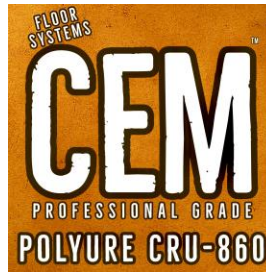


Single Component,
Solvent-based,
Aliphatic
Chemical Resistant
Polyurethane Topcoat



Product Data Sheet

DESCRIPTION: CEM Polyure CRU-860 a High Gloss, Aliphatic, High Performance, Single Component, Solvent-borne Moisture Cured Polyurethane topcoat which yields a highly light reflective, smooth finish with U.V. Stability and good gloss retention.

CEM's Polyure CRU-860's long working time, good gloss retention and clarity making it a good choice for aircraft hangar floors, as a gloss topcoat over CEM's Metallic & Luster coating systems and in moderate traffic environments which desire a high gloss finish.

For solid colors, CEM's Polyure CRU-860 accepts CEM Color Packs (sold separately). For a low sheen finish, add CEM's Low Sheen Aluminum Oxide Powder Additive (sold separately).

RECOMMENDED AS A FINAL TOPCOAT FOR:

- Industrial, Commercial & Retail Environments
- Aircraft Hangar Floors
- Showrooms
- Museums
- Pharmaceutical Floors
- Interior Decorative Concrete
- Metallic & Luster

HIGHLIGHTS:

- Good Gloss Retention & Light Reflectivity
- High Performance – Improves service life of coating system
 - Abrasion Resistant – Very Durable
 - Chemical & Stain Resistant
- U.V. Stable, Aliphatic Polyurethane
- Long Working time
- Easy to Clean
- Resistant to Hot Tire Pickup
- Less Odor than Traditional Solvent-based, Moisture-Cured Polyurethanes
- VOC compliant in most regions <99 g/L
- Meets FDA & USDA standards for flooring

STORAGE: Indoors between 55°F (12.7°C) to 95°F (35°C)

SUBSTRATE TEMPERATURE: 55°F (12.7°C) to 95°F (35°C) with 30% to 75% Humidity.

*Do NOT Apply below 25% Ambient Humidity

SHELF LIFE:

6 Months in original, unopened containers;
Use within 30 days once opened

AVAILABLE KIT SIZES:

1 Gallon Jug
5 Gallon Jug

SHEEN: Gloss;

Optional CEM's LSA-300

Low Sheen additive (sold separately)

= use 1 jar per gallon (up to 2 lbs. per gallon)

COLOR: Clear, Transparent;

Optional Colors (sold separately)

= 10% to 20% ISC by volume

CURE TIMES (@50% Humidity):

*Cure time is affected by temperature and humidity.

	72°F	90°F
Pot-Life	Ready-to-Use	Ready-to-Use
Working Time	2 to 2 ½ hours	1 hour
Tack Free	3 ½ to 4 hours	2 ½ hours
Recoat Window	N/A (Sand prior to recoat)	
Foot Traffic	24 hours	18 hours
Heavy Traffic (i.e. forklift)	36 hours	24 hours
Full Chemical Resistance	7 to 14 days	6 to 12 days

CURED COATING PROPERTIES (DRY FILM):

PROPERTY	TEST METHOD	RESULTS
Abrasion Resistance mg/loss *Taber Abraser	ASTM D4060	23 mg loss (Gloss)
Hardness (Pencil)	ASTM D3363	2H
Adhesion to Steel – Pull Strength, psi (MPa)	ASTM D4541	2,248 psi (15.5 MPa)
Adhesion to Concrete	ASTM D4541	Concrete Fails
Conical Mandrel – Resistance to Cracking	ASTM D522	Pass
Water Absorption 24-hour immersion test	ASTM C413	<0.02%
Gloss (60°)	ASTM D1455	±85 to 95 (Gloss) ±40 (Low Sheen)
Viscosity – @ 77°F	ASTM D2196	820 cP
Volume Solids (Clear)	ASTM D2196	86%
VOC's	ASTM D3960	<99 g/L (Clear)

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

APPROXIMATE COVERAGE (DRY FILM):

Coverage Equation: $1604 \div \text{milage} \times 0.86 = \text{Dry Film Thickness}$

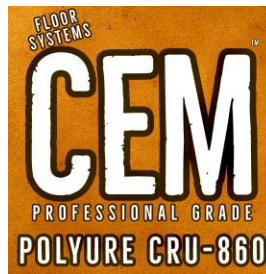
*To avoid fogging or foaming, Do NOT Exceed 5 mils in a single coat

**Coverage varies due to thickness, floor profile & substrate absorbency

HIGH GLOSS Wet Mil Thickness (Dry Film Thickness)	Approximate Yield per kit per sq.ft.	
	1 Gallon	5 Gallon
4 mils (3.44 mils)	400 sq.ft.	2,000 sq.ft.

with LSA-300 Wet Mil Thickness (Dry Film Thickness)	Approximate Yield per kit per sq.ft.	
	1 Gallon	5 Gallon
3 mils (2.58 mils)	535 sq.ft.	2,675 sq.ft.

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Typical Chemical & Stain Resistance

Covered Spot Test [ASTM D1308] - 3 mil film after 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	w/ A/O 325
Acetic Acid 25% (Vinegar)	E	E
Citric Acid 10%	E	E
Lactic Acid (Milk)	D	D
Phosphoric Acid 85%	D	D
Sulfuric Acid 25% (Battery Acid)	D	G
Sulfuric Acid 98%	NR	NR
Hydrochloric Acid 32% (Muriatic)	E	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	E	E
Isopropyl Alcohol 91%	E	E
Methanol	E	E
SOLVENTS		
Acetone	E	E
d-Limonene	E	E
MEK	E	E
Methylene Chloride	E	E
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	E	E
MISCELLANEOUS		
Coffee	E	E
Coke®	E	E
Dish Detergent (Dawn®)	E	E
Hydrogen Peroxide 3%	E	E
Ketchup	E	E
Monster Energy® Drink	E	E
Mustard	E	E
Povidone-iodine (BETADINE®)	E	E
Tide® 1%	E	E
Windex® (Ammonia Based)	E	E
Wine - Red	E	E

- Prevent contact with eyes

LIMITATIONS:

- Primer or coating system is required prior to applying. NOT RECOMMENDED for application to direct-to-concrete applications
- For industrial & wheeled traffic / fork lift traffic conditions, a minimum of a ICRI CSP 3 profile is required for mechanical preparation
- Does NOT block Ultra Violet light radiation 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 applied thicker than 5 mils or when applied over a hot substrate
 - Do NOT Apply in direct sunlight
 - Turn off radiant in-floor heating a minimum of 1 hour prior to & for 24 hours after application
- Do NOT install coatings when the Dew point is within 5° of the temperature
- Application is NOT recommended above 80% Humidity at time of install
- Do NOT apply when ambient humidity is expected to be below 30% within the first 5 hours of cure to avoid surface defects
- CEM's LSA-300 Aluminum Oxide is not a traction / slip resistant additive. Instead use CEM's Resin Sand or similar to increase slip resistance

PRECAUTIONS / WARNING:

Contains Solvent - Material is Flammable

- Extinguish all flames, pilot lights & electric motors until all vapors are gone & the coating is hard
 - Keep away from sparks, heat & open flame
 - Use 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: Substrate temperature & materials must be maintained between 55°F (12°C) to 95°F (35°C) with between 30% to 75% Ambient Humidity for 24 hours prior to & 24 hours after installation.

CHECK FOR MOISTURE: 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.

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.

Smith Paint Products 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 & a proper course of remediation. Contact Smith Paint Products for remedial recommendations while following local, state & federal regulations regarding contaminant & disposal.

OIL CONTAMINATION: Use CEM's Oil Stop to remove petroleum, synthetic & food oils, from the surface of the concrete prior to mechanical preparation. Once the concrete is mechanically prepared, an Oil Stop primer may be utilized to encapsulate any remaining oil within the concrete.

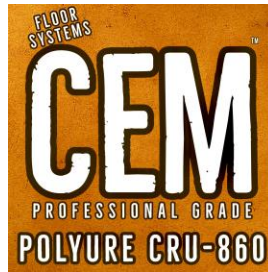
NECESSARY TOOLS and EQUIPMENT:

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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

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- Plastic Sheeting or Ram Board to cover floor for mix station
- Low speed 1/2" drill (Variable Speed ≤450 rpm) with paint mixing paddle
- 5-gallon Plastic Mixing Buckets
- Premium, Non-Shed 1/4" 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: Thoroughly sand to degloss surface, vacuum then Acetone tack rag clean prior to application of CEM's Polyure CRU-860. Do NOT Use alcohol to clean substrate due to risk of moisture being drawn to the substrate surface from the air. *See Screen/Sanding below for instructions.

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

CLEANING – Detergent scrub 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 a degreaser.

TOPCOAT OVER A NEW COATING SYSTEM – Ensure the previous layer has cured enough to receive another layer and shows no indication of blushing. Correct any surface imperfections in the previous layer prior to topcoating. Sand to degloss the surface of previous layer to remove surface imperfections and to achieve ideal intercoat adhesion between layers.

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. Mock-ups are highly encouraged. Allow the mock-up to cure for at least 1 week before adhesion testing, such as a tape test or using an in-situ Elcometer® tensile bond tester.



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 (*but not courser*) leaving a uniformly dull finish with no remaining shiny areas then vacuum and solvent tack rag using Acetone prior to topcoating.

BARE CONCRETE – NOT INTENDED FOR USE DIRECTLY OVER BARE CONCRETE, priming required. CEM's Polyure CRU-860 must be applied as a thin topcoat over a floor coating system or a primed substrate. Acceptable primers (including but not limited to):

- EPIX QCWB-60 Fast Cure Waterborne Epoxy Primer
- EPIX CR-100 Chemical Resistant Industrial Epoxy
- SPAR FC-100 Fast Cure Polyaspartic
- SPAR FC-200 Extended Working Time Polyaspartic

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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 joint filler prior to priming the substrate. Honoring the joint at the surface after the coating is applied then filling with an appropriate joint filler can lessen joint telegraphing. CEM's Polyure CRU-860 may be applied as a topcoat over construction or control joints but is NOT recommended over caulking, silicone, elastomeric urethane, Polyurea or other flexible joint fillers.

ACI recommends allowing a concrete slab to cure for a minimum of 60 to 90 days or longer to allowing 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 to 10 days after filling with an appropriate semi-rigid joint filler.

Patching chips, gouges, etc. may be repaired with a variety of different, compatible coating materials, ask a representative.

Ensure repairs are hard enough to walk on without the risk of damage before proceeding with subsequent sanding or diamond grinding followed by resinous coating system of choice. 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.

MIXING:

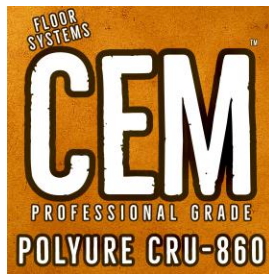
GLOSS – CEM's Polyure CRU-860 is ready-to-use, however, it should be stirred with a clean paint stir stick for about 30 seconds before applying as a clear, gloss topcoat.



SOLID COLOR or LOW SHEEN FINISH – Mechanically mixed for 2 to 3 minutes using a 1/2" low speed (<450 RPM) drill with a paint mixing paddle when used as a solid color or low sheen finish. Avoid whipping air into mixture.



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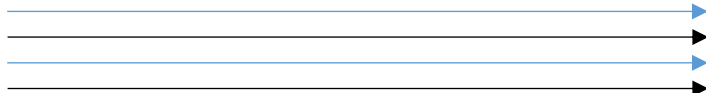
APPLICATION: CEM's Polyure CRU-860 is strictly a finish Topcoat product intended for no more than 5 mils and will blister if applied too thick. Any imperfections, sanding marks/swirls, scratches, gouges, etc. that can be felt by hand or catch a fingernail when pulled across the area in the prior layer may transfer through this finish due to the minimal thickness of CEM's Polyure CRU-860 in a single coat application. Surface defects are purely aesthetic and pose no threat to the long-term performance of the coating system.

NOTE: 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. **DO NOT POUR DIRECTLY ON THE FLOOR.**

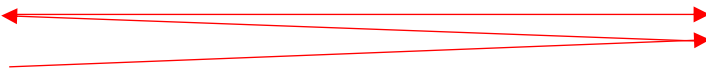
Roll out two parallel pathways roughly 8 to 10 feet in length.



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 overlapping 1/2" over the previous pass while 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" in to the wet edge of the prior pass continuing across the entire section.



Occasionally, replace it with a fresh, new roller cover when it becomes contaminated with debris.

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

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

COVERAGE: CEM's Polyure CRU-860 is intended for thin, topcoats only. **DO NOT APPLY** as a Gloss at thicker than 375 sq.ft. per gallon and no less than 425 sq.ft. per mixed gallon (approximately 4 mils wet) in a single layer to avoid fogging, orange peel or CO₂ bubbles in the film.

Low Sheen – Apply CEM's Polyure CRU-860 with CEM's LSA-300 Low Sheen Additive via dip and roll method out of a paint tray at a rate of 500 to 600 sq.ft. per gallon over previous coated layer OR

OO NOT APPLY to bare / unprimed concrete.

SLIP RESISTANCE: CEM Coatings Group 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.

Do NOT Use CEM's LSA-300 Aluminum Oxide for additional traction as it is too fine to be considered "Anti-skid". Instead use CEM's Resin Sand or similar 20 to 60 mesh when using a traction additive.

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

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

To maximum your investment with proper floor care & 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 & a set day per week or month for heavy cleaning:

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

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

DETERGENT: Always use the least aggressive detergent necessary to remove the residue. A neutral type or similar, may be used for general purpose cleaning. CEM's Oil Stop, or similar degreaser, for more degreasing & 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 pallet, etc.*

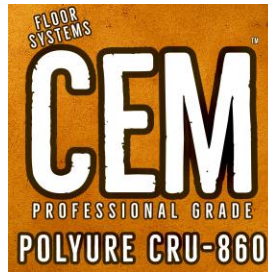
Avoid spinning tires on a coated floor surface as the heat created from the friction of a spinning tire will quickly soften the coating causing permanent damage.

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 & high-performance car tires. Plasticizer will stain coatings & commercial flooring leaving an amber to yellow-like stain that may 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 & 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 & 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 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 & 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 & save all products you purchased in order for any warranty to occur along with the invoice that matches said quantity.

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