indoors between 65°F (18°C) to 90°F (32°C)

SUBSTRATE TEMPERATURE: 50°F (10°C) to 95°F (35°C) with 30% to 75% Humidity

SHELF LIFE:

12 Months in original, unopened containers;
30 days once opened

AVAILABLE KIT SIZES:

Gloss:
1 Gallon Jug
5 Gallon Jug

CEM LSA-300

LOW SHEEN ADDITIVE: Gloss; Optional Low Sheen additive (sold separately) = use 1 unit per gallon

COLOR: Slightly Amber, Transparent;

CEM Color Pack

Optional Additive (sold separately) = 10% to 20% ISC by volume

POT-LIFE & TRAFFIC TIMES:

<i>*Cure time is affected by temperature and humidity.</i>	72°F / 50% Humidity	90°F / 50% Humidity
Pot-Life	2 hours	45 min.
Working Time	60 min.	30 min.
Recoat Window	Tack free to 24 hrs	Tack free to 14 hrs
Foot Traffic	12 hours	8 hours
Heavy Traffic (i.e. forklift)	24 hours	20 hours
Full Chemical Resistance	7 days	7 days

APPROXIMATE CURE TIMES BETWEEN COATS:

HUMIDITY	TEMPERATURE (Cure Rate in Hours)		
	55°F (12.7°C)	77°F (25°C)	90°F (32.2°C)
≤35%	8 hrs	6 hrs	5 hrs
50%	6 ½ hrs	5 hrs	4 hrs
75%	5 ½ hrs	4 hrs	3 hrs
≥85%	4 hrs	3 hrs	2 ½ hrs

CURED COATING PROPERTIES (DRY FILM):

PROPERTY	TEST METHOD	RESULTS
Abrasion Resistance <i>mg/loss *Taber Abraser</i>	ASTM D4060	25 mg (Gloss) 22 mg (Low Sheen)
Hardness (Pencil)	ASTM D3363	2H
Adhesion to Steel – Pull Strength, psi (MPa)	ASTM D4541	3,190 psi (22 MPa)
Adhesion to Concrete	ASTM D4541	Concrete Fails
VOC's	ASTM D3960	202 g/L (Clear)
Gloss (60°)	ASTM D1455	±85 (Gloss) ±30 (Low Sheen)
Viscosity – @ 77°F	ASTM D2196	157 cP
Flammability	ASTM D635	Self-Extinguishing
Volume Solids (Clear)	ASTM D2196	±60% (Gloss)

*CS-17 Taber Abrasion Wheel, 1,000 gram load, 1,000 revolutions Results are based on conditions at 77°F (25°C), 50% relative humidity.

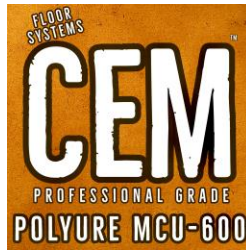
APPROXIMATE COVERAGE (DRY FILM):

Coverage Equation: $1604 \div \text{milage} \times 0.6 = \text{Dry Film Thickness}$

Wet Mil Thickness (Dry Film Thickness)	Approximate Yield per kit per square foot Wet Film		
	12 oz Touch-up	1 Gallon	5 Gallon
4 mils (2.4 mils)	36 sq.ft	400 sq.ft.	2,000 sq.ft.
5 mils (3 mils)	28 sq.ft.	321 sq.ft.	1,605 sq.ft.
6 mils (3.6 mils)	24 sq.ft.	267 sq.ft.	1,336 sq.ft.

*To avoid fogging or foaming, Do NOT Exceed 6 mils in a single coat

**Coverage varies due to thickness, floor profile & absorbency of concrete



Product Data Sheet and Application Guide

Typical Chemical & Stain Resistance

Covered Spot Test - 3 mil film at 7 day cure:

E - Excellent; **G** - Good (slight sign of exposure/stains, coating recovers);

D - Discolored / Stain; **NR** - Not Recommended (Permanent Damage)

24 hour Exposure

ACIDS	Gloss	Low Sheen
Acetic Acid 25% (Vinegar)	E	E
Citric Acid 10%	E	E
Lactic Acid (Milk)	G	E
Phosphoric Acid 85%	G	G
Sulfuric Acid 25% (Battery Acid)	G	G
Sulfuric Acid 98%	NR	NR
Hydrochloric Acid 32% (Muriatic)	G	E
Nitric Acid 50%	NR	NR
BASES		
Ammonium Hydroxide 10%	E	E
EBGE	E	E
Sodium Chloride 20%	E	E
Sodium Hydroxide 50%	E	E
Sodium Hypochlorite (Bleach)	E	E
Trisodium Phosphate 10%	E	E
ALCOHOLS		
Ethylene Glycol (Antifreeze)	E	E
Hand Sanitizer	G	G
Isopropyl Alcohol 91%	E	E
Methanol	E	E
SOLVENTS		
Acetone	E	E
d-Limonene	E	E
MEK	G	G
Methylene Chloride	G	G
Mineral Spirits	E	E
PGMEA	E	E
HYDROCARBONS		
Brake Fluid	E	E
Transmission Fluid	E	E
Motor Oil	E	E
Gasoline	E	E
Kerosene	E	E
Hydraulic Fluid	E	E
Skydrol® - LD-4	D	E
MISCELLANEOUS		
Coffee	E	E
Coke®	E	E
Dish Detergent (Dawn®)	E	E
Hydrogen Peroxide 3%	G	G
Ketchup	E	E
Monster Energy® Drink	E	E
Mustard	D	D
Povidone-iodine (BETADINE®)	D	D
Tide® 1%	E	E
Windex® (Ammonia Based)	E	E
Wine - Red	E	E

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PERSONAL PROTECTION EQUIPMENT RECOMMENDED:

- Use of a self-contained respiratory equipment (TC 19C NIOSH/MESA) - Avoid inhaling atomized spray & fumes
- Wear Chemical Resistant Gloves - Avoid all contact with skin
- Wear Chemical Resistant Eye Protection - Prevent contact with eyes

LIMITATIONS:

- For water immersion or industrial & wheeled traffic/fork lift traffic conditions, a minimum of an ICRI CSP 3 profile is required for mechanical preparation
- Does NOT block U.V. light when applied clear over a non-U.V. Stable product (i.e. Epoxy, etc.)
- NOT water clear - may discolor underlying layer when applied clear
- Foaming possible when over applied - Not intended as a grout coat or use over heavily textured surfaces such as Vinyl Chip, Color Quartz, Stamped Concrete. Skip Trowel or Knockdown finishes.
- Do NOT install coatings when the Dew point is within 5° of the temperature.
- Application is NOT recommended above 80% at time of install

PRECAUTIONS / WARNING:

Contains Solvent - Material is combustible.

- Extinguish all flames, pilot lights & electric motors until all vapors are gone & the coating is hard
- Keep away from sparks, heat & open flame
- Use with adequate ventilation when mixing, applying & curing
- DO NOT SPRAY - Product may emit harmful solvent & isocyanate vapors when spray applied which can cause respiratory irritation. Individuals with chronic lung or breathing problems or negative reaction to isocyanates, should not use this product

INSPECT THE SUBSTRATE: Ensure the substrate is structurally sound & solid as well as free of any contaminants that may act as a bond breaker, such as oil, paint, densifier/sealers, curing compounds, wax, silicone, etc.

TEMPERATURE & HUMIDITY: Temperature of substrate & product must remain between 50°F (10°C) to 95°F (35°C) with < 80% Ambient Humidity for 24 hours prior to & 24 hours after installation.

CHECK FOR MOISTURE: For interior applications, testing concrete moisture via both the Calcium chloride (ASTM F1869) and In-situ Relative Humidity (ASTM F2170) methods is highly recommended to accurately determine both the Moisture Vapor Emission Rate (ASTM F1869) and the available Moisture Content (ASTM F2170) at the time of testing. Using only one test method will only give all of the necessary information & may not indicate other potential risks such as contaminants, etc. that may pose a risk for delamination, chemical attack, etc. which are not caused by moisture vapor emissions or high alkalinity.

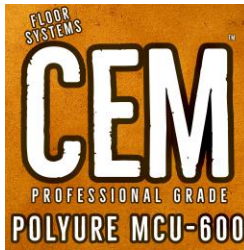
A moisture mitigation product, in conjunction with proper testing & mechanical preparation, will reduce the moisture vapor emission rate to a level within the tolerance of subsequent coatings and traditional floor covering needs.

Follow the testing manufacturer's instructions precisely or visit www.astm.org, see ASTM F1869 or F2170, to purchase the test methods. Testing MUST occur within an acclimated, interior environment for the results to be valid & conclusive. CEM Coatings Group, Inc. is strictly a product manufacturer and does NOT offer any testing or analysis but may be able to offer guidance to an appropriate testing lab or third party inspector. When in doubt, hire a qualified third party testing firm.

CONTAMINATION OF SUBSTRATE: Concrete is porous & can become contaminated with oils, chemical from spills, etc. which act as a bond breaker. Determine if a potential bond breaker exists and a proper course of remediation. Contact CEM Coatings Group, Inc. for remedial recommendations while following local regulations regarding contaminant & disposal.

OIL CONTAMINATION: CEM's Oil Stop may be used to remove oils, such as petroleum, synthetic & food oils, from the surface of the concrete prior to mechanical preparation. Wood substrates contaminated with oil may require removal & replacement of the oil contaminated area with new wood to ensure proper adhesion.

NECESSARY TOOLS and EQUIPMENT:



Product Data Sheet and Application Guide

- Plastic Sheeting or Ram Board to cover floor for mix station
- Paint mixing paddle
- Low speed ½" drill (Variable Speed ≤450 rpm)
- 5 gallon Plastic Mixing Buckets
- Premium, Non-Shed ¼" or 3/8" Nap Paint Roller Covers
- Several 18" wide, non-metallic Paint Roller Frames
- Wide paint trays (for dip & roll applying)
- Multiple Extension Poles
- Cleaning Solvent (Acetone, MEK, or Xylene)

SUBSTRATE PREPARATION

NOTE: Methyl Methacrylate (MMA) is NOT an acceptable substrate, expect delamination if topcoated.

CLEANING: Detergent scrub and rinse with clean, potable water to remove surface dirt, light surface grease/oil and contaminants prior to mechanical preparation. Heavy grease and oil should be removed using **CEM's Oil Stop**. If a densifier or dissipative curing compound is believed to have been present, use biodegradable etching gel after mechanical preparation methods.

TOPCOAT OVER A NEW COATING SYSTEM: Ensure the previous layer has cured enough to receive another layer, shows no indication of blushing and has NOT exceeded the recoat window. Correct any surface imperfections in the previous layer prior to topcoating. It is highly recommended to degloss the surface of epoxy and other prior layers to remove surface imperfections and to achieve ideal intercoat adhesion between layers, especially in wheeled traffic environments or if the previous layer has cured beyond the recoat window. *See Screen/Sanding below for instructions.

TOPCOAT EXISTING FLOOR COATING SYSTEMS: Adhesion to any existing coating system is only as good as the adhesion the existing coating system has to its substrate. Always test to determine the suitability of an existing substrate and mock-ups are highly encouraged. Allow the mock-up to cure for no less than 1 week before performing adhesion testing, such as a tape test or using an Elcometer. To verify the existing coatings bond strength to its substrate, follow ASTM D 4541 using an Elcometer to determine an in-situ direct tensile pull-off strength greater than 250 psi (1.7 MPa) to pass the test. Once the existing coating system has been deemed to be well bonded and sound, thoroughly degrease as necessary using **CEM's Oil Stop** prior to diamond grinding with 100 to 150 grit diamonds or sanding the entire surface with 80 to 120 grit sandpaper or screens to a uniformly dull finish. Ensure no shiny areas remain then thoroughly vacuum and tack rag the entire surface with Acetone.

BARE CONCRETE: PRIMING REQUIRED EXTERIOR.

CEM Polyurea MCU-600 may be used to seal stain which has been applied to a properly prepared substrate after the stain has cured for a minimum of 24 hours.

Diamond Grind – Use 40 to 80 grit metal bond diamonds with an appropriate industrial, weighted head floor grinder to thoroughly remove the concrete surface until uniformly white. Do NOT use resin bond diamonds to prepare concrete to be sealed due to the risk of resin residue transfer to the concrete surface and potential for fisheyes or a bond breaker.

Screen/Sanding – Mechanical abrasion is highly recommended for CEM Polyurea MCU-600 to properly adhere to a surface using 100 to 120 grit sand paper or screens (but not courser) attached to an orbital floor machine to a uniformly dull surface with no remaining shiny areas then cleaned to remove all dust/debris prior to receiving a topcoat of CEM Polyurea MCU-600 f (Courser grit sandpaper or screens are less effective any deglossing and achieving a fine scratch pattern). Tack rag the surface with a solvent (i.e. Acetone) and a white, clean cloth or microfiber mop.

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JOINTS, CRACKS & PATCHING: Honor expansion joints at the finish floor elevation. Follow ACI 224.3R-95: Joints in Concrete

Construction guidelines for proper filling of construction and control joints. Cut all joints and moving cracks open with a Diamond cutting blade and fill with an appropriate semi-rigid joint filler, prior to priming the substrate. Honor the joint at the surface after the coating is applied then fill with an appropriate joint filler can lessen joint telegraphing. CEM Polyurea MCU-600 may be applied as a topcoat over semi-rigid epoxy joint fillers but is NOT recommended over caulking, Polyurea, silicone, urethane or other flexible joint fillers.

ACI recommends allowing a concrete slab to cure for a minimum of 60-90 days or longer to allow the slab to shrink and acclimate to the intended joint width thus reducing the risk of joint wall separation from the joint filler. Cooler climate applications such as freezer and coolers must be brought up to and held at a minimum of 45°F substrate temperature for no less than 10 days prior to as well as 7-10 days after filling with an appropriate semi-rigid joint filler, ideally longer if possible.

Patching of chips, gouges, etc. may be repaired with a variety of different, compatible coating materials. (Decorative Concrete Applications).

Ensure patching products are hard enough to walk on without the risk of damage before proceeding with subsequent sanding and coatings. Should the surface of the concrete require extensive resurfacing or repairs, please contact CEM Coatings Group, Inc. for more recommendations based on the site conditions.

PRIMING:

Exterior Applications – PRIME FIRST

- Vehicular / Castor / Heavy Traffic Applications = CEM's SPAR FC-100, SPAR RC-200
- Commercial Applications (Ask for Recommendation)
- Residential Applications (Ask for Recommendation)

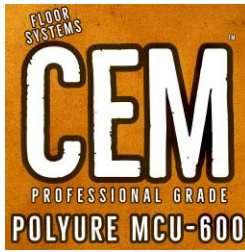
CEM Polyurea MCU-600 may be used directly over stain which has been applied to a properly prepared substrate.

Priming Interior Applications Exposed to Wheeled Traffic –

Once prepared, prime the concrete to achieve the best looking end result and optimal adhesion, allow the primer to dry then degloss the surface of the prior layer using an Orbital floor machine with 100 to 120 grit sanding screens or sandpaper then clean and vacuum prior to topcoating. *See individual product data sheets for more in-depth details.

MIXING: CEM Polyurea MCU-600 is ready-to-use, however, it should be stirred prior to use with a paint stir stick or a clean paint mixing paddle attached to a low speed drill (≤450 RPM) for about 30 seconds.

For Low Sheen – add 1 unit of CEM's LSA-300 Low Sheen Additive to 1 gallon of CEM Polyurea MCU-600 then mix using a low-speed drill (≤450 RPM) with a paint paddle and mix for 2 to 3 minutes. Avoid whipping air into the mixture.



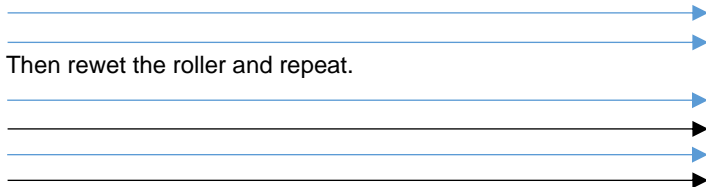
Product Data Sheet and Application Guide

APPLICATION: CEM Polyure MCU-600 is strictly a finish topcoat product intended for no more than 5 mils and will blister if applied too thick. Any imperfections, sanding marks/swirls, scratches, gouges, etc. that can be felt by hand or catch a finger nail when pulled across the area in the prior layer may transfer through this finish due to the minimal thickness of CEM Polyure MCU-600 in a single coat application. Surface defeats are purely aesthetic and pose no threat to the long term performance of the coating system.

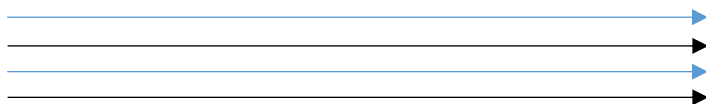
NOTE: DO NOT TURN THE MIXING VESSEL UPSIDE DOWN ON THE SUBSTRATE TO ALLOW THE RESIDUAL PRODUCT TO DRAIN ONTO THE FLOOR.

Best practice is to pour the mixed contents into a tall paint tray, such as a [Wooster® Wide Boy™](#) 5 gallon paint tray, or similar, then dip the 3/8" or 1/4" nap roller into the mixture coat the roller head then roll off any excess into the paint tray avoiding liquid build-up on the sides of the roller caps and/or the frame.

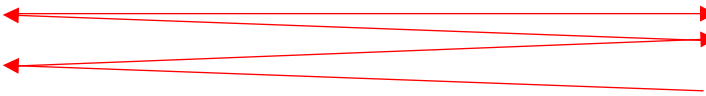
Roll out two parallel pathways roughly 8 to 10 feet in length.



Then rewet the roller and repeat.



Next, cross roll in a V-shaped pattern starting at one of the lines on the end working across the area while overlaying one side of the roller to connect and evenly place the Polyure MCU-600 ensuring a uniform film thickness.



Finish by extending the roller out to the furthest point of this area and pull back across the surface with light pressure in a straight line to remove roller marks and overlap each pass by 1/2" continuing across the entire section.



Occasionally use the roller cover to remix the filler into the liquid in the paint tray. Ideally every 20 minutes.

On larger projects, it is recommended to have a separate person perform for each stage of the product placement, V-roll and finishing process to ensure productivity and a uniform appearance to avoid roller lines.

If the appearance is less than unsatisfactory, repeat the finish roll process again until a satisfactory appearance is achieved. Continue until the entire area desired is topcoated and allow to cure.

COVERAGE: CEM Polyure MCU-600 is intended for thin, topcoats between 2.5 to 7 mils only (WFT). *DO NOT APPLY as a Gloss at thicker than 225 sq.ft. per mixed gallon (WFT) in a single layer to avoid fogging or bubbles in the film.*

Low Sheen Best Practice - Apply CEM Polyure MCU-600 with CEM's LSA-300 Low Sheen Additive via dip and roll method out of a paint tray at a rate of 400 to 550 sq.ft. per gallon over previous coated layer / primer.

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SLIP RESISTANCE: CEM Coatings Group, Inc. recommends the use of angular slip-resistant aggregate in all coatings that may be exposed to wet, oily or greasy conditions as well as any condition where increased traction may be necessary. It is the contractor and end users' responsibility to determine the appropriate traction needs and footwear necessary for the conditions as well as setting performance parameters prior to beginning the application, testing to determine parameters have been met upon completion to achieve the end users documented safety standards.

Mock-ups are highly recommended as part of the evaluation process to determine the appropriate amount of slip-coefficient necessary for the environment.

MAINTENANCE: *The coating system must be allowed to cure for no less than one week before using any mechanical cleaning equipment on the surface and no less than 48 hours before neutral cleaner or water exposure. This includes auto-scrubbers, swing buffers, sweepers, etc. Only dust and wet mopping may occur the first week.*

Dust mopping, removal of debris and regular cleaning is crucial to maintaining the aesthetics of the coating and obtaining the maximum life span of the floor coating system. Cleaning cannot occur too often and inefficient cleaning will cause the floor to wear out prematurely and possibly stain or discolor depending on what comes in contact with the floor. Spills should be removed quickly. *Avoid the use of Polypropylene or abrasive bristle (Tynex®) brushes as these brushes will cause the development of scratch patterns and lessen the sheen.*

To maximum your investment with proper floor care and maintenance, remove all particles that may scratch and/or dull the floor coating using the least aggressive method necessary to clean the floor.

It is good practice to develop a floor maintenance schedule to be performed at the end of each shift and a set day per week or month for heavy cleaning:

- Daily = Sweep and dust mop or water only mopping/auto-scrubbing; spot clean spills and oils
- Weekly or Monthly = Scrubbed once per week or month depending on the amount and type of soils present.

Health Department or DEA regulations may necessitate more frequent and stringent cleaning practices as will areas more prone to oils, inks, chemicals, etc. on the floor surface.

DETERGENT: Always use the least aggressive detergent necessary to remove the residue. A detergent or similar, may be used for general purpose cleaning. CEM's Oil Stop or similar degreaser, for more degreasing and heavy duty weekly or monthly cleaning.

Caution: Do not drag or drop heavy objects across any floor, including coatings as scratching, gouging or chipping may occur to the concrete or the coating itself. This includes the tip of the forks on a forklift, nails protruding from a pallets, etc.

Avoid spinning tires on a coated floor surface as the heat created from the friction of a spinning tire will quickly soften the coating causing permanent damage.

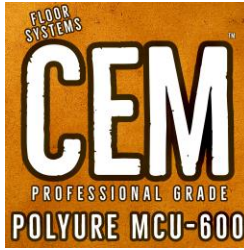
Should a gouge, chip or scratch occur, touch-up the damaged areas immediately to avoid chemical or water intrusion to the concrete which could create additional damage. A thin layer of clear nail polish to the damaged area will provide some minimal protection until the area can be properly repaired.

Rubber tires are prone to plasticizer migration, especially aviation tires and high performance car tires. Plasticizer will stain coatings and commercial flooring leaving an amber to yellow-like stain that can be permanent. This can be more noticeable where aircraft or vehicles are stationary for longer periods of time, more so in non-climate controlled environments such as aircraft hangars with lighter colored floors. To avoid plasticizer staining, use a piece of Plexiglas® or LEXAN® panels, cut a few inches in diameter larger than the tires that will rest on the panels, between the floor and the contact point of the tire when storing rubber tired vehicles on any floor, including floor coating systems. Some tire stains can be removed if cleaned before a set-in stain occurs using a d-Limonene based degreaser with mild agitation via an orbital, low speed floor machine.

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Liability is limited to replacement of defectively manufactured product of the same type and cost of the originally purchased product upon presentation of a valid, fully paid invoice at the time of a claim. No warranty shall be granted for outstanding invoices or for accounts with unpaid balances until paid in full. No damages, whether consequential, liquidated or other, shall be provided



Product Data Sheet and Application Guide

under this Limitation of Liability and Limited Warranty. Should a product defect be suspected at the time of application, cease use of the product immediately and notify CEM Coatings Group, Inc. for investigation as you will be responsible for the cost to repair or replace any work performed with product(s) suspected of defect. Record batch codes and save all products you purchased in order for any warranty to occur along with the invoice that matches said quantity.

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